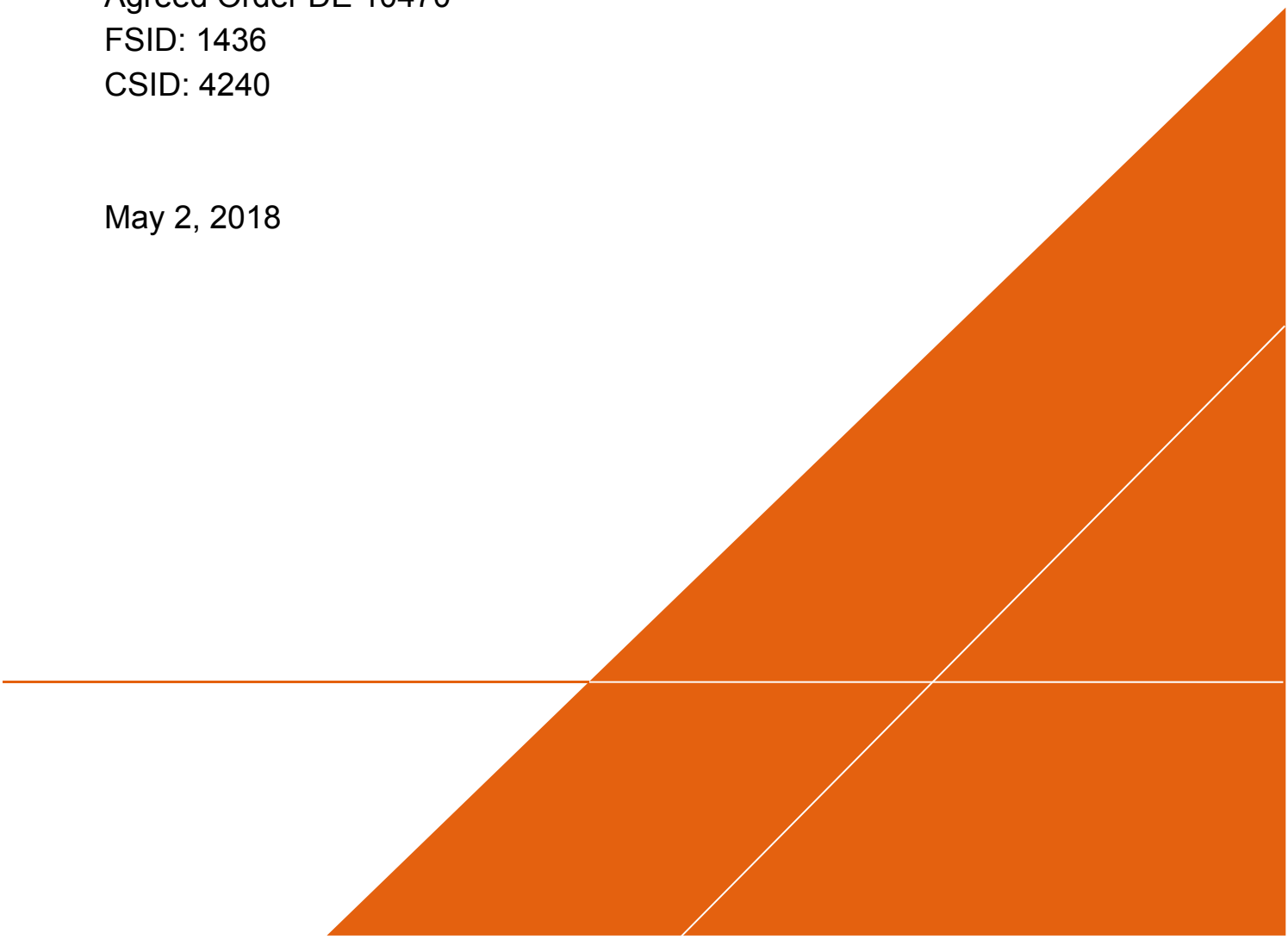
ARCADIS Design & Consultancy for natural and built assets

CLOSURE REQUEST REPORT

Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington 98502
Agreed Order DE 10470
FSID: 1436
CSID: 4240

May 2, 2018



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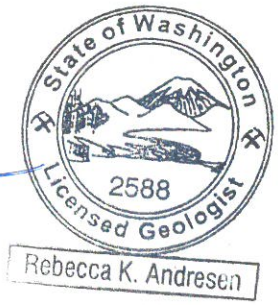

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Project Manager

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F/S ID: 1436
Cleanup Site ID: 4240

Prepared for:

BP West Coast Products, LLC

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Our Ref.:

GP09BPNA.WA60

Date:

May 2, 2018

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ACRONYMS AND ABBREVIATIONS

AO	Agreed Order
Arcadis	Arcadis U.S., Inc
ARCO	Atlantic Richfield Company
AST	above-ground storage tank
bgs	below ground surface
BNSF	Burlington Northern Santa Fe Railroad
BP	BP West Coast Products, LLC
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
btoc	below top of casing
CAP	Cleanup Action Plan
closure request	Closure Request Report
COC	constituent of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSM	conceptual site model
CSID	Cleanup Site Identification Number
DRO	diesel range organics
DU	decision units
East Portion	the portion of the former IPD property on the east side of West Bay Drive
EDB	Ethylene dibromide
EDC	1,2-Dichloroethane
Ecology	Washington State Department of Ecology
EIMS	Environmental Information Management System
EPA	Environmental Protection Agency
former IPD property	former Industrial Petroleum Distributors property located at 1120 West Bay Drive Northwest in Olympia, Washington
FSID	Facility Site Identification Number
GRO	gasoline range organics

HO	heavy oil range organics
IPD	Industrial Petroleum Distributors
Integral	Integral Consulting, Inc.
Method A Soil CULs	Method A Soil Cleanup Levels for Unrestricted Land Uses as presented in Table 740-1 of Chapter 173-340 WAC
Method A Groundwater CULs	Method A Cleanup Levels for Ground Water as presented in Table 720-1 of Chapter 173-340 WAC
MTBE	methyl tert-butyl ether
MTCA	Model Toxics Control Act
Naphthalenes	Naphthalene, 1-methylnapthalene, 2-mehtylnapthalene
NAVD 88	North American Vertical Datum of 1988
NFA	No Further Action
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
Port	Port of Olympia
RI Report	2012 Remedial Investigation report
SGT	silica gel treatment
TPH	total petroleum hydrocarbons
WAC	Washington Administrative Code
West Portion	the portion of the former IPD property on the west side of West Bay Drive
µg/kg	micrograms per kilogram
µg/L	micrograms per liter

1 INTRODUCTION

On behalf of BP West Coast Products, LLC (BP), Arcadis U.S., Inc. (Arcadis) has prepared this Closure Request Report (closure request) for the former Industrial Petroleum Distributors (IPD) property located at 1120 West Bay Drive Northwest in Olympia, Washington (former IPD property). A former IPD property site location map is presented on Figure 1.

The former IPD property is under the Washington State Department of Ecology (Ecology) Agreed Order (AO) No. DE 10470 (Ecology 2014) including a cleanup action plan (CAP) and effective since October 24, 2014. AO No. DE 10470 requires Atlantic Richfield Company (ARCO) to implement the requirements of the CAP. In AO No. DE 10470, the former IPD property consists of two areas: the portion on the west side of West Bay Drive (West Portion) and the portion on the east side of West Bay Drive (East Portion). This closure request focused on the East Portion, the West Portion having been issued a No Further Action (NFA) letter by Ecology on June 25, 2003.

This closure request follows the submission of the Cleanup Action Completion Report (Arcadis 2017) summarizing the cleanup action implemented at the East Portion according to the CAP. The final Cleanup Action Completion Report was submitted to Ecology on September 20, 2017 with Ecology approval issued by letter on January 3, 2018 (Appendix A). This closure request presents post-cleanup action groundwater characterization data as required per the CAP as well as two additional groundwater events implemented upon Ecology request. This closure request will demonstrate that ARCO has met the requirements of the CAP as determined by the AO No. DE 10470, (Ecology 2014) and that an NFA determination is the appropriate action for the entirety of the former IPD property.

The former IPD property is formally known as Industrial Petroleum Distributors in Ecology's database. Identifiers are:

- Facility Site Identification Number (FSID): 1436
- Cleanup Site Identification Number (CSID): 4240

Previous studies, including historical investigations and remedial actions that have been conducted at the former IPD property, are summarized in the AO No. DE 10470 and the Cleanup Action Completion Report, which are both accessible on Ecology's website for the former IPD property is available at: https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=4240. The full file can be reviewed at Ecology's Southwest Regional Office Regional Office in Lacey (phone (360)407-6365). Data collected during investigations of the former IPD property are available in Ecology's Environmental Information Management System (EIMS) database under the EIMS Study ID AODE1628.

2 BACKGROUND

This section describes the former IPD property and summarizes its historical activities.

2.1 Site Description and History

2.1.1 Site Description

The former IPD property includes two upland parcels of land (parcel Nos. 0903-000-5000 and 0903-000-3000) on the west side of West Bay Drive and is referred to as the West Portion, and one lowland area (parcel No. 0903-000-1000) located east of West Bay Drive and is referred to as the East Portion. The former IPD property is adjacent to the Budd Inlet in the City of Olympia, Washington (See Section 2.2.1).

The West Portion was issued a NFA letter by Ecology on June 25, 2003 and the remedial investigation reports are available as public record through the Ecology website mentioned above. Fourth Street Commercial LLC has owned the 1.36-acre developed parcel No 0903-000-3000 since 2005 and used it for professional services according to the Thurston County Website (http://tcproperty.co.thurston.wa.us/propsql/land.asp?fe=PS&pn=09030003000). The Olympia Coalition for Ecosystems Preservation has owned the 0.92-acre undeveloped parcel No 0903-000-5000 since 2017 according to the Thurston County Website (http://tcproperty.co.thurston.wa.us/propsql/land.asp?fe=PS&pn=09030005000). The East Portion is the focus of this closure request. The Port of Olympia (Port) owns the 1.28-acre undeveloped parcel No 0903-000-1000 and Burlington Northern Santa Fe Railroad (BNSF) has a right of way of approximately 0.02-acre located on the west side of the East Portion. The East Portion is currently undeveloped vacant land. An East Portion site plan is presented on Figure 2.

2.1.2 Site History

As discussed in the AO No. DE 10470 Section - Findings of Fact, the former IPD property was in active use from the 1950s to the late 1980s and inactive but used as storage from 1989 to 1999. During its active period, the former IPD property was used as a bulk petroleum storage and distribution facility by ARCO and IPD. IPD provided infrastructure for a bulk petroleum storage facility (bulk plant) operated on the West Portion. A pipeline on the north side of the East Portion was used to transfer petroleum products (gasoline and oil) from barges into eight above-ground storage tanks (ASTs) located at the bulk plant. The pipeline surfaced above-ground on the East Portion and ran across a pier that extended approximately 400 feet into Budd Inlet. The pipeline on the East Portion was removed sometime between 1999 and 2000, likely when the bulk plant infrastructure was removed; however, an exact date could not be found after reviewing known historic documents. From 1999 to present, the former IPD property has undergone multiple phases of work intended to remove past infrastructure, assess, and remediate the environmental impacts associated with its former use. After the West Portion received a NFA in 2003, the environmental activities have been focused on the East Portion of the former IPD property. The pier was removed by the Washington State Department of Natural Resources in 2013 as part of a Budd Inlet creosote piling removal project.

A summary timeline of the former IPD property use follows:

- Early 1950s – ARCO owned and developed a bulk fuel storage and distribution facility including an office, eight ASTs, a pier into Budd Inlet, and above and below ground product piping.
- September 1977 – ARCO sold their four parcels (known as 0903-000-5000 and 0903-000-3000 on the west side and as 9101-290-0000 and 0903-000-1000 on the east side) to Darron Cole and Chester and Wilma Chaloupka (husband and wife) which subsequently leased them to IPD.
- 1979 – The parcels on the east side of West Bay Drive (East Portion) were sold to the Port.
- Late 1980s to 1990s - The facility was used by IPD to store waste oil.
- 1987 – The parcels on the west side of West Bay Drive (West Portion) were sold to IPD.
- 1989 to 1999, the bulk plant on the West Portion was inactive but continued to store approximately 160,000 gallons of potentially contaminated waste materials.
- 1997, John J. O'Connell obtained title and, following his death, the Estate of John J. O'Connell transferred ownership of the West Portion (0903-000-5000 and 0903-000-3000) to the Trust.
- 1999, the Trust demolished the ASTs, associated piping, and pumping rack under AO No. DE 98HW-S271.

After 1999, activities were conducted to characterize and remediate the impacts from historical uses at the former IPD property (See Section 3).

2.1.3 Regulatory History

The former IPD property has been under Ecology oversight since 1994:

- 1994: the former IPD property was placed on the Washington State Confirmed and Suspected Sites List in 1994 after an Ecology inspection observed corrosion around the base of several ASTs and soil staining in several areas.
- AO No. DE 98HW-S271: in 1998, Ecology issued AO No. DE 98HW-S271 requiring waste stored onsite to be removed (West Portion).
- AO No. DE 00TCPSR-1628: in 2000, Ecology issued AO No. DE 00TCPSR-1628, requiring the preparation of a final Remedial Investigation/Feasibility Study (RI/FS) report (West and East Portions).
- Voluntary Cleanup Program (VCP) No. SW0401: implementation of the CAP written under AO DE 00TCPSR-1628 occurred through Ecology's VCP SW0401 (West Portion) in 2002/2003.
- NFA: on June 25, 2003, Ecology issued a VCP opinion letter stating that no further remedial action was needed for the West Portion but that further investigation under AO will take place for the East Portion.
- AO No. DE 8953: in 2012, Ecology issued AO No. DE 8953 fully superseding and replacing the previous AODE 00TCPSR-1628, included all of the tasks of the previous AO plus the preparation of a draft CAP for the East Portion.

- AO No. DE 10470: in 2014, Ecology issued AO No. DE 10470 including the final CAP prepared under AO No. DE 8953 requiring ARCO to implement the final CAP.

2.2 Regional and Site-Specific Settings

This section describes the local and regional hydrogeologic setting and focuses on the East Portion.

2.2.1 Geology and Hydrogeology

The East Portion is situated on West Bay, located on the southern end of Budd Inlet in Puget Sound. Puget Sound is located in the Puget Trough, which is bordered by the Cascade Range to the east and the Coast Range to the west. The East Portion elevation is approximately mean sea level, and the topography of the immediate area is generally flat, with a slope towards West Bay. The former IPD property is located in a geographic area known as the Puget Sound lowlands, on an area of Pleistocene-age glacial recessional outwash. The recessional outwash forms a layer ranging from a few feet to 150 feet thick and is characterized as poorly sorted, discontinuously bedded loose gravel with some sand, silt, and clay (Washington State Department of Water Resources 1970).

Subsurface material observed during the East Portion investigation activities generally consisted of silty clays and sandy silt to approximately 6 feet below ground surface (bgs) and fine to medium sand and fine gravel between 6 and 13 feet bgs. Large amounts of intermixed wood debris and bark dust were observed between 3 and 15 feet bgs. Observed subsurface conditions are consistent with the location of the East Portion adjacent to West Bay and are indicative of historical glacial deposition. Boring logs with lithological descriptions are included as Appendix B.

Historical groundwater elevations, tidal stages during sampling events, and groundwater electrical conductivity readings have been evaluated to determine if brackish bay water is intruding into groundwater on the East Portion. Arcadis presented a detailed evaluation of tidal influence on the hydrogeology of the East Portion in the 2012 Remedial Investigation report (RI Report) (Arcadis 2012). Groundwater gradient at the East Portion is generally toward the southeast towards West Bay at a hydraulic gradient of approximately 0.033 and 0.031 foot/foot at high and low tides, respectively. Groundwater elevation data from 2010 to 2017 are presented in Table 1. Groundwater in wells MW-7, MW-8, and MW-9 are likely experiencing influence from brackish bay water based on an evaluation of electrical conductivity and their proximity to the bay (Arcadis 2012).

2.2.2 Land and Water Use

The East Portion is zoned as urban waterfront, according to the Thurston County Geodata Center and is located within a mixed commercial/industrial and residential district of Olympia, Washington. Adjacent properties include West Bay Drive and a residential and commercial condominium complex to the west, commercial/ industrial properties to the north, and West Bay to the south and east. Based on information provided by Ecology, the city of Olympia may redevelop the East Portion for use as a public park in the future. Based on the allowable uses included for areas designated as urban waterfront in the city of Olympia's Comprehensive Plan, Arcadis conservatively estimates unrestricted future land use at the Site is foreseeable.

The East Portion is located within the city of Olympia water service area. No drinking water wells are located on the East Portion. Groundwater at the East Portion is not currently used for potable purposes and, based on the location of the East Portion within the city of Olympia water service area; future use of groundwater for potable purposes is unlikely. However, the future installation of a drinking water well on the East Portion would not be prohibited by the city of Olympia. Thus, as a conservative estimate, it is assumed that groundwater use may include drinking water beneficial uses in the future.

3 ENVIRONMENTAL ACTIVITIES HISTORY

Environmental activities at the former IPD property have been conducted since 1998 leading to the different AOs listed on Section 2.1.3. The following sections summarize the environmental activities conducted at the former IPD property based on AO No. DE 10470 (Ecology 2014) and the several independent consultants' reports. Sections 3.1.2 to 3.1.4 focus on the East Portion.

3.1 Known Historical Releases

Former IPD property activities have had several recorded incidents leading to the release of petroleum hydrocarbons:

- May 16, 1972, and November 28, 1973, Ecology Bulk Oil Handling Facility inspection logs noted that spilled petroleum products ("oil") was observed on the ground. The logs also note that the products stored included "volatile oil," "diesel oil," and "stove, heat oil."
- 1974 (approximately), two employees of the local fire department reported that a gasoline overflow spill occurred at the former IPD property during off-loading into an AST on the West Portion.
- 1984, an oil spill of an estimated 600 gallons occurred from the overfilling of one of the West Portion ASTs. Attempts were made to clean up the spill with sawdust; however, an unknown amount of oil discharged into a storm drain which discharged into Budd Inlet. Contaminated soil and sawdust were excavated and left onsite until at least the rest of that year.

In 1999, former IPD property infrastructure including ASTs and product piping were removed, concluding the former IPD property's use as a petroleum products facility. No known releases occurred beyond this date.

3.2 Investigation Summary

3.2.1 Pre-2012 Investigation

Although visits by Ecology and a Site Hazard Assessment were conducted at the former IPD property in the 1990s (See Section 2.1.3.) little information is available for the East Portion before 2000.

Following the AO No. DE 00TCPSR-1628 issued by Ecology in 2000 requiring the preparation of a RI/FS report (West and East Portions), several subsurface investigations were conducted between 2000 and 2010.

From 2000 to 2004, the investigation focused on the north side of the East Portion near the underground pipeline formerly used to transfer petroleum products:

- A total of 15 soil samples (IPD-1 through IPD-6, S-1 through S-6, WBTP-01 through WBTP-03, and MW-IP [MW-6]) were collected from 16 locations at depths ranging from 2.5 to 9 feet bgs. Grab groundwater samples were collected from 10 of these locations (IPD-1 through IPD-5, W-1 [S-1] and W-2 [S-2], and WBTP-01, WBTP-02, and MW-6) (SECOR, 2001). Analytical results are summarized in Table 4 for groundwater, and Table 7 for soil.

- Selected soil samples were analyzed for: Volatile Organic Compounds (VOCs) (benzene, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and total xylenes), total petroleum hydrocarbons (TPH) (gasoline range organics [GRO], diesel range organics [DRO], and heavy oil range organics [HO]), polychlorinated biphenyls (PCBs) (PCB-1016, 1221, 1232, 1242, 1248, 1254, 1260, and PCB mixture), metals (antimony, arsenic, barium, cadmium, chromium, copper, total lead, mercury, nickel, selenium, silver, thallium, and zinc), and carcinogenic polyaromatic hydrocarbons (cPAHs).
- Selected groundwater samples were analyzed for: VOCs, TPH, Metals, and cPAHs.
- The results of the historic investigations detected petroleum constituents including DRO and HO, cPAHs, metals and VOCs in both soil and groundwater samples. GRO was not detected above laboratory method reporting limits in any of the soil samples submitted for analysis but was detected in the grab groundwater samples collected from the borings. Only DRO, lead, and cPAHs were detected at concentrations exceeding applicable Model Toxics Control Act (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Uses as presented in Table 740-1 of Chapter 173-340 WAC (Method A Soil CULs) in the soil samples collected. GRO, DRO, HO, arsenic and lead were detected in the grab groundwater samples at concentrations exceeding MTCA Method A Cleanup Levels for Groundwater as presented in Table 720-1 of Chapter 173-340 WAC (Method A Groundwater CULs). Details of these investigations and analytical data are presented in the CAP (Arcadis 2014).

At the request of Ecology in their October 24, 2005 and July 31, 2006 letters, and pursuant to AO No. DE 00TCPSR-1628, additional investigations were conducted on the East Portion. Investigations consisted of soil and groundwater sampling on the East Portion and sediment sampling below the former pier in West Bay.

- In August 2009, Integral Consulting, Inc. (Integral), under subcontract to Delta Environmental Consultants, investigated marine sediments bordering the East Portion. The objective of the sediment sampling was to screen intertidal sediments for petroleum hydrocarbon impacts. The investigation included the collection of sediment samples at four locations along the abandoned pier at sampling locations and depths specified by Ecology. The samples were analyzed for TPH by Hydrocarbon Identification Method. The analytes were not detected above the laboratory reporting limits. A detailed summary of the sampling methodology is presented the Integral Sediment Screening and Sampling Report, dated December 17, 2009 (Integral 2009).
- In August and October 2010, Arcadis installed 16 soil borings to characterize the extent of petroleum hydrocarbons in soil. Seven of the borings were completed as groundwater monitoring wells (MW-6-R and MW-7 to MW-12) and sampled to evaluate potential constituents of concern (COCs) in groundwater. Soil analytical results from the 16 borings were compared to the MTCA Method A Soil CULs. Naphthalenes, cPAHs, GRO, and DRO were detected above the applicable MTCA Method A Soil CULs in soil samples collected from several locations in the northwest corner of the East Portion. Groundwater analytical results for the East Portion were compared to the MTCA Method A Groundwater CULs. Groundwater samples did not exhibit concentrations of analyzed chemicals in exceedance of the MTCA Method A Groundwater CULs. Results of groundwater sample analyses for October 2010 through 2017 are summarized in Tables 1, 2, and 3. Results of soil analyses are

presented in Tables 4 and 5. The East Portion investigation are summarized in the RI Report (Arcadis, 2012)

3.2.2 Post-2012 Investigation

Following the completion of the RI Report, Ecology issued AO No. DE 8953 fully superseding and replacing the previous AODE 00TCPSR-1628, including the tasks of the previous AO plus the preparation of a draft CAP for the East Portion. The CAP was completed in August of 2014 by Arcadis (Arcadis 2014) and proposed pre-excavation soil sampling data to be collected to determine the horizontal and vertical excavation extents. AO No. DE 10470 (Ecology 2014) was entered between ARCO and Ecology, which covered the execution of the CAP and included all prior actions.

Arcadis conducted the pre-excavation soil sampling on the East Portion in 2015 in accordance with the CAP. From August 17 to September 2, 2015, Arcadis oversaw the advancement of 71 boring locations, centered in 10-foot by 10-foot decision units (DU) with analytical samples taken from surface to 5-, 5 to 10-, and 10 to 15-foot depth intervals. This was done to thoroughly characterize the soil lithology and petroleum impacts prior to excavation of the East Portion, as detailed in the CAP and captured in the AO No. DE 10470. The pre-excavation soil sampling and a detailed plan for the execution of the CAP, were included in the Construction Plans and Specifications Summary Report (Arcadis 2016).

Analytical results from these DUs were used to define the excavation limits. Soils containing COCs with concentrations above the MTCA Method A CULs were designated to be removed, while intervals with analytical results below the MTCA Method A CUL did not need to be excavated. Boring locations and analytical results are reported in the Construction Plans and Specifications Summary Report (Arcadis, 2016). Boring logs for soil borings and existing wells are included in Appendix B. Pre-excavation soil sample locations and analytical results maps for the three sampling intervals are included as Figures 3 through 5.

Following the soil excavation cleanup action carried out in September and October of 2016, a new groundwater monitoring well (MW-13) was completed on the East Portion in December 2016 (See Section 4.).

3.3 Soil Excavation Cleanup Action

Arcadis oversaw remedial excavation activities on the East Portion between September 29, and October 24, 2016, in accordance with the CAP included in the AO No. DE 10470. Impacted soils were removed from the East Portion and disposed of at an approved landfill. Approximately 944 tons of impacted material were removed. Approximately 1,972 tons of backfill and ground surface cover was imported to the East Portion. Imported material consisted of one and one quarter inch minus crushed angular rock. The Cleanup Action Completion Report (Arcadis 2017) summarizes the cleanup action implemented at the East Portion. The final report was approved by Ecology in a letter dated January 3, 2018 (Appendix A).

3.4 Groundwater Monitoring Program

Groundwater monitoring at the East Portion has occurred with variable frequency since site investigation and remedial activities began. Data collected from 2010 to 2014 from monitoring wells MW-6R, and MW-7 through MW-12 were used along with other data to develop the CAP. In accordance with the Construction Plans and Specifications Summary Report (Arcadis, 2016), wells located within the excavation extents (MW-6R, MW-10, MW-11, MW-12 and historic well MW-6) were decommissioned. Since the 2016 soil excavation cleanup action, monitoring wells MW-7, MW-8, MW-9, and MW-13 account for the monitoring well network on the East Portion and are used to monitor groundwater conditions.

4 2016 AND 2017 ENVIRONMENTAL ACTIVITIES

This closure request follows the submission of the Cleanup Action Completion Report (Arcadis 2017) summarizing the cleanup action implemented at the East Portion according to the CAP and approved by Ecology in a letter dated January 3, 2018 (Appendix A). This closure request presents the 2016 and 2017 environmental activities post cleanup action, which included the groundwater characterization data post cleanup action as required per the CAP as well as two additional groundwater events implemented upon Ecology request.

Arcadis conducted three quarterly groundwater monitoring events after the excavation cleanup action. These monitoring events were conducted on December 15, 2016, March 9, 2017, and May 8, 2017. During the first event in December 2016, wells MW-7, MW-8, and MW-9 were gauged while MW-13 was installed by Holt Services. MW-13 was gauged and all four wells were sampled upon completion of MW-13. During the following two events in March and May 2017, wells MW-7, MW-8, MW-9, and MW-13 were gauged and sampled. Each well was sampled for the same constituents. Samples were collected via a low flow purge method with a peristaltic pump and polyethylene tubing. Field data sheets are included as Appendix C. Groundwater samples were collected in laboratory-provided bottles and placed in a cooler with ice. Samples were then submitted under standard chain-of-custody protocols. The laboratory analytical reports and chain-of-custody documents are included as Appendix D.

Groundwater samples from the December 2016 event were analyzed for the following COCs and submitted to Eurofins Lancaster Laboratories:

- TPH as GRO by Ecology Northwest Method NWTPH-Gx;
- TPH as DRO and as HO by Ecology Northwest Method NWTPH-Dx. A secondary analysis was run for DRO and HO after the addition of a silica gel treatment (SGT) due to the geology observed at the East Portion;
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX, collectively) by Environmental Protection Agency (EPA) Method 8260B;
- Methyl tert-butyl ether (MTBE) by EPA Method 8260B;
- 1,2-Dichloroethane (EDC) by EPA Method 8260B;
- Ethylene dibromide (EDB) by EPA Method 8011;
- Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene (collectively known as cPAHs) by EPA Method 8270C-SIM;
- Naphthalene, 1-methylnapthalene, 2-mehtylnapthalene (Naphthalenes, collectively) by EPA Method 8270D-SIM; and
- Total lead by EPA Method 6010C.

Groundwater samples from March and May were analyzed for the same COCs as above, however the laboratory was changed to Environmental Science Corporation. With the change of laboratory, one

method was updated: BTEX, MTBE and EDC were analyzed by EPA Method 8260C rather than EPA Method 8260B. Additionally, dissolved lead was analyzed in addition to total lead.

Observed range of depths to groundwater, in feet below top of casing (btoc), during each sampling event are as follows:

- 12/15/2016 – 2.02 (MW-8) to 2.89 (MW-9)
- 03/09/2017 – 2.33 (MW-13) to 2.66 (MW-8)
- 05/08/2017 – 2.52 (MW-13) to 4.22 (MW-7)

Observed range of groundwater elevations, in feet above mean sea level by North American Vertical Datum of 1988 (NAVD88) was not calculated for well MW-13 because the top of casing elevation was not surveyed. During each sampling event the range of elevations between wells MW-7 to MW-9 are as follows:

- 12/15/2016 – 11.79 (MW-9) to 11.98 (MW-7)
- 03/09/2017 – 11.32 (MW-8) to 12.06 (MW-9)
- 05/08/2017 – 10.32 (MW-7) to 11.37 (MW-8)

Analytical results for groundwater samples collected during these events indicate that the concentration of the following COCs are greater than its MTCA Method A Groundwater CULs:

- 12/15/2016
    - DRO without SGT was detected at a concentration exceeding its MTCA Method A Groundwater CUL of 500 micrograms per liter (µg/L) in the sample collected from MW-8 (810 µg/L), however the same sample with SGT was below the MTCA Method A Groundwater CUL (210 µg/L).
    - Remaining COCs detected above laboratory method detection limits (MDLs) did not exceed MTCA Method A CULs in any of the remaining samples.
- 03/09/2017
    - COCs detected above laboratory MDLs did not exceed MTCA Method A Groundwater CULs.
- 05/08/2017
    - DRO without SGT was detected at a concentration slightly exceeding its MTCA Method A Groundwater CUL in the sample from MW-8 (524 µg/L), however the same sample with SGT was below the MTCA Method A Groundwater CUL (68.8 µg/L).
    - HO without SGT was detected at a concentration exceeding its MTCA Method A Groundwater CUL of 500 µg/L in the samples from MW-8 and MW-9 (874 µg/L and 544 µg/L, respectively), however the same samples with SGT was below the laboratory MDLs (below 82.5 µg/L each).
    - Remaining COCs detected above laboratory MDLs did not exceed MTCA Method A Groundwater CULs.

During the three events, results for the DRO and HO samples prepared with SGT that correspond to the untreated samples that exceeded MTCA Method A Groundwater CULs were either non-detectable above the laboratory MDL or were detected below the MTCA Method A Groundwater CULs (Table 3).

The geology observed during the pre-cleanup characterization and the excavation showed that the majority of the East Portion geology consisted of organic material/woody debris interbedded with clays and silts. Additionally, as described in the Cleanup Action Report (Arcadis, 2017), a portion of the East Portion was built out into Budd Inlet, which explains the large quantity of woody debris and organic materials in the subsurface. The breakdown of organic materials, especially in large quantities as found at the East Portion, can produce compounds that show up in the same ranges as DRO and HO petroleum constituents. This causes interference with the detection and quantification of petroleum hydrocarbons. To mitigate this interference, SGT is used to help remove these interfering compounds. Therefore, although several DRO and HO water concentrations exceeded their MTCA Method A Groundwater CULs, the DRO and HO analyses prepared with SGT from the same sample bottles were well below the applicable MTCA Method A Groundwater CULs. This demonstrates that the detections without SGT were elevated due to organic material interference and not from petroleum COCs.

Groundwater gauging data and select analytical results are summarized in Tables 1 through 3. Quarterly groundwater analytical data, including well locations, calculated groundwater elevations, and analytical results for these sampling events are depicted on Figures 6 through 8. Field data sheets from the groundwater monitoring events are included as Appendix C and the laboratory analytical reports, including DRO and HO chromatograms, are included as Appendix D.

5 CLEANUP STANDARDS

A cleanup standard consists of the following three elements [WAC 173-340-700(3)]:

- Cleanup level - the concentration that must be met to protect human health and the environment.
- Point of Compliance (POC) - the location where the cleanup level must be achieved.
- Other regulatory requirements commonly referred to as applicable or relevant and appropriate requirements (ARARs) that apply to a site because of the type of action or the location of the site.

Cleanup standards presented in this report are based on MTCA Method A.

5.1 Cleanup Levels and Point of Compliance

The CAP included in the AO No. DE 10470, defined the COCs as listed in the Table below and selected the MTCA Method A Soil and Groundwater CULs as the cleanup levels to be met throughout the East Portion. Additionally, the CAP defined the POC as throughout the East Portion for groundwater, i.e. throughout the monitoring well network onsite. The POCs for soil are throughout the East Portion and shall be met within the standard soil POC, which is within 15 feet of the ground surface.

Table 5-1. Soil and Groundwater Cleanup Levels

Constituents of Concern	Cleanup Levels Groundwater (µg/L)	Cleanup Levels Soil (mg/kg)
GRO[1]	800/1,000	30/100
DRO	500	2000
HO	500	2000
Benzene	5	0.03
Toluene	1,000	7
Ethylbenzene	700	6
Total Xylenes	1,000	9
MTBE	20	0.1
EDB	0.01	0.005
EDC	5	Not Applicable
n-Hexane	Not Applicable	Not Applicable
cPAHs	0.1	0.1
Naphthalenes	160	5.0
PCB mixtures	0.1	1.0
Lead	15	250

[1]. MTCA Method A CULs for GRO are determined based on the presence of benzene

5.2 Applicable Relevant and Appropriate Requirements

According to WAC 173-340-360(2), all cleanup actions under MTCA must comply with applicable state and federal laws. Such laws are defined under MTCA as including ARARs. The ARARs for the East Portion include:

Federal

- Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901-6992, 40 CFR Part 260-268) –IDW and any other waste produced during activities at the site will be handled per RCRA regulations, and implemented according to WAC 173-303.
- OSHA (29 CFR 1910) – Site activities will be conducted in a manner compliant with OSHA standards and regulations.
- Rules for Transport of Hazardous Waste (49 CFR 107, 171) – Hazardous waste generated at the site will be appropriately characterized to determine package, transportation and transportation requirements.

State

- Source water protection (WAC 246-290-135) – All new and existing drinking water wells will establish a wellhead protection program that includes an inventory of potential groundwater contamination sources and be appropriately delineated from all potential contamination sources.
- Model Toxics Control Act (WAC 173-340) – Site activities will occur in accordance with MTCA Statutes and Regulations.
- Dangerous Waste Regulations (WAC 173-303) - IDW and any other waste produced during activities at the site will be handled per RCRA regulations and implemented according to WAC 173-303.
- Minimum Standards for Construction and Maintenance of Wells, Regulation and Licensing of Well Contractors and Operators (RCW 18.104, WAC 173-160, 162)
    - Resource protection wells will be constructed and maintained according to the appropriate regulations.
    - Private water wells will be constructed considering certain setback requirements from known or potential sources of contamination.
- Washington Industrial Safety and Health Act, Chapter 296-62 WAC - Site activities will be conducted in a manner compliant with Washington Industrial Safety and Health Act standards and regulations.
- Maximum Environmental Noise Levels (WAC 173-60) – Site activities will be conducted at appropriate noise levels, according to WAC 173-60.

6 NATURE AND EXTENT OF CONTAMINATION

This section describes the type of COCs from the East Portion (nature) and the distribution of these COCs vertically and horizontally across the East Portion (extent). The nature and extent of contamination were identified based on data collected during environmental activities described in Sections 3 and 4. The East Portion environmental data were compared to the CULs described in Section 5 to determine the nature and extent of contamination.

6.1 Environmental Data Summary

The nature and extent for each preliminary COC in soil and groundwater is summarized in the following Tables 6-1 and 6-2.

Table 6-1. Groundwater Data Summary

Constituent	Cleanup Level[1] (µg/L)	Groundwater Data Summary
GRO	800/1,000[2]	Groundwater samples collected by Arcadis from past on-site wells (MW-6R, MW-7 through MW-12) and current on-site wells (MW-7, MW-8, MW-9, and MW-13) have indicated concentrations less than the MTCA Method A Groundwater CUL from October 2010 through May 2017.
DRO	500	Groundwater samples with SGT collected by Arcadis from past on-site wells (MW-6R, MW-7 through MW-12) and current on-site wells (MW-7, MW-8, MW-9, and MW-13) have indicated concentrations less than the MTCA Method A Groundwater CUL from October 2010 through May 2017. Use of SGT is appropriate due to the large quantity of woody debris and organic materials in the subsurface.
HO	500	Groundwater samples with SGT collected by Arcadis from past on-site wells (MW-6R, MW-7 through MW-12) and current on-site wells (MW-7, MW-8, MW-9, and MW-13) have indicated concentrations less than the MTCA Method A Groundwater CUL from October 2010 through May 2017. Use of SGT is appropriate due to the large quantity of woody debris and organic materials in the subsurface.
EDB	0.01	Full suite EPA Method 8260B analysis was performed on grab groundwater samples in 2001 (samples IPD-1 through IPD-6), including EDB. EDB was not reported to have been detected in grab groundwater samples collected from the East Portion[6]. This constituent was analyzed in groundwater prior to and after the excavation cleanup action with no detections.
EDC	5	Full suite EPA Method 8260B analysis was performed on grab groundwater samples in 2001 (samples IPD-1 through IPD-6), including EDC. EDC was not reported to have been detected in grab groundwater samples collected from the East Portion[6]. This constituent was analyzed in groundwater prior to and after the excavation cleanup action with no detections.

Benzene	5	Groundwater samples collected by Arcadis from past on-site wells (MW-6R, MW-7 through MW-12) and current on-site wells (MW-7, MW-8, MW-9, and MW-13) have indicated concentrations less than the MTCA Method A Groundwater CUL from October 2010 through May 2017.
Toluene	1,000	Groundwater samples collected by Arcadis from past on-site wells (MW-6R, MW-7 through MW-12) and current on-site wells (MW-7, MW-8, MW-9, and MW-13) have indicated concentrations less than the MTCA Method A Groundwater CUL from October 2010 through May 2017.
Ethylbenzene	700	Groundwater samples collected by Arcadis from past on-site wells (MW-6R, MW-7 through MW-12) and current on-site wells (MW-7, MW-8, MW-9, and MW-13) have indicated concentrations less than the MTCA Method A Groundwater CUL from October 2010 through May 2017.
Total xylenes	1,000	Groundwater samples collected by Arcadis from past on-site wells (MW-6R, MW-7 through MW-12) and current on-site wells (MW-7, MW-8, MW-9, and MW-13) have indicated concentrations less than the MTCA Method A Groundwater CUL from October 2010 through May 2017.
MTBE	20	Full suite EPA Method 8260B analysis was performed on groundwater samples in 2001 (samples IPD-1 through IPD-6), including MTBE. MTBE was not reported to have been detected in grab groundwater samples collected from the East Portion[6]. This constituent was analyzed in groundwater prior to and after the excavation cleanup action with no detections.
n-Hexane	6	Full suite EPA Method 8260B analysis was performed on groundwater samples in 2001 (samples IPD-1 through IPD-6), including n-Hexane. N-hexane, was not reported to have been detected in grab groundwater samples collected from the East Portion[6]. Further sampling of this constituent was discontinued since no groundwater detections were observed.
cPAHs	0.1[3]	Groundwater samples collected by Arcadis from past on-site wells (MW-6R, MW-7 through MW-12) and current on-site wells (MW-7, MW-8, MW-9, and MW-13) have indicated concentrations less than the MTCA Method A Groundwater CUL from October 2010 through May 2017.
Naphthalenes	160[4]	Groundwater samples collected by Arcadis from past on-site wells (MW-6R, MW-7 through MW-12) and current on-site wells (MW-7, MW-8, MW-9, and MW-13) have indicated concentrations less than the MTCA Method A Groundwater CUL from October 2010 through May 2017.
PCBs	0.1[5]	PCBs were analyzed in groundwater from the East Portion in 2004 and were not detected[7].
Lead	15	Groundwater samples collected by Arcadis from past on-site wells (MW-6R, MW-7 through MW-12) and current on-site wells (MW-7, MW-8, MW-9, and MW-13) have indicated concentrations less than the MTCA Method A Groundwater CUL from October 2010 through May 2017.

µg/L = micrograms per liter

[1]Cleanup levels from Ecology's MTCA Method A Cleanup Levels for Ground Water (WAC 173-340-900, Table 720-1)
[2] MTCA Method A CULs for GRO are determined based on the presence of benzene
[3] Based on benzo(a)pyrene equivalencies (WAC 173-340-900, Table 740-1).
[4] Calculated using procedures in WAC 173-340-747(4).
[5] Total value for all PCBs (mixtures)
[6] SECOR 2001. Final Remedial Investigation and Feasibility Study, Former Industrial Petroleum Distributors, 1117 West Bay Drive, Olympia, Washington. October 30.
[7]Parametrix 2004. West Bay Phase II Environmental Site Assessment, Prepared for City of Olympia Parks, Arts, and Recreation Department. June.

Table 6-2. Soil Data Summary

Constituent	Cleanup Level[1] (mg/kg)	Soil Data Summary
GRO	30/100 [2]	Arcadis analyzed soil for GRO in 2010 and again in 2015 during the remedial investigation and pre-excavation soil sampling. Concentrations of GRO that exceeded MTCA Method A Soil CUL were removed during the completion of the excavation cleanup action in 2016.
DRO	2000	Arcadis analyzed soil for DRO in 2010 and again in 2015 during the remedial investigation and pre-excavation soil sampling. Concentrations of DRO that exceeded MTCA Method A Soil CUL were removed during the completion of the excavation cleanup action in 2016.
HO	2000	Arcadis analyzed soil for HO in 2010 and again in 2015 during the remedial investigation and pre-excavation soil sampling. Concentrations of HO exceeded MTCA Method A Soil CUL in several locations only in 2015. These areas were removed during the completion of the excavation cleanup action in 2016.
EDB	0.005	Full suite EPA Method 8260B analysis was performed on soil samples in 2001 (samples IPD-1 through IPD-6), including EDB. EDB was not reported to have been detected in soil collected from the East Portion[6].
EDC	6	Full suite EPA Method 8260B analysis was performed on soil samples in 2001 (samples IPD-1 through IPD-6), including EDC. EDC was not reported to have been detected in soil samples collected from the East Portion[6].
Benzene	0.03	Arcadis analyzed soil samples for benzene in 2010 during the remedial investigation. Concentrations detected in soil were less than MTCA Method A Soil CUL at all boring locations.
Toluene	7	Arcadis analyzed soil samples for toluene in 2010 during the remedial investigation. Concentrations detected in soil were less than MTCA Method A Soil CUL at all boring locations.
Ethylbenzene	6	Arcadis analyzed soil samples for ethylbenzene in 2010 during the remedial investigation. Concentrations detected in soil were less than MTCA Method A Soil CUL at all boring locations.
Total xylenes	9	Arcadis analyzed soil samples for total xylenes in 2010 during the remedial investigation. Concentrations detected in soil were less than MTCA Method A Soil CUL at all boring locations.
MTBE	0.1	Full suite EPA Method 8260B analysis was performed on soil samples in 2001 (samples IPD-1 through IPD-6), including MTBE. MTBE was not reported to have been detected in soil samples collected from the East Portion[6].
n-Hexane	6	Full suite EPA Method 8260B analysis was performed on soil samples in 2001 (samples IPD-1 through IPD-6), including n-hexane. N-hexane was not reported to have been detected in soil or groundwater samples collected from the East Portion[6].
cPAHs	0.1[3]	Arcadis analyzed soil for cPAHs in 2010 and again in 2015 during the remedial investigation and pre-excavation soil sampling. Concentrations of cPAHs that exceeded MTCA Method A Soil CUL were removed during the completion of the excavation cleanup action in 2016.

Naphthalenes	5[4]	Arcadis analyzed soil for naphthalenes in 2010 and again in 2015 during the remedial investigation and pre-excavation soil sampling. Concentrations of naphthalenes that exceeded MTCA Method A Soil CUL were removed during the completion of the excavation cleanup action in 2016.
PCBs	1[5]	PCBs were analyzed in soil from the East Portion in 2004 and were not detected[7].
Lead	250	Arcadis analyzed soil samples for lead in 2010 during the remedial investigation. Concentrations detected in soil were less than MTCA Method A Soil CUL at all boring locations.

mg/kg = milligrams per kilogram

[1]Cleanup levels from Ecology's MTCA Method A Cleanup Levels for Soil (WAC 173-340-900, Table 740-1)

[2]MTCA Method A CULs for GRO are determined based on the presence of benzene

[3] Based on benzo(a)pyrene equivalencies (WAC 173-340-900, Table 740-1).

[4] Calculated using procedures in WAC 173-340-747(4).

[5] Total value for all PCBs (mixtures)

[6] SECOR 2001. Final Remedial Investigation and Feasibility Study, Former Industrial Petroleum Distributors, 1117 West Bay Drive, Olympia, Washington. October 30.

[7]Parametrix 2004. West Bay Phase II Environmental Site Assessment, Prepared for City of Olympia Parks, Arts, and Recreation Department. June.

6.2 Historical Impacts

Historical impacts are presented on Tables 1, 2, 3, and 4 for groundwater and Tables 5, 6, and 7 for soil.

6.2.1 Historical Soil Quality

Soil sampling activities were completed in locations across the East Portion from 2000 to 2015. Soil has been analyzed for the COCs listed in Section 5.1. as defined in the CAP. Table 6-3 summarizes the maximum soil concentrations observed onsite.

Table 6-3. Soil Historical Data Summary

	Constituents detected above MDLs	Historical maximum concentration ever observed	Date of historical maximum concentration ever observed	Constituents historically detected above MTCA Method A CUL
GRO	Yes	2,400 mg/kg	2015	Yes
DRO	Yes	14,000 mg/kg	2000	Yes
HO	Yes	64,000	2015	Yes
Benzene	No	--	--	No
Toluene	Yes	0.0342 mg/kg	2010	No
Ethylbenzene	No	--	--	No
Total Xylenes	Yes	23.9 mg/kg	2000	Yes - Once

MTBE	No	--	--	No
n-Hexane	No	--	--	No
EDB	No	--	--	No
EDC	No	--	--	No
Naphthalenes	Yes	87 mg/kg	2015	Yes
cPAHs	Yes	22.757 mg/kg	2015	Yes
Lead	Yes	724 mg/kg	2004	Yes - Once

6.2.2 Historical Groundwater Quality

Groundwater monitoring at the East Portion has been ongoing from 2000 to 2017 from temporary wells via grab samples as well as from the monitoring well network including wells MW-6R, and MW-6 through MW-13. Groundwater has been analyzed for the COCs listed in Section 5.1. as defined in the CAP. Table 6-4 summarizes the maximum groundwater concentrations observed onsite.

Table 6-4. Groundwater Historical Data Summary

	Constituents detected above MDLs	Historical maximum concentration ever observed	Date of historical maximum concentration ever observed	Constituents historically detected above MTCA Method A CUL
GRO	Yes	1,930 µg/L	2001	Yes - Once
DRO	Yes	280,000 µg/L	2000	Yes
DRO with SGT	Yes	210 µg/L	2016	No
HO	Yes	1,000 µg/L	2015	Yes
HO with SGT	No*	--	--	--
Benzene	Yes	1.64 µg/L	2001	No
Toluene	Yes	39 µg/L	2016	No
Ethylbenzene	No	--	--	--
Total Xylenes	Yes	170 µg/L	2000	No
MTBE	No	--	--	--
n-Hexane	No	--	--	--
EDB	No	--	--	--
EDC	No	--	--	--

Naphthalenes	Yes	61.05 µg/L	2004	No
cPAHs	Yes	0.0831 µg/L	2011	No
Lead	Yes	49.9 µg/L	2001	Yes - Once
Dissolved Lead	Yes	0.15 µg/L	2015	No

*One sample was flagged since the constituent was found in the associated blank and is therefore considered erroneous.

6.3 Remaining Impacts

Excavation cleanup action has been conducted at the East Portion, as described in Section 3.3. As the result of the excavation activities, impacted soil encountered through the investigations conducted between 2000 and 2015, were excavated and removed from the East Portion.

6.3.1 Current Soil Quality

In accordance with the AO No. DE 10470 and the CAP, East Portion soil impacts were assessed during the pre-excavation soil sampling (See Section 3.2.3) and analytical results were reported in the Construction Plans and Specifications Summary Report (Arcadis 2016), along with the excavation plans to remove impacted soils throughout the East Portion. After completion of the soil removal cleanup action, no soil impacts remain throughout the East Portion. The Cleanup Action Completion Report (Arcadis 2017) showed that compliance with the CAP and AO had been met through the cleanup action.

6.3.2 Current Groundwater Quality

As described in Section 4, concentrations of groundwater constituents meet their respective MTCA Method A CULs thorough the East Portion. Table 6-5 below summarizes the maximum groundwater concentration observed since the completion of the excavation cleanup in 2016.

Table 6-5. Groundwater Recent Data Summary

	Constituents detected above MDLs	Remaining maximum concentration observed	Date of remaining maximum concentration observed	Constituents still detected above MTCA Method A CUL
GRO	Yes	540 µg/L	12/15/2016	No
DRO with SGT	Yes	210 µg/L	12/15/2016	No
DRO	Yes	810 µg/L (with SGT 210 µg/L) *	12/15/2016	No, with SGT. See Section 4.
HO with SGT	No	--	--	No

HO	Yes	874 µg/L (ND<82.5 µg/L)*	5/8/2017	No, with SGT. See Section 4.
Benzene	No	--	--	No
Toluene	Yes	39 µg/L	12/15/2016	No
Ethylbenzene	No	--	--	No
Total Xylenes	No	--	--	No
MTBE	No	--	--	No
Lead	Yes	3.48 µg/L	3/9/2017	No
Dissolved Lead	Yes	--	--	No
EDB	No	--	--	No
EDC	No	--	--	No

() *concentration with SGT.

7 CONCEPTUAL SITE MODEL

7.1 Human Health Conceptual Site Model

The conceptual site model (CSM) was developed during the preparation of the CAP included in the AO No. DE 10470. The CSM was developed in accordance with the methods and procedures described in MTCA (WAC 173-340-708). The source of contamination was identified as the former bulk plant operations, including the storage of gasoline, diesel and/or oil. Based on current and future land use, which may include the use of the East Portion as a public park, potential future receptors may include on-site residents, children, recreational users, commercial workers, industrial workers and construction workers. The CSM with potential pathways are presented on Figure 9 and summarized below.

Potential on-site receptors may be exposed to constituents in surface and subsurface soils by direct contact. Routes of exposure by direct contact include incidental ingestion of soil and/or dermal contact with soil. The East Portion is not currently developed; thus, no current on-site human receptors have been identified. However, it is assumed that the East Portion may be redeveloped in the future to industrial, commercial, residential, or public park land use. Thus, potential future receptors that may be directly exposed to constituents in surface and/or subsurface soil from the East Portion may include on-site residents, children, recreational users, commercial workers, industrial workers, and construction workers. Since there are no known constituents in soil exceeding the MTCA Method A Soil CULs, this is not considered a complete exposure pathway.

Constituents may leach from soil to groundwater beneath the East Portion by infiltration, resulting in potential direct contact exposures to constituents in groundwater.

- Routes of exposure by direct contact with groundwater include ingestion of tap water, dermal contact with tap water, and inhalation of volatile constituents released from tap water if groundwater is used as drinking water. However, there are no constituents in groundwater that exceed the MTCA Method A Groundwater CULs protective of groundwater as a drinking water source from the East Portion. Therefore, tap water ingestion, dermal contact with tap water, and inhalation of volatile constituents in tap water are not complete exposure pathways for current on-site and off-site receptors.
- Groundwater from the East Portion is generally encountered at depths ranging from approximately 3 to 5 feet bgs. In the future, it is possible that the East Portion or properties adjacent to the East Portion may be redeveloped, and construction workers may encounter groundwater at shallow depths. Thus, direct contact (e.g., incidental ingestion and dermal contact) with groundwater may occur; however, since groundwater COCs don't exceed the MTCA Method A Groundwater CULs, this is not considered a complete exposure pathway for construction workers.

Another potential transport mechanism on the East Portion may include volatilization of constituents in soil and/or groundwater to outdoor air and/or the indoor air of future on-site or off-site buildings, or air within a trench used by future on-site or off-site construction workers. Since there are not soil or groundwater constituents exceeding applicable MTCA Method A CULs, no human receptors can be affected by volatilization under the current or any future East Portion use. Therefore, volatilization is not a complete pathway.

Potential on-site receptors may be exposed to surface water and sediments by direct contact. Routes of exposure by direct contact include incidental ingestion of and/or dermal contact with surface water and/or sediments. The East Portion is not currently developed; thus, residents, children and recreational users are not likely to have direct contact with surface water or sediment. However, assuming hypothetical future development of the East Portion for residential purposes, residents, children, and recreational users could have direct contact with surface water and/or sediments in the future. Benthic organisms and fish may have direct contact with surface water and/or sediments based on current site use. However, there are no soil or groundwater constituents exceeding applicable CULs, and this is not a complete pathway.

