Intergovernmental Agreement for Remedial Investigation and Source Control Measures

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# Outfall Basin 22 Dry-Weather Flow, Inline Solids, and Sediment Investigation

Technical Memorandum No. OF 22-2 City of Portland Outfall Project ECSI No. 2425

July 2015

PREPARED BY





ENVIRONMENTAL SERVICES CITY OF PORTLAND working for clean rivers



1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204 • Nick Fish, Commissioner • Michael Jordan, Director

TECHNICAL MEMORANDUM No. OF22-2

# **Outfall Basin 22 Dry-Weather Flow, Inline Solids, and Sediment Investigation**

TO:	Mike Romero, Oregon Department of Environmental Quality (DEQ) Lt. Chad D. Thompson, United States Coast Guard (USCG)
THROUGH:	Matt Criblez, City of Portland, Bureau of Environmental Services (BES)
FROM:	Linda Scheffler, BES
COPIES:	Mike Greenberg, DEQ Alex Liverman, DEQ
DATE:	July 15, 2015
SUBJECT:	Portland Harbor Source Investigations

# Introduction

This technical memorandum presents the results of the City of Portland source investigation, conducted between May 27<sup>th</sup> and June 3<sup>rd</sup>, 2015, in Outfall Basin 22. The City's BES Portland Harbor program conducted this investigation in response to recurring reports of oil sheen in the vicinity of Outfall 22 (OF-22) and recent discussions with the USCG, DEQ, BES Pollution Prevention staff, and representatives from industrial sites in the basin.

Basin 22 is located on the west side of the Willamette River in the Willbridge area, which largely consists of bulk fuel terminals that have been in operation since the early 1900s. The basin includes drainage from Forest Park, a small residential and commercial area, Highway 30, and an industrial area between Highway 30 and the river. The majority of the developed area consists of industrial sites that are evaluating contaminant pathways to the river under DEQ Cleanup Program oversight to determine whether additional source controls are needed. Due to the nature and extent of site-related contamination, Cleanup Program work has included evaluation of stormwater and preferential groundwater discharges into and along the Basin 22 conveyance system. Remedial investigation of the bulk fuel terminal area dates to the late 1970s, and has entailed site-specific work under individual agreements with DEQ and collaborative work on the groundwater concerns by three of the terminals under a Consent Order with DEQ for the Willbridge Bulk Fuel Area. In 2013 under an Intergovernmental Agreement (IGA) with DEQ for investigation of sources to City outfalls in Portland Harbor (DEQ, 2003), the City concluded that all major contaminant sources in the basin had been identified and would be controlled by DEQ Cleanup and Water Quality programs (BES, 2013).

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Frequent observations of petroleum sheen at OF-22 indicate that current controls at known sources are not adequate and/or that there are unknown sources present. The objective of the investigation described in this memorandum was to identify specific source areas and pathways to the Basin 22 conveyance system that warrant further investigation, control, and/or enforcement under City, state, or federal authority. Other investigations contributing to this specific City investigation include ongoing work by the USCG, the Willbridge-area sites (Sites), and the City to identify an intermittent source of oil sheen to OF-22.

Investigation results indicate that preferential groundwater pathways to the Basin 22 conveyance system are present and that contaminants present in dry-weather flow entering the municipal system are a potential source of sheen observed at the outfall and warrant control. System investigation also identified an area of the system where inline solids indicate that a historical release occurred. Source investigation activities, findings, and recommendations are described in detail below.

# Background

#### Conveyance System Configuration and Drainage Basin

OF-22 discharges to the west side of the Willamette River at approximately River Mile 7.8 (see Figure 1) in an area known as Willbridge Cove, and drains approximately 95 acres. Basin 22 includes a portion of Highway 30 (i.e., major transportation land use). Land use in the basin on the west side of Highway 30 (NW St. Helens Road) is predominantly open space (Forest Park), with a small mixed commercial and residential area. Land use on the east side of NW St. Helens Rd. is heavy industrial.

The U.S. Environmental Protection Agency (EPA) has designated the inriver area in the vicinity of OF-22 as an Area of Potential Concern (AOPC 16) based on elevated concentrations of metals, polycyclic aromatic hydrocarbons (PAHs), and other contaminants in river sediment (EPA, 2010). In addition to OF-22, 11 non-City outfalls also discharge to AOPC 16 in the area of Willbridge Cove, and there are three docks within the cove. Due to a history of releases from Sites to the outfall, the Sites installed and maintain a containment boom around OF-22 as part of ongoing sheen response activities (ARCADIS, 2009a) and constructed a cutoff collar and liner in the portion of the conveyance system between NW Front and the outfall to control preferential migration of contaminated groundwater into and along this segment of Basin 22.

The conveyance system consists of two main branches (i.e., NW Doane Avenue and NW Front Avenue) that combine at a manhole east of NW Front Avenue and discharge to OF-22 via a 60-inch-diameter pipe. Surface drainage from Forest Park passes through a water quality swale before joining with stormwater flow from the developed area west of Highway 30 and drainage from the roadway. This drainage then flows into the NW Doane Avenue branch of the system, which serves the adjacent bulk oil terminals (i.e., Chevron Willbridge Distribution Terminal and Phillips 66 Company). The NW Front Avenue branch extends south from NW Doane Avenue and serves the former Chevron Asphalt facility on the west side of NW Front and the McCall Oil/Brenntag Pacific facilities on the east side of NW Front.

#### **Potential Petroleum Source Areas**

Known potential source areas include six DEQ Cleanup Program sites in Basin 22, as listed in DEQ's Environmental Cleanup Site Information (ECSI) database. Four of these sites are bulk fuel and/or chemical storage facilities (Chevron-Willbridge Distribution Terminal, Chevron USA Asphalt, Unocal – Willbridge Terminal/Phillips 66, and McCall Oil). Small portions of the remaining two sites (Oregon Department of Transportation – ODOT and Burlington Northern Santa Fe Willbridge Yard) are included in the basin. General locations of these sites are shown on Figure 1, spatial extent of each site is shown on Figure 2, and known piped connections from each site to the Basin 22 conveyance system are shown on Figure 3.

Two of the six ECSI sites (Chevron USA Asphalt – ECSI #1281 and McCall Oil – ECSI #134) completed a Source Control Evaluation (SCE) under DEQ oversight, and received Source Control Decisions from DEQ (DEQ, 2010 and 2014). These decisions conclude that contamination at these sites has been characterized and controlled to the extent feasible and that these sites are not significant ongoing sources of contaminants to the Willamette River. SCEs are underway at the four remaining ECSI sites to identify all potentially complete pathways to the river, to determine whether site contaminants are migrating offsite via those pathways, and to implement source controls where needed.

Industrial sites that are covered by National Pollutant Discharge Elimination System (NPDES) stormwater regulations also were considered as potential sources of sheen to the City conveyance system, because permit coverage is based on the nature of the industrial operation and the potential for stormwater to be exposed to pollutants associated with industrial operations. Current industrial stormwater permittees within the basin are shown on Figure 1.

The area west of NW St. Helens Rd. is not likely to contain significant sheen sources. The majority of the drainage in this area is from Forest Park, and the developed area is a mix of residential and small commercial properties. City review of stormwater data collected by the Sites (ARCADIS, 2012a) to represent basin stormwater coming into the system upstream of terminal connections did not indicate that significant contaminant sources were present in this portion of the basin (BES, 2012a).

#### **Previous Investigations**

- The City completed an inline solids source investigation in Basin 22 in 2006 under an ongoing IGA with DEQ (DEQ, 2003), to determine whether there were major contaminant sources in the basin (BES, 2008). Results indicated that metals (copper and zinc), PAHs, and bis(2-ethylhexyl)phthalate sources were present, but that exceedances of DEQ/EPA Joint Source Control Strategy (JSCS) screening levels were relatively low (DEQ/EPA, 2005).
- In 2007-2008, the Lower Willamette Group collected stormwater and sediment trap data in Basin 22 at a point representing all piped discharges to the basin (Anchor and Integral, 2008), and the City evaluated these data to determine if the results changed the City's conclusions about the need for additional source tracing. Based on the results of these data and site investigation results, the City concluded that sources had been identified, that all identified sources were in an appropriate program for subsequent Site investigation and control, and that further City source tracing in Basin 22 was not needed (BES, 2010).

• In 2010-2011, the Chevron Willbridge and Unocal-Willbridge Terminal (now Phillips 66) sites jointly collected stormwater upgradient and downgradient of the Terminal to meet DEQ Cleanup Program requirements (ARCADIS, 2012a). Results of those evaluations are still under DEQ review.

#### **Recent Sheen Report Response**

On April 22, 2015, BES representatives from the Environmental Compliance and Portland Harbor programs met with USCG, DEQ, and Site representatives to discuss the recent history of sheen observations at OF-22. Sites monitor the outfall and surrounding area and report sheens observed at OF-22 to DEQ and the City under the *Outfall Inspection and Sheen Response Plan* (ARCADIS, 2012b) approved by DEQ. The City was not involved in the development or approval of the plan. When sheens are observed, Site representatives investigate possible Site-related source areas. The BES Spill Protection and Citizen Response (SPCR) program also conducts investigations when it receives reports of sheens that may be related to discharges from OF-22. Analytical data have been collected by the USCG, the City SPCR Program, and Sites as part of sheen response and are managed by those respective entities.

As an outcome of the April meeting, BES agreed to coordinate with the USCG on a targeted comprehensive investigation of the Basin 22 system in an effort to identify specific sheen sources.

# Sheen Source Investigation

#### **Investigation Overview**

As part of the Environmental Compliance sheen response effort, the City conducted video surveys of the NW Doane Avenue branch, the NW Front Avenue branch, and the main line between NW Front Avenue and the outfall in April and May 2015. The purpose of the video surveys was to identify specific segments of the system where further investigation was warranted (e.g., suspicious staining or discharges, inline solids accumulation, etc.). Based on a review of the video surveys, the City developed a sampling plan (see Attachment A) to describe forthcoming sheen source investigation and response plans. The investigation activities summarized in this technical memorandum represent a comprehensive three-day effort to look at a variety of potential sources and pathways to the Basin 22 system. Work conducted for this portion of the sheen investigation included: sampling and analysis of 1) sediments immediately adjacent to the outfall pipe; 2) inline solids; 3) dry-weather flow; and 4) wipes of stained areas within the conveyance system. The City analyzed all samples for total petroleum hydrocarbons (TPH) via the NWTPH-HCID method, with quantification of detected petroleum constituents if sample volume was sufficient. In addition, field crews submitted samples of dry-weather flow for PAH analysis via method SM8270-SIM and collected field readings for conductivity.

#### **Field Activities**

#### Sampling Locations and Procedures

BES field crews investigated the outfall and each manhole along the Doane and Front Avenue branches to identify sampling locations for sediment, inline solids, dry-weather flow, and wipes.

Actual locations were selected based on solids and flow availability, evidence of suspicious stains, and knowledge of drainage areas served by connecting laterals. The City conducted the sampling activities consistent with the City's *Amended Programmatic Quality Assurance Project Plan* (BES, 2007a) and *Amended Programmatic Sampling and Analysis Plan* (BES, 2007b) for collection of water and solids samples for the City of Portland Outfalls Project. At some locations, the USCG requested BES field crews to collect split samples or separate samples (e.g., netted sheen samples and/or wipe samples) for analysis by the USCG. This report does not include the results of the USCG analyses. Sampling locations are summarized by sampling matrix in Table 1 and are shown on Figure 4.

Sample collection took place over three days: May 27<sup>th</sup>, May 28<sup>th</sup>, and June 3<sup>rd</sup>, 2015. Field crews began at the outfall and then worked their way up-the-pipe along each main branch from downstream to upstream. Weather conditions on May 27<sup>th</sup> and May 28<sup>th</sup> were dry, with more than two weeks of antecedent dry period (i.e., rainfall < 0.10 inches over each 24-hour period). Shower activity on June 1<sup>st</sup> and 2<sup>nd</sup> resulted in 0.18 inches and 0.11 inches of rain being recorded at the BES Water Pollution Control Laboratory (WPCL) rain gage on those days. Recordable rainfall did not occur during sample collection activities on June 3<sup>rd</sup>. Due to these conditions, flow observations made on June 3<sup>rd</sup> could reflect both stormwater and preferential groundwater discharges from adjacent upland areas.

A total of one outfall sediment sample, fourteen inline solids samples, fourteen dry-weather flow samples, and eleven wipe samples were collected to investigate possible sheen sources to Basin 22. Field crews also collected an equipment blank sample for quality assurance. Photographs of the sampling locations are provided in Attachment B. Field notes taken during sampling activities are provided in Attachment C. Additional details regarding sample collection and analysis are provided below.

#### **Outfall Sediment Sample**

Inspection of OF-22 indicated that the river level was below the elevation of the outfall pipe and that pockets of sandy sediment and iron bacteria were present between the outfall and the river edge (see Photo 2). Chevron maintains multiple booms around the area to which the outfall discharges, and a sheen was evident in the boomed area at the time of sample collection (see Photos 1 and 3). The field crew collected a surface sediment composite sample from the area adjacent to the outfall by collecting three subsamples of approximately equal volume, from three discrete location, homogenizing them into one sample, and filling the sample jars. BES provided a split sample to the USCG.

#### **Conveyance System Samples**

#### **Outfall Main**

Outfall 22

• Dry-weather flow sample from the outfall (dry-weather flow from the outfall is visible in Photo 2).

#### Manhole AAM077

This is the junction of the Doane and Front Avenue branches, and the beginning of the lined section of the system (i.e., groundwater not expected to infiltrate directly to the system between this location and the outfall).

• Three dry-weather flow samples: outgoing line, incoming line from Doane, incoming line from Front (see Photos 4-6).

#### Doane Avenue Branch

#### Manhole AAM080

- Inline solids from main line upstream of manhole (see Photo 7).
- Dry-weather flow from manhole.

#### Manhole AAM075

Two site laterals (Chevron #1 and Phillips #1) connect at this location (see Photos 9-10).

- Two inline solids samples: upstream of manhole in main line and on shelf in manhole (see Photos 11-12).
- Two dry-weather flow samples: main line downstream of manhole and from Chevron #1 lateral. Flow observed in Phillips #1 lateral but not enough volume to sample.
- Three wipe samples due to observance of stains and possible sheen: Chevron #1 lateral, Phillips #1 lateral, and shelf near bottom of manhole invert.

#### Manhole AAM076

- One inline solids sample from outgoing line.
- One wipe sample from small dry stain on underside of sanitary lateral crossing through manhole chamber (see Photos 13-14).

#### Wye APA018

This is a lateral line (Phillips #2) that enters the main line from the south between manholes AAM076 and AAM086 (see Photo 15).

- One dry-weather flow sample from water entering main from space below the Phillips #2 lateral line (i.e., preferential flow along the underside of the lateral line). Floating and suspended black droplets observed in sample (see Photo 16).
- One wipe sample from a dark stain on the upstream side of the Phillips #2 lateral connection.

#### Manhole APA016

Three incoming private lines enter this manhole from the Phillips 66 site and discharge to NW Doane via the APA018 wye.

- One dry-weather flow sample from manhole.
- One wipe sample from stained area within manhole chamber (see Photo 17).

#### Manhole AAM086

• One inline solids sample from outgoing line (see Photo 18).

#### Private manhole to lateral AQB059

Access point to Chevron #2 lateral that has a blind connection to the Doane Avenue main.

- One dry-weather flow sample from manhole (see Photos 19-20).
- Two wipe samples from stained areas around two inlets to private manhole.

#### Manhole AAP794

Point of connection for lateral line from south (Phillips #3).

- One inline solids sample from outgoing main line (see Photo 22).
- Two dry-weather flow samples: one from Phillips #3 lateral (see Photo 21) and one from incoming main line to manhole.

#### Manhole ANV453

Location where two lines from Phillips 66 site converge before discharge to AAP794 (see Photos 23-24).

• Two wipe samples: one from east lateral and one from east side of manhole invert.

Manhole AAP792

Point of connection for lateral line from north (Chevron #3).

• One dry-weather flow sample from Chevron #3 (see Photo 25).

#### Manhole AAP791

Upstream of all bulk oil terminal connections.

- One inline solids sample upstream of manhole in main line (see Photo 26).
- One dry-weather flow sample in manhole (see Photo 27).

#### **Front Avenue Branch**

#### Manhole AAM078

Downstream of all connections to the Front Avenue branch.

- One inline solids sample from incoming main line (see Photo 28).
- One wipe sample from infiltration area around manhole collar (see Photo 29).

#### Manhole AAP799

Point of connection for McCall #3 lateral and historical connections from former Chevron Asphalt facility.

• Two inline solids samples: one from outgoing line and one from incoming inactive 15-inch lateral from the west (see Photos 30-31).

#### Manhole AAP796

Access point on inactive line to which former Chevron Asphalt site had two connections (now abandoned).

• One inline solids sample upstream of manhole in 8-inch lateral from the north (see Photo 32).

#### Manhole AAP800

Current point of connections for Chevron Asphalt site and McCall #5 lateral. Inline solids observed midway up pipe walls, only upstream of manhole.

• One inline solids sample from material caked on pipe walls, upstream of manhole (see Photo 33).

#### Unmapped Catch Basin on South Side of NW Front

Located on the south side of the unpaved portion of the right-of-way (i.e., in the gravel area between the curb and the Chevron Asphalt site). Orientation of discharge line suggests connection to Front Avenue branch between manholes AAP799 and AAP800.

• One inline solids sample (see Photos 37-38).

#### Catch Basin ANF249

Located on the south side of the unpaved portion of the right-of-way, and discharges to catch basin ANF248.

• One inline solids sample (see Photos 39-40).

### Summary of Results

Laboratory results are summarized in Tables 2 through 4 and displayed on Figures 5 through 7. Attachment D includes the laboratory reports and accompanying Laboratory Data Quality Assurance/Quality Control (QA/QC) Review memorandum for each of three sample batches.

The TPH scans detected petroleum hydrocarbons in the outfall sediment sample, three of the seven inline solids samples from the Doane Avenue branch, and all seven of the inline solids samples from the Front Avenue branch. The highest concentrations in solids were found in the Front Avenue branch in a sample collected from the walls of the main line upstream of manhole AAP800.

TPH scans of the dry-weather flow samples indicated that petroleum constituents were present at the outfall and in the Doane Avenue branch (seven of eleven samples) but are not present in dryweather flow from the Front Avenue branch. Subsequent quantification indicated that dieselrange and lube oil-range constituents were present. Quantification of gasoline-range hydrocarbons per the TPH method was not possible in the dry-weather flow samples because separate samples were not collected in the appropriate container for this purpose. However, PAH analysis (per method SM8270-SIM) also was conducted on all dry-weather flow samples. PAHs were detected in all samples, with the highest concentration observed in the Doane Avenue branch at the Phillips #2 lateral connection.

TPH was detected in two of the eleven wipe samples – both on the Doane Avenue branch, and both affiliated with lateral connections from the Phillips 66 facility.

# Data Evaluation

The investigation utilized three sample matrices (sediment and inline solids, dry-weather flow, and surface wipes) to evaluate potential sources of sheen to Outfall 22. Results indicate that petroleum sources to the Doane Avenue and Front Avenue branches are present, and sources are not likely to be present between Front Avenue and the outfall. The dry-weather flow pathway is the primary concern on the Doane Avenue branch. On the Front Avenue branch, field observations and inline solids results indicate that contaminated solids are present from an unknown source near the upper end of the branch. Results from the two branches are evaluated in more detail below.

Laboratory analysts noted difficulty in quantifying petroleum hydrocarbon components in the diesel, lube oil, and gasoline ranges (see Attachment D) due to overlaps of peaks with range patterns. Therefore, in some parts of this discussion, quantified hydrocarbon fractions have been summed into a total TPH concentration.

### **Doane Avenue Branch**

Most inline solids samples from this branch did not have detectable levels of TPH, and total TPH concentrations were <300 milligrams per kilogram (mg/Kg) for the three samples in which hydrocarbons were detected. The ten wipe sample locations on this branch primarily were

associated with lateral connections from the Chevron and Phillips 66 facilities. Two samples, both affiliated with lateral connections from the Phillips 66 facility, indicated the presence of diesel-range hydrocarbons.

Dry-weather flow results and observations are compelling, and indicate that this continues to be a significant pathway to the river via OF-22. Figure 8 displays concentrations of total PAHs in dry-weather flow samples collected during this investigation, plotted on the DEQ guidance curve for total PAHs in stormwater discharged from Portland Harbor heavy industrial sites. The knee of this stormwater curve is at approximately  $1.0 \ \mu g/L$  (micrograms per liter); concentrations above the curve inflection (i.e., on the rising limb) indicate concentrations that are higher than typical concentrations in stormwater from heavy industrial sites. Although Basin 22 data do not represent stormwater flows (i.e., samples were collected during dry-weather conditions), comparison to this curve is a useful line of evidence in determining whether source controls may be warranted. As shown on the curve, concentrations in the main line to the outfall and the Doane Avenue branch are all on the rising limb of the curve. Concentrations at and around the Phillips #2 lateral (see Figure 3) plot off the chart.

Observations made by field crews in the line indicate the presence of groundwater infiltration at all six of the lateral connections from the Chevron and Phillips 66 facilities. Although infiltration was not observed in the Doane Avenue main line, staining and mineral deposits were observed at joints and seams, which may indicate that groundwater infiltrates directly to this branch under some conditions (e.g., higher groundwater elevation). The highest concentrations (total PAHs of 18 and 67  $\mu$ g/L respectively) were observed in and adjacent to the Phillips #2 lateral (see Photos 15 and 16 in Attachment B). In 2008 the Phillips 66 site implemented measures to control groundwater infiltration at this lateral, including lining manhole APA016 (see Photo 17), lining the lateral between the manhole and the junction with the Doane Avenue line, and patching the joint between the Phillips #2 lateral and the main line (i.e., at wye APA018).<sup>1</sup> Field crews observed flow discharging to the Doane Avenue line both from the Phillips #2 lateral and from the outside of the lateral where it joins the Doane Avenue line. The sample collected from the outside of the Phillips #2 lateral had the highest concentration of total PAHs and observable suspended material that resembled petroleum product (see Photo 16).

Elevated total PAHs also were observed in the Chevron #1 and Chevron #2 lateral lines. Flow volume in the Phillips #1 lateral line was not sufficient to collect a sample, and total PAHs in the Chevron #3 and Phillips #3 laterals were on the flatter portion of the DEQ curve.

Table 3 also compares individual PAH concentrations to relevant screening level values (SLVs) for groundwater discharges to Portland Harbor (DEQ/EPA, 2005). SLVs were exceeded in every dry-weather flow sample except in the Chevron #3 lateral sample. The SLV exceedances were up to more than two orders-of-magnitude.

In conclusion, Doane Avenue branch dry-weather flow and inline solids data do not indicate that significant sheen sources are present upgradient of the Willbridge terminal facilities. Elevated PAH concentrations in dry-weather flow being discharged to the Doane Avenue branch from the Chevron and Phillips 66 facilities are potential sources of sheen being observed at the outfall. This pathway has been under investigation at both Sites under DEQ oversight. Investigation

<sup>&</sup>lt;sup>1</sup> Job #EP8554 constructed by Stratus Corporation on behalf of the ConocoPhillips Willbridge Terminal. August 2008.

results indicate that additional source controls are needed to address the preferential pathway to the river via the Basin 22 conveyance system.

#### **Front Avenue Branch**

In the Front Avenue branch, one dry-weather flow sample, one wipe sample, and seven inline solids samples were collected and analyzed. The dry-weather flow sample and the wipe sample were both collected at the downstream end of the branch, and neither sample indicated significant presence of petroleum hydrocarbons (see Tables 3 and 4 and Figures 6 and 7). The inline solids results indicate that a petroleum hydrocarbon source (or sources) is present in the upper end of the branch (see Table 2 and Figure 5).

Three inline solids samples were collected from the main line; petroleum hydrocarbons were detected in all three samples, at concentrations ranging from 190 mg/Kg at the manhole downstream of all connections to the branch (manhole AAM078) to 123,000 mg/Kg in a sample collected upstream of manhole AAP800. An elevated concentration (11,400 mg/Kg) was also detected in a sample collected in an inactive lateral connection to manhole AAP799, (downstream of AAP800) but comparison of chromatograms from the TPH analyses confirms that material in the lateral was likely from a similar source as the source to manhole AAP800 (i.e., observed solids were deposited into the lateral from the upstream main line, not from the lateral itself). Chevron confirmed via video surveys that all connections to the storm line between manholes AAM084 and AAP796 have been abandoned with permanent caps (ARCADIS, 2009b). Therefore, because this lateral line is inactive, any solids present in this lateral originated from degradation of the piping and invert materials and/or deposits of solids from flows to manhole AAP799 from points upstream.

At the location where the solids sample with the highest TPH concentration was collected (upstream of manhole AAP800), the solids were caked on the walls of the main line (see Photo 33, Attachment B), rather than being part of the bedload typically found in the bottom of the pipe, such as was observed at manhole AAP799 downstream of this location (see Photo 30). This unique position within the pipe indicates that these solids were likely deposited during a large discharge event. The segment of the main line immediately downstream of manhole AAP800 did not have this same pattern of oily solids on the pipe walls (see Photo 34), and the only other upstream manhole (AAP802) did not have the same solid material present at or downstream of the manhole (see Photos 35 and 36). The pattern on the pipe walls upstream of AAP800 suggests that there may have been floating petroleum product in a higher-volume discharge to the system (e.g., spill, tank release, etc.) that resulted in material adhering to the pipe walls as the flow subsided. City spill records did not indicate recent large releases from the two facilities (McCall/Brenntag and Chevron Asphalt) that discharge at and upstream of this location (see Figure 3); however, not all illicit releases are reported to the City.

The City also investigated two catch basins on the south side of NW Front Avenue, in a gravel portion of the right-of-way between manholes AAP799 and AAP802 (see Figure 4).<sup>2</sup> Trucks have been observed parking in this area (see Photo 41) so these inlets were identified as potential pathways for contaminated solids to enter the storm system on the Front Avenue branch.

 $<sup>^{2}</sup>$  A review of construction drawings for the Front Avenue line did not include these catch basins. No record of construction or connection to the Front Avenue line has been found.

Analytical results indicate that petroleum hydrocarbons are present (360 mg/Kg total TPH) but are not at the elevated concentrations similar to those found at main line locations downstream.

The City concludes that the dry-weather flow pathway from the Front Avenue branch does not appear likely to be a significant source of petroleum sheen observed at Outfall 22, but that a significant source or sources of petroleum-contaminated solids is present in the upper portion of this branch. Residual solids in this branch represent a potential future source of sheen to the outfall, but likely did not contribute to the sheen observed at the outfall at the outset of this investigation on May 27, 2015. Dry-weather flow and inline solids samples collected at the downstream end of the branch did not indicate elevated TPH concentrations, and the solids with the highest concentration were deposited on the walls of the pipe above the level of the dry-weather flow.

# Recommendations

This investigation was conducted in support of ongoing efforts by the BES Portland Harbor and Pollution Prevention programs to identify and control sources of petroleum contaminants to the Basin 22 conveyance system. The following recommendations are based on these findings and on available information from the DEQ Cleanup Program on work completed to date related to the ECSI sites discharging to Basin 22.

#### DEQ:

- 1. Require the Chevron Willbridge and Phillips 66 facilities to control contaminated groundwater discharges to Basin 22 under DEQ Cleanup Program oversight. The need for more substantive investigation and possible controls related to preferential pathways to the Doane Avenue branch was identified by the City several years ago (BES, 2012a and 2012b) but no additional work has been done.
- 2. Facilitate review and revision of the *Outfall Inspection and Sheen Response Plan* and involve BES Pollution Prevention in that process. It was noted during the meeting that sheen observations were not always reported to the City in a timely manner and did not meet City Code reporting requirements. City code prohibits discharge of sheen to the municipal stormwater conveyance system. Updates to the plan should include routine monitoring of Site laterals at Site manholes to determine if sheens are present.

#### City:

- 3. Pursue City enforcement action in response to contaminated discharges to the NW Doane Avenue storm line. Field observations and analytical results indicate that dryweather flow discharges from the Chevron Willbridge and Phillips 66 facilities warrant referral to the BES Environmental Compliance Officer for potential enforcement under City Code 17.39.040.
- 4. Clean the section of the Front Avenue branch between manholes AAP802 and AAM083 to remove contaminated inline solids and conduct post-cleaning video survey to confirm that material in pipe bottom and adhered to pipe sidewalls has been removed. Because no responsible party has been identified for contaminated solids observed in this

portion of the system, the City should conduct this work and pursue cost recovery if a responsible party is identified at a later date.

- 5. Consult with Maintenance Engineering regarding abandonment of the inactive connection from manhole AAP796 to manhole AAP799 on the Front Avenue branch. Line condition is poor between manholes AAM084 and AAP799 and there are no current or likely future connections to this line.
- 6. Consult with Maintenance Engineering regarding abandonment of the two catch basins in the unpaved portion of the right-of-way on the south side of NW Front Avenue, between manholes AAP799 and AAP802. No record of inlet construction was found, indicating that these inlets may have been installed by a private party without City approval. These inlets are located in an impervious area where stormwater should infiltrate, and represent an obvious source of solids loading to the Basin 22 system. Tanker truck parking has been observed in the immediate vicinity of the inlets, so abandonment will also result in increased protection from releases to Basin 22.
- 7. Communicate investigation findings on NW Front Avenue to BES Industrial Stormwater Program inspectors for the McCall/Brenntag and Chevron Asphalt sites for follow up and technical assistance on identifying potential onsite sources to the NW Front Avenue branch. NPDES industrial stormwater permits are in place at the McCall, Brenntag, and Paramount Petroleum (operator at the former Chevron Asphalt site) facilities and routine inspections occur. Inspectors should confirm that illicit batch discharging to the system of petroleum-contaminated water is not occurring.
- 8. Obtain results of USCG samples collected during this investigation to determine if their data indicate any additional potential source areas or pathways.
- 9. Continue to implement sample collection protocols during sheen response events, and consider analyzing water samples for PAHs (at low detection limits) in addition to the TPH scan. Future data during actual sheen events will help to pinpoint ongoing sheen sources to the system. PAH analyses per method SM8270-SIM can attain lower method reporting limits than the NWTPH quantification methods, and DEQ screening level values for PAHs are available for data evaluation.

This investigation met the objective of identifying potential sources and pathways for petroleum sheen to enter the Basin 22 conveyance system. Response actions by identified sources, DEQ, and the City are needed to address investigation findings.

# References

- Anchor and Integral. 2008. Portland Harbor RI/FS. Round 3A and 3B Stormwater Data Report. Prepared for the Lower Willamette Group, Portland, OR by Anchor Environmental, L.L.C. and Integral Consulting Inc. September 30, 2008.
- ARCADIS. 2009a. Revised Spill Response/Outfall Management Plan. City of Portland Outfall #22 at ConocoPhillips Portland Terminal Dock Facility. ARCADIS. April 23, 2009.

- ARCADIS. 2009b. Source Control Evaluation Report. Former Chevron Willbridge Asphalt Plant No. 209293. Prepared for Chevron Environmental Management Company by ARCADIS. May 2009.
- ARCADIS. 2012a. NW Doane Avenue Stormwater Evaluation Report. Prepared for Chevron Willbridge and ConocoPhillips by ARCADIS. January 2012.
- ARCADIS. 2012b. Outfall Inspection and Sheen Response Plan. City of Portland Outfall #22 at ConocoPhillips Portland Terminal Dock Facility. ARCADIS. April 25, 2012.
- BES. 2007a. Amended Programmatic Quality Assurance Project Plan, City of Portland Outfalls Project, Revision to Programmatic Source Control Remedial Investigation Work Plan Appendix D. Prepared by the City of Portland, Bureau of Environmental Services, Portland Harbor Program. August 2007.
- BES. 2007b. Amended Programmatic Sampling and Analysis Plan, City of Portland Outfalls Remedial Investigation/Source Control Measures Project. Prepared by the City of Portland, Bureau of Environmental Services, Portland Harbor Program. August 2007.
- BES. 2008. Outfall Basin 22 Inline Solids Sampling. Technical Memorandum No. OF22-1. City of Portland, Bureau of Environmental Services. April 3, 2008.
- BES. 2010. Stormwater Evaluation Report. City of Portland, Bureau of Environmental Services. February 2010.
- BES. 2012a. Subject: Review of NW Doane Avenue Stormwater Evaluation Report, prepared by ARCADIS for Chevron Environmental Management Company, and dated January 2012. Letter to M. Romero (DEQ) from L. Scheffler (BES). October 31, 2012.
- BES. 2012b. Subject: Review of Groundwater Source Control Evaluation Report, prepared by ARCADIS for Chevron Environmental Management Company, and dated March 25, 2011. Letter to M. Romero (DEQ) from L. Scheffler (BES). October 31, 2012.
- BES. 2013. Municipal Stormwater Source Control Report for Portland Harbor. Appendix A Closure Report for City of Portland Outfalls Project. Completion Summary for City of Portland Outfall Basin 22. Prepared by the City of Portland, Bureau of Environmental Services, Portland Harbor Program. December 2013 (Amended February 2014).
- DEQ. 2003. Intergovernmental Agreement for Remedial Investigation and Source Control Measures between the City of Portland Bureau of Environmental Services and the Oregon Department of Environmental Quality. DEQ No. LQVC-NWR-03-10. City of Portland Outfall Project. August 13, 2003.
- DEQ. 2010. Chevron Asphalt Plant Site ECSI #1281 Source Control Decision. Mark Pugh, Oregon Department of Environmental Quality, Northwest Region Cleanup Program. July 8, 2010.
- DEQ. 2014. Re: McCall Oil and Chemical Site File ECSI #134 Proposed Source Control Decision. Jim Orr, Oregon Department of Environmental Quality, Northwest Region Cleanup Program. May 9, 2014.

- DEQ/EPA. 2005. Portland Harbor Joint Source Control Strategy. Prepared by the Oregon Department of Environmental Quality and the U.S. Environmental Protection Agency. December 2005 (Table 3-1 updated July 2007).
- EPA. 2010. Re: Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240. Portland Harbor Feasibility Source Tables. Letter from EPA to Mr. Bob Wyatt, Chairman, Lower Willamette Group. November 23, 2010.

#### Tables

- Table 1 Sampling Locations
- Table 2 Sediment and Inline Solids Results Basin 22
- Table 3 Dry-Weather Flow Results Basin 22
- Table 4 Wipe Sample Results Basin 22

#### **Figures**

- Figure 1 Outfall Basin 22 Overview
- Figure 2 Outfall Basin 22 ECSI Site Boundaries
- Figure 3 Outfall Basin 22 ECSI Site Stormwater Connections
- Figure 4 Outfall Basin 22 Sampling Locations
- Figure 5 TPH in Basin 22 Inline Solids and Sediment Adjacent to OF-22
- Figure 6 TPH and Total PAHs in Basin 22 Dry-Weather Flow
- Figure 7 TPH in Basin 22 Surface Wipes
- Figure 8 DEQ Guidance Curve for Total PAHs in Stormwater at Portland Harbor Heavy Industrial Sites and Basin 22 Dry-Weather Flow Data

#### Attachments

- Attachment A Outfall 22 Petroleum Sheen Investigation Sampling Plan
- Attachment B Photographs
- Attachment C Field Notes
- Attachment D Laboratory Results

Tables

System Branch	Sample Location	Sample Code	Description						
Outfall Sedir	ment Sample	1							
Outfall	OF-22	22_8	Composite of 3 subsamples collected between end of outfall pipe and river edge.						
Inline Solids	Samples								
	AAM080	22_11	Upstream of manhole in 48" main.						
	A A M075	22_14	Shelf in west side of manhole chamber with mineral deposit at seep area.						
D	AAM075	22_16	Upstream of manhole in 48" main.						
Doane Ave.	AAM076	22_18	Downstream of manhole in 48" main.						
11,0.	AAM086	22_19	Downstream of manhole in 48" main.						
	AAP794	22_28	Downstream of manhole in 48" main.						
	AAP791	22_33	Upstream of manhole in 27" main.						
	AAM078	22_34	Upstream of manhole in 30" main.						
	AAP799	22_36	Downstream of manhole in 30" main.						
	AAF 799	22_37	Upstream of manhole in 15" lateral line from the southwest.						
Front Ave.	AAP796	22_38	Upstream of manhole in 8" lateral from north.						
	Unmapped CB	22_41	Catch basin in gravel area connected to main between AAP799 and AAP800.						
	AAP800	22_39	Upstream of MH in 18" main.						
	ANF249	22_40	Catch basin in gravel area connected to catch basin ANF248.						
Dry-Weather	r Flow Samples								
Outfall	OF-22	22_8W	Discharge from OF-22 (AAM079).						
Outlall	AAM077	22_9W	Flow in 60" line discharging from manhole.						
	AAM077	22_4W	Flow in 48" line entering manhole from Doane Ave. line.						
	AAM080	22_10W	Water pooled in manhole invert.						
	A A M075	22_15W	Flow in 48" line discharging from manhole.						
	AAM075	22_13W	Flow in lateral line entering from the north (i.e., 'Chevron #1').						
Doane	APA018	22_21W	Flow from beneath lateral line (i.e., between lateral pipe and sidewall of 48 main) entering from the south (i.e., 'Phillips #2').						
Ave.	APA016	22_22W	Water pooled in manhole invert.						
	AQB059	22_24W	'Chevron #2.' Water pooled in manhole invert.						
	A A D704	22_27W	Flow in 12" lateral line entering from the south (i.e., 'Phillips #3').						
	AAP794	22_29W	Flow in 36" main line entering manhole (i.e., Doane Ave. main).						
	AAP792	22_32W	Flow in 12" lateral line entering from the north (i.e., Chevron #3').						
	AAP791	22_6W	Flow in manhole invert.						
Front Ave.	AAM077	22_5W	Flow in 30" line entering manhole from Front Ave. line.						
Wipe Sample	es								
		22_14Wipe	Two wet stained areas within manhole invert on elevated shelf.						
Doane	AAM075	22_12Wipe	Wetted underside of lateral entering manhole from south (i.e., 'Phillips #1').						
Ave.		22_13Wipe	Lateral entering manhole from north (i.e., 'Chevron #1').						
	AAM076	22_17Wipe	Stain on underside of sanitary line crossing through manhole chamber.						