7.2 Exposures to Ecological Receptors

A terrestrial ecological evaluation was conducted in accordance with WAC 173-340-7492. The purpose of the terrestrial ecological evaluation includes determining whether a release to soil threatens the terrestrial environment, to characterize potential threats to terrestrial plants and animals, and to establish site-specific cleanup standards for the protection of terrestrial plants and animals. Per subsection 7492(2) of Chapter 173-340 WAC, the East Portion qualifies for a simplified terrestrial ecological evaluation based on two factors:

- The area of soil contamination at the site is less than 350 square feet, since petroleum impacted soil and fill were fully excavated during the 2016 remedial excavation.
- Known historical site use and laboratory analytical results indicate priority contaminants of concern for sites that qualify for the simplified ecological evaluation procedure found in Table 749-2 are below the thresholds for industrial and commercial sites in the upper 15 feet of soil. Documentation of exclusion is included as Appendix E.

8 CONCLUSION

ARCO and Ecology entered AO No. DE 8953 in 2012, and AO No. DE 10470 in 2014, with a combined goal of removing constituents of concern from the East Portion. Through the RI Report, CAP, and the final cleanup action summarized in the cleanup Action Completion Report, COCs were characterized, extents defined and removed from the East Portion in both soil and groundwater, meeting MTCA Method A CULs and therefore the requirements of both AOs No. DE 8953 and AO No. DE 10470. As the terms of the AOs have been met, Arcadis request a No Further Action determination to be completed for the East Portion.

9 REFERENCES

Arcadis U.S., Inc. (Arcadis) 2012. Remedial Investigation Report, Former ARCO Olympia Bulk Terminal, Industrial Petroleum Distributors Site (Facility Identification No. 1436), 1120 West Bay Drive, Olympia, Washington. January 30.

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TABLES

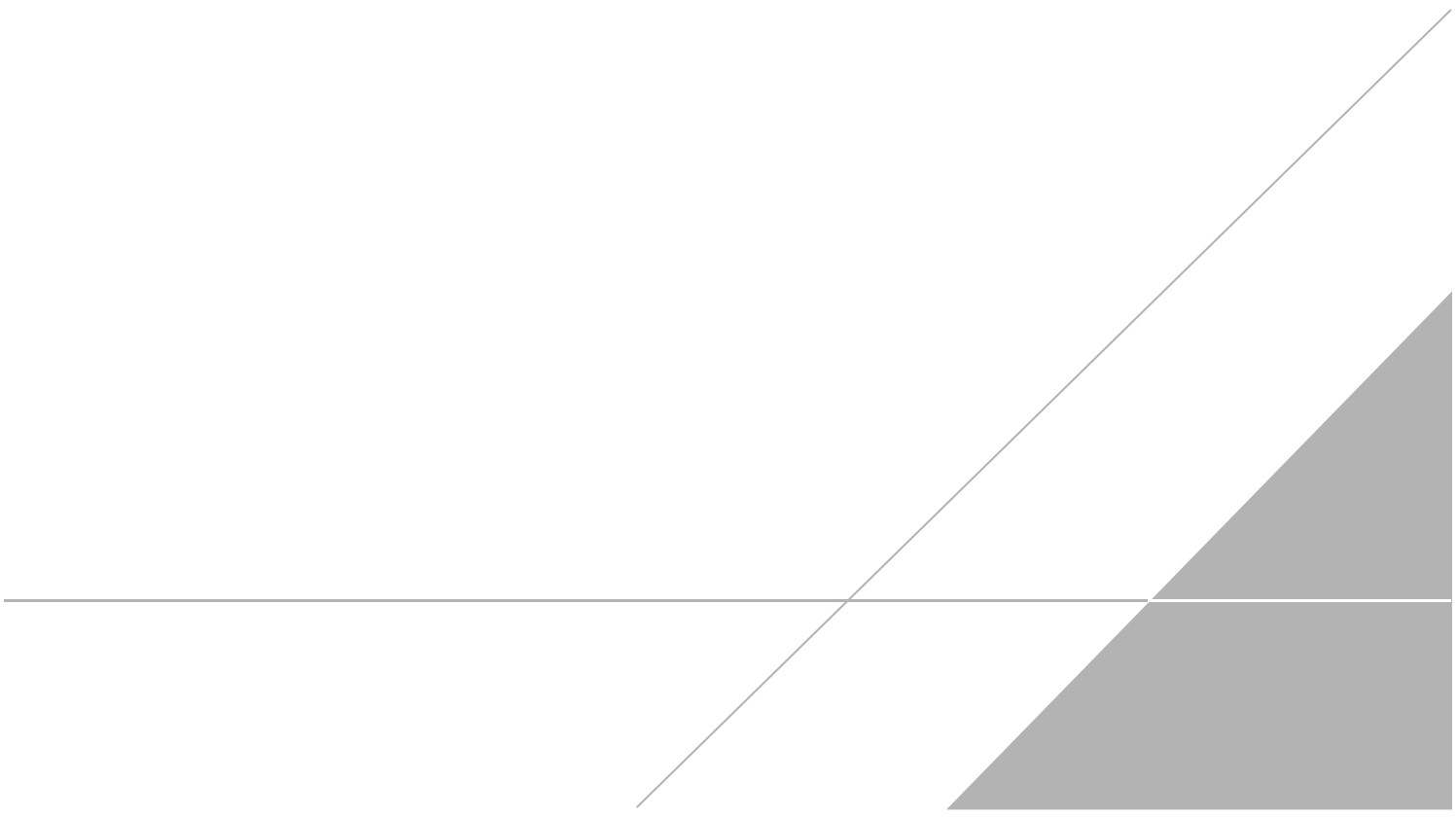

Table 1
GROUNDWATER GAUGING DATA AND SELECT ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Site
1120 West Bay Drive Northwest, Olympia, WA

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO[1]	HO[1]	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-6R	10/1/2010	(LFP)	14.34	2.42	0.0	11.92	<50	<120	<240	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-6R	12/29/2010		14.34	2.00	0.0	12.34	--	--	--	--	--	--	--	--	--	--	--	--
MW-6R	12/30/2010	(LFP)	14.34	--	--	--	<50.0	<76	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-6R	12/30/2010	(Dup)(LFP)	14.34	--	--	--	<50.0	<76	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-6R	3/17/2011	(LFP)	14.34	1.80	0.0	12.54	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	5.4	<2.0
MW-6R	4/19/2011		14.34	1.96	0.0	12.38	--	--	--	--	--	--	--	--	--	--	--	--
MW-6R	6/11/2011	(LFP)	14.34	2.02	0.0	12.32	<50.0	<85	<430	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-6R	9/22/2011	(LFP)	14.34	2.35	0.0	11.99	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-6R	12/22/2011	(LFP)	14.34	2.24	0.0	12.10	<50.0	<91	<450	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-6R	12/22/2011	(Dup)(LFP)	14.34	2.24	0.0	12.10	<50.0	<84	<420	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-6R	9/2/2015	(LFP)	14.34	1.92	0.0	12.42	<50	<46	<100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0094	<0.50	0.72(J)	<0.13
MW-6R	9/20/2016	Well Abandoned Prior to Excavation																
MW-7	10/1/2010	(LFP)	14.54	4.80	0.0	9.74	<50	150(Y)	<250	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-7	12/29/2010	(LFP)	14.54	2.21	0.0	12.33	<50.0	<77	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-7	3/17/2011	(LFP)	14.54	2.24	0.0	12.30	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-7	4/19/2011		14.54	3.61	0.0	10.93	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	6/11/2011	(LFP)	14.54	5.07	0.0	9.47	<50.0	<87	<430	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-7	6/11/2011	(Dup)(LFP)	14.54	5.07	0.0	9.47	<50.0	<86	<430	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-7	9/22/2011	(LFP)	14.54	7.21	0.0	7.33	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-7	12/22/2011	(LFP)	14.54	4.79	0.0	9.75	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-7	9/2/2015	(LFP)	14.54	5.60	0.0	8.94	<50	130	<100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0096	<0.50	<0.13	<0.13
MW-7	9/2/2015	(Dup)(LFP)	14.54	5.60	0.0	8.94	<50	110	<100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0094	<0.50	<0.13	<0.13
MW-7	12/15/2016	(LFP)	14.54	2.56	0.0	11.98	<50	<29	<67	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0095	<0.50	0.094(J)	<0.090
MW-7	3/9/2017	(LFP)	14.54	2.51	0.0	12.03	<31.6	<82.5	<165	<0.331	<0.412	<0.384	<1.06	<0.367	<0.00240	<0.361	3.48(J)	<1.90
MW-7	5/8/2017	(LFP)	14.54	4.22	0.0	10.32	<31.6	233	292	<0.331	<0.412	<0.384	<1.06	<0.367	<0.00238	<0.361	2.06(J)	<1.90
MW-8	10/1/2010	(LFP)	13.98	3.93	0.0	10.05	<50	200(Y)	<240	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-8	12/29/2010	(LFP)	13.98	2.25	0.0	11.73	<50.0	<77	<380	0.21	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-8	3/17/2011	(LFP)	13.98	2.19	0.0	11.79	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-8	3/17/2011	(Dup)(LFP)	13.98	2.19	0.0	11.79	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-8	4/19/2011		13.98	2.68	0.0	11.30	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	6/11/2011	(LFP)	13.98	3.85	0.0	10.13	<50.0	<83	<420	0.26	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-8	9/22/2011	(LFP)	13.98	6.43	0.0	7.55	<50.0	<75	<380	0.35	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-8	12/22/2011	(LFP)	13.98	3.89	0.0	10.09	<50.0	<87	<430	0.23	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-8	9/2/2015	(LFP)	13.98	4.96	0.0	9.02	<50	**670**	**1,000**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0095	<0.50	<0.13	<0.13
MW-8	12/15/2016	(LFP)	13.98	2.02	0.0	11.96	540(J)	210	420	<0.50	39	<0.50	<0.50	<0.50	<0.0095	<0.50	2.2	<0.090
MW-8	3/9/2017	(LFP)	13.98	2.66	0.0	11.32	<31.6	390	419(J)	<0.331	6.00	<0.384	<1.06	<0.367	<0.00240	<0.361	<1.90	<1.90
MW-8	5/8/2017	(LFP)	13.98	2.61	0.0	11.37	<31.6	**524**	**874**	<0.331	5.02	<0.384	<1.06	<0.367	<0.00238	<0.361	<1.90	<1.90
MW-9	10/1/2010	(LFP)	14.62	3.21	0.0	11.41	110	160(Y)	<250	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-9	12/29/2010	(LFP)	14.62	2.50	0.0	12.12	56.5	<76	<380	0.21	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-9	3/17/2011	(LFP)	14.62	2.28	0.0	12.34	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-9	4/19/2011		14.62	3.21	0.0	11.41	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	6/11/2011	(LFP)	14.62	3.78	0.0	10.84	84.4	<88	<440	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-9	9/22/2011	(LFP)	14.62	3.81	0.0	10.81	241	<75	<380	0.37	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0

Table 1
GROUNDWATER GAUGING DATA AND SELECT ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Site
1120 West Bay Drive Northwest, Olympia, WA

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO[1]	HO[1]	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-9	12/22/2011	(LFP)	14.62	3.10	0.0	11.52	222	<76	<380	0.30	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-9	9/2/2015	(LFP)	14.62	4.45	0.0	10.17	67(J)	<45	<100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0096	<0.50	0.30(J)	<0.13
MW-9	12/15/2016	(LFP)	14.62	2.89	0.0	11.73	130(J)	88(J)	97(J)	<0.50	5.4	<0.50	<0.50	<0.50	<0.0095	<0.50	0.53(J)	<0.090
MW-9	3/9/2017	(LFP)	14.62	2.56	0.0	12.06	<31.6	347	376(J)	<0.331	3.42	<0.384	<1.06	<0.367	<0.00240	<0.361	2.72(J)	<1.90
MW-9	5/8/2017	(LFP)	14.62	3.29	0.0	11.33	<31.6	330	**544**	<0.331	1.55	<0.384	<1.06	<0.367	<0.00238	<0.361	2.72(J)	<1.90
MW-10	10/1/2010	(LFP)	15.03	3.56	0.0	11.47	<50	<120	<240	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-10	10/1/2010	(Dup)(LFP)	15.03	3.56	0.0	11.47	<50	<120	<240	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-10	12/29/2010	(LFP)	15.03	2.70	0.0	12.33	<50.0	<77	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-10	3/17/2011	(LFP)	15.03	2.92	0.0	12.11	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-10	4/19/2011		15.03	3.08	0.0	11.95	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	6/11/2011	(LFP)	15.03	3.10	0.0	11.93	<50.0	<86	<430	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-10	9/22/2011	(LFP)	15.03	3.31	0.0	11.72	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-10	12/22/2011	(LFP)	15.03	3.21	0.0	11.82	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-10	9/2/2015	(LFP)	15.03	3.90	0.0	11.13	<50	<45	<100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0094	<0.50	2.1	0.15(J)
MW-10	9/20/2016	Well Abandoned Prior to Excavation																
MW-11	10/1/2010	(LFP)	15.75	2.75	0.0	13.00	<50	<120	<240	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-11	12/29/2010		15.75	2.10	0.0	13.65	--	--	--	--	--	--	--	--	--	--	--	--
MW-11	12/30/2010	(LFP)	15.75	--	--	--	<50.0	110	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-11	3/17/2011	(LFP)	15.75	1.74	0.0	14.01	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-11	4/19/2011		15.75	1.94	0.0	13.81	--	--	--	--	--	--	--	--	--	--	--	--
MW-11	6/11/2011	(LFP)	15.75	2.09	0.0	13.66	<50.0	<84	<420	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-11	9/22/2011	(LFP)	15.75	2.82	0.0	12.93	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-11	12/22/2011	(LFP)	15.75	2.49	0.0	13.26	<50.0	<86	<430	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-11	9/2/2015	(LFP)	15.75	2.42	0.0	13.33	<50	<48	<110	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0096	<0.50	0.87(J)	<0.13
MW-11	9/20/2016	Well Abandoned Prior to Excavation																
MW-12	10/1/2010	(LFP)	15.60	2.63	0.0	12.97	<50	<120	<240	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-12	12/29/2010		15.60	1.95	0.0	13.65	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	12/30/2010	(LFP)	15.60	--	--	--	<50.0	89	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-12	3/17/2011	(LFP)	15.60	1.56	0.0	14.04	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-12	4/19/2011		15.60	1.86	0.0	13.74	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	6/11/2011	(LFP)	15.60	1.97	0.0	13.63	<50.0	<82	<410	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-12	9/22/2011	(LFP)	15.60	2.51	0.0	13.09	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-12	12/22/2011	(LFP)	15.60	2.38	0.0	13.22	<50.0	<85	<430	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-12	9/2/2015	(LFP)	15.60	2.18	0.0	13.42	<50	<48	<110	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0096	<0.50	<0.13	<0.13
MW-12	9/20/2016	Well Abandoned Prior to Excavation																
MW-13	12/15/2016	(LFP)	--	2.36	0.0	--	58(J)	<28	<66	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0095	<0.50	0.21(J)	<0.090
MW-13	12/15/2016	(Dup)(LFP)	--	2.36	0.0	--	57(J)	65(J)	470	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--	--
MW-13	3/9/2017	(LFP)	--	2.33	0.0	--	<31.6	<82.5	<165	<0.331	<0.412	<0.384	<1.06	<0.367	<0.00240	<0.361	2.14(J)	<1.90
MW-13	3/9/2017	(Dup)(LFP)	--	2.33	0.0	--	<31.6	<82.5	<165	<0.331	<0.412	<0.384	<1.06	<0.367	--	<0.361	--	--
MW-13	5/8/2017	(LFP)	--	2.52	0.0	--	<31.6	<66.0	132(J)	<0.331	0.569(J)	<0.384	<1.06	<0.367	<0.00238	<0.361	2.41(J)	<1.90
MW-13	5/8/2017	(Dup)(LFP)	--	2.52	0.0	--	<31.6	<66.0	102(J)	<0.331	0.515(J)	<0.384	<1.06	<0.367	--	<0.361	<1.90	--

Table 1
GROUNDWATER GAUGING DATA AND SELECT ANALYTICAL RESULTS
Closure Request Report
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1120 West Bay Drive Northwest, Olympia, WA

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO[1]	HO[1]	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**

TOC = Top of casing in feet North American Vertical Datum of 1988 (NAVD 88)
DTW = Depth to water in feet below TOC
NAPL = Non-aqueous phase liquid thickness in feet
GWE = Groundwater elevation in feet NAVD 88
GRO = Total petroleum hydrocarbons - gasoline range organics
DRO = Total petroleum hydrocarbons - diesel range organics
HO = Total petroleum hydrocarbons - heavy oil range organics
[1] = DRO/HO analytical results reported were analyzed without silica gel treatment. Table 3 reports DRO/HO analytical results with and without silica gel treatment.
MTBE = Methyl tertiary butyl ether
EDB = Ethylene dibromide
EDC = 1,2-Dichloroethane
800/1,000 = GRO MTCA Method A CUL with benzene present is 800 µg/L and without is 1,000 µg/L
LF/LFP = Low flow (purge) sample
< = Analytical result is less than reporting limit shown
-- = Not analyzed/not applicable
^ = Instrument related QC exceeds the control limits
DUP = Duplicate sample
Y = Laboratory qualifier: Results in the diesel organics range are primarily due to overlap from a gasoline range product.
Wells were resurveyed in 2010 and are referenced to vertical datum NAVD 88 and horizontal datum NAD 83/98
If NAPL is present, the GWE is corrected according to the following formula (TOC elevation - depth to water) + (0.8 x NAPL thickness)
Data collected prior to 2010 have been provided by previous consultants and are included as historical reference only
GRO, DRO, HO analyzed by Ecology Northwest Methods; Benzene, toluene, ethylbenzene, and total xylenes (BTEX), MTBE, and EDB by 8260B; Lead by U.S. Environmental Protection Agency (EPA)
BOLD constituent detected above MTCA Cleanup Levels

Table 2
GROUNDWATER POLYCYCLIC AROMATIC HYDROCARBONS ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Site
1120 West Bay Drive Northwest, Olympia, WA

All analytical results are presented in micrograms per liter (µg/L)

Well ID	Date	Notes	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Total Naphthalenes	Total cPAHs
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L			--	0.1	--	--	--	--	--	--	--	--	160	0.1
MW-6R	10/1/2010	(LFP)	<0.0097	0.019	0.017	<0.0097	0.011	<0.0097	0.011	<0.0097	<0.013	0.010	0.031	0.0234
MW-6R	12/30/2010	(LFP)	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.1425	<0.0717
MW-6R	3/17/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.061	<0.094	<0.094	<0.14	<0.094	<0.47	<0.352	<0.0710
MW-6R	6/11/2011	(LFP)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.165	<0.0825
MW-6R	9/22/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.141	<0.0713
MW-6R	12/22/2011	(LFP)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.15	<0.0756
MW-7	10/1/2010	(LFP)	0.017	0.019	<0.0097	<0.0097	<0.0097	<0.0097	<0.0097	0.23	0.16	0.086	0.722	0.0227
MW-7	12/29/2010	(LFP)	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.144	<0.0725
MW-7	3/17/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.14	<0.094	<0.47	<0.352	<0.0710
MW-7	6/11/2011	(LFP)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.165	<0.0831
MW-7	9/22/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	0.16	0.13	<0.094	0.467	<0.0710
MW-7	12/22/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	0.11	<0.094	<0.094	0.204	<0.0710
MW-7	12/15/2016	(LFP)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.021 J	0.017 J	<0.030	0.053	<0.00755
MW-7	3/9/2017	(LFP)	<0.0041	<0.0116	<0.00212	<0.0136	<0.0108	<0.00396	<0.0148	0.0245 J	0.0359 J	0.120 J B	0.180	<0.007783
MW-7	5/8/2017	(LFP)	<0.0041	<0.0116	<0.00212	<0.0136	<0.0108	<0.00396	<0.0148	0.0895 J	0.0555 J	0.109 J	0.254	<0.007783
MW-8	10/1/2010	(LFP)	<0.0097	<0.019	<0.0097	<0.0097	0.053	<0.0097	<0.0097	0.11	0.038	0.085	0.356	0.0125
MW-8	12/29/2010	(LFP)	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.144	<0.0725
MW-8	3/17/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.061	<0.094	<0.094	<0.14	<0.094	<0.47	<0.352	<0.0708
MW-8	6/11/2011	(LFP)	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.144	<0.0725
MW-8	9/22/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	0.13	<0.094	0.12	0.417	<0.0710
MW-8	12/22/2011	(LFP)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.165	<0.0831
MW-8	12/15/2016	(LFP)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.020 J	0.015 J	0.066	0.101	<0.00755
MW-8	3/9/2017	(LFP)	<0.0041	<0.0116	<0.00212	<0.0136	<0.0108	<0.00396	<0.0148	0.0269 J	0.0134 J	0.0608 J B	0.101	<0.007783
MW-8	5/8/2017	(LFP)	<0.0082	<0.0232	<0.00424	<0.0272	<0.0216	<0.00792	<0.0296	0.0314 J	<0.0180	0.0706 J	0.111	<0.015566
MW-9	10/1/2010	(LFP)	<0.0094	<0.019	<0.0094	<0.0094	<0.0094	<0.0094	<0.0094	0.019	0.013	0.400	0.432	<0.0119
MW-9	12/29/2010	(LFP)	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	0.59	0.685	<0.0717
MW-9	3/17/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.061	<0.094	<0.094	<0.14	<0.094	<0.47	<0.352	<0.0708
MW-9	6/11/2011	(LFP)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	0.36	0.830	<0.0831

Table 2
GROUNDWATER POLYCYCLIC AROMATIC HYDROCARBONS ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Site
1120 West Bay Drive Northwest, Olympia, WA

All analytical results are presented in micrograms per liter (µg/L)

Well ID	Date	Notes	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Total Naphthalenes	Total cPAHs
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L			--	0.1	--	--	--	--	--	--	--	--	160	0.1
MW-9	9/22/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.141	<0.0710
MW-9	12/22/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	0.17	<0.094	2.6	5.417	<0.0710
MW-9	12/15/2016	(LFP)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.077	0.044 J	0.73	0.851	<0.00755
MW-9	3/9/2017	(LFP)	<0.0041	<0.0116	<0.00212	<0.0136	<0.0108	<0.00396	<0.0148	0.105 J	0.0488 J	1.07	1.224	<0.007783
MW-9	5/8/2017	(LFP)	<0.0041	0.0126 J	<0.00212	<0.0136	<0.0108	<0.00396	<0.0148	0.0942 J	0.0921 J	0.915	1.1013	0.014583
MW-10	10/1/2010	(LFP)	<0.0094	<0.019	<0.0094	<0.0094	<0.0094	<0.0094	<0.0094	<0.012	<0.0094	<0.0094	<0.015	<0.0119
MW-10	12/29/2010	(LFP)	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.144	<0.0725
MW-10	3/17/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.061	<0.094	<0.094	<0.14	<0.094	<0.47	<0.352	<0.0717
MW-10	6/11/2011	(LFP)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.165	<0.0831
MW-10	9/22/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.141	<0.0710
MW-10	12/22/2011	(LFP)	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.1425	<0.0717
MW-11	10/1/2010	(LFP)	<0.0098	<0.020	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.013	0.012	0.035	<0.0125
MW-11	12/30/2010	(LFP)	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.143	<0.0717
MW-11	3/17/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.061	<0.094	<0.094	<0.14	<0.094	<0.47	<0.352	<0.0708
MW-11	6/11/2011	(LFP)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.165	<0.0831
MW-11	9/22/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.141	<0.0710
MW-11	12/22/2011	(LFP)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.165	<0.0831
MW-12	10/1/2010	(LFP)	<0.0097	<0.019	<0.0097	<0.0097	<0.0097	<0.0097	<0.0097	<0.0097	<0.013	0.019	0.030	<0.0120
MW-12	12/30/2010	(LFP)	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.096	<0.144	<0.0725
MW-12	3/17/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.061	<0.094	<0.094	<0.14	<0.094	<0.47	<0.352	<0.0708
MW-12	6/11/2011	(LFP)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.165	<0.0831
MW-12	9/22/2011	(LFP)	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.141	<0.0710
MW-12	12/22/2011	(LFP)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.165	<0.0831
MW-13	12/15/2016	(LFP)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.062	0.031 J	0.30	0.393	<0.00755
MW-13	12/15/2016	(DUP)(LFP)	--	--	--	--	--	--	--	--	--	--	--	--
MW-13	3/9/2017	(LFP)	<0.0041	<0.0116	<0.00212	<0.0136	<0.0108	<0.00396	<0.0148	0.0100 J	<0.00902	0.0482 J B	0.06271	<0.007783
MW-13	3/9/2017	(DUP)(LFP)	--	--	--	--	--	--	--	--	--	--	--	--
MW-13	5/8/2017	(LFP)	<0.0041	<0.0116	<0.00212	<0.0136	<0.0108	<0.00396	<0.0148	0.0142 J	0.0127 J	0.0460 J	0.0729	<0.007783
MW-13	5/8/2017	(DUP)(LFP)	--	--	--	--	--	--	--	--	--	--	--	--

Table 2
GROUNDWATER POLYCYCLIC AROMATIC HYDROCARBONS ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Site
1120 West Bay Drive Northwest, Olympia, WA

All analytical results are presented in micrograms per liter (µg/L)

Well ID	Date	Notes	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Total Naphthalenes	Total cPAHs
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L			**--**	**0.1**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**160**	**0.1**

Notes:
-- = Not analyzed/not applicable
LFP = Low Flow purge sample
DUP = Duplicate Sample
< = Analytical result is less than reporting limit shown
J = estimated value – The result is greater than or equal to the Method Detection Limit (MDL) and less than the Limit of Quantitation (LOQ)
B = Target analyte found in associated blank
cPAHs = Carcinogenic Polycyclic Aromatic Hydrocarbons
cPAHs and Naphthalenes analyzed by U.S. Environmental Protection Agency (EPA) 8270C SIM
cPAHs adjusted for toxicity according to Washington State Administrative Code 173-340-708(8). If one or more adjusted cPAH constituents were reported as Non-Detect, half of the reporting limit was used in calculations.
Naphthalenes is a sum total of 1-methyl-naphthalene, 2-methyl-naphthalene, and naphthalene. If one or more constituents were reported as Non-Detect, half of the reporting limit was used in calculations.
BOLD concentration greater than the MTCA Method A cleanup level

Table 3

GROUNDWATER DRO AND HO SILICA GEL TREATMENT ANALYTICAL RESULTS

Closure Request Report

Former Industrial Petroleum Distributors Site

1120 West Bay Drive Northwest, Olympia, WA

All analytical results are presented in micrograms per liter (µg/L)

Well ID	Date	Notes	DRO w/ SGT	DRO w/out SGT	HO w/ SGT	HO w/out SGT
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L			**500**	**500**	**500**	**500**
MW-7	12/15/2016	(LFP)	<29	<29	<67	<67
MW-7	3/9/2017	(LFP)	<82.5	<82.5	<165	<165
MW-7	5/8/2017	(LFP)	81.4 J	233	<82.5	292
MW-8	12/15/2016	(LFP)	210	**810**	<68	420
MW-8	3/9/2017	(LFP)	87.6 J	390	<165	419 J
MW-8	5/8/2017	(LFP)	68.8 J	**524**	<82.5	**874**
MW-9	12/15/2016	(LFP)	88 J	260	<66	97 J
MW-9	3/9/2017	(LFP)	<82.5	347	<165	376 J
MW-9	5/8/2017	(LFP)	<66.0	330	<82.5	**544**
MW-13	12/15/2016	(LFP)	<28	<28	<66	<66
MW-13	12/15/2016	(DUP)(LFP)	<46 B	65 J B	470 B	450 B
MW-13	3/9/2017	(LFP)	<82.5	<82.5	<165	<165
MW-13	3/9/2017	(DUP)(LFP)	<82.5	<82.5	<165	<165
MW-13	5/8/2017	(LFP)	<66.0	<66.0	<82.5	132 J
MW-13	5/8/2017	(DUP)(LFP)	<66.0	<66.0	<82.5	102 J

Notes:

DRO = Diesel Range Organics

HO = Heavy Oil Range Organics

SGT = Silica Gel Treatment

LFP = Low Flow purge sample

DUP = Duplicate Sample

< = Analytical result is less than reporting limit shown

J = estimated value – The result is greater than or equal to the Method Detection Limit (MDL) and less than the Limit of Quantitation (LOQ)

B = The same analyte is found in the associated blank

BOLD concentration greater than the MTCA Method A cleanup level

Table 4
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Site
1120 West Bay Drive Northwest, Olympia, WA

All analytical results are presended in micrograms per liter (µg/L)

Analysis	MTCA Method A Cleanup Levels	Sample ID Sample Location Type Date Collected											
		W-1 9/20/2000	W-2 9/20/2000	IPD-1 TP 2001	IPD-2 TP 2001	IPD-3 TP 2001	IPD-4 TP 2001	IPD-5 TP 2001	WBTP-01 TP 3/9/2004	WBTP-02 TP 3/9/2004	MW-6 MW 8/26/2004	MW-6 MW 11/12/2004	MW-6 MW 1/10/2005
Volatile Organic Compounds													
Benzene	5	<1	<1	<1.00	<1.00	<1.00	1.64	<1.00	--	--	--	--	--
Ethylbenzene	700	<1	<1	<1.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
Toluene	1,000	<1	<1	<1.00	<1.00	4.38	<1.00	<1.00	--	--	--	--	--
Total Xylenes	1,000	<1	170	<2.00	<2.00	<2.00	31.1	6.9	--	--	--	--	--
TPH - HCID													
Gasoline Range Organics	--	--	--	--	ND	--	ND	ND	ND	--	--	<250	<250	<250
Diesel Range Organics	--	--	--	--	ND	DET	DET	ND	ND	--	--	<500	<500	<500
Heavy Oil Range Organics	--	--	--	--	ND	ND	DET	ND	ND	--	--	<500	<500	<500
TPH-NWTPH													
Gasoline Range Organics	800	<100	<100	<80	--	**1,930**	149	254	--	--	--	--	--	--
Diesel Range Organics	500	**35,000**	**280,000**	<333	1,020	**14,100**	<250	<250	<200**	<400**	--	--	--	--
Heavy Oil Range Organics	500	<400	<400	<240	<500	**590**	<500	<500	<200	<400	--	--	--	--
Metals													
Antimony	NE	--	--	1.10	<1.00	<1.00	<1.00	<1.00	<2.5	<2.5	--	--	--	--
Arsenic	5	--	--	21.9	<1.00	2.01	1.32	<1.00	2.74	0.865	--	--	--	--
Barium	NE	--	--	112	18.6	72.2	31.40	27.9	--	--	--	--	--	--
Beryllium	NE	--	--	<1.00	<1.00	<1.00	<1.00	<1.00	<0.5	<0.5	--	--	--	--
Cadmium	5	--	--	<1.00	<1.00	<1.00	<1.00	<1.00	<0.5	<0.5	--	--	--	--
Chromium	50	--	--	24.0	4.92	20.7	7.76	6.33	3.57	6.05	--	--	--	--
Copper	NE	--	--	44.5	5.22	20.4	8.34	6.12	<0.5	<0.5	--	--	--	--
Lead (Total)	15	<1	--	49.9	2.64	5.15	1.78	1.40	0.535	<0.5	ND^	--	--	--
Lead (Dissolved)	15	--	--	--	--	--	--	--	--	--	ND^	--	--	--
Mercury	2	--	--	--	--	--	--	--	<0.2	<0.2	--	--	--	--
Nickel	NE	--	--	28.0	4.75	20.3	8.77	6.13	2.44	3.85	--	--	--	--
Selenium	NE	--	--	1.15	<1.00	<1.00	<1.00	<1.00	<1	<1	--	--	--	--
Silver	NE	--	--	--	--	--	--	--	<0.5	<0.5	--	--	--	--
Thallium	NE	--	--	--	--	--	--	--	<0.5	<0.5	--	--	--	--
Zinc	NE	--	--	85.7	18.3	35.6	21.5	11.7	7.89	8.58	--	--	--	--
c-Polyaromatic Hydrocarbons													
Naphthalene	(a)	--	--	<1.33	10.6	6.30	<1.00	5.73	<0.1	<0.1	--	--	--	--
1-Methylnaphthalene	(a)	--	--	--	--	--	--	--	3.4	28	--	--	--	--
2-Methylnaphthalene	(a)	--	--	--	--	--	--	--	11	33	--	--	--	--
Naphthalenes	160	--	--	0.67	10.6	6.30	0.50	5.73	--	--	--	--	--	--
Acenaphthene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--	--
Acenaphthylene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--	--
Anthracene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--	--
Benzo (a) anthracene	(b)	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--	--
Benzo (a) pyrene	0.1	--	--	<1.33*	<1.00*	<1.00*	<1.00*	<1.00*	<0.1	<0.1	--	--	--	--
Benzo (b) fluoranthene	(b)	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--	--

Table 4
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Site
1120 West Bay Drive Northwest, Olympia, WA

All analytical results are presended in micrograms per liter (µg/L)

Analysis	MTCA Method A Cleanup Levels	Sample ID Sample Location Type Date Collected											
		W-1 9/20/2000	W-2 9/20/2000	IPD-1 TP 2001	IPD-2 TP 2001	IPD-3 TP 2001	IPD-4 TP 2001	IPD-5 TP 2001	WBTP-01 TP 3/9/2004	WBTP-02 TP 3/9/2004	MW-6 MW 8/26/2004	MW-6 MW 11/12/2004	MW-6 MW 1/10/2005
Benzo (g,h,i) perylene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Benzo (k) fluoranthene	(b)	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Chrysene	(b)	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Dibenzo (a,h) anthracene	(b)	--	--	<2.67	<2.00	<2.00	<2.00	<2.00	<0.1	<0.1	--	--	--
Fluoranthene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Fluorene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Indeno (1,2,3-cd) pyrene	(b)	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Phenanthrene	NE	--	--	<1.33	<1.00	2.28	<1.00	<1.00	<0.1	<0.1	--	--	--
Pyrene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
cPAH B(a)P Equivalents	0.1	--	--	1.88	0.86	0.81	0.81	0.81	--	--	--	--	--

Notes:

Concentrations compared to the Model Toxics Control Act (MTCA) Method A groundwater cleanup levels presented in Table 720-1 of Chapter 173-340 of the Washington Administrative Code (WAC)

The MTCA cleanup level for gasoline range total petroleum hydrocarbons is 1000-µg/kg without benzene and 800-µg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 800-µg/kg was utilized.

TP = test pit

MW = monitoring well

µg/L = micrograms per kilogram

NE = Cleanup level not established under MTCA

cPAH = Carcinogenic polyaromatic hydrocarbons

B(a)P = Benzo(a)pyrene

ND = Not Detected (Hydrocarbon Identification Method)

ND^ = Reported by previous consultant as "Not Detected". Reporting and/or detection limit was not specified.

** Laboratory report in Appendix B of Parametrix's 2004 West Bay Phase II ESA indicated these constituents were ND. Table 2 of Delta's 2008 Remedial Investigation Work Plan reported TPH-D concentrations as 10,000 and 59,000 µg/L (WBTP-01 and WBTP-02, respectively). The 2008 RIWP did not provide a laboratory report.

-- = not applicable or analyzed

< = Chemical not detected above the laboratory reporting limit, method detection limit, or practical quantitation limit

Italics = Value calculated for comparison to MTCA cleanup level

ND' = Laboratory practical quantitation limit is elevated above the MTCA Method A cleanup level, but chemical was not observed above the laboratory reporting limit

Bolded and highlighted font indicates results above the MTCA Method A cleanup leve

(a) = See MTCA cleanup level for naphthalene. This is a total value for naphthalene, 1-methylnaphthalene and 2-methylnaphthalene

(b) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)

Table 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
Closure Request Report
Former Industrial Petroleum Distributors Bulk Terminal
1120 West Bay Drive Northwest, Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID (Depth below ground surface in feet) Date Collected						
		GP-1 (2-2.5) 8/25/2010	GP-1 (4-4.5) 8/25/2010	GP-1 (6-6.5) 8/25/2010	GP-2 (2-2.5) 8/25/2010	GP-2 (4-4.5) 8/25/2010	GP-3 (2-2.5) 8/24/2010	GP-3 (4-4.5) 8/24/2010
Volatile Organic Compounds	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Benzene	0.03	<0.0047	<0.019	--	<0.0042	<0.0086	<0.0034	<0.0038
Ethylbenzene	6	<0.0047	<0.019	--	<0.0042	<0.0086	<0.0034	<0.0038
Toluene	7	<0.0047	0.0342	--	<0.0042	<0.0086	<0.0034	<0.0038
Total Xylenes	9	<0.014	<0.0567	--	<0.0126	<0.0259	<0.0101	<0.0113
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Hydrocarbons	30	<8.6	<47*	--	<9.8	**264**	<6.2	<8.6
Diesel Range Organics	2,000	30.4	60.9	--	732	**3,120**	<21.8	31.1
Residual Range/Heavy Oil Organics	2,000	198	481	--	<124	296	<87.1	<103
RCRA 8 Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	20	<12.3	<4.8	--	<13.3	<4.4	<10.9	<12.4
Barium	NE	80.6	52.7	--	53.6	50.0	107	101
Cadmium	2	<6.2*	<2.4*	--	<6.6*	<2.2*	<5.5*	<6.2*
Chromium (total)	(a)	26.7	10.4	--	24.6	17.5	34.5	40.4
Lead	250	4.7	5.2	--	4.1	4.9	5.2	4.0
Mercury	2	<0.12	<0.27	--	<0.15	<0.24	<0.11	<0.12
Selenium	NE	<6.2	<2.4	--	<6.6	<2.2	<5.5	<6.2
Silver	NE	<6.2	<2.4	--	<6.6	<2.2	<5.5	<6.2
c-Polyaromatic Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Naphthalene	(b)	0.0087	<0.0178	<0.0451	<0.0104	0.192	<0.0075	<0.0087
1-Methylnaphthalene	(b)	<0.0087	<0.0178	<0.0451	0.0217	0.449	<0.0075	0.0143
2-Methylnaphthalene	(b)	0.0111	<0.0178	<0.0451	0.0228	0.463	<0.0075	0.0199
Naphthalenes	5	*0.0242*	*0.0267*	*0.0677*	*0.0497*	*1.10*	*0.011*	*0.039*
Acenaphthene	NE	<0.0087	<0.0178	<0.0451	<0.0104	0.0896	<0.0075	<0.0087
Acenaphthylene	NE	<0.0087	<0.0178	<0.0451	0.0107	0.0688	<0.0075	<0.0087
Anthracene	NE	<0.0087	<0.0178	<0.0451	<0.0104	0.194	<0.0075	<0.0087
Benzo (a) anthracene	(c)	<0.0087	<0.0178	<0.0451	<0.0104	0.315	<0.0075	<0.0087
Benzo (a) pyrene	0.1	<0.0087	<0.0178	<0.0451	<0.0104	**0.233**	<0.0075	<0.0087
Benzo (b) fluoranthene	(c)	<0.0087	<0.0178	<0.0451	<0.0104	0.165	<0.0075	<0.0087
Benzo (g,h,i) perylene	NE	<0.0087	<0.0178	<0.0451	<0.0104	0.0429	<0.0075	<0.0087
Benzo (k) fluoranthene	(c)	<0.0087	<0.0178	<0.0451	<0.0104	0.205	<0.0075	<0.0087
Chrysene	(c)	<0.0087	<0.0178	<0.0451	<0.0104	0.338	<0.0075	<0.0087
Dibenzo (a,h) anthracene	(c)	<0.0087	<0.0178	<0.0451	<0.0104	0.0498	<0.0075	<0.0087
Fluoranthene	NE	<0.0087	0.0237	0.0540	<0.0104	0.488	<0.0075	<0.0087
Fluorene	NE	<0.0087	<0.0178	<0.0451	0.0136	0.294	<0.0075	<0.0087
Indeno (1,2,3-cd) pyrene	(c)	<0.0087	<0.0178	<0.0451	<0.0104	0.0550	<0.0075	<0.0087
Phenanthrene	NE	0.0114	0.0302	<0.0451	0.0383	0.999	<0.0075	0.0103
Pyrene	NE	<0.0087	<0.0178	0.0625	<0.0104	0.522	<0.0075	<0.0087
cPAH B(a)P Equivalents	0.1	0.0044	0.0089	0.0226	0.00785	**0.315**	0.0038	0.0044

Table 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
Closure Request Report
Former Industrial Petroleum Distributors Bulk Terminal
1120 West Bay Drive Northwest, Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID (Depth below ground surface in feet) Date Collected						
		GP-4 (2-2.5) 8/23/2010	GP-4 (4-4.5) 8/23/2010	GP-5 (2-2.5) 8/23/2010	GP-5 (4-4.5) 8/23/2010	GP-5 (6-6.5) 8/23/2010	GP-6 (2-2.5) 8/25/2010	GP-6 (4-4.5) 8/25/2010
Volatile Organic Compounds	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Benzene	0.03	<0.0033	<0.0033	<0.0034	<0.0095	--	<0.0031	<0.0029
Ethylbenzene	6	<0.0033	<0.0033	<0.0034	<0.0095	--	<0.0031	<0.0029
Toluene	7	<0.0033	<0.0033	<0.0034	<0.0095	--	<0.0031	<0.0029
Total Xylenes	9	<0.0099	<0.0099	<0.0102	**0.107**	--	<0.0094	<0.0087
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Hydrocarbons	30	<7.6	<7.4	<7.2	**875**	--	<6.6	**486**
Diesel Range Organics	2,000	<24.7	<26.2	31.8	**3,780**	--	<23.3	899
Residual Range/Heavy Oil Organics	2,000	<98.6	<105	<98.8	1,040	--	<93.1	<98.7
RCRA 8 Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	20	<13.1	<12.6	<12.4	<21.0*	--	<11.5	<12.1
Barium	NE	120	115	107	130	--	127	139
Cadmium	2	<6.5*	<6.3*	<6.2*	<10.5*	--	<5.7*	<6.1*
Chromium (total)	(a)	48.1	48.3	35.1	40.7	--	41.5	42.4
Lead	250	4.6	7.1	8.6	31.0	--	6.4	6.3
Mercury	2	<0.13	<0.13	<0.11	<0.17	--	<0.093	<0.11
Selenium	NE	<6.5	<6.3	<6.2	<10.5	--	<5.7	<6.1
Silver	NE	<6.5	<6.3	<6.2	<10.5	--	<5.7	<6.1
c-Polyaromatic Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Naphthalene	(b)	<0.0086	<0.0089	0.0556	4.090	0.988	<0.0079	0.141
1-Methylnaphthalene	(b)	<0.0086	<0.0089	0.0397	9.56	2.580	<0.0079	0.532
2-Methylnaphthalene	(b)	<0.0086	<0.0089	0.0771	12.300	2.840	<0.0079	0.627
Naphthalenes	5	*0.013*	*0.013*	*0.172*	***25.95***	***6.408***	*0.019*	*1.30*
Acenaphthene	NE	<0.0086	<0.0089	<0.0083	0.205	0.0646	<0.0079	0.0331
Acenaphthylene	NE	<0.0086	<0.0089	0.0105	0.155	0.0524	<0.0079	0.0323
Anthracene	NE	<0.0086	<0.0089	0.0214	0.0802	<0.0288	<0.0079	0.0113
Benzo (a) anthracene	(c)	<0.0086	<0.0089	0.0227	0.0231	<0.0288	<0.0079	0.0177
Benzo (a) pyrene	0.1	<0.0086	<0.0089	0.0216	<0.0147	<0.0288	<0.0079	0.0124
Benzo (b) fluoranthene	(c)	<0.0086	<0.0089	0.0269	0.0152	<0.0288	<0.0079	0.0081
Benzo (g,h,i) perylene	NE	<0.0086	<0.0089	0.0185	<0.0147	<0.0288	<0.0079	<0.0077
Benzo (k) fluoranthene	(c)	<0.0086	<0.0089	0.0219	<0.0147	<0.0288	<0.0079	0.0120
Chrysene	(c)	<0.0086	<0.0089	0.0312	0.0352	<0.0288	<0.0079	0.0202
Dibenzo (a,h) anthracene	(c)	<0.0086	<0.0089	<0.0083	<0.0147	<0.0288	<0.0079	<0.0077
Fluoranthene	NE	<0.0086	<0.0089	0.0645	0.0864	0.0517	0.0140	0.0359
Fluorene	NE	<0.0086	<0.0089	<0.0083	0.856	0.262	<0.0079	0.113
Indeno (1,2,3-cd) pyrene	(c)	<0.0086	<0.0089	0.0164	<0.0147	<0.0288	<0.0079	<0.0077
Phenanthrene	NE	<0.0086	<0.0089	0.0594	1.460	0.289	0.0109	0.152
Pyrene	NE	<0.0086	<0.0089	0.0530	0.125	0.048	0.0100	0.0426
cPAH B(a)P Equivalents	0.1	0.0043	0.0045	0.0307	0.0123	0.022	0.0056	0.016

Table 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
Closure Request Report
Former Industrial Petroleum Distributors Bulk Terminal
1120 West Bay Drive Northwest, Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID (Depth below ground surface in feet) Date Collected						
		GP-6 (6-6.5) 8/25/2010	GP-7 (2-2.5) 8/24/2010	GP-7 (6-6.5) 8/24/2010	GP-8 (2-2.5) 8/25/2010	GP-8 (4-4.5) 8/25/2010	GP-8 (6-6.5) 8/25/2010	GP-9 (2-2.5) 8/24/2010
Volatile Organic Compounds	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Benzene	0.03	<0.0038	<0.0041	<0.0031	<0.003	--	<0.0031	<0.0031
Ethylbenzene	6	<0.0038	<0.0041	<0.0031	<0.003	--	<0.0031	<0.0031
Toluene	7	<0.0038	<0.0041	<0.0031	<0.003	--	<0.0031	<0.0031
Total Xylenes	9	<0.0114	<0.0122	<0.0093	<0.009	--	<0.0093	<0.0092
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Hydrocarbons	30	**94.4**	<7.3	<7.2	<6.2	--	<6.6	<7.2
Diesel Range Organics	2,000	57.1	<23	<24.5	<19.3	--	<22.3	<24.9
Residual Range/Heavy Oil Organics	2,000	<108	<92.1	<98.2	<77.1	--	<89.3	<99.6
RCRA 8 Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	20	<13.9	<11.5	<12.7	<10.3	--	<11.8	12.4
Barium	NE	112	154	113	51	--	71.8	129
Cadmium	2	<7.0*	<5.8*	<6.3*	<5.2*	--	<5.9*	<6.2*
Chromium (total)	(a)	44.2	45	39.9	26.7	--	32.8	42.7
Lead	250	7.1	6.8	4.3	8.8	--	10.1	7.3
Mercury	2	<0.11	<0.11	<0.12	<0.096	--	<0.10	<0.12
Selenium	NE	<7.0	<5.8	<6.3	<5.2	--	<5.9	<6.2
Silver	NE	<7.0	<5.8	<6.3	<5.2	--	<5.9	<6.2
c-Polyaromatic Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Naphthalene	(b)	0.0135	<0.0081	<0.0085	0.0092	0.0089	0.0112	0.0181
1-Methylnaphthalene	(b)	0.0218	<0.0081	<0.0085	0.0090	0.0075	0.0102	0.0162
2-Methylnaphthalene	(b)	0.0217	<0.0081	<0.0085	0.0125	0.0109	0.0148	0.0248
Naphthalenes	5	*0.0570*	*0.012*	*0.013*	*0.031*	*0.027*	*0.0362*	*0.0591*
Acenaphthene	NE	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	<0.0084
Acenaphthylene	NE	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	<0.0084
Anthracene	NE	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	0.0126
Benzo (a) anthracene	(c)	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	0.0162
Benzo (a) pyrene	0.1	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	0.0147
Benzo (b) fluoranthene	(c)	<0.0097	<0.0081	<0.0085	0.0105	0.0085	0.0089	0.0239
Benzo (g,h,i) perylene	NE	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	0.0113
Benzo (k) fluoranthene	(c)	<0.0097	<0.0081	<0.0085	0.0078	<0.0071	<0.0077	0.0139
Chrysene	(c)	<0.0097	<0.0081	<0.0085	0.0111	0.0089	0.0092	0.0220
Dibenzo (a,h) anthracene	(c)	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	<0.0084
Fluoranthene	NE	<0.0097	<0.0081	<0.0085	0.0158	0.0143	0.0142	0.0424
Fluorene	NE	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	<0.0084
Indeno (1,2,3-cd) pyrene	(c)	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	0.0112
Phenanthrene	NE	<0.0097	<0.0081	<0.0085	0.0127	0.0122	0.0134	0.0323
Pyrene	NE	<0.0097	<0.0081	<0.0085	0.0124	0.0120	0.0110	0.0290
cPAH B(a)P Equivalents	0.1	0.0064	0.0041	0.0043	0.0054	0.0048	0.0052	0.0214

Table 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
Closure Request Report
Former Industrial Petroleum Distributors Bulk Terminal
1120 West Bay Drive Northwest, Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID (Depth below ground surface in feet) Date Collected						
		GP-9 (4-4.5) 8/24/2010	GP-9 (5.5-6) 8/24/2010	MW-6R (2-2.5) 8/23/2010	MW-6R (4-4.5) 8/23/2010	MW-6R (6-6.5) 8/23/2010	MW-7 (2-2.5) 8/24/2010	MW-7 (6-6.5) 8/24/2010
Volatile Organic Compounds	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Benzene	0.03	--	<0.0031	<0.0031	<0.0215	--	<0.0030	<0.0031
Ethylbenzene	6	--	<0.0031	<0.0031	<0.0215	--	<0.0030	<0.0031
Toluene	7	--	<0.0031	<0.0031	<0.0215	--	<0.0030	<0.0031
Total Xylenes	9	--	<0.0092	<0.0094	<0.0644	--	<0.0090	<0.0094
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Hydrocarbons	30	--	**13.8**	<6.5	**665**	--	<4.9	<6.8
Diesel Range Organics	2,000	--	<25.0	<22.5	**7,060**	--	<20.3	<24.3
Residual Range/Heavy Oil Organics	2,000	--	<100	<89.9	1,360	--	<81.0	<97.4
RCRA 8 Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	20	--	<13.0	<12.0	<10.0	--	<10.5	<12.5
Barium	NE	--	102	110	<100	--	84.1	123
Cadmium	2	--	<6.5*	<6.0*	<5.0*	--	<5.2*	<6.2*
Chromium (total)	(a)	--	36.5	39.4	5.0	--	22.8	34.4
Lead	250	--	10.7	4.3	12.6	--	6.6	10.7
Mercury	2	--	<0.11	<0.11	<0.43	--	<0.11	<0.12
Selenium	NE	--	<6.5	<6.0	<5.0	--	<5.2	<6.2
Silver	NE	--	<6.5	<6.0	<5.0	--	<5.2	<6.2
c-Polyaromatic Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Naphthalene	(b)	0.0110	0.0184	<0.0080	2.4800	0.0177	<0.0072	0.0092
1-Methylnaphthalene	(b)	<0.0089	0.0108	<0.0080	13.0000	0.0623	<0.0072	<0.0085
2-Methylnaphthalene	(b)	0.0123	0.018	<0.0080	16.7000	0.0568	<0.0072	<0.0085
Naphthalenes	5	*0.028*	*0.047*	*0.012*	***32.18***	*0.137*	*0.0108*	*0.0170*
Acenaphthene	NE	<0.0089	<0.0086	<0.0080	0.4860	<0.0101	<0.0072	<0.0085
Acenaphthylene	NE	<0.0089	0.0086	<0.0080	0.3300	<0.0101	<0.0072	<0.0085
Anthracene	NE	<0.0089	0.0205	<0.0080	0.1190	<0.0101	<0.0072	<0.0085
Benzo (a) anthracene	(c)	0.0143	0.0339	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Benzo (a) pyrene	0.1	0.0142	0.0317	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Benzo (b) fluoranthene	(c)	0.0163	0.0277	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Benzo (g,h,i) perylene	NE	<0.0089	0.0177	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Benzo (k) fluoranthene	(c)	0.0148	0.029	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Chrysene	(c)	0.0184	0.0334	<0.0080	0.0395	<0.0101	<0.0072	<0.0085
Dibenzo (a,h) anthracene	(c)	<0.0089	<0.0086	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Fluoranthene	NE	0.0405	0.0932	<0.0080	0.0544	<0.0101	<0.0072	<0.0085
Fluorene	NE	<0.0089	0.0167	<0.0080	1.6900	<0.0101	<0.0072	<0.0085
Indeno (1,2,3-cd) pyrene	(c)	0.0093	0.0172	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Phenanthrene	NE	0.0253	0.0877	<0.0080	2.9000	<0.0101	<0.0072	<0.0085
Pyrene	NE	0.0290	0.0652	<0.0080	0.2120	<0.0101	<0.0072	<0.0085
cPAH B(a)P Equivalents	0.1	0.0199	0.0428	0.0040	0.0183	0.00510	0.0036	0.0043