#### Table 1. Sampling Locations

System Branch	Sample Location	Sample Code	Description
	APA018	22_20Wipe	Stain adjacent to upstream side of lateral entering manhole from south (i.e., 'Phillips #2').
	APA016	22_23Wipe	Stains on surface of manhole chamber below lateral from NE labeled "Scale pit/garage roof drain' (i.e., Phillips #2).
	A OD 050	22_25Wipe	Stain on top of 16" lateral line entering manhole from the north (i.e., 'Chevron #2').
	AQB059	22_26Wipe	Stain below 6" lateral line entering manhole from the NW (i.e., 'Chevron #2').
	ANV453	22_30Wipe	Orange material below perched lateral line entering line from the east (i.e., 'Phillips #3').
		22_31Wipe	Stain on shelf on east side of manhole chamber.
Front Ave.	AAM078	22_35Wipe	Wetted area at manhole collar.

Notes:

The City also collected samples for USCG at highlighted locations.

#### Table 2 **Basin 22 Sediment and Inline Solids Results**

		Outfall	NW Doane Avenue							NW Front Avenue								
		Exposed sediments adjacent to end of Outfall 22 22_8 W15E194-01	Manhole AAM080 Upstream in 48" line 22_11 W15E194-08	Manhole AAM075 Solids from shelf 22_14 W15E194-14	Manhole AAM075 Upstream in 48" line 22_16 W15E194-15	Manhole AAM076 Downstream in 48" line 22_18 W15E194-17	Manhole AAM086 Downstream in 48" line 22_19 W15E194-18	Manhole AAP794 Downstream in 48" line 22_28 W15E199-05	Manhole AAP791 Upstream in 27" line 22_33 W15E199-11	Manhole AAM078 Upstream in 30" line 22_34 W15E199-12	Manhole AAP799 Downstream in 30" line 22_36 W15F041-01	Manhole AAP799 Upstream in 15" lateral line 22_37 W15F041-02	Manhole AAP796 Upstream in 8" lateral line 22_38 W15F041-03	Unmapped Catch Basin (Connects upstream of manhole AAP799) Within catch basin 22_41 W15F041-06	Manhole AAP800 Upstream in 18" line 22_39 W15F041-04	Catch Basin ANF245 Within catch basin 22_40 W15F041-05		
Class Analyte	Units	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/28/2015	5/28/2015	5/28/2015	6/3/2015	6/3/2015	6/3/2015	6/3/2015	6/3/2015	6/3/2015		
Total Solids (EPA 160.3M)																		
TS	%	77.5	79.2	51.4	58.0	80.4	82.5	73.0	81.5	85.0	76.5	72.2	82.4	80.1	58.3	62.9		
Total Petroleum Hydrocarbons Scan (N	WTPH-HCID)																	
Diesel	mg/Kg	DET	ND	ND	DET	ND	ND	ND	ND	ND	DET	DET	DET	ND	DET	DET		
Gasoline	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	DET J	DET	ND	ND	ND	ND		
Lube oil	mg/Kg	ND	ND	ND	DET	ND	ND	DET	DET	DET	DET	DET	DET	DET	DET	DET		
Total Petroleum Hydrocarbons - Diesel	& Oil (NWTPH-Dx)																	
Diesel	mg/Kg	81 J	NA	NA	78	NA	NA	28 U	25 U	26 U	2,100 J	3,100 J	120 J	30 J	37,000 J	33 U		
Lube oil	mg/Kg	110 J	NA	NA	220	NA	NA	200	130	190	4,800	8,300	770	330	86,000 J	360		
Total Petroleum Hydrocarbons - Gasoli	ne (NWTPH-Gx)																	
Gasoline	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	156 J	140 J	NA	NA	NA	NA		

Notes: DET = Detected

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

NA = Not analyzed or not applicable

ND = Not detected

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

mg/Kg = Milligrams per kilogram.

# Table 3Basin 22 Dry-Weather Flow Results

		Outfa	all Main	ain NW Doane Avenue											NW Front Avenue	JSCS Water SLVs <sup>(1)</sup>		
		End of outfall (Node AAM079) DWF from outfall 22_8W W15E194-02	Manhole AAM077 DWF downstream in 60" line 22_9W W15E194-03	Manhole AAM077 DWF upstream in 48" line 22_4W W15E194-04	Manhole AAM080 Surface sheen within manhole 22_10W W15E194-06	Manhole AAM075 DWF downstream in 48" line 22_15W W15E194-12	Manhole AAM075 DWF upstream in Chevron #1 lateral line 22_13W W15E194-13	Wye APA018 DWF at connection of Phillips #2 lateral line 22_21W W15E194-20		Manhole AQB059 DWF within manhole on Chevron #2 lateral line 22_24W W15E199-01	Manhole AAP794 DWF upstream in 36 line 22_29W W15E199-06	Manhole AAP794 " DWF upstream in Phillips #3 lateral line 22_27W W15E199-04	Manhole AAP792 DWF upstream in Chevron #3 lateral line 22_32W W15E199-09	Manhole AAP791 DWF within manhole 22_6W W15E194-02	Manhole AAM077 DWF upstream in 30" line 22_5W W15E194-05	Human Health		
																Fish	Human Health	1
Analyte	Units	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/28/2015	5/28/2015	5/28/2015	5/28/2015	5/28/2015	5/27/2015	Consumption <sup>(2)</sup>	Ingestion <sup>(3)</sup>	Ecolo
Measurements																		
Conductivity	µmhos/cm	309	NA	NA	322	324	679	482	187	254	184	103	173	194	NA			
clic aromatic hydrocarbons (PAHs) (E	PA 8270-SIM	LL)																
1-Methylnaphthalene	µg/L	0.11	0.18	0.16	0.19	0.14	0.18	2.2 U	2.1	0.040 U	0.079	0.051	0.040 U	0.040 U	0.040 U			
2-Methylnaphthalene	µg/L	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.080 U	2.0 U	0.20	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U		0.2	
Acenaphthene	μg/L	0.83	1.1	1.0	1.1	0.82	0.90	8.4	0.56	0.020	0.20	0.12	0.020 U	0.020 U	0.020 U	990	0.2	:
Acenaphthylene	μg/L	0.20 U	0.22 U	0.20 U	0.24 U	0.20 U	0.20 U	2.5 U	0.17	0.060 U	0.060 U	0.060 U	0.020 U	0.020 U	0.020 U		0.2	
Anthracene	μg/L	0.17	0.21	0.19	0.29	0.14	0.026	1.5	0.20	0.10	0.12	0.075	0.047	0.23	0.020 U	40000	0.2	
Benzo(a)anthracene	µg/L	0.010	0.021	0.013	0.19	0.063	0.010 U	0.50	0.89 J	0.037	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.018	0.092	(
Benzo(a)pyrene	µg/L	0.010 U	0.011	0.010 U	0.13	0.09	0.010 U	0.32	<b>1.1</b> J	0.058	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.018	0.0092	(
Benzo(b)fluoranthene	µg/L	0.010 U	0.014	0.010 U	0.15	0.13	0.010 U	0.34	1.6 J	0.11	0.013	0.010	0.010 U	0.010	0.010 U	0.018	0.092	-
Benzo(g,h,i)perylene	μg/L	0.010 U	0.010 U	0.010 U	0.11	0.09	0.010 U	0.27	1.3 J	0.15	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U		0.2	
Benzo(k)fluoranthene	μg/L	0.010 U	0.010 U	0.010 U	0.031	0.044	0.010 U	0.12	0.88 J	0.037	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.018	0.2	
Chrysene	μg/L	0.013	0.028	0.014	0.26	0.097	0.010 U	0.73	1.4 J	0.071	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.018	0.2	
Dibenzo(a,h)anthracene	μg/L	0.01 U	0.010 U	0.010 U	0.030	0.020	0.010 U	0.080	0.54 J	0.019	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.018	0.0092	
Fluoranthene	μg/L	0.053	0.085	0.058	0.51	0.15	0.016	1.6	2.0 J	0.098	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	140	0.2	
Fluorene	μg/L	2.2	2.7	2.5	2.4	1.8	1.6	21	0.85	0.030 U	0.47	0.26	0.020 U	0.020 U	0.025	5300	0.2	
Indeno(1,2,3-cd)pyrene	μg/L	0.01 U	0.010 U	0.010 U	0.054	0.070	0.010 U	0.14	0.99 J	0.063	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.018	0.092	
Naphthalene	μg/L	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.80 U	4.0 U	1.2 U	0.040 U	0.20 U	0.080 U	0.040 U	0.040 U	0.040 U		0.2	
Phenanthrene	μg/L	2.1	2.7	2.4	3.4	1.2	0.16	29	1.2 0	0.043	0.11	0.12	0.020 U	0.020 U	0.020 U		0.2	-
Pyrene	μg/L	0.10	0.16	0.11	0.91	0.21	0.043	2.8	2.1 J	0.20	0.016	0.010	0.010 U	0.010 U	0.010 U	4000	0.2	
Total PAHs <sup>(5</sup>	) µg/L	5.6	7.2	6.4	9.8	5.1	2.9	67	18	1.0	1.0	0.65	0.047	0.24	0.025			
	10	5.0	7.2	0.1	210		2.7	07	10	110	1.0	0.05	01017	0121	0.020			
etroleum Hydrocarbons Scan (NWTF	,																	
Diesel	mg/L	DET J	DET J	DET J	DET J	DET J	DET	DET	DET	DET	ND	ND	ND	ND	ND			
Gasoline	mg/L	ND	ND	ND	ND	ND	ND	DET J	ND	ND	ND	ND	ND	ND	ND			
Lube oil	mg/L	DET J	DET J	DET J	DET J	DET J	ND	DET J	DET	DET	ND	ND	ND	ND	ND			
Petroleum Hydrocarbons - Diesel & O																		
Diesel	mg/L	2.0 J	3.0 J	1.3 J	1.9 J	0.93 J	0.49	130 J	1.7 J	0.48	NA	NA	NA	NA	NA			
Lube oil	mg/L	0.57 J	0.69 J	0.28 J	0.25 J	0.46 J	0.13 U	15 U	2.7 J	1.4	NA	NA	NA	NA	NA			
T = Detected WF = Dry-weather flow The result is an estimated quantity. T A = Not analyzed D = Not detected	he associated n	umerical value is the a	approximate concentration	of the analyte in the sam	iple.													

umhos/cm = micromhos per centimeter

 $\mu g/L = Micrograms per liter$ 

mg/L = Milligrams per liter

<sup>(1)</sup> 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.

<sup>(3)</sup> 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 are available, then DEQ's AWQC values are listed for the constituent. If no AWQC values are available, then DAQ's AWQC values are available, then DEQ's AWQC values are available.

(5) Total PAHs are calcualted by assigning "0" to undetected constituents.

"--" = No JSCS screening level available

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

**bold** = Concentration exceeds DEQ's SLV

#### Table 4 Basin 22 Wipe Sample Results

		NW Doane Avenue											
			Manhole AAM075 Sheen on shelf 22_14Wipe W15E194-11	Manhole AAM075 In Chevron #1 lateral line 22_13Wipe W15E194-10	Manhole AAM075 In Phillips #1 lateral line 22_12Wipe W15E194-09	Manhole AAM076 Underside of sanitary lateral line 22_17Wipe W15E194-16	Wye APA018 At connection of Phillips#2 lateral line 22_20Wipe W15E194-19	Manhole APA016 Stain below lateral line entering Phillips #2 lateral from northeast 22_23Wipe W15E194-22	Manhole AQB059 Stain above 16" inlet to Chevron #2 lateral 22_25Wipe W15E199-02	Manhole AQB059 Stain below 6" perched inlet to Chevron #2 lateral 22_26Wipe W15E199-03	Manhole ANV453 Stain below east lateral line to Phillips#3 lateral 22_30Wipe W15E199-07	Manhole ANV453 Stain on east shelf of invert in Phillips #3 lateral 22_31Wipe W15E199-08	Manhole AAM078 Manhole collar 22_35Wipe W15E199-13
Class	Analyte	Units	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/28/2015	5/28/2015	5/28/2015	5/28/2015	5/28/2015
Total P	etroleum Hydrocarbons Scan (NWTPH-HCID)												
	Diesel	mg/wipe	ND	ND	ND	ND	DET	ND	ND	ND	ND	DET	ND
	Gasoline	mg/wipe	ND	ND	ND	ND	DET J	ND	ND	ND	ND	DET J	ND
	Lube oil	mg/wipe	ND	ND	ND	ND	DET J	ND	ND	ND	ND	DET J	ND
Total P	etroleum Hydrocarbons - Diesel & Oil (NWTPH	I-Dx)											
	Diesel	mg/wipe	NA	NA	NA	NA	290 J	NA	NA	NA	NA	420 J	NA
	Lube oil	mg/wipe	NA	NA	NA	NA	62 U	NA	NA	NA	NA	110 U	NA

#### Notes:

DET = Detected

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

NA = Not analyzed or not applicable

ND = Not detected

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

mg/wipe = Milligrams per wipe

Figures



Document Path: B:\GIS\Project\_MXDs\084\_TM\OF\_Basin\_22\Figure1\_Overview.mxd



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AAM079 - End of Outfall (22\_8) AAM079 - From Outfall (22\_8W)

MH AAM080 - US (22\_11) MH AAM080 - (22\_10W) MH AAM075 - US (22\_16) MH AAM075 - Shelf (22\_14) MH AAM075 - Chevron #1 Lateral (22\_13W) MH AAM075 - DS (22\_15W) MH AAM075 - Chevron #1 Lateral (22\_13Wipe)

MH AAM077 - 60" DS (22 9W) MH AAM077 - 48" US (22\_4W) MH AAM077 - 30" US (22\_5W) MH AAM078 - US (22\_34) MH AAM078 - (22\_35Wipe)

MH AAM075 - Phillips #1 Lateral (22\_12Wipe) MH AAM075 - Shelf (22\_14Wipe)

Wye APA018 - US of Phillips #2 Lateral (22\_20WIpe) Wye APA018 - Below Phillips #2 Lateral (22\_21W) MH AAM086 - DS (22\_19)

MH AAM076 - DS (22\_18) MH AAM076 - Sanitary Lateral (22\_17Wipe)

MH ANV453 - East Shelf Phillips #3 Lateral (22\_31Wipe)

MH ANV453 - Stain under E inlet to Phillips #3 Lateral (22\_30Wipe)

MH AQB059 - Chevron #2 Lateral (22\_24W) MH AQB059 - Wipe Below 6" Perched Inlet (22\_26Wipe) MH AQB059 - Wipe Above 16" Inlet (22\_25Wipe)

MH AAP794 - DS (22\_28)

MH AAP794 - US (22\_29W)

MH AAP794 - Phillips #3 Lateral (22\_27W)

MH APA016 - Phillips #2 Lateral (22\_22W)

MH APA016 - Stain at NE Inlet to Phillips #2 Lateral (22\_23Wipe)

MH AAP799 - DS (22\_36)

MH AAP796 - 8" North Lateral (22\_38) MH AAP799 - 15" West Lateral (22\_37)

CB Unmapped - Connects US of AAP799 (22\_41)

MH AAP800 - US (22\_39)

MH AAP792 - Chevron #3 Lateral (22\_32W)

MH AAP791 - US (22\_23) MH AAP791 - (22\_6W)

CB ANF249 - (22\_40)

GIS\Project\_MXDs\084\_TM\OF\_Basin\_22\Figure4\_Sample\_Locs.mxc







Water Solutions, Inc.



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•	Sample Location								
Sample Type									
	Dry Weather Flow								
All Other Features									
	Outfall Basin 22								
-	Storm Line								
	Lined Pipe								
$\bigcirc$	City Outfall								
•	Non-City Outfall								
$\bigcirc$	Manhole (MH)								
	River Mile Tenths								



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•	Sample Location								
Samp	Sample Type								
	Wipe								
All Other Features									
	Outfall Basin 22								
	Storm Line								
	Lined Pipe								
0	City Outfall								
•	Non-City Outfall								
$\bigcirc$	Manhole (MH)								
	River Mile Tenths								



# Attachment A Outfall 22 Petroleum Sheen Investigation Sampling Plan

### City of Portland Bureau of Environmental Services Outfall 22 Petroleum Sheen Investigation Sampling Plan May 20, 2015

### Background

A petroleum sheen has been repeatedly observed in the Willamette River in the vicinity of stormwater Outfall 22 (OF-22). OF-22 serves an approximately 95-acre area consisting mainly of Forest Park and the Willbridge industrial area. The industrialized portion of the basin is almost entirely comprised of sites that are being investigated (or were investigated) under the Oregon Department of Environmental Quality (DEQ) Cleanup Program. Although it is not yet known whether or not past sheens resulted from discharges from the outfall, analysis of a samples collected directly from the outfall, in response to a sheen on May 5, 2015, indicated a small amount of diesel and lube oil in the discharge to the river, 1.3 mg/L and 0.52 mg/L respectively. The City, the United States Coast Guard (USGS), DEQ, and representatives from the Willbridge bulk oil terminals recently met to discuss a collaborative approach for identifying and controlling petroleum discharges to the river via OF-22.

#### Objective

The purpose of this investigation is to collect samples throughout the portion of the Basin 22 conveyance system that serves the Willbridge bulk oil terminals to identify possible sources for the petroleum sheen so that appropriate controls can be selected and implemented. The investigation includes two primary components: 1) a comprehensive dry-weather investigation of the system and connections to it based on review of recent video surveys conducted by the City and 2) sheen-response investigations to trace sheen sources while the sheen is occurring. For the dry-weather investigation, dry-weather water samples, inline sediment samples and wipe samples of dark stains will be collected at numerous locations throughout the basin. In addition, if river levels allow, a composite sample of sediment at the end of the outfall will be collected to help ascertain if observed sheens may be resulting from agitation of contaminated inriver sediment during basin discharge conditions. For the sheen-response investigation, water samples will be collected as needed from Basin 22 and connecting private systems.

#### **USCG** Coordination

During the recent meeting regarding the petroleum sheens in the vicinity of OF-22, the USCG indicated that it would like to partner with the City on the investigation. Anticipated coordination for the investigation includes but is not limited to: observing City field investigations, providing and analyzing hydrophilic nets to assist with source tracing, and collecting and analyzing split samples for forensics analysis.

#### Inline Sediment and Dry-weather Flow Sampling Locations

Figure 1 is an area map of Basin 22, which contains a small portion of NW Front Ave, NW Doane Ave and a portion of NW St Helens Rd. TV inspections conducted by the City of Portland in April and May

2015 identified several areas with inline sediments and infiltration of groundwater. Figure 2 below is a map of the identified locations for potential sampling. Additionally, we will investigate each manhole as we move up the two main branches of the basin (i.e., the Doane Avenue branch and the Front Avenue branch) and will collect samples from other locations based on field observations.

### Dark Stain Wipe Sampling Locations

The TV inspections also identified several locations with dark stains on the walls within the storm line. Wipe samples will be collected from the dark stains to determine if there are possible petroleum sources to the basin. Figure 3 below is a map with the identified locations, but again, as we move up the basin we may identify additional dark stains to be sampled or may determine that locations identified in the survey don't actually warrant sampling.

### **Inriver Sediment Sampling Location**

If river levels allow access to the end of the outfall, and sediment is present in the vicinity of the outfall via shoreline access, one composite sample will be collected from a minimum of three points near the end of the outfall.

### Analytical Scope

All samples will be analyzed at the City of Portland Water Pollution Control Laboratory for NWTPH-HCID (Hydrocarbon Scan) with NWTPH-Dx (Diesel and Oil Range) and NWTPH-Gx (Gasoline Range) follow-up analysis if detected in the hydrocarbon scan. The dry-weather flow samples will also be analyzed for PAHs by method EPA 8270-SIM.

### Field Protocols and Documentation

Inline Sediment sampling and dry-weather flow sampling will done in accordance with the City of Portland Field Operations Standard Operating Procedures (SOP 2.02a - Grab Sample with Bottle, SOP 2.02b - Grab Sample Collection with Stainless Steel Beaker and SOP 5.02a - Inline Sampling of Stormwater Solids). Soil sample collection near the outfall will be done in accordance with the Field Operations SOP 5.01a - Sampling of Soil and Sediment. Currently the City of Portland does not have an SOP for wipe sampling but we have performed a similar sampling for a previous project. City of Portland staff will record and take photos of all observations. Field Data Sheets will be completed documenting the conditions and characteristics of each sample collected.

In addition to collecting samples, field staff will assess locations within the system and at connecting laterals for potential deployment of hydrophilic nets or other oil absorbents to meet sheen response objectives. If suitable locations and deployment methods are identified, deployment may occur at the time of entry or during field activities scheduled at a separate time.

### **Quality Assurance and Control**

To demonstrate that there is no cross-contamination due to equipment decontamination and airborne inputs two Field Decontamination Blank samples will be collected at a selected location. One sample from the stainless steel bowls used for inline sediment sample homogenization and the other from stainless steel bailers used for dry-weather flow sampling following the City of Portland Field Operations SOP 7.01c - QC Sample Collection. The WPCL will also analyze an unused wipe to determine if there is any contribution of hydrocarbons from the wipes themselves.

### Data Reporting and Evaluation

The WPCL will generate lab reports with results and a qualitative narrative explaining the interpretation of the NWTPH chromatograms. WPCL staff will review chromatograms and generate charts showing comparisons of the Outfall 22 sample with samples collected from points within the basin. The intent is to identify any sources that appear to match the chromatogram pattern that we are seeing at the outfall. If samples are collected and analyzed by other parties (e.g., USCG forensics), these data will be shared with the City to facilitate data evaluation.

### Schedule and Target Conditions

The comprehensive investigation will occur on a dry day to avoid dilution of dry-weather flows and to allow for field staff to enter system without lateral discharges and elevated flow in lines. The investigation and sampling is estimated to require two to three days to complete. Due to traffic control issues, investigation of the manholes on NW Front Ave may require additional staff for flagging. The sheen response investigation will be conducted on an as-needed basis regardless of weather conditions.

### **Project Management**

The dry-weather investigation will be directed by Linda Scheffler from the Portland Harbor section. A formalized report summarizing the findings will be disseminated to all of the parties involved. The sheen response investigations will be led and documented by Mark Walla of the Spill Response section and provided to Linda for potential inclusion in the summarized report. Mark Walla will also continue as the contact for coordination with the US Coast Guard.

Figure 1 – Stormwater Basin 22 Area Map



Figure 2 – Dry-Weather Flow, Inliine Sediment, and Inriver Sediment Sampling Locations



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Attachment B Field Photographs

# **Basin 22 Dry-Weather Sheen Investigation**



Photo 1 (May 27, 2015). Willbridge Cove and boomed area around Outfall 22.



Photo 2 (May 27, 2015). Sediment sampling at Outfall 22.



Photo 3 (May 27, 2015). Boomed area with sheen around Outfall 22.



Photo 4 (May 27, 2015). Manhole AAM077. Lined 60" discharge pipe.



Photo 5 (May 27, 2015). Manhole AAM077. Incoming 48" line from NW Doane.



Photo 6 (May 27, 2015). Manhole AAM077. Incoming 30" line from NW Front.

# **Doane Avenue Branch**



**Photo 7 (May 27, 2015)**. Manhole AAM080. Incoming 48" line where inline solids sample was collected.



Photo 8 (May 27, 2015). Inline solids collected from AAM080.



**Photo 9** (May 27, 2015). Manhole AAM075. Chevron #1 lateral connection with dryweather flow and staining.



**Photo 10 (May 27, 2015).** Manhole AAM075. Phillips #1 lateral connection with dryweather flow and staining.



Photo 11 (May 27, 2015). Manhole AAM075. Inline solids sample location in incoming main line.



Photo 12 (May 27, 2015). Manhole AAM075. Inline solids and seepage on manhole shelf.



Photo 13 (May 27, 2015). Manhole AAM076. Sanitary lateral bisecting invert.



Photo 14 (May 27, 2015). Manhole AAM076. Wipe sample location on sanitary lateral.



**Photo 15** (May 27, 2015). Wye APA018. Phillips #2 lateral. Dry-weather flow sample from seep underneath left side of pipe and wipe sample from stain to right of pipe.



**Photo 16 (May 27, 2015).** Wye APA018. Dry-weather flow sample with suspended droplets from underside of Phillips #2 lateral connection.



Photo 17 (May 27, 2015). Manhole APA016. Wipe sample.



**Photo 18 (May 27, 2015).** Manhole AAM086. Location of inline solids sample from outgoing line. Phillips #2 lateral on top right.



**Photo 19 (May 28, 2015).** Private manhole access to lateral AQB059 (Chevron #2). Incoming line at bottom, outgoing line to NW Doane at top.



**Photo 20** (May 28, 2015). Private manhole on lateral AQB059 (Chevron #2). Foamy material in manhole invert and boom in outgoing line.



**Photo 21 (May 28, 2015).** Manhole AAP794. Phillips #3 lateral with dry-weather flow entering main line from south.



**Photo 22** (May 28, 2015). Manhole AAP794. Inline solids sample collected from 48" main line downstream of manhole and Phillips #3 connection.



**Photo 23 (May 28, 2015).** Manhole ANV453. Evidence of groundwater infiltration in Phillips #3 connection.



**Photo 24 (May 28, 2015).** Manhole ANV453. Location of sample 22\_30Wipe in manhole chamber along Phillips #3 lateral.



**Photo 25 (May 28, 2015).** Manhole AAP792. Dry-weather flow collected from Chevron #3 lateral entering chamber at top of picture.



Photo 26 (May 28, 2015). Manhole AAP791. Inline solids upstream of invert.



**Photo 27 (May 28, 2015).** Manhole AAP791. Dry-weather flow collected from manhole. Flow direction is from left to right.

# **Front Avenue Branch**



Photo 28 (May 28, 2015). Manhole AAM078. Inline solids upstream of manhole in 30-inch line.



Photo 29 (May 28, 2015). Manhole AAM078. Wipe sample location in manhole collar.



Photo 30 (June 3, 2015). Manhole AAP799. Inline solids downstream of manhole.



Photo 31 (June 3, 2015). Manhole AAP799. Inline solids in 15" lateral from west.



**Photo 32 (June 3, 2015).** Manhole AAP796. Inline solids in 8" lateral from north. Chevron confirmed that all connections to this line have been abandoned.



**Photo 33 (June 3, 2015).** Manhole AAP800. Inline solids caked on sidewalls upstream of manhole. Similar solids not present in bottom of line. Sample collected from walls.



**Photo 34 (June 3, 2015).** Manhole AAP800. Inline solids not present on pipe walls or bottom downstream of manhole.



**Photo 35 (June 3, 2015).** Manhole AAP802. Inline solids present in small quantity, but gravelly and not similar to solids observed upstream of AAP800.



**Photo 36 (June 3, 2015).** Manhole AAP802. Inline solids not present in significant quantity in downstream main line.



**Photo 37 (June 3, 2015).** Unnamed catch basin on south side of NW Front between manholes AAP799 and AAP800.



Photo 38 (June 3, 2015). Unnamed NW Front catch basin with solids and debris.



Photo 39 (May 27, 2015). Catch basin ANF249.



Photo 40 (June 3, 2015). Catch basin ANF249. Solids and debris prior to sampling.



**Photo 41 (May 27, 2015).** Evidence of truck parking and erodible soil dragout in vicinity of catch basin ANF249 and unnamed catch basin on south side of NW Front Avenue.

Attachment C Field Notes

of Page \_ Project Portland Hurberr Project No. Date 5/27/15 Location Basin 22 subject Basin 22 Dury-weather perpleum sheen inv. By MITS, WCR, JFG. 0900 - Met with LAS PHA Mark Walla and coust guard representatives at Phillips 66 office to access OF22 1923 - DFZZ - arrive at AAM 079 to collect sedirent coupor ite sample ( I SW From new outfallound dry-weather Plowsample 1979 - Sed sample collected (ZZ-8) 0930 - Dy weather Flow sample collected from outfall light pero - Iron beateria and staht petroleon show visible in Flow outside ofoutfal -Slight sheen visible in sample bailerand the stainless sheet bout -Splitsedinent sangle with USCG 0948 - ATTIVE at AAMOTT, UR ble iron bacteria coming from 48" me ht petrolium other coming From man Tom Dane Ave, 1205 Where Lawrint of ItT at stort at liver on withet 60" 1004-Sample collected of dry-weather From AAM077 outlet 60" live ight petroleumorlar and light yollow color: 122-9W ected of dry-weather Flow From 48" in let from Down Ave. 1224 1009-Sanol Has a yellow color and petroleum order. No visible It I upstroam in 48" line ed at dry-weethor Flow for 30" inlet From Front Ave (22.50) 1013-SELOK Col Very smill amount of Flow. Flow, 3 clear and no over. Smill crack the stain upstrom in 30" live, deered not worth wipe sampling Attachments

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distribution (estimated percentages):       SilicitalySandOther (describe)       Coarse GravelOthersOther (describe)         If present, type of debris in sample       Wood Metal PlasticOther (describe)       Removed debris? Yes (Type & Amount) No         Compositing notes       Per SOP5.01b Deviations (describe)       Deviations (describe)         Sample Jars Collected (number, size, full or partial)?       fnot enough sample to fill all of the jars, list jars collected analytes sampled (as per inalyte priority list in work order).       Jar Size	Visual and olfactory observati	ons: D Shee	en 🖉	·	Color of sampl	e 🗆 Grey		IGHT YEUQ
If present, type of debris in sample       Image: Metal image: Organics       Plastic image: Organics       Paper         Compositing notes       Per SOP5.01b       Deviations (describe)         Sample Jars Collected (number, size, full or partial)?         f not enough sample to fill all of the jars, list jars sollected and related analytes sampled (as per imalyte priority list in work order).       Jar Size       Amount Full       Target Analyses         ab ID Here       Duplicate sample collected? Y/N         Duplicate sample identification # on COC:       Dup ID Here		Silvolay	San osed Organ	id	Fine Gravel Other (describe)	_ Coarse G	Gravel [	)ebris
Sample Jars Collected (number, size, full or partial)?  f not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per inalyte priority list in work order).  ab ID Here Duplicate sample identification # on COC: Dup ID Here Dup ID H	If present, type of debris in sa	mple 🛛 🗆 Metal	□ Plas	tic	Removed debris	, □ Yes (T	ype & Amou	nt) □ No
f not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per inalyte priority list in work order).          Jar Size       Amount Full       Target Analyses	Compositing notes   □ Per S	OP5.01b 🗆 Devia	ations (desc	ribe)				
collected and related analytes sampled (as per inalyte priority list in work order).         ab ID Here         Duplicate sample identification # on COC:         Dup ID Here	Sample Jars Collected (numbe	r, size, full or partia	l)?					
Duplicate sample identification # on COC: Dup ID Here	collected and related analytes s	ampled (as per	Jar S	ize	Amount Full		Target Analy	/Ses
Duplicate sample identification # on COC: Dup ID Here		с. С	· · · · · · · · · · · · · · · · · · ·		·····			
	ab ID Here		Duplicate s	sample c	ollected? Y/N	· .		······
	Duplicate sample identification	# on COC:	Dup ID He	70-			·····	· · · · · · · · · · · · · · · · · · ·
	·							

Overview of node showing drainage area	Filename(s):
Plan view of sediments inline	Filename:
Homogenized sample (sediment in bowl)	Filename:
Other?	Filename(s):

CITY OF PORTLAND **ENVIRONMENTAL SERVICES** Nater Pollution Control Laboratory 6543 N. Burlington Ave. Portland, OR 97203-5452 INLINE SEDIMENT SAMPLING FIELD DATA SHEET DRY WE ATHER PETRO-Project Name: Sample ID; PORTLAUD HARROR IN SHEER HUEST, <u>M 080</u> N Sampling Team: WCR M55 Date Arrival Time: Point Code: S SKG AHA LAS 22.10W Basin: 1 Node: Address: 4M 08C Current weather: (X, Y)Date and time of last known rainfall 15 trail SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT is there water inline? Yes or No If present, water is: Flowing or Standing Depth of water = \_\_\_\_ in Rate of flow = fps Brown Hydrocarbon Does river back up to this location? Yes or Nov If river is backed up: Water Color Grey □ Sanitary Water Odor □ Other Are sediments observed in the line? Yes or No Are recoverable quantities of sediments present in the line? Kes or No Avg Depth of seds = 2.0 in Sed Depth Range = 0.5 in to 3.0If sediments present: in. Estimated dimensions of sediment deposit: 16 in by UP PHPKin. OR As far as can be seen SITE DIAGRAM: Include street intersections/main lines/laterals/catch basins/MH's/pipe sizes/ flow direction/ driveways cuts and extent of solids accumulation as well as subsample locations. 22-10W mater sample collected of surface sheen (SAMALE COLLECTED) 2'VASTREAM (22-11)

Page 1 of 2

Date: SECTION :	2 - SAMPLE CO		) Орт	Node:	Point Code:
3 = 1 10				AAMOSC	22-11
Sampling Equipment: CL Stainless steel utensil	& stainless steel re	ceptacle	(Describe)		22-10W
Equipment Decontamination process:	OP 7.01a □ Dev	viations (Describe)			440.5
5-27-15 1105	De Identification Co	- US			
Sample location:	om line If from	n line, segment is F	rom Node_	080 A. To No	de
Sample collection technique: □ Per SOP5.01b 3 <sup>4</sup> WINE ACRUSS PIPE	□ Deviations (de	•		· · · ·	
Visual and olfactory observations:	r en oloration	Color of sample		(describe)	
Sample composition/particle size Silt/Clay distribution (estimated percentages): Decomp	Sand <u>30</u> osed Organics	_ Fine Gravel 20	Coarse C	Bravel <u>30</u> D	ebris <u>5</u>
If present, type of debris in sample □ Wood □ Metal □ Organ	□ Large rocks □ Plastic ics □ Paper	Removed debris?	Ves (T	ype & Amour	nt) ec □ No
Compositing notes Per SOP5.01b Devia	ations (describe)	•		<u>.</u>	· · ·
Sample Jars Collected (number, size, full or partia	1)? 1 - 4	107. FUR	· L		
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per	Jar Size		A set of the first state of the	Target Analy	/ses
analyte priority list in work order).				· · ·	• • • • • • •
					······································
	-		÷.	······	
Lab ID Here	Duplicate sample	collected? Y/N			
Duplicate sample identification # on COC:	Dup ID Here		· · · · · · · · · · · · · · · · · · ·	······	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>
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	and the second				

SECTION	3 - PHOTOGRAPH LOG
Overview of node showing drainage area	Filename(s):
Plan view of sediments inline	Filename:
Homogenized sample (sediment in bowl)	Filename:
Other?	Filename(s):

Project Name: Project Name: Pr	IE SEDIMENT SA	nd, OR 97203-5452		
Project Name: PORTLAUD Sampling Team: WCR,M5	ORY	IVING FIELD L	ATA SHEET	
	HARRON SHEE	WANDER PETROLAU 14 VESTILATIO4	Sample ID: If Collected	wife 32-13
sit, party 22		rrival Time:	Point Code: SK	Muter) DIMENT FROM
Basin: 72	Node:	///>	Address: 22-14 Str	27-22-14
Current weather:	$\perp \frac{1}{10000000000000000000000000000000000$	)	Address: 22-15w	<u>/</u>
Date and time of last known rain	124/15.	trace	0.0.210	<u> </u>
SECTI				
Is there water inline? (Yes) or No	ON 1 - PRE-SAMPL		0	
	li present, water ist Flo	wing or Standing Depth c		
Does river back up to this location?	Yes or No If river is backed	up: Water Color 🗖 🤉	Krey Water Odor E	] Hydrocarbon ] Sanitary ] Other
Are sediments observed in the line?	Are reco		ents present in the line?	
If sediments present: Avg Depth		Sed Depth Range =	<u>1</u> in to <u>4</u> in.	
Estimated dimensions of sediment d	· · · · · · · · · · · · · · · · · · ·	/	in as can be seen	
SITE DIAGRAM: Include street and extent of solids accumulation	as well as subsample loo	ations.	s/pipe sizes/ flow directior	1/ driveways cut
			4	· .
	•		E-W	
	22-13 Wipe /	122-1	5W -dry meather fl	ow sample
55	-13 W \ \			
dry meath water so	implot to the	~ 1,22	-12 wipe	
		Ya-		
22_1"	I wipe -			
22_1	1 - Axil			an a
		22	15-16	
	mineral precipitate	Fire k		
	material from scep	5cd im	an t	erio 19 19 19
	tion seek	2 M		
	·			

Page 1 of 2
Date: 5-27-15	St		2 - SAMP		LECTION REI	PORT	Node: AANOZ	Point Code:
Sampling Equipment	: Distainless st	teel utensil	& stainless	steel rec	eptacle  □ Other	(Describe)		SHALF SED.
Equipment Decontan	nination process:	B Per S	OP 7.01a	🗆 Devi	ations (Describe)			
5-27-15	Sample time:		an an trainn an trainn. Ta an trainn		e (IL-XX-NNNNN			
Sample location:	From MH chaml	ber IFr	-16 om line	If from	line, segment is <del>F</del>	rom-Nede_	upstrean ————————————————————————————————————	of AAMO
Sample collection tec	hnique: 🖻 Per S	OP5.01b	🗆 Devia	tions (de	scribe below)			· · · · · · · · · · · · · · · · · · ·
·		· · ·	•			1 - 1		· · · · · · · · · · · · · · · · · · ·
Visual and olfactory	observations:	□ Shee	r en oloration		Color of sample	Brown e □ Grey ∎∕Other	მ <u>კ_ 16</u> (describe) _	32-14 MANGE-10
Sample composition distribution (estimate	on/particle size ed percentages):	Silt/Clay Decomp	Sar Sar Sar	nd	Fine Gravel	Coarse G		
If present, type of de	bris in sample	□ Wood □ Metal □ Organ	□ Larg □ Plas ics □ Pap		Removed debris?	, □ Yes (T	ype & Amou	int) □ No
Compositing notes	Per SOP5.01	b 🗆 Devia	ations (desc	ribe)				
Sample Jars Collected	l (number, size, f	ull or partia	l)? /-	40	2-			
not enough sample to	o fill all of the jars	, list jars	Jar S	lize	Amount Full		arget Ana	yses
ollected and related a nalyte priority list in w	nalytes sampled ork order).	(as per			·	*		· · · · · · · ·
	· ·							
	and the second sec							
· · · · ·								
ab ID Here			Duplicate	sample c	ollected? Y/N			

SECTION 3 - F	PHOTOGRAPH LOG
Overview of node showing drainage area	Filename(s):
Plan view of sediments inline	Filename:
Homogenized sample (sediment in bowl)	Filename:
Other?	Filename(s):

CITY OF PORTLAND ENVIRONMENTAL SERV	
Water Pollution Control Laboratory 6543 N. Burlington Ave, Portland, OR 97203-5452	
INLINE SEDIMENT SAMPLING FIELD E	DATA SHEET
Project Name: Portland Haihor Basm 27 sheen Inv	Sample ID:
MJS WCR JFG, PHA 5/27/15 Arrival Time: 1238	Point Code: 22-18, 22-17 w. 4e
Basin: 72 Node: AAM 076	Address:
Sumply	· · · · · · · · · · · · · · · · · · ·
Date and time of last known rainfall: 5/24/15 trace	
SECTION 1 - PRE-SAMPLING VISUAL OBSER	RVATION REPORT
Is there water inline? Yes or No If present, water is: Flowing or Standing Depth of	of water = $3$ in Rate of flow = $0.5$ fps
Does river back up to this location? Yes or No. If river is backed up: Water Color	Brown ☐ Hydrocarbon Grey Water Odor ☐ Sanitary Clear ☐ Other
Are sediments observed in the line Yes or No Are recoverable quantities of sedim	ents present in the line? (res or No
If sediments present: Avg Depth of seds = <u></u> in Sed Depth Range =	
Estimated dimensions of sediment deposit: in. by in. OR 🖬 As fa	ar as can be seen
SITE DIAGRAM: Include street intersections/main lines/laterals/catch basins/MH's and extent of solids accumulation as well as subsample locations.	s/pipe sizes/ flow direction/ driveways cuts
N 1 22_17w	ipe (underside of samitary line)
1/ 122-	18 sed ment sample
2-3 (x)	

. .