Table 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
Closure Request Report
Former Industrial Petroleum Distributors Bulk Terminal
1120 West Bay Drive Northwest, Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID (Depth below ground surface in feet) Date Collected						
		MW-8 (2-2.5) 8/24/2010	MW-8 (6-6.5) 8/24/2010	MW-9 (2-2.5) 8/24/2010	MW-9 (6-6.5) 8/24/2010	MW-10 (2-2.5) 8/24/2010	MW-10 (4-4.5) 8/24/2010	MW-11 (2-2.5) 8/25/2010
Volatile Organic Compounds	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Benzene	0.03	<0.0036	<0.0036	<0.0042	<0.0032	<0.0039	<0.0033	<0.0033
Ethylbenzene	6	<0.0036	<0.0036	<0.0042	<0.0032	<0.0039	<0.0033	<0.0033
Toluene	7	<0.0036	<0.0036	<0.0042	<0.0032	<0.0039	<0.0033	<0.0033
Total Xylenes	9	<0.011	<0.0109	<0.013	<0.0097	<0.0116	<0.010	<0.010
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Hydrocarbons	30	<7.0	<7.9	<9.0	<8.36	<8.1	<7.8	<7.0
Diesel Range Organics	2,000	<21.6	<25.4	<24.7	<25.6	<23.4	<26.9	**72.3**
Residual Range/Heavy Oil Organics	2,000	<86.3	<102	<98.7	<102	<93.4	<107	**176**
RCRA 8 Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	20	<10.9	<13.1	<10.0	<11.1	<12.4	<13.2	<11.2
Barium	NE	131	140	156	126	118	126	131
Cadmium	2	<5.5*	<6.6*	<5.0*	<5.6*	<6.2*	<6.6*	<5.6*
Chromium (total)	(a)	41.7	41.9	49.0	46.0	45.8	42.0	28
Lead	250	5	4.1	7.7	6.1	4.9	14.0	58.3
Mercury	2	<0.11	<0.12	<0.13	<0.11	<0.12	<0.14	0.12
Selenium	NE	<5.5	<6.6	<5.0	<5.6	<6.2	<6.6	<5.6
Silver	NE	<5.5	<6.6	<5.0	<5.6	<6.2	<6.6	<5.6
c-Polyaromatic Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Naphthalene	(b)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.106
1-Methylnaphthalene	(b)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.146
2-Methylnaphthalene	(b)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.180
Naphthalenes	5	*0.011*	*0.014*	*0.013*	*0.014*	*0.012*	*0.014*	*0.432*
Acenaphthene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	<0.0076
Acenaphthylene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0147
Anthracene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0277
Benzo (a) anthracene	(c)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0461
Benzo (a) pyrene	0.1	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0460
Benzo (b) fluoranthene	(c)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0566
Benzo (g,h,i) perylene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0231
Benzo (k) fluoranthene	(c)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0356
Chrysene	(c)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0701
Dibenzo (a,h) anthracene	(c)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0087
Fluoranthene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0943
Fluorene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0120
Indeno (1,2,3-cd) pyrene	(c)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0210
Phenanthrene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.125
Pyrene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	0.0860
cPAH B(a)P Equivalents	0.1	0.0037	0.0045	0.0044	0.0045	0.0041	0.0045	0.0635

Table 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
Closure Request Report
Former Industrial Petroleum Distributors Bulk Terminal
1120 West Bay Drive Northwest, Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID (Depth below ground surface in feet) Date Collected				
		MW-11 (4-4.5) 8/25/2010	MW-11 (6-6.5) 8/25/2010	MW-12 (2-2.5) 8/25/2010	MW-12 (4-4.5) 8/25/2010	MW-12 (6-6.5) 8/25/2010
Volatile Organic Compounds	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Benzene	0.03	<0.0036	--	<0.0034	<0.0035	--
Ethylbenzene	6	<0.0036	--	<0.0034	<0.0035	--
Toluene	7	<0.0036	--	<0.0034	<0.0035	--
Total Xylenes	9	<0.0108	--	<0.010	<0.011	--
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Hydrocarbons	30	<7.4	--	<6.9	<7.2	--
Diesel Range Organics	2,000	52.9	--	75.7	43.1	--
Residual Range/Heavy Oil Organics	2,000	142	--	153	154	--
RCRA 8 Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	20	<11.5	--	<12.3	<11.4	--
Barium	NE	132	--	146	103	--
Cadmium	2	<5.8*	--	<6.2*	<5.7*	--
Chromium (total)	(a)	31.6	--	39.9	27.9	--
Lead	250	55.2	--	17.0	49.7	--
Mercury	2	0.2	--	<0.12	<0.11	--
Selenium	NE	<5.8	--	<6.2	<5.7	--
Silver	NE	<5.8	--	<6.2	<5.7	--
c-Polyaromatic Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Naphthalene	(b)	0.0585	0.0891	0.147	0.101	0.0785
1-Methylnaphthalene	(b)	0.0814	0.105	0.141	0.110	0.0282
2-Methylnaphthalene	(b)	0.101	0.134	0.194	0.149	0.0458
Naphthalenes	5	*0.241*	*0.3281*	*0.482*	*0.360*	*0.153*
Acenaphthene	NE	<0.0078	0.0726	0.0186	0.0093	<0.0117
Acenaphthylene	NE	0.0105	0.0210	0.0205	0.0232	<0.0117
Anthracene	NE	0.0209	0.112	0.0517	0.0561	0.0225
Benzo (a) anthracene	(c)	0.0314	0.154	0.0871	0.0849	0.108
Benzo (a) pyrene	0.1	0.0328	**0.168**	0.0941	0.0861	**0.114**
Benzo (b) fluoranthene	(c)	0.0445	0.181	0.118	0.136	0.106
Benzo (g,h,i) perylene	NE	0.0181	0.0745	0.0504	0.0472	0.0548
Benzo (k) fluoranthene	(c)	0.0352	0.120	0.0866	0.0877	0.0882
Chrysene	(c)	0.0477	0.171	0.146	0.134	0.116
Dibenzo (a,h) anthracene	(c)	<0.0078	0.0270	0.0198	0.0174	0.0231
Fluoranthene	NE	0.0690	0.415	0.292	0.219	0.244
Fluorene	NE	<0.0078	0.0367	0.0206	0.0136	0.0126
Indeno (1,2,3-cd) pyrene	(c)	0.0173	0.0708	0.0480	0.0492	0.0532
Phenanthrene	NE	0.0733	0.426	0.257	0.143	0.0945
Pyrene	NE	0.0564	0.358	0.228	0.165	0.195
cPAH B(a)P Equivalents	0.1	0.0465	**0.225**	**0.132**	**0.125**	**0.153**

Table 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
Closure Request Report
Former Industrial Petroleum Distributors Bulk Terminal
1120 West Bay Drive Northwest, Olympia, Washington

Notes:
Concentrations compared to the Model Toxics Control Act (MTCA) Method A soil cleanup levels for unrestricted land uses presented in Table 740-1 of Chapter 173-340 of the Washington Administrative Code (WAC)
The MTCA cleanup level for gasoline range total petroleum hydrocarbons is 100-mg/kg without benzene and 30-mg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 30-mg/kg was utilized.
ft = Feet
bgs = Below ground surface
mg/kg = milligram per kilogram
NE = Cleanup level not established under MTCA
-- = not applicable or analyzed
cPAH = Carcinogenic polyaromatic hydrocarbons
B(a)P = Benzo(a)pyrene
< = Chemical not detected above the laboratory reporting limit
* = Laboratory practical quantitation limit is elevated above the MTCA Method A cleanup level, but chemical was not observed above the laboratory method detection limit
Italics = Value calculated for comparison to MTCA cleanup level
Bold = Chemical detected at a concentration above the laboratory reporting limit
Bolded and highlighted font indicates results above the MTCA Method A cleanup level
(a) = Analysis is for total chromium. No MTCA cleanup level has been established for total chromium.
(b) = MTCA cleanup level is 5-mg/kg for total concentration of naphthalene, 1-methylnaphthalene and 2-methylnaphthalene
(c) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)
Lab QA/QC surrogate recovery was outside control limits due to matrix interference for samples GP1-4-4.5, GP1-6-6.5, GP2-4-4.5, GP5-4-4.5, GP6-4-4.5, GP6-6-6.5

Table 6
PRE-EXCAVATION CLEANUP ACTION PLAN SOIL ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Site
1120 West Bay Drive Northwest, Olympia, Washington

All analytical results are presented in milligrams per kilogram (mg/kg)

Sample Location	Sample ID	Sample Depth (feet bgs)	Depth range (feet bgs)	Date	NWTPH-GX Soil C7-C12	Diesel Range Organics C12-C24	Heavy Range Organics C24-C40	DRO C12-C24 w/Si Gel	HRO C24-C40 w/Si Gel	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Naphthalenes[1]	Total Adjusted cPAHs[2]
Model Toxics Control Act (MTCA) Method A Cleanup Levels					**30/100**	**2000**	**2000**	**2,000**	**2,000**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**5**	**0.1**
AUS-SB01	AUS-SB-1A(4.5-5)	(4.5-5)	(0-5)	08/17/2015	ND 1.5	-	-	9.2	64	0.0012 J	0.0014 J	0.0035	0.0014 J	0.0028	ND 0.00085	ND 0.00085	0.0029	0.0049	0.0037	0.0115	0.002
AUS-SB01	SB-1A-12.5	12.5	(10-15)	08/28/2015	ND 1.2	-	-	ND 3.6	ND 12	ND 0.00080	ND 0.00080	ND 0.00080	ND 0.00080	ND 0.00040	ND 0.00080	ND 0.00080	ND 0.00080	ND 0.00080	ND 0.00080	0.0012	0.001
AUS-SB01	SB-1A-7.5	7.5	(5-10)	08/28/2015	ND 80	-	-	1,300	680	0.044	0.045	0.060	0.020	0.048	0.0036 J	0.012	0.013	0.019	0.046	0.078	0.059
AUS-SB02	AUS-SB-2(2-2.5)	(2-2.5)	(0-5)	08/17/2015	ND 1.3	-	-	5.7 J	49	ND 0.00083	ND 0.00083	0.0012 J	ND 0.00083	0.0012 J	ND 0.00083	ND 0.00083	ND 0.00083	0.0011 J	0.0024	0.003915	0.001
AUS-SB02	SB-2-9.5	9.5	(5-10)	08/28/2015	ND 10	-	-	ND 3.4	ND 11	0.0079	0.0082	0.012	0.0040	0.0086	ND 0.00076	0.0017 J	0.00076 J	0.0019 J	0.0020	0.00466	0.011
AUS-SB03	AUS-SB-3(2-2.5)	(2-2.5)	(0-5)	08/17/2015	ND 1.5	-	-	8.7	68	0.0056	0.0062	0.013	0.0052	0.01	0.00084 J	0.0028	0.001 J	0.002 J	0.0045	0.0075	0.009
AUS-SB03	SB-3-7.5	7.5	(5-10)	08/31/2015	ND 57	-	-	170	1,500	ND 0.0021	ND 0.0021	0.0030 J	ND 0.0021	0.0050 J	ND 0.0021	ND 0.0021	0.12	0.054	0.041	0.215	0.002
AUS-SB04	AUS-SB-4A(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 16	-	-	ND 3.6	ND 12	0.0036	0.0030	0.0096	0.0041 J	0.011	ND 0.00081	0.0018 J	0.0012 J	0.0022	0.0019 J	0.0053	0.005
AUS-SB04	SB-4A-7.5	7.5	(5-10)	08/28/2015	ND 11	-	-	ND 3.4	ND 11	ND 0.00075	ND 0.00075	0.0012 J	ND 0.00075	0.00073 J	ND 0.00075	ND 0.00075	ND 0.00075	ND 0.00075	ND 0.00075	0.001125	0.001
AUS-SB05	AUS-SB-5A(4.5-5)	(4.5-5)	(0-5)	08/17/2015	ND 1.3	-	-	ND 3.8	ND 13	0.0029	0.0031	0.006	0.002 J	0.0043	ND 0.00083	0.0012 J	0.0053	0.012	0.0074	0.0247	0.004
AUS-SB05	SB-5A-12.5	12.5	(10-15)	08/28/2015	ND 1.0	-	-	ND 3.4	ND 11	ND 0.0010	ND 0.0010	ND 0.0010	ND 0.0010	ND 0.00051	ND 0.0010	ND 0.0010	ND 0.0010	ND 0.0010	ND 0.0010	0.0015	0.001
AUS-SB05	SB-5A-7.5	7.5	(5-10)	08/28/2015	ND 73	-	-	850	580	0.0049 J	0.0057 J	0.010	0.0037 J	0.0057 J	ND 0.0030	ND 0.0030	0.065	0.093	0.018	0.176	0.008
AUS-SB05	DUP-5	12.5	(10-15)	08/28/2015	ND 1.0	-	-	ND 3.5	ND 12	ND 0.00077	ND 0.00077	ND 0.00077	ND 0.00077	ND 0.00039	ND 0.00077	ND 0.00077	0.011	0.012	0.0057	0.0287	0.001
AUS-SB06	AUS-SB-6(2-2.5)	(2-2.5)	(0-5)	08/17/2015	2.4 J	-	-	13	120	0.00095 J	ND 0.00091	0.0034	0.00095 J	0.0022 J	ND 0.00091	ND 0.00091	0.001 J	0.0011 J	0.007	0.0091	0.001
AUS-SB06	SB-6-7.5	7.5	(5-10)	08/31/2015	ND 69	-	-	290	1,100	ND 0.013	ND 0.013	ND 0.013	ND 0.013	0.010 J	ND 0.013 UJ	ND 0.013 UJ	1.4 J	1.9 J	0.056 J	3.356	0.010
AUS-SB06	DUP-7	7.5	(5-10)	08/31/2015	77 J	-	-	440	1,500	ND 0.025	ND 0.025	ND 0.025	ND 0.025	ND 0.012	ND 0.025	ND 0.025	7.9 J	12 J	0.25 J	**20.15**	0.019
AUS-SB07	AUS-SB-7(2-2.5)	(2-2.5)	(0-5)	08/17/2015	ND 1.4	-	-	5.9 J	22 J	0.0017 J	0.002 J	0.0051	0.0016 J	0.004	ND 0.00086	0.001 J	ND 0.00086	0.0011 J	0.0022	0.00373	0.003
AUS-SB07	SB-7-7.5	7.5	(5-10)	08/31/2015	ND 65	-	-	290	1,700	0.0026 J	ND 0.0024	0.0061	ND 0.0024	0.0076	ND 0.0024	ND 0.0024	0.96	0.62	0.23	1.81	0.003
AUS-SB08	AUS-SB-8(2-2.5)	(2-2.5)	(0-5)	08/17/2015	ND 1.5	-	-	ND 3.6	ND 12	0.0011 J	0.0013 J	0.0049	0.0013 J	0.0039	ND 0.0008	ND 0.0008	0.0018 J	0.0025	0.0075	0.0118	0.002
AUS-SB08	SB-8-7.5	7.5	(5-10)	09/01/2015	ND 54	-	-	310	1,800	ND 0.011	ND 0.011	ND 0.011	ND 0.011	0.0062 J	ND 0.011	ND 0.011	0.22	0.091	0.083	0.394	0.008
AUS-SB09	AUS-SB-9(2-2.5)	(2-2.5)	(0-5)	08/17/2015	1.0 J	-	-	20	110	0.035	0.040	0.13	0.032	0.080	0.0070	0.020	0.026	0.042	0.038	0.106	0.063
AUS-SB09	SB-9-7.5	7.5	(5-10)	08/28/2015	ND 13	-	-	ND 3.8	ND 13	0.0043	0.0053	0.012	0.0034	0.0070	ND 0.00085	0.0016 J	0.0013 J	0.0028	0.0040	0.0081	0.008
AUS-SB10	AUS-SB-10A(2-2.5)	(2-2.5)	(0-5)	08/17/2015	ND 1.4	-	-	ND 3.6	ND 12	0.033	0.035	0.095	0.041	0.079	0.0050	0.017	0.0067	0.0099	0.013	0.0296	0.055
AUS-SB10	SB-10-7.5	7.5	(5-10)	08/28/2015	ND 11	-	-	ND 3.6	21 J	0.15	0.16	0.21	0.095	0.16	0.011	0.032	0.011	0.019	0.043	0.073	**0.211**
AUS-SB11	AUS-SB-11(2-2.5)	(2-2.5)	(0-5)	08/17/2015	ND 1.3	-	-	ND 3.8	ND 13	0.0030	0.0040	0.010	0.0033	0.0076	ND 0.00083	0.0021	0.0023	0.0028	0.0048	0.0099	0.006
AUS-SB11	SB-11-12.5	12.5	(10-15)	08/31/2015	ND 11	-	-	ND 3.4	ND 11	0.13	0.13	0.18	0.073	0.14	0.012	0.039	0.027	0.031	0.026	0.084	**0.175**
AUS-SB11	SB-11-7.5	7.5	(5-10)	08/31/2015	ND 63	-	-	310	1,300	ND 0.012	ND 0.012	0.016 J	ND 0.012	0.0098 J	ND 0.012	ND 0.012	0.57	0.75	0.093	1.413	0.010
AUS-SB12	AUS-SB-12(2-2.5)	(2-2.5)	(0-5)	08/18/2015	2.4 J	-	-	3.6 J	16 J	ND 0.00080	ND 0.00080	0.00084 J	ND 0.00080	0.0011 J	ND 0.00080	ND 0.00080	0.0034	0.0060	0.0081	0.0175	0.001
AUS-SB12	SB-12-7.5	7.5	(5-10)	08/31/2015	ND 69	-	-	580	1,900	ND 0.0026 UJ	ND 0.0026 UJ	0.0035 J	ND 0.0026 UJ	0.0029 J	ND 0.0026 UJ	ND 0.0026 UJ	0.12 J	0.044 J	0.017 J	0.181	0.002
AUS-SB12	DUP-2	(2-2.5)	(0-5)	08/18/2015	1.7 J	-	-	ND 3.5	25 J	ND 0.00079	ND 0.00079	0.00093 J	ND 0.00079	0.00071 J	ND 0.00079	ND 0.00079	0.0017 J	0.0032	0.0043	0.0092	0.001
AUS-SB13	AUS-SB-13(2-2.5)	(2-2.5)	(0-5)	08/18/2015	1.6 J	-	-	ND 3.5	ND 12	0.00097 J	0.0010 J	0.0026	ND 0.00078	0.0028	ND 0.00078	0.00088 J	ND 0.00078	0.0010 J	0.0041	0.00549	0.002
AUS-SB13	SB-13-7.5	7.5	(5-10)	09/01/2015	ND **260**	-	-	340	1,900	ND 0.011	ND 0.011	ND 0.011	ND 0.011	0.0056 J	ND 0.011	ND 0.011	0.48	0.22	0.21	0.91	0.008
AUS-SB14	AUS-SB-14(2-2.5)	(2-2.5)	(0-5)	08/18/2015	2.4 J	-	-	5.9 J	18 J	ND 0.00080	ND 0.00080	0.0013 J	ND 0.00080	0.0014 J	ND 0.00080	ND 0.00080	0.00084 J	0.0016 J	0.011	0.01344	0.001
AUS-SB14	SB-14-7.5	7.5	(5-10)	09/01/2015	ND 47	-	-	210	1,200	ND 0.0096	ND 0.0096	ND 0.0096	ND 0.0096	0.0066 J	ND 0.0096	ND 0.0096	0.030	0.020 J	0.018 J	0.068	0.007
AUS-SB15	SB-15-7.5	7.5	(5-10)	08/27/2015	ND 0.94	-	-	ND 3.3	ND 11	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00037	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	0.00111	0.001
AUS-SB16	SB-16-7.5	7.5	(5-10)	08/27/2015	ND 0.84	-	-	4.0 J	24 J	1.4	1.8	2.1	0.86	1.5	0.10	0.27	0.019	0.052	0.13	0.201	**2.288**
AUS-SB17	AUS-SB-17(2-2.5)	(2-2.5)	(0-5)	08/18/2015	ND 1.5	-	-	ND 3.8	ND 13	0.012	0.011	0.046	0.018	0.043	0.0016 J	0.0063	0.0085	0.015	0.014	0.0375	0.020
AUS-SB17	SB-17-7.5	7.5	(5-10)	08/31/2015	ND 0.99	-	-	ND 3.4	ND 11	0.018	0.019	0.023	0.011	0.019	0.0017 J	0.0055	0.0021	0.0027	0.0045	0.0093	0.025
AUS-SB18	AUS-SB-18(2-2.5)	(2-2.5)	(0-5)	08/18/2015	ND 1.4	-	-	ND 3.4	26 J	0.0020	0.0023	0.0054	0.0020	0.0046	ND 0.00075	0.0011 J	ND 0.00075	0.0013 J	0.00094 J	0.002615	0.003
AUS-SB18	SB-18-7.5	7.5	(5-10)	08/31/2015	55 J	-	-	**4,500** J	**10,000** J	19 J	16 J	39 J	ND 0.34 UJ	26 J	2.4 J	4.4 J	16 J	19 J	19 J	**54**	**22.757**
AUS-SB18A	SB-18A-12.5	12.5	(10-15)	08/31/2015	2.0 J	-	-	ND 3.2	ND 11	0.0011 J	0.00096 J	0.0011 J	ND 0.00072	0.00095 J	ND 0.00072	ND 0.00072	0.00083 J	0.0014 J	ND 0.00072	0.00259	0.001
AUS-SB19	AUS-SB-19(2-2.5)	(2-2.5)	(0-5)	08/18/2015	ND 1.3	-	-	ND 3.4	ND 11	ND 0.00075	ND 0.00075	0.0012 J	ND 0.00075	0.0013 J	ND 0.00075	ND 0.00075	ND 0.00075	ND 0.00075	0.00075 J	0.0015	0.001
AUS-SB19	SB-19-14.5	14.5	(10-15)	08/31/2015	28 J	-	-	580	**2,300**	7.7 J	6.7 J	6.7 J	3.1 J	7.7 J	0.69 J	1.9 J	14 J	23 J	50 J	**87**	**8.786**
AUS-SB19	SB-19-7.5	7.5	(5-10)	08/31/2015	ND 58	-	-	**9,600** J	**64,000** J	7.7 J	7.0 J	16 J	ND 0.11 UJ	11 J	0.87 J	1.7 J	2.1 J	2.0 J	3.3 J	**7.4**	**9.743**
AUS-SB20	AUS-SB-20(2-2.5)	(2-2.5)	(0-5)	08/18/2015	ND 1.2	-	-	ND 3.5	ND 12	0.0011 J	0.0015 J	0.0036	0.0011 J	0.0036	ND 0.00078	0.0013 J	ND 0.00078	0.00088 J	0.0016 J	0.00287	0.002
AUS-SB20	SB-20-12.5	12.5	(10-15)	08/31/2015	ND 73	-	-	170	630	ND 0.0027	ND 0.0027	0.0065 J	ND 0.0027	0.0046 J	ND 0.0027	0.0028 J	0.10	0.11	0.049	0.259	0.003
AUS-SB20	SB-20-7.5	7.5	(5-10)	08/31/2015	**160** J	-	-	150	810	ND 0.0023	ND 0.0023	0.0047 J	ND 0.0023	0.0020 J	ND 0.0023	ND 0.0023	0.41	0.42	0.057	0.887	0.002
AUS-SB21	AUS-SB-21(2-2.5)	(2-2.5)	(0-5)	08/18/2015	ND 1.3	-	-	ND 3.5	ND 12	ND 0.00078	ND 0.00078	0.0015 J	ND 0.00078	0.0015 J	ND 0.00078	ND 0.00078	ND 0.00078	ND 0.00078	0.0022	0.00298	0.001
AUS-SB21	SB-21-7.5	7.5	(5-10)	08/28/2015	ND 69	-	-	340	1,800	ND 0.0025	ND 0.0025	0.0035 J	ND 0.0025	0.0048 J	ND 0.0025	ND 0.0025	0.36	0.14	0.052	0.552	0.002
AUS-SB22	AUS-SB-22(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 18	-	-	ND 3.7 UJ	ND 12	0.0082 J	0.0074 J	0.018	0.0051 J	0.016 J	0.0015 J	0.0052 J	0.011 J	0.015 J	0.016 J	0.042	0.011
AUS-SB22	SB-22-7.5	7.5	(5-10)	08/27/2015	ND 0.97	-	-	ND 3.3	ND 11	ND 0.00073	ND 0.00073	0.00079 J	ND 0.00073	ND 0.00037	ND 0.00073 UJ	ND 0.00073 UJ	ND 0.00073	ND 0.00073	ND 0.00073	0.001095	0.001
AUS-SB23-A	SB-23-A-7.5	7.5	(5-10)	08/27/2015	ND 1.1	-	-	ND 3.3	ND 11	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00037	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	0.00111	0.001
AUS-SB24	SB-24-7.5	7.5	(5-10)	08/31/2015	ND 0.83	-	-	ND 3.2	ND 11	ND 0.00072	ND 0.00072	ND 0.00072	ND 0.00072	ND 0.00036	ND 0.00072	ND 0.00072	ND 0.00072	ND 0.00072	ND 0.00072	0.00108	0.001
AUS-SB25	AUS-SB-25A(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 13	-	-	5.8 J	55	0.0036	0.0049	0.012	0.0045 J	0.0079	0.00098 J	0.0036	0.0017 J	0.0032	0.0046	0.0095	0.007
AUS-SB25	SB-25A-12.5	12.5	(10-15)	08/28/2015	ND 1.1	-	-	ND 3.6	ND 12	ND 0.00080	ND 0.00080	ND 0.00080	ND 0.00080	ND 0.00040	ND 0.00080	ND 0.00080	ND 0.00080	ND 0.00080	ND 0.00080	0.0012	0.001
AUS-SB25	SB-25A-7.5	7.5	(5-10)	08/28/2015	ND **1,000**	-	-	500	2,000	0.0053 J	ND 0.0025	0.0065	ND 0.0025	0.0065	ND 0.0025	ND 0.0025	0.012	0.011	0.021	0.044	0.003
AUS-SB26	AUS-SB-26A(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 23	-	-	76	900	ND 0.0047	ND 0.0047	0.0049 J	ND 0.0047	0.0042 J	ND 0.0047	ND 0.0047	ND 0.0047	ND 0.0047	0.0048 J	0.0095	0.004
AUS-SB26	SB-26A-12.5	12.5	(10-15)	09/01/2015	ND 67	-	-	300	1,200	0.026 J	0.030	0.040	0.021 J	0.029 J	ND 0.012	ND 0.012	0.029 J	0.021 J	0.062	0.112	0.040
AUS-SB26	SB-26A-7.5	7.5	(5-10)	09/01/2015	**240** J	-	-	1,700	2,000	ND 0.012	ND 0.012	0.012 J	ND 0.012	0.014 J	ND 0.012	ND 0.012	1.5	1.5	0.23	3.23	0.010
AUS-SB27	AUS-SB-27(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 21	-	-	52	500	0.0021	0.026 J	0.031 J	ND 0.00084 UJ	0.0053	ND 0.00084 UJ	0.0011 J	0.0022	0.0045	0.0077	0.0144	0.030
AUS-SB27	SB-27-7.5	7.5	(5-10)	08/28/2015	**140** J	-	-	220	1,400	ND 0.0030	ND 0.0030	0.0059 J	0.0032 J	0.0048 J	ND 0.0030	ND 0.0030	0.64	0.21	0.066	0.916	0.003
AUS-SB28	AUS-SB-28(2-2.5)	(2-2.5)	(0-5)	08/18/2015	8.1 J	-	-	61	410	0.0011 J	0.0016 J	0.0044	0.0010 J	0.0029	ND 0.00082	ND 0.00082	0.0038	0.0063	0.0069	0.017	0.002
AUS-SB28	SB-28-7.5	7.5	(5-10)	08/28/2015	ND 73	-	-	220	1,600	ND 0.0027	0.0028 J	0.0081	ND 0.0027	0.0049 J	ND 0.0027	ND 0.0027	0.76	0.21	0.11	1.08	0.004
AUS-SB29	AUS-SB-29(2-2.5)	(2-2.5)	(0-5)	08/18/2015	3.8 J	-	-	5.5 J	ND 12	0.0076	0.0079	0.028	0.011	0.034	0.0014 J	0.0053	0.0038	0.0044	0.0088	0.017	0.014

Table 6
PRE-EXCAVATION CLEANUP ACTION PLAN SOIL ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Site
1120 West Bay Drive Northwest, Olympia, Washington

All analytical results are presented in milligrams per kilogram (mg/kg)

Sample Location	Sample ID	Sample Depth (feet bgs)	Depth range (feet bgs)	Date	NWTPH-GX Soil C7-C12	Diesel Range Organics C12-C24	Heavy Range Organics C24-C40	DRO C12-C24 w/Si Gel	HRO C24-C40 w/Si Gel	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-c,d)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Naphthalenes[1]	Total Adjusted cPAHs[2]
Model Toxics Control Act (MTCA) Method A Cleanup Levels					**30/100**	**2000**	**2000**	**2,000**	**2,000**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**5**	**0.1**
AUS-SB29	SB-29-7.5	7.5	(5-10)	08/28/2015	80 J	-	-	420	1,300	ND 0.0023	ND 0.0023	0.0034 J	ND 0.0023	0.0035 J	ND 0.0023	ND 0.0023	2.0	2.3	0.38	4.68	0.002
AUS-SB30	AUS-SB-30(2-2.5)	(2-2.5)	(0-5)	08/18/2015	24 J	-	-	430 J	700 J	0.0074	0.0076	0.029	0.0079	0.022	0.0015 J	0.0049	0.073	0.23	0.091	0.394	0.013
AUS-SB30	SB-30-7.5	7.5	(5-10)	08/28/2015	**160**	-	-	280	1,500	ND 0.025	ND 0.025	ND 0.025	ND 0.025	ND 0.013	ND 0.025	ND 0.025	2.9	3.8	1.2	**7.9**	0.019
AUS-SB31	AUS-SB-31(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 28	-	-	53	170	0.0092	0.013 J	0.037 J	0.0086 J	0.017	ND 0.0013 UJ	0.0045 J	0.016	0.020	0.030	0.066	0.019
AUS-SB31	SB-31-7.5	7.5	(5-10)	08/27/2015	ND 0.98	-	-	ND 3.4	ND 11	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00037	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	0.00111	0.001
AUS-SB32	AUS-SB-32(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 14	-	-	ND 3.8	ND 13	0.0014 J	0.0021	0.0046	0.0012 J	0.0036	ND 0.00084	0.00090 J	0.0028	0.0055	0.0053	0.0136	0.003
AUS-SB32	SB-32-7.5	7.5	(5-10)	08/27/2015	ND 1.3	-	-	37 J	**2,200**	0.011	0.015	0.016	0.0079	0.013	0.0025	0.0091	0.0013 J	0.0022	0.0053	0.0088	0.020
AUS-SB33	SB-33-7.5	7.5	(5-10)	08/31/2015	ND 20	-	-	ND 3.3	ND 11	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00037	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	0.00111	0.001
AUS-SB34	AUS-SB-34(4.5-5)	(4.5-5)	(0-5)	08/19/2015	**180**	-	-	420	51 J	0.0056	0.047 J	0.073 J	ND 0.0012 UJ	0.012	0.0015 J	0.0029 J	1.3	1.7	0.38	3.38	0.055
AUS-SB34	SB-34-7.5	7.5	(5-10)	08/31/2015	ND 55	-	-	130	210	0.019 J	0.016 J	0.044	0.014 J	0.025 J	ND 0.011	ND 0.011	1.3	1.4	0.42	3.12	0.025
AUS-SB35	AUS-SB-35(2-2.5)	(2-2.5)	(0-5)	08/19/2015	ND 15	-	-	200	1,900	0.029	0.055 J	0.21 J	ND 0.0078 UJ	0.072	ND 0.0078 UJ	0.014 J	0.013 J	0.025	0.026	0.064	0.082
AUS-SB35	SB-35-7.5	7.5	(5-10)	09/01/2015	ND 51	-	-	130	1,000	ND 0.010	ND 0.010	ND 0.010	ND 0.010	0.0055 J	ND 0.010	ND 0.010	1.2	0.41	0.17	1.78	0.008
AUS-SB36	AUS-SB-36(2-2.5)	(2-2.5)	(0-5)	08/19/2015	ND 15	-	-	21	240	0.014	0.013 J	0.036 J	0.012 J	0.024	0.0021 J	0.0048 J	0.0022	0.0036	0.0043	0.0101	0.020
AUS-SB36	SB-36-12.5	12.5	(10-15)	08/31/2015	ND 14	-	-	11	33 J	0.0043	0.0053	0.0062	0.0037	0.0052	ND 0.00092	0.0018 J	0.029	0.026	0.014	0.069	0.007
AUS-SB36	SB-36-7.5	7.5	(5-10)	08/31/2015	71 J	-	-	710 J	1,200 J	0.0027 J	0.0025 J	0.0061 J	ND 0.0023 UJ	0.0065 J	ND 0.0023 UJ	ND 0.0023 UJ	0.37 J	0.35 J	0.050 J	0.77	0.004
AUS-SB36	DUP-6	7.5	(5-10)	08/31/2015	**1,100** J	-	-	**8,900** J	**44,000** J	5.3 J	4.0 J	6.0 J	2.3 J	5.5 J	0.27 J	0.67 J	3.4 J	3.4 J	6.0 J	**12.8**	**5.509**
AUS-SB37	AUS-SB-37(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 15	-	-	10	68	0.00083 J	0.0014 J	0.0047	0.00095 J	0.0031	ND 0.00074	ND 0.00074	ND 0.00074	ND 0.00074	0.00080 J	0.00154	0.002
AUS-SB37	SB-37-12.5	12.5	(10-15)	09/01/2015	ND 69	-	-	260	720	ND 0.013	ND 0.013	ND 0.013	ND 0.013	0.0077 J	ND 0.013	ND 0.013	0.041	0.041	0.084	0.166	0.010
AUS-SB37	SB-37-7.5	7.5	(5-10)	09/01/2015	ND 63	-	-	740	1,700	ND 0.011	ND 0.011	ND 0.011	ND 0.011	0.0066 J	ND 0.011	ND 0.011	0.57	0.26	0.090	0.92	0.008
AUS-SB38	AUS-SB-38(2-2.5)	(2-2.5)	(0-5)	08/18/2015	17 J	-	-	470	1,700	0.011 J	0.010 J	0.029 J	0.012 J	0.025 J	ND 0.0016 UJ	0.0033 J	0.0094 J	0.0081 J	0.0034 J	0.0209	0.016
AUS-SB38	SB-38-7.5	7.5	(5-10)	08/28/2015	ND 77	-	-	350	1,400	ND 0.0028	ND 0.0028	0.0046 J	ND 0.0028	0.0030 J	ND 0.0028	ND 0.0028	0.068	0.035	0.028	0.131	0.002
AUS-SB39	AUS-SB-39(2-2.5)	(2-2.5)	(0-5)	08/18/2015	ND 52	-	-	190	1,300	0.0018 J	0.0013 J	0.0044 J	ND 0.00094 UJ	0.0047	ND 0.00094 UJ	0.0017 J	0.011	0.016	0.0082	0.0352	0.002
AUS-SB39	SB-39-7.5	7.5	(5-10)	08/28/2015	68 J	-	-	330	1,400	0.020	0.0099	0.029	0.0083	0.036	ND 0.0023	0.0038 J	1.9	1.9	1.0	4.8	0.016
AUS-SB40	AUS-SB-40(2-2.5)	(2-2.5)	(0-5)	08/18/2015	7.7 J	-	-	9.7 J	71	0.0016 J	0.0023	0.0090	0.0022	0.0075	ND 0.00081 UJ	0.0018 J	0.010	0.029	0.014	0.053	0.004
AUS-SB40	SB-40-7.5	7.5	(5-10)	08/28/2015	ND 62	-	-	400	1,200	ND 0.023	ND 0.023	0.031 J	ND 0.023	0.040 J	ND 0.023	ND 0.023	1.8	2.1	0.87	4.77	0.020
AUS-SB41	AUS-SB-41(2-2.5)	(2-2.5)	(0-5)	08/17/2015	27 J	-	-	28	82	0.0035 J	0.0035 J	0.012 J	0.0026 J	0.012 J	0.0013 J	0.003 J	0.024 J	0.055 J	0.087 J	0.166	0.006
AUS-SB41	SB-41-7.5	7.5	(5-10)	08/28/2015	81 J	-	-	250	750	ND 0.0030	ND 0.0030	0.0039 J	0.0067 J	0.0030 J	ND 0.0030	ND 0.0030	4.3	5.5	0.76	**10.56**	0.003
AUS-SB41	DUP-9	(2-2.5)	(0-5)	08/17/2015	6.4 J	-	-	7.9 J	43	0.20 J	0.23 J	0.36 J	0.12 J	0.24 J	0.030 J	0.093 J	0.018 J	0.043 J	0.060 J	0.121	**0.313**
AUS-SB41-A	AUS-SB-41-Offset(2-2.5)	(2-2.5)	(0-5)	08/20/2015	55	30	ND 12	44 J	ND 11 UJ	0.00091 J	ND 0.00077	0.0015 J	ND 0.00077	0.0027	ND 0.00077	ND 0.00077	0.036	0.099	0.063	0.198	0.001
AUS-SB41-A	SB-41-Offset-12.5	12.5	(10-15)	09/01/2015	ND 71	-	-	250	840	ND 0.0026	ND 0.0026	ND 0.0026	ND 0.0026	0.0030 J	ND 0.0026	ND 0.0026	0.23	0.24	0.49	0.96	0.002
AUS-SB41-A	SB-41-Offset-7.5	7.5	(5-10)	09/01/2015	**1,700**	-	-	1,200	**2,400**	ND 0.0094	ND 0.0094	ND 0.0094	ND 0.0094	0.0084 J	ND 0.0094	ND 0.0094	8.7	13	24	**45.7**	0.007
AUS-SB41-B	SB-41-B-12.5	12.5	(10-15)	09/02/2015	83 J	-	-	920	**2,100**	ND 0.021	ND 0.021	0.022 J	ND 0.021	0.032 J	ND 0.021	ND 0.021	1.3	2.0	0.88	4.18	0.017
AUS-SB41-B	SB-41-B-2.5	2.5	(0-5)	09/02/2015	**150**	-	-	340 J	1,600	ND 0.0069	ND 0.0069	ND 0.0069	ND 0.0069	0.0065 J	ND 0.0069	ND 0.0069	0.012 J	0.017 J	0.36	0.389	0.005
AUS-SB41-B	SB-41-B-7.5	7.5	(5-10)	09/02/2015	**870** J	-	-	920	1,400	0.029 J	0.016 J	0.036	ND 0.012	0.051	ND 0.012	ND 0.012	14	25	17	**56**	0.025
AUS-SB41-C	SB-41-C-12.5	12.5	(10-15)	09/01/2015	63 J	-	-	780	**2,200**	ND 0.011 UJ	ND 0.011 UJ	ND 0.011 UJ	ND 0.011 UJ	0.0055	ND 0.011 UJ	ND 0.011 UJ	1.5 J	1.9 J	0.87 J	4.27	0.008
AUS-SB41-C	SB-41-C-2.5	2.5	(0-5)	09/01/2015	ND 14	-	-	ND 3.9	ND 13	ND 0.00086	ND 0.00086	0.0015 J	ND 0.00086	0.0012 J	ND 0.00086	ND 0.00086	0.0011 J	0.0015 J	0.0097	0.0123	0.001
AUS-SB41-C	SB-41-C-7.5	7.5	(5-10)	09/01/2015	ND **570**	-	-	**4,400**	**8,200**	ND 0.011 UJ	ND 0.011 UJ	ND 0.011 UJ	ND 0.011 UJ	ND 0.0053 UJ	ND 0.011 UJ	ND 0.011 UJ	0.85 J	0.94 J	2.7 J	4.49	0.008
AUS-SB41-D	SB-41-D-12.5	12.5	(10-15)	09/01/2015	ND 49	-	-	**2,500**	2,000	ND 0.0096 UJ	ND 0.0096 UJ	ND 0.0096 UJ	ND 0.0096 UJ	ND 0.0048 UJ	ND 0.0096 UJ	ND 0.0096 UJ	0.33 J	0.36 J	0.79 J	1.48	0.007
AUS-SB41-D	SB-41-D-2.5	2.5	(0-5)	09/01/2015	ND 2.0	-	-	ND 3.9	ND 13	ND 0.00086	ND 0.00086	0.0014 J	ND 0.00086	0.0014 J	ND 0.00086	ND 0.00086	0.0028	0.0047	0.0048	0.0123	0.001
AUS-SB41-D	SB-41-D-7.5	7.5	(5-10)	09/01/2015	**270**	-	-	980	**2,100**	ND 0.0083	ND 0.0083	0.021 J	ND 0.0083	0.021	ND 0.0083	ND 0.0083	0.055	0.050	0.76	0.865	0.008
AUS-SB41-E	SB-41-E-12.5	12.5	(10-15)	09/01/2015	ND **230**	-	-	400	920	ND 0.0082	ND 0.0082	ND 0.0082	ND 0.0082	0.0095 J	ND 0.0082	ND 0.0082	0.17	0.19	0.27	0.63	0.006
AUS-SB41-E	SB-41-E-2.5	2.5	(0-5)	09/01/2015	ND 14	-	-	ND 3.8	ND 13	ND 0.00085	ND 0.00085	ND 0.00085	ND 0.00085	0.00048 J	ND 0.00085	ND 0.00085	0.026	0.063	0.040	0.129	0.001
AUS-SB41-E	SB-41-E-7.5	7.5	(5-10)	09/01/2015	**390** J	-	-	1,400	**2,300**	ND 0.025	ND 0.025	ND 0.025	ND 0.025	0.017 J	ND 0.025	ND 0.025	1.3	1.6	4.2	**7.1**	0.019
AUS-SB42	AUS-SB-42(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 13	-	-	ND 3.3	13 J	0.028	0.023	0.051	0.018 J	0.046	ND 0.0036	0.011	0.028	0.037	0.032	0.097	0.034
AUS-SB42	SB-42-7.5	7.5	(5-10)	08/27/2015	ND 1.1	-	-	ND 3.4	ND 11	ND 0.00075	ND 0.00075	ND 0.00075	ND 0.00075	ND 0.00037	ND 0.00075	ND 0.00075	ND 0.00075	ND 0.00075	ND 0.00075	0.001125	0.001
AUS-SB43-A	AUS-SB-43A(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 17	-	-	10	77	0.066	0.059	0.13	0.053 J	0.11	0.0082 J	0.027	0.013	0.025	0.052	0.09	0.089
AUS-SB43-A	SB-43-A-7.5	7.5	(5-10)	08/27/2015	ND 1.3	-	-	100	520	0.0046	0.0057	0.0092	0.0031	0.0057	ND 0.00078	0.0016 J	0.0023	0.0034	0.010	0.0157	0.008
AUS-SB44	AUS-SB-44(4.5-5)	(4.5-5)	(0-5)	08/20/2015	**1900**	-	-	820	34 J	ND 0.027 R	ND 0.027 R	ND 0.027 R	ND 0.027 R	0.028 J	ND 0.027 R	ND 0.027 R	2.6 J	2.3 J	0.71 J	**5.61**	0.021
AUS-SB44	SB-44-7.5	7.5	(5-10)	08/31/2015	ND 8.7 R	-	-	ND 3.4	ND 11	0.0052	0.0069	0.010	0.0045	0.0055	ND 0.00074	0.0019	0.0015 J	0.0015 J	0.0043	0.0073	0.009
AUS-SB44	DUP-4	(4.5-5)	(0-5)	08/20/2015	**990** J	-	-	1,900 J	ND 98	0.026 J	0.028 J	0.032 J	ND 0.013	0.038	ND 0.013	ND 0.013	2.5	2.5	0.55	**5.55**	0.036
AUS-SB45	AUS-SB-45(2-2.5)	(2-2.5)	(0-5)	08/19/2015	ND 19	-	-	48	130	0.016	0.040 J	0.069 J	0.014 J	0.031	0.0027 J	0.0073 J	0.034	0.079	0.060	0.173	0.051
AUS-SB45	SB-45-7.5	7.5	(5-10)	08/31/2015	ND 65	-	-	86 J	350 J	0.0052 J	0.0054 J	0.015 J	0.0047 J	0.011 J	ND 0.0036 UJ	0.0043 J	0.015 J	0.015 J	0.038 J	0.068	0.009
AUS-SB45	DUP-8	7.5	(5-10)	08/31/2015	ND 64 UJ	-	-	290 J	740 J	0.0046 J	0.0057 J	0.019	0.0065	0.012	ND 0.0024	0.0034 J	0.020	0.015	0.037	0.072	0.009
AUS-SB46	AUS-SB-46(2-2.5)	(2-2.5)	(0-5)	08/19/2015	ND 18	-	-	110	170	0.0055	0.0061	0.013 J	0.0042	0.011 J	ND 0.00081	0.0025	0.013 J	0.022 J	0.019	0.054	0.009
AUS-SB46	SB-46-12.5	12.5	(10-15)	08/31/2015	ND 0.96	-	-	ND 3.5	ND 12	ND 0.00077	ND 0.00077	0.00078 J	ND 0.00077	ND 0.00038	ND 0.00077	ND 0.00077	ND 0.00077	ND 0.00077	0.0018 J	0.00257	0.001
AUS-SB46	SB-46-7.5	7.5	(5-10)	08/31/2015	ND 60	-	-	240	710	0.14	0.13	0.18	0.065	0.14	ND 0.011	0.024 J	2.0	1.6	0.99	4.59	**0.173**
AUS-SB46	DUP-3	(2-2.5)	(0-5)	08/19/2015	ND 18	-	-	150	270	0.0013 J	0.0014 J	0.0042 J	0.0017 J	0.0038 J	ND 0.00081 UJ	0.00085 J	0.0019 J	0.0031 J	0.0038 J	0.0088	0.002
AUS-SB47	AUS-SB-47(2-2.5)	(2-2.5)	(0-5)	08/19/2015	ND 14	-	-	370	210	0.0021	0.0030	0.0085	0.0022	0.0082	ND 0.00078	0.0015 J	0.0028	0.0048	0.0038	0.0114	0.005
AUS-SB47	SB-47-12.5	12.5	(10-15)	09/01/2015	ND 53	-	-	120	690	0.020 J	0.024 J	0.034	0.015 J	0.026	ND 0.010	ND 0.010	0.048	0.046	0.051	0.145	0.032
AUS-SB47	SB-47-7.5	7.5	(5-10)	09/01/2015	**420**	-	-	1,500	1,000	ND 0.013	ND 0.013	ND 0.013	ND 0.013	0.0080 J	ND 0.013	ND 0.013	2.6	1.7	0.38	4.68	0.010
AUS-SB48	AUS-SB-48(2-2.5)	(2-2.5)	(0-5)	08/19/2015	ND 14	-	-	20	ND 12	ND 0.00080	0.0011 J	0.0031	ND 0.00080	0.0024	ND 0.00080	ND 0.00080	0.0055	0.0043	0.0079	0.0177	0.002
AUS-SB48	SB-48-7.5	7.5	(5-10)	08/31/2015	ND 72	-	-	530	1,300	ND 0.0027	ND 0.0027	0.0051 J	ND 0.0027	0.0052 J	ND 0.0027	ND 0.0027	0.70	0.26	0.080	1.04	0.002
AUS-SB49	SB-49-7.5	7.5	(5-10)	08/28/2015	65 J	-	-	820	1,700	0.0027 J	0.0025 J	0.0075 J	0.0057 J	0.0049 J	ND 0.0024	0.0024 J	0.97	0.31	0.11	1.39	0.004
AUS-SB50	AUS-SB-50(2-2.5)	(2-2.5)	(0-5)	08/17/2015	ND 1.3	-	-	10	18 J	ND 0.00075	0.0011 J	0.0041	0.0012 J	0.0031	ND 0.00075	0.00077 J	0.0025	0.0062	0.0036	0.0123	0.002

Table 6
PRE-EXCAVATION CLEANUP ACTION PLAN SOIL ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Site
1120 West Bay Drive Northwest, Olympia, Washington

All analytical results are presented in milligrams per kilogram (mg/kg)