Date: 5/27/15 SECTION 2	- SAMPLE CO	LECTION REP	ORT	Node: AAM076	Point Code:
Sampling Equipment:	& stainless steel rec	eptacle	(Describe)	<u></u>	<del>93</del> -18
Equipment Decontamination process:	OP 7.01a □ Dev	iations (Describe)			
Sample date: Sample time: Samp		le (IL-XX-NNNNNN		stiem of	- AAMOTIS
Sample location:  General From MH chamber  From From MH chamber	om line If from	line, segment is Fr	om N <del>ode_</del>	To No	nde
Sample collection technique: Per SOP5.01b	Deviations (de	scribe below)		······	
□ Odor	•		□ Brown		
visual and olfactory observations:	en oloration	Color of sample	🗹 Grey	(describe)	
	Sand <u>50</u>	Fine Gravel <b>35</b> Other (describe)	Coarse C	Gravel <u>25</u> D	)ebris
□ Wood If present, type of debris in sample □ Metal □ Organi	I Large rocks □ Plastic ics □ Paper	Removed debris?	r Yes (1	ype & Amou	nt) □ No
Compositing notes Der SOP5.01b Devia	itions (describe)				
Sample Jars Collected (number, size, full or partia	1)3				
If not enough sample to fill all of the jars, list jars	Jar Size	Amount Full		Target Anal	/ses
collected and related analytes sampled (as per analyte priority list in work order).	402	Farll			
	-		· · · · · · · · · · · · · · · · · · ·		
Lab ID Here	Duplicate sample	collected? Y/N			
Duplicate sample identification # on COC:	Dup ID Here			· · · · · · · · ·	· · · ·

SECTION	3 - PHOTOGRAPH LOG	
Overview of node showing drainage area	Filename(s):	
Plan view of sediments inline	Filename:	· ·
Homogenized sample (sediment in bowl)	Filename:	· · ·
Other?	Filename(s):	

	CITY OF PORTLAND ENVIRONMENTAL SERV Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452	/ICES
INLINE	SEDIMENT SAMPLING FIELD	DATA SHEET
	arbor - OFZZ sheen Inv.	Sample ID: If pollected
Sampling Team: MJS_WLR_JF6_PHA	Date: Arrival Time: 5/27/15 1300	Point Code: 32_19, 22_20w.pe
	Node: AAM 086	Address: 22_21w
Date and time of last known rainfal		
	N 1 - PRE-SAMPLING VISUAL OBSE	
Is there water inline? Yes or No	If present, water is Flowing or Standing Depth	of water = $\frac{75}{10}$ in Rate of flow = $\frac{0.5}{0.5}$ fps
Does river back up to this location? Ye	s or Nov If river is backed up: Water Color	Brown Difference Brown Brown Difference
Are sediments observed in the line?	es or No Are recoverable quantities of sedi	ments present in the line? (res) or No
If sediments present: Avg Depth of	seds = in Sed Depth Range =	7_in. toin.
Estimated dimensions of sediment dep	osit: I d in. by in. OR BY As	far as can be seen
SITE DIAGRAM: Include street int and extent of solids accumulation a	ersections/main lines/laterals/catch basing/ML	l's/pipe sizes/ flow direction/ driveways cuts
	N1	
		12-19
$Q \Rightarrow$		526
	22.20 Wipe	22-21 W
		jouth lateral

Date: 5/97/15 SECTION	2 - SAMPLE C				
		OLLECTION REI	PORT	Node: AAM086	Point Code:
Sampling Equipment:  □ Stainless steel utensi	& stainless steel i	eceptacle	(Describe)	· · · · · · · · · · · · · · · · · · ·	22-20WY 22-21W
Equipment Decontamination process:	SOP 7.01a D	eviations (Describe)			0.000100
Sample date: Sample time: Sam		ode (IL-XX-NNNNI			
Sample location:	rom line If fro	n line, segment is F	rom Node	AAMO TONO	86 
Sample collection technique:  Per SOP5.01b	□ Deviations (	describe below)		· · · · · · · · · · · · · · · · · · ·	
			<u> </u>		
	or <u>pervolcum</u> en coloration	Color of sample		(describe)	
Sample composition/particle size Silt/Clay distribution (estimated percentages): Decomp	∠ Sand <u>} ⊆</u> posed Organics	Fine Gravel <u>50</u> Other (describe)	Coarse G	ravel <u>25</u> D	ebris
If present, type of debris in sample □ Wood □ Metal □ Organ		Removed debris?	TYes (T	ype & Amour	nt) □ No
Compositing notes	ations (describe)				
ample Jars Collected (number, size, full or partia	al)?				
not enough sample to fill all of the jars, list jars	Jar Size	Amount Full	T	arget Analy	ses
ellected and related analytes sampled (as per alyte priority list in work order).	402	Full		· · · · · · · · · · · · · · · · · · ·	<u></u>
	· · · · · · · · · · · · · · · · · · ·				n
b ID Here	Duplicate sample	collected? Y/N			<u>,</u>
uplicate sample identification # on COC:	Dup ID Here		· · ·		, · · ·
		·			<u></u>

SECTION	3 - PHOTOGRAPH LOG	
Overview of node showing drainage area	Filename(s):	
Plan view of sediments inline	Filename:	
Homogenized sample (sediment in bowl)	Filename:	
Other?	Filename(s):	

Montol Laboratory	Date: <u>5/37/5</u> Work Order #: <u>しんらを794</u> Collected By: <u>ハウS, wcR, すFe, P</u> HA					Tum-Around-Time Request	Standard (10 business days) Rush (5 business days)	er.		Sediment Composite AAM079 (OF22)	AAM077-E 60"	AAM077-W 48"	AAM077-SW 30" Drywesther Flow	AAM080 Surface Sheen	Field Decon Blank of Bowl and Bailer	AAM080-SW Inline Sediment	AAM075-S Wipe under lateral	AAM075-N Wipe from end of pipe	Datu:	Time:	
And Christel Laboratory And Christel Laboratory and Christel Laboratory and Christel Laboratory and Christel Laboratory and Christel Constrained and Christel Constraine	D rk Orde Collected					Tum-A						5	2		5		•••	-	eceived By: jnsture:	nted Name:	
Chick Laboratory Answerses and an answerses and an answerses and an answerses and an answerses and an answerses e. Director's Office E. Director's	Mo		•		-	(wo)	A (mupoa	livitouhr	COI	N N	3			32					<u>स</u> थ्र	<u>문.</u>	
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en Control Laboratory en An. en Stroos-sees en Stroos-sees en Stroos-sees en Stroos-sees en Stroos-sees en Stroos-sees en Stroos-sees en Director's Office en Director'	nd ody Services			laa hat														4. 	<u>telinquished B</u> gneturo:	fated Kane:	
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on Control Laboratory on Ave. n 97203-4552 an (503) 823-5656 an (503) 823-5656 bit for (503) 823-5656 an (503) 823-5666				. <i>•</i>		·. ·	· · ·	Sample	Sed	Water	Water	Water	Water	Water	Water	hes 'sed	Wipe	Wipe		_	, .
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Pollution Control Laboratory Burfington Ave. Unegon 97203-4652 Custodian (503) 823-5666 Lab. (503) 823-5666 La		r's Offic	d Harbol			igation	if detecte	Sample Time			1004	1009	1013	1049	1121	1105	1140	1147		Time:	Sheen COC
Pollution Control Burtington Ave. U Oregon 97203-45. Custodian: (503) 823-568 Lah: (503) 823-568 Lah: (503) 823-568 Instructions: 22 Petroleum SI WTPH-Dx and WTPH-Dx and WTPH-Dx and WTPH-Dx and 22_6W 22_8W 22_8W 22_8W 22_8W 22_8W 22_8W 22_11 22_5W 22_112 22_11 22_112_11	l Laboratory 52 3-5696 1	Director	Portland			heen Investi	NWTPH-Gx	Sample Date	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	Mui-	/a h	22 Petroleum
Projectian Restants Centeral Centeral Centeral Projectian Collent Projectian Sectian Collent Projectian Sectian Collent Collen	Water Pollution Control Labo 6543 N. Burlington Ave. Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5696 General Lab: (503) 823-5681	Client Name:	Project Name:		Special Instructions;	asin 22 Petroleum St	Run NWTPH-Dx and	Location ID	22 8	22_8W	22_9W	22_4W	22_5W	22_10W	FDBLANK	22_11	22_12Wipe	22_13Wipe	2 N	Nath 5all Nah	Portland Harthor - Basin 22 Petroleum Sheen COC #1 15-27.15

Wafer Pollution Control Laboratory 6543 N. Burlington Ave. Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5691 General Lab: (503) 823-5681	Al Laboratory 552 23-5696					Bureau	ain-of ain-of envi	City of Portland Chain-of-Custody	land stody tal Serv	Ces Ces		.:	Work	Order #	Work Order #: (NSE 194 Collected By: <u>mss, wck, TEG, PHA</u>
Client Name: Proiect Name:	Director's Office Portland Harbor	's Office Harbor													
Special Instructions: Basin 22 Petroleum Sheen Investigation	theen Investic	ation				· · · · · · · · · · · · · · · · · · ·		Reg	uested	Requested Analyses	es		(uu)	Tum-Arour	Tum-Around-Time Request:
<sup>1</sup> Run NWTPH-Dx and NWTPH-Gx if detected	I NWTPH-Gx I	if detecter							<u> </u>				lamo /soyuun) Ay	C Standar Rush (5	Stendard (10 bustness days) Ruish (5 business days)
Location (D	Sample Date	Sample Titte	Grab or Comp	Sample Matrix	H-K9TWN 1101) ehaq		• •						Vitoubno: .neter	ច្រីខឹ	Remarke
22_14Wipe	5/27/2015	1153	9	Wipe	I	•,									AAM075-Shelf Wibe from Shelf
22_15W	5/27/2015	1159	9	Water	•					 			224	a	AAM075 - DS Drv-weather Flow
22 <u>.</u> 13W	5/27/2015	1201	ი	Water								-	679	d	AAM075-N Drv-weather Flow
22_14	5/27/2015	1209	50 20	Sed	•			 				.  / 		-	AAM075-Shelf Inline Sediment
22_16	5/27/2015	1212	nizim Q Q	Sed	•				4 						AAM075-US Inline Sediment
22_17Wipe	5/27/2015	1249	<i>ورو</i> ن	Wipe	•				· · · ·			- -			AAM076-Sanitary Line Wipe from bottom
22_18	5/27/2015	1253	ررو	Sed	•										AAM076-DS Inline Sediment
22_19	5/27/2015	1315	کھ	Sed	•				· · · · · ·						AAM086-DS Inline Sediment
22_20Wipe	5/27/2015	1322	9	Wipe	•						· · · · · · ·				AAM086-S Wipe on US side of Lat
22_21W	5/27/2015	1327	0	Water	•						·		482	5	AAM086-S Flow on DS side of Lat
Relinquished By: Signatures A A	M.		Date: / - / - / -	Received By:	B	$\left  \right\rangle$	Ň	Dates	Relingu Signature:	<u>Relinguished By:</u> Signature:		Date:	Rec	Received BV: Signature:	Date:
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Page of 10r res par Project Project No, DF22 1281 Location Date \_ subject OFZZ Dry Wonther Petralcum Sheen In BY PHAMINS/WCR/ECI QBA 000 - ARA059 rived and of et new ale CTT. ha water an in as as a hrows town form an sustace in wo Ph Aso 5, 900 Provin ute is 5.71 Dife from Morth 0 e outlet on well tain bili a Lock (Main in et 1. 16" Coming Freise locali booky is haying from rung in ank 19 Ner 10 00 QBAR AB0.059 -015 water sample from surface with w (72.24W/20 collect sample leaving ment Twich oder ond =754 a Bod wipe sample from derk stain above 16" main inlet. \$ 059-018 be oily 72 BSWIEC force of ELVID SECPIN OUT appears 5 a 5133 QRQ 107 80059-1.1 wipe simple from derti stain vi tom 11 22-26wipe Appeared to be greasy degraded material 1033 ESI in wa ine Ca tainent oran in 1: Ir Sec. Sp Finn Comm Ct Min on Y NV 453 17" 48"00 Pe has a Be" 8 Sec Tien 10" the dipe From the upstream XX. 7" FLAR MA er conton out in Dert. - 1/2 FAS Attachments



of Page 1 ac Project Project No. Location OF 22 Date 5/2/15 BY A-H/MUS/WOR/ECH Sheen Tur Subject OF22 Dry weather Peter bound Pl le from 12" later 1043 Collecti Novisike south 1 sems Y-WEarthe 22.27W =103 AN CONS Sullie sed went saple from just 050 2 Sumstream 22-28) 5 Wizik , wo odor NON ð der-weather Hr as Laiple TOWN UPSTREE -24 22 =184 FVellows 1 15 C. in other and 00 atamia Obylous Weit (SIA -an ives Pas M Oron 114 60 M 14Va Amariant DEE A m4-Battet is also 12" SA 16-A NVUS 2 Wipe Sevole -1.K letech FOR OTCH North n o la 22.30 wiplateral Cast From AN11452 De Samo 15% 22-3/wipe/her/ Stain MINON AW, NO OFFICE entern. STLA 1 west, An DONT be clear water in sn mas er. APE HOW VD amount 5 se C.D Deast 10 Attachments

Page of Harbor Vos Hand Project \_\_\_\_ Project No. OF22 Date 5/28/15 Location \_\_\_\_ Subject OF22 Dry-aire the Potos from Sheen In. By PHA/MJS/WOR/ECH 114 Flow Coming ATTIVEN c.t south. 27" in 12" Main ostletis 1000 ten 74 279 R 610 ppox O.lepsic at this 1-watter Les aten -rom ere 22-320 58. Eurward, we 700anoom 1 L ch Sus erra incomin pope. 14 appeds lesple seleds up hele A addies SOLAND 12 Streak 0 West Sen - Cont= =33W 90 Cow 7 701 -1 C.= diresinch ND 18.m ch ar onlare 50 (22-33 begin settinup traffic 245 MOTX- Arrived a 0 Nooraingo anoon Vac orto nul helow collar m ecta re ca. POGESE (22-34 68 078 sediment sample from upstrean, approx\_2" And as Shren 0 0 27.36 Wide sample 078-1 mll tron **Attachments** Wipe

		Water (	MENTAL SERV Pollution Control Laboratory 5543 N Burlington Ave., ortland, OR 97203-5452	ICES	
	INLIN	ESEDIMENT	SAMPLING FIELD D	ATA SHEET	
	Project Name: Portland Harbor	- Basin 22 Dry Wea	ather Sheen Investigation	Sample ID: If collection	-24W
	Sampling Team: MJS, ECH, WCR, PHA, +	Date: 5/28/15	Arrival Time:	Point Code: 22	-25wip
	Basin: <b>22</b>	Node: ABC	059 (lateral Mer	Address:	- 20m ps
d.	Current weather: Sunny, 60s in I	norning – 80s in af	ternoon		
	Date and time of last known rainf	all: ~¼" on 5/11/15,	~1/10" on 5/12/15		· .
	SECTIO	)N 1 - PRE-SAN	IPLING VISUAL OBSE	RVATION REPORT	
5	Is there water inline? Yes or No	If present, water is	Flowing or Standing Depth	of water = $\frac{1}{2}$ in Rate of	of flow = ( fps
	Does river back up to this location?	'es or No If river is b	acked up: Water Color	Grey Water Odor	I Hydrocarbon I Sanitary I Other
	Are sediments observed in the line?	Yes or No Ar	e recoverable quantities of sedir	ments present in the line? Ye	es or No
	If sediments present: Avg Depth	of seds =	in Sed Depth Range =	in. to in.	
	Estimated dimensions of sediment de	posit: in.	byin. OR 🗆 As	far as can be seen	
40 <sup>20</sup>	SITE DIAGRAM: Include street i and extent of solids accumulation			's/pipe sizes/ flow direction	n/ driveways cuts
	No & wipe locatio	가지 아내는 이 것이 집에 귀에서 있는 것이 없다. 것이 집에서 이 것이 집에서 가지 않는 것이 없다.		1013 water sump	10 22-24
	4		анаа — 5 ж ж. 8 ж. т	1918 hime from	above inlet
	HIG" I			1021 Wipe from	belew G
2 a 2			$\mathbf{i}$	inter 38.	.26wipe
		= Q 10		n saiga n n	
161	A	BR			
		059		10	
		·			
	X	8 <sup>2</sup>			
12	4				
-	6"		boom hanging	in outlet but u	t
			placking	<u></u>	

· · · · · · · · · · · · · · · · · · ·	1	1		· ,	25 E
Date: 5/28/15 SECTION 2	- SAM	PLE COI	LECTION REPO	ORT Node:	Point Code:
Sampling Equipment:     Stainless steel utensil	& stainles	ss steel rec	eptacle	Describe)	
Equipment Decontamination process:	OP 7.01a	a 🗆 Devi	iations (Describe)		
Sample date Sample time; 5 78 15 013 (water) Sample Sample	le Identifi	ication Cod	le (IL-XX-NNNNNN-	-mmyy)	
Sample location:  □ From MH chamber □ From	om line	If from	line, segment is Fro	om NodeTo	Node
Sample collection technique:  Per SOP5.01b	□ Dev	riations (de	scribe below)	1	
Visual and olfactory observations: 😾 Shee	r <u>là</u> en <u>o</u> loration		Color of sample	<ul> <li>Brown</li> <li>Grey</li> <li>Other (describe)</li> </ul>	)
Sample composition/particle size Silt/Clay distribution (estimated percentages): Decompo	S osed Orga	and anics	Fine Gravel Other (describe)	Coarse Gravel	Debris
□ Wood If present, type of debris in sample □ Metal □ Organ	🗆 Pla		Removed debris?	□ Yes (Type & An	nount) □ No 
Compositing notes   Per SOP5.01b  Devia	ations (de	scribe)			
Sample Jars Collected (number, size, full or partia	Constant of the	and a second second	500 mL		3 ( @P)
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).	Jai	r Size	Amount Full	Target A	nalyses
					د بار ایر ایر ایر میروند در ایر میروند ا
Lab ID Here	Duplicat	te sample (	collected? Y/N		
Duplicate sample identification # on COC:	Dup ID I		34 G	· · · · · · · · · · · · · · · · · · ·	
	Innh in	Here	e <u>e</u> 1		10
		Here		- 	
SECTION			RAPH LOG		
SECTION Overview of node showing drainage area					
		нотос	(s):		
Overview of node showing drainage area		HOTOG Filename	(s): :		

	$\cap$		$(\gamma)$	
		TY OF PORTLAND MENTAL SERVI Pollution Control Laboratory 43 N. Burlington Ave., rtland, OR 97203-5452	CES	
INLIN	E SEDIMENT S	AMPLING FIELD D	ATA SHEET	
Project Name: Portland Harbor	- Basin 22 Dry Weat	her Sheen Investigation	Sample ID: If confector	-27N
Sampling Team: MJS, ECH, WCR, PHA, +	Date: 5/28/15	Arrival Time:	Point Code:	- 28
Basin: 22	Node: AAP -	794	Address:	6-29W
Current weather: Sunny, 60s in I	norning – 80s in afte	ernoon		
Date and time of last known rainf	all: ~¼" on 5/11/15, ~	-1/10" on 5/12/15		•
OFOTIC				
		PLING VISUAL OBSEI	AL JA	
Is there water inline? Yes or No	If present, water is:	Flowing or Standing Depth	of water = $10^{-10}$ in Rate	of flow = $\frac{4}{4}$ fps
Does river back up to this location? Y	es of No If river is ba	cked up: Water Color 🛛 🛛		Hydrocarbon     Sanitary     Other
Are sediments observed in the line?	Yes or No	recoverable quantities of sedin $EN_{\mathcal{O}} = SEOB + M$	the line? $C$	res or No
If sediments present: Avg Depth	of seds = $3$ in	Sed Depth Range =0	nosi atautly	3 in
Estimated dimensions of sediment de	positi in bi		aras can be seen	а
SITE DIAGRAM: Include street i and extent of solids accumulation			s/pipe sizes/ flow directi	on/ driveways cuts
K NI	A Q	(043	lateral 2	- W
# Goliment		10=		- san ple
porbant seek 1		- Tab 105	le water lette	tine
An - AA	P	A 12" Pipe	att 12	- 29w
a Joy		ECH	NT DE LA CALLANT	· · ·
	- 1	(Pipe incor drawn-o ziole	y opposite	
	· · · /·			5. 
		KXXX	X 30 peanople	3
L QX / In	.1		. 3	2014 To.
48"		ал мара мара <sup>1</sup>		Page 1 of 2

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Date: 5 24 15 SECTION 2 - SAMPLE COLLECTION REPORT Node: Point Code:
Sampling Equipment: Stainless steel utensil & stainless steel receptacle Dother (Describe)
Equipment Decontamination process: Y Per SOP 7.01a Deviations (Describe)
Sample date: Sample time: Sample Identification Code (IL-XX-NNNNN-mmyy)
Sample location: I From MH chamber From line If from line, segment is From Node To Node
Sample collection technique: Per SOP5:01b Deviations (describe below)
Visual and olfactory observations:
Sample composition/particle size distribution (estimated percentages): Silt/Clay Sand Fine Gravel Coarse Gravel Debris
If present, type of debris in sample Model Large rocks Model Plastic Model Paper Model
Compositing notes Per SOP5.01b Deviations (describe)
Sample Jars Collected (number, size, full or partial)? (1) / 12 - L1
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 Here Duplicate sample collected? Y/N
Duplicate sample identification # on COC: Dup ID Here

## SECTION 3 - PHOTOGRAPH LOG

Overview of node showing drainage area	Filename(s):	
Plan view of sediments inline	Filename:	
Homogenized sample (sediment in bowl)	Filename:	
Other?	Filename(s):	5

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	Wa	ter Pollution Control Labor 6543 N. Burlington Ave., Portland, OR 97203-5452			
INLIN	IE SEDIMENT	SAMPLING F	IELD DATA	SHEET	
Project Name: Portland Harbon	r – Basin 22 Dry W	eather Sheen Invest	igation Sample	ID: If collected	-30 wie
Sampling Team: MJS, ECH, WCR, PHA, +	Date: 5/28/15	Arrival Time:	Point C	ode: 17	-Mwip
Basin: 22	Node: ANI	1453	Addres	s:	
Current weather: Sunny, 60s in	morning – 80s in	afternoon			
Date and time of last known rain	nfall: ~1⁄4" on 5/11/1	5, ~1/10" on 5/12/15		а П. <sub>П</sub>	and the second se
SECTI	ON 1 - PRE-SA	MPLING VISUAL	OBSERVATIO	DN REPORT	1
Is there water inline? Yes or for	If present, water	is: Flowing or Standir	ng Depth of water =		of flow = $\frac{2,0}{1}$
Does river back up to this location?	Yes or No If river is	backed up: Water C	olor 🖾 Grey	Water Odor	Anitary     Other
Are sediments observed in the line?	Yes or No	Are recoverable quantiti	es of sediments pre	sent in the line?	res or No
If sediments present: Avg Dept	h of seds =	_ in Sed Depth Rang	e = in. to	) in.	
Estimated dimensions of sediment of	deposit: ir	n. byin. OR	□ As far as can	be seen	
SITE DIAGRAM: Include street and extent of solids accumulatio	intersections/main	lines/laterals/catch b	asins/MH's/pipe s	zes/ flow direction	on/ driveways c
	tet about ?	a i	ipetakes	- bend -	temards
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* locatives		T	1116 wig	val and cl	talow 6'
	2 D	the last	Seal	n- orange	30 wide
12" 1 1	ANV		1119 Wi	petrom	cliance
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			ex"n	2				
Date: SEC	TION 2 - SAMI	PLE COL	LECTION REP	ORT Node:	Point Code:			
Sampling Equipment:	el utensil & stainles	s steel rece	eptacle 🗆 Other (	(Describe)				
Equipment Decontamination process:	Per SOP 7.01a	a 🗆 Devia	ations (Describe)	and the second				
Sample date: Sample time:	Sample Identifi	ication Code	e (IL-XX-NNNNNN	-mmyy)				
Sample location:  □ From MH chamber	Sample location:  ☐ From MH chamber  ☐ From line  If from line, segment is From NodeTo Node							
Sample collection technique:   Per SOF	'5.01b □ Dev	riations (des	cribe below)	20 0 P & S	ser rear d			
	- Odor		1	Brown				
	Odor     Sheen		Color of sample		10			
	Discoloration			D Other (describe	e)			
	Silt/Clay S Decomposed Orga		Fine Gravel _ Other (describe)_		Debris			
If present, type of debris in sample		arge rocks astic aper	Removed debris?	□ Yes (Type & Ar	mount) □ No			
Compositing notes	Deviations (de	scribe)		2. <b></b>				
Sample Jars Collected (number, size, full	or partial)?							
If not enough sample to fill all of the jars, li		r Size	Amount Full	Target A	nalyses			
collected and related analytes sampled (as analyte priority list in work order).	s per			•				
			8	0 				
કુ સૌથ અને કે સાથે પ્ર		<sup>a</sup> nar a ka		an a' tha tha				
	8							
Lab ID Here	Duplicat	te sample c	collected? Y/N		0. 20			
Duplicate sample identification # on COC	: Dup ID I	Here			2			
				acceletation and a second s				
SE	CTION 3 - PI	HOTOG	RAPH LOG					
SE Overview of node showing drainage area	CTION 3 - PI	HOTOG Filename(						
	CTION 3 - PI	1	(s):					
Overview of node showing drainage area	CTION 3 - PI	Filename(	(s): :					

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		r Pollution Control Laboratory 6543 N. Burlington Ave , Portland, OR 97203-5452		
		SAMPLING FIELD I		
Project Name: Portland Harbor			Sample ID: If	<u> </u>
-	Date: 5/28/15			3W
Sampling Team: MJS, ECH, WCR, PHA, +	Date: 5/26/15	Arrival Time:	Point Code:	*
Basin: 22	Node: AAP	792	Address:	a a
Current weather: Sunny, 60s in	morning – 80s in a	iternoon	10	
Date and time of last known rain	fall: ~¼" on 5/11/15,	~1/10" on 5/12/15		2
	ON 4 DDE CAN			
$\square$		Flowing or Standing Depth		Olapon
Is there water inline? Yes for No	If present, water is	$\subseteq$		
Does river back up to this location?	Yes or No)If river is b	acked up: Water Color D	Grey Water Odor	Hydrocarbon     Sanitary     Other
Are sediments observed in the line?	Yes or No Ar	e recoverable quantities of sedi	ments present in the line?	res or No?
If sediments present: Avg Depth	of seds =	in Sed Depth Range =	in. to in.	
Estimated dimensions of sediment d	eposit: in	hv in OR □ As	far as can he seen	
	-			
SITE DIAGRAM: Include street and extent of solids accumulation			i s/pipe sizes/ now direction	on driveways o
N A		1(48	sumple to	nce-the
-Vaa			use flow from	
/			ateral &	20
				-76W
trace				
NO.1 gpm	AAP	TAT	e 2 <sup>- 1</sup> - 10 - 10	
T	792	Q 2=		· · · · · · · · · · · ·
12"		- ]		a s F s <sup>7</sup>
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and forther	· · · ·			**************************************
down the line	X		u.	
but appenvis 1 40			100	

			5 F K K				
Date: SECTION 2	- SAMP	LE COL	LECTION REPO	ORT Node	Pol	int Code:	
Sampling Equipment:	k stainless	steel rece	eptacle 🛛 Other (I	Describe)	* *		
Equipment Decontamination process:	)P 7.01a	Devi	ations (Describe)				
Sample date: Sample time: Sample	e Identifica	ation Cod	e (IL-XX-NNNNNN-	-mmyy)			
Sample location:  From MH chamber  From line If from line, segment is From Node To Node							
Sample collection technique:  Per SOP5.01b	Devia	itions (des	scribe below)		e		
Visual and olfactory observations:	n loration		Color of sample	□ Brown □ Grey □ Other (desc	ribe)		
	San Sed Organ		Fine Gravel _ Other (describe)	Coarse Gravel	Debi	ris	
☐ Wood If present, type of debris in sample ☐ Metal ☐ Organia	□ Larg □ Plas cs □ Pap		Removed debris?	□ Yes (Type 8	Amount)	п No	
Compositing notes	tions (desc	cribe)					
Sample Jars Collected (number, size, full or partial	)?						
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).	Jar S	Size		Targe	et Analyse	S	
				·		<u> </u>	
	а <b>к</b>			12		,	
Lab ID Here	Duplicate	sample c	collected? Y/N		1.000000-00	9 æ <sup>60 40</sup>	
Duplicate sample identification # on COC:	Dup ID H	Here					
· · · · · · · · · · · · · · · · · · ·			•••••				
SECTION	3 - PH	OTOG	RAPH LOG				
Overview of node showing drainage area	P Re ( NGa, em.	Filename(	(s):	200-200-200-200-200-200-200-200-200-200	0		
Plan view of sediments inline	5	Filename:			2		
Homogenized sample (sediment in bowl)	· •	Filename:	:			×	

Filename(s):

Other?

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н. н. Н		ENVIRONN Water I	TY OF PORTLAND MENTAL SERVI Pollution Control Laboratory 43 N. Burlington Ave., rtland, OR 97203-5452	CES	
	INLIN	E SEDIMENT S	AMPLING FIELD D	ATA SHEET	22 CW
	Project Name: Portland Harbor -	- Basin 22 Dry Weat	her Sheen Investigation	Sample ID: If colleged	27-2 P
	Sampling Team: MJS, ECH, WCR, PHA, +	Date: 5/28/15	Arrival Time:	Point Code:	-94->
	Basin: 22	Node: AAP	701	Address:	22.33
1	Current weather: Sunny, 60s in r	norning – 80s in afte	ernoon	22	
	Date and time of last known rainfa	all: ~¼" on 5/11/15, ~	1/10" on 5/12/15		
	SECTIO	N 1 - PRE-SAMI	PLING VISUAL OBSER	RVATION REPORT	
8	Is there water inline? Yes or No	If present, water is:	Flowing or Standing Depth of		
	Does river back up to this location? Y	es or No If river is ba	cked up: Water Color D	Grey Water Odor	Hydrocarbon Sanitary Other
•	Are sediments observed in the line?	Yes or No Are	recoverable quantities of sedin	U line is a	es or No
1	If sediments present: Avg Depth	of seds = $\frac{1}{2}$ in	Sed Depth Range =	in. to fabre	0
24 24	Estimated dimensions of sediment de	posit: in. b	$\frac{30}{10}$ in. OR $\Box$ As f	ar as can be seen	
	SITE DIAGRAM: Include street in and extent of solids accumulation			s/pipe sizes/ flow directio	n/ driveways cuts
• • • • •	Nox sample 100 attions	4	Q n	Lan Mole is by grave 1-1	surrounded not asphalt
		1	1	209 Water	Ear Ph
		AAP 791		21 le zedine	33mo sample
	A QX			400	72-8
	and And And And And			e e	4
а		2	* 000 #		

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Date: 5 28 15 SECTION 2	2 - SAMPLE COLLECTION REPORT Node: Point Code:
Sampling Equipment: Stainless steel utensil 8	& stainless steel receptacle
Equipment Decontamination process: Per SC	OP 7.01a  □ Deviations (Describe)
Sample date: Sample time: Sampl 5/28/15 1216	ble Identification Code (IL-XX-NNNNN-mmyy)
Sample location:  □ From MH chamber	om line If from line, segment is From Node To Node
Visual and olfactory observations:	r Brown to Compositi
	10 Sand $30$ Fine Grave $30$ Coarse Grave $38$ Debris $3$ osed Organics $0$ Other (describe)
☐ Wood If present, type of debris in sample ☐ Organie	Plastic Removed debris?     Plastic Removed debris
Compositing notes Der SOP5.01b Deviat	ations (describe)
Sample Jars Collected (number, size, full or partial	a)? (1) U oz fot
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).	Jar Size Amount Full Target Analyses
Lab ID Here	Duplicate sample collected? Y/N
Duplicate sample identification # on COC:	Dup ID Here

SECTION 3 - PHOTOGRAPH LOG					
Overview of node showing drainage area	Filename(s):				
Plan view of sediments inline	Filename:				
Homogenized sample (sediment in bowl)	Filename:				
Other?	Filename(s):				

	С	TY OF PORTLAND		
	ENVIRONN Water	MENTAL SERVI Pollution Control Laboratory 543 N. Burlington Ave., irtland, OR 97203-5452	CES	
INLIN	E SEDIMENT S	AMPLING FIELD D	ATA SHEET	22-34
Project Name: Portland Harbor	- Basin 22 Dry Weat	ther Sheen Investigation	Sample ID:	850
Sampling Team: MJS, ECH, WCR, PHA, +	Date: 5/28/15	Arrival Time:	Point Code:	Howipe
Basin: 22	Node: AAW	1078	Address:	22-35
Current weather: Sunny, 60s in	norning – 80s in aft	ernoon		
Date and time of last known rainf	all: ~¼" on 5/11/15, ·	~1/10" on 5/12/15		
SECTIO	N 1 - PRE-SAM	PLING VISUAL OBSER	RVATION REPORT	
Is there water inline? Yes or No	If present, water is:	Flowing or Standing Depth of	of water = <u>2</u> in Rai	te of flow = 0.25ps
Does river back up to this location?	res or No Diviver is ba	cked up: Water Color 🛛 🗘	Brown Grey Water Odor Clear	Hydrocarbon Sanitary Other
Are sediments observed in the line?	Yes or No Are	recoverable quantities of sedim	nents present in the line?	Yes or No
If sediments present: Avg Depth	of seds = $3$ ir	n Sed Depth Range =	in. to <u></u> in.	9 a
Estimated dimensions of sediment de	eposit: <u>16</u> in. b	nyin. OR 🗶 Asf	ar as can be seen	
SITE DIAGRAM: Include street and extent of solids accumulation				
		e locations.	08 Sample	dredin
	1ª		412 wiped	1+ 138-30
		WI III Iodatieg	1	2226
	·	44 comine in		22-350
	ar a	In pipes price	475-	
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	078	- Int	<u></u>	
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		Y FIR &		e 8
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4 <sup></sup>		XXX 3Ld	subsamples	5
4 ****		* I	20	

the state of the s	а.	N %	1 · · · · · · · · · · · · · · · · ·		
Date: 5 28 15 SE	CTION 2	- SAMPLE COL	LECTION REP	DRT Node: Po	oint Code:
Sampling Equipment: Stainless ste	el utensil 8	k stainless steel rec	eptacle  □ Other (	Describe)	
Equipment Decontamination process:	Ber SC	DP 7.01a □ Devi	ations (Describe)		
Sample date: 5 Sample time: 408	Sampl	e Identification Cod			34
Sample location:	er DEro	m line If from	line, segment is Fro	om Node To Node	
Sample collection technique: V Per SC		Deviations (des	scribe below)		10444111 I 16
Visual and olfactory observations:	Shee	n loration	Color of sample	□ Brown b: Grey □ Other (describe)	
Sample composition/particle size distribution (estimated percentages):	Silt/Clay_ Decompo	<b>3</b> Sand <u>80</u> sed Organics	Fine Gravel <u>10</u> Other (describe)	Coarse Gravel <u>5</u> Deb	ris <u>2</u>
If present, type of debris in sample	□ Wood Va Metal ) □ Organi	□ Large rocks □ Plastic cs □ Paper □ C(1) D<	Removed debris?	□ Yes (Type & Amount) + a Vernaue + a vernaue	¢ No
Compositing notes Per SOP5.01	Devia	tions (describe)		too su	na []
Sample Jars Collected (number, size, fi	ull or partial	)? (1)	V OZ jav	3	
If not enough sample to fill all of the jars collected and related analytes sampled analyte priority list in work order).	and the second se	Jar Size	Amount Full	Target Analyse	<b>:S</b>
	nin F			······································	
	£				
Lab ID Here	<u> </u>	Duplicate sample o	collected? Y/N )		
Duplicate sample identification # on CO	<b>C:</b>	Dup ID Here			
	Summer L		s	Margane	
			St. 24.5		

SECTION	3 - PHOTOGRAPH LOG
Overview of node showing drainage area	Filename(s):
Plan view of sediments inline	Filename:
Homogenized sample (sediment in bowl)	Filename:
Other?	Filename(s):

e: Director's Office Ine: Portland Harbor. Portland Harbor. Portland Harbor. Hox and NUTPH-Cor If detected How assessing total or a sample service sample between the service sample service servic	Client Name: Project Name:	1	t a		1 1 1			Chain-of-Custody	land stody		sa	Worl	t Order #	Work Order #: WISE199
e: Director's Office lice: Portland Harbor rollarmic Harbor PDM Sheen Investigation rollarmic Scanson Sample PDX and NVTPH-CX if detected PDX and NVTP	Client Name: Project Name:			•			Bureau	of Environmen	tal Services		8.84.85 80			where way to and a
Ine:     Portland Harbor       Contrant Harbor       Requested Analyses       Colons:       Requested Analyses       Onlow:       Sample Sample Sample Sample Math (Colspan="2">Requested Analyses       Colspan= Sample Sam	Project Name:	Directo	r's Office											
efforts:		Portlan	d Harbor			а 2	1			* *	•			
Cifons:         Cifons:         Cifons:         Cifons:           1-1X and NWTPH-Cx if detected         1								Ren	lected Analyse		•	a.		
Oleum Sheen Investigation         All NWTPH-Cx ff detected           +Dx and NWTPH-Cx ff detected         +Dx and NWTPH-Cx ff detected           +Dx and NWTPH-Cx ff detected         Sample Sampl	Special Instruction	IS:				Ŀ								
+DX and NWTPH-GX if detected       ample Sample Sam	3asin 22 Petroleu	um Sheen Invest	igation		82 82 8					1		(woys	Tum-Arou	Tum-Around-Time Request:
Sample         Sample<	Run NWTPH-Dx	and NWTPH-Gx	If detected	U		and a second	-			r		oyusn) Ali	00	Standard (10 business days) Rush (5 business days)
W         5/28/2015         1013         G         Water         •	Location ID	Sample Date	Sample Time	Grab or. Comp	Sample Matrix	Constant of the second s						/	<u>ہ</u> گ	
Nipe         5/28/2015         1018         G         Wipe         •	22_24W	5/28/2015		U	Water	•			· ·			110	2	AQL3 OS1 ABQ059 4
Ipe         5/28/2015         1021         G         Wibe         •         Mipe         Mipe         •         Mipe         Mipe<	22_25Wipe		1018	<u>ں</u>	Wipe	•							4 F	AQBOSG ABQ059
W       5/28/2015       1043       G       Mater       •	22_26Wipe	5/28/2015			- CSS 	•							4	A & B O S A B Q O S A B Q O S A B Q O S A B Q O S A B Q O S A B Q O S A S A S A S A S A S A S A S A S A S
B         5/28/2015         1050         C         Hater         Sed         Image: Sed <thimage: sed<="" th="">         Image: Sed         Image: Sed</thimage:>	22_27W	5/28/2015	51 1			•				<u> </u>		103	2	AP794
W         5/28/2015         1056         G         Water         •	22_28	5/28/2015		3 2 4		•							-	AP794 Infine Sediment DS
Ipe         5/28/2015         1116         G         Wipe         Image: Signal and Si	22_29W	5/28/2015	1056	- 1								184	2	AAP794 Drv Flow from US
Ipe         5/28/2015         1119         G         Wipe         Image: Market	22_30Wipe	5/28/2015	1116	છ	Wipe	•				2 () 			-	ANV453 Wipe under east Lat §
W 5/28/2015 1148 G Water • • •	22_31Wipe	5/28/2015		σ	Wipe	•							-	
W 5/28/2015 1209 G Water • •	22_32W	5/28/2015	,	ΰ	Water				· · · · · · · · · · · · · · · · · · ·			173	2	Dry Flow from & Lat
Berekrad Bir	22-33M-	5/28/2015	1209	σ	Water	•						194	2	
Mrs 2 11 294 114 Bartines 11 Bartines 15		21hr	*/s		Received By:	5	N	Lette	Relinguished By: Signature:		Date	Rec Sgm	Received Byc Signature:	Date:
1150kg 1/2/15 Mindland Jone	Matt 5411	luken .	転代	14	IE	das	Source				Time:	Printe	Printed Name:	Time:

	Printed Name:	Prin	Time:				Printed Name:		15115		ŝ	ennos	M	Alicheles	15	15/5	NW	Matt Sull Non 1515
Date	Received By: Signature:	S. Re	Date:			thed By:	<u>Relinquished By:</u> Signature:		5-38-15	• • •	in dia second	M	N	Received By:		5/38/14	lar	Senture Menue
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2	<u>,</u>		•						_							<u> </u>		2
Vipe from MH Collar							а 8 – 1					]	•	Wipe	U	1412	5/28/2015	22_80Wipe 5/2
AAM078 Inline Sediment US													•	Sed	570 358	1408	5/28/2015	22_36 34 5/
AAP791 Inline Sediment US				8									•	Sed	জন্ত ৯	1216	5/28/2015	22_34_33_51
* Remarks	י ונ	Anthroad and the second s	······································						· · · · · · · · · · · · · · · · · · ·				HqTWN HqtWV	Sample Matrix	Grab or . Comp	Sample Tirthe	Sample S Date	Location (D
Standard (10 business days) Rush (5 business days)	C C C	yun) Ay										haven u	M-FGAG)			letected	TPH-Gx If c	Run NWTPH-Dx and NWTPH-Gx If detected
Turn-Around-Time Request:	Turn-Arou	S (woys										12	· ·		а <sup>н</sup> 11 12 <sub>5</sub>	tion	n Investiga	Basin 22 Petroleum Sheen Investigation
					ses	Requested Analyses	fed	senba	<b>8</b>				-					Special Instructions:
	10				10	u n R	1	8% 8								arbor	Portland Harbor	Project Name: P.
1		2 2 2											2			Office	Director's Office	Client Name: D
Date: 5/38/15 Work Order #: いリラビー99 Collected By: ハフ5, wとえ、ELH, PHA	Dat k Order /	Nor		. 3		See See	<ul> <li>City of Portland</li> <li>Chain-of-Custody</li> <li>Bureau of Environmental Services</li> </ul>	City of Portland Chain-of-Custody	DF-C DF-C		Che Che au of						boratory	Water Politution Control Laboratory 6543 N. Burlington Ave. Portland, Oregon 97203-4552 Sample Custodan: (503) 823-5691 General Lab: (503) 823-5681
		2.4									2							· · ·





Page erbor Project No. Date 6315 Project \_ Location OFZZ BY PHA/MJS/WER/ECH subject OFZZ Dry Weither Petroleon Shern Anu. 05X-AAV796- ( Sleeted live sectivent sample from 8" in aten ny 7239) Wort 22-38) 22-AAP800 - Arrived Forsin above on site; no HOW AT SCO trace at sediment upstream may be same Rht Petrokum orloc, 184 downstream miles upstream wein. non westis 10" livent sample ops inline se voluce sample collected directly in MJS 5  $t^{\mathcal{D}}$ wall of Dipe induded in Samp is line apoprex qu'up the sides of pipe Appens (22.39 sides of RAN - goorox 20' There is no builduo on walls of WHSTEIN Extend VOSTRA is clay-like and bes stoht netrolcom orlor. Sheen an line. The materia water in sample Loon - Sour Wisch 1064 Miner NF750 them nort on NW appears to come from coto sample cole solids in any leter 50 are course 5 don't appear containivate 1724-Arrived on Site P. basin . Cert elave south. Smill proc 3" appears to NW Front Ave mein 00 a weephole that doesn't go anywhere Ostlet is ANDON. Attachments 120th 33 15" Plastics, or an ics, meta \$00000 Cutch besin 13 30" deep



Page Harbor Project Project No. Location DF22 Date 63 Subject\_OF22 oloun S BY PHA/MJS/WOR/ECH on The 12 -24 hing all counted besin 500+ cide of NU From ANFZ48 411F748 Antin , west assume to catch besins join into one EXit AP&N> drains to 111 MJ e sectiment sample new o 730 HD (ງ) 1239-04 000 GNUE DETWIEL 110799 a appears to icin in a h bisin j2 Seve SiZE 8.5 TRO went is dry an TROPHET 9. et lens c er x 50 30" deco is 10" al spiline sediment sample mar catch basin outlet. stiz orgains, Styntoon. TRIK chris. Attachments

		ENVIRON Wate	CITY OF PORTLANI MENTAL S r Pollution Control Labor 3543 N. Burlington Ave., Portland, OR 97203-5452		ES	
	INLINE	SEDIMENT	SAMPLING F	IELD DA	TA SHEET	22_36
Project Name: Po	rtland Harbor –	Basin 22 Sheen Inv	estigation	<u> </u>	Sample ID:	1-27 MJ:
Sampling Team: I WCR, PHA	/JS, ECH,	Date: 6/3/15	Arrival Time:	F	Point Code: (Sc	e additional
Basin: 22		Node: AAP	799	A	Address:	collectier
Current weather:	Overcast, upwai	ds of mid 60s			rep.	1 0
Date and time of I	ast known rainfa	all: ~0.2" 6/1/2015-6	/2/2015		19	2-3/8-)A
	SECTIC	N 1 - PRE-SAN	IPLIN <u>G V</u> ISUAL	OBSER	ATION REPO	<del>37/</del>
Is there water inline	Yes or No	If present, water is	Flowing or Standi	ng Depth of	water = $1.5$ in	Rate of flow $\beta.24$
Does river back up	o this location? Y	es or No If river is b	acked up: Water C	olor Gre	w Water Oc	□ Hydrocarbon lor □ Sanitary □ Other
Are sediments obse			e recoverable guantiti 3e0, MIN ( 39 WWE 2 CB I N	lets en	nts present in the lin acever abo Lev avt let	10? (Yes) or No
If sediments presen	: Avg Depth	of seds =	in Sed Depth Rang	e=	in to	in.
Estimated dimension	ns of sediment de	posit: <u>()</u> in.	by in. OR	As far	as can be seen	
SITE DIAGRAM: and extent of solid	Include street in s accumulation	ntersections/main li as well as subsamp	nes/laterals/catch b ble locations. Pipe contai Mostly com Matching Some	us k with o	oth 10" in	lets enter se about 2
30"		AAP 7901		R	18" 22-3	DI014-3av Bid Inma DS of V 6 22-22
22-36 Q	12 37				petroleun	20- Sampl in 15" inly 37 22 22
XX SED Subsu	mas 22-38 mple hens	AVA For	sociated FC sampling det lentains	5 ails	as entra	int stirre

Date: 0 3/15 SECTION 2	2 - SAMPLE CO	LECTION REP	ORT	Node:	Point Code:			
Sampling Equipment: Stainless steel utensil	& stainless steel red	eptacle	(Describe)					
Equipment Decontamination process:	OP 7.01a □ Dev	iations (Describe)						
Sample date: Sample time: Samp 0315 1014	ele Identification Coo	ie (IL-XX-NNNNN 22_		,	Э			
Sample location:	om line If from	line, segment is Fr		TO NO PT99	de to NW			
Sample collection technique: A Per SOP5.01b Collected geds abo ovtlet pipe, Seds start	Deviations (de yv + 2' D5 -abev + 4		ve CI	3 ente	<u>.</u>			
Visual and olfactory observations:	en oloration	Color of sample		(describe)	· · · · · · · · · · · · · · · · · · ·			
	<u>13</u> Sand <u>15</u> osed Organics	Fine Gravel 20 Other (describe)	Coarse C	iravel <u>30</u> [	Debris <u>2</u>			
□ Wood If present, type of debris in sample □ Organ	□ Large rocks □ Plastic ics □ Paper	Removed debris?	Ves (T Me	vpe & Amou ta ( SL AV	nt) □No nuel			
Compositing notes								
Sample Jars Collected (number, size, full or partia	1)? ({ } ) L	02 jav	1 fr					
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).	Jar Size	Amount Full		Target Analı	yses			
		····		· · · · · · ·	·····			
				······································				
Lab ID Here	Duplicate sample	collected? YN	L					
Duplicate sample identification # on COC:	Dup ID Here		· · · ·	· · · ·	·			
	·			• . •				

# SECTION 3 - PHOTOGRAPH LOG

SECTION	3 - PHOTOGRAPH LOG	
Overview of node showing drainage area	Filename(s):	
Plan view of sediments inline	Filename:	• • •
Homogenized sample (sediment in bowl)	Filename:	
Other?	Filename(s):	

		A LEW CONTRACTOR OF THE REAL PROPERTY OF THE PROPERTY OF THE REAL PROPER		
		ITY OF PORTLAND MENTAL SERV Pollution Control Laboratory 543 N. Burlington Ave., ortland, OR 97203-5452	ICES	
INLI	NE SEDIMENT &	SAMPLING FIELD I	DATA SHEET	
Project Name: Portland Harbor	- Basin 22 Sheen Inve	estigation	Sample ID:	AT MIS
Sampling Team: MJS, ECH, WCR, PHA	Date: 6/3/15	Arrival Time: 0952	Point Code: 22	-37
Basin: 22	Node: AAP	799-10+1001+	Address:	
Current weather: Overcast, upv	vards of mid 60s			
Date and time of last known rai	nfall: ~0.2" 6/1/2015-6/	2/2015	·····	······································
SECT	ION 1 - PRE-SAM	PLING VISUAL OBSE		
Is there water inline? Yes)or No		Flowing or Standing Depth		n Charles and Shenda and Shendar (Shendar)
Does river back up to this location	? Yes or No? If river is ba	acked up: Water Color 🛛	Brown Grey Water Odor Clear	□ Hydrocarbon □ Sanitary □ Other
Are sediments observed in the line	? Yes or No Are	recoverable quantities of sedi	ments present in the line?	Yesfor No
If sediments present: Avg Dep	th of seds = ir	اSed Depth Range =	<u>_</u>	
If sediments present: Avg Dep Estimated dimensions of sediment		n Sed Depth Range = by in. OR 💆 As	in.toin.	
Estimated dimensions of sediment SITE DIAGRAM: Include stree and extent of solids accumulation	deposit: in. b t intersections/main line on as well as subsample	es/laterals/catch basins/MH	in.toin. IVLI For VVVin. far as can be seen	

Date: 6 3 (15 S	ECTION 2	- SAMPLE CO	OLLECTION REF	PORT	Node:	Point Code:
Sampling Equipment: Stainless s	steel utensil	& stainless steel re	eceptacle	(Describe)		I, , , , , , , , , , , , , , , , ,
Equipment Decontamination process		OP 7.01a 🗆 De	eviations (Describe)			1 - <b></b>
Sample date: Sample time:	Samp	le Identification Co	ode (IL-XX-NNNNN 2 2 - 3			
Sample location:	iber (Fro	om line If fro	m line, segment is Fi	AA1 rom Node_	P799 To No	AA <b>A</b> 79@ ode
Sample collection technique: Per S	30P5.01b	□ Deviations (c	lescribe below)			
		Avannie	docomp			
Visual and olfactory observations:	A Odor C Shee Disco		Color of sample		ı (describe)	•
Sample composition/particle size distribution (estimated percentages):	Silt/Clay	The Sand <u>10</u> psed Organics		_ Coarse C	Gravel 20 [	)ebris
If present, type of debris in sample	□ Wood □ Metal □ Organi	□ Large rocks □ Plastic ics □ Paper	s Removed debris?	, □ Yes (1 	Гуре & Amou	<sup>nt)</sup> ¥∕No -
Compositing notes Per SOP5.0	1b 🗆 Devia	itions (describe)			1999 1997 1997	· · · · · · · · · · · · · · · · · · ·
Sample Jars Collected (number, size,	full or partia	1)? (1)	) 4 02 -	fr11		
If not enough sample to fill all of the jar	s, list jars	Jar Size	Amount Full		Target Analy	yses
collected and related analytes sampled analyte priority list in work order).	l (as per			<u> </u>		<u>and and an </u>
and the property not in more ordery.		· · · · · · · · · · · · · · · · · · ·				
Lab ID Here		Duplicate sample	collected? Y/N	1		• <u>·</u> ···································
Duplicate sample identification # on Co	)C:	Dup ID Here				· · · · ·
· · · · · · · · · · · · · · · · · · ·		Are and the second seco				

SECTION	I 3 - PHOTOGRAPH LOG
Overview of node showing drainage area	Filename(s):
Plan view of sediments inline	Filename:
Homogenized sample (sediment in bowl)	Filename:
Other?	Filename(s):

		CITY OF PORTLAND MENTAL SEF er Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452	WICES	
INLIN	E SEDIMENT	SAMPLING FIELI	D DATA SHEET	
Project Name: Portland Harbor -	- Basin 22 Sheen Inv	/estigation	Sample ID:	- <b>3</b> MJS
Sampling Team: MJS, ECH, WCR, PHA	Date: 6/3/15	Arrival Time:	Point Code: 22	_38
Basin: 22	Node: AAP 7	79 3	Address:	
Current weather: Overcast, upwa	ards of mid 60s			· · · · ·
Date and time of last known rain	fall: ~0.2" 6/1/2015-6	6/2/2015		·
Is there water inline? Yes or No. NOW IN 8			SERVATION REPORT pth of water = <u>1Va</u> in Rat	
	Yes or No Ar	bove S" inter	Brown Grey Water Odor Clear ediments present in the line?	☐ Hydrocarbon ☐ Sanitary ☐ Other Yes or No
Estimated dimensions of sediment d	eposit: in.	byin. OR 🗴	As far as can be seen	······································
SITE DIAGRAM: Include street and extent of solids accumulation M XXX 420 WbBarmple locothoms 8" I 3" 8" I 2011 8" I 2011 1	as well as subsamp		MH's/pipe sizes/ flow direct 58 Sampled 8" inlet, a vpstream MH enan 22-38	sed from about 3" from uber f MIS

Date: 6 3/15 SECTION 2	- SAMPL	E COL	LECTION REP	ORT	Node;	Point Code:
Sampling Equipment: Stainless steel utensil	& stainless s	steel rece	eptacle 🗆 Other i	(Describe)		
Equipment Decontamination process: A Per So	OP 7.01a	Devia	ations (Describe)	<u> </u>		
Sample date: Sample time: Samp	le Identifica	ton Code	e (IL XX-NNNNNN 2)	-mmyy) <b>38</b>		
Sample location:  □ From MH chamber	m line	If from	M30 * line, segment is Fr	_		ode
Sample collection technique: Per SOP5.01b	Deviat	ions (des	scribe below)			
Visual and olfactory observations: Evil 4 Odor A Disco		paars	Color of sample		(describe)	
Sample composition/particle size distribution (estimated percentages): Decompo	15 San osed Organi		Fine Gravel _ Other (describe)_	Coarse G	Gravel <u>20</u> E	Debris <u>5</u>
Vooting aq I Wood If present, type of debris in sample I Metal Dai WT Alecks? I Organi	□ Large ∕	e rocks ic er	Removed debris? AB MUM	KYes (T	ype & Amou	nt) □ No
Compositing notes Per SOP5.01b  Devia	itions (desci				-	
Sample Jars Collected (number, size, full or partia	1)?	(1)	2 0Z -	h11		
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).	Jar S	ize	Amount Full		Target Anal	yses
				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
Lab ID Here	Duplicate s	sample c	ollected? Y/N)	•	· · · · .	
Duplicate sample identification # on COC:	Oup ID He	(e				••••••••••••••••••••••••••••••••••••••
						- n n '

SECTION 3 - I	PHOTOGRAPH LOG
Overview of node showing drainage area	Filename(s):
Plan view of sediments inline	Filename:
Homogenized sample (sediment in bowl)	Filename:
Other?	Filename(s):

		CITY OF PORTLAND NMENTAL SER ater Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452	VICES						
INLI	NE SEDIMENT	SAMPLING FIELD	DATA SHEET						
Project Name: Portland Harbor	– Basin 22 Shéen II	nvestigation	Sample ID: 11	IA- MJS					
Sampling Team: MJS, ECH, WCR, PHA	Date: 6/3/15	Arrival Time:	Point Code: 22-	39					
Basin: 22	Node: AA	POKER AAP80	3 Address:						
Current weather: Overcast, upw	ards of mid 60s								
Date and time of last known rai	nfall: ~0.2" 6/1/2015	-6/2/2015							
		MPLING VISUAL OBS	n an	<u></u>					
Is there water inline? Yes or No	If present, water	is: Flowing or Standing Dep	th of water = <u>Wall</u> in Rate of	flow = <u> </u>					
Does river back up to this location?		backed up: Water Color	□ Grey Water Odor □ S	lydrocarbon Sanitary Dther					
Are sediments observed in the line	regior No	Are recoverable quantities of se	diments present in the line? Yes	)or No					
If sediments present: Avg Dept	h of seds = tvall	, - in Sed Depth Range =	in. to in.	ear M					
	~								
Estimated dimensions of sediment $\frac{340075}{340075}$		by 1 in OR DA	1						
SITE DIAGRAM: Include street and extent of solids accumulation	t intersections/main n as well as subsan	nple locations.		_					
AP XX ged gular	ample	. (	133 sumpled -	seds					
locat	ing	1	and FOG 1	ne take					
·			22-4	🖉 . MJS					
			22-30	1					
			pipe M	ows					
TT	AAT	>	QXX 18" line on	um FOG					
18" 2	Soc		18" line on	walls abo					
	,		high wo	termark					
	1	T	+ Include	d in saw					
	4		-line is a	bert 9"					
		opre	sent vp pipe u tu extends	vall and					
		on bo Side							
	· · · · · · · · · · · · · · · · · · ·		line 20' upst	ream,					
	ilo		ubiv or Dite Page	Jof 2 mestin					
Date: 0 3/15 SECTION 2	- SAMPI	E COL	LECTION REP	ORT	Node:	Point Code			
---	---------------	------------	---------------------	-----------------	-------------	---------------------------------------	--	--	--
Sampling Equipment: Stainless steel utensil & stainless steel receptacle									
Equipment Decontamination process: Per So	DP 7.01a	🗆 Devi	ations (Describe)						
Sample date: Sample time: Samp	le Identifica	ition Cod		1-mmyy) 2_39					
Sample location:	m line	If from	line, segment is Fi	rom Node_	7800 U	petre au ode			
Sample collection technique:  Per SOP5.01b Deviations (describe below) <u>divet fill</u> frem Sco3 in pipe and FOG on pipe <u>walls dve for low verve</u> Visual and olfactory observations:  Sheen Color of sample (Grey Other (describe)									
Sample composition/particle size Silt/Clay A Sand Fine Gravel Coarse Gravel Debris Decomposed Organics Other (describe)									
If present, type of debris in sample □ Wood □ Large rocks □ Metal □ Plastic Removed debris? □ Yes (Type & Amount) □ No □ Organics □ Paper									
Compositing notes □ Per SOP5.01b Deviations (describe) See abave									
Sample Jars Collected (number, size, full or partia	))? ([	) 4	02 ful						
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).	Jar S	ilze	Amount Full		Target Anal	yses			
Lab ID Here	Duplicate	sample o	ollected? Y/N)		·				
Duplicate sample identification # on COC:	Dup ID He	); () }				· · · · · · · · · · · · · · · · · · ·			
				·	-				
			****			•			

# **SECTION 3 - PHOTOGRAPH LOG**

SECTION	3 - PHOTOGRAPH LOG
Overview of node showing drainage area	Filename(s):
Plan view of sediments inline	Filename:
Homogenized sample (sediment in bowl)	Filename:
Other?	Filename(s):

CITY OF PORTLAND **ENVIRONMENTAL SERVICES** Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452 **INLINE SEDIMENT SAMPLING FIELD DATA SHEET** Project Name: PORTLAND HARBOR - BASIN SHEEN INVEST POLTION Sampling Team: MG, ECH, Date/ Arrival Time Point Code: WOR PHA D Basin: / Node: Address: Current weather: UVAVCas DWard 605 Date and time of last known rainfall: n0.2" 612 15 15 SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT Is there water inline? Yes#or No If present, water is: Flowing or Standing) bepth of water =  $Mall_in$  Rate of flow = Ufps +VAPR Brown Does river back up to this location? Yes of No) If river is backed up: Hydrocarbon Water Color Grey Water Odor Sanitary Clear □ Other Are sediments observed in the line? Yes, or No Are recoverable quantities of sediments present in the line? Yes br No COOVER and app 2 aV 0 If sediments present: Avg Depth of seds = Sed Depth Range = in in. to Estimated dimensions of sediment deposit: in. OR DAS tarras can be seen AVAVN SITE DIAGRAM: Include street intersections/main lines/laterals/catch basins/MH's/pipe sizes/ flow direction/ driveways cuts and extent of solids accumulation as well as subsample locations. 10" inlets 34" off Manufact floor pu Northern 10" inlet bends to right towards ANF 250-has seds but not reachable gravel appears te ceme france c'i julet 18 A" 40 ANT 10"

Date: SECTION	2 - SAMP	LE COI	LECTION REF	PORT	Node:	Point Code:
Sampling Equipment:	il & stainless	steel rec	eptacle	(Describe)		<u> </u>
Equipment Decontamination process:	SOP 7.01a	Deví	iations (Describe)			
Sample date: Sample time: Sam	ıple Identific;	ation Cod	e (IL-XX-NNNNN	N-mmyy)		
Sample location:  □ From MH chamber □ F	From line	If from	line, segment is F	rom Node	То	Node
Sample collection technique:  Per SOP5.01b	Devia	itions (de	scribe below)	**************************************		· · · · · · · · · · · · · · · · · · ·
Visual and olfactory observations:	or een scoloration		Color of sample			
Sample composition/particle size Silt/Clau distribution (estimated percentages): Decom	y Sar posed Orgar	nd	Fine Gravel _ Other (describe)	Coarse (		· · · · · · · · · · · · · · · · · · ·
☐ Wood If present, type of debris in sample ☐ Meta □ Orga			Removed debris?	, □ Yes (`	Type & Amo	ount) □ No
Compositing notes	iations (desc	cribe)				
Sample Jars Collected (number, size, full or parti	ial)?					
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).	Jar S	Size	Amount Full		Target An	alyses
	· · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·	
			· .			·
.ab ID Here	Dunlicate		ollected? Y/N			· · · · · · · · · · · · · · · · · · ·
Duplicate sample identification # on COC:	Duplicate					<u></u>
	\$ where the given it that it is a second			*******		
SECTIO	)N 3 - PH	ΙΟΤΟG	RAPH LOG			
Overview of node showing drainage area		Filename	·(s):		<u>, dalah kana kana k</u> ana kana kana kana kana kan	<u>della estre ma vitada en sua</u>
Plan view of sediments inline		Filename	:			,
Homogenized sample (sediment in how)				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	

rioniegenized sample (sediment in bowi)	riiename.
Other?	Filename(s):



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

			10.61
	BASIN SOLIDS & FIELD DATA SHE	승규가 잘 많은 것을 만들었는 것 같아. 이렇게 모양 생활에 있	
Project Name: Portland Harbor – Basin 22 She	en Investigation	Sample ID:	M3544 22-40
Sampling Team: MJS, ECH, WCR, PHA Date:	6/3/15	Arrival Time:	Point Code:
Basin: 22 Node:	ANFZUM	Address:	
Current weather: Overcast, upwards of mid 60s	5		1730)
Date and time of last known rainfall: ~0.2" 6/1/20	<u> </u>	inkled about 10 prod	vee vunage
	SAMPLING VISUAL	OBSERVATION REP	PORT
Indicate observed erodible solids or adjacent operations that could impact catch basin:		aterials Storage □ O eavy Truck Traffic □ O	n-site Processes ther
Percent of catch basin grate clogged = $5\%$	Type of debris clogging catch basin grate:		/ood ravel ther
Is there standing water in catch basin? Yes	No Depth of	standing water, if present	=in
Q Orga	Sheen/Discolored Sedime nics	nt ) ▲ Paper □ Cigarette butts	□ Hydrocarbon odor □ Solvent odor 2 Other: <u>349 offaa</u> M
Total depth of catch basin = <u>in</u>		n = <u>15</u> in Sed dep	
SITE DIAGRAM: Include street intersections, in locations, etc.	nlets and outlets, catch ba	asin dimensions, sedimer 30	t depth detail, subsample
AN		-	
NW FRONT	JEMB PARP	30" ANYE	· 茶子子丁12"
CONCRETE SIDWAL	11/2	4 (	most appears te
		ې د )	be a seep trake
BUT =- GRAVEL AN	JF24R ties to		concret
DBB sumpled ada	in eves to AAI	XXX GU	mple Definitions
Just prior to 1	2" outlet		
22-40 22-41	MJS		

Date: 6 3/15 SECTIO	N 2 - SAMPLE CO	DLLECTION RE	PORT	Node:	Point Code:			
Sampling Equipment: Stainless steel	Sampling Equipment: 🖌 Stainless steel utensil & stainless steel receptacle 🛛 Other (describe)							
Equipment decontamination procedure:	Per SOP7.01a	Deviations (desc	ribe)					
Sample Date: Sample Time:	Sample Identificatio	- 4 + 22	-40					
Sample collection technique: Per 2003 et	12M Hill SOP – Guida	ince for Sampling of	Catch Basin	Śolids				
Der SOP5.02a - Inline Sampling of Stormwater Solids Deviations (describe below) mmpled divide the invand Memory Mized in avoue to abound ance of Manteviel.								
Visual or olfactory evidence of	heen	Color of sample	Brown □ Grey □ Other (	describe)	· · · · · · · · · · · · · · · · · · ·			
	clay <u>10</u> Sand <u>3</u> Sand <u>3</u> Sand Sand Sand Sand Sand Sand Sand Sand	Fine Gravel OOther (describe		avel Del	bris			
If present, type of debris in sample 🛛 🗆 Me								
Compositing notes 🙀 Per SOP5.01a 🛛 Devi	Compositing notes & Per SOP5.01a 🗆 Deviations (describe) to collectice							
Sample jars collected (number, size, full or pa	nrtial)?	) 407,-	Pull					
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).	Jar Size	Amount Full		arget Analys	es			
				······································				
Lab ID Here	Duplicate sample col	lected? YN	L					
Duplicate sample identification # on COC:	Dup ID Here			· .				
	· · · · · · · · · · · · · · · · · · ·							

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

ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452
CATCH BASIN SOLIDS SAMPLING FIELD DATA SHEET みみ_41
Project Name: PORTLAND HARBOR - BASIN 22 Sample ID: 19942 M35
Sampling Team: MJS, ECH, WUC, Date: Co 3115 Arrival Time: Point Code:
Basin: 22 Current weather: Overcast, upwards of wid 60c
Date and time of last known rainfall: 20.2" 6/1-6/2/15, light sprinkle but norunoff
SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT
Indicate observed erodible solids or adjacent operations that could impact catch basin:
Percent of catch basin grate clogged = $\frac{15}{2}$ %Type of debris clogging catch basin grate:Type SedsI WoodUnderstand </td
Is there standing water in catch basin?  Yes V No Depth of standing water, if present =in
Note visual or olfactory observations
Total depth of catch basin = <u>30</u> in Average sediment depth = <u>15</u> in Sed depth range = <u>6</u> in to <u>18</u> in
SITE DIAGRAM: Include street intersections, inlets and outlets, catch basin dimensions, sediment depth detail, subsample locations, etc.
MN 1901 1901 1901 1901 1211 Co-sumpled seds from Cotell busin just prior to 10" outlet <b>22-41</b> 22-41
XXX sed subsample Deations

						a a de la composición
Date: () 3/15 SECTION	2 - SAMPL	E COLL	ECTION R	EPORT	Node:	Point Code:
Sampling Equipment: Stainless steel ut	ensil & stainles	ss steel re	ceptacle c	Other (desc	ribe)	
Equipment decontamination procedure:	Per SOP7.01a	a 🗆 D	eviations (de	scribe)		
Sample Date: Sample Time:	Sample Identi	ification C		NNNN-mmyy) = ススー <b>リ</b>		
Sample collection technique.	M Hill SOP - (	Guidance	for Sampling	of Catch Basin	Solids	
Visual or olfactory evidence of	nto jar ince off	mate	homa	X Ø Brown le □ Grey	IN al	
	ay <u>[0</u> Sano nposed Organi	nd <u>30</u> ics 60	Fine Gravel _ Other (descri	Coarse Gr be)	avel Del	oris
☐ Wo If present, type of debris in sample ☐ Met □ Org	al 🛛 🗆 Plast	tic  F	Removed debi	ris? X Yes (T 2M IXE to co	ype & Amount	) INO
Compositing notes APer SOP5.01a □ Devia	tions (describe	e)		to ca	leethe	en
Sample jars collected (number, size, full or par	tial)?	) 4	or fu			
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).	Jar Size		mount Full	T	arget Analyse	3 <b>S</b>
Lab ID Here	Duplicate samp	ple collect	ed? Y/N		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
Duplicate sample identification # on COC:	Dup IO Here					<u>en en e</u>
SECTI	ON 3 - PH	IOTOG	RAPH LC	G Carlos		
Overview of CB showing drainage area		Filename	(s):		<u>en tri se se settitit de </u>	

-

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

Provide City of Portland       City of Portland       City of Portland       City of Portland       Constant       City of Portland       Bureau of Environmental Services       Bureau of Environmental Services       City of Portland       City of Portland       City of Portland       City of Portland       Bureau of Environmental Services       Sample Construct       City of Portland       City of Construction       Construction       Construction       Construction       Construction       Constrend       Construction	Sector
	tory tory cctor's Office H-Gx if detected H-Gx if detected 1015 1058 0015 1014 Compo 11 1230 0015 1058 0015 1014 Compo 11 1230 0015 1058 0015 1014 Compo 11 1230 0015 1058 00 0015 1020 0000 000
	tory tory cctor's Office H-Gx if detected H-Gx if detected 1015 1058 0015 1014 Compo 11 1230 0015 1058 0015 1014 Compo 11 1230 0015 1058 0015 1014 Compo 11 1230 0015 1058 00 0015 1020 0000 000
Ty         No         No<	Cetor's Of         Cetor's Of           015         10           015         10           112         10
	Direct         Direct           4552         823-5696           823-5696         823-5696           823-5696         823-5696           881         Direct           9         6/3/201           8         6/3/201           8         6/3/201           8         6/3/201           8         6/3/201

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Attachment D Laboratory Results Investigation Day One May 27, 2015



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 Petroleum Sheen Investigation Outfall Basin 22

To:FileFrom:Andrew Davidson, GSIDate:June 23, 2015

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated during a source control investigation sampling event conducted by the City of Portland (City). Six composite inline solids samples, nine dry weather flow (DWF) grab samples, six wipe samples, and one field decontamination blank sample were collected in Outfall Basin 22 on May 27, 2015 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 included the following analyses:

- BES WPCL
  - Total Solids SM 2540 G (Inline solids samples only)
  - Field Conductivity FO SOP 1.03a
  - Hydrocarbon Analysis NWTPH-HCID (NWTPH-Dx if detected)
  - Polycyclic Aromatic Hydrocarbons (PAHs) EPA 8270-SIM (DWF samples only)

The WPCL summary report for all analyses associated with this sampling event is attached for review.