Sample Location	Sample ID	Sample Depth (feet bgs)	Depth range (feet bgs)	Date	NWTPH-GX Soil C7-C12	Diesel Range Organics C12-C24	Heavy Range Organics C24-C40	DRO C12-C24 w/Si Gel	HRO C24-C40 w/Si Gel	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-c,d)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Naphthalenes[1]	Total Adjusted cPAHs[2]
Model Toxics Control Act (MTCA) Method A Cleanup Levels					**30/100**	**2000**	**2000**	**2,000**	**2,000**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**5**	**0.1**
AUS-SB50	SB-50-7.5	7.5	(5-10)	08/28/2015	38 J	-	-	350	**2,100**	0.0098 J	ND 0.0040	0.0099 J	ND 0.0040	0.015	ND 0.0040	0.0051 J	2.7	2.9	0.76	**6.36**	0.005
AUS-SB51	AUS-SB-51(2-2.5)	(2-2.5)	(0-5)	08/17/2015	ND 1.7	-	-	24	15 J	0.0017 J	0.0016 J	0.0079	0.002 J	0.0064	ND 0.00087	0.0013 J	0.014	0.022	0.021	0.057	0.003
AUS-SB51	SB-51-7.5	7.5	(5-10)	08/28/2015	ND 84	-	-	220	1,300	ND 0.030	ND 0.030	ND 0.030	ND 0.030	ND 0.015	ND 0.030	ND 0.030	3.5	3.8	0.87	**8.17**	0.023
AUS-SB52	AUS-SB-52(2-2.5)	(2-2.5)	(0-5)	08/17/2015	**2,400** J	-	-	1,300 J	ND 130	ND 0.0084	ND 0.0084	0.014 J	ND 0.0084	0.015 J	ND 0.0084	ND 0.0084	4.6 J	7.7	1.9	**14.2**	0.007
AUS-SB52	SB-52-7.5	7.5	(5-10)	08/28/2015	**110** J	-	-	640	1,100	0.0048 J	0.0034 J	0.0088	0.0049 J	0.0090	ND 0.0026	ND 0.0026	6.6	8.9	1.3	**16.8**	0.006
AUS-SB52	DUP-1	(2-2.5)	(0-5)	08/17/2015	**1,200** J	-	-	**3,800** J	170 J	ND 0.0089	ND 0.0089 UJ	0.0092 J	ND 0.0089 UJ	0.010 J	ND 0.0089 UJ	ND 0.0089 UJ	7.8 J	12	2.9	**22.7**	0.007
AUS-SB52-A	AUS-SB-52-Offset(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 1.2	5.7 J	20 J	ND 3.6 UJ	ND 12 UJ	ND 0.00082	ND 0.00082	0.0020 J	ND 0.00082	0.0025	ND 0.00082	ND 0.00082	0.0014 J	0.0030	0.014	0.0184	0.001
AUS-SB52-A	SB-52-Offset-12.5	12.5	(10-15)	09/01/2015	ND 72	-	-	1,000	1,300	0.0064 J	0.0062 J	0.018	ND 0.0026	0.014	ND 0.0026	0.0032 J	0.68	0.72	0.95	2.35	0.009
AUS-SB52-A	SB-52-Offset-7.5	7.5	(5-10)	09/01/2015	**160** J	-	-	740	980	ND 0.0099	ND 0.0099	ND 0.0099	ND 0.0099	0.0084 J	ND 0.0099	ND 0.0099	3.9	5.8	2.8	**12.5**	0.008
AUS-SB52-B	SB-52-B-2.5	2.5	(0-5)	09/02/2015	ND 12	-	-	210	340	ND 0.0040	ND 0.0040	0.0095 J	ND 0.0040	ND 0.0020	ND 0.0040	ND 0.0040	ND 0.0040	ND 0.0040	0.0051 J	0.0091	0.004
AUS-SB52-B	SB-52-B-7.5	7.5	(5-10)	09/02/2015	ND 14	-	-	12	20 J	ND 0.00088	ND 0.00088	0.0018 J	ND 0.00088	0.0016 J	ND 0.00088	ND 0.00088	0.0027	0.0047	0.013	0.0204	0.001
AUS-SB53	SB-53-7.5	7.5	(5-10)	08/27/2015	ND 1.0	-	-	ND 3.4	ND 11	ND 0.00075	ND 0.00075	ND 0.00075	ND 0.00075	ND 0.00037	ND 0.00075	ND 0.00075	ND 0.00075	ND 0.00075	ND 0.00075	0.001125	0.001
AUS-SB54	AUS-SB-54(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 14	-	-	23	140	0.040	0.036	0.092	0.025 J	0.075	0.0075 J	0.025	0.033	0.054	0.053	0.14	0.056
AUS-SB54	SB-54-7.5	7.5	(5-10)	08/27/2015	ND 1.0	-	-	ND 3.4	ND 11	ND 0.00076	ND 0.00076	ND 0.00076	ND 0.00076	ND 0.00038	ND 0.00076	ND 0.00076	0.00092 J	0.0021	0.0018 J	0.00482	0.001
AUS-SB55	AUS-SB-55(4.5-5)	(4.5-5)	(0-5)	08/19/2015	ND 17	-	-	ND 4.2	ND 14	ND 0.00094	0.0011 J	0.0019 J	ND 0.00094	0.0011 J	ND 0.00094	ND 0.00094	0.0011 J	0.0017 J	0.0074	0.0102	0.001
AUS-SB55	SB-55-9.5	9.5	(5-10)	08/27/2015	ND 27	-	-	57	260	4.7	4.7	5.5	2.1	5.0	0.59	2.4	0.72	0.90	2.3	3.92	**6.279**
AUS-SB56	AUS-SB-56(4.5-5)	(4.5-5)	(0-5)	08/19/2015	ND 16	-	-	23	81	0.0016 J	0.0025	0.0070	0.0017 J	0.0046	ND 0.00088	0.0013 J	0.0084	0.015	0.028	0.0514	0.004
AUS-SB56	SB-56-7.5	7.5	(5-10)	08/31/2015	ND 15	-	-	9.9	23 J	0.0012 J	0.0014 J	0.0046	0.0013 J	0.0031	ND 0.00093	ND 0.00093	0.0088	0.013	0.034	0.0558	0.002
AUS-SB57	AUS-SB-57(2-2.5)	(2-2.5)	(0-5)	08/19/2015	ND 1.2	-	-	4.1 J	25 J	0.00097 J	0.0018 J	0.0052 J	0.00094 J	0.0035	ND 0.00075 UJ	ND 0.00075 UJ	0.0012 J	0.0018 J	0.0030	0.006	0.003
AUS-SB57	SB-57-7.5	7.5	(5-10)	08/31/2015	ND 14	-	-	ND 4.0	14 J	0.0027	0.0025	0.0067	0.0022 J	0.0060	ND 0.00090	0.00093 J	0.013	0.028	0.042	0.083	0.004
AUS-SB58	AUS-SB-58(2-2.5)	(2-2.5)	(0-5)	08/19/2015	ND 14	-	-	ND 3.4	12 J	0.00092 J	0.0012 J	0.0045	0.0011 J	0.0042	ND 0.00075	0.00097 J	ND 0.00075	0.0012 J	0.0034	0.004975	0.002
AUS-SB58	SB-58-7.5	7.5	(5-10)	08/28/2015	57	-	-	30	29 J	ND 0.00085	ND 0.00085	ND 0.00085	ND 0.00085	ND 0.00043	ND 0.00085	ND 0.00085	ND 0.00085	ND 0.00085	ND 0.00085	0.001275	0.001
AUS-SB59	AUS-SB-59(4.5-5)	(4.5-5)	(0-5)	08/19/2015	ND 16	-	-	10	69	0.0034	0.0048	0.0081	0.0031	0.0070	ND 0.00088	0.0029	0.0072	0.013	0.040	0.0602	0.007
AUS-SB59	SB-59-7.5	7.5	(5-10)	09/01/2015	ND 15	-	-	5.1 J	ND 14	ND 0.00091	ND 0.00091	0.0021 J	ND 0.00091	0.0013 J	ND 0.00091	ND 0.00091	0.013	0.0092	0.045	0.0672	0.001
AUS-SB60	AUS-SB-60(2-2.5)	(2-2.5)	(0-5)	08/19/2015	ND 17	-	-	ND 3.6	ND 12	0.0012 J	0.0017 J	0.0051	0.0014 J	0.0048	ND 0.00080	0.0018 J	0.00093 J	0.0017 J	0.0092	0.01183	0.003
AUS-SB60	SB-60-7.5	7.5	(5-10)	09/01/2015	ND 17	-	-	ND 4.1	ND 14	ND 0.00091	ND 0.00091	0.0020 J	ND 0.00091	0.0015 J	ND 0.00091	ND 0.00091	0.027	0.025	0.10	0.152	0.001
AUS-SB61	AUS-SB-61(2-2.5)	(2-2.5)	(0-5)	08/17/2015	ND 1.3	-	-	ND 3.5	12 J	ND 0.00079	0.00085 J	0.0038	0.00094 J	0.003	ND 0.00079	ND 0.00079	0.0050	0.010	0.0073	0.0223	0.001
AUS-SB61	SB-61-7.5	7.5	(5-10)	08/28/2015	40 J	-	-	260	1,400	0.0046 J	0.0048 J	0.011	0.0049 J	0.013	ND 0.0034	ND 0.0034	0.11	0.10	0.79	1	0.007
AUS-SB62	AUS-SB-62(2-2.5)	(2-2.5)	(0-5)	08/17/2015	ND 2	-	-	6.6 J	49	ND 0.00082	0.00098 J	0.0049	0.00095 J	0.0043	ND 0.00082	0.00091 J	0.0011 J	0.0019 J	0.014	0.017	0.002
AUS-SB62	SB-62-7.5	7.5	(5-10)	08/28/2015	52 J	-	-	190	1,100	ND 0.030	ND 0.030	0.052 J	ND 0.030	0.065 J	ND 0.030	ND 0.030	0.64	0.60	2.5	3.74	0.027
AUS-SB62-A	AUS-SB-62-Offset(4.5-5)	(4.5-5)	(0-5)	08/20/2015	33	29 J	58	11 J	ND 13 UJ	ND 0.00084	ND 0.00084	0.0026	ND 0.00084	0.0026	ND 0.00084	0.0010 J	0.0034	0.0044	0.025	0.0328	0.001
AUS-SB62-A	SB-62-Offset-7.5	7.5	(5-10)	09/01/2015	ND 25	-	-	11	ND 14	ND 0.00097	0.0018 J	0.0059	0.0013 J	0.0027	ND 0.00097	0.0012 J	0.0043	0.0045	0.042	0.0508	0.003
AUS-SB63	AUS-SB-63(2-2.5)	(2-2.5)	(0-5)	08/20/2015	ND 12	-	-	6.4 J	61	0.0062 J	0.0050 J	0.018	0.0069 J	0.0097	ND 0.0035	0.0052 J	ND 0.0035	0.0038 J	0.0056 J	0.01115	0.009
AUS-SB63	SB-63-7.5	7.5	(5-10)	08/27/2015	ND 13	-	-	ND 3.6	ND 12	ND 0.00079	ND 0.00079	0.0013 J	ND 0.00079	0.0011 J	ND 0.00079	ND 0.00079	ND 0.00079	ND 0.00079	0.00088 J	0.00167	0.001
MS	AUS-SB-22(2-2.5)MS	(2-2.5)	(0-5)	08/20/2015	18 J	-	-	140	ND 13	0.060	0.056	0.079	0.058	0.074	0.032	0.037	0.064	0.072	0.063	0.199	0.083
MS	AUS-SB-40(2-2.5)-MS	(2-2.5)	(0-5)	08/18/2015	31	-	-	110	82	0.036	0.038	0.050	0.043	0.043	0.027	0.027	0.045	0.064	0.049	0.158	0.057
MS	AUS-SB-41(2-2.5)-MS	(2-2.5)	(0-5)	08/17/2015	97	-	-	210	110	0.046	0.042	0.053	0.042	0.053	0.038	0.038	0.06	0.09	0.12	0.27	0.064
MS	AUS-SB-57(2-2.5)MS	(2-2.5)	(0-5)	08/19/2015	17	-	-	110	24 J	0.033	0.035	0.052	0.042	0.037	0.023	0.021	0.038	0.041	0.042	0.121	0.052
MS	SB-1A-12.5 MS	12.5	(10-15)	08/28/2015	9.7	-	-	140	ND 12	0.046	0.043	0.052	0.041	0.045	0.044	0.042	0.040	0.041	0.041	0.122	0.066
MS	SB-36-7.5 MS	7.5	(5-10)	08/31/2015	**250** J	-	-	870	860	0.084	0.10	0.13	0.13	0.085	0.060	0.058	0.71	0.62	0.20	1.53	**0.147**
MS	SB-36-7.5 MSD	7.5	(5-10)	08/31/2015	**250** J	-	-	870	860	0.084	0.10	0.13	0.13	0.085	0.060	0.058	0.71	0.62	0.20	1.53	**0.147**
MS	SB-45-7.5 MS	7.5	(5-10)	08/31/2015	**130** J	-	-	440	400	0.18	0.18	0.25	0.19	0.18	0.10	0.099	0.18	0.20	0.20	0.58	**0.264**
MS	SB-6-7.5 MS	7.5	(5-10)	08/31/2015	**170** J	-	-	880	1,900	0.13	0.12	0.16	0.14	0.12	0.057	0.056	3.5	4.8	0.24	**8.54**	**0.176**
MSD	AUS-SB-22(2-2.5)MSD	(2-2.5)	(0-5)	08/20/2015	19 J	-	-	110	ND 13	0.067	0.066	0.096	0.066	0.082	0.030	0.038	0.069	0.076	0.070	0.215	0.097
MSD	AUS-SB-40(2-2.5)-MSD	(2-2.5)	(0-5)	08/18/2015	32	-	-	100	89	0.034	0.038	0.050	0.048	0.039	0.025	0.024	0.043	0.057	0.046	0.146	0.056
MSD	AUS-SB-41(2-2.5)-MSD	(2-2.5)	(0-5)	08/17/2015	45	-	-	170	71	0.041	0.041	0.05	0.045	0.051	0.031	0.03	0.075	0.12	0.17	0.365	0.061
MSD	AUS-SB-57(2-2.5)MSD	(2-2.5)	(0-5)	08/19/2015	17	-	-	120	26 J	0.034	0.034	0.050	0.040	0.038	0.021	0.020	0.034	0.036	0.037	0.107	0.051
MSD	SB-1A-12.5 MSD	12.5	(10-15)	08/28/2015	8.7	-	-	150	ND 12	0.047	0.045	0.054	0.044	0.047	0.046	0.045	0.043	0.044	0.043	0.13	0.069
MSD	SB-36-7.5 MSD	7.5	(5-10)	8/31/2015	**180**	-	-	850	1,000	0.084	0.091	0.12	0.11	0.080	0.054	0.052	0.36	0.34	0.16	0.86	**0.134**
MSD	SB-45-7.5 MSD	7.5	(5-10)	08/31/2015	ND 63	-	-	420	450	0.16	0.17	0.22	0.20	0.16	0.095	0.092	0.18	0.19	0.20	0.57	**0.248**
MSD	SB-6-7.5 MSD	7.5	(5-10)	08/31/2015	**140** J	-	-	810	1,400	0.13	0.13	0.19	0.14	0.13	0.061	0.057	2.4	2.8	0.23	**5.43**	**0.189**

Table 6
PRE-EXCAVATION CLEANUP ACTION PLAN SOIL ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Site
1120 West Bay Drive Northwest, Olympia, Washington

All analytical results are presented in milligrams per kilogram (mg/kg)

Sample Location	Sample ID	Sample Depth (feet bgs)	Depth range (feet bgs)	Date	NWTPH-GX Soil C7-C12	Diesel Range Organics C12-C24	Heavy Range Organics C24-C40	DRO C12-C24 w/Si Gel	HRO C24-C40 w/Si Gel	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-c,d)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Naphthalenes[1]	Total Adjusted cPAHs[2]
Model Toxics Control Act (MTCA) Method A Cleanup Levels					30/100	2000	2000	2,000	2,000	--	--	--	--	--	--	--	--	--	--	5	0.1

Notes:
All samples labeled "offset" in this table and analytical reports have been replaced with -A in the figure.
Samples labeled SB1A, SB4A, SB5A, SB23A, SB25A,and SB26A in the table and analytical reports are labeled without the "A" in the figure.
Concentrations compared to the Model Toxics Control Act (MTCA) Method A soil cleanup levels for unrestricted land uses presented in Table 740-1 of Chapter 173-340 of the Washington Administrative Code (WAC)
The MTCA cleanup level for gasoline range total petroleum hydrocarbons is 100-mg/kg without benzene and 30-mg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 30-mg/kg was utilized.
bgs = Below ground surface
mg/kg = milligram per kilogram
- = not applicable or analyzed
cPAH = Carcinogenic polyaromatic hydrocarbons
J = estimated value – The result is greater than or equal to the Method Detection Limit (MDL) and less than the Limit of Quantitation (LOQ)
ND = Chemical not detected above the laboratory reporting limit
Bolded and highlighted font indicates results above the MTCA Method A cleanup level
(1) = MTCA cleanup level is 5-mg/kg for total concentration of naphthalene, 1-methylnaphthalene and 2-methylnaphthalene
(2) = Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)
Lab QA/QC surrogate recovery was outside control limits due to matrix interference for samples GP1-4-4.5, GP1-6-6.5, GP2-4-4.5, GP5-4-4.5, GP6-4-4.5, GP6-6-6.5

TABLE 7
HISTORICAL SOIL ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Bulk Terminal
1120 West Bay Drive
Olympia, Washington

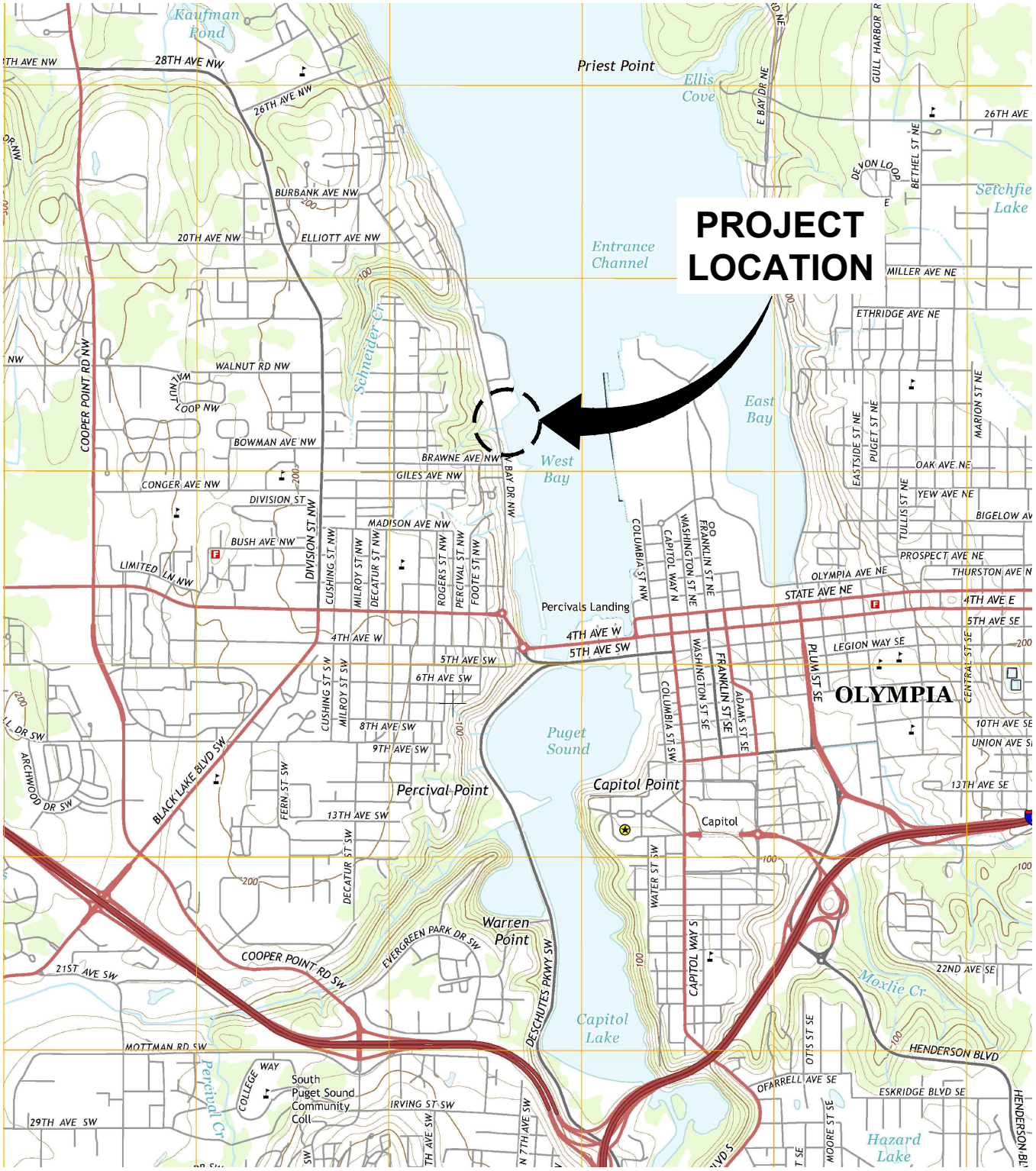
Analysis	MTCA Method A Soil Cleanup Levels	Sample ID Depth (bgs) Date Collected																			
		S-1 5' 9/20/2000	S-2 7' 9/20/2000	S-3 6.5' 9/20/2000	S-4 5' 9/20/2000	S-5 5.5' 9/20/2000	S-6 5.5' 9/20/2000	IPD-1-3 3' 11/1/2001	IPD-2-4 4' 11/1/2001	IPD-3-2.5 2.5' 11/1/2001	IPD-4-4.5 4.5' 11/1/2001	IPD-5-4.5 4.5' 11/1/2001	IPD-6-5 5' 11/1/2001	WBTP-01 NS 3/9/2004	WBTP-02 NS 3/9/2004	WBTP-03 NS 3/9/2004	MW-IP-1 (MW-6) 1' 8/10/2004	MW-IP-3 (MW-6) 3' 8/10/2004	MW-IP-5 (MW-6) 5' 8/10/2004	MW-IP-7 (MW-6) 7' 8/10/2004	MW-IP-9 (MW-6) 9' 8/10/2004
Volatile Organic Compounds	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Benzene	0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	5	--	--	--	--	--	--	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	NE	--	--	--	--	--	--	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	NE	--	--	--	--	--	--	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Xylenes	9	<0.05	<0.05	<0.05	<0.05	<0.05	23.9	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	--
TPH - HCID																					
Gasoline Range Organics	NE	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--
Diesel Range Organics	NE	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	**DET**	ND	ND	--	--	--	--	--
Heavy Oil Range Organics	NE	--	--	--	--	--	--	DET	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--
TPH-NWTPH	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Gasoline Range Organics	30	<10	--	--	--	--	<10	--	--	--	--	--	--	--	--	--	<20	<20	<20	<20	<20
Diesel Range Organics	2,000	330	<20	<20	<20	<20	**14,000**	<25	--	--	--	--	--	570	1,100	--	<50	<50	<50	<50	<50
Heavy Oil Range Organics	2,000	<40	<40	<40	<40	<40	<40	296	--	--	--	--	--	--	--	--	<100	<100	<100	<100	<100
PCBs	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
PCB-1016	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--
PCB-1221	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--
PCB-1232	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--
PCB-1242	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--
PCB-1248	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--
PCB-1254	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--
PCB-1260	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--
PCB Mixtures	1	**--**	--	--	--	--	**--**	--	--	--	--	--	--	*0.175*	**--**	--	--	--	--	--	--
Metals	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Antimony	NE	--	--	--	--	--	--	--	--	--	--	--	--	ND^	ND^	ND^	--	--	--	--	--
Arsenic	20	--	--	--	--	--	--	2.35	--	**--**	**--**	--	--	ND^	ND^	ND^	--	--	--	--	--
Barium	NE	--	--	--	--	--	--	64.5	**--**	**--**	**--**	**--**	**--**	ND^	ND^	ND^	**--**	**--**	--	--	--
Cadmium	2	--	--	--	--	--	--	--	--	--	--	--	--	ND^	ND^	ND^	--	--	--	--	--
Chromium	(a)	--	--	--	--	--	--	17.6	**--**	**--**	**--**	**--**	**--**	ND^	10	ND^	**--**	**--**	--	--	--
Copper	NE	--	--	--	--	--	--	25.1	**--**	**--**	**--**	**--**	**--**	ND^	ND^	ND^	**--**	**--**	--	--	--
Lead (Total)	250	11	--	--	--	--	30	27.4	**--**	**--**	**--**	**--**	**--**	8	ND^	ND^	50.3	51	**724**	8.28	2.46
Mercury	2	--	--	--	--	--	--	--	--	--	--	--	--	ND^	ND^	ND^	--	--	--	--	--
Nickel	NE	--	--	--	--	--	--	23.0	**--**	**--**	**--**	**--**	**--**	ND^	ND^	16	**--**	**--**	--	--	--
Selenium	NE	--	--	--	--	--	--	--	--	--	--	--	--	ND^	ND^	ND^	--	--	--	--	--
Silver	NE	--	--	--	--	--	--	--	--	--	--	--	--	ND^	ND^	ND^	--	--	--	--	--
Thallium	NE	--	--	--	--	--	--	--	--	--	--	--	--	ND^	ND^	ND^	--	--	--	--	--
Zinc	NE	--	--	--	--	--	--	39.5	**--**	**--**	**--**	**--**	**--**	ND^	ND^	ND^	**--**	**--**	--	--	--
c-Polyaromatic Hydrocarbons	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Naphthalene	(b)	--	--	--	--	--	--	<0.134	--	**--**	--	**--**	**--**	--	**--**	**--**	**--**	**--**	--	--	--
1-Methylnaphthalene	(b)	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	(b)	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalenes	5	--	--	--	--	--	--	0.201	**--**	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	NE	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	NE	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--
Anthracene	NE	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo (a) anthracene	(c)	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 7
HISTORICAL SOIL ANALYTICAL RESULTS
Closure Request Report
Former Industrial Petroleum Distributors Bulk Terminal
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Soil Cleanup Levels	Sample ID Depth (bgs) Date Collected																		
		S-1 5' 9/20/2000	S-2 7' 9/20/2000	S-3 6.5' 9/20/2000	S-4 5' 9/20/2000	S-5 5.5' 9/20/2000	S-6 5.5' 9/20/2000	IPD-1-3 3' 11/1/2001	IPD-2-4 4' 11/1/2001	IPD-3-2.5 2.5' 11/1/2001	IPD-4-4.5 4.5' 11/1/2001	IPD-5-4.5 4.5' 11/1/2001	IPD-6-5 5' 11/1/2001	WBTP-01 NS 3/9/2004	WBTP-02 NS 3/9/2004	WBTP-03 NS 3/9/2004	MW-IP-1 (MW-6) 1' 8/10/2004	MW-IP-3 (MW-6) 3' 8/10/2004	MW-IP-5 (MW-6) 5' 8/10/2004	MW-IP-7 (MW-6) 7' 8/10/2004	MW-IP-9 (MW-6) 9' 8/10/2004
Benzo (a) pyrene	0.1	--	--	--	--	--	--	<0.134*	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo (b) fluoranthene	(c)	--	--	--	--	--	--	0.188	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo (g,h,i) perylene	NE	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo (k) fluoranthene	(c)	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	(c)	--	--	--	--	--	--	0.185	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzo (a,h) anthracene	(c)	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	NE	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluorene	NE	--	--	--	--	--	--	0.312	--	--	--	--	--	--	--	--	--	--	--	--	--
Indeno (1,2,3-cd) pyrene	(c)	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	NE	--	--	--	--	--	--	0.212	--	--	--	--	--	--	--	--	--	--	--	--	--
Pyrene	NE	--	--	--	--	--	--	0.235	--	--	--	--	--	--	--	--	--	--	--	--	--
cPAH B(a)P Equivalents	0.1	--	--	--	--	--	--	**0.11**	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
Concentrations compared to the Model Toxics Control Act (MTCA) Method A soil cleanup levels for unrestricted land uses presented in Table 740-1 of Chapter 173-340 of the Washington Administrative Code (WAC)
The MTCA Method A cleanup level for gasoline range total petroleum hydrocarbons is 100-mg/kg without benzene and 30-mg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 30-mg/kg was utilized.
ft = feet
bgs = below ground surface
mg/kg = milligram per kilogram
NS = Depth not specified. Previous consultant stated that test pit soil samples were collected above the highest apparent water level. Water level was not specified.
NE = Cleanup level not evaluated under MTCA
ND = Not Detected (Hydrocarbon Identification Method)
ND^ = Reported by previous consultant as "Not Detected". Reporting and/or detection limit was not specified.
-- not analyzed
TPH = Total Petroleum Hydrocarbons
HCID = Laboratory analysis by Hydrocarbon Identification
NWTPH = Laboratory analysis by Northwest Method Total Petroleum Hydrocarbons
cPAH = Carcinogenic polyaromatic hydrocarbons
B(a)P = Benzo(a)pyrene
< = Not detected above the laboratory reporting limit (RL) and/or method detection limit
Bold = Chemical detected at a concentration above the laboratory reporting limit
Bolded and highlighted font indicates results above the MTCA Method A cleanup level
(a) = Analysis is for total chromium. No MTCA cleanup level has been established for total chromium.
(b) = MTCA cleanup level is 5-mg/kg for total concentration of naphthalene, 1-methylnaphthalene and 2-methylnaphthalene. Total concentration conservatively assumed to be the sum any detected concentration and/or of half of the value of each RL if not detected
(c) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)
(d) = See MTCA cleanup level for PCB Mixtures. Per MTCA, cleanup level based on applicable federal law (40 CFR 761.61). This is a total value for all PCBs, conservatively assumed to be the sum any detected concentration and/or of half of the value of each RL if not detected.
NA = Not applicable
* = Laboratory practical quantitation limit is elevated above the MTCA Method A cleanup level, but chemical was not observed above the laboratory method detection limit

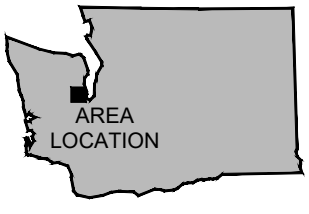
FIGURES



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., TUMWATER, WASHINGTON, 2014

0 2500' 5000'

Approximate Scale: 1 in. = 2500 ft.

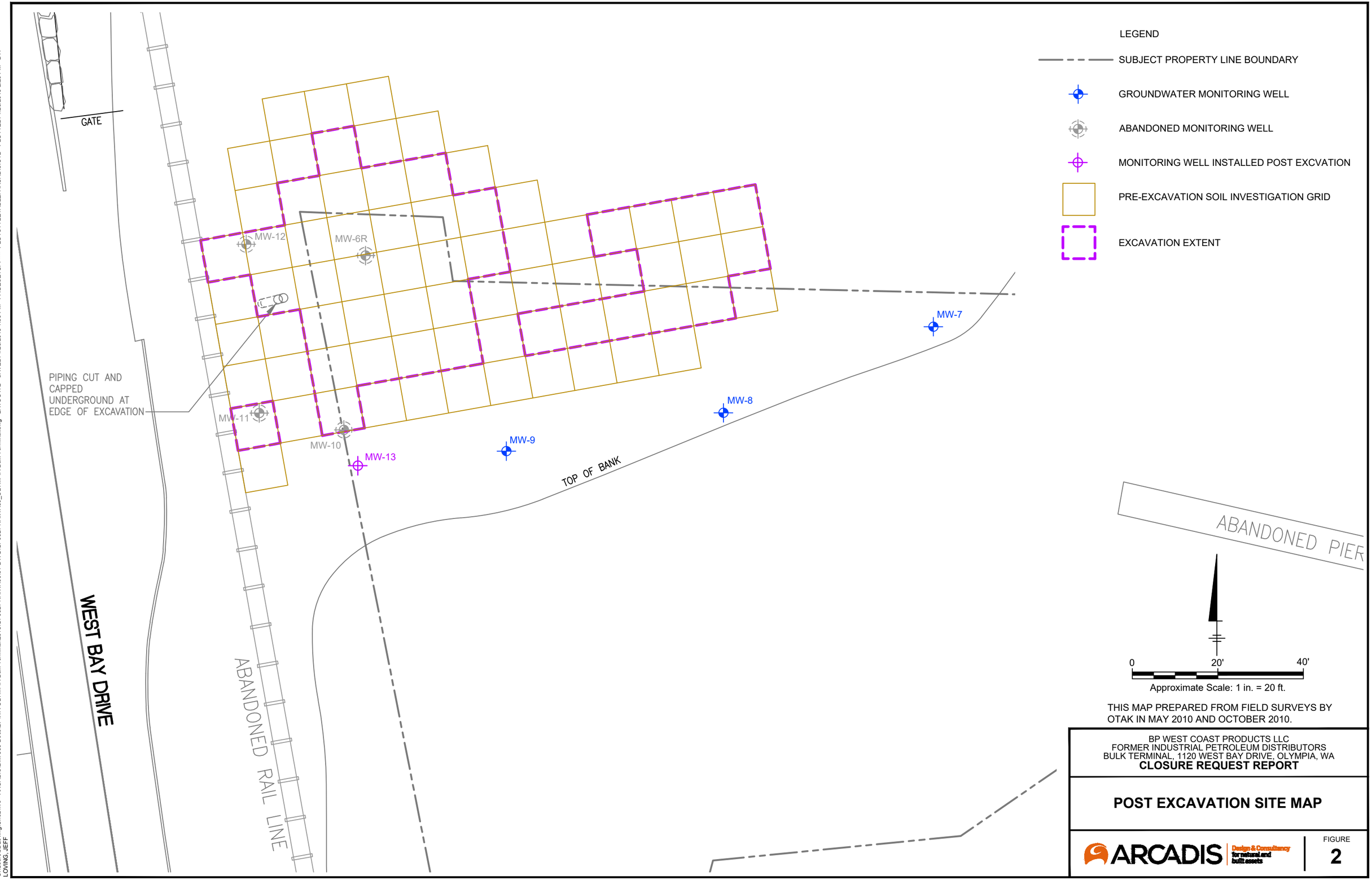


BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
CLOSURE REQUEST REPORT

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1



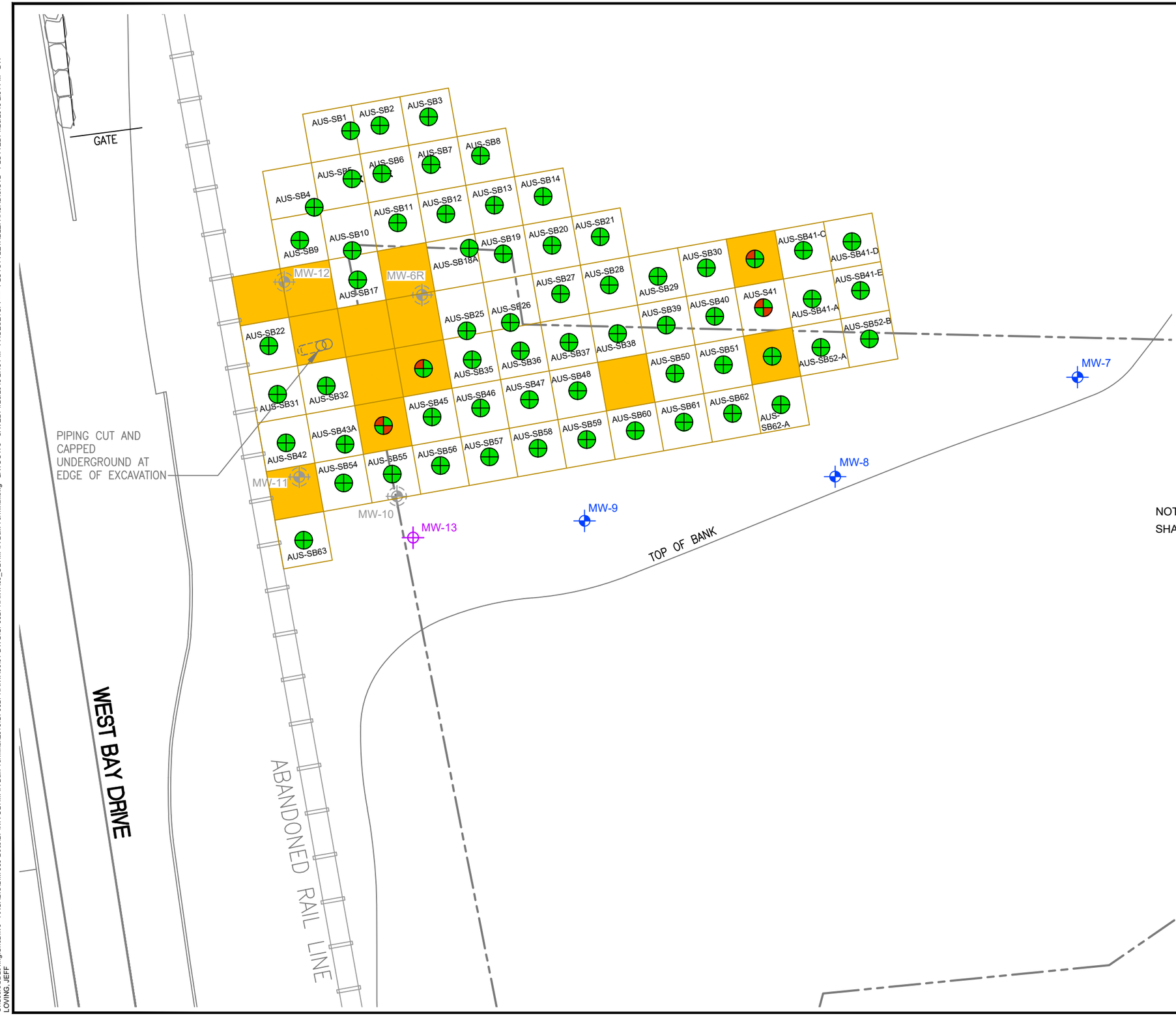
THIS MAP PREPARED FROM FIELD SURVEYS BY OTAK IN MAY 2010 AND OCTOBER 2010.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
CLOSURE REQUEST REPORT

POST EXCAVATION SITE MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2



LEGEND

- SUBJECT PROPERTY LINE BOUNDARY
- MW-9 — GROUNDWATER MONITORING WELL
- MW-10 — ABANDONED GROUNDWATER MONITORING WELL
- NOT DETECTED ABOVE LABORATORY REPORTING LIMIT OR DETECTED BELOW OR = MTCA-A
- DETECTED > MTCA-A
- MONITORING WELL INSTALLED POST EXCVATION
- TPH-G / TPH-D/HO / cPAHs / Naph
- TPH-G = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE RANGE ORGANICS
- TPH-D/HO = TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND HEAVY OIL ORGANICS RANGE
- cPAH = CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS ADJUSTED FOR TOXICITY
- NAPH = NAPHTHALENES
- MTCA-A = MTCA METHOD A CLEANUP LEVEL
- EXCAVATION GRIDS

NOTE:
SHALLOW INTERVAL DEPTH IS FROM 0 to 5 FEET BELOW GROUND SURFACE.

0 20' 40'

Approximate Scale: 1 in. = 20 ft.

THIS MAP PREPARED FROM FIELD SURVEYS BY OTAK IN MAY 2010 AND OCTOBER 2010.

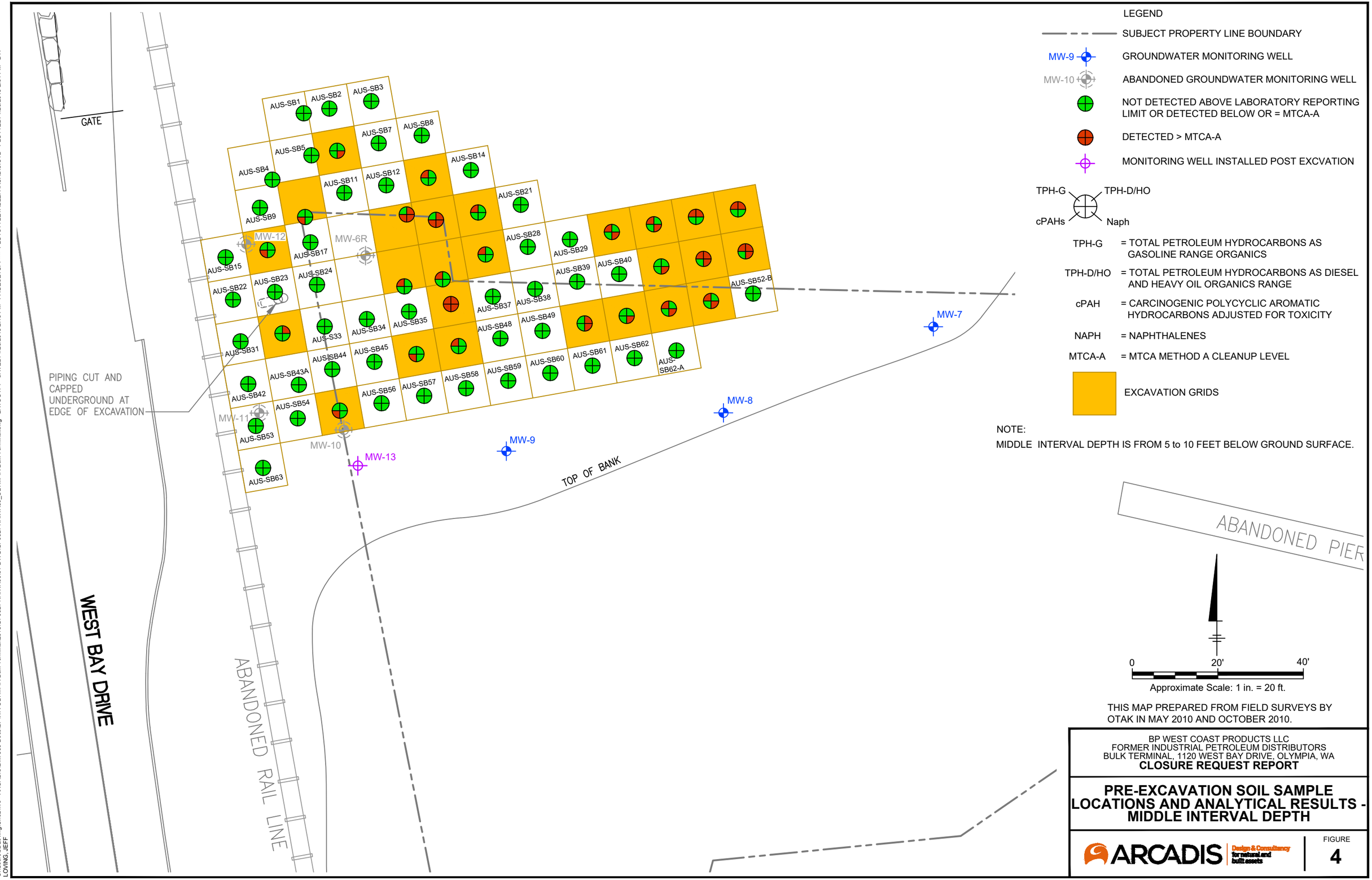
BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
CLOSURE REQUEST REPORT

PRE-EXCAVATION SOIL SAMPLE LOCATIONS AND ANALYTICAL RESULTS - SHALLOW INTERVAL DEPTH

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

CITY:(IRVINE) DIV/GROUP:IMDV DB: AREYES LD:AREYES
C:\Users\JDLoving\OneDrive - ARCADIS\BIM 360 Docs\BP\WA-OLYMPIA Bulk Terminal\2018\GP09BPNA.WA60\01-DWG\GP09BPNA.WA60_OLYMPIA Bulk Terminal.dwg LAYOUT: 3 SAVED: 1/26/2018 2:48 PM PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 1/26/2018 2:54 PM BY: LOVING, JEFF

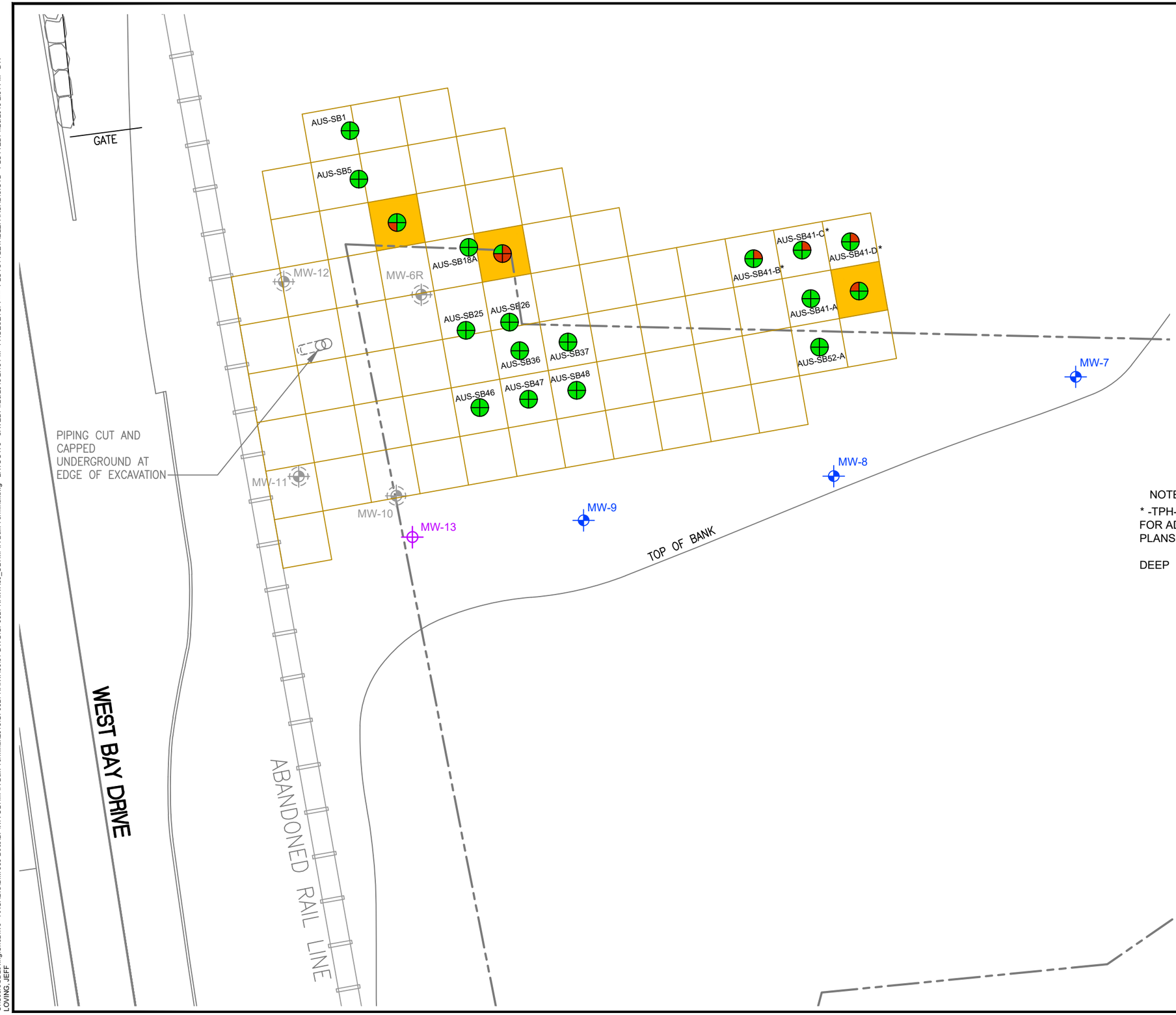


BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
CLOSURE REQUEST REPORT

PRE-EXCAVATION SOIL SAMPLE LOCATIONS AND ANALYTICAL RESULTS - MIDDLE INTERVAL DEPTH

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4



LEGEND

- SUBJECT PROPERTY LINE BOUNDARY
- MW-9 — GROUNDWATER MONITORING WELL
- MW-10 — ABANDONED GROUNDWATER MONITORING WELL
- NOT DETECTED ABOVE LABORATORY REPORTING LIMIT OR DETECTED BELOW OR = MTCA-A
- DETECTED > MTCA-A
- MONITORING WELL INSTALLED POST EXCVATION
- TPH-G / TPH-D/HO / cPAHs / Naph
- TPH-G = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE RANGE ORGANICS
- TPH-D/HO = TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND HEAVY OIL ORGANICS RANGE
- cPAH = CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS ADJUSTED FOR TOXICITY
- NAPH = NAPHTHALENES
- MTCA-A = MTCA METHOD A CLEANUP LEVEL
- EXCAVATION GRIDS

NOTE:

* -TPH-D/HO CONCENTRATIONS ATTRIBUTED TO NATURAL ORGANIC MATERIAL. FOR ADDITIONAL INFORMATION PLEASE REFER TO THE CONSTRUCTION PLANS AND SPECIFICATIONS SUMMARY REPORT SECTION 3.3.4.

DEEP INTERVAL DEPTH IS FROM 10 to 15 FEET BELOW GROUND SURFACE.

0 20' 40'

Approximate Scale: 1 in. = 20 ft.

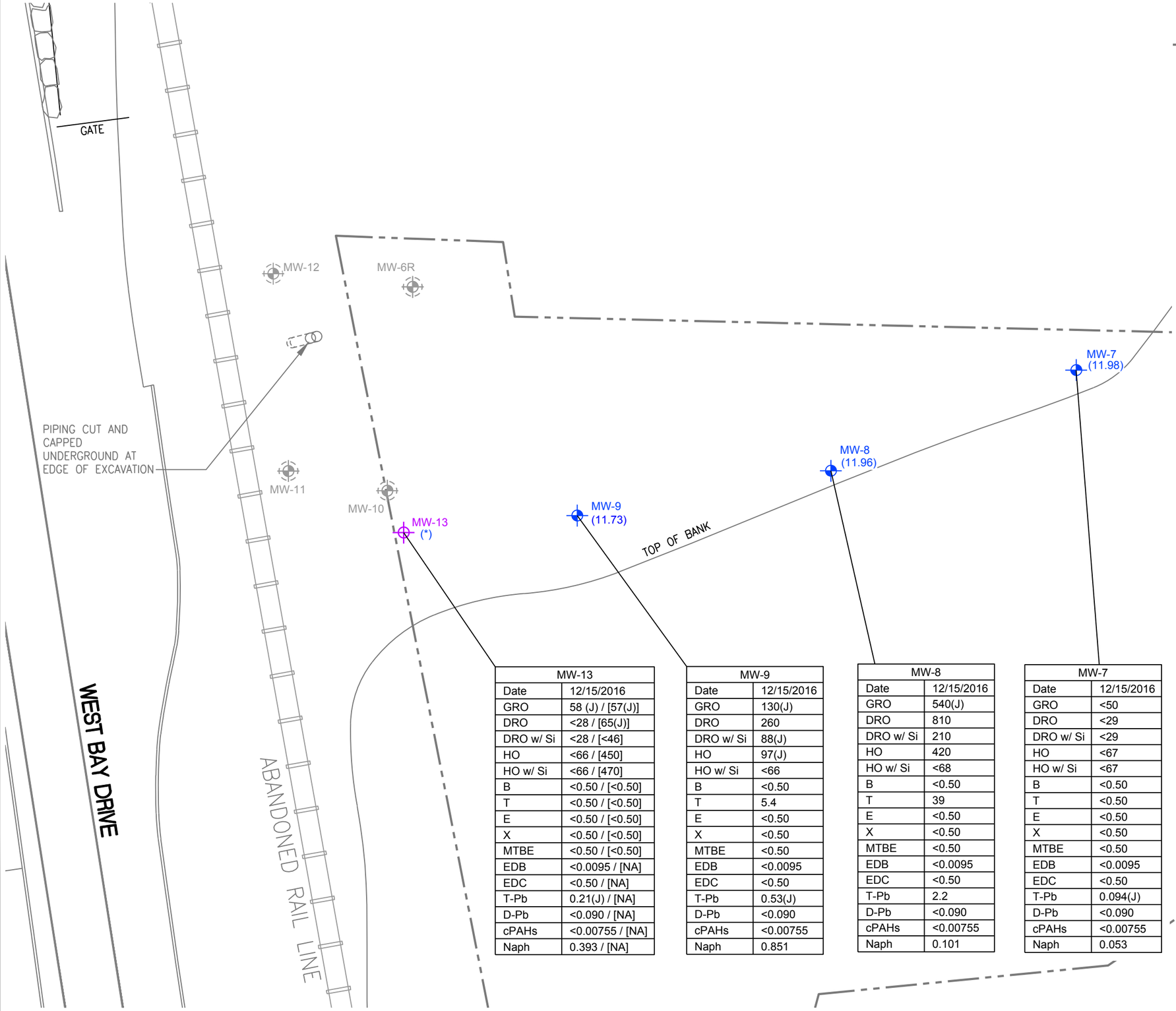
THIS MAP PREPARED FROM FIELD SURVEYS BY OTAK IN MAY 2010 AND OCTOBER 2010.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
CLOSURE REQUEST REPORT

PRE-EXCAVATION SOIL SAMPLE LOCATIONS AND ANALYTICAL RESULTS - DEEP INTERVAL DEPTH

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5



LEGEND

- SUBJECT PROPERTY LINE BOUNDARY
- GROUNDWATER MONITORING WELL
- DECOMMISSIONED WELL
- MONITORING WELL INSTALLED POST EXCAVATION
- (11.98) GROUNDWATER ELEVATION (FEET ABOVE NAVD 88)
- NAVD 88 NORTH AMERICAN VERTICAL DATUM 1988
- (*) WELL NOT SURVEYED FOR TOP OF CASING ELEVATION, THEREFORE THE GROUNDWATER ELEVATION IS NOT AVAILABLE
- (J) ESTIMATED VALUE - THE RESULT IS GREATER THAN OR EQUAL TO THE METHOD DETECTION LIMIT AND LESS THAN THE LIMIT OF QUANTITATION.
- NA NOT ANALYZED
- < NOT DETECTED, VALUE SHOWN IS DETECTION LIMIT

NORTH

Location ID	
Date	Date Collected
GRO	Total Petroleum Hydrocarbons-Gasoline Range Organics (µg/L) / [Duplicate (µg/L)]
DRO	Total Petroleum Hydrocarbons-Diesel Range Organics (µg/L) / [Duplicate (µg/L)]
DRO w/ Si	Total Petroleum Hydrocarbons-Diesel Range Organics with Silica Gel (µg/L) / [Duplicate (µg/L)]
HO	Total Petroleum Hydrocarbons-Heavy Range Organics (µg/L) / [Duplicate (µg/L)]
HO w/ Si	Total Petroleum Hydrocarbons-Heavy Range Organics with Silica Gel (µg/L) / [Duplicate (µg/L)]
B	Benzene (µg/L) / [Duplicate (µg/L)]
T	Toluene (µg/L) / [Duplicate (µg/L)]
E	Ethylbenzene (µg/L) / [Duplicate (µg/L)]
X	Total Xylene (µg/L) / [Duplicate (µg/L)]
MTBE	Methyl Tertiary Butyl Ether (µg/L) / [Duplicate (µg/L)]
EDB	Ethylene Dibromide (µg/L)
EDC	1, 2-Dichloroethane (µg/L)
T-Pb	Total Lead (µg/L)
D-Pb	Dissolved Lead (µg/L)
cPAHs	Carcinogenic Polycyclic Aromatic Hydrocarbons (µg/L)
Naph	Total Naphthalenes (µg/L)

MW-13	
Date	12/15/2016
GRO	58 (J) / [57(J)]
DRO	<28 / [65(J)]
DRO w/ Si	<28 / [<46]
HO	<66 / [450]
HO w/ Si	<66 / [470]
B	<0.50 / [<0.50]
T	<0.50 / [<0.50]
E	<0.50 / [<0.50]
X	<0.50 / [<0.50]
MTBE	<0.50 / [<0.50]
EDB	<0.0095 / [NA]
EDC	<0.50 / [NA]
T-Pb	0.21(J) / [NA]
D-Pb	<0.090 / [NA]
cPAHs	<0.00755 / [NA]
Naph	0.393 / [NA]

MW-9	
Date	12/15/2016
GRO	130(J)
DRO	260
DRO w/ Si	88(J)
HO	97(J)
HO w/ Si	<66
B	<0.50
T	5.4
E	<0.50
X	<0.50
MTBE	<0.50
EDB	<0.0095
EDC	<0.50
T-Pb	0.53(J)
D-Pb	<0.090
cPAHs	<0.00755
Naph	0.851

MW-8	
Date	12/15/2016
GRO	540(J)
DRO	810
DRO w/ Si	210
HO	420
HO w/ Si	<68
B	<0.50
T	39
E	<0.50
X	<0.50
MTBE	<0.50
EDB	<0.0095
EDC	<0.50
T-Pb	2.2
D-Pb	<0.090
cPAHs	<0.00755
Naph	0.101

MW-7	
Date	12/15/2016
GRO	<50
DRO	<29
DRO w/ Si	<29
HO	<67
HO w/ Si	<67
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
EDB	<0.0095
EDC	<0.50
T-Pb	0.094(J)
D-Pb	<0.090
cPAHs	<0.00755
Naph	0.053

0 20' 40'

Approximate Scale: 1 in. = 20 ft.

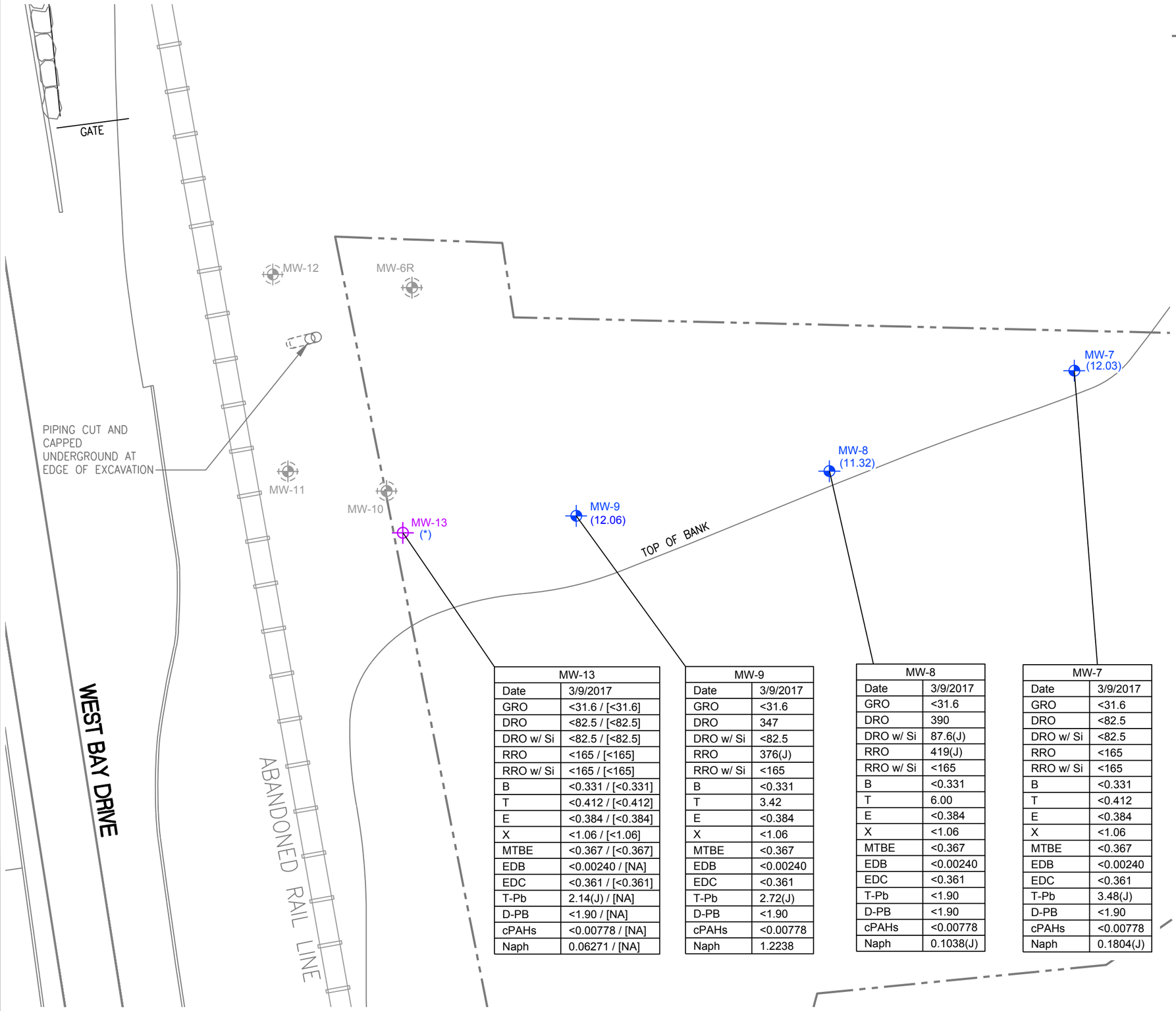
THIS MAP PREPARED FROM FIELD SURVEYS BY OTAK IN MAY 2010 AND OCTOBER 2010.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
CLOSURE REQUEST REPORT

FOURTH QUARTER 2016 GROUNDWATER ANALYTICAL DATA

ARCADIS Design & Consultancy for natural and built assets

FIGURE 6



LEGEND

- SUBJECT PROPERTY LINE BOUNDARY
- GROUNDWATER MONITORING WELL
- DECOMMISSIONED WELL
- MONITORING WELL INSTALLED POST EXCAVATION
- (12.03) GROUNDWATER ELEVATION (FEET ABOVE NAVD 88)
- NAVD 88 NORTH AMERICAN VERTICAL DATUM 1988
- (*) WELL NOT SURVEYED FOR TOP OF CASING ELEVATION, THEREFORE THE GROUNDWATER ELEVATION IS NOT AVAILABLE
- (J) ESTIMATED VALUE - THE RESULT IS GREATER THAN OR EQUAL TO THE METHOD DETECTION LIMIT AND LESS THAN THE LIMIT OF QUANTITATION.
- NA NOT ANALYZED
- < NOT DETECTED, VALUE SHOWN IS DETECTION LIMIT

NORTH

Location ID	
Date	Date Collected
GRO	Total Petroleum Hydrocarbons-Gasoline Range Organics (µg/L) / [Duplicate (µg/L)]
DRO	Total Petroleum Hydrocarbons-Diesel Range Organics (µg/L) / [Duplicate (µg/L)]
DRO w/ Si	Total Petroleum Hydrocarbons-Diesel Range Organics with Silica Gel (µg/L) / [Duplicate (µg/L)]
RRO	Total Petroleum Hydrocarbons-Residual Range Organics (µg/L) / [Duplicate (µg/L)]
RRO w/ Si	Total Petroleum Hydrocarbons-Residual Range Organics with Silica Gel (µg/L) / [Duplicate (µg/L)]
B	Benzene (µg/L) / [Duplicate (µg/L)]
T	Toluene (µg/L) / [Duplicate (µg/L)]
E	Ethylbenzene (µg/L) / [Duplicate (µg/L)]
X	Total Xylene (µg/L) / [Duplicate (µg/L)]
MTBE	Methyl Tertiary Butyl Ether (µg/L) / [Duplicate (µg/L)]
EDB	Ethylene Dibromide (µg/L)
EDC	1, 2-Dichloroethane (µg/L) / [Duplicate (µg/L)]
T-Pb	Total Lead (µg/L)
D-Pb	Dissolved Lead (µg/L)
cPAHs	Carcinogenic Polycyclic Aromatic Hydrocarbons (µg/L)
Naph	Total Naphthalenes (µg/L)

MW-13	
Date	3/9/2017
GRO	<31.6 / [<31.6]
DRO	<82.5 / [<82.5]
DRO w/ Si	<82.5 / [<82.5]
RRO	<165 / [<165]
RRO w/ Si	<165 / [<165]
B	<0.331 / [<0.331]
T	<0.412 / [<0.412]
E	<0.384 / [<0.384]
X	<1.06 / [<1.06]
MTBE	<0.367 / [<0.367]
EDB	<0.00240 / [NA]
EDC	<0.361 / [<0.361]
T-Pb	2.14(J) / [NA]
D-PB	<1.90 / [NA]
cPAHs	<0.00778 / [NA]
Naph	0.06271 / [NA]

MW-9	
Date	3/9/2017
GRO	<31.6
DRO	347
DRO w/ Si	<82.5
RRO	376(J)
RRO w/ Si	<165
B	<0.331
T	3.42
E	<0.384
X	<1.06
MTBE	<0.367
EDB	<0.00240
EDC	<0.361
T-Pb	2.72(J)
D-PB	<1.90
cPAHs	<0.00778
Naph	1.2238

MW-8	
Date	3/9/2017
GRO	<31.6
DRO	390
DRO w/ Si	87.6(J)
RRO	419(J)
RRO w/ Si	<165
B	<0.331
T	6.00
E	<0.384
X	<1.06
MTBE	<0.367
EDB	<0.00240
EDC	<0.361
T-Pb	<1.90
D-PB	<1.90
cPAHs	<0.00778
Naph	0.1038(J)

MW-7	
Date	3/9/2017
GRO	<31.6
DRO	<82.5
DRO w/ Si	<82.5
RRO	<165
RRO w/ Si	<165
B	<0.331
T	<0.412
E	<0.384
X	<1.06
MTBE	<0.367
EDB	<0.00240
EDC	<0.361
T-Pb	3.48(J)
D-PB	<1.90
cPAHs	<0.00778
Naph	0.1804(J)

0 20' 40'

Approximate Scale: 1 in. = 20 ft.

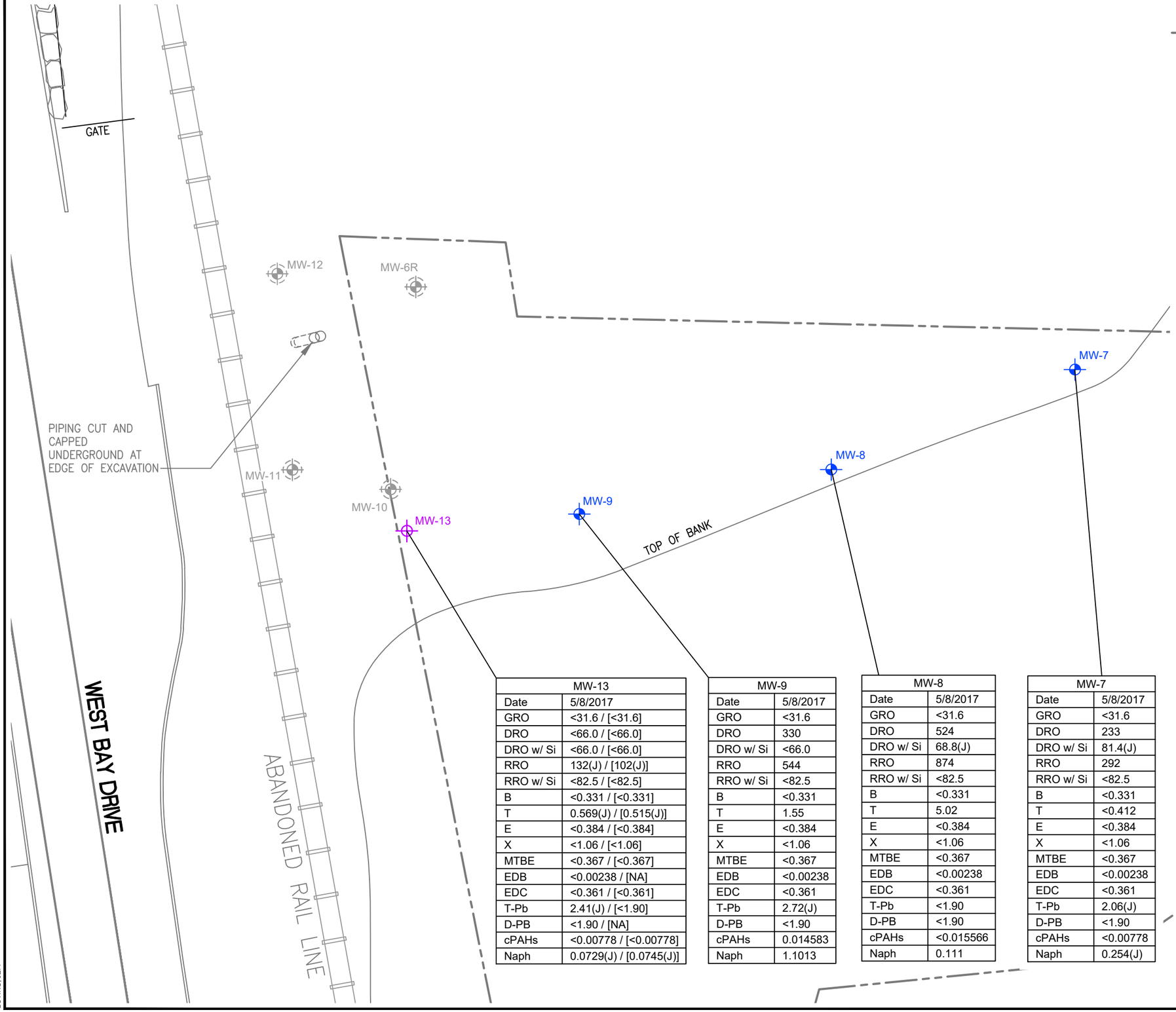
THIS MAP PREPARED FROM FIELD SURVEYS BY OTAK IN MAY 2010 AND OCTOBER 2010.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
CLOSURE REQUEST REPORT

FIRST QUARTER 2017 GROUNDWATER ANALYTICAL DATA

ARCADIS Design & Consultancy for natural and built assets

FIGURE 7



LEGEND

- SUBJECT PROPERTY LINE BOUNDARY
- GROUNDWATER MONITORING WELL
- DECOMMISSIONED WELL
- MONITORING WELL INSTALLED POST EXCAVATION
- (10.32) GROUNDWATER ELEVATION (FEET ABOVE NAVD 88)
- NAVD 88 NORTH AMERICAN VERTICAL DATUM 1988
- (*) WELL NOT SURVEYED FOR TOP OF CASING ELEVATION, THEREFORE THE GROUNDWATER ELEVATION IS NOT AVAILABLE
- (J) ESTIMATED VALUE - THE RESULT IS GREATER THAN OR EQUAL TO THE METHOD DETECTION LIMIT AND LESS THAN THE LIMIT OF QUANTITATION.
- NA NOT ANALYZED
- < NOT DETECTED, VALUE SHOWN IS DETECTION LIMIT

NORTH

Location ID	
Date	Date Collected
GRO	Total Petroleum Hydrocarbons-Gasoline Range Organics (µg/L) / [Duplicate (µg/L)]
DRO	Total Petroleum Hydrocarbons-Diesel Range Organics (µg/L) / [Duplicate (µg/L)]
DRO w/ Si	Total Petroleum Hydrocarbons-Diesel Range Organics with Silica Gel (µg/L) / [Duplicate (µg/L)]
RRO	Total Petroleum Hydrocarbons-Residual Range Organics (µg/L) / [Duplicate (µg/L)]
RRO w/ Si	Total Petroleum Hydrocarbons-Residual Range Organics with Silica Gel (µg/L) / [Duplicate (µg/L)]
	Benzene (µg/L) / [Duplicate (µg/L)]
	Toluene (µg/L) / [Duplicate (µg/L)]
	Ethylbenzene (µg/L) / [Duplicate (µg/L)]
	Total Xylene (µg/L) / [Duplicate (µg/L)]
MTBE	Methyl Tertiary Butyl Ether (µg/L) / [Duplicate (µg/L)]
EDB	Ethylene Dibromide (µg/L)
EDC	1, 2-Dichloroethane (µg/L) / [Duplicate (µg/L)]
T-Pb	Total Lead (µg/L) / [Duplicate (µg/L)]
D-Pb	Dissolved Lead (µg/L)
cPAHs	Carcinogenic Polycyclic Aromatic Hydrocarbons (µg/L) / [Duplicate (µg/L)]
Naph	Total Naphthalenes (µg/L) / [Duplicate (µg/L)]

MW-13	
Date	5/8/2017
GRO	<31.6 / [<31.6]
DRO	<66.0 / [<66.0]
DRO w/ Si	<66.0 / [<66.0]
RRO	132(J) / [102(J)]
RRO w/ Si	<82.5 / [<82.5]
B	<0.331 / [<0.331]
T	0.569(J) / [0.515(J)]
E	<0.384 / [<0.384]
X	<1.06 / [<1.06]
MTBE	<0.367 / [<0.367]
EDB	<0.00238 / [NA]
EDC	<0.361 / [<0.361]
T-Pb	2.41(J) / [<1.90]
D-PB	<1.90 / [NA]
cPAHs	<0.00778 / [<0.00778]
Naph	0.0729(J) / [0.0745(J)]

MW-9	
Date	5/8/2017
GRO	<31.6
DRO	330
DRO w/ Si	<66.0
RRO	544
RRO w/ Si	<82.5
B	<0.331
T	1.55
E	<0.384
X	<1.06
MTBE	<0.367
EDB	<0.00238
EDC	<0.361
T-Pb	2.72(J)
D-PB	<1.90
cPAHs	0.014583
Naph	1.1013

MW-8	
Date	5/8/2017
GRO	<31.6
DRO	524
DRO w/ Si	68.8(J)
RRO	874
RRO w/ Si	<82.5
B	<0.331
T	5.02
E	<0.384
X	<1.06
MTBE	<0.367
EDB	<0.00238
EDC	<0.361
T-Pb	<1.90
D-PB	<1.90
cPAHs	<0.015566
Naph	0.111

MW-7	
Date	5/8/2017
GRO	<31.6
DRO	233
DRO w/ Si	81.4(J)
RRO	292
RRO w/ Si	<82.5
B	<0.331
T	<0.412
E	<0.384
X	<1.06
MTBE	<0.367
EDB	<0.00238
EDC	<0.361
T-Pb	2.06(J)
D-PB	<1.90
cPAHs	<0.00778
Naph	0.254(J)

0 20' 40'

Approximate Scale: 1 in. = 20 ft.

THIS MAP PREPARED FROM FIELD SURVEYS BY OTAK IN MAY 2010 AND OCTOBER 2010.

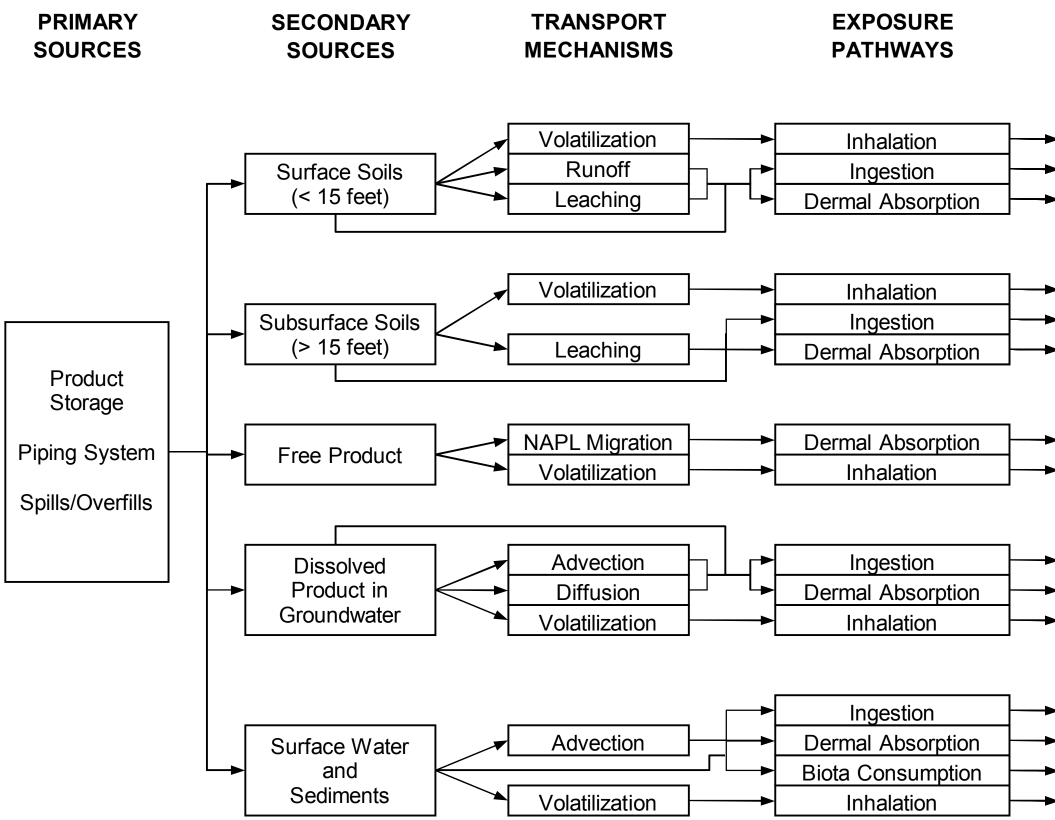
BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
CLOSURE REQUEST REPORT

SECOND QUARTER 2017 GROUNDWATER ANALYTICAL DATA

ARCADIS Design & Consultancy for natural and built assets

FIGURE 8

CITY:(IRVINE) DIV/GROUP:IMDV DB: AREYES LD:AREYES
C:\Users\JDLoving\OneDrive - ARCADIS\BIM 360 Docs\BPWA-OLYMPIA Bulk Terminal\2018\GP09BPNA.WA60\01-DWG\GP09BPNA.WA60_OLYMPIA Bulk Terminal.dwg LAYOUT: 8 SAVED: 1/26/2018 1:59 PM PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 1/26/2018 2:22 PM BY: LOVING, JEFF



	POTENTIAL RECEPTORS									
	Residential/ Children		Recreational Users		Commercial Workers		Industrial Workers		Construction Workers	
Exposure Pathway	Current	Future	Current	Future	Current	Future	Current	Future	Current	Future
Inhalation	-	-	-	-	-	-	-	-	-	-
Ingestion	-	-	-	-	-	-	-	-	-	-
Dermal Absorption	-	-	-	-	-	-	-	-	-	-
Inhalation	-	-	-	-	-	-	-	-	-	-
Ingestion	-	-	-	-	-	-	-	-	-	-
Dermal Absorption	-	-	-	-	-	-	-	-	-	-
Dermal Absorption	-	-	-	-	-	-	-	-	-	-
Inhalation	-	-	-	-	-	-	-	-	-	-
Ingestion	-	-	-	-	-	-	-	-	-	-
Dermal Absorption	-	-	-	-	-	-	-	-	-	-
Inhalation	-	-	-	-	-	-	-	-	-	-
Ingestion	-	-	-	-	-	-	-	-	-	-
Dermal Absorption	-	-	-	-	-	-	-	-	-	-
Biota Consumption	-	-	-	-	-	-	-	-	-	-
Inhalation	-	-	-	-	-	-	-	-	-	-

Notes:

- **E** = This route is a source of exposure
- **I** = This route is an insignificant source of exposure
- **-** = There is no exposure by this route
- **P** = This route is a potential source of exposure

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL DISTRIBUTORS BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON
CLOSURE REQUEST REPORT

CONCEPTUAL SITE MODEL HUMAN EXPOSURE PATHWAYS

ARCADIS Design & Consultancy for natural and built assets

FIGURE **9**

APPENDIX A

Ecology Letter Approval of the *Cleanup Action Completion Report*

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

January 3, 2018

Mr. Chris Dotson
Project Manager
ARCADIS
111 SW Columbia Street, STE 670
Portland, OR 97201

Re: Ecology Approval of the *Cleanup Action Completion Report*, prepared by ARCADIS, dated September 20, 2017.

- **Site Name:** Industrial Petroleum Distributors
- **Site Address:** 1120 West Bay Drive, Olympia, WA
- **Draft Agreed Order** DE 10470
- **Facility/Site No.** 1436
- **Cleanup Site ID No.** 4240

Dear Mr. Dotson:

Thank you for submitting the above-referenced revised report for our review in response to our redline comments submitted via e-mail on June 30, 2017. As previously communicated via e-mail on January 2, Ecology has no further comments. Therefore, please consider the report as approved by Ecology.

Please submit one additional paper copy of the report. This will be needed for the eventual public comment period when the Site is delisted.

If you have any questions, please contact me at (360) 407-6247 or at steve.teel@ecy.wa.gov.

Sincerely,

SS Teel

Steve Teel, LHG
Cleanup Project Manager/Hydrogeologist
Toxics Cleanup Program
Southwest Regional Office

By Certified Mail: [91 7199 9991 7037 7471 8675]

Cc: Mr. Ross LaGrandeur, AFS Project Manager 3/Certified Project Manager, ARCADIS
Nick Acklam, Department of Ecology
Megan MacClellan, Department of Ecology
Ivy Anderson, Office of the Attorney General

APPENDIX B

Site Boring Logs

Date Start/Finish: August 25, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA
Sampling Method: HA
Rig Type: HA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 6.5'
Surface Elevation: --

Descriptions By: Colleen Martin

Well/Boring ID: **GP-1**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	
		GP-1-2-2.5	2-2.5		4.1	ML		Grey sandy SILT mixed with bark dust and gravel, moist, fine sand, no odor or staining.	Bentonite backfilled to surface.
								Wet at 3.5' bgs.	
		GP-1-4-4.5	4-4.5		0.2	--		Brown WOOD debris, trace silt, wet, no odor or staining.	
5	-5	GP-1-6-6.5	6-6.5		0.0			Boring terminated at 6.5' bgs.	
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 25, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA
Sampling Method: HA
Rig Type: HA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 6.5'
Surface Elevation: --

Descriptions By: Colleen Martin

Well/Boring ID: GP-2

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	
								Brown SILT with sand and wood debris (20%), no odor or staining.	
		GP-2-2-2.5	2-2.5		9.1				
						ML		WOOD debris with some silt, faint odor, wet at 3.5' bgs.	Bentonite backfilled to surface.
		GP-2-4-4.5	4-4.5		17.5				
5	-5								
					4.6			WOOD debris and bark dust and water, trace silt in water. Boring terminated at 6.5' bgs.	
10	-10								

Remarks: bgs: below ground surface
HA: Hand Auger

ARCADIS
Infrastructure, environment, buildings

Date Start/Finish: August 24, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA
Sampling Method: HA
Rig Type: HA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 5'
Surface Elevation: --

Descriptions By: Colleen Martin

Well/Boring ID: **GP-3**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	
		GP-3-2-2.5	2-2.5		1.1	ML		Orange brown sandy SILT, trace gravel, fine sand, subrounded fine gravel, occasional organics, dry, no odor or staining.	Bentonite backfilled to surface.
		GP-3-4-4.5	4-4.5		4.7			Brown sandy SILT, fine sand, wood debris, moist, no odor or staining. Boring terminated at 5' bgs (refusal).	
5	-5								
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 23, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA
Sampling Method: HA
Rig Type: HA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 5'
Surface Elevation: --

Descriptions By: Colleen Martin

Well/Boring ID: GP-4

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	
						ML		Brown SILT with clay, trace sand, low plasticity, very fine sand, some wood debris, moist, no odor or staining.	
		GP-4-2-2.5	2-2.5		1.2				Bentonite backfilled to surface.
		GP-4-4-4.5	4-4.5		4.6	--		WOOD debris with some silt, trace sand, few cobbles, no odor or staining, wet at 3' bgs.	
5	-5							Boring terminated at 5' bgs (refusal).	
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 23, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA
Sampling Method: HA
Rig Type: HA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 6.5'
Surface Elevation: --

Descriptions By: Colleen Martin

Well/Boring ID: **GP-5**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	Bentonite backfilled to surface.
		GP-5-2-2.5	2-2.5		5.5	ML		Brown SILT with clay and trace sand, non-plastic, very fine sand, moist, no odor or staining. Wet at 3' bgs.	
		GP-5-4-4.5	4-4.5		97.5	--		Bark and WOOD debris with some silt, moderate odor, wet.	
5	-5	GP-5-6-6.5	6-6.5		3.7	ML		Brown SILT with clay, trace sand, lots of wood debris and bark, faint odor, wet. Boring terminated at 6.5' bgs.	
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 25, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA
Sampling Method: HA
Rig Type: HA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 6.5'
Surface Elevation: --

Descriptions By: Colleen Martin

Well/Boring ID: **GP-6**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	Bentonite backfilled to surface.
		GP-6-2-2.5	2-2.5		1.0	ML		Brown SILT with sand and gravel, non-plastic, fine sand, subrounded gravel, moist, no odor or staining, increasing wood debris.	
		GP-6-4-4.5	4-4.5		243				
5	-5							Brown SILT with trace fine sand, faint odor, wet at 5' bgs.	
		GP-6-6-6.5	6-6.5		9.8			Boring terminated at 6.5' bgs.	
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 24, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA
Sampling Method: HA
Rig Type: HA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 6.5'
Surface Elevation: --

Descriptions By: Colleen Martin

Well/Boring ID: **GP-7**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	
		GP-7-2-2.5	2-2.5		1.8	ML		Light brown sandy SILT, trace gravel, non-plastic, fine sand, subangular fine gravel, dry, no odor or staining, occasional organics.	Bentonite backfilled to surface.
		GP-7-4-4.5	4-4.5		4.2			Brown sandy SILT, non-plastic, little wood debris, moist, no odor or staining.	
5	-5	GP-7-6-6.5	6-6.5		4.2			Brown SILT with fine sand, trace clay, low plasticity, moist, no odor or staining. Boring terminated at 6.5' bgs.	
10	-10								

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Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 25, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA
Sampling Method: HA
Rig Type: HA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 6.5'
Surface Elevation: --

Descriptions By: Colleen Martin

Well/Boring ID: **GP-8**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	
		GP-8-2-2.5	2-2.5		0.4	ML		Light brown sandy SILT, trace gravel, non-plastic, fine sand, subrounded fine gravel, moist, no odor or staining.	Bentonite backfilled to surface.
5	-5	GP-8-4-4.5	4-4.5		0.2	SM		Brown SAND with trace silt and gravel, fine to medium sand, fine rounded gravel, moist, no odor or staining.	
		GP-8-6-6.5	6-6.5		0.6			Boring terminated at 6.5' bgs.	
10	-10								

Remarks: bgs: below ground surface
HA: Hand Auger

ARCADIS
Infrastructure, environment, buildings

Date Start/Finish: August 24, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA
Sampling Method: HA
Rig Type: HA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 6.2'
Surface Elevation: --

Descriptions By: Colleen Martin

Well/Boring ID: **GP-9**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	Bentonite backfilled to surface.
		GP-9-2-2.5	2-2.5		0.9	ML		Brown SILT with clay, trace sand, non-plastic, very fine sand, moist, no odor or staining, occasional organics.	
		GP-9-4-4.5	4-4.5		0.6				
5	-5					CL		Brown silty CLAY, trace sand, moderate plasticity, very fine sand, moist, no odor or staining.	
		GP-9-5.5-6	5.5-6		0.8			Boring terminated at 6.2 bgs.	
10	-10								

Remarks: bgs: below ground surface
HA: Hand Auger

ARCADIS
Infrastructure, environment, buildings

ARCADIS Design & Consultancy for natural and built assets

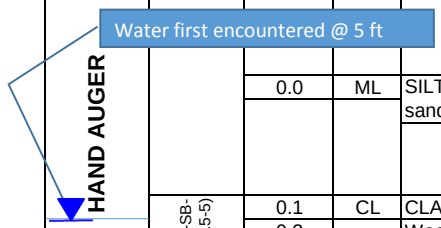
Boring No.: AUS-SB01

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1								
2				0.0	ML	SILT with clay and pebbles, brown, trace coarse grained sand, small to medium pebble size, well graded		
3								
4								
5			AUS-SB-1A(4.5-5)	0.1	CL	CLAY, grey, trace silt, low plasticity, moist/wet		
6				0.3		Woody debris, wet		
7								
8			SB-1-A -7.5	0.3		Woody debris		
9								
10								
11								
12			SB-1-A - 12.5	0.2	SW	SAND with gravel, brown, fine to coarse grained sand, small to large gravel, well graded, wet		
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								



Hydrated Bentonite Chips

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Muddy Waters	Sampling Interval:	
Drilling Method:	VAC, HA, Geoprobe	Water First encountered:	5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB02

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 5 ft		
2		HAND AUGER	AUS-SB-2 (2-2.5)	0.0	CL	CLAY, trace silt, grey, low plasticity, dry	Hydrated Bentonite Chips	
3								
4								
5				0.8		Woody debris		
6								
7			SB-2 -9.5	0.0				
8								
9					SW	SAND with gravel, fine to coarse grained sand, small to large gravel, well graded, wet		
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	VAC, HA, Geoprobe	Water First encountered:	5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB03

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 4.5 ft		
2		HAND AUGER	AUS-SB-3 (2-2.5)	0.2	CL	CLAY, trace silt, grey, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-3 -7.5	0.6		Woody debris		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	VAC, HA, Geoprobe	Water First encountered:	4.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB04

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1–20		HAND AUGER	AUS-SB-4A (2-2.5)	0.5	CL	Silty CLAY, grey / brown, poorly graded, dry	Hydrated Bentonite Chips	
7–10			SB-4A -7.5	0.2	SP	SAND with gravel, brown, medium to fine grained sand, fine to medium gravel, uniformly graded, wet		

Water first encountered @ 6.5 ft

End of Borehole at 10 feet bgs

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	VAC, HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

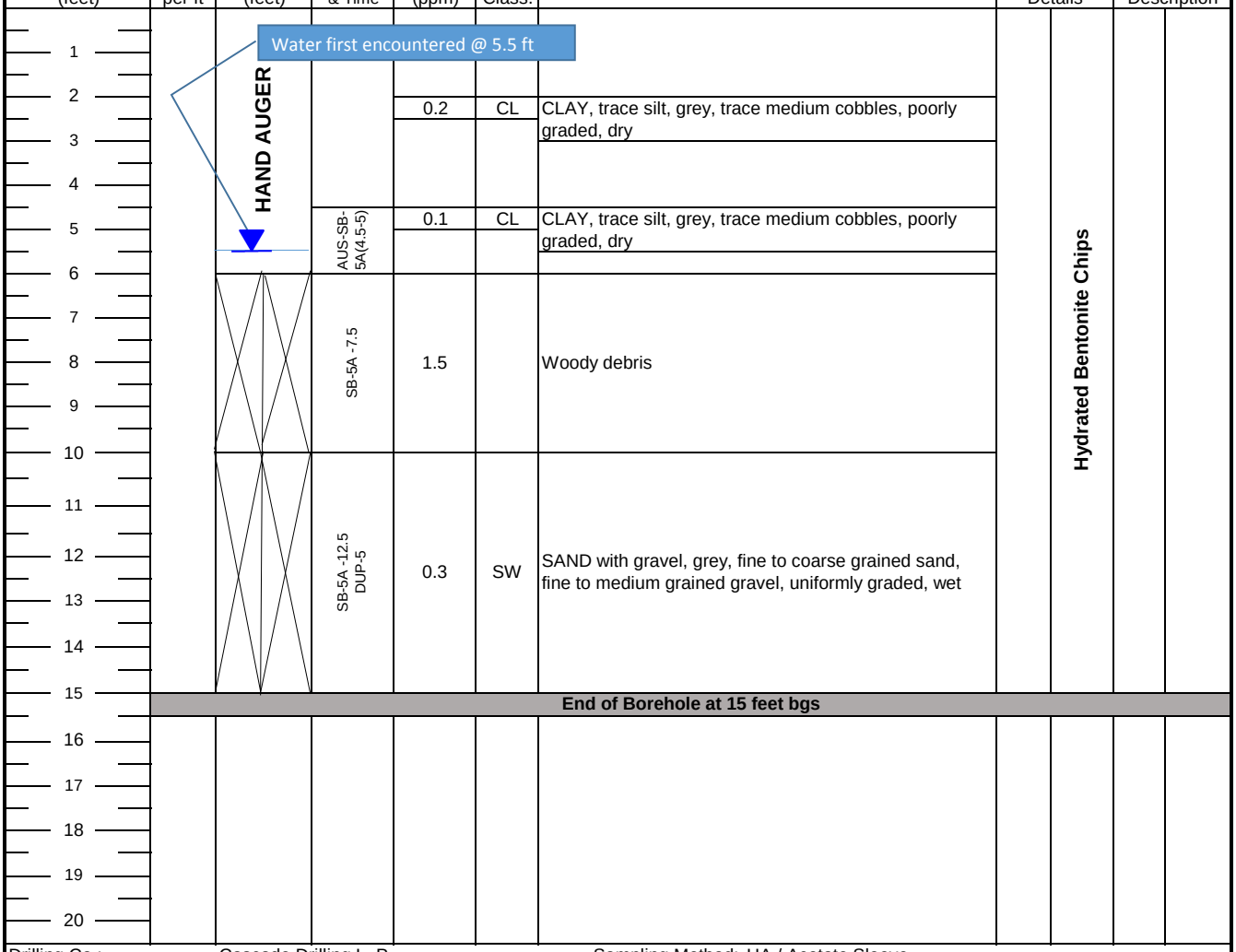
ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB05

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA



Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1								
2				0.2	CL	CLAY, trace silt, grey, trace medium cobbles, poorly graded, dry		
3								
4								
5			AUS-SB-5A(4.5-5)	0.1	CL	CLAY, trace silt, grey, trace medium cobbles, poorly graded, dry		
6								
7			SB-5A -7.5	1.5		Woody debris		
8								
9								
10								
11			SB-5A -12.5 DUP-5	0.3	SW	SAND with gravel, grey, fine to coarse grained sand, fine to medium grained gravel, uniformly graded, wet		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C/ Muddy Waters	Sampling Interval:	
Drilling Method:	VAC, HA, Geoprobe	Water First encountered:	5.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB06

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 4.5 ft		
2		HAND AUGER	AUS-SB-6(2-2.5)	0.5	CL	CLAY, grey, trace silt, trace small cobbles, poorly graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-6 -7.5 DUP 7	3.4		Woody debris		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Muddy Waters	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	4.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB07

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 6 ft		
2		HAND AUGER	AUS-SB-7(2-2.5)	0.5	CL	CLAY, grey, trace silt, trace small cobbles, poorly graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-7-7.5	1.0		Woody debris		
8								
9								
10								
11				0.2	SW	SAND with gravel, brown, coarse grained sand, small to medium gravel, wet		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C.	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB08

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 6.5 ft ft		
2		HAND AUGER	AUS-SB-8(2-2.5)	0.0	CL	CLAY, grey, trace silt, trace small cobbles, trace coarse grained sand, poorly graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-8-7.5	0.5		Woody debris		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB09

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 3.5 ft ft		
2		HAND AUGER	AUS-SB-9(2-2.5)	0.0	SM	Silty SAND, light brown, trace rounded gravel, well graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-9-7.5	0.2	SW	SAND with gravel, brown, fine to coarse grained sand, fine to medium gravel, well graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	3.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB10

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 3.5 ft	Hydrated Bentonite Chips	
2		HAND AUGER	AUS-SB-10A (2-2.5)	0.0	SM	Silty SAND, light brown, trace gravel, poorly graded, dry, organic debris		
3								
4								
5						Organic wood debris from 4.5 to 6.5 feet bgs		
6								
7			SB-10-7.5	0.2	SW	SAND with gravel, brown, fine to coarse grained sand, fine to medium graded gravel, well graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	VAC, HA, Geoprobe	Water First encountered:	3.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB11

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	08/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	08/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 4.5 ft		
2		HAND AUGER	AUS-SB-11 (2-2.5)	0.0	ML	Clayey SILT, brown, poorly graded, low plasticity, dry, trace organic debris	Hydrated Bentonite Chips	
3								
4								
5						Organic wood debris		
6								
7			SB-11-7.5	12.8		Woody debris		
8								
9								
10								
11			SB-11-12.5	0.1	SW	SAND with gravel, coarse grained sand, small to medium grained gravel, brown, well graded, wet		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	4.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC=Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB12

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	08/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	08/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1								
2		HAND AUGER	AUS-SB-12 (2-2.5) DUP-2	2.6	CL	CLAY, grey, trace silt, poorly graded, low plasticity, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-12-7.5	1.4		Woody debris		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Water first encountered @ 4 ft

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate sleeve
Driller:	Muddy Waters	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	4 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC=Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB13

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 3.5 ft		
2		HAND AUGER	AUS-SB-13 (2-2.5)	2.4	CL	CLAY, grey, trace Silt, low plasticity, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-13-7.5	0.5		Woody debris		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Muddy Waters / Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	3.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB14

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		HAND AUGER	AUS-SB-14 (2-2.5)	2.0	CL	CLAY, grey, trace silt, poorly graded, dry	Hydrated Bentonite Chips	
2								
3								
4								
5								
6								
7			SB-14-7.5	0.9		Woody debris		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Water first encountered @ 3.5 ft

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Muddy Waters / Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	3.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

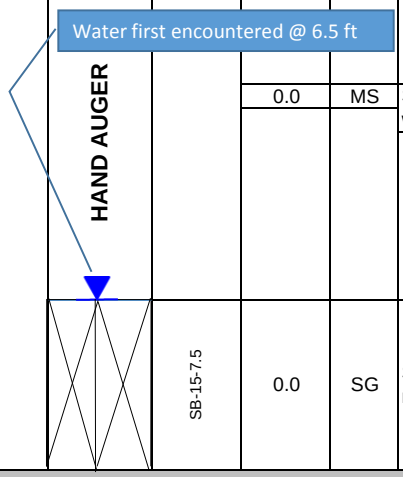
Boring No.: AUS-SB15

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/27/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1								
2				0.0	MS	Sandy SILT, brown, with small and medium cobbles, well graded, dry		
3								
4								
5								
6								
7			SB-15-7.5	0.0	SG	SAND with gravel, brown, coarse grained sand, medium, rounded gravel, gap graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								



Completion Details: Hydrated Bentonite Chips

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB16

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/27/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		HAND AUGER				Water first encountered @ 6.5 ft	Hydrated Bentonite Chips	
2				0.1	ML	SILT with small cobbles, brown, trace coarse grained sand, poorly graded, dry		
3								
4								
5								
6								
7			SB-16-7.5	0.0	SP	SAND with gravel, brown, coarse grained sand, medium grained gravel, gap graded		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Muddy Waters	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB17

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 2.5 ft		
2		HAND AUGER	AUS-SB-17(2-2.5)	0.1	CH	CLAY, grey, trace silt, trace small cobbles, medium plasticity, moist	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-17-7.5	0.7	SW	SAND with gravel, brown, fine to coarse grained sand, small to medium gravel, well graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	2.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB18

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 4.5 ft		
2		HAND AUGER	AUS-SB-18(2-2.5)	0.1	ML	SILT, brown, trace sand, trace small cobbles, poorly graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-18-7.5	28.5		Woody debris, brown to black		
8								
9								
10						Woody debris, black		
11						**End of Borehole at 11 feet bgs**		
12						Refusal at 11 feet bgs, boring AUS-SB18A advanced to 15 feet bgs in an adjacent location, see separate boring log.		
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Muddy Waters / Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	4.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB18A

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 4.5 ft		
2		HAND AUGER		0.1	ML	SILT, brown, trace sand, trace small cobbles, poorly graded, dry (from boring AUS-SB18)	Hydrated Bentonite Chips	
3								
4								
5								
6								
7				28.5		Woody debris, brown to black (from boring AUS-SB18)		
8								
9								
10								
11						Woody debris, black		
12			SB-18A-12.5	0.2	CL	CLAY		
13								
14					SW	SAND with gravel, fine to coarse grained sand		
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Muddy Waters / Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	4.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB19

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		HAND AUGER					Hydrated Bentonite Chips	
2			AUS-SB-19(2-2.5)		CL	CLAY with silt, brown, trace small cobbles, dry		
3								
4						Water first encountered @ 7.5 ft		
5								
6								
7								
8	5		SB-19-7.5	15.4		Woody debris		
9	5							
10	5							
11								
12								
13								
14	40/6		SB-19-14.5	12.8		Woody debris		
15					SW	SAND with gravel, black, fine to coarse grained sand, small to medium gravel, well graded, wet		
16						**End of Borehole at 15.5 feet bgs**		
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	Hand Auger, Split spoon sampler
Driller:	Muddy Waters / James Cable	Sampling Interval:	
Drilling Method:	VAC, HA, Hollow Stem Auger	Water First encountered:	7.5 ft bgs
Drill Rig Type:	NA	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB20

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		HAND AUGER				Water first encountered @ 3.5 ft	Hydrated Bentonite Chips	
2			AUS-SB-20(2-2.5)	0.2	CL	CLAY, brown, trace silt, trace very small cobbles, poorly sorted, brown, dry		
3								
4								
5								
6								
7								
8	2 2 2		SB-20-7.5	16.1		Woody debris		
9								
10								
11								
12								
13	10 12 12		SB-20-12.5	9.6		Woody debris		
14						**End of Borehole at 14 feet bgs**		
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	Hand Auger, Split spoon sampler
Driller:	Muddy Waters / Kyle C	Sampling Interval:	
Drilling Method:	HA, Hollow Stem Auger	Water First encountered:	3.5 ft bgs
Drill Rig Type:	NA	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB21

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		HAND AUGER					Hydrated Bentonite Chips	
2			AUS-SB-21(2-2.5)	1.0	CL	CLAY, grey, trace silt, low plasticity, dry		
3								
4						Water first encountered @ 6.5 ft		
5								
6								
7			SB-21-7.5	2.0		Lithology description not available		
8								
9								
10								
11				0.2		Lithology description not available		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Muddy Waters	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB22

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/27/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		HAND AUGER					Hydrated Bentonite Chips	
2			AUS-SB-22(2-2.5)	1.2	ML	Clayey SILT, brown, trace small cobbles, trace coarse grained sand, poorly graded, dry		
3								
4								
5						Water first encountered @ 6.5 ft		
6								
7			SB-22-7.5	0.0	SP	SAND with gravel, brown, coarse grained sand, medium rounded gravel, gap graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

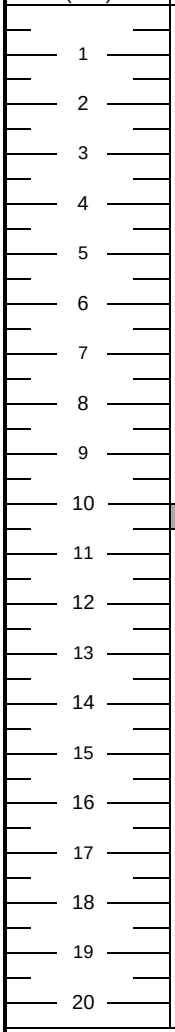
ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB23-A

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/27/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA



Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1–5				11.1	ML	Sandy SILT with woody debris, brown, fine to coarse grained sand, poorly graded, dry	Hydrated Bentonite Chips	
6–9			SB-23-A -7.5	0.6	SP	SAND with gravel, brown, coarse grained sand, medium rounded gravel, gap graded, wet		
10						**End of Borehole at 10 feet bgs**		

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB24

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1–6		HAND AUGER				Water first encountered @ 6.5 ft	Hydrated Bentonite Chips	
2				0.4	ML	Clayey SILT, brown, poorly graded, dry		
7–9			SB-24-7.5	0.2	SP	SAND with gravel, brown, fine to coarse grained sand, small to medium gravel, uniformly graded, wet		
10						**End of Borehole at 15 feet bgs**		
11–20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB25

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNA WA 60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1					SG	SAND and gravel, dry, with organics	Hydrated Bentonite Chips	
2		HAND AUGER	AUS-SB-25A (2-2.5)	0.4	ML	Sandy SILT, light brown, with trace clay, stiff, dry		
3								
4						Wet wood fragments		
5								
6								
7			SB-25A-7.5	0.0		Woody debris		
8								
9								
10								
11			SB-25A-12.5	0.1	SW	SAND with gravel, brown, fine to coarse grained sand, small to medium gravel, well graded, wet		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Water first encountered @ 3 ft

Drilling Co.:	Cascade Drilling L.P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First Encountered:	3 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA = Not Applicable/Not Available		North Coor:	NA
HA = Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB26

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNA WA 60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1					SG	SAND and gravel, medium dense, dry, with organics	Hydrated Bentonite Chips	
2		HAND AUGER	AUS-SB-26A (2-2.5)		SM	Silty SAND, brown, with some clay and gravel, loose, dry		
3								
4						Wood fragments, wet		
5								
6								
7			SB-26A-7.5	25.4		Woody debris		
8								
9								
10								
11			SB-26A-12.5	2.0	SW	SAND with gravel, fine to coarse grained sand, fine to medium grained gravel, well graded, wet		
12								
13								
14								
15						**End of Borehole at 15.0 feet bgs**		
16								
17								
18								
19								
20								

Water first encountered @ 3 ft

Drilling Co.:	Cascade Drilling L.P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First Encountered:	3 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA = Not Applicable/Not Available		North Coor:	NA
HA = Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB27

Soil Boring Log

Sheet : 1 of 1

Project Name: BP Olympia Bulk Plant
Project Number: GP09BPNA WA 60
Project Location: 1120 West Bay Drive NW, Olympia, WA
Date Started: 8/20/2015
Date Completed: 8/28/2015
Logger: Jason Little
Editor: Ross LaGrandeur
Weather Conditions: NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
		Water first encountered @ 4 ft			SG	SAND and gravel, fine to coarse grained, well graded, dense, dry, with some organics	Hydrated Bentonite Chips	
1		HAND AUGER						
2			AUS-SB-27 (2-2.5)	0.3	SM	Silty SAND, brown, with some clay, fine grained, medium dense, dry		
3								
4						Wood fragments and organics, low to no recovery		
5								
6								
7			SB-27-7.5	4.6		Woody debris		
8								
9								
10								
11								
12				6.1		Woody debris		
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.: Cascade Drilling L.P.
Driller: Kyle C
Drilling Method: HA, Geoprobe
Drill Rig Type: Geoprobe

Sampling Method: HA / Acetate Sleeve
Sampling Interval:
Water First Encountered: 4 ft bgs
Water Level Finish: NA
Converted to Well: ☐ Yes ☑ No
Surface Elev: NA
North Coor: NA
East Coor: NA

Remarks:
bgs = below ground surface
NA = Not Applicable/Not Available
HA = Hand Auger

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB28

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNA WA 60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
						Water first encountered 6.5 ft		
1								
2		HAND AUGER	AUS-SB-28 (2-2.5)	0.6	CL	CLAY, brown, trace silt, dry, trace woody debris	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-28-7.5	0.0		Woody debris		
8								
9								
10								
11								
12				0.5		Woody debris		
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L.P.	Sampling Method:	HA/ Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First Encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA = Not Applicable/Not Available		North Coor:	NA
HA = Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB29

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNA WA 60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
						Water first encountered @ 6.5 ft		
1		HAND AUGER						
2			AUS-SB-29 (2-2.5)	1.4	CL	CLAY, grey, trace silt, low plasticity, dry, trace woody debris		
3								
4								
5								
6								
7			SB-29-7.5	2.2		Woody debris	Hydrated Bentonite Chips	
8								
9								
10				0.2		Woody debris		
11								
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L.P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First Encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA = Not Applicable/Not Available		North Coor:	NA
HA = Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB30

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNA WA 60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1					SG	SAND and GRAVEL, light brown, medium to coarse gravel, sub angular to sub rounded, well graded, loose, dry	Hydrated Bentonite Chips	
2			AUS-SB-30 (2-2.5)	4.4	SM	Silty SAND, light to dark brown, fine grained, some gravel (medium to coarse grained), loose, dry, trace organics, (2.5-3) - no recovery		
3								
4								
5						Wood fragments, wet, no recovery		
6								
7			SB-30-7.5	5.8		Woody debris		
8								
9								
10								
11								
12				0.4		Woody debris		
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Water first encountered @ 4 ft

HAND AUGER

Drilling Co.:	Cascade Drilling L.P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First Encountered:	4 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA = Not Applicable/Not Available		North Coor:	NA
HA = Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB31

Soil Boring Log

Sheet : 1 of 1

Project Name: BP Olympia Bulk Plant | Date Started: 8/20/2015 | Logger: Jason Little
Project Number: GP09BPNA WA 60 | Date Completed: 8/27/2015 | Editor: Ross LaGrandeur
Project Location: 1120 West Bay Drive NW, Olympia, WA | Weather Conditions: NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1					SG	SAND and gravel, with organics	Hydrated Bentonite Chips	
2		HAND AUGER	AUS-SB-31 (2-2.5)		SP	Fine to medium SAND, dark brown, with medium to coarse gravel and trace silt, medium dense, dry		
3								
4								
5					SM	SAND, dark grey, with some silt and trace clay, loose, wet		
6								
7			SB-31-7.5	0.0	SG	SAND with gravel, coarse grained sand, medium graded gravel, rounded gravel, gap graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Water first encountered @ 4 ft

Drilling Co.: Cascade Drilling L.P.
Driller: Frank Scott
Drilling Method: HA, Geoprobe
Drill Rig Type: Geoprobe

Sampling Method: HA / Acetate Sleeve
Sampling Interval:
Water First Encountered: 4 ft bgs
Water Level Finish: NA
Converted to Well: ☐ Yes ☑ No
Surface Elev: NA
North Coor: NA
East Coor: NA

Remarks:
bgs = below ground surface
NA = Not Applicable/Not Available
HA = Hand Auger

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB32

Soil Boring Log

Sheet : 1 of 1

Project Name: BP Olympia Bulk Plant | Date Started: 8/20/2015 | Logger: Jason Little

Project Number: GP09BPNA WA 60 | Date Completed: 8/27/2015 | Editor: Ross LaGrandeur

Project Location: 1120 West Bay Drive NW, Olympia, WA | Weather Conditions: NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
						Water first encountered @ 6.5 ft		
1								
2		HAND AUGER	AUS-SB-32 (2-2.5)		ML	Clayey SILT, brown, poorly graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-32-7.5		SG	SAND with gravel, coarse grained sand, medium grained gravel, rounded gravel, gap graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.: Cascade Drilling L.P.