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

- Chain-of-custody for completeness and continuous custody
- Analysis conducted within holding times
- Chemicals of interest detected in method blanks and/or field decontamination blanks

- Internal standard recoveries within laboratory control limits
- Surrogate recoveries within laboratory control limits
- Matrix spike/matrix spike duplicate (MS/MSD) sample results within laboratory control limits
- Laboratory control/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 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

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

# **Method Blanks**

Method blanks were processed during the hydrocarbon scan analysis (NWTPH-HCID) and the analysis of diesel/oil hydrocarbons (NWTPH-Dx) for wipe, DWF, and inline solids samples. No analytes were detected in any of the blank samples processed during the analysis of hydrocarbons in wipe, DWF, or inline solids samples. One method blank sample was processed during the analysis of PAHs. No analytes were detected in the method blank sample.

## **Field Decontamination Blanks**

One field decontamination blank was collected during the sampling event and analyzed for petroleum hydrocarbons and PAHs. No target analytes were detected in the field decontamination blank.

## **Surrogate Recoveries**

Surrogate recoveries were processed during the laboratory analyses of hydrocarbons and PAHs. Surrogate recoveries were within control limits with the following exceptions:

• High concentrations of hydrocarbons in samples W15E194-19 and W15E194-20 prevented determination of surrogate recoveries during the initial hydrocarbon scan (NWTPH-HCID). Despite the sample undergoing silica gel-cleanup, associated surrogate recoveries could not be determined in these same samples during the diesel/oil analysis (NWTPH-Dx) due to required dilutions of the sample extract. Accordingly, diesel/oil hydrocarbon results for these samples are qualified as estimates and flagged "J" due to

unacceptable surrogate recovery "SR"; that is there is a degree of uncertainty associated with the values due to the high dilutions that prevented acceptable recovery of the surrogate compound 2-Fluorobiphenyl.

- Recovery of the surrogate compound 2-Fluorobiphenyl was below acceptance limits for the DWF sample W15E194-21 during the NWTPH-Dx analysis. WPCL reports that the sample results may be low estimates. Accordingly, diesel/oil hydrocarbon results for this sample are qualified as estimates and flagged "J" due to unacceptable surrogate recovery "SR".
- Recovery of the surrogate compound fluoranthene-d10 was below acceptance criteria during the analysis of PAHs for the DWF sample W15E194-21. WPCL reports that associated sample results may be low estimates. Accordingly, associated target compounds for fluoranthene-d10 (fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene) are flagged as estimates "J" due to surrogate recovery outside acceptance limits "SR".

# Matrix Spike/Matrix Spike Duplicate

MS/MSD samples were prepared using aliquots of DWF sample W15E194-05 and processed during the laboratory analysis of PAHs in DWF samples. MS/MSD recoveries and RPDs were within acceptance limits for all spiked analytes.

# Laboratory Control Samples/Duplicate Laboratory Control Samples

LCS samples were processed during the analyses of hydrocarbons in wipe, DWF, and inline solids samples and during the analyses of PAHs in DWF samples. DLC samples were processed during the analyses of hydrocarbons in DWF samples. All laboratory control sample recoveries and RPDs were within laboratory control limits.

# **Duplicate Samples**

Duplicate samples were processed during the analyses of total solids and hydrocarbons (NWTPH-HCID and NWTPH-Dx) for inline solids samples. All RPDs were within acceptance criteria.

# **Additional Information**

WPCL reports the following additional information regarding wipe, DWF, and inline solids samples:

• For samples where hydrocarbons were detected by the initial hydrocarbon scan (NWTPH-HCID), additional analyses NWTPH-Dx and NWTPH-Gx were to be run. WPCL reports that no VOAs were available for follow-up analysis of NWTPH-Gx on water samples; no extra jars were available for follow-up analysis of NWTPH-Gx on inline solids; no additional sample available for follow-up analysis of NWTPH-Gx on the wipe samples. Accordingly, only NWTPH-Dx analyses were conducted for the samples where hydrocarbons were detected by NWTPH-HCID.

- All samples analyzed by NWTPH-Dx underwent silica gel clean-up.
- WPCL reports that detections quantified as Diesel and Lube Oil in samples W15E194-01, W15E194-02, W15E194-03, W15E194-04, W15E194-05, W15E194-06, and W15E194-12 actually appear to be a single petroleum product that is heavier than Diesel #2 and lighter than the reference lube oil. The data are qualified as estimates "J" due to inadequate matching with the reference compounds "RC".
- WPCL reports that the fuel pattern in samples W15E194-01, W15E194-02, W15E194-03, W15E194-04, W15E194-05, W15E194-06, W15E194-12, and W15E194-15 most closely resembles transformer oil. Specifically, WPCL reports that samples W15E194-02, W15E194-03, W15E194-04, W15E194-06, and W15E194-12 resemble a non-Aroclor transformer oil.
- WPCL reports that during the initial hydrocarbon scan, results for gasoline and lube oil in samples W15E194-19 and W15E194-20 were primarily due to overlap from diesel-range hydrocarbons. These detections are qualified as estimates "J" in subsequent tables to indicate matrix interference "MI".
- WPCL qualifies that reported analytes for the hydrocarbon analyses of wipe samples (quantified in mg/Wipe) are not certified under the National Environmental Laboratory Accreditation Program (NELAP).



#### City of Portland Water Pollution Control Laboratory

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



June 17, 2015

Linda Scheffler Director's Office

> Work Order W15E194

Project Portland Harbor Received 05/27/15 15:51

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.

ennifer Shackelford

Jennifer Shackelford Laboratory Coordinator QA/QC





#### Water Pollution Control Laboratory

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 **ORELAP Certification ID 4023** 



#### LABORATORY ANALYSIS REPORT

Project: Work Order: Received:	Portland Harbor W15E194 5/27/15 15:51	Client: Project Mgr:	Director's Office Linda Scheffler
Submitted By:	Field Operations		

			Sample Collection Date			
Sample	Laboratory ID	Matrix	Туре	Start	End	Qualifier
22_8	W15E194-01	Sediment	Grab	05/27/15 09:29	05/27/15 09:29	
22_8W	W15E194-02	Water	Grab	05/27/15 09:30	05/27/15 09:30	
22_9W	W15E194-03	Water	Grab	05/27/15 10:04	05/27/15 10:04	
22_4W	W15E194-04	Water	Grab	05/27/15 10:09	05/27/15 10:09	
22_5W	W15E194-05	Water	Grab	05/27/15 10:13	05/27/15 10:13	
22_10W	W15E194-06	Water	Grab	05/27/15 10:49	05/27/15 10:49	
FDBLANK	W15E194-07	Water	Grab	05/27/15 11:21	05/27/15 11:21	
22_11	W15E194-08	Sediment	Composite	05/27/15 11:05	05/27/15 11:05	
22_12Wipe	W15E194-09	Wipe	Grab	05/27/15 11:40	05/27/15 11:40	
22_13Wipe	W15E194-10	Wipe	Grab	05/27/15 11:47	05/27/15 11:47	
22_14Wipe	W15E194-11	Wipe	Grab	05/27/15 11:53	05/27/15 11:53	
22_15W	W15E194-12	Water	Grab	05/27/15 11:59	05/27/15 11:59	
22_13W	W15E194-13	Water	Grab	05/27/15 12:01	05/27/15 12:01	
22_14	W15E194-14	Sediment	Composite	05/27/15 12:09	05/27/15 12:09	
22_16	W15E194-15	Sediment	Composite	05/27/15 12:12	05/27/15 12:12	
22_17Wipe	W15E194-16	Wipe	Grab	05/27/15 12:49	05/27/15 12:49	
22_18	W15E194-17	Sediment	Composite	05/27/15 12:53	05/27/15 12:53	
22_19	W15E194-18	Sediment	Composite	05/27/15 13:15	05/27/15 13:15	
22_20Wipe	W15E194-19	Wipe	Grab	05/27/15 13:22	05/27/15 13:22	
22_21W	W15E194-20	Water	Grab	05/27/15 13:27	05/27/15 13:27	
22_22W	W15E194-21	Water	Grab	05/27/15 13:45	05/27/15 13:45	
22_23Wipe	W15E194-22	Wipe	Grab	05/27/15 13:51	05/27/15 13:51	

#### **Case Narrative**

PAH/phthalates by 8270-SIM Analysis: Only PAH analysis was requested. Phthalates are not reported.

Analyte	Result Units	MRL	MDL	Dil	. Batch	Prepared	Analyzed	Method	Qualifier
Field Parameters									
Field conductivity									
22_8W : W15E194-02 Conductivity*	<b>309</b> umhos/cm			1	B15E421	05/27/15	05/27/15	FO SOP 1.03a	
Reported: 06/17/15 13:47		The	results in t	his re	port apply on			alifiers and case	

Jennifer Shackelford

narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford, Laboratory Coordinator QA/QC

#### Water Pollution Control Laboratory



6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

ORELAP Certification ID 402

, ,	tland Harbor 5E194		Client: Director's Office Received: 05/27/15 15:51							
Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier	
Field Parameters										
Field conductivity										
22_10W : W15E194-0 Conductivity*	6 322 umhos/cm			1	B15E421	05/27/15	05/27/15	FO SOP 1.03a		
22_15W : W15E194-1; Conductivity*	2 324 umhos/cm			1	B15E421	05/27/15	05/27/15	FO SOP 1.03a		
22_13W : W15E194-1 Conductivity*	3 679 umhos/cm			1	B15E421	05/27/15	05/27/15	FO SOP 1.03a		
22_21W : W15E194-2 Conductivity*	0 <b>482</b> umhos/cm			1	B15E421	05/27/15	05/27/15	FO SOP 1.03a		
22_22W : W15E194-2 Conductivity*	1 187 umhos/cm			1	B15E421	05/27/15	05/27/15	FO SOP 1.03a		
General Chemistry										
Total Solids										
22_8 : W15E194-01 Total solids	77.5 % W/W	0.01			B15E432	05/28/15	05/29/15	SM 2540G		
22_11 : W15E194-08 Total solids	<b>79.2</b> % W/W	0.01			B15E432	05/28/15	05/29/15	SM 2540G		
22_14 : W15E194-14 Total solids	<b>51.4</b> % W/W	0.01			B15E432	05/28/15	05/29/15	SM 2540G		
22_16 : W15E194-15 Total solids	58.0 % W/W	0.01			B15E432	05/28/15	05/29/15	SM 2540G		
22_18 : W15E194-17 Total solids	80.4 % W/W	0.01			B15E432	05/28/15	05/29/15	SM 2540G		
22_19 : W15E194-18 Total solids	82.5 % W/W	0.01			B15E432	05/28/15	05/29/15	SM 2540G		

Reported: 06/17/15 13:47

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

1

#### Water Pollution Control Laboratory



6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 **ORELAP Certification ID 4023** 

Portland Harbor W15E194			Client: Director's Office Received: 05/27/15 15:51						
Resul	t Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifie
ns by GC-FID									
•									
	ma/ka day	26		1	D15E046	06/02/15	06/02/15		F F0, F
									F0, F
			% Boo			06/03/15	06/03/15	NVVIPH-DX	FU, F
						06/03/15	06/03/15		
	ing/kg ury	20.0	5170	00 100	B101 040	00,00,10	00,00,10		
-02									F
2.0	) mg/L	0.066		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
0.57	r mg/L	0.13		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
		Expected	%Rec	Limits(%	5)				
0.095	5 mg/L	0.105	91%	50-150	B15F001	06/01/15	06/03/15	NWTPH-Dx	
-03									F
		0.069		1	B15E001	06/01/15	06/03/15		F0, F
	-								F0, F
	0		%Pac	-		00/01/15	00/03/15		10,1
		•			,	06/01/15	06/03/15	NWTPH-Dx	
	- mg/L	0.111	10070	00 /00	2707007	00,01,10	00,00,10		
-04									F
1.3	<b>s</b> mg/L	0.070		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
0.20	3 mg/L	0.14		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
Resul	t	Expected	%Rec	Limits(%	5)				
0.0993	3 mg/L	0.112	88%	50-150	B15F001	06/01/15	06/03/15	NWTPH-Dx	
4-06									F
	ma/l	0.066		1	B15E001	06/01/15	06/03/15		F0, F
	-								F0, F
	0		%Pec	-		00/01/13	00/03/13		10,1
		•		•	,	06/01/15	06/03/15	NWTPH-Dx	
									_
4-12									F
0.93	3 mg/L	0.066		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
0.46	3 mg/L	0.13		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
		-		-	-				
0.0790	) mg/L	0.105	75%	50-150	B15F001	06/01/15	06/03/15	NWTPH-Dx	
4-13									F
	ma/l	0.066		1	B15E057	06/03/15	06/09/15		•
	-								
	0		%Rec			00/03/13	00/09/13		
		•		•		06/03/15	06/09/15	NWTPH-Dx	
	5								
									F
78	3 mg/kg dry	34		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	F
220	) mg/kg dry	68		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	
<b>D</b> /	+	Expected	%Rec	Limits(%	5)				
Resul	ng/kg dry	27.1		-	B15F046			NWTPH-Dx	
	ns by GC-FID 11 84 110 Resul 18.7 1-02 2.0 0.57 Resul 0.0955 1-03 3.0 0.66 Resul 0.095 1-03 0.112 1-04 1.3 0.28 Resul 0.0993 04-06 1.5 0.29 04-06 1.5 0.28 Resul 0.0993 04-12 0.93 04-12 0.93 04-12 0.93 04-12 0.93 04-13 0.09 04-13 0.09 04-13 0.46 Resul 0.099 04-14 0.09 04-14 0.09 04-14 0.09 04-14 0.09 04-14 0.09 04-14 0.09 04-14 0.09 04-14 0.09 04-14 0.09 04-14 0.09 04-14 0.09 04-14 0.09 04-14 0.09 04-14 0.09 0	Result         Units           ns by GC-FID         1           81         mg/kg dry           10         mg/kg dry           11         18.7           11         mg/kg dry           12         0.0           10         mg/kg dry           18.7         mg/kg dry           18.7         mg/kg dry           18.7         mg/kg dry           19         mg/L           0.012         mg/L           0.028         mg/L           0.093         mg/L           0.0831         mg/L           0.0831         mg/L           0.4-12         0.93           0.4-13         0.49           0.41         mg/L           0.0790         mg/L           0.44-13         0.49           0.99         mg/L           0.99         mg/L	Result         Units         MRL           ns by GC-FID         10         mg/kg dry         26           110         mg/kg dry         51           Result         Expected         18.7 mg/kg dry         20.6           1-02         0.066         0.57 mg/L         0.13           Result         Expected         0.055           0.0955 mg/L         0.105         110           1-02         0.069         0.69           0.0955 mg/L         0.105         111           1-03         0.069         0.14           Result         Expected         0.111           1-04         0.112 mg/L         0.111           1-04         0.070         0.28 mg/L         0.112           1-04         1.3 mg/L         0.070         0.14           Result         Expected         0.0993 mg/L         0.112           0-04         1.3 mg/L         0.112         0.112           0-04         0.055 mg/L         0.13         Result         Expected           0.093 mg/L         0.13         Result         0.106           0.0831 mg/L         0.106         0.105         0.105           04-12         0.33 mg/	Result Units         MRL         MDL           ns by GC-FID         110 mg/kg dry         26           110 mg/kg dry         51         Expected %Rec           18.7 mg/kg dry         20         91%           1-02         0.066         91%           1-02         0.0955 mg/L         0.13           Result         Expected %Rec         0.0055           0.0955 mg/L         0.105         91%           1-03         3.0 mg/L         0.069           0.69 mg/L         0.14         Expected %Rec           0.112 mg/L         0.111         100%           1-04         1.3 mg/L         0.070           0.28 mg/L         0.14         Result           Result         Expected %Rec           0.0993 mg/L         0.112         88%           04-06         1.9 mg/L         0.066           0.25 mg/L         0.13         Result           Result         Expected %Rec         0.0831 mg/L           0.0331 mg/L         0.106         78%           0.41         Result         Expected %Rec           0.0331 mg/L         0.105         75%           04-12         0.33 mg/L         0.0105         75	Result Units         MRL         MDL         Dil.           ns by GC-FID         11         81         mg/kg dry         26         1           110         mg/kg dry         51         1         1           Result         Expected         %Rec         Limits/%           18.7         mg/kg dry         20.6         91%         50-150           1-02         0.066         1         1         1           0.57         mg/L         0.13         1         1           0.0955         mg/L         0.105         91%         50-150           1-03         0.0995         mg/L         0.105         91%         50-150           1-03         0.091         0.14         1         1         1           Result         Expected         %Rec         Limits/%         0.111         100%         50-150           1-04         13         0.14         1	Result Units         MRL         MDL         Dil.         Batch           Ins by GC-FID         I         B1 mg/kg dry         26         1         B15F046           110         mg/kg dry         26         1         B15F046           110         mg/kg dry         26         1         B15F046           110         mg/kg dry         26         1         B15F046           120         12.7         mg/kg dry         20.6         91%         50-150         B15F046           140         18.7         mg/kg dry         20.6         91%         50-150         B15F046           140         0.57         mg/L         0.13         1         B15F001           0.57         mg/L         0.105         91%         50-150         B15F001           10.69         mg/L         0.105         91%         50-150         B15F001           10.69         mg/L         0.14         1         B15F001           10.28         mg/L         0.111         100%         50-150         B15F001           10.28         mg/L         0.112         88%         50-150         B15F001           10.28         mg/L         0.112	Result Units         MRL         MDL         Dil.         Batch         Prepared           ns by GC-FID         11         81 mg/kg dry 110 mg/kg dry Result         26         1         B15F046         06/03/15           110 mg/kg dry Result         26         1         B15F046         06/03/15           18.7 mg/kg dry Result         20.6         91%         50-150         B15F046         06/03/15           10.02         2.0 mg/L         0.066         1         B15F001         06/01/15           0.055 mg/L         0.105         91%         50-150         B15F001         06/01/15           0.0955 mg/L         0.105         91%         50-150         B15F001         06/01/15           0.095 mg/L         0.105         91%         50-150         B15F001         06/01/15           0.095 mg/L         0.114         1         B15F001         06/01/15           0.112 mg/L         0.111         100%         50-150         B15F001         06/01/15           0.28 mg/L         0.14         1         B15F001         06/01/15           0.28 mg/L         0.112         8%         50-150         B15F001         06/01/15           0.28 mg/L         0.13         1	Result Units         MRL         MDL         Dil.         Batch         Prepared         Analyzed           ns by GC-FID	Result Units         MRL         MDL         Dil.         Batch         Prepared         Analyzed         Method           11         1

Reported: 06/17/15 13:47

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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.

Jennifer Shackelford, Laboratory Coordinator QA/QC



#### Water Pollution Control Laboratory



6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Work Order:	Portland Har W15E194	bor				Client: Director's Office Received: 05/27/15 15:51					
Analyte		Result	Units	MRL	MDL	. Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels											
Diesel/Oil Hydrocarb	ons by GC-FID										
22_20Wipe : W1	5F194-19										F7
Diesel*		290	mg/Wipe	31		25	B15E430	05/29/15	06/03/15	NWTPH-Dx	17
Lube oil*			mg/Wipe	62		25	B15E430	05/29/15	06/03/15	NWTPH-Dx	
Surrogate		Result		Expected	%Rec						
2-Fluorobiphenyl		0.00	mg/Wipe	0.100	%		́ В15Е430	05/29/15	06/03/15	NWTPH-Dx	SU5
22_21W : W15E <sup>2</sup>	194-20										F7
Diesel	104 20	130	mg/L	7.3		100	B15F057	06/03/15	06/09/15	NWTPH-Dx	17
Lube oil			mg/L	15		100	B15F057	06/03/15	06/09/15	NWTPH-Dx	
Surrogate		Result	ing/L	Expected	%Rec			00/00/10	00/00/10		
2-Fluorobiphenyl			mg/L	0.116	%	50-150	B15F057	06/03/15	06/09/15	NWTPH-Dx	SU5
22 22W : W15E <sup>2</sup>	104 21										F7
—	194-21	4 7	ma/l	0.10		1		06/02/15	06/00/15		F7
Diesel			mg/L	0.12		1 1	B15F057	06/03/15	06/09/15	NWTPH-Dx	
Lube oil <b>Surrogate</b>		Z./ Result	mg/L	0.25 Expected	%Pec	-	B15F057	06/03/15	06/09/15	NWTPH-Dx	
2-Fluorobiphenyl		0.0828	ma/L	0.200		50-150	" B15F057	06/03/15	06/09/15	NWTPH-Dx	SU1
Hydrocarbon Scan b	v GC-FID		5								
-	•										
22_8 : W15E194	-01										
Gasoline			mg/kg dry	23		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Diesel			mg/kg dry	58		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Lube oil			mg/kg dry	115	0/ <b>D</b>	1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Surrogate 2-Fluorobiphenyl		Result 9 89	mg/kg dry	Expected 11.5		50-150	») B15E420	05/28/15	05/28/15	NWTPH-HCID	
		0.00	ing/kg ury	11.0	0070	00 100	B102420	00/20/10	00/20/10		
22_8W : W15E19	94-02										
Gasoline			mg/L	0.26		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Diesel			mg/L	0.53		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Lube oil			mg/L	0.53		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Surrogate 2-Fluorobiphenyl		<b>Result</b> 0.0963	ma/l	Expected 0.105	% <b>Rec</b> 92%	Limits(% 50-150		06/01/15	06/01/15	NWTPH-HCID	
		0.0303	mg/L	0.705	9270	50-750	B151 001	00/01/13	00/01/13	NWIFIFICID	
22_9W : W15E19	94-03										
Gasoline		ND	mg/L	0.28		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Diesel		DET	mg/L	0.56		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Lube oil			mg/L	0.56		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Surrogate		Result		Expected		•		00/04/45	00/04/45		
2-Fluorobiphenyl		0.107	mg/L	0.111	96%	50-150	B15F001	06/01/15	06/01/15	NWTPH-HCID	
22_4W : W15E19	94-04										
Gasoline		ND	mg/L	0.28		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Diesel		DET	mg/L	0.56		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Lube oil		DET	mg/L	0.56		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Surrogate		Result		Expected							
2-Fluorobiphenyl		0.0978	mg/L	0.112	87%	50-150	B15F001	06/01/15	06/01/15	NWTPH-HCID	
22_5W : W15E19	94-05										
Gasoline		ND	mg/L	0.28		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	

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#### Water Pollution Control Laboratory

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Project: Portlan Work Order: W15E19	d Harbor )4			Client: Receiv		Director's 05/27/15 1			
Analyte	Result Units	MRL	MDL	. Dil.	Batch	Prepared	Analyzed	Method	Qualifie
els									
drocarbon Scan by GC-FID									
22_5W : W15E194-05									
Diesel	ND mg/L	0.56		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Lube oil	ND mg/L	0.56		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec						
2-Fluorobiphenyl	0.0863 mg/L	0.112	77%	50-150	B15F001	06/01/15	06/01/15	NWTPH-HCID	
22_10W : W15E194-06									
Gasoline	ND mg/L	0.27		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Diesel	DET mg/L	0.53		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F
Lube oil	DET mg/L	0.53		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0943 mg/L	0.106	89%	50-150	B15F001	06/01/15	06/01/15	NWTPH-HCID	
FDBLANK : W15E194-07									
Gasoline	ND mg/L	0.27		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Diesel	ND mg/L	0.55		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Lube oil	ND mg/L	0.55		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0721 mg/L	0.110	66%	50-150	B15F001	06/01/15	06/01/15	NWTPH-HCID	
22_11 : W15E194-08									
Gasoline	ND mg/kg dry	22		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Diesel	ND mg/kg dry	56		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Lube oil	ND mg/kg dry	112		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected		-	-				
2-Fluorobiphenyl	7.48 mg/kg dry	11.2	67%	50-150	B15E420	05/28/15	05/28/15	NWTPH-HCID	
22_12Wipe : W15E194-09									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected		-	-				
2-Fluorobiphenyl	0.0902 mg/Wipe	0.100	90%	50-150	B15E430	05/28/15	05/28/15	NWTPH-HCID	
22_13Wipe : W15E194-10									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected		-	-				
2-Fluorobiphenyl	0.0878 mg/Wipe	0.100	88%	50-150	B15E430	05/28/15	05/28/15	NWTPH-HCID	
22_14Wipe : W15E194-11									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected		-	-	05/00/15			
2-Fluorobiphenyl	0.0885 mg/Wipe	0.100	88%	50-150	B15E430	05/28/15	05/28/15	NWTPH-HCID	
22_15W : W15E194-12									

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#### Water Pollution Control Laboratory

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

JRELAP Certification ID 402

Project: Portla Work Order: W15E	nd Harbor 194	Client: Director's Office Received: 05/27/15 15:51							
Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels									
Hydrocarbon Scan by GC-FIE	)								
22_15W : W15E194-12									
Gasoline	ND mg/L	0.26		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Diesel	DET mg/L	0.53		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Lube oil	DET mg/L	0.53		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Surrogate	Result	Expected	%Rec	-		00/01/10	00/01/10		1 64, 1 6
2-Fluorobiphenyl	0.0775 mg/L	0.105			" B15F001	06/01/15	06/01/15	NWTPH-HCID	
22_13W : W15E194-13									
Gasoline	ND mg/L	0.27		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Diesel	DET mg/L	0.53		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	F0
Lube oil	ND mg/L	0.53		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	10
Surrogate	Result	Expected	%Pec	•		00/03/13	00/04/13		
2-Fluorobiphenyl	0.0958 mg/L	0.106		50-150	• <b>/</b> B15F057	06/03/15	06/04/15	NWTPH-HCID	
			/-						
22_14 : W15E194-14									
Gasoline	ND mg/kg dry	35		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Diesel	ND mg/kg dry	88		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Lube oil	ND mg/kg dry	176		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected		•	,				
2-Fluorobiphenyl	14.2 mg/kg dry	17.6	81%	50-150	B15E420	05/28/15	05/28/15	NWTPH-HCID	
22_16 : W15E194-15									
Gasoline	ND mg/kg dry	31		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Diesel	DET mg/kg dry	77		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Lube oil	DET mg/kg dry	154		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	15.5 mg/kg dry	15.4		50-150	B15E420	05/28/15	05/28/15	NWTPH-HCID	
22 17Wipe : W15E194-16	6								
 Gasoline*	ND mg/Wipe	1		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	2		1	B15E430		05/28/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430		05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	-		00/20/10	00,20,10		
2-Fluorobiphenyl	0.0928 mg/Wipe	0.100		-	-	05/28/15	05/28/15	NWTPH-HCID	
22 18 : W15E194-17									
Gasoline	ND mg/kg dry	22		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Diesel	ND mg/kg dry	56		1	B15E420		05/28/15	NWTPH-HCID	
Lube oil	ND mg/kg dry	112		1	B15E420		05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Pec	-		03/20/13	03/20/13		
2-Fluorobiphenyl	9.33 mg/kg dry	11.2				05/28/15	05/28/15	NWTPH-HCID	
22_19 : W15E194-18	/								
Gasoline	ND mg/kg dry	21		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Diesel	ND mg/kg dry	52		1	B15E420		05/28/15	NWTPH-HCID	
Lube oil	ND mg/kg dry	105		1	B15E420 B15E420		05/28/15	NWTPH-HCID	
Surrogate	ND mg/kg ary Result	Expected	%Pac			03/20/13	03/20/13		
2-Fluorobiphenyl	9.80 mg/kg dry	10.5		•	,	05/28/15	05/28/15	NWTPH-HCID	
			0 / / 0	50 100	2.02.20	0.20,10	00.20,10		

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#### Water Pollution Control Laboratory

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Work Order:	Portland Harbor W15E194			Client: Receiv		Director's 05/27/15				
Analyte	Resu	ılt Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
<u>Fuels</u>										
Hydrocarbon Scan I	by GC-FID									
22_20Wipe : W										
Gasoline*	DE	T mg/Wipe	1		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	F4
Lube oil*	DE	T mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	F2
Diesel*	DE	T mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	F0b
Surrogate	Resi		Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.	00 mg/Wipe	0.100	%	50-150	B15E430	05/28/15	05/28/15	NWTPH-HCID	F6
22_21W : W15E	194-20									
Gasoline	DI	<b>T</b> mg/L	0.29		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	F4
Diesel	DE	ET mg/L	0.58		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Lube oil	DE	<b>T</b> mg/L	0.58		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	F2
Surrogate	Resi	ılt	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0	00 mg/L	0.116	%	50-150	B15F057	06/03/15	06/04/15	NWTPH-HCID	F6
22_22W : W15E	194-21									
Gasoline	Ν	ID mg/L	0.50		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Diesel	DE	<b>T</b> mg/L	1.00		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Lube oil	DE	<b>T</b> mg/L	1.00		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Surrogate	Resi	ılt	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.09	82 mg/L	0.200	49%	50-150	B15F057	06/03/15	06/04/15	NWTPH-HCID	SU1
22_23Wipe : W	I5E194-22									
Gasoline*	Ν	ID mg/Wipe	1		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Lube oil*	Ν	ID mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Diesel*	Ν	ID mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Resi	ılt	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.1	00 mg/Wipe	0.100	100%	50-150	B15E430	05/28/15	05/28/15	NWTPH-HCID	

Reported: 06/17/15 13:47

Jennifer Shackelford

	654		Pollutic	on Co d OR 97		Labc	<b>Dratory</b> ) fax (503) 823-5	656		
Project:	Portland Harbor			(	Client:		Director's	Office		
Work Order:	W15E194				Receiv	ed:	05/27/15 1	5:51		
Analyte	Result	t Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Orga	nics - SIM									
Polynuclear Aromatics	& Phthalates by GCN	IS-SIM								
22 8W : W15E194	1-02									
Acenaphthene		ug/L	0.020	0.020	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene		) ug/L	0.20	0.20	1	B15E414		06/01/15	EPA 8270-SIM	
Anthracene		ug/L	0.020	0.020	) 1	B15E414		06/01/15	EPA 8270-SIM	
Benzo(a)anthracene		ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene		) ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	ND	) ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	ND	) ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	ND	) ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	0.013	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthrace	ne ND	) ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	0.053	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	2.2	ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrei	ne ND	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	0.11	ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND	) ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND	) ug/L	0.40	0.40	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene	2.1	ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	0.10	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result	t	Expected	%Rec	Limits(%	)				
2-Methylnaphthalene	-d10 0.25	ō ug/L	0.229	108%	60.4-153	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10	0.25	ō ug/L	0.229	110%	69-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
22_9W : W15E194	4-03									
- Acenaphthene		ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene		ug/L	0.22	0.22	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene		ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(a)pyrene		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene		) ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Chrysene		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthrace		) ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Fluoranthene		iug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Fluorene		′ug/L	0.020	0.020		B15E414		06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrei		) ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
1-Methylnaphthalene		ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene		) ug/L	0.040	0.040	1	B15E414		06/01/15	EPA 8270-SIM	
Naphthalene		) ug/L	0.40	0.40	1	B15E414		06/01/15	EPA 8270-SIM	
Phenanthrene		′ug/L	0.020	0.020	1	B15E414		06/01/15	EPA 8270-SIM	
Pyrene		iug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Surrogate	Result	-	Expected				-			
2-Methylnaphthalene		5 ug/L	0.229			B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10	0.26	β ug/L	0.229	115%	69-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	

Jennifer Shackelford

		6543 N		r Pollutic n Ave. / Portlar	on Co nd OR 97		I Labo	<b>Dratory</b> D fax (503) 823-	5656	20 A.L.	
Project: Work Order:	Portland W15E19	d Harbor 94				Client: Receiv	ved:	Director's 05/27/15			
Analyte		Result U	Inits	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Org	anics - S	IM									
Polynuclear Aromati	cs & Phthal	ates by GCMS-	SIM								
22_4W : W15E1	94-04										
- Acenaphthene		<b>1.0</b> u	g/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene		ND u	g/L	0.20	0.20	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene		<b>0.19</b> u	g/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracen	e	<b>0.013</b> u	g/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene		ND u	g/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthe	ne	ND u	g/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylen	е	ND u	g/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranther	ne	ND u	g/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene		<b>0.014</b> u	g/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthra	cene	ND u	g/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene		<b>0.058</b> u	g/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene		<b>2.5</b> u	g/L	0.020	0.020		B15E414		06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyr		ND u	-	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
1-Methylnaphthaler		<b>0.16</b> u	-	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
2-Methylnaphthaler	ne	ND u	•	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
Naphthalene		ND u	•	0.40	0.40	1	B15E414		06/01/15	EPA 8270-SIM	
Phenanthrene		<b>2.4</b> u	-	0.020	0.020		B15E414		06/01/15	EPA 8270-SIM	
Pyrene		0.11 u	g/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate 2-Methylnaphthaler	ne_d10	<b>Result</b> 0.27 u	a/l	Expected 0.229			9) 8 B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10		0.24 u	0	0.229			B15E414		06/01/15	EPA 8270-SIM	
22_5W : W15E1	94-05										
Acenaphthene		ND u	g/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene		ND u	g/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene		ND u	g/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracen	е	ND u	g/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene		ND u	g/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthe	ne	ND u	g/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylen	e	ND u	g/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranther	ne	ND u	-	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene		ND u	-	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthra	cene	ND u	-	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Fluoranthene		ND u	-	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Fluorene		<b>0.025</b> u	-	0.020	0.020		B15E414		06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyr		ND u	•	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
1-Methylnaphthaler		ND u	-	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
2-Methylnaphthaler	ne	ND u	-	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
Naphthalene		ND u	-	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
Phenanthrene		ND u	-	0.020	0.020		B15E414		06/01/15	EPA 8270-SIM	
Pyrene		ND u	g/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate 2-Methylnaphthaler	ne_d10	<b>Result</b> 0.23 u	a/l	Expected 0.229			5) 8 B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10	10-010	0.23 u 0.23 u	•	0.229			B15E414 B15E414		06/01/15	EPA 8270-SIM EPA 8270-SIM	

Jennifer Shackelford

	6543	Water P 3 N. Burlington Av	Ollutio	n Co		l Labo		656		
- ,	Portland Harbor W15E194			(						
Analyte	Result	Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Orga	nics - SIM									
Polynuclear Aromatics	& Phthalates by GCM	S-SIM								
22_10W : W15E19										
- Acenaphthene		ug/L	0.020	0.020	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND	ug/L	0.24	0.24	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.29	ug/L	0.020	0.020	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	0.19	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	0.13	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	0.15	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	0.11	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	0.031	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	0.26	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthrace	ne 0.030	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	0.51	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	2.4	ug/L	0.020	0.020	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrer	ne 0.054	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	0.19	ug/L	0.040	0.040	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND	ug/L	0.040	0.040	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND	ug/L	0.40	0.40	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	0.91	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result		Expected		•	,				
2-Methylnaphthalene-		ug/L				B15E414		06/01/15	EPA 8270-SIM	
Fluoranthene-d10	0.21	ug/L	0.229	91%	69-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
22_10W : W15E19	4-06RE1									
– Phenanthrene		ug/L	0.10	0.10	5	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
	404.07									
FDBLANK : W15E										
Acenaphthene		ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene		ug/L	0.020	0.020		B15E414		06/01/15	EPA 8270-SIM	
Anthracene		ug/L	0.020	0.020		B15E414		06/01/15	EPA 8270-SIM	
Benzo(a)anthracene		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(a)pyrene		ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene		ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene		ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene		ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene		ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthrace		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Fluoranthene		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Fluorene		ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrer		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
1-Methylnaphthalene		ug/L	0.040	0.040		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene		ug/L	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
Naphthalene		ug/L	0.040	0.040		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene		ug/L	0.020	0.020		B15E414		06/01/15	EPA 8270-SIM	
Pyrene <b>Surrogate</b>	ND Result	ug/L	0.010 <i>Expected</i>	0.010 <b>%Rec</b>		B15E414 )	05/28/15	06/01/15	EPA 8270-SIM	

Jennifer Shackelford

		6543		Pollutio	on Cond OR 97		l Labo	<b>)ratory</b> 0 fax (503) 823-5	656		
Project:	Portland Hart	or			(	Client:		Director's	Office		
Work Order:	W15E194					Receiv	ed:	05/27/15 1	5:51		
Analyte		Result	Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Orga	anics - SIM										
Polynuclear Aromatic	s & Phthalates by	GCM	S-SIM								
FDBLANK : W15	=194-07										
Surrogate	_ 10 1 01	Result		Expected	%Rec	Limits(%	5)				
2-Methylnaphthalen	e-d10		ug/L	0.229		•	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10		0.24	ug/L	0.229	104%	69-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
22_15W : W15E1	94-12										
Acenaphthene		0.82	ug/L	0.020	0.020	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene			ug/L	0.20	0.20	1	B15E414		06/01/15	EPA 8270-SIM	
Anthracene			ug/L	0.020	0.020	) 1	B15E414		06/01/15	EPA 8270-SIM	
Benzo(a)anthracene		0.063	-	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(a)pyrene		0.090	-	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthen	۹		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene		0.090	-	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthen		0.044	0	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Chrysene	6	0.097	-	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthrac	ana	0.020	-	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Fluoranthene	ene		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Fluorene			-	0.020	0.010		B15E414		06/01/15	EPA 8270-SIM	
			ug/L		0.020		B15E414			EPA 8270-SIM	
Indeno(1,2,3-cd)pyre		0.070	-	0.010					06/01/15		
1-Methylnaphthalene			ug/L	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	9		ug/L	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
Naphthalene			ug/L	0.40	0.40	1	B15E414		06/01/15	EPA 8270-SIM	
Phenanthrene			ug/L	0.020	0.020		B15E414		06/01/15	EPA 8270-SIM	
Pyrene			ug/L	0.010	0.010			05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	a d10	Result		Expected 0.229		•		05/09/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalen Fluoranthene-d10	9-010		ug/L ug/L	0.229				05/28/15 05/28/15	06/01/15	EPA 8270-SIM EPA 8270-SIM	
			39, <u>–</u>	0.220	,.		2.02	00/20/70			
22_13W : W15E1	94-13										
Acenaphthene			ug/L	0.020	0.020	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene		ND	ug/L	0.20	0.20	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene		0.026	ug/L	0.020	0.020	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene		ND	ug/L	0.010	0.010	) 1	B15E414		06/01/15	EPA 8270-SIM	
Benzo(a)pyrene		ND	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthen	e	ND	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	9	ND	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthen	е	ND	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene		ND	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthrac	ene	ND	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene		0.016	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene		1.6	ug/L	0.020	0.020	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyre	ene	ND	ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	9	0.18	ug/L	0.040	0.040	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene			ug/L	0.080	0.080	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene			ug/L	0.80	0.80	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	

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	6	6543	20 J									
, ,	Portland Harbor W15E194					Clien Rece		ed:	Director's 05/27/15 1			
Analyte	Res	ult	Units	MRL	MDL	Di	i <b>l</b>	Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Orga	nics - SIM											
Polynuclear Aromatics	s & Phthalates by G0	CM	S-SIM									
22_13W : W15E19	94-13											
Phenanthrene		.16	ug/L	0.020	0.020	) 1		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene			ug/L	0.010	0.010			B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate		sult	5.	Expected								
2-Methylnaphthalene	-d10 0	.34	ug/L	0.229				B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10	0	.24	ug/L	0.229	104%	69-149	)	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
22_21W : W15E19	04-20RF1											
Acenaphthene		<b>0</b> /	ug/L	0.10	0.10	5		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
•			-	2.5	2.5	5		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Acenaphthylene			ug/L		2.5 0.10							
Anthracene			ug/L	0.10	0.050	5		B15E414 B15E414		06/02/15 06/02/15	EPA 8270-SIM EPA 8270-SIM	
Benzo(a)anthracene			ug/L	0.050								
Benzo(a)pyrene			ug/L	0.050	0.050			B15E414		06/02/15	EPA 8270-SIM	
Benzo(b)fluoranthene			ug/L	0.050	0.050			B15E414		06/02/15	EPA 8270-SIM	
Benzo(g,h,i)perylene			ug/L	0.050	0.050			B15E414		06/02/15	EPA 8270-SIM	
Benzo(k)fluoranthene			ug/L	0.050	0.050			B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Chrysene			ug/L	0.050	0.050			B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Dibenzo(a,h)anthrace			ug/L	0.050	0.050			B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Fluoranthene			ug/L	0.050	0.050			B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyre	ne O	.14	ug/L	0.050	0.050			B15E414	05/28/15	06/02/15	EPA 8270-SIM	
1-Methylnaphthalene		ND	ug/L	2.2	2.2	5		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
2-Methylnaphthalene		ND	ug/L	2.0	2.0	5		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Naphthalene		ND	ug/L	4.0	4.0	5		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Pyrene			ug/L	0.050	0.050	) 5		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Surrogate	Res			Expected			• •					
2-Methylnaphthalene			ug/L	0.229				B15E414		06/02/15	EPA 8270-SIM	
Fluoranthene-d10	0	.24	ug/L	0.229	100%	69-145	,	B15E414	05/28/15	06/02/15	EPA 8270-SIM	
22_21W : W15E19	94-20RE2											
Fluorene		21	ug/L	0.50	0.50	25		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Phenanthrene		29	ug/L	0.50	0.50	25		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
22 22W : W15E19	04-21											
-				0.040	0.040			D165414	05/28/15	06/01/15		
Acenaphthene			ug/L	0.040	0.040			B15E414		06/01/15	EPA 8270-SIM	
Acenaphthylene			ug/L	0.040	0.040			B15E414		06/01/15	EPA 8270-SIM	
Anthracene			ug/L	0.040	0.040			B15E414		06/01/15	EPA 8270-SIM	
Benzo(a)anthracene			ug/L	0.020	0.020			B15E414		06/01/15	EPA 8270-SIM	
Benzo(a)pyrene			ug/L	0.020	0.020			B15E414		06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene			ug/L	0.020	0.020			B15E414		06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene			ug/L	0.020	0.020			B15E414		06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	. 0	.88	ug/L	0.020	0.020			B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene		1.4	ug/L	0.020	0.020	) 2		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthrace	ene O	.54	ug/L	0.020	0.020	) 2		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene		2.0	ug/L	0.020	0.020	) 2		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	0	.85	ug/L	0.040	0.040	) 2		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyre	ne O	.99	ug/L	0.020	0.020	) 2		B15E414	05/28/15	06/01/15	EPA 8270-SIM	

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#### Water Pollution Control Laboratory

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

	ortland Harbor /15E194				Client: Receiv	ed:	Director's 0 05/27/15 1	•••		
Analyte	Result	Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Organ	ics - SIM									
Polynuclear Aromatics	& Phthalates by GCM	S-SIM								
22 22W : W15E194	-21									
- 1-Methylnaphthalene	2.1	ug/L	0.080	0.080	2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	0.20	ug/L	0.080	0.080	2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND	ug/L	1.2	1.2	2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene	1.3	ug/L	0.040	0.040	2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	2.1	ug/L	0.020	0.020	2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result		Expected	%Rec	Limits(%	)				
2-Methylnaphthalene-d	10 0.33	ug/L	0.229	146%	60.4-153	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10	0.15	ug/L	0.229	64%	69-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	SU

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RELAP Certification ID 4023

Project: Po Work Order: W

Portland Harbor W15E194 Client: Direc Received: 05/2

Director's Office 05/27/15 15:51

### **Quality Control Report**

			General	Chemi	stry - (	2C				
Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Solids - Batch B15E432										
Duplicate (B15E432-DUP1)			Source: W15	5E194-01						
Total solids	76.7 %	N/W	0.01			77.5		1 (5)	05/28/15 :05/29/15	
			Fu	uels - C	QC					
Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Diesel/Oil Hydrocarbons by GC	-FID - Batch B	15E430								
Blank (B15E430-BLK2)										F7
Diesel	ND mg	/Wipe	1.2						05/28/15 :06/03/15	
Lube oil	ND mg	/Wipe	2.5						05/28/15 :06/03/15	
Surrogate										
2-Fluorobiphenyl	0.0831 mg	/Wipe			0.100		83% (50-150)		05/28/15 :06/03/15	
Diesel/Oil Hydrocarbons by GC	-FID - Batch B	15F001								
Blank (B15F001-BLK2)										F7
Diesel	ND mg	/L	0.062						06/01/15 :06/03/15	
Lube oil	ND mg	/L	0.12						06/01/15 :06/03/15	
Surrogate										
2-Fluorobiphenyl	0.0668 mg	/L			0.100		67% (50-150)		06/01/15 :06/03/15	
LCS (B15F001-BS2)										F7
Diesel	0.907 mg	/L	0.062		1.00		91% (50-150)		06/01/15 :06/03/15	
Lube oil	0.673 mg	/L	0.12		1.00		67% (50-150)		06/01/15 :06/03/15	
Surrogate										
2-Fluorobiphenyl	0.0764 mg	/L			0.100		76% (50-150)		06/01/15 :06/03/15	
LCS Dup (B15F001-BSD2)										F7
Diesel	0.947 mg	/L	0.062		1.00		95% (50-150)	4 (200)	06/01/15 :06/03/15	
Lube oil	0.765 mg	/L	0.12		1.00		76% (50-150)	13 (200)	06/01/15 :06/03/15	
Surrogate										
2-Fluorobiphenyl	0.0807 mg				0.100		81% <i>(50-150)</i>		06/01/15 :06/03/15	
Diesel/Oil Hydrocarbons by GC	-FID - Batch B	15F046								
Blank (B15F046-BLK1)										F7
Diesel	ND mg	/kg wet	21						06/03/15 :06/03/15	
Lube oil	ND mg	/ka wet	42						06/03/15 :06/03/15	

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SREEAF Certification ID 4023

Project: Work Order:	Portland Harbor W15E194			lient: eceiv	ed:	Director's 05/27/15			
		Fu	iels - Q	C					
Analyte	Result Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Diesel/Oil Hydrocarbo	ons by GC-FID - Batch B15F046								
Blank (B15F046-BLK1)									F7
Surrogate									
2-Fluorobiphenyl	14.0 mg/kg wet			16.7		84% (50-150)		06/03/15 :06/03/15	
LCS (B15F046-BS1)									F7
Diesel	<b>190</b> mg/kg wet	25		200		95% (50-150)		06/03/15 :06/03/15	
Lube oil	111 mg/kg wet	50		200		55% (50-150)		06/03/15 :06/03/15	
Surrogate									
2-Fluorobiphenyl	22.0 mg/kg wet			20.0		110% <i>(50-150)</i>		06/03/15 :06/03/15	
Duplicate (B15F046-DU	IP1)	Source: W15	E199-05						F7
Diesel	ND mg/kg dry	32			ND		(50)	06/03/15 :06/03/15	
Lube oil	<b>310</b> mg/kg dry	58			201		43 (50)	06/03/15 :06/03/15	
Surrogate									
2-Fluorobiphenyl	23.8 mg/kg dry			23.4		102% (50-150)		06/03/15 :06/03/15	
Diesel/Oil Hydrocarbo	ons by GC-FID - Batch B15F057								
Blank (B15F057-BLK2)									F7
Diesel	ND mg/L	0.12						06/03/15 :06/09/15	
Lube oil	ND mg/L	0.062						06/03/15 :06/09/15	
Surrogate									
2-Fluorobiphenyl	0.0334 mg/L			0.0500		67% (50-150)		06/03/15 :06/09/15	
LCS (B15F057-BS2)									F7
Diesel	0.304 mg/L	0.031		0.500		61% <i>(50-150)</i>		06/03/15 :06/09/15	
Lube oil	0.403 mg/L	0.062		0.500		81% (50-150)		06/03/15 :06/09/15	
Surrogate									
2-Fluorobiphenyl	0.0324 mg/L			0.0500		65% (50-150)		06/03/15 :06/09/15	
LCS Dup (B15F057-BS	D2)								F7
Diesel	0.303 mg/L	0.031		0.500		61% <i>(50-150)</i>	0.2 (200)	06/03/15 :06/09/15	
Lube oil	0.384 mg/L	0.062		0.500		77% (50-150)	5 (200)	06/03/15 :06/09/15	
Surrogate									
2-Fluorobiphenyl	0.0346 mg/L			0.0500		69% (50-150)		06/03/15 :06/09/15	
Hydrocarbon Scan by	/ GC-FID - Batch B15E420								
Blank (B15E420-BLK1)									
Gasoline	ND mg/kg wet	18						05/28/15 :05/28/15	
Diesel	ND mg/kg wet	45						05/28/15 :05/28/15	
Lube oil	ND mg/kg wet	91						05/28/15 :05/28/15	
Surrogate									
2-Fluorobiphenyl	8.65 mg/kg wet			9.09		95% (50-150)		05/28/15 :05/28/15	
Duplicate (B15E420-DU	JP1)	Source: W15	E194-14						

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		ORELA	P Certifica	tion ID	4023				1851
Project: Work Order:	Portland Harbor W15E194			lient: eceiv	ed:	Director's ( 05/27/15 1			
		Fı	uels - Q	С					
Analyte	Result Units	MRL	MDL	Spike	Source Result		RPD (Limit)	Prepared: Analyzed	Qualifi
	by GC-FID - Batch B15E420					()	()	Filaly200	
Duplicate (B15E420-D	-	Source: W15	E404 44						
			0 1 9 4 - 1 4		ND			05/08/15 -05/08/15	
Gasoline	ND mg/kg dry	38			ND ND			05/28/15 :05/28/15	
Diesel	ND mg/kg dry	95						05/28/15 :05/28/15	
	ND mg/kg dry	190			ND			05/28/15 :05/28/15	
2 Elucrobinhenvl	17 1 malka day			19.0		90% (50-150)		05/28/15 .05/20/15	
2-Fluorobiphenyl	17.1 mg/kg dry			19.0		90% (90-190)		05/28/15 :05/28/15	
Hydrocarbon Scan I	by GC-FID - Batch B15E430								
Blank (B15E430-BLK	1)								
Gasoline	ND mg/Wipe	1						05/28/15 :05/28/15	
Lube oil	ND mg/Wipe	2						05/28/15 :05/28/15	
Diesel	ND mg/Wipe	2						05/28/15 :05/28/15	
Surrogate									
2-Fluorobiphenyl	0.0867 mg/Wipe			0.100		87% (50-150)		05/28/15 :05/28/15	
Blank (B15F001-BLK) Gasoline	1) ND mg/L	0.25						06/01/15 :06/01/15	
Diesel	ND mg/L	0.50						06/01/15 :06/01/15	
Lube oil	ND mg/L	0.50						06/01/15 :06/01/15	
Surrogate									
2-Fluorobiphenyl	0.0672 mg/L			0.100		67% (50-150)		06/01/15 :06/01/15	
_CS (B15F001-BS1)									
Gasoline	DET mg/L	0.25		0.400		74% (50-150)		06/01/15 :06/01/15	
Diesel	DET mg/L	0.50		1.00		91% (50-150)		06/01/15 :06/01/15	
Lube oil	DET mg/L	0.50		1.00		83% (50-150)		06/01/15 :06/01/15	
Surrogate									
2-Fluorobiphenyl	0.0692 mg/L			0.100		69% (50-150)		06/01/15 :06/01/15	
_CS Dup (B15F001-B	SD1)								
Gasoline	, DET mg/L	0.25		0.400		79% (50-150)		06/01/15 :06/01/15	
Diesel	DET mg/L	0.50		1.00		95% (50-150)		06/01/15 :06/01/15	
Lube oil	DET mg/L	0.50		1.00		85% (50-150)		06/01/15 :06/01/15	
Surrogate	<u> </u>					,/			
2-Fluorobiphenyl	0.0736 mg/L			0.100		74% (50-150)		06/01/15 :06/01/15	
	by GC-FID - Batch B15F057					. ,			
Blank (B15F057-BLK	-								
•		0.40						00/00/45 00/04/45	
Gasoline	ND mg/L	0.12						06/03/15 :06/04/15	
Diesel	ND mg/L	0.25						06/03/15 :06/04/15	
Lube oil	ND mg/L	0.25						06/03/15 :06/04/15	

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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.

Jennifer Shackelford, Laboratory Coordinator QA/QC



LCS Dup (B15F057-BSD1)

Gasoline

Diesel

Lube oil

Surrogate 2-Fluorobiphenyl **City of Portland** 

Water Pollution Control Laboratory



Qualifier

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 **ORELAP Certification ID 4023** 

Project: **Portland Harbor** Client: **Director's Office** Work Order: W15E194 Received: 05/27/15 15:51 **Fuels - QC** Spike Source %Rec RPD Prepared: Result Units MRL MDL (Limit) Analyte Level Result (Limits) Analyzed Hydrocarbon Scan by GC-FID - Batch B15F057 Blank (B15F057-BLK1) Surrogate 0.0333 mg/L 2-Fluorobiphenyl 0.0500 67% (50-150) 06/03/15 :06/04/15 LCS (B15F057-BS1) Gasoline DET mg/L 0.06 0.200 42% (50-150) 06/03/15 :06/04/15 Diesel 0.25 0.500 66% (50-150) DET mg/L 06/03/15 :06/04/15 66% (50-150) 0.25 06/03/15 :06/04/15 Lube oil DET mg/L 0.500 Surrogate 0.0296 mg/L 2-Fluorobiphenyl 0.0500 59% (50-150) 06/03/15 :06/04/15

0.05

0.25

0.25

0.200

0.500

0.500

0.0500

29% (50-150)

66% (50-150)

61% (50-150)

65% (50-150)

06/03/15 06/04/15

06/03/15 :06/04/15

06/03/15 :06/04/15

06/03/15 :06/04/15

DET ma/L

DET mg/L

DET mg/L

0.0325 mg/L

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6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

ORELAP Certification ID 4023

Project:	Portland Harbor	Client:	Director's Office
Work Order:	W15E194	Received:	05/27/15 15:51

#### Semivolatile Organics - SIM - QC

Analyte	Result Ur	nits MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Polynuclear Aromatics & Phth	nalates by GCMS-SI	M - Batch B15E414	Ļ						
- Blank (B15E414-BLK1)	-								
Acenaphthene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Acenaphthylene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Anthracene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Benzo(a)anthracene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(a)pyrene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(b)fluoranthene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(k)fluoranthene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Chrysene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Fluoranthene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Fluorene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Indeno(1,2,3-cd)pyrene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
1-Methylnaphthalene	ND ug/L	0.040	0.040					05/28/15 :06/01/15	
2-Methylnaphthalene	ND ug/L	0.040	0.040					05/28/15 :06/01/15	
Naphthalene	ND ug/L	0.040	0.040					05/28/15 :06/01/15	
Phenanthrene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Pyrene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Butyl benzyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Di-n-butyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Diethyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Dimethyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Di-n-octyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Bis(2-ethylhexyl) phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Surrogate									
2-Methylnaphthalene-d10	0.23 ug/L			0.229		102% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.25 ug/L			0.229		108% (69-149)		05/28/15 :06/01/15	
LCS (B15E414-BS1)									
Acenaphthene	0.112 ug/L	0.020	0.020	0.114		98% (58.8-155)		05/28/15 :06/01/15	
Acenaphthylene	0.115 ug/L	0.020	0.020	0.114		100% (64-155)		05/28/15 :06/01/15	
Anthracene	0.117 ug/L	0.020	0.020	0.114		102% (76.2-129		05/28/15 :06/01/15	
Benzo(a)anthracene	0.119 ug/L	0.010	0.010	0.114		104% (72.9-138		05/28/15 :06/01/15	
Benzo(a)pyrene	0.122 ug/L	0.010	0.010	0.114		106% (75.5-137		05/28/15 :06/01/15	
Benzo(b)fluoranthene	0.117 ug/L	0.010	0.010	0.114		102% (59.9-160		05/28/15 :06/01/15	
Benzo(g,h,i)perylene	0.106 ug/L	0.010	0.010	0.114		93% (70.1-134)		05/28/15 :06/01/15	
Benzo(k)fluoranthene	0.119 ug/L	0.010	0.010	0.114		104% (61.1-157		05/28/15 :06/01/15	
Chrysene	0.123 ug/L	0.010	0.010	0.114		108% (76.7-146		05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	0.117 ug/L	0.010	0.010	0.114		102% (63.9-140		05/28/15 :06/01/15	
Fluoranthene	0.119 ug/L	0.010	0.010	0.114		104% (77.5-134		05/28/15 :06/01/15	
Fluorene	0.118 ug/L	0.020	0.020	0.114		103% (61.2-157		05/28/15 :06/01/15	

Reported: 06/17/15 13:47

Jennifer Shackelford





Semivolatile Organics - SIM - QC

#### Water Pollution Control Laboratory

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Client:



Project: Work Order:

Portland Harbor W15E194 Director's Office

Received: 05/27/15 15:51

Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Polynuclear Aromatics & Phthal	ates by GCMS	-SIM - E	atch B15E414							
LCS (B15E414-BS1)										
Indeno(1,2,3-cd)pyrene	0.112 ug/L		0.010	0.010	0.114		98% (68.4-135)		05/28/15 :06/01/15	
1-Methylnaphthalene	0.131 ug/L		0.040	0.040	0.114		114% (79.6-158		05/28/15 :06/01/15	
2-Methylnaphthalene	0.125 ug/L		0.040	0.040	0.114		109% (76-161)		05/28/15 :06/01/15	
Naphthalene	0.117 ug/L		0.040	0.040	0.114		103% (60.6-164		05/28/15 :06/01/15	
Phenanthrene	0.111 ug/L		0.020	0.020	0.114		97% (77.4-140)		05/28/15 :06/01/15	
Pyrene	0.127 ug/L		0.010	0.010	0.114		111% (81.1-141)		05/28/15 :06/01/15	
Surrogate										
2-Methylnaphthalene-d10	0.23 ug/L				0.229		102% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.24 ug/L				0.229		105% (69-149)		05/28/15 :06/01/15	
Matrix Spike (B15E414-MS1)			Source: W15E	194-05	;					
Acenaphthene	0.325 ug/L		0.020	0.020	0.286	ND	114% (58.8-155		05/28/15 :06/01/15	
Acenaphthylene	0.319 ug/L		0.020	0.020	0.286	ND	112% (64-155)		05/28/15 :06/01/15	
Anthracene	0.328 ug/L		0.020	0.020	0.286	ND	115% (76.2-129		05/28/15 :06/01/15	
Benzo(a)anthracene	0.302 ug/L		0.010	0.010	0.286	ND	106% (72.9-138		05/28/15 :06/01/15	
Benzo(a)pyrene	0.300 ug/L		0.010	0.010	0.286	ND	105% (75.5-137		05/28/15 :06/01/15	
Benzo(b)fluoranthene	0.288 ug/L		0.010	0.010	0.286	ND	101% (59.9-160		05/28/15 :06/01/15	
Benzo(g,h,i)perylene	0.259 ug/L		0.010	0.010	0.286	ND	91% (70.1-134)		05/28/15 :06/01/15	
Benzo(k)fluoranthene	0.291 ug/L		0.010	0.010	0.286	ND	102% (61.1-157		05/28/15 :06/01/15	
Chrysene	0.315 ug/L		0.010	0.010	0.286	ND	110% (76.7-146		05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	0.282 ug/L		0.010	0.010	0.286	ND	99% (63.9-140)		05/28/15 :06/01/15	
Fluoranthene	0.319 ug/L		0.010	0.010	0.286	ND	112% (77.5-134		05/28/15 :06/01/15	
Fluorene	0.345 ug/L		0.020	0.020	0.286	0.0251	112% (61.2-157		05/28/15 :06/01/15	
Indeno(1,2,3-cd)pyrene	0.274 ug/L		0.010	0.010	0.286	ND	96% (68.4-135)		05/28/15 :06/01/15	
1-Methylnaphthalene	0.367 ug/L		0.040	0.040	0.286	ND	129% (79.6-159		05/28/15 :06/01/15	
2-Methylnaphthalene	0.350 ug/L		0.040	0.040	0.286	ND	123% (76-161)		05/28/15 :06/01/15	
Naphthalene	0.325 ug/L		0.040	0.040	0.286	ND	114% (60.6-164		05/28/15 :06/01/15	
Phenanthrene	0.313 ug/L		0.020	0.020	0.286	ND	109% (77.4-140		05/28/15 :06/01/15	
Pyrene	0.341 ug/L		0.010	0.010	0.286	ND	119% (81.1-141		05/28/15 :06/01/15	
Surrogate										
2-Methylnaphthalene-d10	0.25 ug/L				0.229		109% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.25 ug/L				0.229		110% (69-149)		05/28/15 :06/01/15	
Matrix Spike Dup (B15E414-MSD1)	)		Source: W15E	194-05						
Acenaphthene	, <b>0.322</b> ug/L		0.020	0.020	0.286	ND	113% <i>(58.8-155</i> 0.	.7 (50)	05/28/15 :06/01/15	
Acenaphthylene	0.320 ug/L		0.020	0.020	0.286	ND	112% (64-155) 0.		05/28/15 :06/01/15	
Anthracene	0.324 ug/L		0.020	0.020	0.286	ND	113% (76.2-129 1		05/28/15 :06/01/15	
Benzo(a)anthracene	0.310 ug/L		0.010	0.010	0.286	ND	108% (72.9-138 3	(50)	05/28/15 :06/01/15	
Benzo(a)pyrene	0.310 ug/L		0.010	0.010	0.286	ND	108% (75.5-137 3	. ,	05/28/15 :06/01/15	
Benzo(b)fluoranthene	0.293 ug/L		0.010	0.010	0.286	ND	103% (59.9-160 2	. ,	05/28/15 :06/01/15	
Benzo(g,h,i)perylene	0.271 ug/L		0.010	0.010	0.286	ND	95% (70.1-134) 4		05/28/15 :06/01/15	
Benzo(k)fluoranthene	0.303 ug/L		0.010	0.010	0.286	ND	106% (61.1-157 4		05/28/15 :06/01/15	

Reported: 06/17/15 13:47

Jennifer Shackelford

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.

Jennifer Shackelford, Laboratory Coordinator QA/QC



#### Water Pollution Control Laboratory

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023



Project: I Work Order: N

#### Portland Harbor W15E194

Client: Director's Office

Received: 05/27/15 15:51

#### Semivolatile Organics - SIM - QC

Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Polynuclear Aromatics & Phthalate	s by GCMS	S-SIM - E	atch B15E414							
Matrix Spike Dup (B15E414-MSD1)			Source: W15E	194-05	;					
Chrysene	<b>0.324</b> ug/l	L	0.010	0.010	0.286	ND	113% (76.7-146	3 (50)	05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	0.297 ug/l	L	0.010	0.010	0.286	ND	104% (63.9-140	5 (50)	05/28/15 :06/01/15	
Fluoranthene	0.317 ug/l	L	0.010	0.010	0.286	ND	111% (77.5-134)	0.7 (50)	05/28/15 :06/01/15	
Fluorene	0.351 ug/l	L	0.020	0.020	0.286	0.0251	114% (61.2-157	2 (50)	05/28/15 :06/01/15	
Indeno(1,2,3-cd)pyrene	0.287 ug/l	L	0.010	0.010	0.286	ND	101% (68.4-135	5 (50)	05/28/15 :06/01/15	
1-Methylnaphthalene	0.364 ug/l	L	0.040	0.040	0.286	ND	127% (79.6-159	0.9 (50)	05/28/15 :06/01/15	
2-Methylnaphthalene	0.350 ug/l	L	0.040	0.040	0.286	ND	122% (76-161)	0.2 (50)	05/28/15 :06/01/15	
Naphthalene	0.320 ug/l	L	0.040	0.040	0.286	ND	112% (60.6-164	2 (50)	05/28/15 :06/01/15	
Phenanthrene	0.315 ug/l	L	0.020	0.020	0.286	ND	110% (77.4-140	0.9 (50)	05/28/15 :06/01/15	
Pyrene	0.337 ug/l	L	0.010	0.010	0.286	ND	118% (81.1-141	1 (50)	05/28/15 :06/01/15	
Surrogate										
2-Methylnaphthalene-d10	0.25 ug/l	L			0.229		108% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.25 ug/l	L			0.229		108% (69-149)		05/28/15 :06/01/15	

#### Qualifiers

- F0 Fuel pattern most closely resembles transformer oil.
- F0a Result most closely resembles non-Aroclor transformer oil.
- F0b Results resembles most closely non-PCB transformer oil.
- F2 Result for heavy oil is primarily due to overlap from diesel-range hydrocarbons.
- F4 Result for gasoline is primarily overlap from diesel-range hydrocarbons.
- F6 Surrogate recovery could not be determined due to the high concentration of hydrocarbons in the sample.
- F7 This sample underwent silica gel clean-up.
- F8 Hydrocarbons quantified as Diesel and Lube Oil appear to be a single petroleum product that is heavier than Diesel #2 and lighter than the reference Lube Oil.
- SU1 Recovery for one or more surrogate compounds was outside the acceptance range (low). Sample results may be low estimates.
- SU5 Surrogate recovery could not be determined due to required dilution of the sample extract.

#### Definitions DET Analyte Detected ND Analyte Not Detected at or above the reporting limit Method Reporting Limit MDL Method Detection Limit MRL Not Reportable Sample results reported on a dry weight basis NR dry **Relative Percent Difference** % Rec. Percent Recovery RPD This analyte is not certified under NELAP

Reported: 06/17/15 13:47

Jennifer Shackelford

Date: <u>5/a7/ち</u> Work Order #: <u>(人くそ]9                                    </u>					Turn-Around-Time Request	Vitro Contract (10 business days)	ַ 3	1 AAN	309 2 Drv-weather Flow	2 AAM077-E 60" 2 Drv-weather Flow	2 AAM077-W 48" Drv-weather Flow	2 AAM077-SW 30" Dry-weather Flow	322 <sup>2</sup> AAM080 Surface Sheen	2 Field Decon Blank of Bowl and Bailer	1 AAM080-SW Inline Sediment	1 AAM075-S Wipe under lateral	1 AAM075-N Wipe from end of pipe	Received By: Signature:	Printed Name: Tame:	Page 1 of 3
land stody 🔊			Requested Analyses															Relinquished By: Sgnature: Date:	Printed Name: Time:	
City of Portland Chain-of-Custody Bureau of Environmental Services			Reg			M-Leve!} HCID¹	Sample Matrix PAHs (Io	Sed	Water	Water •	Water •	Water	Water	Water •	Sed	Mipe	Wipe	Received By: Signature. 5 Date: 5	e Lebutze ren	
		Harbor			ation	detected	Sample <u>G</u> rab or S Time <u>C</u> omp A	0929 C	0330 G V	1004 G V	1009 G	1013 G W	1049 G W	•	1105 C ountry Sed	1140 G	1147 G V	Date: /27/15 Signature		teen COC #1 (5-27-15)
Water Pollution Control Laboratory 6543 N. Burlington Ave. Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5696 General Lab: (503) 823-5681	Client Name: Director's Office	Project Name: Portland Harbor		Special Instructions:	Basin 22 Petroleum Sheen Investigation	<sup>1</sup> Run NWTPH-Dx and NWTPH-Gx if detected	Sample S Location ID Date	22_8 5/27/2015	22_8W 5/27/2015	22_9W 5/27/2015	22_4W 5/27/2015	22_5W 5/27/2015	22_10W 5/27/2015	FDBLANK 5/27/2015	22_11 5/27/2015	22_12Wipe 5/27/2015	ipe 5/27/2015	linquished By: ature: 1/14, H. B. M.	Red Name: Matt Sullivan	Portland Harbor - Basin 22 Petroleum Sheen COC #1 (5-27-15)
Were Follution Corted Laboratory Rest Reparations Seals Barrier Strates       City of Porfland Constrates         Were Follution Corted Laboratory Seals Constrates       Event Strates         Rest Reparations       Event Strates         Client Name:       Intercurs Children         Reprised Analyses       Sample grant         Scanning Strates       Even Name         Reprised Analyses       Sample grant         Scanning Strates       Even Name         Rest 22 Patroleum Streen Investigation       Intercurs Children         Rest 22 Patroleum Streen Investigation       Intercurs Children         Rest 22 Patroleum Streen Investigation       Scanning Streen St	Date: $5/a7/15$ Work Order #: $(MSE 194)$ Collected By: $Ms_{y} = \sqrt{1}$			Turn-Around-Time Request	Standard (10 business days)	ŝ	AAI VVip	201 2 AAM075 - DS Dry-weather Flow	679 Dry-weather Flow	1 AAM075-Shelf Inline Sediment	AAM075-US Inline Sediment	AAM076-Sanitary Line	AAM076-DS Inline Sediment	AAM086-DS Inline Sediment	AAM086-S Vripe on US side of Lat	$4 g_2 \rightarrow Flow on DS side of Lat$	Received By: Date: Signature: Date:	Tame: Printed Name: Time:	Page 2 of 3	
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Refer Pollution Control Laboratory 281. Burnington Aer.     Set Burnington Aer.       AS N. Burnington Aer.     Differ Ontrol Laboratory and Oregon 9723-6452       animul, Oregon 9723-6452     Differ Oregon 9723-6452       animul Consolidation Control Laboratory     Differ Oregon 9723-645       Point Instructions:     Differ Oregon 9723-646       Point Instructions:     Differ Oregon 88       Point Instructions:     Differ Oregon 88       Point Instructions:     Sample 8       Differ Oregon 115     Control 115       Bain NWTPH-Dx and NWTPH-Gx if detected     Matrix       Location ID     Sample 8       22_14Wipe     5/27/2015       22_13W     5/27/2015       22_14     5/27/2015       22_13W     5/27/2015       22_14     5/27/2015       22_13W     5/27/2015       22_14     5/27/2015       22_14     5/27/2015       22_14     5/27/2015       22_14     5/27/2015       22_15W     5/27/2015       22_16     5/27/2015       22_17     5/27/2015       22_18     5/27/2015       22_	ity of Portland lain-of-Custody of Environmental Services		Requested Analyses															Inter 1 (SS f		
Alter Pollution Control Laboratory 431. Burlington Ave. 243. N Burlington Ave. 263. 823-569. Enerat Lab. (503) 823-569. Enerat Lab. (503) 823-569. Enerat Lab. (503) 823-569. Eneration (503) 823-569. Portland Harbor         Diffector Solutions: Portland Harbor       Diffector's Office         Portland Harbor       Portland Harbor         Distructions: Postal Instructions:       Diffector's Office         Sample Custon ID       Sample Size for the End of the elded of the elded of the end of the elded of th	Bureau					натwи		•	•							•	eceived By:	Jehn Bare		
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ad New Sector 100 100 100 100 100 100 100 100 100 10	ol Laborator 552 23-5696	Direct		heen Inve	NWTPH-G	Sample Date	5/27/201:	5/27/201	5/27/201	5/27/201	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	Min	T	sin 22 Petrolet	
Jequin V de L 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Water Pollution Contro 6543 N. Burlington Ave. Portland, Oregon 97203 45 Sample Custodian: (503) 82 General Lab. (503) 823-568	Client Name: Proiect Name:	Special Instructions:	Basin 22 Petroleum S							22_16				22_20Wipe		inquished	ad Name: we the		

Date: 5/27/15 Work Order #: WISE 94 Collected By: ASS, web, 5F6, PHA					2	Image: Standard (10 business days)       Image: Standard (10 business days)       Image: Standard (10 business days)       Image: Standard (10 business days)	Conduct Meter: # of Containers Remarks	Sur Sur	Vipe					Received By: Signature: Date:	Printed Name: Tame:	Page <u>3</u> of <u>3</u>
City of Portland Chain-of-Custody			Requested Analyses											<i>ا</i> /د	Time: Printed Name: Time:	
Burea					(	MCID₁	Sample Matrix NWTPH	Water •	Wipe	 				Received By: Signature	inted Name: ULLathered	
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aboratory 1696	Director's Office	Portiand Harbor		:	en Investigatio	WTPH-Gx if det	Sample Sample Date Time	5/27/2015 1345	5/27/2015 1351	 			 	l.		22 Petroleum Sheen
Water Pollution Control Laboratory 6543 N. Burlington Ave. Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5636 General Lab: (503) 823-5681	Client Name:	Project Name:		Special Instructions:	Basin ZZ Petroleum Sheen Investigation	<sup>1</sup> Run NWTPH-DX and NWTPH-GX if detected	Location ID	22_22W	22_23Wipe					a multiple By: 5 mue: Man By:	D Da Name: A + + Sullivan	Portland Harbo
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1	HNO <sub>3</sub> (1:1) to	pH <2					)mL; 4-5 drops/50m	L centrifuge tube
2	H₂SO₄ (18N) te						)mL ; 1.6mL/1000m	
3	HCI (1:1) to pl	H <2	1500678	.1.0m	L/500mL;	2.0mL/100	)0mL	
4	HCI (1:1) to pl	H 2-3		For T	OC: 2-5 d	lrops/250m	nL	
5	NaOH (pellets	) to pH >12	2	4-10	pellets/50	0mL; 8-20	pellets/1000mL	· · · · ·
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Comments: 052915.kn 6x Jollowaps on Dwater VOAS ava ans no lab no. available wipes to 6x no sample available tollowups on sectments owups. on 67

S:\LAB\Forms\WPCL Cooler Receipt Form Nov 2013.doc

Investigation Day Two May 28, 2015



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 Petroleum Sheen Investigation Outfall Basin 22

To:FileFrom:Andrew Davidson, GSIDate:June 28, 2015

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated during a source control investigation sampling event conducted by the City of Portland (City). Three inline solids samples, five dry weather flow (DWF) grab samples, and five wipe samples were collected in Outfall Basin 22 on May 28, 2015 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 included the following analyses:

- BES WPCL
  - Total Solids SM 2540 G (Inline solids samples only)
  - Field Conductivity FO SOP 1.03a
  - Hydrocarbon Analysis NWTPH-HCID (NWTPH-Dx if detected)
  - Polycyclic Aromatic Hydrocarbons (PAHs) EPA 8270-SIM (DWF samples only)

The WPCL summary report for all analyses associated with this sampling event is attached for review.