Driller: Frank Scott

Drilling Method: HA, Geoprobe

Drill Rig Type: Geoprobe

Sampling Method: HA/ Acetatae Sleeve

Sampling Interval:

Water First Encountered: 6.5 ft bgs

Water Level Finish: NA

Converted to Well: ☐ Yes ☑ No

Surface Elev: NA

North Coor: NA

East Coor: NA

Remarks:

bgs = below ground surface

NA = Not Applicable/Not Available

HA = Hand Auger

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB33

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/31/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		Water first encountered @ 6.5ft						
2		HAND AUGER		0.0	ML	Clayey SILT, light brown, trace sand, poorly graded, organic debris, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7						Woody debris		
8			SB-33-7.5	0.4	SW	SAND with gravel, brown, fine to coarse grained sand, small to medium gravel, uniformly graded, wet		
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

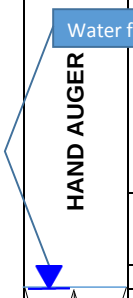
Boring No.: **AUS-SB34**

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/19/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1								
2				0.5	ML	Clayey SILT, with small cobbles, trace coarse grained sand		
3								
4								
5			AUS-SB-34 (4.5-5)	76.2	CL	CLAY, grey, poorly graded, moist, with woody debris		
6								
7			SB-33-7.5	4.8		Woody debris		
8								
9								
10								
						End of Borehole at 10 feet bgs		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								



Completion Details: Hydrated Bentonite Chips

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB35

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/19/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 6.5 ft		
2		HAND AUGER	AUS-SB-35 (2-2.5)		ML	Clayey SILT, brown, trace small cobbles, poorly graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-35 -7.5	3.2		Woody debris		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: **AUS-SB36**

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	Logger:
Project Number:	GP09BPNAWA60	Date Completed:	Editor: Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA	Weather Conditions:	

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1								
2		HAND AUGER	AUS-SB-36(2-2.5)	0.3	ML	Clayey SILT, brown, poorly graded, dry		
3								
4								
5								
6								
7								
8	2 2 2		SB-36-7.5 DUP-6	61.3		Woody debris		
9								
10								
11	3 4 4			26.7		Woody debris, trace Sand		
12								
13	50/6		SB-36-12.5	9.7	SW	SAND with gravel, brown, fine to coarse grained sand, small to large gravel, well graded, wet		
14								
15	47-50/6			1.1	SW	SAND with gravel, brown, fine to coarse grained sand, small to large gravel, well graded, wet		
16						**End of Borehole at 16 feet bgs**		
17								
18								
19								
20								

Water first encountered @ 7.5 ft

Completion Details: **Hydrated Bentonite Chips**

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Split Spoon Sampler
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Hollow Stem Auger	Water First encountered:	7.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB37

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/1/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 4 ft		
2		HAND AUGER	AUS-SB-37 (2-2.5)	0.0	ML	Clayey SILT, brown, trace cobbles, poorly graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-37-7.5	8.9		Woody debris		
8								
9								
10								
11			SB-37-12.5	7.3		Woody debris		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	VAC, HA, Geoprobe	Water First encountered:	4 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB38

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1								
2		HAND AUGER	AUS-SB-38 (2-2.5)	1.0		Woody debris, trace silt, trace small cobbles, rounded, moist		
3								
4								
5								
6								
7			SB-38-7.5	0.9		Woody debris		
8								
9								
10								
11								
12				3.0		Woody debris		
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Water first encountered @ 3 ft

Hydrated Bentonite Chips

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	3 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB39

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		Water first encountered @3ft						
2		HAND AUGER	AUS-SB-39 (2-2.5)	0.6	ML	SILT with woody debris, brown, trace fine grained sand, trace cobbles, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-39-7.5	2.0		Woody debris		
8								
9								
10								
11				1.7		Woody debris		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Muddy Waters	Sampling Interval:	
Drilling Method:	VAC, HA, Geoprobe	Water First encountered:	3 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB40

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1					SG	SAND and GRAVEL, light brown, medium to coarse grained sand, medium to coarse gravel, well graded, rounded, loose, dry, with some organics		
2		HAND AUGER	AUS-SB-40 (2-2.5)	2.8	MS	Sandy SILT, grey, with trace clay and fine to medium gravel, medium dense, medium plasticity, dry		
3						Water first encountered @ 3 ft		
4						Wood fragments, wet, low to no recovery		
5								
6								
7			SB-40-7.5	1.8		Woody debris	Hydrated Bentonite Chips	
8								
9								
10								
11								
12				2.0		Woody debris		
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	3 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB41

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 3 ft		
2		HAND AUGER	AUS-SB-41(2-2.5), DUP-9	6.1	CL	Silty CLAY, with some fine to coarse gravels, very low plasticity, medium dense	Hydrated Bentonite Chips	
3								
4								
5						Wood fragments, loose, wet, no recovery		
6						Wood fragments, loose, wet, no recovery		
7			SB-41-7.5	0.3		Woody debris		
8								
9								
10								
11				1.9		Woody debris		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	3 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB41-A

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		Water first encountered @ 6.5 ft ft						
2		HAND AUGER	AUS-SB-41-Offset (2-2.5)	63	ML	Clayey SILT, light brown to grey, trace sands, poorly graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-41-Offset-7.5	119.1		Woody debris		
8								
9								
10								
11			SB-41-Offset-12.5	3.2		Woody debris		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB41-B

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	9/2/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/2/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 6.5 ft		
2		HAND AUGER	SB-41B-2.5					
3				19.0	ML	Clayey SILT, grey, dry		
4						Woody debris		
5								
6								
7			SB-41B-7.5	39.6		Woody debris	Hydrated Bentonite Chips	
8								
9								
10								
11			SB-41B-12.5	11.8		Woody debris		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

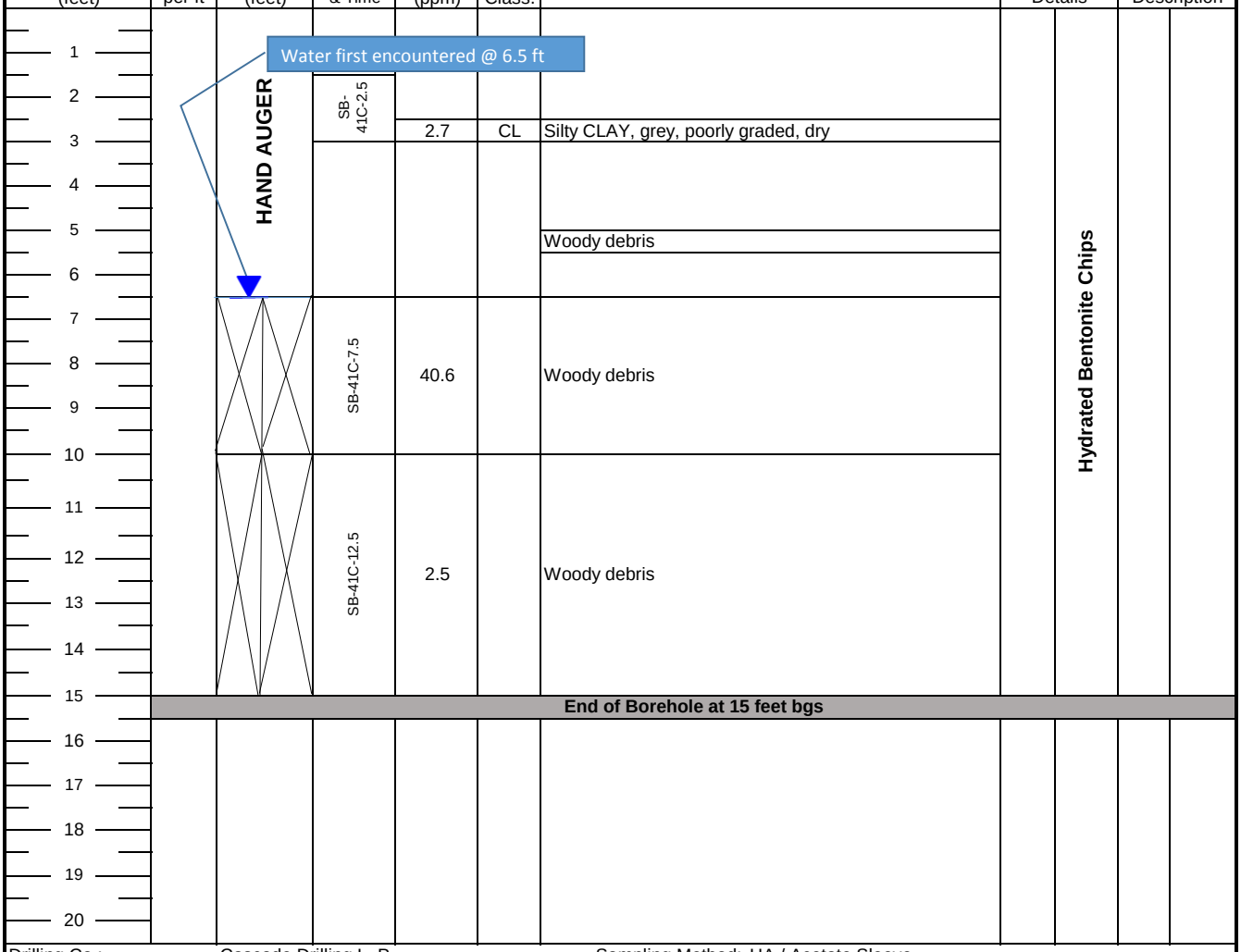
ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB41-C

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	9/01/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA



Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
			SB-41C-2.5	2.7	CL	Silty CLAY, grey, poorly graded, dry	Hydrated Bentonite Chips	
						Woody debris		
			SB-41C-7.5	40.6		Woody debris		
			SB-41C-12.5	2.5		Woody debris		
						End of Borehole at 15 feet bgs		

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB41-D

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	9/01/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		HAND AUGER				Water first encountered @ 6.5 ft	Hydrated Bentonite Chips	
2			SB-41-D-2.5					
3				1.4	CH	Silty CLAY, grey, trace woody debris, medium plasticity, poorly graded, moist		
4								
5						Woody debris		
6								
7			SB-41-D-7.5	38.4		Woody debris		
8								
9								
10								
11			SB-41-D-12.5	4.3		Woody debris		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

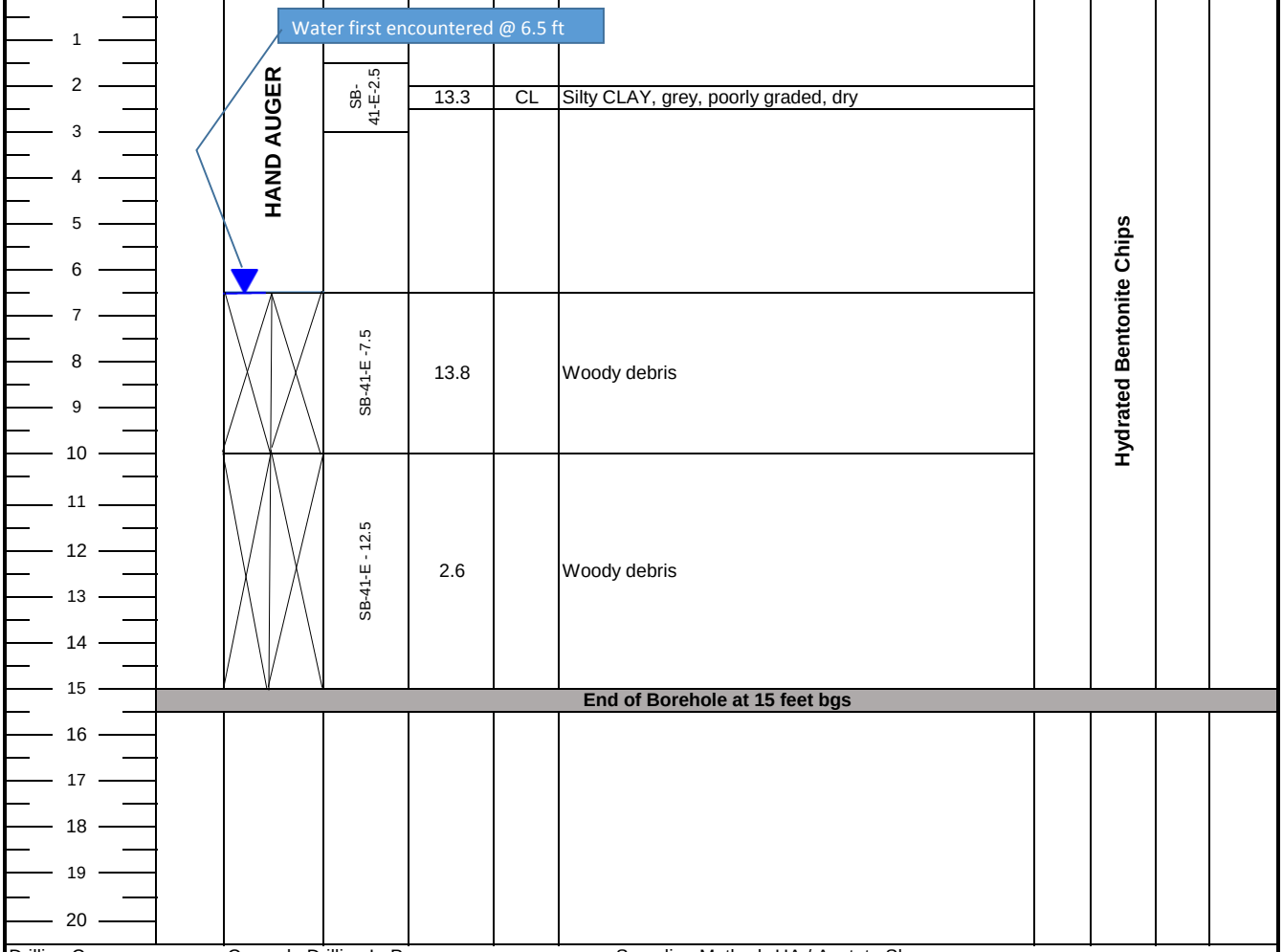
ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB41-E

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	9/01/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA



Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
			SB-41-E-2.5	13.3	CL	Silty CLAY, grey, poorly graded, dry	Hydrated Bentonite Chips	
			SB-41-E -7.5	13.8		Woody debris		
			SB-41-E - 12.5	2.6		Woody debris		
						End of Borehole at 15 feet bgs		

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

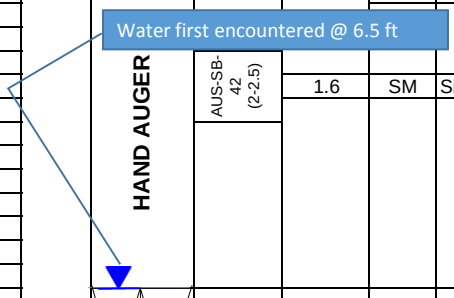
Boring No.: AUS-SB42

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	08/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	08/27/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1					SG	SAND and gravel, with organics	Hydrated Bentonite Chips	
2		HAND AUGER	AUS-SB-42 (2-2.5)	1.6	SM	Silty SAND with clay, light brown, dry		
3								
4								
5								
6								
7			SB-42-7.5	0.0	GP	GRAVEL, brown, large gravel, trace coarse grained sand, poorly graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								



Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB43A

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/27/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1					SG	SAND and gravel, light brown, with large cobbles, light brown, dry	Hydrated Bentonite Chips	
2		HAND AUGER	AUS-SB-43A(2-2.5)	0.3	SM	Silty SAND, trace clay, dry		
3								
4								
5								
6								
7			SB-43-A-7.5	0.0	SP	SAND, black, medium grained, uniformly graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Water first encountered @ 6.5 ft

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB44

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1					SG	SAND and gravel, with organics	Hydrated Bentonite Chips	
2		HAND AUGER				Water first encountered @ 4 ft		
3				0.6	MS	Sandy SILT, light brown, with little clay, medium stiff, dry		
4				25.5	CH	CLAY with trace silt, grey, medium plasticity, stiff, moist, odors		
5			AUS-SB-44(4.5-5) DUP-4	320.2	CL	Sandy silty CLAY, grey, wet		
6						Wood fragments		
7			SB-44-7.5	0.2	SW	SAND with gravel, brown, fine to coarse grained sand, small to medium gravel, well graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	4 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB45

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/19/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		HAND AUGER				Water first encountered @ 4.5 ft	Hydrated Bentonite Chips	
2			AUS-SB-45(2-2.5)	1.1	ML	Clayey SILT, brown, poorly graded, moist		
3								
4								
5				0.4	CL	CLAY, trace sand, trace silt, trace angular cobbles, poorly graded, wet		
6								
7			SB-45-7.5, DUP-8	0.4		Woody debris		
8								
9								
10								
11						Woody debris		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	4.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB46

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/19/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1–20		HAND AUGER	AUS-SB-46(2-2.5), DUP-3	0.2	MS	Sandy SILT, brown, dry, organic debris	Hydrated Bentonite Chips	
7–9			SB-46-7.5	7.2		Woody debris		
10–13			SB-46-12.5	0.2	SW	SAND with gravel, brown, fine to coarse grained sand, small to medium gravel, well graded, wet		
15						**End of Borehole at 15 feet bgs**		

Water first encountered @ 6.5 ft

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB47

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/19/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		Water first encountered @ 6.5 ft						
2		HAND AUGER	AUS-SB-47 (2-2.5)	0.5	CL	CLAY, trace silt, brown, poorly graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-47-7.5	24.3		Woody debris		
8								
9								
10			SB-47-12.5	2.5		Woody debris		
11								
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB48

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/19/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1					SG	Water first encountered @ 6.5 ft SAND and Gravel, with some organics	Hydrated Bentonite Chips	
2		HAND AUGER	AUS-SB-48-2-2.5	3.2	SM	Silty SAND, brown, fine grained, little gravel, loose, dry, organics		
3								
4								
5								
6								
7								
8	2 3 4		SB-48 - 7.5	4.8		Woody debris		
9								
10								
11	2 2 4			2.5		Woody debris		
12								
13	7 9 10			1.3		Woody debris		
14								
15	14 17 20			0.3		Woody debris		
16						**End of Borehole at 15.5 feet bgs**		
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Split Spoon Sampler
Driller:	James Cable	Sampling Interval:	
Drilling Method:	HA, 'HSA	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Auger Rig	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available	HSA= Hollow Stem Auger	North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB49

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/18/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
Water first encountered @6.5 ft		HAND AUGER		0.1	SM	SAND with silt, brown, poorly graded, dry	Hydrated Bentonite Chips	
7 – 10			SB-49 -7.5	3.3		Woody debris		
11 – 15				0.7		Woody debris		
						End of Borehole at 15 feet bgs		

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

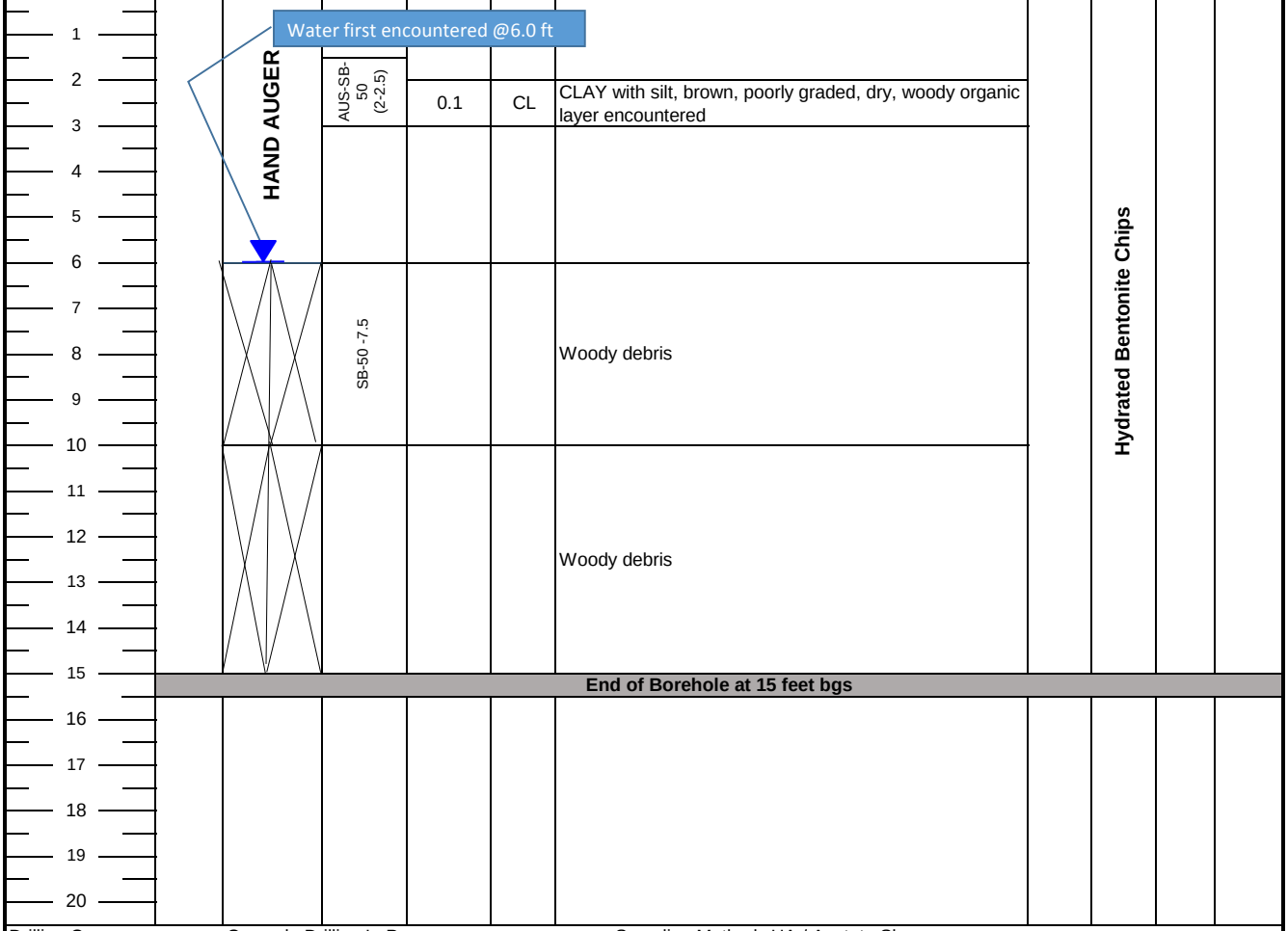
ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB50

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA



Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
0							Hydrated Bentonite Chips	
2			AUS-SB-50 (2-2.5)	0.1	CL	CLAY with silt, brown, poorly graded, dry, woody organic layer encountered		
6			SB-50 -7.5			Woody debris		
10						Woody debris		
15						**End of Borehole at 15 feet bgs**		

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.0 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB51

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1–20		HAND AUGER	AUS-SB-51(2-2.5)	0.1	CL	Water first encountered @ 6 ft CLAY, grey, trace silt, poorly graded, moist, some woody debris	Hydrated Bentonite Chips	
6–8			SB-51-7.5	1.1		Woody debris		
10–12				0.5		Woody debris		
15						**End of Borehole at 15 feet bgs**		

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable / Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB52

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		HAND AUGER				Water first encountered @ 4 ft	Hydrated Bentonite Chips	
2			AUS-SB-52(2-2.5), DUP-1	169.7	CL	Silty CLAY, dark brown, poorly graded, low plasticity, wood debris		
3								
4								
5				NM		Wood fragments, loose, wet, no recovery		
6				NM		Wood fragments, loose, wet, no recovery		
7			SB-52-7.5	3.8		Woody debris		
8								
9								
10								
11				0.7		Woody debris		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	4 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available	NM=Not Measured	North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB52-A

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		Water first encountered @ 6.5 ft					Hydrated Bentonite Chips	
2		HAND AUGER	AUS-SB-52-Offset(2-2.5)					
3				1.6	ML	Clayey SILT, light brown, poorly graded, dry, organic debris		
4								
5								
6								
7			SB-52-Offset -7.5	11.1		Woody debris		
8								
9								
10								
11			SB-52-Offset - 12.5	1.3		Woody debris		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

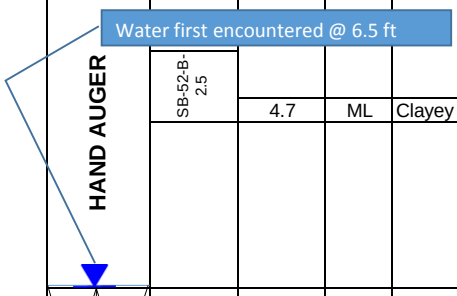
Boring No.: AUS-SB52-B

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	9/02/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/02/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1–10		HAND AUGER	SB-52-B-2.5	4.7	ML	Clayey SILT, grey, poorly graded, dry	Hydrated Bentonite Chips	
			SB-52-B-7.5	2.0	ML	Clayey SILT, grey, poorly graded, wet		
						Woody debris		
						End of Borehole at 10 feet bgs		



Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
VAC= Vacuum		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB53

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/27/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/27/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		HAND AUGER				Water first encountered @ 6.5 ft	Hydrated Bentonite Chips	
2				0.0	ML	Clayey SILT, brown, trace sand, poorly graded, organic debris		
3								
4								
5								
6								
7			SB-53-7.5	0.0	SP	SAND with cobbles, brown, coarse grained sand, rounded coarse gravel, gap graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB54

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/27/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
						Water first encountered @ 6.5ft		
1		HAND AUGER						
2			AUS-SB-54 (2-2.5)	0.6	ML	Clayey SILT, brown, trace fine grained sand, trace cobbles, poorly graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-54-7.5	0.0	SG	SAND with gravel, brown, coarse grained sand, medium coarse gravel, gap graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB55

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/19/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/27/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
						Water first encountered @ 5 ft		
1		HAND AUGER						
2				0.0	ML	Clayey SILT, brown, poorly graded, dry		
3								
4			AUS-SB-55 (4.5-5)					
5				0.8	CL	CLAY, grey, poorly graded, wet		
6			SB-55-9.5	0.2		Woody debris		
7								
8								
9					SP	SAND, black, medium grained, poorly graded, wet		
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Completion Details: Hydrated Bentonite Chips

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Geoprobe
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB56

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/19/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		Water first encountered @ 5.5 ft						
2		HAND AUGER		0.4	CL	CLAY, brown, trace silt, poorly graded, low plasticity, dry	Hydrated Bentonite Chips	
3								
4								
5			AUS-SB-56 (4.5-5)	0.8	CL	CLAY, brown, trace silt, poorly graded, low plasticity, dry, trace woody debris		
6								
7			SB-56 -7.5	0.5	CH	CLAY, grey, high plasticity, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	5.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB57

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/19/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/31/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1								
2		HAND AUGER	AUS-SB-57 (2-2.5)	0.3	ML	Sandy SILT, brown, poorly graded, dry	Hydrated Bentonite Chips	
3								
4				0.9	CH	CLAY, grey, poorly graded, high plasticity, moist		
5								
6								
7			SB-57-7.5	0.2	CH	CLAY, grey, poorly graded, high plasticity, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Water first encountered @ 6.5 ft

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

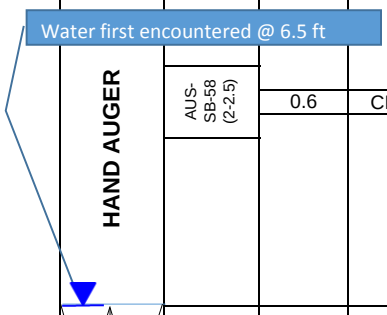
Boring No.: AUS-SB58

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/19/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1								
2		HAND AUGER	AUS-SB-58 (2-2.5)	0.6	CL	CLAY, brown, trace silt, poorly graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-58 -7.5	2.7	CL	CLAY, grey, uniformly graded, wet		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								



Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB59

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/19/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1					SG	SAND and gravel with some organics	Hydrated Bentonite Chips	
2		HAND AUGER		1.4	ML	Sandy SILT with little gravel, grey, medium dense		
3								
4								
5			AUS-SB-59 (4.5-5)	1.5	CH	CLAY, grey, medium plasticity, very dense, moist		
6						Wood fragments, wet		
7			SB-59-7.5	1.2		Woody debris, wet		
8								
9						Woody debris		
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Water first encountered @ 4.5 ft

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	4.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: **AUS-SB60**

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	08/19/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	09/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1					SG	SAND and gravel with some organics	Hydrated Bentonite Chips	
2		HAND AUGER	AUS-SB-60 (2-2.5)	0.8	ML	Sandy SILT with little gravel, grey, medium dense		
3						Large cobble encountered at 3.5 feet bgs		
4								
5						Wood fragments, wet		
6								
7			SB-60-7.5	0.2	ML	Sandy SILT, grey, poorly graded, low plasticity, wet, trace woody debris		
8								
9								
10						Woody debris		
						End of Borehole at 10 feet bgs		
16								
17								
18								
19								
20								

Water first encountered @ 4 ft

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	4 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB61

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	08/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	08/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1						Water first encountered @ 5 ft	Hydrated Bentonite Chips	
2		HAND AUGER	AUS-SB-61 (2-2.5)	0.0	CL	CLAY, brown, trace silt, trace small cobbles, poorly graded, dry		
3								
4								
5				0.2	CL	CLAY, grey, trace silt, poorly graded, wet		
6								
7			SB-61-7.5	0.3		Woody debris		
8								
9								
10								
11								
12				0.6		Woody debris		
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB62

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	08/17/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	08/28/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
						Water first encountered @ 4ft	Hydrated Bentonite Chips	
1		HAND AUGER						
2			AUS-SB-62 (2-2.5)	0.1	ML	Fine SILT, trace clay, medium dense, dry, organic debris		
3					CL	CLAY with little silt		
4						Wood fragments, wet		
5						Wood fragments, wet (no recovery)		
6								
7			SB-62-7.5	1.2		Woody debris		
8								
9								
10								
11				1.3		Woody debris		
12								
13								
14								
15						**End of Borehole at 15 feet bgs**		
16								
17								
18								
19								
20								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Frank Scott	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	4 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB62-A

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	9/01/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA	Weather Conditions:			NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1								
2		HAND AUGER		0.1	ML	Clayey SILT, light brown, trace sand, poorly graded, low plasticity, dry	Hydrated Bentonite Chips	
3								
4								
5			AUS-SB-62-Offset(4.5-5)	1.7	CL	Silty CLAY, low plasticity, stiff, moist		
6								
7			SB-62-Offset-7.5	0.8	CL	Silty CLAY, low plasticity, stiff, moist		
8								
9								
10						Woody debris		
						End of Borehole at 10 feet bgs		
11								
12								
13								
14								
15								

Water first encountered @ 6.5ft

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
		Converted to Well:	☐ Yes ☑ No
		Surface Elev:	NA
		North Coor:	NA
		East Coor:	NA

Remarks:
bgs = below ground surface
NA= Not Applicable/ Not Available
HA= Hand Auger

ARCADIS Design & Consultancy for natural and built assets

Boring No.: AUS-SB63

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia Bulk Plant	Date Started:	8/20/2015	Logger:	Jason Little
Project Number:	GP09BPNAWA60	Date Completed:	8/27/2015	Editor:	Ross LaGrandeur
Project Location:	1120 West Bay Drive NW, Olympia, WA			Weather Conditions:	NA

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details	Misc. Description
1		Water first encountered @ 6.5 ft						
2		HAND AUGER	AUS-SB-63 (2 -2.5)	0.0	SP	SAND, brown, fine grain size, poorly graded, dry	Hydrated Bentonite Chips	
3								
4								
5								
6								
7			SB-63 -7.5	0.0	SG	SAND with gravel, brown, coarse grained sand, medium grained rounded gravel, gap graded		
8								
9								
10						**End of Borehole at 10 feet bgs**		
11								
12								
13								
14								
15								

Drilling Co.:	Cascade Drilling L. P.	Sampling Method:	HA / Acetate Sleeve
Driller:	Kyle C	Sampling Interval:	
Drilling Method:	HA, Geoprobe	Water First encountered:	6.5 ft bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☐ Yes ☑ No
bgs = below ground surface		Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
HA= Hand Auger		East Coor:	NA

Date Start/Finish: August 23, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA/HSA
Sampling Method: HA/HSA
Rig Type: HA/HSA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 12'
Surface Elevation: --

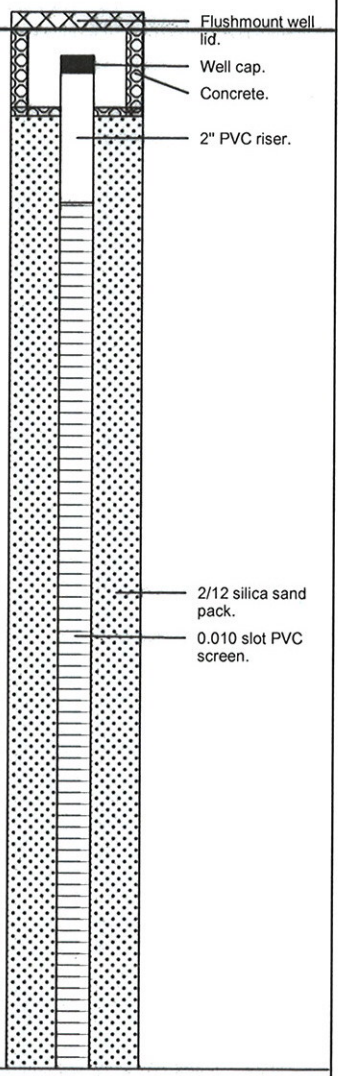
Descriptions By: Colleen Martin

Well/Boring ID: **MW-6R**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description
0	0					--		Gravel packed soil surface.
		--						Brown SILT with clay and trace sand, no odor.
		MW-6R-2-2.5	2-2.5	100	1.5			
								Wet at 3' bgs.
		MW-6R-4-4.5	4-4.5	100	43.8	ML		Brown SILT with wood debris, moderate hydrocarbon-like odor, wet.
5	-5							
		MW-6R-6-6.5	6-6.5	100	0.2			
								Wet WOOD.
								No recovery, wet silty brown liquid.
10	-10			0		--		
								Boring terminated at 12' bgs.



Well/Boring Construction

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

Date Start/Finish: August 24, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA/HSA
Sampling Method: HA/HSA
Rig Type: HA/HSA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 13'
Surface Elevation: --

Descriptions By: Colleen Martin

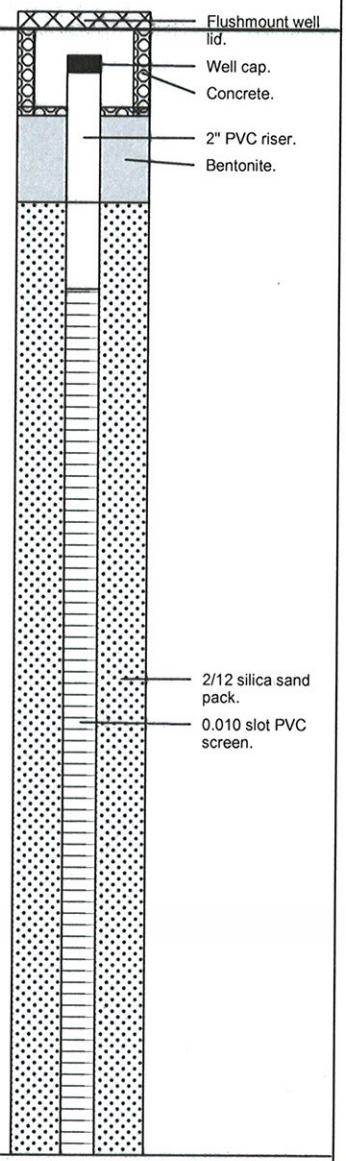
Well/Boring ID: **MW-7**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description
0	0					--		Gravel packed soil surface.
								Brown sandy SILT, trace fine subrounded and subangular gravel, fine sand, dry, occasional organics, no odor or staining.
		MW-7-2-2.5	2-2.5	100	1.7			
						ML		Brown SILT with fine sand, low plasticity, slightly moist, no odor or staining.
		MW-7-4-4.5	4-4.5	100	0.4			
5	-5							
		MW-7-6-6.5	6-6.5	100	1.4			Brown silty SAND, trace gravel, fine to medium sand, subrounded fine gravel, increasing silts, moist, no odor or staining.
				100	0.3	SM		
10	-10							
				100	0.2			
				100	--	ML		Brown sandy SILT, fine sand, no odor or staining, wet at 11.5' bgs.
								Boring terminated at 13' bgs.

Well/Boring Construction



Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

ARCADIS
Infrastructure, environment, buildings

Date Start/Finish: August 24, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA/HSA
Sampling Method: HA/HSA
Rig Type: HA/HSA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 13'
Surface Elevation: --

Descriptions By: Colleen Martin

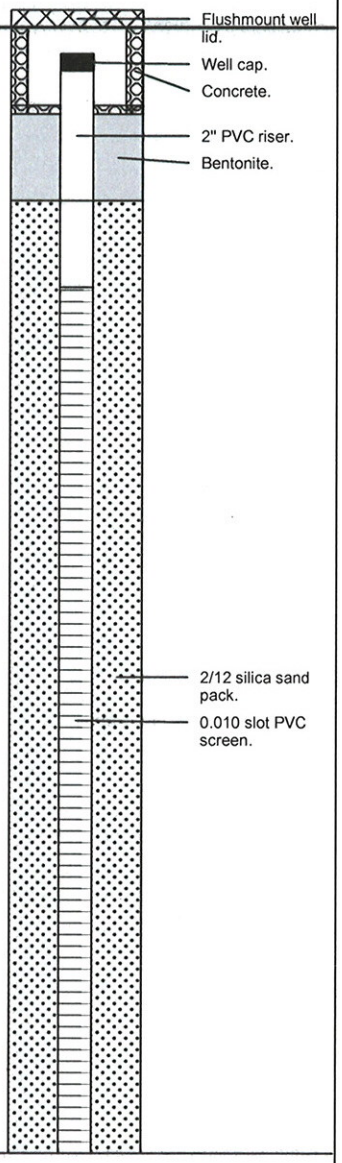
Well/Boring ID: **MW-8**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description
0	0					--		Gravel packed soil surface.
		MW-8-2-2.5	2-2.5	100	2.9	ML		Light brown sandy SILT with clay, trace fine subrounded gravel, fine sand, moist, occasional organics, no odor or staining.
		MW-8-4-4.5	4-4.5	100	1.1			Brown clayey SILT, trace very fine sand, wood debris, moderate plasticity, moist, no odor or staining.
5	-5	MW-8-6-6.5	6-6.5	100	2.4			Brown SILT with clay, trace very fine sand, trace wood debris, increasing sand, low plasticity, moist, no odor or staining.
				100	--			
10	-10			100	--			Brown sandy SILT with trace gravel, fine sand, fine rounded gravel, no odor or staining, wet at 12' bgs.
				100	--			Boring terminated at 13' bgs.

Well/Boring Construction



Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

ARCADIS
Infrastructure, environment, buildings

Date Start/Finish: August 24, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA/HSA
Sampling Method: HA/Split Spoon
Rig Type: HA/HSA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 13'
Surface Elevation: --

Descriptions By: Colleen Martin

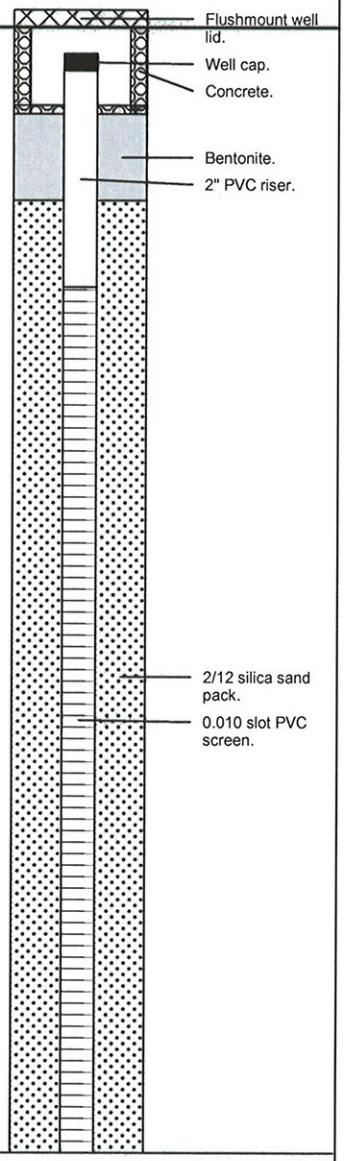
Well/Boring ID: **MW-9**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description
0	0					--		Gravel packed soil surface.
								Light brown sandy SILT with clay, trace fine rounded gravel, fine sand, non-plastic, moist, no odor or staining.
		MW-9-2-2.5	2-2.5	100	1.3			
		MW-9-4-4.5	4-4.5	100	1.4			
5	-5							
		MW-9-6-6.5	6-6.5	100	1.9	ML		Brown SILT with sand, very fine sand, some wood debris, increasing sand, low plasticity, moist, no odor or staining.
				100	--			
10	-10							Wet at 10' bgs.
				100	--			
				100	--			Boring terminated at 13' bgs.

Well/Boring Construction



ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

Date Start/Finish: August 24, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA/HSA
Sampling Method: HA/Split Spoon
Rig Type: HA/HSA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 13'
Surface Elevation: --

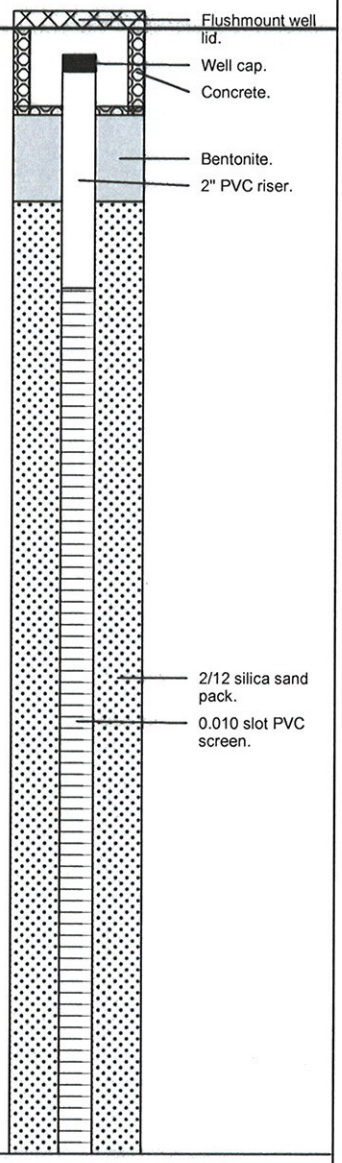
Descriptions By: Colleen Martin

Well/Boring ID: **MW-10**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description
0	0					--		Gravel packed soil surface.
						ML		Light brown SILT with sand and trace gravel, non-plastic, fine sand, subangular fine gravel, no odor or staining.
		MW-10-2-2.5	2-2.5	100	2.7			Wet at 4' bgs.
		MW-10-4-4.5	4-4.5	100	1.6			Brown SILT with sand, trace clay, low plasticity, very fine sand, no odor or staining, wet.
5	-5	MW-10-6-6.5	6-6.5	100	5.4			Brown sandy SILT with wood debris (30%), fine sand, wet, no odor or staining.
				100				
10	-10			100				
				0		--		No recovery.
								Boring terminated at 13' bgs.



Well/Boring Construction

Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

ARCADIS
Infrastructure, environment, buildings

Date Start/Finish: August 25, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA/HSA
Sampling Method: HA/Split Spoon
Rig Type: HA/HSA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 13'
Surface Elevation: --

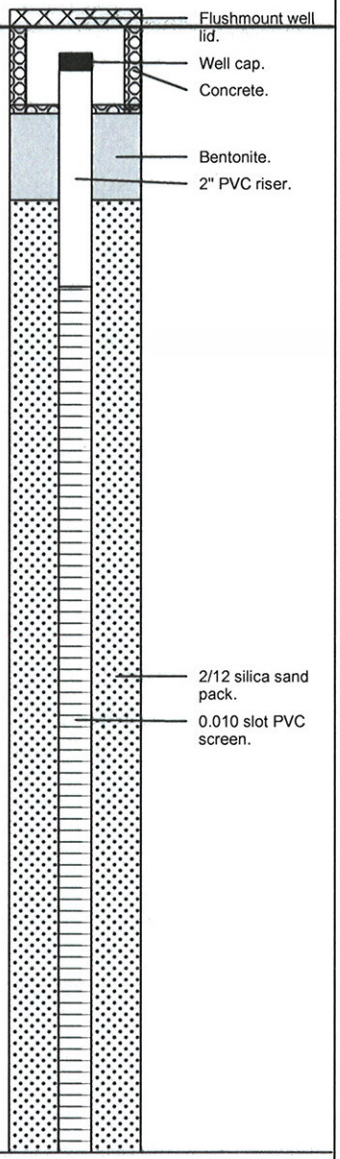
Descriptions By: Colleen Martin

Well/Boring ID: **MW-11**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description
0	0					--		Gravel packed soil surface.
		MW-11-2-2.5	2-2.5	100	2.1	ML		Light brown SILT with sand and gravel, non-plastic, fine sand, medium to coarse subrounded gravel, no odor or staining.
		MW-11-4-4.5	4-4.5	100	2.0			
5	-5							Wet at 6' bgs.
		MW-11-6-6.5	6-6.5	100	1.4			Brown sandy SILT with trace gravel, fine sand, medium rounded gravel, wet, no odor or staining.
				100				
10	-10			100				
								No recovery.
				0		--		Boring terminated at 13' bgs.



Well/Boring Construction

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

Date Start/Finish: August 25, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA/HSA
Sampling Method: HA/Split Spoon
Rig Type: HA/HSA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 13'
Surface Elevation: --

Descriptions By: Colleen Martin

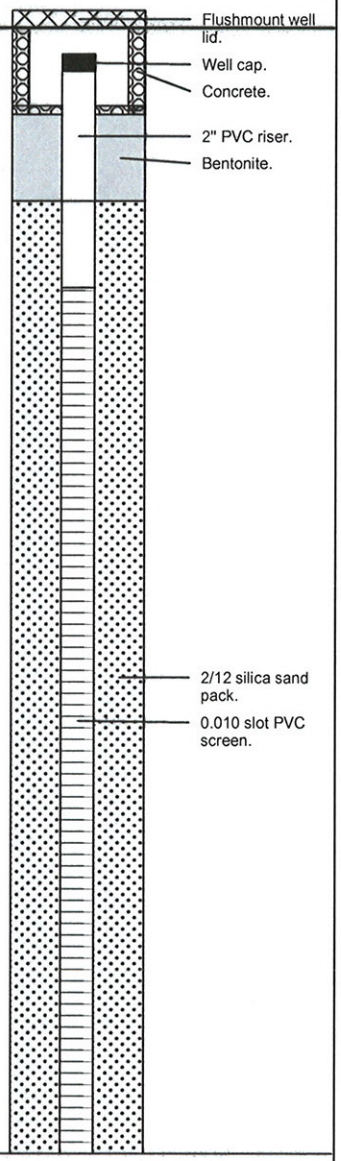
Well/Boring ID: **MW-12**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description
0	0					--		Gravel packed soil surface.
								Brown SILT with sand, trace fine subrounded gravel, fine sand, non-plastic, moist, no odor or staining.
		MW-12-2-2.5	2-2.5	100	0.4			
		MW-12-4-4.5	4-4.5	100	0.6			
5	-5							
		MW-12-6-6.5	6-6.5	100	0.1	ML		Brown sandy SILT with gravel and wood debris, fine sand, fine rounded gravel, no odor or staining, wet at 6' bgs.
				100	--			
10	-10			100	--			
				100	--			Boring terminated at 13' bgs.