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

- Chain-of-custody for completeness and continuous custody.
- Analysis conducted within holding times.
- Chemicals of interest detected in method blanks and/or field decontamination blanks.

- Internal standard recoveries within laboratory control limits.
- Surrogate recoveries within laboratory control limits.
- Matrix spike/matrix spike duplicate (MS/MSD) sample results within laboratory control limits.
- Laboratory control/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 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

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

# **Method Blanks**

Method blanks were processed during the hydrocarbon scan analysis (NWTPH-HCID) and the analysis of diesel/oil hydrocarbons (NWTPH-Dx) for wipe, DWF, and inline solids samples. Blank samples were free of target analytes with one exception:

• WPCL reports that lube oil was detected in the method blank associated with the hydrocarbon scan of DWF samples at a concentration greater than one half of the reporting level, but less than the reporting level. Lube oil was not detected in any of the associated DWF samples, and the data are not further qualified.

One method blank sample was processed during the analysis of PAHs. No analytes were detected in the method blank sample.

# **Surrogate Recoveries**

Surrogate recoveries were processed during the laboratory analyses of hydrocarbons and PAHs. Surrogate recoveries were within control limits with the following exception:

• High concentrations of hydrocarbons in sample W15E199-08 prevented determination of surrogate recoveries during the initial hydrocarbon scan (NWTPH-HCID). Despite the sample undergoing silica gel-cleanup, associated surrogate recoveries could not be determined during the diesel/oil analysis (NWTPH-Dx) due to high dilution (25X) of the sample extract. The associated result for diesel is qualified as an estimate and flagged "J" due to unacceptable surrogate recovery "SR"; that is there is a degree of uncertainty

associated with the value due to the high dilution that prevented acceptable recovery of the surrogate compound 2-Fluorobiphenyl.

# Matrix Spike/Matrix Spike Duplicate

MS/MSD samples were prepared using aliquots of DWF sample W15E194-05 and processed during the laboratory analysis of PAHs in DWF samples. MS/MSD recoveries and RPDs were within acceptance limits for all spiked analytes.

# Laboratory Control Samples/Duplicate Laboratory Control Samples

LCS samples were processed during the analyses of hydrocarbons in DWF and inline solids samples and during the analyses of PAHs in DWF samples. DLC samples were processed during the analyses of hydrocarbons in DWF samples. All laboratory control sample recoveries and RPDs were within laboratory control limits.

# **Duplicate Samples**

Duplicate samples were processed during the analyses of total solids and hydrocarbons (NWTPH-HCID and NWTPH-Dx) for inline solids samples. All RPDs were within acceptance criteria.

# **Additional Information**

WPCL reports the following additional information regarding wipe, DWF, and inline solids samples:

- For samples where hydrocarbons were detected by the initial hydrocarbon scan (NWTPH-HCID), additional analyses NWTPH-Dx and NWTPH-Gx were to be run. WPCL reports that no VOAs were available for follow-up analysis of NWTPH-Gx on water samples; no extra jars were available for follow-up analysis of NWTPH-Gx on inline solids; no additional sample available for follow-up analysis of NWTPH-Gx on the wipe samples. Accordingly, only NWTPH-Dx analyses were conducted for the samples where hydrocarbons were detected by NWTPH-HCID.
- All samples analyzed by NWTPH-Dx underwent silica gel clean-up.
- WPCL reports that the fuel pattern in sample W15E199-01 most closely resembles transformer oil, and the fuel pattern in sample W15E199-08 most closely resembles non-PCB transformer oil.
- WPCL reports that during the initial hydrocarbon scan, results for gasoline and lube oil in sample W15E199-08 were primarily due to overlap from diesel-range hydrocarbons. These detections are qualified as estimates "J" in subsequent tables to indicate matrix interference "MI".
- WPCL qualifies that reported analytes for the hydrocarbon analyses of wipe samples (quantified in mg/Wipe) are not certified under the National Environmental Laboratory Accreditation Program (NELAP).



### City of Portland Water Pollution Control Laboratory

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



June 17, 2015

Linda Scheffler Director's Office

> Work Order W15E199

Project Portland Harbor Received 05/28/15 15:15

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.

ennifer Shackelford

Jennifer Shackelford Laboratory Coordinator QA/QC





### Water Pollution Control Laboratory

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023



#### LABORATORY ANALYSIS REPORT

Project:	Portland Harbor	Client:	Director's Office
Work Order:	W15E199	Project Mgr:	Linda Scheffler
Received: Submitted By:	5/28/15 15:15 Field Operations	, ,	

				Sample Col		
Sample	Laboratory ID	Matrix	Туре	Start	End	Qualifier
22_24W	W15E199-01	Water	Grab	05/28/15 10:13	05/28/15 10:13	
22_25Wipe	W15E199-02	Wipe	Grab	05/28/15 10:18	05/28/15 10:18	
22_26Wipe	W15E199-03	Wipe	Grab	05/28/15 10:21	05/28/15 10:21	
22_27W	W15E199-04	Water	Grab	05/28/15 10:43	05/28/15 10:43	
22_28	W15E199-05	Sediment	Composite	05/28/15 10:50	05/28/15 10:50	
22_29W	W15E199-06	Water	Grab	05/28/15 10:56	05/28/15 10:56	
22_30Wipe	W15E199-07	Wipe	Grab	05/28/15 11:16	05/28/15 11:16	
22_31Wipe	W15E199-08	Wipe	Grab	05/28/15 11:19	05/28/15 11:19	
22_32W	W15E199-09	Water	Grab	05/28/15 11:48	05/28/15 11:48	
22_6W	W15E199-10	Water	Grab	05/28/15 12:09	05/28/15 12:09	
22_33	W15E199-11	Sediment	Composite	05/28/15 12:16	05/28/15 12:16	
22_34	W15E199-12	Sediment	Composite	05/28/15 14:08	05/28/15 14:08	
22_35Wipe	W15E199-13	Wipe	Grab	05/28/15 14:12	05/28/15 14:12	

#### **Case Narrative**

PAH/phthalates by 8270-SIM Analysis: Only PAH analysis was requested. Phthalates are not reported.

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Quali
Field Parameters									
Field conductivity									
22_24W:W15E199-01 Conductivity*	254 umhos/cm			1	B15E440	05/28/15	05/28/15	FO SOP 1.03a	
22_27W : W15E199-04 Conductivity*	103 umhos/cm			1	B15E440	05/28/15	05/28/15	FO SOP 1.03a	
22_29W : W15E199-06 Conductivity*	184 umhos/cm			1	B15E440	05/28/15	05/28/15	FO SOP 1.03a	
22_32W : W15E199-09 Conductivity*	173 umhos/cm			1	B15E440	05/28/15	05/28/15	FO SOP 1.03a	
22_6W : W15E199-10									

Reported: 06/17/15 12:54

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		Water 6543 N. Burlington	Polluti Ave. / Portla							
Project: Work Order:	Portland Ha W15E199	rbor			lient: eceiv		Director's 05/28/15			
Analyte		Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Field Parameters	6									
Field conductivity										
22_6W:W15E19 Conductivity*	99-10	<b>194</b> umhos/cm			1	B15E440	05/28/15	05/28/15	FO SOP 1.03a	
General Chemist	trv									
Total Solids	-									
22_28:W15E19 Total solids	9-05	73.0 % W/W	0.01			B15E448	05/29/15	05/30/15	SM 2540G	
22_33 : W15E19 Total solids	9-11	81.5 % W/W	0.01			B15E448	05/29/15	05/30/15	SM 2540G	
22_34:W15E19 Total solids	9-12	85.0 % W/W	0.01			B15E448	05/29/15	05/30/15	SM 2540G	

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### Water Pollution Control Laboratory



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Project: Portland Work Order: W15E199				Client: Receiv	ved:	Director's 05/28/15 1			
Analyte	Result Units	MRL	MDL	. Dil.	Batch	Prepared	Analyzed	Method	Qualifie
uels									
iesel/Oil Hydrocarbons by GC-	FID								
22_24W : W15E199-01									F
Diesel	0.48 mg/L	0.068		1	B15F057	06/03/15	06/09/15	NWTPH-Dx	•
Lube oil	1.4 mg/L	0.14		1	B15F057	06/03/15	06/09/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	-		00,00,10	00,00,10		
2-Fluorobiphenyl	0.0901 mg/L	0.109			B15F057	06/03/15	06/09/15	NWTPH-Dx	
22_28 : W15E199-05									F
ZZ_20 . W ISE 199-05	ND ma/ka day	28		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	Г
	ND mg/kg dry	28 56		1	B15F046		06/03/15		
Lube oil <b>Surrogate</b>	200 mg/kg dry Result	50 Expected	%Poo	-		06/03/15	00/03/15	NWTPH-Dx	
2-Fluorobiphenyl	22.1 mg/kg dry	22.4		50-150	» B15F046	06/03/15	06/03/15	NWTPH-Dx	
22 21Wing : W15E 100 09									-
22_31Wipe : W15E199-08	<b>100</b>	24		25	D455 400	05/00/45	00/02/45		F
Diesel*	420 mg/Wipe	31		25	B15E430	05/29/15	06/03/15	NWTPH-Dx	
Lube oil*	ND mg/Wipe <b>Result</b>	110 <b>F</b> rance of a d	0/ <b>D</b> = =	25	B15E430	05/29/15	06/03/15	NWTPH-Dx	
Surrogate 2-Fluorobiphenyl	0.00 mg/Wipe	Expected 0.100	%Rec %	50-150	») B15E430	05/29/15	06/03/15	NWTPH-Dx	SU
		000	<i>,</i> <b>.</b>		2.02.00	00.20.10			
22_33 : W15E199-11									F
Diesel	ND mg/kg dry	25		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	
Lube oil	130 mg/kg dry	51		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	
Surrogate	Result	Expected				00/00//5	00/00//5		
2-Fluorobiphenyl	20.9 mg/kg dry	20.3	103%	50-150	B15F046	06/03/15	06/03/15	NWTPH-Dx	
22_34 : W15E199-12									F
Diesel	ND mg/kg dry	26		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	
Lube oil	190 mg/kg dry	47		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	19.6 mg/kg dry	18.8	105%	50-150	B15F046	06/03/15	06/03/15	NWTPH-Dx	
ydrocarbon Scan by GC-FID									
22_24W : W15E199-01									
Gasoline	ND mg/L	0.27		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Diesel	DET mg/L	0.54		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	F
Lube oil	DET mg/L	0.54		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0911 mg/L	0.109		50-150		06/03/15	06/04/15	NWTPH-HCID	
22_25Wipe : W15E199-02									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	5		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec			50.20/10	00.20,10		
2-Fluorobiphenyl	0.0972 mg/Wipe	0.100		50-150		05/29/15	05/29/15	NWTPH-HCID	
22_26Wipe : W15E199-03									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
		1							
Lube oil*	ND mg/Wipe	5		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	

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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.

Jennifer Shackelford, Laboratory Coordinator QA/QC

$\equiv \approx$

### Water Pollution Control Laboratory

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ORELAP Certification ID 402

Project: Portland I Work Order: W15E199	Harbor			Client: Receiv		Director's 05/28/15 1			
Analyte	Result Units	MRL	MDL	. Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels									
Hydrocarbon Scan by GC-FID									
22_26Wipe : W15E199-03									
Diesel*	ND mg/Wipe	2		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%					
2-Fluorobiphenyl	0.0901 mg/Wipe	0.100	90%	50-150	B15E430	05/29/15	05/29/15	NWTPH-HCID	
22_27W : W15E199-04									
Gasoline	ND mg/L	0.27		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Diesel	ND mg/L	0.54		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Lube oil	ND mg/L	0.54		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0855 mg/L	0.109	79%	50-150	B15F057	06/03/15	06/04/15	NWTPH-HCID	
22_28 : W15E199-05									
Gasoline	ND mg/kg dry	24		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Diesel	ND mg/kg dry	60		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Lube oil	DET mg/kg dry	121		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected			-				
2-Fluorobiphenyl	11.2 mg/kg dry	12.1	93%	50-150	B15E437	05/29/15	05/29/15	NWTPH-HCID	
22_29W : W15E199-06									
Gasoline	ND mg/L	0.27		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Diesel	ND mg/L	0.54		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Lube oil	ND mg/L	0.54		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected			-				
2-Fluorobiphenyl	0.0924 mg/L	0.109	85%	50-150	B15F057	06/03/15	06/04/15	NWTPH-HCID	
22_30Wipe : W15E199-07									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	5		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected			-	05/00/45	05/00/45		
2-Fluorobiphenyl	0.0806 mg/Wipe	0.100	81%	50-150	B15E430	05/29/15	05/29/15	NWTPH-HCID	
22_31Wipe : W15E199-08									
Gasoline*	DET mg/Wipe	1		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	F4
Lube oil*	DET mg/Wipe	5		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	F2
Diesel*	DET mg/Wipe	2		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	F0b
Surrogate	Result	Expected				05/00/45	05/00/45		
2-Fluorobiphenyl	0.00 mg/Wipe	0.100	%	50-150	B15E430	05/29/15	05/29/15	NWTPH-HCID	Fé
22_32W : W15E199-09									
Gasoline	ND mg/L	0.28		1	B15F057		06/04/15	NWTPH-HCID	
Diesel	ND mg/L	0.57		1	B15F057		06/04/15	NWTPH-HCID	
Lube oil	ND mg/L	0.57		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Surrogate 2-Fluorobiphenyl	<b>Result</b> 0.0917 mg/L	Expected 0.114		•	6) B15F057	06/03/15	06/04/15	NWTPH-HCID	
	0.0317 Hig/L	0.114	0170	50-150	5156037	00/03/13	00/04/13		
22_6W : W15E199-10									
Gasoline	ND mg/L	0.27		1	B15F126	06/08/15	06/08/15	NWTPH-HCID	

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### Water Pollution Control Laboratory



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1 ,	Portland Harbor W15E199			Client: Receiv		Director's 05/28/15 1			
Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels									
Hydrocarbon Scan by	GC-FID								
22_6W : W15E199	-10								
Diesel	ND mg/L	0.53		1	B15F126	06/08/15	06/08/15	NWTPH-HCID	
Lube oil	ND mg/L	0.53		1	B15F126	06/08/15	06/08/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0708 mg/L	0.106	67%	50-150	B15F126	06/08/15	06/08/15	NWTPH-HCID	
22_33 : W15E199-	11								
Gasoline	ND mg/kg dry	19		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Diesel	ND mg/kg dry	48		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Lube oil	DET mg/kg dry	96		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	9.31 mg/kg dry	9.58	97%	50-150	B15E437	05/29/15	05/29/15	NWTPH-HCID	
22_34 : W15E199-	12								
Gasoline	ND mg/kg dry	21		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Diesel	ND mg/kg dry	52		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Lube oil	DET mg/kg dry	104		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	8.38 mg/kg dry	10.4	81%	50-150	B15E437	05/29/15	05/29/15	NWTPH-HCID	
22 35Wipe : W15E	E199-13								
Gasoline*	ND mg/Wipe	1		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	5		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0842 mg/Wipe	0.100	84%	50-150	B15E430	05/29/15	05/29/15	NWTPH-HCID	

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	City of Portland         Water Pollution Control Laboratory         6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5660       fax (503) 823-5656         ORELAP Certification ID 4023       Director's Office									
Project:										
Work Order:	W15E199				Receiv	red:	05/28/15 1	5:15		
Analyte	Resul	t Units	MRL	MDL	. Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Orga	anics - SIM									
_	s & Phthalates by GCM	1S-SIM								
22_24W : W15E1	99-01									
Acenaphthene		) ug/L	0.020	0.020	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene		) ug/L	0.060	0.060		B15E414		06/01/15	EPA 8270-SIM	
Anthracene		) ug/L	0.020	0.020		B15E414		06/01/15	EPA 8270-SIM	
Benzo(a)anthracene		/ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(a)pyrene		Bug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene		iug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene		ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
		-	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Chrysene		lug/L							EPA 8270-SIM	
Dibenzo(a,h)anthrace		ug/L	0.010	0.010		B15E414		06/01/15		
Fluoranthene		3 ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Fluorene		) ug/L	0.030	0.030		B15E414		06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyre		3 ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
1-Methylnaphthalene		) ug/L	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
2-Methylnaphthalene		) ug/L	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
Naphthalene	NE	) ug/L	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
Phenanthrene	0.043	3 ug/L	0.020	0.020	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene		) ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Resul		Expected		-	-	05/00//5	00/04/45	554 0070 OUL	
2-Methylnaphthalene Fluoranthene-d10		4 ug/L 4 ug/L	0.229 0.229		60.4-153 69-149	B15E414 B15E414		06/01/15 06/01/15	EPA 8270-SIM EPA 8270-SIM	
		r ug/L	0.229	10576	09-149	DIJL414	03/20/13	00/01/13	LFA 0270-311	
22_27W : W15E1	99-04									
Acenaphthene	0.12	2 ug/L	0.020	0.020	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	NE	) ug/L	0.060	0.060	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.075	5 ug/L	0.020	0.020	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	NE	) ug/L	0.010	0.010	) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene		) ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene		) ug/L	0.010	0.010	) 1	B15E414		06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene		) ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene		) ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Chrysene		) ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthrace		) ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Fluoranthene		) ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Fluorene		iug/L	0.020	0.020		B15E414		06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyre		) ug/L	0.020	0.020		B15E414		06/01/15	EPA 8270-SIM	
1-Methylnaphthalene		ug/L	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
2-Methylnaphthalene		) ug/L	0.040	0.040		B15E414		06/01/15	EPA 8270-SIM	
Naphthalene		) ug/L	0.040	0.040		B15E414 B15E414		06/01/15	EPA 8270-SIM	
Phenanthrene		-	0.080	0.080		B15E414		06/01/15	EPA 8270-SIM	
		2 ug/L	0.020	0.020		B15E414				
Pyrene <b>Surrogate</b>	0.010 Resul	) ug/L t	Expected				00/20/10	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene		ι βug/L	0.229	99%		9 B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10		2 ug/L	0.229			B15E414		06/01/15	EPA 8270-SIM	

Reported: 06/17/15 12:54

Jennifer Shackelford

		Wate 6543 N. Burlingt	on Ave. / Portla		ontro 203 (503	I Labo		5656		
Project: Work Order:	Portland H W15E199	larbor			Client: Receiv	ed:	Director's 05/28/15 1			
Analyte		Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Org	anics - SIM									
Polynuclear Aromatic		s by GCMS-SIM								
22 29W : W15E		<u> </u>								
Acenaphthene		0.20 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene		ND ug/L	0.060	0.060	1	B15E414		06/01/15	EPA 8270-SIM	
Anthracene		0.12 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	е	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene		ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranther	ne	0.013 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylen	e	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranther	ne	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene		ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthrae	cene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene		ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene		<b>0.47</b> ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyr	ene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalen	e	0.079 ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalen	e	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene		ND ug/L	0.20	0.20	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene		0.11 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene		0.016 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate		Result	Expected		-	-				
2-Methylnaphthalen Fluoranthene-d10	ne-d10	0.28 ug/L 0.24 ug/L	0.229 0.229			B15E414 B15E414		06/01/15 06/01/15	EPA 8270-SIM EPA 8270-SIM	
22_32W : W15E	199-09									
Acenaphthene		ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene		ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene		0.047 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	e	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene		ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranther	ne	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylen	e	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranther	ne	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene		ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthrae	cene	ND ug/L	0.010	0.010	1	B15E414		06/01/15	EPA 8270-SIM	
Fluoranthene		ND ug/L	0.010	0.010	1	B15E414		06/01/15	EPA 8270-SIM	
Fluorene		ND ug/L	0.020	0.020	1	B15E414		06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyr		ND ug/L	0.010	0.010	1	B15E414		06/01/15	EPA 8270-SIM	
1-Methylnaphthalen		ND ug/L	0.040	0.040	1	B15E414		06/01/15	EPA 8270-SIM	
2-Methylnaphthalen	e	ND ug/L	0.040	0.040	1	B15E414		06/01/15	EPA 8270-SIM	
Naphthalene		ND ug/L	0.040	0.040	1	B15E414		06/01/15	EPA 8270-SIM	
Phenanthrene		ND ug/L	0.020	0.020	1	B15E414		06/01/15	EPA 8270-SIM	
Pyrene		ND ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	a d10	Result	Expected		Limits(%	-	05/09/45	06/04/45		
2-Methylnaphthalen Fluoranthene-d10	10-010	0.25 ug/L 0.24 ug/L	0.229 0.229			B15E414 B15E414		06/01/15 06/01/15	EPA 8270-SIM EPA 8270-SIM	

Reported: 06/17/15 12:54

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### Water Pollution Control Laboratory

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

	Portland Harbor W15E199				Client: Receiv	ved:	Director's 05/28/15 1			
Analyte	Result	Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Orga	nics - SIM									
Polynuclear Aromatics	& Phthalates by GCM	S-SIM								
22 6W : W15E199	-10									
- Acenaphthene	ND	ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND	ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.23	ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	ND	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	ND	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	0.010	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	ND	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	ND	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	ND	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthrace	ne ND	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	ND	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	ND	ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrer	ne ND	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND	ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene	ND	ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	ND	ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result		Expected	%Rec	Limits(%	5)				
2-Methylnaphthalene- Fluoranthene-d10		ug/L ug/L	0.229 0.229			B15E414 B15E414		06/01/15 06/01/15	EPA 8270-SIM EPA 8270-SIM	

Reported: 06/17/15 12:54

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RELAP Certification ID 4023

Project:

Portland Harbor W15E199 Client: Dire Received: 05/2

Director's Office 05/28/15 15:15

### **Quality Control Report**

			General	Chemi	stry - (	2C				
Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Solids - Batch B15E448										
Duplicate (B15E448-DUP1)			Source: W15	5E202-02	2					
Total solids	83.2 %	W/W	0.01			83.0		0.2 (5)	05/29/15 :05/30/15	
			Fu	uels - C	QC					
Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Diesel/Oil Hydrocarbons by GC	-FID - Batch E	315E430								
Blank (B15E430-BLK2)										F7
Diesel	ND mg	J/Wipe	1.2						05/28/15 :06/03/15	
Lube oil	ND mg	J/Wipe	2.5						05/28/15 :06/03/15	
Surrogate										
2-Fluorobiphenyl	0.0831 mg	J/Wipe			0.100		83% (50-150)		05/28/15 :06/03/15	
Diesel/Oil Hydrocarbons by GC	-FID - Batch B	315F046								
Blank (B15F046-BLK1)										F7
Diesel	ND mg	j/kg wet	21						06/03/15 :06/03/15	
Lube oil	ND mg	j/kg wet	42						06/03/15 :06/03/15	
Surrogate										
2-Fluorobiphenyl	<i>14.0</i> mg	g/kg wet			16.7		84% (50-150)		06/03/15 :06/03/15	
LCS (B15F046-BS1)										F7
Diesel	<b>190</b> mg	j/kg wet	25		200		95% (50-150)		06/03/15 :06/03/15	
Lube oil	<b>111</b> mg	j/kg wet	50		200		55% (50-150)		06/03/15 :06/03/15	
Surrogate										
2-Fluorobiphenyl	22.0 mg	g/kg wet			20.0		110% <i>(50-150)</i>	)	06/03/15 :06/03/15	
Duplicate (B15F046-DUP1)			Source: W18	5E199-05	i					F7
Diesel	ND mg	J/kg dry	32			ND		(50)	06/03/15 :06/03/15	
Lube oil	<b>310</b> mg	J/kg dry	58			201		43 (50)	06/03/15 :06/03/15	
Surrogate										
2-Fluorobiphenyl	23.8 mg				23.4		102% <i>(50-150)</i>	)	06/03/15 :06/03/15	
Diesel/Oil Hydrocarbons by GC	-FID - Batch E	315F057								
Blank (B15F057-BLK2)										F7
Diesel	ND mg	J/L	0.12						06/03/15 :06/09/15	
Lube oil	ND mg	J/L	0.062						06/03/15 :06/09/15	

Reported: 06/17/15 12:54

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Water Pollution Control Laboratory



6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 **ORELAP Certification ID 4023** 

		ORELA	P Certification	ID 4023				1851
Project: Portla Work Order: W15E	ind Harbor 199		Clien Rece		Director's 05/28/15			
		Fu	els - QC					
•			Spik			RPD	Prepared:	0
Analyte	Result Units	MRL	MDL Leve	el Result	(Limits)	(Limit)	Analyzed	Qualifie
Diesel/Oil Hydrocarbons by G	5C-FID - Balcii B 15F057							
Blank (B15F057-BLK2)								
Surrogate	0.0224		0.05	•	078/ (50.450)		00/00/45 -00/00/45	
2-Fluorobiphenyl	0.0334 mg/L		0.050	0	67% (50-150)		06/03/15 :06/09/15	
LCS (B15F057-BS2)								F
Diesel	0.304 mg/L	0.031	0.50	)	61% (50-150)		06/03/15 :06/09/15	
Lube oil	0.403 mg/L	0.062	0.50	)	81% (50-150)		06/03/15 :06/09/15	
Surrogate								
2-Fluorobiphenyl	0.0324 mg/L		0.050	0	65% (50-150)		06/03/15 :06/09/15	
LCS Dup (B15F057-BSD2)								F
Diesel	0.303 mg/L	0.031	0.50	)	61% <i>(50-150)</i>	0.2 (200)	06/03/15 :06/09/15	
Lube oil	0.384 mg/L	0.062	0.50	)	77% (50-150)	5 (200)	06/03/15 :06/09/15	
Surrogate								
2-Fluorobiphenyl	0.0346 mg/L		0.050	0	69% (50-150)		06/03/15 :06/09/15	
Hydrocarbon Scan by GC-FIE Blank (B15E430-BLK1)		1					05/09/15 -05/09/15	
Gasoline Lube oil	ND mg/Wipe	1					05/28/15 :05/28/15 05/28/15	
Diesel	ND mg/Wipe	2					05/28/15 :05/28/15	
Surrogate	ND mg/wipe	2					05/26/15 .05/26/15	
2-Fluorobiphenyl	0.0867 mg/Wipe		0.10	n	87% (50-150)		05/28/15 :05/28/15	
Hydrocarbon Scan by GC-FIE	<b>.</b> .		0.70				00/20/10 .00/20/10	
Blank (B15E437-BLK1)								
Gasoline	ND mg/kg wet	17					05/29/15 :05/29/15	
Diesel	ND mg/kg wet	42					05/29/15 :05/29/15	
Lube oil	ND mg/kg wet	83					05/29/15 :05/29/15	
Surrogate								
2-Fluorobiphenyl	7.64 mg/kg wet		8.33		92% (50-150)		05/29/15 :05/29/15	
Duplicate (B15E437-DUP1)		Source: W15	E199-05					
Gasoline	ND mg/kg dry	27		ND			05/29/15 :05/29/15	
Diesel	ND mg/kg dry	66		ND			05/29/15 :05/29/15	
Lube oil	DET mg/kg dry	133		DET			05/29/15 :05/29/15	
Surrogate								
2-Fluorobiphenyl	13.0 mg/kg dry		13.3		98% (50-150)		05/29/15 :05/29/15	
Hydrocarbon Scan by GC-FIE	0 - Batch B15F057							
Blank (B15F057-BLK1)								
Gasoline	ND mg/L	0.12					06/03/15 :06/04/15	

Diesel ND mg/l 0.25 06/03/15:06/04/15	Gasoline	ND mg/L	0.12	06/03/15 :06/04/15
	Diesel	ND mg/L	0.25	06/03/15 :06/04/15

Reported: 06/17/15 12:54

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Water Pollution Control Laboratory



6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Client: **Director's Office Portland Harbor** Work Order: W15E199 Received: 05/28/15 15:15 Fuels - QC Spike Source %Rec RPD Prepared: Qualifier Units MDL Analyte Result MRL Level Result (Limits) (Limit) Analyzed Hydrocarbon Scan by GC-FID - Batch B15F057 Blank (B15F057-BLK1) ND mg/L 0.25 06/03/15 :06/04/15 Lube oil Surrogate 2-Fluorobiphenyl 0.0333 mg/L 0.0500 67% (50-150) 06/03/15 :06/04/15 LCS (B15F057-BS1) 06/03/15 :06/04/15 Gasoline DET mg/L 0.06 0.200 42% (50-150) DET mg/L 0.25 Diesel 0.500 66% (50-150) 06/03/15 :06/04/15 Lube oil DET mg/L 0.25 0.500 66% (50-150) 06/03/15 :06/04/15 Surrogate 2-Fluorobiphenyl 0.0296 mg/L 06/03/15 06/04/15 0.0500 59% (50-150) LCS Dup (B15F057-BSD1) Gasoline DET mg/L 0.05 0.200 29% (50-150) 06/03/15 06/04/15 Diesel DET mg/L 0.25 0.500 66% (50-150) 06/03/15 :06/04/15 Lube oil DET mg/L 0.25 0.500 61% (50-150) 06/03/15 :06/04/15 Surrogate 2-Fluorobiphenyl 0.0325 mg/L 0.0500 65% (50-150) 06/03/15 :06/04/15 Hydrocarbon Scan by GC-FID - Batch B15F126 Blank (B15F126-BLK1) Gasoline ND ma/L 0.12 06/08/15 :06/08/15 06/08/15 :06/08/15 Diesel ND mg/L 0.25 0.25 06/08/15 :06/08/15 F0 Lube oil ND mg/L Surrogate 0.0290 mg/L 06/08/15 :06/08/15 2-Fluorobiphenyl 0.0500 58% (50-150) LCS (B15F126-BS1) DET mg/L 0.25 0.500 66% (50-150) 06/08/15 :06/08/15 Diesel Surrogate 2-Fluorobiphenyl 0.0372 mg/L 06/08/15 :06/08/15 0.0500 74% (50-150) LCS Dup (B15F126-BSD1) Diesel DET mg/L 0.25 0.500 58% (50-150) 06/08/15 :06/08/15 Surrogate 2-Fluorobiphenyl 0.0292 mg/L 0.0500 58% (50-150) 06/08/15 :06/08/15

Reported: 06/17/15 12:54

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#### Water Pollution Control Laboratory

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project:Portland HarborClient:Director's OfficeWork Order:W15E199Received:05/28/15 15:15

#### Semivolatile Organics - SIM - QC

Analyte	Result Uni	ts MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Polynuclear Aromatics & Phth	nalates by GCMS-SIN	/I - Batch B15E414							
Blank (B15E414-BLK1)									
Acenaphthene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Acenaphthylene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Anthracene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Benzo(a)anthracene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(a)pyrene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(b)fluoranthene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(k)fluoranthene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Chrysene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Fluoranthene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Fluorene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Indeno(1,2,3-cd)pyrene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
1-Methylnaphthalene	ND ug/L	0.040	0.040					05/28/15 :06/01/15	
2-Methylnaphthalene	ND ug/L	0.040	0.040					05/28/15 :06/01/15	
Naphthalene	ND ug/L	0.040	0.040					05/28/15 :06/01/15	
Phenanthrene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Pyrene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Butyl benzyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Di-n-butyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Diethyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Dimethyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Di-n-octyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Bis(2-ethylhexyl) phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Surrogate									
2-Methylnaphthalene-d10	0.23 ug/L			0.229		102% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.25 ug/L			0.229		108% (69-149)		05/28/15 :06/01/15	
LCS (B15E414-BS1)									
Acenaphthene	0.112 ug/L	0.020	0.020	0.114		98% (58.8-155)		05/28/15 :06/01/15	
Acenaphthylene	0.115 ug/L	0.020	0.020	0.114		100% (64-155)		05/28/15 :06/01/15	
Anthracene	0.117 ug/L	0.020	0.020	0.114		102% (76.2-129		05/28/15 :06/01/15	
Benzo(a)anthracene	0.119 ug/L	0.010	0.010	0.114		104% (72.9-138		05/28/15 :06/01/15	
Benzo(a)pyrene	0.122 ug/L	0.010	0.010	0.114		106% (75.5-137		05/28/15 :06/01/15	
Benzo(b)fluoranthene	0.117 ug/L	0.010	0.010	0.114		102% (59.9-160		05/28/15 :06/01/15	
Benzo(g,h,i)perylene	0.106 ug/L	0.010	0.010	0.114		93% (70.1-134)		05/28/15 :06/01/15	
Benzo(k)fluoranthene	0.119 ug/L	0.010	0.010	0.114		104% (61.1-157		05/28/15 :06/01/15	
Chrysene	0.123 ug/L	0.010	0.010	0.114		108% (76.7-146		05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	0.117 ug/L	0.010	0.010	0.114		102% (63.9-140		05/28/15 :06/01/15	
Fluoranthene	0.119 ug/L	0.010	0.010	0.114		104% (77.5-134		05/28/15 :06/01/15	
Fluorene	0.118 ug/L	0.020	0.020	0.114		103% (61.2-157		05/28/15 :06/01/15	

Reported: 06/17/15 12:54

Jennifer Shackelford







### Water Pollution Control Laboratory

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Client:



Project: P Work Order: V

#### Portland Harbor W15E199

Director's Office

Received: 05/28/15 15:15

		Semivolatile	Organ	ics - Sl	M - QC				
Analyte	Result I	Jnits MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Polynuclear Aromatics & Phthala	ates by GCMS-S	SIM - Batch B15E41	4						
LCS (B15E414-BS1)									
Indeno(1,2,3-cd)pyrene	0.112 ug/L	0.010	0.010	0.114		98% (68.4-135)		05/28/15 :06/01/15	
1-Methylnaphthalene	0.131 ug/L	0.040	0.040	0.114		114% (79.6-158		05/28/15 :06/01/15	
2-Methylnaphthalene	0.125 ug/L	0.040	0.040	0.114		109% (76-161)		05/28/15 :06/01/15	
Naphthalene	0.117 ug/L	0.040	0.040	0.114		103% (60.6-164		05/28/15 :06/01/15	
Phenanthrene	0.111 ug/L	0.020	0.020	0.114		97% (77.4-140)		05/28/15 :06/01/15	
Pyrene	0.127 ug/L	0.010	0.010	0.114		111% (81.1-141)		05/28/15 :06/01/15	
Surrogate									
2-MethyInaphthalene-d10	0.23 ug/L			0.229		102% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.24 ug/L			0.229		105% (69-149)		05/28/15 :06/01/15	
Matrix Spike (B15E414-MS1)		Source: W1	5E194-0	5					
Acenaphthene	0.325 ug/L	0.020	0.020	0.286	ND	114% (58.8-155		05/28/15 :06/01/15	
Acenaphthylene	0.319 ug/L	0.020	0.020	0.286	ND	112% (64-155)		05/28/15 :06/01/15	
Anthracene	0.328 ug/L	0.020	0.020	0.286	ND	115% (76.2-129		05/28/15 :06/01/15	
Benzo(a)anthracene	0.302 ug/L	0.010	0.010	0.286	ND	106% (72.9-138		05/28/15 :06/01/15	
Benzo(a)pyrene	0.300 ug/L	0.010	0.010	0.286	ND	105% (75.5-137		05/28/15 :06/01/15	
Benzo(b)fluoranthene	0.288 ug/L	0.010	0.010	0.286	ND	101% (59.9-160		05/28/15 :06/01/15	
Benzo(g,h,i)perylene	0.259 ug/L	0.010	0.010	0.286	ND	91% (70.1-134)		05/28/15 :06/01/15	
Benzo(k)fluoranthene	0.291 ug/L	0.010	0.010	0.286	ND	102% (61.1-157		05/28/15 :06/01/15	
Chrysene	0.315 ug/L	0.010	0.010	0.286	ND	110% (76.7-146		05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	0.282 ug/L	0.010	0.010	0.286	ND	99% (63.9-140)		05/28/15 :06/01/15	
Fluoranthene	0.319 ug/L	0.010	0.010	0.286	ND	112% (77.5-134		05/28/15 :06/01/15	
Fluorene	0.345 ug/L	0.020	0.020	0.286	0.0251	112% (61.2-157		05/28/15 :06/01/15	
Indeno(1,2,3-cd)pyrene	0.274 ug/L	0.010	0.010	0.286	ND	96% (68.4-135)		05/28/15 :06/01/15	
1-Methylnaphthalene	0.367 ug/L	0.040	0.040	0.286	ND	129% (79.6-159		05/28/15 :06/01/15	
2-Methylnaphthalene	0.350 ug/L	0.040	0.040	0.286	ND	123% (76-161)		05/28/15 :06/01/15	
Naphthalene	0.325 ug/L	0.040	0.040	0.286	ND	114% (60.6-164		05/28/15 :06/01/15	
Phenanthrene	0.313 ug/L	0.020	0.020	0.286	ND	109% (77.4-140		05/28/15 :06/01/15	
Pyrene	0.341 ug/L	0.010	0.010	0.286	ND	119% (81.1-141		05/28/15 :06/01/15	
Surrogate									
2-Methylnaphthalene-d10	0.25 ug/L			0.229		109% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.25 ug/L			0.229		110% (69-149)		05/28/15 :06/01/15	
<u> Matrix Spike Dup (B15E414-MSD1)</u>		Source: W1	5E194-0	5					
Acenaphthene	0.322 ug/L	0.020	0.020	0.286	ND	113% <i>(58.8-155</i> 0.7	(50)	05/28/15 :06/01/15	
Acenaphthylene	0.320 ug/L	0.020	0.020	0.286	ND	112% (64-155) 0.2	(50)	05/28/15 :06/01/15	
Anthracene	0.324 ug/L	0.020	0.020		ND	113% (76.2-129 1 (	50)	05/28/15 :06/01/15	
Benzo(a)anthracene	0.310 ug/L	0.010	0.010	0.286	ND	108% (72.9-138 3 (	50)	05/28/15 :06/01/15	
Benzo(a)pyrene	0.310 ug/L	0.010	0.010		ND	108% (75.5-137 3 (		05/28/15 :06/01/15	
Benzo(b)fluoranthene	0.293 ug/L	0.010	0.010		ND	103% (59.9-160 2 (5		05/28/15 :06/01/15	
Benzo(g,h,i)perylene	0.271 ug/L	0.010	0.010	0.286	ND	95% (70.1-134) 4 (5	,	05/28/15 :06/01/15	
Benzo(k)fluoranthene	0.303 ug/L	0.010	0.010		ND	106% (61.1-157 4 (5	,	05/28/15 :06/01/15	

Reported: 06/17/15 12:54

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC



### Water Pollution Control Laboratory

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023



Project: P Work Order: W

#### Portland Harbor W15E199

Client: Director's Office

Received: 05/28/15 15:15

# Semivolatile Organics - SIM - QC

Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Polynuclear Aromatics & Phthalate	s by GCM	S-SIM - E	atch B15E414							
Matrix Spike Dup (B15E414-MSD1)			Source: W15	E194-05	i					
Chrysene	0.324 ug	/L	0.010	0.010	0.286	ND	113% (76.7-146	3 (50)	05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	0.297 ug	/L	0.010	0.010	0.286	ND	104% (63.9-140	5 (50)	05/28/15 :06/01/15	
Fluoranthene	0.317 ug	/L	0.010	0.010	0.286	ND	111% (77.5-134)	0.7 (50)	05/28/15 :06/01/15	
Fluorene	0.351 ug	/L	0.020	0.020	0.286	0.0251	114% (61.2-157	2 (50)	05/28/15 :06/01/15	
Indeno(1,2,3-cd)pyrene	0.287 ug	/L	0.010	0.010	0.286	ND	101% (68.4-135	5 (50)	05/28/15 :06/01/15	
1-Methylnaphthalene	0.364 ug	/L	0.040	0.040	0.286	ND	127% (79.6-159	0.9 (50)	05/28/15 :06/01/15	
2-Methylnaphthalene	0.350 ug	/L	0.040	0.040	0.286	ND	122% (76-161)	0.2 (50)	05/28/15 :06/01/15	
Naphthalene	<b>0.320</b> ug	/L	0.040	0.040	0.286	ND	112% (60.6-164	2 (50)	05/28/15 :06/01/15	
Phenanthrene	0.315 ug	/L	0.020	0.020	0.286	ND	110% (77.4-140	0.9 (50)	05/28/15 :06/01/15	
Pyrene	0.337 ug	/L	0.010	0.010	0.286	ND	118% (81.1-141	1 (50)	05/28/15 :06/01/15	
Surrogate										
2-Methylnaphthalene-d10	0.25 ug	/L			0.229		108% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.25 ug	/L			0.229		108% (69-149)		05/28/15 :06/01/15	

#### Qualifiers

F0 Analyte was detected in the Method Blank at a concentration greater than one half of the reporting level, but less than the reporting level. Sample result may be a high estimate.