Well/Boring Construction



ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

ARCADIS Design & Consultancy for natural and built assets

Boring No.: **MW-13**

Soil Boring Log

Sheet : 1 of 1

Project Name:	BP Olympia	Date Started:	12/15/16	Logger:	Ryan Brauchla
Project Number:	GP09BPNA.WA60	Date Completed:	12/15/16	Editor:	
Project Location:	1120 West Bay Drive, Olympia, WA			Weather Conditions:	Cloudy, 30-35° F

Depth (feet)	Blows per ft	Recovery (feet)	Sample ID & Time	PID (ppm)	USCS Class.	Description	Completion Details
1		HAND AUGER					Concrete; Bentonite Chips; 2" diameter schedule 40 PVC riser
2							
3	HA			0.2	SP	0 - 3': Fine SAND, poorly sorted, light brown, dry, fairly loose.	
4							
5	HA			0.9	CL	3 - 6.5': Medium plasticity SILT and CLAY, light brown, dense	2" diameter prepacked screen; Sand
6							
7				0.9	Wood	6.5 - 7': Woody debris with little grey clay	
8				0.4	CL	7 - 9': Medium plasticity SILT and CLAY, grey, wet, some wood included	
9				1.2	Wood		
10						9 - 13': Woody debris with grey sand and clay	
11							
12							
13				0.8	Wood		
		End of Boring @ 13 feet bgs					
14							
15							
16							
17							
18							
19							
20							

Water first encountered @ 2.35 ft bgs

Drilling Co.:	Holt Services	Sampling Method:	HA / acetate sleeve
Driller:	Michael Running	Sampling Interval:	2.5' (0 - 6.5'); continuous (6.5 - 13')
Drilling Method:	Hand Auger / Direct Push	Water First encountered:	2.35' bgs
Drill Rig Type:	Geoprobe	Water Level Finish:	NA
Remarks:		Converted to Well:	☑ Yes ☐ No
bgs = below ground surface	HA= Hand Auger	Surface Elev:	NA
NA= Not Applicable/ Not Available		North Coor:	NA
Vac= Vacuum		East Coor:	NA

APPENDIX C

Groundwater Monitoring Field Data Sheets

ARCADIS Design & Consultancy for natural and built assets

GROUNDWATER SAMPLING LOG

Page 1 of 1

Project No. GPOYBPNA WA60 ~~BP OLYMPIA~~ Well ID MW-7 Date 12-15-16

Project Name/Location BP OLY / 1120 West Bay Drive, Olympia, WA Weather 35°F cloudy

Measuring Pt. Description top of casing Screen Setting (ft-bmp) 3.28 Casing Diameter (in.) 2 Well Material X PVC ___ SS

Static Water Level (ft-bmp) 2.56' Total Depth (ft-bmp) 12.37' Water Column/ Gallons in Well 9.81' / 1.6 gallons

MP Elevation — Pump Intake (ft-bmp) 10 Purge Method: LFP Centrifugal Submersible Other peristaltic Sample Method grab

Pump On/Off 0850/0925 Volumes Purged 1.0 gallons

Sample Time: Label 0915 Start 0910 End 0925 Replicate/ Code No. — Sampled by RB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (mMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
0900	10	200	3.28	0.5	7.46	614.5	—	0.52	10.1	255.3	clear	no
0903	13	↓	3.28	0.65	7.47	544.6	—	0.47	10.0	223.0	↓	↓
0906	16	↓	3.28	0.8	7.51	527.7	—	0.31	9.9	187.4	↓	↓
0908	18	↓	3.28	0.9	7.52	522.9	-	0.29	9.9	186.2	↓	↓
0910	20	↓	3.28	1.0	7.52	523.0	-	0.28	9.8	181.0	↓	↓

Constituents Sampled	Container	Number	Preservative
GRO	VOA	3	HCl
BTEX/MTBE/EDC	VOA	3	HCl
EDB	VOA	2	HCl
DRO/HO w/ SGC	AMBER	2	HCl
DRO/HO w/o SGC	AMBER	2	HCl
cPAH/Naphthalenes	AMBER	2	none
Total Lead	POLY	1	HNO_3
Dissolved Lead	POLY	1	none

Well Casing Volumes

Gallons/Foot 1" = 0.04 1.25" = 0.06 1.5" = 0.09 2" = 0.16 2.5" = 0.26 3" = 0.37 3.5" = 0.50 4" = 0.65 6" = 1.47

Well Information

Well Location: S edge of excavation Well Locked at Arrival: Yes / ~~No~~

Condition of Well: good Well Locked at Departure: Yes / ~~No~~

Well Completion: (Flush Mount) / Stick Up Key Number To Well:

ARCADIS Design & Consultancy for natural and built assets

GROUNDWATER SAMPLING LOG

Project No. GP09BPNAWA60 Well ID MW-8 Date 12/15/16

Project Name/Location BP OLY/1120 West Bay Drive, Olympia, WA Weather 35°F cloudy

Measuring Pt. Description top of casing Screen Setting (ft-bmp) 3.54' Casing Diameter (in.) 2" Well Material X PVC ___ SS

Static Water Level (ft-bmp) 2.02 Total Depth (ft-bmp) 13.19' Water Column/ Gallons in Well 11.17'/1.8 gallons

MP Elevation — Pump Intake (ft-bmp) 3.54' Purge Method: LFP Sample Method grab

Pump On/Off 0847/1040 Volumes Purged 0.9 gal Centrifugal ___ Submersible ___ Other peristaltic

Sample Time: Label 1015 Start 1012 End 1040 Replicate/ Code No. — Sampled by RB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (mMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
0957	10	200	3.54	0.5	7.35	1521	—	0.46	10.2	44.3	sheen	no
1000	13	↓	3.54	0.65	7.36	1555	-	0.39	10.2	41.0	↓	↓
1003	16	↓	3.54	0.8	7.36	1590	-	0.36	10.1	39.8	↓	↓
1005	18	↓	3.54	0.4	7.36	1533	-	0.35	10.1	39.2	↓	↓

Constituents Sampled	Container	Number	Preservative
GRO	VOA	3	HCl
BTEX/MTBE/EDC	VOA	3	HCl
EDB	VOA	2	HCl
DRO/HO w/ SGC	AMBER	2	HCl
DRO/HO w/o SGC	AMBER	2	HCl
cPAH/Naphthalenes	AMBER	2	none
Total Lead	POLY	1	HNO_3
Dissolved Lead	POLY	1	none

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: S edge of excavation

Condition of Well: good

Well Completion: (Flush Mount) / Stick Up

Well Locked at Arrival: Yes / (No)

Well Locked at Departure: Yes / (No)

Key Number To Well:

ARCADIS Design & Consultancy for natural and built assets

GROUNDWATER SAMPLING LOG

Project No. GP09BPNAWA60 Well ID MW-9 Date 12-15-2016

Project Name/Location BPOLY / 1120 West Bay Drive, Olympia, WA Weather 35°F, cloudy

Measuring Pt. Description top of casing Screen Setting (ft-bmp) 3.95 Casing Diameter (in.) 2" Well Material X PVC ___ SS

Static Water Level (ft-bmp) 2.89 Total Depth (ft-bmp) 13.31' Water Column/ Gallons in Well 10.42'/1.7 gal

MP Elevation ___ Pump Intake (ft-bmp) 8' Purge Method: LFP Centrifugal ___ Submersible ___ Other peristaltic Sample Method grab

Pump On/Off 1100/1143 Volumes Purged 0.7 gallons

Sample Time: Label 1115 Start 1123 End 1143 Replicate/ Code No. ___ Sampled by RB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (mMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1110	10	200	3.95	0.5	7.48	514.2	-	0.37	10.3	22.0		
1112	12	↓	3.95	0.6	7.47	519.8	-	0.35	10.3	23.4		
1114	14	↓	3.95	0.7	7.47	523.9	-	0.34	10.3	21.6		

Constituents Sampled	Container	Number	Preservative
GRO	VOA	3	HCl
BTEX/MTBE/EDC	VOA	3	HCl
EDB	VOA	2	HCl
DRO/HO w/SGC	AMBER	2	HCl
DRO/HO w/o SGC	AMBER	2	HCl
cPAHs/Naphthalenes	AMBER	2	none
Total Lead	POLY	1	HNO_3
Dissolved Lead	POLY	1	none

Well Casing Volumes

Gallons/Foot 1" = 0.04 1.25" = 0.06 1.5" = 0.09 2" = 0.16 2.5" = 0.26 3" = 0.37 3.5" = 0.50 4" = 0.65 6" = 1.47

Well Information

Well Location: S edge of excavation

Condition of Well: good

Well Completion: (Flush Mount) / Stick Up

Well Locked at Arrival: Yes / (No)

Well Locked at Departure: Yes / (No)

Key Number To Well:

ARCADIS Design & Consultancy for natural and built assets

GROUNDWATER SAMPLING LOG

Project No. GP09BPNA.WA60 Well ID MW-13 Date 12-15-16

Project Name/Location BPOLY / 1120 West Bay Road, Olympia, WA Weather 35°F, cloudy

Measuring Pt. Description top of casing | Screen Setting (ft-bmp) 3' | Casing Diameter (in.) 2" | Well Material X PVC ___ SS

Static Water Level (ft-bmp) 2.36' | Total Depth (ft-bmp) ___ | Water Column/ Gallons in Well ___

MP Elevation ___ | Pump Intake (ft-bmp) 7' | Purge Method: LFP Centrifugal ___ Submersible ___ Other peristaltic | Sample Method grab

Pump On/Off 1243/1350 | Volumes Purged 1.55 gallons

Sample Time: Label 1315 Start 1322 End 1350 | Replicate/ Code No. DUP-1 (GRO, BTEX, MTBE, DRO/HO) | Sampled by RB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (mMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
12:50	6	200	2.40	0.3	7.64	340.5	-	0.80	9.8	107.4	clear	no
12:53	9	200	2.37	0.45	7.65	341.2	-	0.67	10.0	68.8		
12:56	12	200	2.37	0.6	7.67	342.1	-	0.41	10.2	63.0		
12:59	15	200	2.37	0.75	7.69	345.1	-	0.31	10.1	36.1		
13:08	25	200	2.35	1.25	7.64	346.0	-	0.21	10.2	-31.4		
13:11	28	200	2.35	1.4	7.64	346.3	-	0.21	10.2	-34.3		
13:14	31	200	2.35	1.55	7.64	346.1	-	0.22	10.3	-37.1		

Constituents Sampled	Container	Number	Preservative
GRO	VOA	3 x 2	HCl
BTEX/MTBE/EDC	VOA	3 x 2	HCl
EDB	VOA	2	HCl
DRO/HO w/ SGC	AMBER	2	HCl
DRO/HO w/o SGC	AMBER	2	HCl
cPAH/Naphthalene	AMBER	2	none
Total Lead	POLY	1	HNO3
Dissolved Lead	POLY	1	none

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: S edge of excavation | Well Locked at Arrival: Yes / (No)

Condition of Well: new | Well Locked at Departure: Yes / (No)

Well Completion: (Flush Mount) / Stick Up | Key Number To Well: ___

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

Gauging Data

Date 03/09/2017

Sampler Eric Krueger

Well	Date/Time	Depth To Water (ft)	Well Depth (ft)	Depth to LNAPL (ft)	PID (ppmv)	Remarks
MW-13	03/09/2017 11:21	2.33	12.23		0.2	
MW-7	03/09/2017 10:45	2.51	12.37		0.3	
MW-8	03/09/2017 10:53	2.66	13.19		0.2	
MW-9	03/09/2017 11:15	2.56	13.31		0.3	
WA-BPOLY-Site	03/10/2017 08:27					

Sampler: Eric Krueger

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-7

Date	03/09/2017	Weather Conditions	Rain	Depth to Water (ft bmp)	2.51
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	12.37
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	9.86
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.61
Purge Volume Units	ml	Pump Intake Depth (ft bmp)		Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
12:13	600	6.0	6.44	310.7	144.7	1.84		2.53	
12:16	1200	6.7	6.42	304.2	136.3	1.64		2.56	
12:19	1800	6.8	6.42	305.5	130.3	1.57		2.59	
12:21	2200	6.9	6.39	305.7	125.6	1.52		2.63	

Sampling Summary

Sample Date	03/09/2017	Odor	No
Sample Time	12:25	Analysis	SW8260B,SW6010B,8011,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-7-Q117		
Duplicate Sample ID		COC	
Dup Sample Time		Bottles	3 - 40mL vial with NA2S2O3,1 - 250mL poly with HNO3,1 - 250mL Poly with HNO3,BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-8

Date	03/09/2017	Weather Conditions	Rain	Depth to Water (ft bmp)	2.66
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	13.19
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	10.53
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.72
Purge Volume Units	ml	Pump Intake Depth (ft bmp)	7.00	Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
13:04	600	8.8	6.20	2204	15.6	1.25		2.68	
13:07	1200	8.4	6.20	2222	-12.9	0.80		2.70	
13:10	1800	8.5	6.21	2233	-26.9	0.52		2.72	
13:13	2400	8.4	6.20	2226	-31.1	0.46		2.73	
13:16	3000	8.4	6.21	2202	-35.6	0.43		2.75	

Sampling Summary

Sample Date	03/09/2017	Odor	No
Sample Time	13:20	Analysis	SW8260B,SW6010B,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-8-Q117		
Duplicate Sample ID		COC	
Dup Sample Time		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
		Remarks	

Sampler: Eric Krueger 

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-9

Date	03/09/2017	Weather Conditions	Rain	Depth to Water (ft bmp)	2.56
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	13.31
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	10.75
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.75
Purge Volume Units	ml	Pump Intake Depth (ft bmp)		Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
13:40	600	7.9	5.92	537.6	5.9	0.91		2.59	
13:43	1200	7.8	5.90	536.4	2.0	0.67		2.62	
13:46	1800	7.8	5.89	526.0	-1.6	0.58		2.64	
13:48	2200	7.8	5.90	515.9	-3.8	0.55		2.69	

Sampling Summary

Sample Date	03/09/2017	Odor	No
Sample Time	13:50	Analysis	SW8260B,SW6010B,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-9-Q117		
Duplicate Sample ID		COC	
Dup Sample Time		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,3 - 40mL vial with NA2S2O3,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-13

Date	03/09/2017	Weather Conditions	Rain	Depth to Water (ft bmp)	2.33
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	12.23
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	9.9
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.61
Purge Volume Units	ml	Pump Intake Depth (ft bmp)		Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
14:18	600	8.4	6.53	246.4	10.5	0.93		2.36	
14:21	1200	8.2	6.50	243.7	7.4	0.64		2.39	
14:24	1800	8.1	6.48	237.7	2.4	0.46		2.41	
14:27	2400	8.1	6.49	235.5	0.1	0.43		2.44	
14:29	2800	8.0	6.47	234.8	0.0	0.40		2.46	

Sampling Summary

Sample Date	03/09/2017	Odor	No
Sample Time	14:35	Analysis	SW8260B,SW6010B,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-13-Q117		
Duplicate Sample ID	DUP-1	COC	
Dup Sample Time	14:35	Bottles	3 - 40mL vial with NA2S2O3,BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

Gauging Data

Date 05/08/2017

Sampler Eric Krueger

Well	Date/Time	Depth To Water (ft)	Well Depth (ft)	Depth to LNAPL (ft)	PID (ppmv)	Remarks
MW-13	05/08/2017 09:49	2.52	12.22		4.2	
MW-7	05/08/2017 09:36	4.22	12.37		4.7	
MW-8	05/08/2017 09:40	2.61	13.19		2.8	
MW-9	05/08/2017 09:44	3.29	13.31		3.3	

Sampler: Eric Krueger

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-7

Date	05/08/2017	Weather Conditions	Sunny	Depth to Water (ft bmp)	4.22
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	12.37
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	8.15
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.33
Purge Volume Units	ml	Pump Intake Depth (ft bmp)	8.0	Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
10:21	600	11.4	6.19	1246	-107.2	1.93		4.25	
10:24	1200	11.4	6.16	1249	-103.6	1.09		4.30	
10:27	1800	11.2	6.19	1245	-100.8	0.65		4.33	
10:29	2200	11.2	6.18	1241	-99.1	0.58		4.36	
10:31	2600	11.2	6.19	1234	-97.8	0.53		4.37	

Sampling Summary

Sample Date	05/08/2017	Odor	No
Sample Time	10:35	Analysis	SW8260B,SW8270C-SIM,6020,NWTPH-Dx,NWTPH-Dx,8011
Sample ID	MW-7-Q217	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
Dup Sample Time		Remarks	

Sampler: Eric Krueger 

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-8

Date	05/08/2017	Weather Conditions	Sunny	Depth to Water (ft bmp)	2.61
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	13.19
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	10.58
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.73
Purge Volume Units	ml	Pump Intake Depth (ft bmp)	8.0	Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
10:59	600	11.1	6.18	1733	-37.1	1.16		2.64	
11:02	1200	11.1	6.16	1737	-41.5	0.86		2.68	
11:05	1800	11.2	6.16	1748	-47.7	0.43		2.70	
11:08	2400	11.2	6.16	1745	-50.5	0.35		2.75	
11:10	2800	11.2	6.18	1748	-51.4	0.32		2.78	

Sampling Summary

Sample Date	05/08/2017	Odor	No
Sample Time	11:15	Analysis	NWTPH-Gx,NWTPH-Dx,SW8260B,SW8270C-SIM,6020,8011
Sample ID	MW-8-Q217	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
Dup Sample Time		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-9

Date	05/08/2017	Weather Conditions	Sunny	Depth to Water (ft bmp)	3.29
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	13.31
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	10.02
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.63
Purge Volume Units	ml	Pump Intake Depth (ft bmp)	8.0	Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
11:35	600	10.6	5.88	573.7	-7.5	0.69		3.31	
11:38	1200	10.3	5.89	549.6	-13.0	0.52		3.33	
11:41	1800	10.7	5.87	546.6	-16.8	0.36		3.35	
11:44	2400	10.9	5.88	545.5	-19.2	0.31		3.37	
11:46	2800	10.9	5.98	545.0	-20.4	0.29		3.40	

Sampling Summary

Sample Date	05/08/2017	Odor	No
Sample Time	11:50	Analysis	NWTPH-Gx,NWTPH-Dx,SW8260B,SW8270C-SIM,8011,6020
Sample ID	MW-9-Q217	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
Dup Sample Time		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-13

Date	05/08/2017	Weather Conditions	Sunny	Depth to Water (ft bmp)	2.52
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	12.22
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	9.7
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.58
Purge Volume Units	ml	Pump Intake Depth (ft bmp)	7.0	Total Volume to Remove	
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
12:13	600	11.8	6.57	269.8	-6.0	0.80		2.55	
12:16	1200	11.8	6.56	268.1	-20.9	0.49		2.58	
12:19	1800	11.9	6.53	267.8	-30.4	0.34		2.60	
12:22	2400	11.8	6.52	270.0	-40.3	0.26		2.62	
12:24	2800	11.8	6.52	271.9	-46.5	0.25		2.65	

Sampling Summary

Sample Date	05/08/2017	Odor	No
Sample Time	12:30	Analysis	NWTPH-Gx,NWTPH-Dx,SW8260B,SW8270C-SIM,6020,8011
Sample ID	MW-13-Q217		
Duplicate Sample ID	DUP-1	COC	
Dup Sample Time	12:30	Bottles	
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

Gauging Data

Date 03/09/2017

Sampler Eric Krueger

Well	Date/Time	Depth To Water (ft)	Well Depth (ft)	Depth to LNAPL (ft)	PID (ppmv)	Remarks
MW-13	03/09/2017 11:21	2.33	12.23		0.2	
MW-7	03/09/2017 10:45	2.51	12.37		0.3	
MW-8	03/09/2017 10:53	2.66	13.19		0.2	
MW-9	03/09/2017 11:15	2.56	13.31		0.3	
WA-BPOLY-Site	03/10/2017 08:27					

Sampler: Eric Krueger

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-7

Date	03/09/2017	Weather Conditions	Rain	Depth to Water (ft bmp)	2.51
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	12.37
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	9.86
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.61
Purge Volume Units	ml	Pump Intake Depth (ft bmp)		Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
12:13	600	6.0	6.44	310.7	144.7	1.84		2.53	
12:16	1200	6.7	6.42	304.2	136.3	1.64		2.56	
12:19	1800	6.8	6.42	305.5	130.3	1.57		2.59	
12:21	2200	6.9	6.39	305.7	125.6	1.52		2.63	

Sampling Summary

Sample Date	03/09/2017	Odor	No
Sample Time	12:25	Analysis	SW8260B,SW6010B,8011,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-7-Q117		
Duplicate Sample ID		COC	
Dup Sample Time		Bottles	3 - 40mL vial with NA2S2O3,1 - 250mL poly with HNO3,1 - 250mL Poly with HNO3,BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-8

Date	03/09/2017	Weather Conditions	Rain	Depth to Water (ft bmp)	2.66
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	13.19
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	10.53
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.72
Purge Volume Units	ml	Pump Intake Depth (ft bmp)	7.00	Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
13:04	600	8.8	6.20	2204	15.6	1.25		2.68	
13:07	1200	8.4	6.20	2222	-12.9	0.80		2.70	
13:10	1800	8.5	6.21	2233	-26.9	0.52		2.72	
13:13	2400	8.4	6.20	2226	-31.1	0.46		2.73	
13:16	3000	8.4	6.21	2202	-35.6	0.43		2.75	

Sampling Summary

Sample Date	03/09/2017	Odor	No
Sample Time	13:20	Analysis	SW8260B,SW6010B,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-8-Q117		
Duplicate Sample ID		COC	
Dup Sample Time		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
		Remarks	

Sampler: Eric Krueger 

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-9

Date	03/09/2017	Weather Conditions	Rain	Depth to Water (ft bmp)	2.56
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	13.31
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	10.75
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.75
Purge Volume Units	ml	Pump Intake Depth (ft bmp)		Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
13:40	600	7.9	5.92	537.6	5.9	0.91		2.59	
13:43	1200	7.8	5.90	536.4	2.0	0.67		2.62	
13:46	1800	7.8	5.89	526.0	-1.6	0.58		2.64	
13:48	2200	7.8	5.90	515.9	-3.8	0.55		2.69	

Sampling Summary

Sample Date	03/09/2017	Odor	No
Sample Time	13:50	Analysis	SW8260B,SW6010B,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-9-Q117		
Duplicate Sample ID		COC	
Dup Sample Time		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,3 - 40mL vial with NA2S2O3,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-13

Date	03/09/2017	Weather Conditions	Rain	Depth to Water (ft bmp)	2.33
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	12.23
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	9.9
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.61
Purge Volume Units	ml	Pump Intake Depth (ft bmp)		Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
14:18	600	8.4	6.53	246.4	10.5	0.93		2.36	
14:21	1200	8.2	6.50	243.7	7.4	0.64		2.39	
14:24	1800	8.1	6.48	237.7	2.4	0.46		2.41	
14:27	2400	8.1	6.49	235.5	0.1	0.43		2.44	
14:29	2800	8.0	6.47	234.8	0.0	0.40		2.46	

Sampling Summary

Sample Date	03/09/2017	Odor	No
Sample Time	14:35	Analysis	SW8260B,SW6010B,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-13-Q117		
Duplicate Sample ID	DUP-1	COC	
Dup Sample Time	14:35	Bottles	3 - 40mL vial with NA2S2O3,BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

Gauging Data

Date 05/08/2017

Sampler Eric Krueger

Well	Date/Time	Depth To Water (ft)	Well Depth (ft)	Depth to LNAPL (ft)	PID (ppmv)	Remarks
MW-13	05/08/2017 09:49	2.52	12.22		4.2	
MW-7	05/08/2017 09:36	4.22	12.37		4.7	
MW-8	05/08/2017 09:40	2.61	13.19		2.8	
MW-9	05/08/2017 09:44	3.29	13.31		3.3	

Sampler: Eric Krueger

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-7

Date	05/08/2017	Weather Conditions	Sunny	Depth to Water (ft bmp)	4.22
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	12.37
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	8.15
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.33
Purge Volume Units	ml	Pump Intake Depth (ft bmp)	8.0	Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
10:21	600	11.4	6.19	1246	-107.2	1.93		4.25	
10:24	1200	11.4	6.16	1249	-103.6	1.09		4.30	
10:27	1800	11.2	6.19	1245	-100.8	0.65		4.33	
10:29	2200	11.2	6.18	1241	-99.1	0.58		4.36	
10:31	2600	11.2	6.19	1234	-97.8	0.53		4.37	

Sampling Summary

Sample Date	05/08/2017	Odor	No
Sample Time	10:35	Analysis	SW8260B,SW8270C-SIM,6020,NWTPH-Dx,NWTPH-Dx,8011
Sample ID	MW-7-Q217	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
Dup Sample Time		Remarks	

Sampler: Eric Krueger 

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-8

Date	05/08/2017	Weather Conditions	Sunny	Depth to Water (ft bmp)	2.61
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	13.19
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	10.58
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.73
Purge Volume Units	ml	Pump Intake Depth (ft bmp)	8.0	Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
10:59	600	11.1	6.18	1733	-37.1	1.16		2.64	
11:02	1200	11.1	6.16	1737	-41.5	0.86		2.68	
11:05	1800	11.2	6.16	1748	-47.7	0.43		2.70	
11:08	2400	11.2	6.16	1745	-50.5	0.35		2.75	
11:10	2800	11.2	6.18	1748	-51.4	0.32		2.78	

Sampling Summary

Sample Date	05/08/2017	Odor	No
Sample Time	11:15	Analysis	NWTPH-Gx,NWTPH-Dx,SW8260B,SW8270C-SIM,6020,8011
Sample ID	MW-8-Q217	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
Dup Sample Time		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-9

Date	05/08/2017	Weather Conditions	Sunny	Depth to Water (ft bmp)	3.29
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	13.31
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	10.02
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.63
Purge Volume Units	ml	Pump Intake Depth (ft bmp)	8.0	Total Volume to Remove	0.0
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
11:35	600	10.6	5.88	573.7	-7.5	0.69		3.31	
11:38	1200	10.3	5.89	549.6	-13.0	0.52		3.33	
11:41	1800	10.7	5.87	546.6	-16.8	0.36		3.35	
11:44	2400	10.9	5.88	545.5	-19.2	0.31		3.37	
11:46	2800	10.9	5.98	545.0	-20.4	0.29		3.40	

Sampling Summary

Sample Date	05/08/2017	Odor	No
Sample Time	11:50	Analysis	NWTPH-Gx,NWTPH-Dx,SW8260B,SW8270C-SIM,8011,6020
Sample ID	MW-9-Q217	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL,Lead 1x 250 ml poly HNO3,Dissolved Lead 1x 250 ml poly unpreserved
Dup Sample Time		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

Groundwater Monitoring Field Data Form
Site: WA-BPOLY

MW-13

Date	05/08/2017	Weather Conditions	Sunny	Depth to Water (ft bmp)	2.52
Project Number	GP09BPNA.WA60	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	12.22
Address	1120 West Bay Drive, Olympia, WA98502	Casing Material	PVC	Water Column in Well	9.7
Purge Method	Low Flow - Peristaltic Pump	Casing Diameter (in)	2	Gallons in Well	1.58
Purge Volume Units	ml	Pump Intake Depth (ft bmp)	7.0	Total Volume to Remove	
Sampling Type	Low Flow	Casing Volume to Remove			
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
12:13	600	11.8	6.57	269.8	-6.0	0.80		2.55	
12:16	1200	11.8	6.56	268.1	-20.9	0.49		2.58	
12:19	1800	11.9	6.53	267.8	-30.4	0.34		2.60	
12:22	2400	11.8	6.52	270.0	-40.3	0.26		2.62	
12:24	2800	11.8	6.52	271.9	-46.5	0.25		2.65	

Sampling Summary

Sample Date	05/08/2017	Odor	No
Sample Time	12:30	Analysis	NWTPH-Gx,NWTPH-Dx,SW8260B,SW8270C-SIM,6020,8011
Sample ID	MW-13-Q217		
Duplicate Sample ID	DUP-1	COC	
Dup Sample Time	12:30	Bottles	
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				

Photos and Drawings

APPENDIX D

Laboratory Reports and Chain-of-Custody Documentation

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: January 18, 2017

Project: Former Olympia Bulk Plant

Submittal Date: 12/17/2016
Group Number: 1746296
SDG: WAN02
PO Number: GP09BPNA.WA60
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
MW-7 Water	8753059
MW-7 Filtered Water	8753060
MW-8 Water	8753061
MW-8 Filtered Water	8753062
MW-9 Water	8753063
MW-9 Filtered Water	8753064
MW-13 Water	8753065
MW-13 Filtered Water	8753066
DUP-1 Water	8753067
Trip Blank Water	8753068

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ryan Brauchla

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Respectfully Submitted,

Stacy L. Hess
Project Manager

(717) 556-7236

Project Name: Former Olympia Bulk Plant
LL Group #: 1746296

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8270C SIM, GC/MS Semivolatiles

Sample #s: 8753061, 8753063, 8753065
Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

ECY 97-602 NWTPH-Gx, GC Volatiles

Sample #s: 8753061
Reporting limits were raised due to sample foaming.

ECY 97-602 NWTPH-Dx modified, GC Petroleum Hydrocarbons

Sample #s: 8753067
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.
Target analytes were detected in the method blank associated with the samples as noted on the QC Summary.

Batch #: 163570036A (Sample number(s): 8753067)

The recovery(ies) for the following analyte(s) in the LCS and/or LCSD were below the acceptance window: DX DRO C12-C24

ECY 97-602 NWTPH-Dx modified, GC Petroleum Hydrocarbons w/Si

Sample #s: 8753067

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary.

SW-846 6020, Metals

Batch #: 163636050002A (Sample number(s): 8753059-8753066 UNSPK: 8753065 BKG: 8753065)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Lead

SW-846 6020, Metals Dissolved

Batch #: 163636050002A (Sample number(s): 8753059-8753066 UNSPK: 8753065 BKG: 8753065)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Lead

Sample Description: MW-7 Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753059
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 09:15 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY07 SDG#: WAN02-01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.010	0.051	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.010	0.051	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.010	0.051	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.010	0.051	1
14243	Chrysene	218-01-9	N.D.	0.010	0.051	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.010	0.051	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.010	0.051	1
14243	1-Methylnaphthalene	90-12-0	0.021 J	0.010	0.051	1
14243	2-Methylnaphthalene	91-57-6	0.017 J	0.010	0.051	1
14243	Naphthalene	91-20-3	N.D.	0.030	0.061	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1
Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.0095	0.028	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
08271	Diesel Range Organics C12-C24	n.a.	N.D.	29	96	1
08271	Heavy Range Organics C24-C40	n.a.	N.D.	67	240	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
02211	DRO C12-C24 w/Si Gel	n.a.	N.D.	29	96	1
02211	HRO C24-C40 w/Si Gel	n.a.	N.D.	67	240	1
Metals	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	0.094 J	0.090	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

Sample Description: MW-7 Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753059
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 09:15 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY07 SDG#: WAN02-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	P163581AA	12/23/2016 19:21	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163581AA	12/23/2016 19:21	Daniel H Heller	1
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	16356WAD026	12/22/2016 06:55	William H Saadeh	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	16356WAD026	12/21/2016 17:00	Kate E Lutte	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16356A20A	12/21/2016 12:58	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16356A20A	12/21/2016 12:58	Brett W Kenyon	1
10398	EDB in Wastewater	SW-846 8011	1	163590012A	12/30/2016 14:29	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	163590012A	12/27/2016 17:30	Shawn J McMullen	1
08271	NWTPH-Dx water	ECY 97-602 NWTPH-Dx modified	1	163630023A	12/30/2016 07:36	Thomas C Wildermuth	1
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	163630024A	01/04/2017 05:15	Amy Lehr	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	163630024A	12/29/2016 08:00	Kayla A Yuditsky	1
11197	WA DRO NW DX Ext (Non SG)	ECY 97-602 NWTPH-Dx 06/97	1	163630023A	12/29/2016 08:00	Kayla A Yuditsky	1
06035	Lead	SW-846 6020	1	163636050002A	12/29/2016 23:58	Sarah L Burt	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163636050002	12/29/2016 06:32	James L Mertz	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-7 Filtered Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753060
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 09:15 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY7F SDG#: WAN02-02

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals Dissolved	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.090	1.0	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	163636050002A	12/30/2016 00:00	Sarah L Burt	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163636050002	12/29/2016 06:32	James L Mertz	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-8 Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753061
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 10:15 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY08 SDG#: WAN02-03

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	39		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
14243	Benzo(a)anthracene	56-55-3	N.D.		0.010	0.050	1
14243	Benzo(a)pyrene	50-32-8	N.D.		0.010	0.050	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.		0.010	0.050	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.		0.010	0.050	1
14243	Chrysene	218-01-9	N.D.		0.010	0.050	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.		0.010	0.050	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		0.010	0.050	1
14243	1-Methylnaphthalene	90-12-0	0.020	J	0.010	0.050	1
14243	2-Methylnaphthalene	91-57-6	0.015	J	0.010	0.050	1
14243	Naphthalene	91-20-3	0.066		0.030	0.060	1

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	540	J	500	2,500	10

Reporting limits were raised due to sample foaming.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.0095	0.029	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
08271	Diesel Range Organics C12-C24	n.a.	810		29	96	1
08271	Heavy Range Organics C24-C40	n.a.	420		68	240	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
02211	DRO C12-C24 w/Si Gel	n.a.	210		29	96	1
02211	HRO C24-C40 w/Si Gel	n.a.	N.D.		68	240	1
Metals	**SW-846 6020**		**ug/l**		**ug/l**	**ug/l**	
06035	Lead	7439-92-1	2.2		0.090	1.0	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-8 Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753061
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 10:15 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY08 SDG#: WAN02-03

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	P163581AA	12/23/2016 19:42	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163581AA	12/23/2016 19:42	Daniel H Heller	1
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	16356WAD026	12/22/2016 07:23	William H Saadeh	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	16356WAD026	12/21/2016 17:00	Kate E Lutte	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16357B20A	12/22/2016 19:50	Brett W Kenyon	10
01146	GC VOA Water Prep	SW-846 5030B	1	16357B20A	12/22/2016 19:50	Brett W Kenyon	10
10398	EDB in Wastewater	SW-846 8011	1	163590012A	12/30/2016 14:45	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	163590012A	12/27/2016 17:30	Shawn J McMullen	1
08271	NWTPH-Dx water	ECY 97-602 NWTPH-Dx modified	1	163630023A	12/30/2016 08:40	Thomas C Wildermuth	1
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	163630024A	01/04/2017 05:37	Amy Lehr	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	163630024A	12/29/2016 08:00	Kayla A Yuditsky	1
11197	WA DRO NW DX Ext (Non SG)	ECY 97-602 NWTPH-Dx 06/97	1	163630023A	12/29/2016 08:00	Kayla A Yuditsky	1
06035	Lead	SW-846 6020	1	163636050002A	12/30/2016 00:02	Sarah L Burt	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163636050002	12/29/2016 06:32	James L Mertz	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-8 Filtered Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753062
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 10:15 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY8F SDG#: WAN02-04

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals Dissolved	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.090	1.0	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	163636050002A	12/30/2016 00:04	Sarah L Burt	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163636050002	12/29/2016 06:32	James L Mertz	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-9 Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753063
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 11:15 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY09 SDG#: WAN02-05

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	5.4		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
14243	Benzo(a)anthracene	56-55-3	N.D.		0.010	0.051	1
14243	Benzo(a)pyrene	50-32-8	N.D.		0.010	0.051	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.		0.010	0.051	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.		0.010	0.051	1
14243	Chrysene	218-01-9	N.D.		0.010	0.051	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.		0.010	0.051	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		0.010	0.051	1
14243	1-Methylnaphthalene	90-12-0	0.077		0.010	0.051	1
14243	2-Methylnaphthalene	91-57-6	0.044	J	0.010	0.051	1
14243	Naphthalene	91-20-3	0.73		0.031	0.061	1

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	130	J	50	250	1
Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.0095	0.029	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
08271	Diesel Range Organics C12-C24	n.a.	260		28	94	1
08271	Heavy Range Organics C24-C40	n.a.	97	J	66	240	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
02211	DRO C12-C24 w/Si Gel	n.a.	88	J	28	94	1
02211	HRO C24-C40 w/Si Gel	n.a.	N.D.		66	240	1
Metals	**SW-846 6020**		**ug/l**		**ug/l**	**ug/l**	
06035	Lead	7439-92-1	0.53	J	0.090	1.0	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-9 Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753063
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 11:15 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY09 SDG#: WAN02-05

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	P163581AA	12/23/2016 20:04	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163581AA	12/23/2016 20:04	Daniel H Heller	1
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	16356WAD026	12/22/2016 07:51	William H Saadeh	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	16356WAD026	12/21/2016 17:00	Kate E Lutte	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16356A20A	12/21/2016 14:46	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16356A20A	12/21/2016 14:46	Brett W Kenyon	1
10398	EDB in Wastewater	SW-846 8011	1	163590012A	12/30/2016 15:00	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	163590012A	12/27/2016 17:30	Shawn J McMullen	1
08271	NWTPH-Dx water	ECY 97-602 NWTPH-Dx modified	1	163630023A	12/30/2016 07:58	Thomas C Wildermuth	1
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	163630024A	01/04/2017 05:59	Amy Lehr	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	163630024A	12/29/2016 08:00	Kayla A Yuditsky	1
11197	WA DRO NW DX Ext (Non SG)	ECY 97-602 NWTPH-Dx 06/97	1	163630023A	12/29/2016 08:00	Kayla A Yuditsky	1
06035	Lead	SW-846 6020	1	163636050002A	12/30/2016 00:09	Sarah L Burt	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163636050002	12/29/2016 06:32	James L Mertz	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-9 Filtered Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753064
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 11:15 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY9F SDG#: WAN02-06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals Dissolved	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.090	1.0	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	163636050002A	12/30/2016 00:11	Sarah L Burt	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163636050002	12/29/2016 06:32	James L Mertz	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-13 Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753065
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 13:15 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY13 SDG#: WAN02-07

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
14243	Benzo(a)anthracene	56-55-3	N.D.		0.010	0.050	1
14243	Benzo(a)pyrene	50-32-8	N.D.		0.010	0.050	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.		0.010	0.050	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.		0.010	0.050	1
14243	Chrysene	218-01-9	N.D.		0.010	0.050	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.		0.010	0.050	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		0.010	0.050	1
14243	1-Methylnaphthalene	90-12-0	0.062		0.010	0.050	1
14243	2-Methylnaphthalene	91-57-6	0.031	J	0.010	0.050	1
14243	Naphthalene	91-20-3	0.30		0.030	0.060	1

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	58	J	50	250	1
Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.0095	0.029	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
08271	Diesel Range Organics C12-C24	n.a.	N.D.		28	94	1
08271	Heavy Range Organics C24-C40	n.a.	N.D.		66	240	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
02211	DRO C12-C24 w/Si Gel	n.a.	N.D.		28	94	1
02211	HRO C24-C40 w/Si Gel	n.a.	N.D.		66	240	1
Metals	**SW-846 6020**		**ug/l**		**ug/l**	**ug/l**	
06035	Lead	7439-92-1	0.21	J	0.090	1.0	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-13 Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753065
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 13:15 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY13 SDG#: WAN02-07

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	P163631AA	12/28/2016 20:12	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163631AA	12/28/2016 20:12	Daniel H Heller	1
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	16356WAD026	12/22/2016 08:19	William H Saadeh	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	16356WAD026	12/21/2016 17:00	Kate E Lutte	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16356A20A	12/21/2016 15:40	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16356A20A	12/21/2016 15:40	Brett W Kenyon	1
10398	EDB in Wastewater	SW-846 8011	1	163590012A	12/30/2016 15:16	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	163590012A	12/27/2016 17:30	Shawn J McMullen	1
08271	NWTPH-Dx water	ECY 97-602 NWTPH-Dx modified	1	163630023A	12/30/2016 08:19	Thomas C Wildermuth	1
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	163630024A	01/04/2017 06:20	Amy Lehr	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	163630024A	12/29/2016 08:00	Kayla A Yuditsky	1
11197	WA DRO NW DX Ext (Non SG)	ECY 97-602 NWTPH-Dx 06/97	1	163630023A	12/29/2016 08:00	Kayla A Yuditsky	1
06035	Lead	SW-846 6020	1	163636050002A	12/29/2016 23:29	Sarah L Burt	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163636050002	12/29/2016 06:32	James L Mertz	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-13 Filtered Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753066
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 13:15 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OL13F SDG#: WAN02-08

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals Dissolved	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.090	1.0	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	163636050002A	12/30/2016 00:13	Sarah L Burt	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163636050002	12/29/2016 06:32	James L Mertz	1

*=This limit was used in the evaluation of the final result

Sample Description: DUP-1 Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753067
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLYFD SDG#: WAN02-09FD

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	57	J	50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	65	J	46	100	1
12899	DX HRO C24-C40	n.a.	450		100	250	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.
Target analytes were detected in the method blank associated with the samples as noted on the QC Summary.

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12908	DX DRO C12-C24 w/ SiGel	n.a.	N.D.		46	100	1
12908	DX HRO C24-C40 w/ SiGel	n.a.	470		100	250	1

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary.

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P163581AA	12/23/2016 13:32	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163581AA	12/23/2016 13:32	Daniel H Heller	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16356A20A	12/21/2016 16:06	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16356A20A	12/21/2016 16:06	Brett W Kenyon	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	163570036A	01/07/2017 00:21	Amy Lehr	1
12908	DRO/DX Mini-Ext, Quick SiGel	ECY 97-602 NWTPH-Dx modified	1	163570039A	12/29/2016 02:38	Amy Lehr	1

*=This limit was used in the evaluation of the final result

Sample Description: DUP-1 Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753067
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016 by RB

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLYFD SDG#: WAN02-09FD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12916	Mini-Ext. DRO DX, Quick SiGel	ECY 97-602 NWTPH-Dx 06/97	1	163570039A	12/23/2016 17:00	Ryan J Dowdy	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	163570036A	12/23/2016 17:00	Ryan J Dowdy	1

*=This limit was used in the evaluation of the final result

Sample Description: Trip Blank Water
BP Olympia COC: R215984
1120 West Bay Drive - Olympia, WA

LL Sample # WW 8753068
LL Group # 1746296
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 12/15/2016

Submitted: 12/17/2016 11:10
Reported: 01/18/2017 07:53

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLYTB SDG#: WAN02-10TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		ug/l	ug/l	ug/l	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		ug/l	ug/l	ug/l	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P163581AA	12/23/2016 13:11	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163581AA	12/23/2016 13:11	Daniel H Heller	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16356A20A	12/21/2016 11:37	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16356A20A	12/21/2016 11:37	Brett W Kenyon	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1746296
Reported: 01/18/2017 07:53

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
Batch number: P163581AA	Sample number(s): 8753059,8753061,8753063,8753067-8753068		
Benzene	N.D.	0.50	1.0
1,2-Dichloroethane	N.D.	0.50	1.0
Ethylbenzene	N.D.	0.50	1.0
Methyl Tertiary Butyl Ether	N.D.	0.50	1.0
Toluene	N.D.	0.50	1.0
Xylene (Total)	N.D.	0.50	1.0
Batch number: P163631AA	Sample number(s): 8753065		
Benzene	N.D.	0.50	1.0
1,2-Dichloroethane	N.D.	0.50	1.0
Ethylbenzene	N.D.	0.50	1.0
Methyl Tertiary Butyl Ether	N.D.	0.50	1.0
Toluene	N.D.	0.50	1.0
Xylene (Total)	N.D.	0.50	1.0
Batch number: 16356WAD026	Sample number(s): 8753059,8753061,8753063,8753065		
Benzo(a)anthracene	N.D.	0.010	0.050
Benzo(a)pyrene	N.D.	0.010	0.050
Benzo(b)fluoranthene	N.D.	0.010	0.050
Benzo(k)fluoranthene	N.D.	0.010	0.050
Chrysene	N.D.	0.010	0.050
Dibenz(a,h)anthracene	N.D.	0.010	0.050
Indeno(1,2,3-cd)pyrene	N.D.	0.010	0.050
1-Methylnaphthalene	N.D.	0.010	0.050
2-Methylnaphthalene	N.D.	0.010	0.050
Naphthalene	0.044 J	0.030	0.060
Batch number: 16356A20A	Sample number(s): 8753059,8753063,8753065,8753067-8753068		
NWTPH-Gx water C7-C12	N.D.	50	250
Batch number: 16357B20A	Sample number(s): 8753061		
NWTPH-Gx water C7-C12	N.D.	50	250
Batch number: 163590012A	Sample number(s): 8753059,8753061,8753063,8753065		
Ethylene dibromide	N.D.	0.010	0.030
Batch number: 163570036A	Sample number(s): 8753067		
DX DRO C12-C24	130	45	100
DX HRO C24-C40	350	100	250
Batch number: 163630023A	Sample number(s): 8753059,8753061,8753063,8753065		
Diesel Range Organics C12-C24	N.D.	30	100
Heavy Range Organics C24-C40	N.D.	70	250

*- Outside of specification
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(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS
Reported: 01/18/2017 07:53

Group Number: 1746296

Method Blank (continued)

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
Batch number: 163570039A	Sample number(s): 8753067		
DX DRO C12-C24 w/ SiGel	95 J	45	100
DX HRO C24-C40 w/ SiGel	370	100	250
Batch number: 163630024A	Sample number(s): 8753059,8753061,8753063,8753065		
DRO C12-C24 w/Si Gel	N.D.	30	100
HRO C24-C40 w/Si Gel	N.D.	70	250
Batch number: 163636050002A	Sample number(s): 8753059-8753066		
Lead	N.D.	0.090	1.0

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: P163581AA	Sample number(s): 8753059,8753061,8753063,8753067-8753068								
Benzene	20	18.97			95		78-120		
1,2-Dichloroethane	20	20.8			104		66-128		
Ethylbenzene	20	19.08			95		78-120		
Methyl Tertiary Butyl Ether	20	20.73			104		75-120		
Toluene	20	18.98			95		80-120		
Xylene (Total)	60	57.65			96		80-120		
Batch number: P163631AA	Sample number(s): 8753065								
Benzene	20	19.56			98		78-120		
1,2-Dichloroethane	20	20.22			101		66-128		
Ethylbenzene	20	19.46			97		78-120		
Methyl Tertiary Butyl Ether	20	20.78			104		75-120		
Toluene	20	19.19			96		80-120		
Xylene (Total)	60	59.33			99		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16356WAD026	Sample number(s): 8753059,8753061,8753063,8753065								
Benzo(a)anthracene	1.00	0.965			96		75-119		
Benzo(a)pyrene	1.00	0.972			97		75-115		
Benzo(b)fluoranthene	1.00	1.02			102		75-120		
Benzo(k)fluoranthene	1.00	1.00			100		71-118		
Chrysene	1.00	0.934			93		73-111		
Dibenz(a,h)anthracene	1.00	0.991			99		52-129		
Indeno(1,2,3-cd)pyrene	1.00	0.962			96		52-127		
1-Methylnaphthalene	1.00	0.733			73		42-127		
2-Methylnaphthalene	1.00	0.748			75		43-121		
Naphthalene	1.00	0.758			76		44-113		
	ug/l	ug/l	ug/l	ug/l					

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Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1746296
Reported: 01/18/2017 07:53

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16356A20A	Sample number(s): 8753059,8753063,8753065,8753067-8753068								
NWTPH-Gx water C7-C12	1100	999.5			91		79-120		
Batch number: 16357B20A	Sample number(s): 8753061								
NWTPH-Gx water C7-C12	1100	1004.94	1100	995.12	91	90	79-120	1	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 163590012A	Sample number(s): 8753059,8753061,8753063,8753065								
Ethylene dibromide	0.128	0.132	0.128	0.127	103	99	60-140	4	20
	ug/l	ug/l	ug/l	ug/l					
Batch number: 163570036A	Sample number(s): 8753067								
DX DRO C12-C24	600	349.77	600	322.26	58*	54*	70-130	8	20
Batch number: 163630023A	Sample number(s): 8753059,8753061,8753063,8753065								
Diesel Range Organics C12-C24	1600	1197.25	1600	1283.75	75	80	50-113	7	20
	ug/l	ug/l	ug/l	ug/l					
Batch number: 163570039A	Sample number(s): 8753067								
DX DRO C12-C24 w/ SiGel	600	308.11	600	289.4	51	48	23-115	6	20
Batch number: 163630024A	Sample number(s): 8753059,8753061,8753063,8753065								
DRO C12-C24 w/Si Gel	1600	1335.72	1600	1347.81	83	84	32-117	1	20
	ug/l	ug/l	ug/l	ug/l					
Batch number: 163636050002A	Sample number(s): 8753059-8753066								
Lead	15	15.29			102		80-120		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: P163581AA	Sample number(s): 8753059,8753061,8753063,8753067-8753068 UNSPK: P747177									
Benzene	N.D.	20	21.69	20	21.29	108	106	78-120	2	30
1,2-Dichloroethane	N.D.	20	23.07	20	23.85	115	119	66-128	3	30
Ethylbenzene	N.D.	20	21.95	20	21.35	110	107	78-120	3	30
Methyl Tertiary Butyl Ether	N.D.	20	23.37	20	22.61	117	113	75-120	3	30
Toluene	N.D.	20	21.62	20	21.35	108	107	80-120	1	30
Xylene (Total)	N.D.	60	66.12	60	64.73	110	108	80-120	2	30
Batch number: P163631AA	Sample number(s): 8753065 UNSPK: P754170									
Benzene	N.D.	20	21.71	20	21.09	109	105	78-120	3	30

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Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS
Reported: 01/18/2017 07:53

Group Number: 1746296

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l	ug/l					
1,2-Dichloroethane	N.D.	20	23.55	20	23.5	118	118	66-128	0	30
Ethylbenzene	N.D.	20	21.11	20	20.67	106	103	78-120	2	30
Methyl Tertiary Butyl Ether	N.D.	20	22.61	20	22.27	113	111	75-120	2	30
Toluene	N.D.	20	20.65	20	20.42	103	102	80-120	1	30
Xylene (Total)	N.D.	60	63.96	60	62.63	107	104	80-120	2	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 16356WAD026	Sample number(s): 8753059,8753061,8753063,8753065 UNSPK: P751733									
Benzo(a)anthracene	N.D.	1.01	0.905	1.02	0.958	89	94	75-119	6	30
Benzo(a)pyrene	N.D.	1.01	0.827	1.02	0.768	82	76	75-115	7	30
Benzo(b)fluoranthene	N.D.	1.01	0.957	1.02	0.932	95	92	75-120	3	30
Benzo(k)fluoranthene	N.D.	1.01	0.934	1.02	0.924	92	91	71-118	1	30
Chrysene	N.D.	1.01	0.898	1.02	0.887	89	87	73-111	1	30
Dibenz(a,h)anthracene	N.D.	1.01	0.844	1.02	0.798	83	78	52-129	6	30
Indeno(1,2,3-cd)pyrene	N.D.	1.01	0.840	1.02	0.797	83	78	52-127	5	30
1-Methylnaphthalene	N.D.	1.01	0.704	1.02	0.723	70	71	42-127	3	30
2-Methylnaphthalene	N.D.	1.01	0.709	1.02	0.733	70	72	43-121	3	30
Naphthalene	0.0364	1.01	0.729	1.02	0.752	68	70	44-113	3	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 16356A20A	Sample number(s): 8753059,8753063,8753065,8753067-8753068 UNSPK: 8753059									
NWTPH-Gx water C7-C12	N.D.	1100	1145.48	1100	1101.41	104	100	79-120	4	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 163590012A	Sample number(s): 8753059,8753061,8753063,8753065 UNSPK: P750552									
Ethylene dibromide	N.D.	0.122	0.120			98		60-140		
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 163636050002A	Sample number(s): 8753059-8753066 UNSPK: 8753065									
Lead	0.212	15	15.29	15	15.75	100	104	75-125	3	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max
	ug/l	ug/l		
Batch number: 163590012A	Sample number(s): 8753059,8753061,8753063,8753065 BKG: P750553			
Ethylene dibromide	N.D.	N.D.	0 (1)	30
	ug/l	ug/l		

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Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1746296
Reported: 01/18/2017 07:53

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 163636050002A	Sample number(s): 8753059-8753066 BKG: 8753065			
Lead	0.212	0.134	45* (1)	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: BTEX, MTBE, EDC
Batch number: P163581AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8753059	107	109	110	111
8753061	106	108	108	111
8753063	108	110	109	111
8753067	107	107	108	109
8753068	107	107	109	109
Blank	108	104	109	110
LCS	108	108	102	103
MS	108	111	102	103
MSD	107	110	101	103
Limits:	80-116	77-113	80-113	78-113

Analysis Name: BTEX, MTBE, EDC
Batch number: P163631AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8753065	108	108	107	111
Blank	108	106	107	111
LCS	110	108	101	104
MS	110	110	100	104
MSD	110	109	100	104
Limits:	80-116	77-113	80-113	78-113

Analysis Name: SIM SVOAs 8270C MINI
Batch number: 16356WAD026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
8753059	85	74	65
8753061	62	41	54
8753063	65	66	70
8753065	82	79	61
Blank	77	82	61
LCS	87	95	61
MS	80	81	62

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Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1746296
Reported: 01/18/2017 07:53

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270C MINI
Batch number: 16356WAD026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
MSD	83	78	62
Limits:	46-143	29-144	18-142

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 16356A20A

	Trifluorotoluene-F
8753059	90
8753063	90
8753065	90
8753067	90
8753068	89
Blank	88
LCS	98
MS	99
MSD	98
Limits:	63-135

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 16357B20A

	Trifluorotoluene-F
8753061	90
Blank	91
LCS	98
LCSD	98
Limits:	63-135

Analysis Name: EDB in Wastewater
Batch number: 163590012A

	1,1,2,2-Tetrachloroethane
8753059	89
8753061	90
8753063	78
8753065	84
Blank	84
DUP	89
LCS	88
LCSD	85
MS	88
Limits:	46-136

*- Outside of specification
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Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1746296
Reported: 01/18/2017 07:53

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: DRO/DX Mini-extraction Master
Batch number: 163570036A

	Orthoterphenyl
8753067	78
Blank	87
LCS	88
LCSD	83
Limits:	50-150

Analysis Name: DRO/DX Mini-Ext, Quick SiGel
Batch number: 163570039A

	Orthoterphenyl
8753067	83
Blank	86
LCS	87
LCSD	84
Limits:	50-150

Analysis Name: NWTPH-Dx water
Batch number: 163630023A

	Orthoterphenyl
8753059	91
8753061	62
8753063	92
8753065	57
Blank	91
LCS	95
LCSD	92
Limits:	50-150

Analysis Name: NWTPH-Dx water w/Si Gel
Batch number: 163630024A

	Orthoterphenyl
8753059	96
8753061	67
8753063	93
8753065	62
Blank	99
LCS	105
LCSD	100
Limits:	50-150

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13255 1746296 8753059-68

bp rm

Laboratory Management Program LaMP Chain of Custody Record R215984

Page 1 of 1

BP Site Node Path: _____ Req Due Date (mm/dd/yy): Standard TAT Rush TAT: Yes ___ No X

BP Facility No: BP OLYMPIA Lab Work Order Number: _____

Lab Name: Eurofins Lancaster Laboratories Environmental	Facility Address: 1120 West Bay Drive	Consultant/Contractor: Arcadis
Lab Address: 2425 New Holland Pike, Lancaster, PA 17601	City, State, ZIP Code: Olympia, WA	Consultant/Contractor Project No: GP09BPNAWA60
Lab PM: Stacy Hess	Lead Regulatory Agency: Ecology	Address: 1100 Olive Way, Suite 800, Seattle, WA
Lab Phone: 717.556.7236	California Global ID No.:	Consultant/Contractor PM: Brian Marcum
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 971.235.7174 Email: brian.marcum@arcadis.com
Lab Bottle Order No:	Accounting Mode: Provision ___ OOC-BU ___ OOC-RM ___	Email EDD To: Brian, Ross, Ryan and to lab.enfosdoc@bp.com
Other Info:	Stage: Activity:	Invoice To: BP ___ Contractor X

BP Project Manager (PM):

BP PM Phone:

BP PM Email:

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix: Is this location a well?	No. Containers / Preservative: Total Number of Containers	Unpreserved	H2SO4	HNO3	HCl	Methanol	Requested Analyses: GRO (NWTPH-Gx)	BTEX/MTBE/EDC (8260)	EDB (8011)	DRO/HO with silica gel cleanup (NWTPH-Dx)	DRO/HO without silica gel cleanup (NWTPH-Dx)	cPAHs/Naphthalenes by 8270 CSIM	Total Lead (6020)	Dissolved Lead (6020)	
	MW-7	12-15-16	0915		X		Y	16/14	3		1	12		X	X	X	X	X	X	X	X	
	MW-8	12-15-16	1015		X		Y	16/14	3		1	12		X	X	X	X	X	X	X	X	
	MW-9	12-15-16	1115		X		Y	16/14	3		1	12		X	X	X	X	X	X	X	X	
	MW-13	12-15-16	1315		X		Y	16/14	3		1	12		X	X	X	X	X	X	X	X	
	DUP-1	12-15-16	-		X		Y	10				10		X	NO EDC		X	X				
	Trip Blank	—	-		X		N	2				2		X	NO EDC							

Report Type & QC Level

Standard X

Full Data Package ___ see special instructions

Comments

Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Questions - call R. Brauchla: 509.438.9828

Sampler's Name: Ryan Brauchla (RB)	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Arcadis	[signature] / Arcadis	12/16/16	1150	[signature] / EMLC	12/16/16	11:52
Shipment Method: Ship Date:						
Shipment Tracking No:						

Special Instructions: Please provide chromatograms for all DRO/HO analyses. Lead to be run by 6020 (not 6010 as is printed on the bottles)

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: 0.5 + 4 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

eurofins | Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 171164

Group Number(s): 1746296

Client: WA OFFICE

Delivery and Receipt Information

Delivery Method:	SeaTac	Arrival Timestamp:	12/17/2016 11:10
Number of Packages:	3	Number of Projects:	1
State/Province of Origin:	WA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Karen Diem (3060) at 11:56 on 12/17/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	0.5	DT	Wet	Y	Bagged	N
2	DT121	0.7	DT	Wet	Y	Bagged	N
3	DT121	1.0	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL REPORT

March 17, 2017

Arcadis - Seattle, WA

Sample Delivery Group:	L895193
Samples Received:	03/10/2017
Project Number:	GP09BPNA.WA60
Description:	Olympia Bulk Plant
Site:	1120 WEST BAY DR, OLYMPIA, WA
Report To:	Ross LaGrandeur 1100 Olive Way Suite 800 Seattle, WA 98101

Entire Report Reviewed By:

Brian Ford

Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

MW-7 L895193-01 GW

Collected by: Eric Krueger
Collected date/time: 03/09/17 12:25
Received date/time: 03/10/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG960587	1	03/13/17 21:09	03/14/17 02:21	LTB
Metals (ICP) by Method 6010C	WG961400	1	03/15/17 23:03	03/16/17 03:47	CCE
Volatile Organic Compounds (GC) by Method NWTPHGX	WG960176	1	03/16/17 03:51	03/16/17 03:51	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG959917	1	03/13/17 05:49	03/13/17 05:49	BMB
EDB / DBCP by Method 8011	WG960326	1	03/13/17 07:39	03/14/17 06:44	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG960019	1	03/11/17 00:06	03/11/17 17:39	TRF
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG961524	1	03/14/17 12:54	03/16/17 13:03	TRF
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG960332	1	03/14/17 05:43	03/14/17 11:10	FMB

MW-8 L895193-02 GW

Collected by: Eric Krueger
Collected date/time: 03/09/17 13:20
Received date/time: 03/10/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG960587	1	03/13/17 21:09	03/14/17 02:23	LTB
Metals (ICP) by Method 6010C	WG961400	1	03/15/17 23:03	03/16/17 03:50	CCE
Volatile Organic Compounds (GC) by Method NWTPHGX	WG960176	1	03/16/17 04:12	03/16/17 04:12	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG959917	1	03/13/17 06:11	03/13/17 06:11	BMB
EDB / DBCP by Method 8011	WG960326	1	03/13/17 07:39	03/14/17 06:55	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG960019	1	03/11/17 00:06	03/11/17 17:56	TRF
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG961524	1	03/14/17 12:54	03/16/17 13:20	TRF
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG960332	1	03/14/17 05:43	03/14/17 11:32	FMB