F0a Fuel pattern most closely resembles transformer oil.

F0b Results resembles most closely non-PCB transformer oil.

F2 Result for heavy oil is primarily due to overlap from diesel-range hydrocarbons.

F4 Result for gasoline is primarily overlap from diesel-range hydrocarbons.

F6 Surrogate recovery could not be determined due to the high concentration of hydrocarbons in the sample.

F7 This sample underwent silica gel clean-up.

SU5 Surrogate recovery could not be determined due to required dilution of the sample extract.

		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
*	This analyte is not certified under NELAP		

Reported: 06/17/15 12:54

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

Page 1 of 3			C #1 (5-28-15)	um Sheen CO	3asin 22 Petrole	Роц
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heif		Wipe	U	5 1119	5/28/2015	0 22_31Wipe
1 ANV453 Wipe under east Lat §		Wipe	U	5 1116	5/28/2015	22_30Wipe
$ \{x,y,z,z,z,z,z,z,z,z,z,z,z,z,z,z,z,z,z,z,$		Water	U	5 1056	5/28/2015	6 22_29W
1 AAP794 Inline Sediment DS		•	nho 10 ) W	5 1050	5/28/2015	5 22_28
103 2 AAP794 Dry Flow from 12" Lat		Water	4~** че <u>г</u> () 1	5 1043	5/28/2015	H 22_27W
A & & So 59 ABQ059 Vipe below 6" inlet		Wipe	<del>انا</del> ال	5 1021	5/28/2015	3 22_26Wipe
ា A&0.059 ABQ069 ម្ម Wipe above 16" inlet ខ្ល		Wipe	<del>ن</del>	5 1018	5/28/2015	<b>3</b> 22_25Wipe
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() () () Standard (10 business days) 文文 () Rush (5 business days)			eq	3x if detect	nd NWTPH-(	Bend and NWTPH-Gx if detected
			-	stigation	ז Sheen Inve	Basin 22 Petroleum Sheen Investigation
	Requested Analyses					Special Instructions:
			Ŀ	Portland Harbor	Portla	Project Name:
			e	Director's Office	Direct	Client Name:
Date:       5/38/15         Work Order #:       W15E199         Collected By:       M35, W28, E24, PHA	City of Portland Chain-of-Custody	Bure		2	ntrol Laborato +4552 ) 823-5696 5681	Water Pollution Control Laboratory 6543 N. Burlington Ave. Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5696 General Lab: (503) 823-5681

Date: 5/38/15 Work Order #: いうちし99 Collected By: <u>M35, wc2, EcH, PHA</u>				 Ξ ς ο	(unit of the second sec	leter:	W	Inline Sediment US AAM078	Inline Sediment US	Wipe from MH Collar						Date: Signature: Date:	Time: Printed Name: Tume:	Page 2 of 3
City of Portland Chain-of-Custody			Requested Analyses		(iəvə]-w-											Date: 25-28-15 Signature:	and the Printed Name.	
						Matrix MWTPH.		• Sed				-				Received By: Signature:	heles 3	
						Grab or Sar Comp Ma		e i ho ;	0	м С					 	Date/ B/14 Signature	1515 Printed Nam	#2 (5-28-15)
	Director's Office	Portland Harbor		tigation	t if detected	Sample Time	1216	007	00+1	1412						5/J	Tiffe:	I Sheen COC #
Laboratory 2 -5696	Directo	Portlan		een Invest	WTPH-Gx	Sample Date	5/28/2015			5/28/2015						Mur.	NW	22 Petroleum
Water Pollution Control Laboratory 6543 N. Burlington Ave. Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5696 General Lab: (503) 823-5681	Client Name:	rioject ivame.	Snarial Instructions:	Basin 22 Petroleum Sheen Investigation	<sup>1</sup> Run NWTPH-Dx and NWTPH-Gx if detected	Location (D	22 34 33			22_36Wipe	same					ab linquished By: a nature////////////////////////////////////	ted Na	Portland Harbor - Basin 22 Petroleum Sheen COC #2 (5-28-15)
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Investigation Day Three June 3, 2015



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 Petroleum Sheen Investigation Outfall Basin 22

To:FileFrom:Andrew Davidson, GSIDate:June 28, 2015

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated during a source control investigation sampling event conducted by the City of Portland (City). Six composite inline solids samples were collected in Outfall Basin 22 on June 3, 2015 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 included the following analyses:

- BES WPCL
  - Total Solids SM 2540 G (Inline solids samples only)
  - Hydrocarbon Analysis NWTPH-HCID (NWTPH-Dx, Gx if detected)

The WPCL summary report for all analyses associated with this sampling event is attached for review.

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

- Chain-of-custody for completeness and continuous custody
- Analysis conducted within holding times
- Chemicals of interest detected in method blanks and/or field decontamination blanks
- Internal standard recoveries within laboratory control limits
- Surrogate recoveries within laboratory control limits

- Matrix spike/matrix spike duplicate (MS/MSD) sample results within laboratory control limits
- Laboratory control/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 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**

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

# **Method Blanks**

Method blanks were processed during the hydrocarbon scan analysis (NWTPH-HCID), the analysis of diesel/oil hydrocarbons (NWTPH-Dx), and the analysis of gasoline (NWTPH-Gx). No analytes were detected in any of the method blank samples.

# **Surrogate Recoveries**

Surrogate recoveries were processed during the laboratory analyses of hydrocarbons (NWTPH-HCID, NWTPH-Dx, and NWTPH-Gx). Surrogate recoveries were within control limits for all analyses.

# Laboratory Control Samples/Duplicate Laboratory Control Samples

LCS samples were processed during the NWTPH-Dx and NWTPH-Gx analyses. All LCS recoveries were within laboratory control limits.

# **Duplicate Samples**

Duplicate samples were processed during the analyses of total solids, NWTPH-HCID, NWTPH-Dx, and NWTPH-Gx for inline solids samples. All RPDs were within acceptance criteria with one exception:

• The duplicate sample collected from W15F041-02 and analyzed by NWTPH-Gx had an RPD above acceptance criteria. WPCL reports that the results indicate non-homogenous sample matrix and the sample result should be considered an estimate. Accordingly, the

result for gasoline in sample W15F041-02 is flagged as an estimate "J" due to non-homogenous matrix "NM".

# **Additional Information**

WPCL reports the following additional information regarding inline solids samples:

- Diesel results for samples W15F041-01, W15F041-02, W15F041-03, and W15F041-04 during the NWTPH-Dx analysis were positively biased by overlap from large Motor Oil peaks. Accordingly the data are flagged as estimates "J" due to matrix interference "MI".
- All samples analyzed by NWTPH-Dx underwent silica gel clean-up.
- WPCL reports that detections quantified as Diesel and Lube Oil in sample W15F041-04 actually appear to be a single petroleum product that is heavier than Diesel #2 and lighter than the reference lube oil. The values are qualified as estimates "J" due to inadequate matching with the reference compounds "RC".
- WPCL reports that the detected components in sample W15F041-06 does not resemble a fuel pattern but the quantity exceeds the reporting threshold.
- WPCL reports that gasoline detections in samples W15F041-01 and W15F041-02 are primarily due to overlap from diesel-range hydrocarbons. Accordingly, gasoline results for these two samples are qualified as estimates "J" due to matrix interference "MI".
- Sample aliquots for samples W15F041-01 and W15F041-02 were sub-sampled from a jar during the NWTPH-Gx analysis. The sub-sampled aliquot was not preserved with methanol within 48 hours of sampling. Sample results may be biased low. Associated results are flagged as estimates "J" to reflect inadequate preservation times "HT".



### City of Portland Water Pollution Control Laboratory

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



June 22, 2015

Linda Scheffler Director's Office

> Work Order W15F041

Project Portland Harbor Received 06/03/15 14:57

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.

ennifer Shackelford

Jennifer Shackelford Laboratory Coordinator QA/QC





Water Pollution Control Laboratory

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023



#### LABORATORY ANALYSIS REPORT

Project:Portland HarborWork Order:W15F041Received:6/3/15Submitted By:Field Operations	Client: Director's Office Project Mgr: Linda Scheffler
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				Sample Colle	ction Date	
Sample	Laboratory ID	Matrix	Туре	Start	End	Qualifier
22_36	W15F041-01	Sediment	Composite	06/03/15 10:14	06/03/15 10:14	
22_37	W15F041-02	Sediment	Composite	06/03/15 10:20	06/03/15 10:20	
22_38	W15F041-03	Sediment	Composite	06/03/15 10:58	06/03/15 10:58	
22_39	W15F041-04	Sediment	Composite	06/03/15 11:33	06/03/15 11:33	
22_40	W15F041-05	Sediment	Composite	06/03/15 12:30	06/03/15 12:30	
22_41	W15F041-06	Sediment	Composite	06/03/15 12:46	06/03/15 12:46	
Analyte	Result Units	MRL	Dil. Batch	Prepared Analyze	d Method	Qualifier
General Chemistry						
Total Solids						
22_36 : W15F041-01 Total solids	76.5 % W/W	/ 0.01	B15F079	06/04/15 06/05/15	SM 2540G	
22_37 : W15F041-02 Total solids	<b>72.2</b> % W/W	/ 0.01	B15F079	06/04/15 06/05/15	SM 2540G	
22_38 : W15F041-03 Total solids	82.4 % W/W	V 0.01	B15F079	06/04/15 06/05/15	SM 2540G	
22_39 : W15F041-04 Total solids	58.3 % W/W	V 0.01	B15F079	06/04/15 06/05/15	SM 2540G	
22_40 : W15F041-05 Total solids	62.9 % W/W	V 0.01	B15F079	06/04/15 06/05/15	SM 2540G	
22_41 : W15F041-06 Total solids	80.1 % W/W	V 0.01	B15F079	06/04/15 06/05/15	SM 2540G	

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### Water Pollution Control Laboratory

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ORELAP Certification ID 402

Project: Portland H Work Order: W15F041	larbor		Client Recei		Director's 06/03/15 1			
Analyte	Result Units	MRL	Dil	. Batch	Prepared	Analyzed	Method	Qualifie
uels								
esel/Oil Hydrocarbons by GC-FII	0							
22_36 : W15F041-01								F
 Diesel	2100 mg/kg dry	140	5	B15F213	06/11/15	06/16/15	NWTPH-Dx	F
Lube oil	4800 mg/kg dry	270	5	B15F213	06/11/15	06/16/15	NWTPH-Dx	
Surrogate	Result	Expected %F	ec Limits(	%)				
2-Fluorobiphenyl	20.6 mg/kg dry	21.9 94	% 50-150	B15F213	06/11/15	06/16/15	NWTPH-Dx	
22_37 : W15F041-02								F
 Diesel	3100 mg/kg dry	140	5	B15F213	06/11/15	06/16/15	NWTPH-Dx	F
Lube oil	8300 mg/kg dry	280	5	B15F213	06/11/15	06/16/15	NWTPH-Dx	
Surrogate	Result	Expected %F	ec Limits(	%)				
2-Fluorobiphenyl	22.0 mg/kg dry	22.5 98	% 50-150	B15F213	06/11/15	06/16/15	NWTPH-Dx	
22_38 : W15F041-03								F
Diesel	120 mg/kg dry	51	2	B15F213	06/11/15	06/16/15	NWTPH-Dx	F
Lube oil	770 mg/kg dry	100	2	B15F213		06/16/15	NWTPH-Dx	
Surrogate	Result	Expected %F	ec Limits(					
2-Fluorobiphenyl	19.7 mg/kg dry	20.2 97	% 50-150	B15F213	06/11/15	06/16/15	NWTPH-Dx	
22_39 : W15F041-04								F
Surrogate	Result	Expected %F	ec Limits(	%)				
2-Fluorobiphenyl	30.4 mg/kg dry	•	% 50-150		06/11/15	06/16/15	NWTPH-Dx	
22_39 : W15F041-04RE1								F
Diesel	<b>37000</b> mg/kg dry	780	20	B15F213	06/11/15	06/16/15	NWTPH-Dx	F0, F
Diesei	STOOD Highly dry	780	20	0101210	00/11/13	00/10/13	NVVIFII-DA	10,1
22_39 : W15F041-04RE4								F
Lube oil	86000 mg/kg dry	3100	40	B15F213	06/11/15	06/17/15	NWTPH-Dx	
22_40 : W15F041-05								F
Diesel	ND mg/kg dry	33	1	B15F213	06/11/15	06/16/15	NWTPH-Dx	
Lube oil	360 mg/kg dry	65	1	B15F213		06/16/15	NWTPH-Dx	
Surrogate	Result	Expected %F	Rec Limits(					
2-Fluorobiphenyl	23.6 mg/kg dry	26.1 90	% 50-150	B15F213	06/11/15	06/16/15	NWTPH-Dx	
22_41 : W15F041-06								F
Diesel	30 mg/kg dry	28	1	B15F213	06/11/15	06/16/15	NWTPH-Dx	F
Lube oil	330 mg/kg dry	56	1	B15F213		06/16/15	NWTPH-Dx	·
Surrogate	Result	Expected %F	-		00/11/10	00,10,10		
2-Fluorobiphenyl	20.0 mg/kg dry		% 50-150		06/11/15	06/16/15	NWTPH-Dx	
drocarbon Scan by GC-FID								
22 36 · W15E041 01								
22_36 : W15F041-01 Gasoline	DET malka dar	47	1	B15F078	06/04/15	06/04/15		F
Diesel	DET mg/kg dry	47 117	1 1	B15F078 B15F078		06/04/15 06/04/15	NWTPH-HCID NWTPH-HCID	F
	DET mg/kg dry DET mg/kg dry		1					
Lube oil <b>Surrogate</b>	Result	235 Expected %F		B15F078	06/04/15	06/04/15	NWTPH-HCID	
2-Fluorobiphenyl	11.0 mg/kg dry	-	% 50-150		06/04/15	06/04/15	NWTPH-HCID	
22_37 : W15F041-02	0.0.5							

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Jennifer Shackelford, Laboratory Coordinator QA/QC



### Water Pollution Control Laboratory



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ORELAP Certification ID 402

•	Portland Harbor N15F041				Client: Receiv		Director's 06/03/15 1			
Analyte	Result	Units	MRL		Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels										
Hydrocarbon Scan by (	GC-FID									
22_37 : W15F041-0	02									
Gasoline		mg/kg dry	50		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	F4
Diesel	DET	mg/kg dry	124		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Lube oil	DET	mg/kg dry	248		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Surrogate	Result	007	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	12.0	mg/kg dry	12.4	97%	50-150	B15F078	06/04/15	06/04/15	NWTPH-HCID	
22_38 : W15F041-(	03									
Gasoline	ND	mg/kg dry	41		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Diesel	DET	mg/kg dry	104		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	F1
Lube oil	DET	mg/kg dry	207		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Surrogate	Result		Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	10.2	mg/kg dry	10.4	98%	50-150	B15F078	06/04/15	06/04/15	NWTPH-HCID	
22_39 : W15F041-(	04									
Gasoline	ND	mg/kg dry	62		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Diesel	DET	mg/kg dry	154		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	F1
Lube oil	DET	mg/kg dry	308		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Surrogate	Result		Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	14.5	mg/kg dry	15.4	94%	50-150	B15F078	06/04/15	06/04/15	NWTPH-HCID	
22_40 : W15F041-0	05RE1									
Gasoline	ND	mg/kg dry	57		1	B15F078	06/04/15	06/05/15	NWTPH-HCID	
Diesel		mg/kg dry	143		1	B15F078	06/04/15	06/05/15	NWTPH-HCID	F1
Lube oil	DET	mg/kg dry	285		1	B15F078	06/04/15	06/05/15	NWTPH-HCID	
Surrogate	Result		Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	13.3	mg/kg dry	14.3	93%	50-150	B15F078	06/04/15	06/05/15	NWTPH-HCID	
22_41 : W15F041-0	06RE1									
Gasoline	ND	mg/kg dry	44		1	B15F078	06/04/15	06/05/15	NWTPH-HCID	
Diesel	ND	mg/kg dry	109		1	B15F078	06/04/15	06/05/15	NWTPH-HCID	
Lube oil	DET	mg/kg dry	219		1	B15F078	06/04/15	06/05/15	NWTPH-HCID	
Surrogate	Result		Expected		•	,				
2-Fluorobiphenyl	10.4	mg/kg dry	10.9	96%	50-150	B15F078	06/04/15	06/05/15	NWTPH-HCID	

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	ortland Harbor 15F041		-	lient: eceiv		Director's O 06/03/15 14			
Analyte	Result Units	MRL		Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Volatile Organics									
NWTPH-Gx by GCMS									
22 36 : W15F041-01									F12
Gasoline	<b>156</b> mg/kg dry	8.01		50	B15F176	06/09/15 16:15	06/10/15	NWTPH-Gx	F4
Surrogate	Result	Expected	%Rec L	.imits(%	6)				
Dibromofluoromethane	0.0273 mg/L	0.0250	109% 5	0-150	B15F176	06/09/15 16:15	06/10/15	NWTPH-Gx	
Toluene-d8	0.0314 mg/L	0.0250	125% 5	0-150	B15F176	06/09/15 16:15	06/10/15	NWTPH-Gx	
22_37 : W15F041-02	2								F12
Gasoline	<b>140</b> mg/kg dry	8.43		50	B15F176	06/09/15 16:15	06/10/15	NWTPH-Gx	F4, M1
Surrogate	Result	Expected	%Rec L	.imits(%	6)				
Dibromofluoromethane	0.0275 mg/L	0.0250	110% 5	0-150	B15F176	06/09/15 16:15	06/10/15	NWTPH-Gx	
Toluene-d8	0.0324 mg/L	0.0250	130% 5	0-150	B15F176	06/09/15 16:15	06/10/15	NWTPH-Gx	

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RELAP Certification ID 4023

Project: P Work Order: V

Portland Harbor W15F041 Client: Dire Received: 06/0

Director's Office 06/03/15 14:57

### **Quality Control Report**

			General Ch	emistry - (	JC D				
Analyte	Result I	Units	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Total Solids - Batch B15F079									
Duplicate (B15F079-DUP1)			Source: W15F04	41-01					
Total solids	77.3 % W/V	N	0.01		76.5		1 (5)	06/04/15 :06/05/15	
			Fuels	s - QC					
Analyte	Result I	Units	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Diesel/Oil Hydrocarbons by GC	-FID - Batch B15	5F213							
Blank (B15F213-BLK1)									- F7
Diesel	ND mg/kg	wet	21					06/11/15 :06/16/15	
Lube oil	ND mg/kg	wet	42					06/11/15 :06/16/15	
Surrogate									
2-Fluorobiphenyl	13.5 mg/kg	wet		16.7		81% <i>(50-150)</i>		06/11/15 :06/16/15	
LCS (B15F213-BS1)									F7
Diesel	56.6 mg/kg	wet	25	50.0		113% (50-150)		06/11/15 :06/16/15	
Lube oil	48.3 mg/kg	wet	25	50.0		97% (50-150)		06/11/15 :06/16/15	
Surrogate									
2-Fluorobiphenyl	18.0 mg/kg	wet		20.0		90% (50-150)		06/11/15 :06/16/15	
Duplicate (B15F213-DUP1)			Source: W15F04	41-06					F7
Diesel	ND mg/kg	dry	25		30.1		(50)	06/11/15 :06/16/15	
Lube oil	<b>265</b> mg/kg	dry	51		332		23 (50)	06/11/15 :06/16/15	
Surrogate									
2-Fluorobiphenyl	<i>19.0</i> mg/kg	dry		20.2		94% (50-150)		06/11/15 :06/16/15	
Duplicate (B15F213-DUP2)			Source: W15F1	08-01					F7
Diesel	<b>485</b> mg/kg	dry	30		667		32 (50)	06/11/15 :06/16/15	F3
Lube oil	<b>193</b> mg/kg	dry	59		239		21 (50)	06/11/15 :06/16/15	
Surrogate									
2-Fluorobiphenyl	21.7 mg/kg	dry		23.6		92% (50-150)		06/11/15 :06/16/15	
Hydrocarbon Scan by GC-FID -	Batch B15F078								
Blank (B15F078-BLK1)									
Gasoline	ND mg/kg	wet	33					06/04/15 :06/04/15	
Diesel	ND mg/kg	wet	83					06/04/15 :06/04/15	
Lube oil	ND mg/kg	wet	167					06/04/15 :06/04/15	
Surrogate 2-Fluorobiphenyl	6.68 mg/kg	wet		8.33		80% (50-150)		06/04/15 :06/04/15	

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Jennifer Shackelford, Laboratory Coordinator QA/QC



Water Pollution Control Laboratory



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Project: Po	rtland Harbor		Client:		Director's	Office		
•	15F041		Receiv	ed:	06/03/15			
		Fue	ls - QC					
Analyte	Result Units	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Hydrocarbon Scan by GC	C-FID - Batch B15F078							
Duplicate (B15F078-DUP1)		Source: W15F	)41-03					
Gasoline	ND mg/kg dry	42		ND			06/04/15 :06/04/15	
Diesel	DET mg/kg dry	106		DET			06/04/15 :06/04/15	F
Lube oil	DET mg/kg dry	212		DET			06/04/15 :06/04/15	
Surrogate								
2-Fluorobiphenyl	10.2 mg/kg dry		10.6		96% (50-150)		06/04/15 :06/04/15	
		Volatile O	rganics - Q	C				
Analyte	Result Units	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
/ illuly to	Result Offics		Level	Result			Analyzeu	
			Level	Result			Analyzeu	
NWTPH-Gx by GCMS - B			Level	Result			Allaiyzeu	
NWTPH-Gx by GCMS - B Blank (B15F176-BLK1)	Batch B15F176	4.17						
NWTPH-Gx by GCMS - B Blank (B15F176-BLK1) Gasoline							06/09/15 :06/10/15	
NWTPH-Gx by GCMS - B Blank (B15F176-BLK1)	Batch B15F176		0.0250		114% (50-150)			
NWTPH-Gx by GCMS - B Blank (B15F176-BLK1) Gasoline Surrogate	Batch B15F176 ND mg/kg wet						06/09/15 :06/10/15	
NWTPH-Gx by GCMS - E Blank (B15F176-BLK1) Gasoline Surrogate Dibromofluoromethane Toluene-d8	Batch B15F176 ND mg/kg wet 0.0285 mg/L		0.0250		114% (50-150)		06/09/15 :06/10/15 06/09/15 :06/10/15	
NWTPH-Gx by GCMS - E Blank (B15F176-BLK1) Gasoline Surrogate Dibromofluoromethane Toluene-d8	Batch B15F176 ND mg/kg wet 0.0285 mg/L		0.0250		114% (50-150)		06/09/15 :06/10/15 06/09/15 :06/10/15	
NWTPH-Gx by GCMS - E Blank (B15F176-BLK1) Gasoline Surrogate Dibromofluoromethane Toluene-d8 LCS (B15F176-BS2)	Batch B15F176 ND mg/kg wet 0.0285 mg/L 0.0277 mg/L	4.17	0.0250 0.0250		114% (50-150) 111% (50-150)		06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15	
NWTPH-Gx by GCMS - B Blank (B15F176-BLK1) Gasoline Surrogate Dibromofluoromethane Toluene-d8 CS (B15F176-BS2) Gasoline Surrogate Dibromofluoromethane	Batch B15F176 ND mg/kg wet 0.0285 mg/L 0.0277 mg/L 29.7 mg/kg wet 0.0254 mg/L	4.17	0.0250 0.0250 25.0 0.0250		114% (50-150) 111% (50-150) 119% (70-130) 102% (50-150)		06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15	
NWTPH-Gx by GCMS - B Blank (B15F176-BLK1) Gasoline Surrogate Dibromofluoromethane Toluene-d8 CS (B15F176-BS2) Gasoline Surrogate	Batch B15F176 ND mg/kg wet 0.0285 mg/L 0.0277 mg/L 29.7 mg/kg wet	4.17	0.0250 0.0250 25.0		114% (50-150) 111% (50-150) 119% (70-130)		06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15	
NWTPH-Gx by GCMS - B Blank (B15F176-BLK1) Gasoline Surrogate Dibromofluoromethane Toluene-d8 LCS (B15F176-BS2) Gasoline Surrogate Dibromofluoromethane Toluene-d8	Batch B15F176           ND mg/kg wet           0.0285 mg/L           0.0277 mg/L           29.7 mg/kg wet           0.0254 mg/L           0.0250 mg/L	4.17	0.0250 0.0250 25.0 0.0250 0.0250		114% (50-150) 111% (50-150) 119% (70-130) 102% (50-150)		06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15	
NWTPH-Gx by GCMS - B Blank (B15F176-BLK1) Gasoline Surrogate Dibromofluoromethane Toluene-d8 LCS (B15F176-BS2) Gasoline Surrogate Dibromofluoromethane Toluene-d8	Batch B15F176           ND mg/kg wet           0.0285 mg/L           0.0277 mg/L           29.7 mg/kg wet           0.0254 mg/L           0.0250 mg/L	4.17	0.0250 0.0250 25.0 0.0250 0.0250	140	114% (50-150) 111% (50-150) 119% (70-130) 102% (50-150)	31 (20)	06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15	F4, M <sup>*</sup>
NWTPH-Gx by GCMS - E Blank (B15F176-BLK1) Gasoline Surrogate Dibromofluoromethane Toluene-d8 LCS (B15F176-BS2) Gasoline Surrogate Dibromofluoromethane Toluene-d8 Duplicate (B15F176-DUP1)	ND mg/kg wet           0.0285 mg/L           0.0277 mg/L           29.7 mg/kg wet           0.0254 mg/L           0.0250 mg/L	4.17 5.00 Source: W15F(	0.0250 0.0250 25.0 0.0250 0.0250		114% (50-150) 111% (50-150) 119% (70-130) 102% (50-150)	31 (20)	06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15	
NWTPH-Gx by GCMS - E Blank (B15F176-BLK1) Gasoline Surrogate Dibromofluoromethane Toluene-d8 LCS (B15F176-BS2) Gasoline Surrogate Dibromofluoromethane Toluene-d8 Duplicate (B15F176-DUP1) Gasoline	ND mg/kg wet           0.0285 mg/L           0.0277 mg/L           29.7 mg/kg wet           0.0254 mg/L           0.0250 mg/L	4.17 5.00 Source: W15F(	0.0250 0.0250 25.0 0.0250 0.0250		114% (50-150) 111% (50-150) 119% (70-130) 102% (50-150)	31 (20)	06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15 06/09/15 :06/10/15	

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Water Pollution Control Laboratory

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	Project: Work Order:	Portland Harbor W15F041	Client: Received:	Director's Office 06/03/15 14:57	
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#### Qualifiers

- F0 Result for Diesel range is positively biased by overlap from large Motor Oil peak(s).
- F1 Result for diesel-range hydrocarbons is primarily due to overlap from the heavy oil range.
- F12 Sample aliquot was sub-sampled from a soil jar. The sub-sampled aliquot was not preserved with methanol within 48 hours of sampling. Sample results may be biased low.
- F3 Result for diesel-range hydrocarbons is primarily due to overlap from gasoline range.
- F4 Result for gasoline is primarily overlap from diesel-range hydrocarbons.
- F5 Detected components do not resemble a fuel pattern but the quantity exceeds the reporting threshold.
- F7 This sample underwent silica gel clean-up.
- F8 Hydrocarbons quantified as Diesel and Lube Oil appear to be a single petroleum product that is heavier than Diesel #2 and lighter than the reference Lube Oil.
- M1 Matrix duplicate precision measurement indicates non-homogeneous sample matrix. Sample result should be considered 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
*	This analyte is not certified under NELAP		

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Jennifer Shackelford

			1457	thetayer	ven	5 <u>1</u>	LHS.	^ 00 Botrolaur	hot A Su / Nov 1445 7 Dottend Harbor - Besin 29 Detroloum Chone COC #1 (6 2 45)
Date: Time	Signature: Printed Name:	Date: Time:	Construction Signature:	81	Signature: Printed Name:	Date) 2/15	Sta Sta	Uhr-	natures 1 Mu & Bu
	Boonbrod Bu		Dolinciiched Bur		Received Rv.				induisched Bv:
						-			
CB to AAP / 99 AAP 800 Inline Sed - CB Outlet	·			•	Sed	שנ	1246	6/3/2015	22_4% H
Inline Sed - CB Outlet				•	Sed	Ø	1230	6/3/2015	22_N 40
ANF749						J			
AAP800 Inline Sediment - US	••••••				Sed	Jø	1133	6/3/2015	22_ <b>3</b> 9
AAP796 Inline Sed - 8" N Lat					Sed	ي هو (	1058	6/3/2015	22_39 35
AAP799 Inline Sed - 15" W Lat	<b></b>			•	Sed	و ر	1020	6/3/2015	22_38 37
AAP799 Inline Sediment DS					Sed	Jø	1014	6/3/2015	22_N 36
	# of Containers			41WN	of Matrix	<u> </u>	Sample Time	Date	Location ID 25
K Standard (10 business days) Rush (5 business days) Other:	Standar Rush (5	······		H-HCID,	6 H a 2		if detecte	NWTPH-Gx	<sup>1</sup> Run NWTPH-Dx and NWTPH-Gx if detected
Turn-Around-Time Request:	Turn-Arour			· · · · · · · · · · · · · · · · · · ·	·		igation	teen Invest	Basin 22 Petroleum Sheen Investigation
			Requested Analyses						Special Instructions:
			f T			•	Portland Harbor	Portian	Project Name:
						a	Director's Office	Directo	Client Name:
Work Order #: (いうちょんり) Collected By: ハョッ, PHA, ELH, WCR	<b>/ork Order #</b> Collected By	5	City of Portland Chain-of-Custody	Chain-of Bureau of Enviro				-5696	6543 N. Burlington Ave: Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5696 General Lab: (503) 823-5681
Date: 6/3/15	Date			٠. ١				unternie l	Mater Pollution Control   shorefore

				WPCL Cool	er Rec	eipt Form				
	Work C	Order Number	<u>W15F</u>	-041	С	ooler Rece	eipt Forr	n Filled Ou	it By	
	Project	PDX M	larbor	· · · · · · · · · · · · · · · · · · ·					Ŭ	
	Sample	e transport:	Samples rec	eived on ice		Cour	ier			
			Directly from	field					······	
			Temperature			· ·		· ·		
						Yes	No	NA		
Is the COC present and signed?										
	Are sar	Are sample bottles intact?								
	Do the	COC and sar	nple labels ma	tch?						
Are the appropriate containers used?										
	Are samples appropriately preserved?									
Do VOA vials have Headspace?										
Are samples received within holding times?						. /				
-				-					411.01	· .
	Pres. #	Preservative	).	LIMS ID	Standa	ard Preserv	vation A	mounts		
	1	HNO <sub>3</sub> (1:1) to	o pH <2		0.5mL/	250mL; 1.0	mL/500n	nL; 4-5 drop	s/50mL cent	rifuge tube
	2	H <sub>2</sub> SO <sub>4</sub> (18N)	to pH <2		0.4mL/	250mL; 0.8	mL/500n	nL;1.6mL/1	1000mL	
	3	HCI (1:1) to p	oH <2		.1.0mL/	500mL; 2.0	mL/1000	)mL		·
	4	HCI (1:1) to p	oH 2-3		For TC	C: 2-5 drop	s/250mL	-		

Date	Time	Analyst	Sample LIMS ID	Bottle ID	Pres. #	Comments
	E		· · · · · ·			
		-	······································			· · · · · · · · · · · · · · · · · · ·
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· · ·				· .		

4-10 pellets/500mL; 8-20 pellets/1000mL

Comments:\_

4 5

NaOH (pellets) to pH >12

S:\LAB\Forms\WPCL Cooler Receipt Form Nov 2013.doc