MW-9 L895193-03 GW

Collected by: Eric Krueger
Collected date/time: 03/09/17 13:50
Received date/time: 03/10/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG960587	1	03/13/17 21:09	03/14/17 02:26	LTB
Metals (ICP) by Method 6010C	WG961400	1	03/15/17 23:03	03/16/17 03:53	CCE
Volatile Organic Compounds (GC) by Method NWTPHGX	WG960176	1	03/16/17 04:33	03/16/17 04:33	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG959917	1	03/13/17 06:32	03/13/17 06:32	BMB
EDB / DBCP by Method 8011	WG960326	1	03/13/17 07:39	03/14/17 07:06	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG960019	1	03/11/17 00:06	03/11/17 18:13	TRF
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG961524	1	03/14/17 12:54	03/16/17 13:36	TRF
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG960332	1	03/14/17 05:43	03/14/17 11:55	FMB

MW-13 L895193-04 GW

Collected by: Eric Krueger
Collected date/time: 03/09/17 14:35
Received date/time: 03/10/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG960587	1	03/13/17 21:09	03/14/17 02:29	LTB
Metals (ICP) by Method 6010C	WG961400	1	03/15/17 23:03	03/16/17 04:01	CCE
Volatile Organic Compounds (GC) by Method NWTPHGX	WG960176	1	03/16/17 04:54	03/16/17 04:54	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG959917	1	03/13/17 06:54	03/13/17 06:54	BMB
EDB / DBCP by Method 8011	WG960326	1	03/13/17 07:39	03/14/17 07:17	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG960019	1	03/11/17 00:06	03/11/17 18:30	TRF
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG961524	1	03/14/17 12:54	03/16/17 13:53	TRF
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG960332	1	03/14/17 05:43	03/14/17 12:18	FMB

DUP-1 L895193-05 GW

Collected by: Eric Krueger
Collected date/time: 03/09/17 00:00
Received date/time: 03/10/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method NWTPHGX	WG960176	1	03/16/17 05:15	03/16/17 05:15	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG959917	1	03/13/17 07:15	03/13/17 07:15	BMB
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG960019	1	03/11/17 00:06	03/11/17 18:47	TRF
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG961524	1	03/14/17 12:54	03/16/17 14:09	TRF

TRIP BLANK L895193-06 GW

Collected by: Eric Krueger
Collected date/time: 03/09/17 00:00
Received date/time: 03/10/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG959917	1	03/13/17 01:32	03/13/17 01:32	BMB

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford
Technical Service Representative

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	3.48	J	1.90	5.00	1	03/14/2017 02:21	WG960587
Lead,Dissolved	U		1.90	5.00	1	03/16/2017 03:47	WG961400

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	03/16/2017 03:51	WG960176
(S) a,a,a-Trifluorotoluene(FID)	*100*			*77.0-122*		*03/16/2017 03:51*	WG960176

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	03/13/2017 05:49	WG959917
Toluene	U		0.412	1.00	1	03/13/2017 05:49	WG959917
Ethylbenzene	U		0.384	1.00	1	03/13/2017 05:49	WG959917
Total Xylenes	U		1.06	3.00	1	03/13/2017 05:49	WG959917
Methyl tert-butyl ether	U		0.367	1.00	1	03/13/2017 05:49	WG959917
1,2-Dichloroethane	U		0.361	1.00	1	03/13/2017 05:49	WG959917
(S) Toluene-d8	*110*			*80.0-120*		*03/13/2017 05:49*	WG959917
(S) Dibromofluoromethane	*111*			*76.0-123*		*03/13/2017 05:49*	WG959917
(S) a,a,a-Trifluorotoluene	*105*			*80.0-120*		*03/13/2017 05:49*	WG959917
(S) 4-Bromofluorobenzene	*94.1*			*80.0-120*		*03/13/2017 05:49*	WG959917

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00240	0.0100	1	03/14/2017 06:44	WG960326

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/11/2017 17:39	WG960019
Residual Range Organics (RRO)	U		165	500	1	03/11/2017 17:39	WG960019
(S) o-Terphenyl	*94.3*			*52.0-156*		*03/11/2017 17:39*	WG960019

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/16/2017 13:03	WG961524
Residual Range Organics (RRO)	U		165	500	1	03/16/2017 13:03	WG961524
(S) o-Terphenyl	*121*			*52.0-156*		*03/16/2017 13:03*	WG961524

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	03/14/2017 11:10	WG960332
Benzo(a)pyrene	U		0.0116	0.0500	1	03/14/2017 11:10	WG960332
Benzo(b)fluoranthene	U		0.00212	0.0500	1	03/14/2017 11:10	WG960332
Benzo(k)fluoranthene	U		0.0136	0.0500	1	03/14/2017 11:10	WG960332
Chrysene	U		0.0108	0.0500	1	03/14/2017 11:10	WG960332
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	03/14/2017 11:10	WG960332
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	03/14/2017 11:10	WG960332

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Naphthalene	0.120	B J	0.0198	0.250	1	03/14/2017 11:10	WG960332
1-Methylnaphthalene	0.0245	J	0.00821	0.250	1	03/14/2017 11:10	WG960332
2-Methylnaphthalene	0.0359	J	0.00902	0.250	1	03/14/2017 11:10	WG960332
(S) Nitrobenzene-d5	*119*			*31.0-160*		*03/14/2017 11:10*	WG960332
(S) 2-Fluorobiphenyl	*94.1*			*48.0-148*		*03/14/2017 11:10*	WG960332
(S) p-Terphenyl-d14	*93.1*			*37.0-146*		*03/14/2017 11:10*	WG960332

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	U		1.90	5.00	1	03/14/2017 02:23	WG960587
Lead,Dissolved	U		1.90	5.00	1	03/16/2017 03:50	WG961400

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	03/16/2017 04:12	WG960176
(S) a,a,a-Trifluorotoluene(FID)	*100*			*77.0-122*		*03/16/2017 04:12*	WG960176

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	03/13/2017 06:11	WG959917
Toluene	6.00		0.412	1.00	1	03/13/2017 06:11	WG959917
Ethylbenzene	U		0.384	1.00	1	03/13/2017 06:11	WG959917
Total Xylenes	U		1.06	3.00	1	03/13/2017 06:11	WG959917
Methyl tert-butyl ether	U		0.367	1.00	1	03/13/2017 06:11	WG959917
1,2-Dichloroethane	U		0.361	1.00	1	03/13/2017 06:11	WG959917
(S) Toluene-d8	*108*			*80.0-120*		*03/13/2017 06:11*	WG959917
(S) Dibromofluoromethane	*111*			*76.0-123*		*03/13/2017 06:11*	WG959917
(S) a,a,a-Trifluorotoluene	*103*			*80.0-120*		*03/13/2017 06:11*	WG959917
(S) 4-Bromofluorobenzene	*95.9*			*80.0-120*		*03/13/2017 06:11*	WG959917

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00240	0.0100	1	03/14/2017 06:55	WG960326

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	390		82.5	250	1	03/11/2017 17:56	WG960019
Residual Range Organics (RRO)	419	J	165	500	1	03/11/2017 17:56	WG960019
(S) o-Terphenyl	*101*			*52.0-156*		*03/11/2017 17:56*	WG960019

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	87.6	J	82.5	250	1	03/16/2017 13:20	WG961524
Residual Range Organics (RRO)	U		165	500	1	03/16/2017 13:20	WG961524
(S) o-Terphenyl	*108*			*52.0-156*		*03/16/2017 13:20*	WG961524

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	03/14/2017 11:32	WG960332
Benzo(a)pyrene	U		0.0116	0.0500	1	03/14/2017 11:32	WG960332
Benzo(b)fluoranthene	U		0.00212	0.0500	1	03/14/2017 11:32	WG960332
Benzo(k)fluoranthene	U		0.0136	0.0500	1	03/14/2017 11:32	WG960332
Chrysene	U		0.0108	0.0500	1	03/14/2017 11:32	WG960332
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	03/14/2017 11:32	WG960332
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	03/14/2017 11:32	WG960332

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Naphthalene	0.0608	B J	0.0198	0.250	1	03/14/2017 11:32	WG960332
1-Methylnaphthalene	0.0269	J	0.00821	0.250	1	03/14/2017 11:32	WG960332
2-Methylnaphthalene	0.0134	J	0.00902	0.250	1	03/14/2017 11:32	WG960332
(S) Nitrobenzene-d5	*116*			*31.0-160*		*03/14/2017 11:32*	WG960332
(S) 2-Fluorobiphenyl	*90.2*			*48.0-148*		*03/14/2017 11:32*	WG960332
(S) p-Terphenyl-d14	*84.8*			*37.0-146*		*03/14/2017 11:32*	WG960332

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	2.72	J	1.90	5.00	1	03/14/2017 02:26	WG960587
Lead,Dissolved	U		1.90	5.00	1	03/16/2017 03:53	WG961400

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	03/16/2017 04:33	WG960176
(S) a,a,a-Trifluorotoluene(FID)	*100*			*77.0-122*		*03/16/2017 04:33*	WG960176

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	03/13/2017 06:32	WG959917
Toluene	3.42		0.412	1.00	1	03/13/2017 06:32	WG959917
Ethylbenzene	U		0.384	1.00	1	03/13/2017 06:32	WG959917
Total Xylenes	U		1.06	3.00	1	03/13/2017 06:32	WG959917
Methyl tert-butyl ether	U		0.367	1.00	1	03/13/2017 06:32	WG959917
1,2-Dichloroethane	U		0.361	1.00	1	03/13/2017 06:32	WG959917
(S) Toluene-d8	*108*			*80.0-120*		*03/13/2017 06:32*	WG959917
(S) Dibromofluoromethane	*110*			*76.0-123*		*03/13/2017 06:32*	WG959917
(S) a,a,a-Trifluorotoluene	*104*			*80.0-120*		*03/13/2017 06:32*	WG959917
(S) 4-Bromofluorobenzene	*95.6*			*80.0-120*		*03/13/2017 06:32*	WG959917

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00240	0.0100	1	03/14/2017 07:06	WG960326

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	347		82.5	250	1	03/11/2017 18:13	WG960019
Residual Range Organics (RRO)	376	J	165	500	1	03/11/2017 18:13	WG960019
(S) o-Terphenyl	*104*			*52.0-156*		*03/11/2017 18:13*	WG960019

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/16/2017 13:36	WG961524
Residual Range Organics (RRO)	U		165	500	1	03/16/2017 13:36	WG961524
(S) o-Terphenyl	*109*			*52.0-156*		*03/16/2017 13:36*	WG961524

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	03/14/2017 11:55	WG960332
Benzo(a)pyrene	U		0.0116	0.0500	1	03/14/2017 11:55	WG960332
Benzo(b)fluoranthene	U		0.00212	0.0500	1	03/14/2017 11:55	WG960332
Benzo(k)fluoranthene	U		0.0136	0.0500	1	03/14/2017 11:55	WG960332
Chrysene	U		0.0108	0.0500	1	03/14/2017 11:55	WG960332
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	03/14/2017 11:55	WG960332
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	03/14/2017 11:55	WG960332

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Naphthalene	1.07		0.0198	0.250	1	03/14/2017 11:55	WG960332
1-Methylnaphthalene	0.105	J	0.00821	0.250	1	03/14/2017 11:55	WG960332
2-Methylnaphthalene	0.0488	J	0.00902	0.250	1	03/14/2017 11:55	WG960332
(S) Nitrobenzene-d5	*119*			*31.0-160*		*03/14/2017 11:55*	WG960332
(S) 2-Fluorobiphenyl	*97.1*			*48.0-148*		*03/14/2017 11:55*	WG960332
(S) p-Terphenyl-d14	*92.2*			*37.0-146*		*03/14/2017 11:55*	WG960332

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	2.14	J	1.90	5.00	1	03/14/2017 02:29	WG960587
Lead,Dissolved	U		1.90	5.00	1	03/16/2017 04:01	WG961400

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	03/16/2017 04:54	WG960176
(S) a,a,a-Trifluorotoluene(FID)	*100*			*77.0-122*		*03/16/2017 04:54*	WG960176

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	03/13/2017 06:54	WG959917
Toluene	U		0.412	1.00	1	03/13/2017 06:54	WG959917
Ethylbenzene	U		0.384	1.00	1	03/13/2017 06:54	WG959917
Total Xylenes	U		1.06	3.00	1	03/13/2017 06:54	WG959917
Methyl tert-butyl ether	U		0.367	1.00	1	03/13/2017 06:54	WG959917
1,2-Dichloroethane	U		0.361	1.00	1	03/13/2017 06:54	WG959917
(S) Toluene-d8	*107*			*80.0-120*		*03/13/2017 06:54*	WG959917
(S) Dibromofluoromethane	*110*			*76.0-123*		*03/13/2017 06:54*	WG959917
(S) a,a,a-Trifluorotoluene	*104*			*80.0-120*		*03/13/2017 06:54*	WG959917
(S) 4-Bromofluorobenzene	*96.1*			*80.0-120*		*03/13/2017 06:54*	WG959917

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00240	0.0100	1	03/14/2017 07:17	WG960326

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/11/2017 18:30	WG960019
Residual Range Organics (RRO)	U		165	500	1	03/11/2017 18:30	WG960019
(S) o-Terphenyl	*104*			*52.0-156*		*03/11/2017 18:30*	WG960019

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/16/2017 13:53	WG961524
Residual Range Organics (RRO)	U		165	500	1	03/16/2017 13:53	WG961524
(S) o-Terphenyl	*114*			*52.0-156*		*03/16/2017 13:53*	WG961524

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	03/14/2017 12:18	WG960332
Benzo(a)pyrene	U		0.0116	0.0500	1	03/14/2017 12:18	WG960332
Benzo(b)fluoranthene	U		0.00212	0.0500	1	03/14/2017 12:18	WG960332
Benzo(k)fluoranthene	U		0.0136	0.0500	1	03/14/2017 12:18	WG960332
Chrysene	U		0.0108	0.0500	1	03/14/2017 12:18	WG960332
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	03/14/2017 12:18	WG960332
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	03/14/2017 12:18	WG960332

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Naphthalene	0.0482	B J	0.0198	0.250	1	03/14/2017 12:18	WG960332
1-Methylnaphthalene	0.0100	J	0.00821	0.250	1	03/14/2017 12:18	WG960332
2-Methylnaphthalene	U		0.00902	0.250	1	03/14/2017 12:18	WG960332
(S) Nitrobenzene-d5	*120*			*31.0-160*		*03/14/2017 12:18*	WG960332
(S) 2-Fluorobiphenyl	*95.9*			*48.0-148*		*03/14/2017 12:18*	WG960332
(S) p-Terphenyl-d14	*91.2*			*37.0-146*		*03/14/2017 12:18*	WG960332

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	03/16/2017 05:15	WG960176
(S) a,a,a-Trifluorotoluene(FID)	*100*			*77.0-122*		*03/16/2017 05:15*	WG960176

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	03/13/2017 07:15	WG959917
Toluene	U		0.412	1.00	1	03/13/2017 07:15	WG959917
Ethylbenzene	U		0.384	1.00	1	03/13/2017 07:15	WG959917
Total Xylenes	U		1.06	3.00	1	03/13/2017 07:15	WG959917
Methyl tert-butyl ether	U		0.367	1.00	1	03/13/2017 07:15	WG959917
1,2-Dichloroethane	U		0.361	1.00	1	03/13/2017 07:15	WG959917
(S) Toluene-d8	*107*			*80.0-120*		*03/13/2017 07:15*	WG959917
(S) Dibromofluoromethane	*108*			*76.0-123*		*03/13/2017 07:15*	WG959917
(S) a,a,a-Trifluorotoluene	*104*			*80.0-120*		*03/13/2017 07:15*	WG959917
(S) 4-Bromofluorobenzene	*94.6*			*80.0-120*		*03/13/2017 07:15*	WG959917

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/11/2017 18:47	WG960019
Residual Range Organics (RRO)	U		165	500	1	03/11/2017 18:47	WG960019
(S) o-Terphenyl	*105*			*52.0-156*		*03/11/2017 18:47*	WG960019

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/16/2017 14:09	WG961524
Residual Range Organics (RRO)	U		165	500	1	03/16/2017 14:09	WG961524
(S) o-Terphenyl	*108*			*52.0-156*		*03/16/2017 14:09*	WG961524

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	03/13/2017 01:32	WG959917
Toluene	U		0.412	1.00	1	03/13/2017 01:32	WG959917
Ethylbenzene	U		0.384	1.00	1	03/13/2017 01:32	WG959917
Total Xylenes	U		1.06	3.00	1	03/13/2017 01:32	WG959917
Methyl tert-butyl ether	U		0.367	1.00	1	03/13/2017 01:32	WG959917
1,2-Dichloroethane	U		0.361	1.00	1	03/13/2017 01:32	WG959917
(S) Toluene-d8	*107*			*80.0-120*		*03/13/2017 01:32*	WG959917
(S) Dibromofluoromethane	*108*			*76.0-123*		*03/13/2017 01:32*	WG959917
(S) a,a,a-Trifluorotoluene	*104*			*80.0-120*		*03/13/2017 01:32*	WG959917
(S) 4-Bromofluorobenzene	*95.4*			*80.0-120*		*03/13/2017 01:32*	WG959917

Method Blank (MB)

(MB) R3202970-1 03/14/17 01:49

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Lead	U		1.90	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3202970-2 03/14/17 01:51 • (LCSD) R3202970-3 03/14/17 01:54

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Lead	1000	990	984	99	98	80-120			1	20

L895608-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L895608-03 03/14/17 01:57 • (MS) R3202970-5 03/14/17 02:02 • (MSD) R3202970-6 03/14/17 02:04

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Lead	1000	5.58	994	997	99	99	1	75-125			0	20

Method Blank (MB)

(MB) R3203719-1 03/16/17 03:28

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Lead,Dissolved	U		1.90	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3203719-2 03/16/17 03:30 • (LCSD) R3203719-3 03/16/17 03:33

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Lead,Dissolved	1000	1020	1010	102	101	80-120			1	20

L895608-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L895608-01 03/16/17 03:36 • (MS) R3203719-5 03/16/17 03:41 • (MSD) R3203719-6 03/16/17 03:44

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Lead,Dissolved	1000	ND	1000	1010	100	101	1	75-125			1	20

Method Blank (MB)

(MB) R3203738-3 03/15/17 21:47

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Gasoline Range Organics-NWTPH	U		31.6	100
(S) a,a,a-Trifluorotoluene(FID)	*101*			*77.0-122*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3203738-1 03/15/17 20:44 • (LCSD) R3203738-2 03/15/17 21:05

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Gasoline Range Organics-NWTPH	5500	6130	6590	111	120	72.0-134			7.24	20
(S) a,a,a-Trifluorotoluene(FID)				*103*	*104*	*77.0-122*				

L895193-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L895193-01 03/16/17 03:51 • (MS) R3203738-4 03/16/17 02:47 • (MSD) R3203738-5 03/16/17 03:09

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Gasoline Range Organics-NWTPH	5500	U	6610	6480	120	118	1	23.0-159			1.99	20
(S) a,a,a-Trifluorotoluene(FID)					*103*	*103*		*77.0-122*				

Method Blank (MB)

(MB) R3203135-3 03/13/17 01:10

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Benzene	U		0.331	1.00
1,2-Dichloroethane	U		0.361	1.00
Ethylbenzene	U		0.384	1.00
Methyl tert-butyl ether	U		0.367	1.00
Toluene	U		0.412	1.00
Xylenes, Total	U		1.06	3.00
(S) Toluene-d8	*109*			*80.0-120*
(S) Dibromofluoromethane	*111*			*76.0-123*
(S) a,a,a-Trifluorotoluene	*103*			*80.0-120*
(S) 4-Bromofluorobenzene	*95.0*			*80.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3203135-1 03/13/17 00:06 • (LCSD) R3203135-2 03/13/17 00:27

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Benzene	25.0	27.2	28.4	109	114	69.0-123			4.23	20
1,2-Dichloroethane	25.0	28.5	27.6	114	110	67.0-126			3.35	20
Ethylbenzene	25.0	23.4	26.0	93.8	104	77.0-120			10.5	20
Methyl tert-butyl ether	25.0	27.5	26.8	110	107	64.0-123			2.58	20
Toluene	25.0	25.2	26.4	101	105	77.0-120			4.30	20
Xylenes, Total	75.0	75.7	80.1	101	107	77.0-120			5.65	20
(S) Toluene-d8				*103*	*102*	*80.0-120*				
(S) Dibromofluoromethane				*109*	*110*	*76.0-123*				
(S) a,a,a-Trifluorotoluene				*98.8*	*97.8*	*80.0-120*				
(S) 4-Bromofluorobenzene				*96.8*	*99.8*	*80.0-120*				

L895138-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L895138-01 03/13/17 02:57 • (MS) R3203135-4 03/13/17 01:53 • (MSD) R3203135-5 03/13/17 02:14

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Benzene	25.0	49.2	634	646	117	119	20	34.0-147			1.81	20
1,2-Dichloroethane	25.0	ND	581	598	116	120	20	47.0-141			2.94	20
Ethylbenzene	25.0	34.5	614	608	116	115	20	42.0-147			0.950	20
Methyl tert-butyl ether	25.0	ND	558	604	112	121	20	42.0-142			7.83	20
Toluene	25.0	113	680	691	113	116	20	42.0-141			1.57	20
Xylenes, Total	75.0	1420	3670	3550	150	142	20	41.0-148	J5		3.32	20
(S) Toluene-d8					*103*	*104*		*80.0-120*				

L895138-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L895138-01 03/13/17 02:57 • (MS) R3203135-4 03/13/17 01:53 • (MSD) R3203135-5 03/13/17 02:14

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
(S) Dibromofluoromethane					*104*	*110*		*76.0-123*				
(S) a,a,a-Trifluorotoluene					*99.9*	*97.6*		*80.0-120*				
(S) 4-Bromofluorobenzene					*104*	*104*		*80.0-120*				

Method Blank (MB)

(MB) R3203299-1 03/14/17 05:06

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Ethylene Dibromide	U		0.00240	0.0100

L895470-01 Original Sample (OS) • Duplicate (DUP)

(OS) L895470-01 03/14/17 05:50 • (DUP) R3203299-3 03/14/17 05:39

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Ethylene Dibromide	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3203299-4 03/14/17 07:28 • (LCSD) R3203299-5 03/14/17 09:28

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Ethylene Dibromide	0.250	0.275	0.252	110	101	60.0-140			8.51	20

L895470-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L895470-02 03/14/17 05:28 • (MS) R3203299-2 03/14/17 05:17

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	ug/l	ug/l	ug/l	%		%	
Ethylene Dibromide	0.100	0.623	0.720	97.6	1	60.0-140	E

Method Blank (MB)

(MB) R3202852-1 03/11/17 13:29

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Diesel Range Organics (DRO)	U		83.3	250
Residual Range Organics (RRO)	U		167	500
(S) o-Terphenyl	*98.4*			*52.0-156*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3202852-2 03/11/17 13:46 • (LCSD) R3202852-3 03/11/17 14:02

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Diesel Range Organics (DRO)	750	869	912	116	122	50.0-150			4.86	20
Residual Range Organics (RRO)	750	669	701	89.1	93.5	50.0-150			4.76	20
(S) o-Terphenyl				*102*	*105*	*52.0-156*				

Method Blank (MB)

(MB) R3203861-1 03/16/17 12:14

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Diesel Range Organics (DRO)	U		83.3	250
Residual Range Organics (RRO)	U		167	500
(S) o-Terphenyl	*119*			*52.0-156*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3203861-2 03/16/17 12:30 • (LCSD) R3203861-3 03/16/17 12:47

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Diesel Range Organics (DRO)	750	973	874	130	116	50.0-150			10.7	20
Residual Range Organics (RRO)	750	859	794	115	106	50.0-150			7.91	20
(S) o-Terphenyl				*127*	*114*	*52.0-156*				

Method Blank (MB)

(MB) R3203231-3 03/14/17 10:00

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Benzo(a)anthracene	U		0.00410	0.0500
Benzo(a)pyrene	U		0.0116	0.0500
Benzo(b)fluoranthene	0.00233	J	0.00212	0.0500
Benzo(k)fluoranthene	U		0.0136	0.0500
Chrysene	U		0.0108	0.0500
Dibenz(a,h)anthracene	U		0.00396	0.0500
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500
Naphthalene	0.0496	J	0.0198	0.250
1-Methylnaphthalene	U		0.00821	0.250
2-Methylnaphthalene	U		0.00902	0.250
(S) Nitrobenzene-d5	*144*			*31.0-160*
(S) 2-Fluorobiphenyl	*120*			*48.0-148*
(S) p-Terphenyl-d14	*126*			*37.0-146*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3203231-1 03/14/17 09:14 • (LCSD) R3203231-2 03/14/17 09:37

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzo(a)anthracene	2.00	2.14	2.20	107	110	59.0-134			3.06	20
Benzo(a)pyrene	2.00	2.08	2.17	104	109	61.0-145			4.43	20
Benzo(b)fluoranthene	2.00	2.16	2.12	108	106	57.0-136			2.01	20
Benzo(k)fluoranthene	2.00	1.92	2.16	96.0	108	57.0-141			11.6	20
Chrysene	2.00	1.95	2.01	97.5	101	63.0-140			3.10	20
Dibenz(a,h)anthracene	2.00	2.15	2.22	107	111	49.0-141			3.37	20
Indeno(1,2,3-cd)pyrene	2.00	2.12	2.20	106	110	53.0-141			3.88	20
Naphthalene	2.00	2.11	2.21	105	110	68.0-129			4.51	20
1-Methylnaphthalene	2.00	2.05	2.14	103	107	68.0-137			4.16	20
2-Methylnaphthalene	2.00	1.94	2.02	97.0	101	68.0-134			4.26	20
(S) Nitrobenzene-d5				*120*	*124*	*31.0-160*				
(S) 2-Fluorobiphenyl				*99.4*	*103*	*48.0-148*				
(S) p-Terphenyl-d14				*101*	*104*	*37.0-146*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

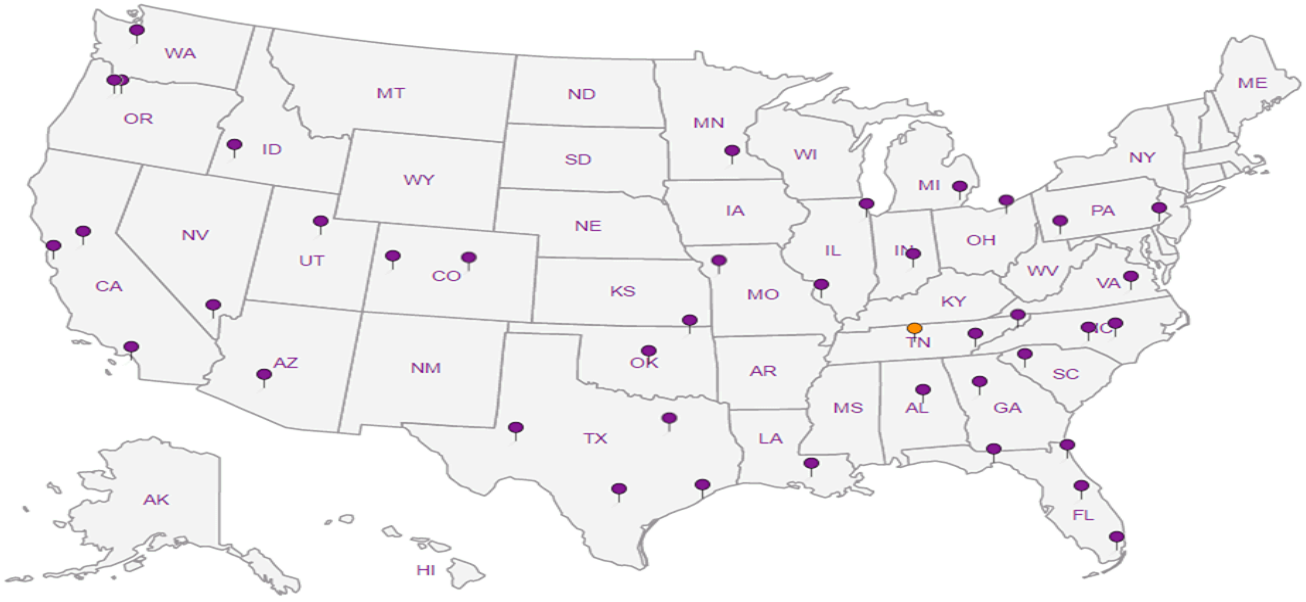
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1.] Drinking Water [2.] Underground Storage Tanks [3.] Aquatic Toxicity [4.] Chemical/Microbiological [5.] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Arcadis - Seattle, WA

1100 Olive Way
Suite 800
Seattle WA 98101

Billing Information:
Attn: Accounts Payable
630 Plaza Dr., Ste. 600
Highlands Ranch, CO 80129

Pres Chk

Report to: Ross LaGrandeur

Email To: Ross.LaGrandeur@arcadis.com; Ryan.Brauchla@arcadis.com;

Project Description: Olympia Bulk Plant

City/State Collected:

Phone: 509-438-9828
Fax:

Client Project # GP09BPNA.WA60

Lab Project # ARCABPWA-BPOLY

Collected by (print): Eric Krueger (EK)

Site/Facility ID # 1120 WEST BAY DR, OLYMPIA,

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day X Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed

Quote #

No. of Cntrs

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEXM/EDC 8260C 40mlAmb-HCl	Diss Pb 6010C 250mlHDPE-NoPres	EDB 8011 40mlClr-NaThio	NWTPHDX (NO SGT) 40mlAmb-HCl-BT	NWTPHDX (SGT) 40mlAmb-HCl-BT	NWTPHGX 40mlAmb HCl	PAH-SIMD 40mlAmb-NoPres-WT	Total Pb 6010C 250mlHDPE-HNO3	trip blk BTEXM/EDC 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-7		GW		3/9/17	1225	15	X	X	X	X	X	X	X	X			-01
MW-8		GW			1320	15	X	X	X	X	X	X	X	X			-02
MW-9		GW			1350	15	X	X	X	X	X	X	X	X			-03
MW-13		GW			1435	15	X	X	X	X	X	X	X	X			-04
DUP-1		GW			—	8	X			X	X	X		X			-05
Trip Blank		GW		—	—	2									X		-06
		GW															
		GW															

Chain of Custody Page ___ of ___

ESC LABORATORIES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L895193

F164

Acctnum: ARCABPWA
Template: T120673
Prelogin: P588878
TSR: 110 - Brian Ford
PB:
Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	3/9/17	1600	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCl / MeoH
TBR

Temp: 2.4 °C Bottles Received: TAT 68

Date: 3-10-17 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Andy Vann

ESC LAB SCIENCES
YOUR LAB OF CHOICE

Login #:L895193	Client: ARCABPWA	Date:03/10/17	Evaluated by:Andy Vann

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time	x	Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Couri
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: Dup-1 marked for PBICP, but we did not receive the total metals container for that id.

Client informed by:		Call		Email	x	Voice Mail		Date:03/10/17	Time:1455
TSR Initials:bjf	Client Contact: Ross.LaGrandeur@arcadis.com; Ryan.Brauchla@arcadis.com; Alexander.Pink@arcadis.com								

Login Instructions:

Proceed with all other analyses.

ANALYTICAL REPORT

May 22, 2017

Arcadis - Seattle, WA

Sample Delivery Group:	L908444
Samples Received:	05/10/2017
Project Number:	GP09BPNA.WA60
Description:	Olympia Bulk Plant
Site:	1120 WEST BAY DR, OLYMPIA, WA
Report To:	Ross LaGrandeur 1100 Olive Way Suite 800 Seattle, WA 98101

Entire Report Reviewed By:

Brian Ford

Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

MW-7 L908444-01 GW

Collected by: Eric Krueger
Collected date/time: 05/08/17 10:35
Received date/time: 05/10/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG978898	1	05/12/17 11:27	05/12/17 16:19	ST
Metals (ICP) by Method 6010C	WG979889	1	05/16/17 17:59	05/16/17 19:05	ST
Volatile Organic Compounds (GC) by Method NWTPHGX	WG979070	1	05/13/17 06:54	05/13/17 06:54	ACG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG979368	1	05/13/17 14:26	05/13/17 14:26	LRL
EDB / DBCP by Method 8011	WG979504	.992	05/14/17 08:37	05/15/17 21:44	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG979247	1	05/13/17 02:19	05/13/17 12:04	TH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG978857	1	05/12/17 09:18	05/13/17 12:55	TH
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG978858	1	05/12/17 09:20	05/15/17 07:54	FMB

MW-8 L908444-02 GW

Collected by: Eric Krueger
Collected date/time: 05/08/17 11:15
Received date/time: 05/10/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG978898	1	05/12/17 11:27	05/12/17 16:22	ST
Metals (ICP) by Method 6010C	WG979889	1	05/16/17 17:59	05/16/17 19:08	ST
Volatile Organic Compounds (GC) by Method NWTPHGX	WG979070	1	05/13/17 07:16	05/13/17 07:16	ACG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG979368	1	05/13/17 14:41	05/13/17 14:41	LRL
EDB / DBCP by Method 8011	WG979504	.992	05/14/17 08:37	05/15/17 21:54	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG979247	1	05/13/17 02:19	05/13/17 12:21	TH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG978857	1	05/12/17 09:18	05/13/17 13:11	TH
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG978858	2	05/12/17 09:20	05/15/17 08:19	FMB

MW-9 L908444-03 GW

Collected by: Eric Krueger
Collected date/time: 05/08/17 11:50
Received date/time: 05/10/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG978898	1	05/12/17 11:27	05/12/17 16:25	ST
Metals (ICP) by Method 6010C	WG979889	1	05/16/17 17:59	05/16/17 19:11	ST
Volatile Organic Compounds (GC) by Method NWTPHGX	WG979070	1	05/13/17 07:38	05/13/17 07:38	ACG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG979368	1	05/13/17 14:57	05/13/17 14:57	LRL
EDB / DBCP by Method 8011	WG979504	.994	05/14/17 08:37	05/15/17 22:04	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG979247	1	05/13/17 02:19	05/13/17 12:37	TH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG978857	1	05/12/17 09:18	05/13/17 13:27	TH
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG978858	1	05/12/17 09:20	05/15/17 08:43	FMB

MW-13 L908444-04 GW

Collected by: Eric Krueger
Collected date/time: 05/08/17 12:30
Received date/time: 05/10/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG978898	1	05/12/17 11:27	05/12/17 16:34	ST
Metals (ICP) by Method 6010C	WG979889	1	05/16/17 17:59	05/16/17 18:54	ST
Volatile Organic Compounds (GC) by Method NWTPHGX	WG979070	1	05/13/17 08:00	05/13/17 08:00	ACG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG979368	1	05/13/17 15:12	05/13/17 15:12	LRL
EDB / DBCP by Method 8011	WG979504	.994	05/14/17 08:37	05/15/17 22:14	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG979247	1	05/13/17 02:19	05/13/17 12:54	TH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG978857	1	05/12/17 09:18	05/13/17 13:44	TH
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG978858	1	05/12/17 09:20	05/15/17 09:07	FMB

DUP-1 L908444-05 GW

Collected by: Eric Krueger
Collected date/time: 05/08/17 00:00
Received date/time: 05/10/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG979889	1	05/16/17 17:59	05/16/17 19:19	ST
Volatile Organic Compounds (GC) by Method NWTPHGX	WG979070	1	05/13/17 08:23	05/13/17 08:23	ACG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG979368	1	05/13/17 15:28	05/13/17 15:28	LRL
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG979247	1	05/13/17 02:19	05/13/17 13:11	TH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG978857	1	05/12/17 09:18	05/13/17 14:00	TH
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG978858	1	05/12/17 09:20	05/15/17 09:31	FMB

TRIP BLANK L908444-06 GW

Collected by: Eric Krueger
Collected date/time: 05/08/17 00:00
Received date/time: 05/10/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method NWTPHGX	WG979070	1	05/13/17 02:05	05/13/17 02:05	ACG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG979368	1	05/13/17 10:49	05/13/17 10:49	LRL

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford
Technical Service Representative

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	2.06	J	1.90	5.00	1	05/16/2017 19:05	WG979889
Lead,Dissolved	U		1.90	5.00	1	05/12/2017 16:19	WG978898

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	05/13/2017 06:54	WG979070
(S) a,a,a-Trifluorotoluene(FID)	*92.9*			*77.0-122*		*05/13/2017 06:54*	WG979070

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	05/13/2017 14:26	WG979368
Toluene	U		0.412	1.00	1	05/13/2017 14:26	WG979368
Ethylbenzene	U		0.384	1.00	1	05/13/2017 14:26	WG979368
Total Xylenes	U		1.06	3.00	1	05/13/2017 14:26	WG979368
Methyl tert-butyl ether	U		0.367	1.00	1	05/13/2017 14:26	WG979368
1,2-Dichloroethane	U		0.361	1.00	1	05/13/2017 14:26	WG979368
(S) Toluene-d8	*105*			*80.0-120*		*05/13/2017 14:26*	WG979368
(S) Dibromofluoromethane	*101*			*76.0-123*		*05/13/2017 14:26*	WG979368
(S) a,a,a-Trifluorotoluene	*105*			*80.0-120*		*05/13/2017 14:26*	WG979368
(S) 4-Bromofluorobenzene	*108*			*80.0-120*		*05/13/2017 14:26*	WG979368

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00238	0.00992	.992	05/15/2017 21:44	WG979504

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	233		66.0	200	1	05/13/2017 12:04	WG979247
Residual Range Organics (RRO)	292		82.5	250	1	05/13/2017 12:04	WG979247
(S) o-Terphenyl	*97.7*			*52.0-156*		*05/13/2017 12:04*	WG979247

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	81.4	J	66.0	200	1	05/13/2017 12:55	WG978857
Residual Range Organics (RRO)	U		82.5	250	1	05/13/2017 12:55	WG978857
(S) o-Terphenyl	*102*			*52.0-156*		*05/13/2017 12:55*	WG978857

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	05/15/2017 07:54	WG978858
Benzo(a)pyrene	U		0.0116	0.0500	1	05/15/2017 07:54	WG978858
Benzo(b)fluoranthene	U		0.00212	0.0500	1	05/15/2017 07:54	WG978858
Benzo(k)fluoranthene	U		0.0136	0.0500	1	05/15/2017 07:54	WG978858
Chrysene	U		0.0108	0.0500	1	05/15/2017 07:54	WG978858
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	05/15/2017 07:54	WG978858
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	05/15/2017 07:54	WG978858

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Naphthalene	0.109	J	0.0198	0.250	1	05/15/2017 07:54	WG978858
1-Methylnaphthalene	0.0895	J	0.00821	0.250	1	05/15/2017 07:54	WG978858
2-Methylnaphthalene	0.0555	J	0.00902	0.250	1	05/15/2017 07:54	WG978858
(S) Nitrobenzene-d5	*126*			*31.0-160*		*05/15/2017 07:54*	WG978858
(S) 2-Fluorobiphenyl	*113*			*48.0-148*		*05/15/2017 07:54*	WG978858
(S) p-Terphenyl-d14	*104*			*37.0-146*		*05/15/2017 07:54*	WG978858

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	U		1.90	5.00	1	05/16/2017 19:08	WG979889
Lead,Dissolved	U		1.90	5.00	1	05/12/2017 16:22	WG978898

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	05/13/2017 07:16	WG979070
(S) a,a,a-Trifluorotoluene(FID)	*94.7*			*77.0-122*		*05/13/2017 07:16*	WG979070

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	05/13/2017 14:41	WG979368
Toluene	5.02		0.412	1.00	1	05/13/2017 14:41	WG979368
Ethylbenzene	U		0.384	1.00	1	05/13/2017 14:41	WG979368
Total Xylenes	U		1.06	3.00	1	05/13/2017 14:41	WG979368
Methyl tert-butyl ether	U		0.367	1.00	1	05/13/2017 14:41	WG979368
1,2-Dichloroethane	U		0.361	1.00	1	05/13/2017 14:41	WG979368
(S) Toluene-d8	*106*			*80.0-120*		*05/13/2017 14:41*	WG979368
(S) Dibromofluoromethane	*104*			*76.0-123*		*05/13/2017 14:41*	WG979368
(S) a,a,a-Trifluorotoluene	*107*			*80.0-120*		*05/13/2017 14:41*	WG979368
(S) 4-Bromofluorobenzene	*105*			*80.0-120*		*05/13/2017 14:41*	WG979368

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00238	0.00992	.992	05/15/2017 21:54	WG979504

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	524		66.0	200	1	05/13/2017 12:21	WG979247
Residual Range Organics (RRO)	874		82.5	250	1	05/13/2017 12:21	WG979247
(S) o-Terphenyl	*95.4*			*52.0-156*		*05/13/2017 12:21*	WG979247

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	68.8	J	66.0	200	1	05/13/2017 13:11	WG978857
Residual Range Organics (RRO)	U		82.5	250	1	05/13/2017 13:11	WG978857
(S) o-Terphenyl	*84.4*			*52.0-156*		*05/13/2017 13:11*	WG978857

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00820	0.100	2	05/15/2017 08:19	WG978858
Benzo(a)pyrene	U		0.0232	0.100	2	05/15/2017 08:19	WG978858
Benzo(b)fluoranthene	U		0.00424	0.100	2	05/15/2017 08:19	WG978858
Benzo(k)fluoranthene	U		0.0272	0.100	2	05/15/2017 08:19	WG978858
Chrysene	U		0.0216	0.100	2	05/15/2017 08:19	WG978858
Dibenz(a,h)anthracene	U		0.00792	0.100	2	05/15/2017 08:19	WG978858
Indeno(1,2,3-cd)pyrene	U		0.0296	0.100	2	05/15/2017 08:19	WG978858

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Naphthalene	0.0706	J	0.0396	0.500	2	05/15/2017 08:19	WG978858
1-Methylnaphthalene	0.0314	J	0.0164	0.500	2	05/15/2017 08:19	WG978858
2-Methylnaphthalene	U		0.0180	0.500	2	05/15/2017 08:19	WG978858
(S) Nitrobenzene-d5	*116*			*31.0-160*		*05/15/2017 08:19*	WG978858
(S) 2-Fluorobiphenyl	*113*			*48.0-148*		*05/15/2017 08:19*	WG978858
(S) p-Terphenyl-d14	*93.8*			*37.0-146*		*05/15/2017 08:19*	WG978858

Sample Narrative:

8270D-SIM L908444-02 WG978858: Cannot run at lower dilution due to viscosity of extract

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	2.72	J	1.90	5.00	1	05/16/2017 19:11	WG979889
Lead,Dissolved	U		1.90	5.00	1	05/12/2017 16:25	WG978898

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	05/13/2017 07:38	WG979070
(S) a,a,a-Trifluorotoluene(FID)	*93.3*			*77.0-122*		*05/13/2017 07:38*	WG979070

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	05/13/2017 14:57	WG979368
Toluene	1.55		0.412	1.00	1	05/13/2017 14:57	WG979368
Ethylbenzene	U		0.384	1.00	1	05/13/2017 14:57	WG979368
Total Xylenes	U		1.06	3.00	1	05/13/2017 14:57	WG979368
Methyl tert-butyl ether	U		0.367	1.00	1	05/13/2017 14:57	WG979368
1,2-Dichloroethane	U		0.361	1.00	1	05/13/2017 14:57	WG979368
(S) Toluene-d8	*106*			*80.0-120*		*05/13/2017 14:57*	WG979368
(S) Dibromofluoromethane	*107*			*76.0-123*		*05/13/2017 14:57*	WG979368
(S) a,a,a-Trifluorotoluene	*104*			*80.0-120*		*05/13/2017 14:57*	WG979368
(S) 4-Bromofluorobenzene	*107*			*80.0-120*		*05/13/2017 14:57*	WG979368

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00238	0.00994	.994	05/15/2017 22:04	WG979504

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	330		66.0	200	1	05/13/2017 12:37	WG979247
Residual Range Organics (RRO)	544		82.5	250	1	05/13/2017 12:37	WG979247
(S) o-Terphenyl	*93.6*			*52.0-156*		*05/13/2017 12:37*	WG979247

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.0	200	1	05/13/2017 13:27	WG978857
Residual Range Organics (RRO)	U		82.5	250	1	05/13/2017 13:27	WG978857
(S) o-Terphenyl	*96.8*			*52.0-156*		*05/13/2017 13:27*	WG978857

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	05/15/2017 08:43	WG978858
Benzo(a)pyrene	0.0126	J	0.0116	0.0500	1	05/15/2017 08:43	WG978858
Benzo(b)fluoranthene	U		0.00212	0.0500	1	05/15/2017 08:43	WG978858
Benzo(k)fluoranthene	U		0.0136	0.0500	1	05/15/2017 08:43	WG978858
Chrysene	U		0.0108	0.0500	1	05/15/2017 08:43	WG978858
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	05/15/2017 08:43	WG978858
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	05/15/2017 08:43	WG978858

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Naphthalene	0.915		0.0198	0.250	1	05/15/2017 08:43	WG978858
1-Methylnaphthalene	0.0942	J	0.00821	0.250	1	05/15/2017 08:43	WG978858
2-Methylnaphthalene	0.0921	J	0.00902	0.250	1	05/15/2017 08:43	WG978858
(S) Nitrobenzene-d5	*120*			*31.0-160*		*05/15/2017 08:43*	WG978858
(S) 2-Fluorobiphenyl	*108*			*48.0-148*		*05/15/2017 08:43*	WG978858
(S) p-Terphenyl-d14	*94.2*			*37.0-146*		*05/15/2017 08:43*	WG978858

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	2.41	J	1.90	5.00	1	05/16/2017 18:54	WG979889
Lead,Dissolved	U		1.90	5.00	1	05/12/2017 16:34	WG978898

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	05/13/2017 08:00	WG979070
(S) a,a,a-Trifluorotoluene(FID)	*92.5*			*77.0-122*		*05/13/2017 08:00*	WG979070

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	05/13/2017 15:12	WG979368
Toluene	0.569	J	0.412	1.00	1	05/13/2017 15:12	WG979368
Ethylbenzene	U		0.384	1.00	1	05/13/2017 15:12	WG979368
Total Xylenes	U		1.06	3.00	1	05/13/2017 15:12	WG979368
Methyl tert-butyl ether	U		0.367	1.00	1	05/13/2017 15:12	WG979368
1,2-Dichloroethane	U		0.361	1.00	1	05/13/2017 15:12	WG979368
(S) Toluene-d8	*106*			*80.0-120*		*05/13/2017 15:12*	WG979368
(S) Dibromofluoromethane	*103*			*76.0-123*		*05/13/2017 15:12*	WG979368
(S) a,a,a-Trifluorotoluene	*101*			*80.0-120*		*05/13/2017 15:12*	WG979368
(S) 4-Bromofluorobenzene	*106*			*80.0-120*		*05/13/2017 15:12*	WG979368

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00238	0.00994	.994	05/15/2017 22:14	WG979504

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.0	200	1	05/13/2017 12:54	WG979247
Residual Range Organics (RRO)	132	J	82.5	250	1	05/13/2017 12:54	WG979247
(S) o-Terphenyl	*102*			*52.0-156*		*05/13/2017 12:54*	WG979247

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.0	200	1	05/13/2017 13:44	WG978857
Residual Range Organics (RRO)	U		82.5	250	1	05/13/2017 13:44	WG978857
(S) o-Terphenyl	*79.6*			*52.0-156*		*05/13/2017 13:44*	WG978857

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	05/15/2017 09:07	WG978858
Benzo(a)pyrene	U		0.0116	0.0500	1	05/15/2017 09:07	WG978858
Benzo(b)fluoranthene	U		0.00212	0.0500	1	05/15/2017 09:07	WG978858
Benzo(k)fluoranthene	U		0.0136	0.0500	1	05/15/2017 09:07	WG978858
Chrysene	U		0.0108	0.0500	1	05/15/2017 09:07	WG978858
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	05/15/2017 09:07	WG978858
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	05/15/2017 09:07	WG978858

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Naphthalene	0.0460	J	0.0198	0.250	1	05/15/2017 09:07	WG978858
1-Methylnaphthalene	0.0142	J	0.00821	0.250	1	05/15/2017 09:07	WG978858
2-Methylnaphthalene	0.0127	J	0.00902	0.250	1	05/15/2017 09:07	WG978858
(S) Nitrobenzene-d5	*118*			*31.0-160*		*05/15/2017 09:07*	WG978858
(S) 2-Fluorobiphenyl	*117*			*48.0-148*		*05/15/2017 09:07*	WG978858
(S) p-Terphenyl-d14	*107*			*37.0-146*		*05/15/2017 09:07*	WG978858

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	U		1.90	5.00	1	05/16/2017 19:19	WG979889

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	05/13/2017 08:23	WG979070
(S) a,a,a-Trifluorotoluene(FID)	*92.5*			*77.0-122*		*05/13/2017 08:23*	WG979070

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	05/13/2017 15:28	WG979368
Toluene	0.515	J	0.412	1.00	1	05/13/2017 15:28	WG979368
Ethylbenzene	U		0.384	1.00	1	05/13/2017 15:28	WG979368
Total Xylenes	U		1.06	3.00	1	05/13/2017 15:28	WG979368
Methyl tert-butyl ether	U		0.367	1.00	1	05/13/2017 15:28	WG979368
1,2-Dichloroethane	U		0.361	1.00	1	05/13/2017 15:28	WG979368
(S) Toluene-d8	*106*			*80.0-120*		*05/13/2017 15:28*	WG979368
(S) Dibromofluoromethane	*103*			*76.0-123*		*05/13/2017 15:28*	WG979368
(S) a,a,a-Trifluorotoluene	*101*			*80.0-120*		*05/13/2017 15:28*	WG979368
(S) 4-Bromofluorobenzene	*105*			*80.0-120*		*05/13/2017 15:28*	WG979368

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.0	200	1	05/13/2017 13:11	WG979247
Residual Range Organics (RRO)	102	J	82.5	250	1	05/13/2017 13:11	WG979247
(S) o-Terphenyl	*99.2*			*52.0-156*		*05/13/2017 13:11*	WG979247

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.0	200	1	05/13/2017 14:00	WG978857
Residual Range Organics (RRO)	U		82.5	250	1	05/13/2017 14:00	WG978857
(S) o-Terphenyl	*83.7*			*52.0-156*		*05/13/2017 14:00*	WG978857

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	05/15/2017 09:31	WG978858
Benzo(a)pyrene	U		0.0116	0.0500	1	05/15/2017 09:31	WG978858
Benzo(b)fluoranthene	U		0.00212	0.0500	1	05/15/2017 09:31	WG978858
Benzo(k)fluoranthene	U		0.0136	0.0500	1	05/15/2017 09:31	WG978858
Chrysene	U		0.0108	0.0500	1	05/15/2017 09:31	WG978858
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	05/15/2017 09:31	WG978858
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	05/15/2017 09:31	WG978858
Naphthalene	0.0439	J	0.0198	0.250	1	05/15/2017 09:31	WG978858
1-Methylnaphthalene	0.0173	J	0.00821	0.250	1	05/15/2017 09:31	WG978858
2-Methylnaphthalene	0.0133	J	0.00902	0.250	1	05/15/2017 09:31	WG978858
(S) Nitrobenzene-d5	*117*			*31.0-160*		*05/15/2017 09:31*	WG978858
(S) 2-Fluorobiphenyl	*116*			*48.0-148*		*05/15/2017 09:31*	WG978858
(S) p-Terphenyl-d14	*103*			*37.0-146*		*05/15/2017 09:31*	WG978858

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	U		31.6	100	1	05/13/2017 02:05	WG979070
(S) a,a,a-Trifluorotoluene(FID)	*92.5*			*77.0-122*		*05/13/2017 02:05*	WG979070

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Benzene	U		0.331	1.00	1	05/13/2017 10:49	WG979368
Toluene	U		0.412	1.00	1	05/13/2017 10:49	WG979368
Ethylbenzene	U		0.384	1.00	1	05/13/2017 10:49	WG979368
Total Xylenes	U		1.06	3.00	1	05/13/2017 10:49	WG979368
Methyl tert-butyl ether	U		0.367	1.00	1	05/13/2017 10:49	WG979368
1,2-Dichloroethane	U		0.361	1.00	1	05/13/2017 10:49	WG979368
(S) Toluene-d8	*104*			*80.0-120*		*05/13/2017 10:49*	WG979368
(S) Dibromofluoromethane	*101*			*76.0-123*		*05/13/2017 10:49*	WG979368
(S) a,a,a-Trifluorotoluene	*103*			*80.0-120*		*05/13/2017 10:49*	WG979368
(S) 4-Bromofluorobenzene	*106*			*80.0-120*		*05/13/2017 10:49*	WG979368

Method Blank (MB)

(MB) R3217862-1 05/12/17 15:22

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Lead,Dissolved	U		1.90	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3217862-2 05/12/17 15:27 • (LCSD) R3217862-3 05/12/17 15:29

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Lead,Dissolved	1000	995	994	99	99	80-120			0	20

L908431-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L908431-01 05/12/17 15:32 • (MS) R3217862-5 05/12/17 15:38 • (MSD) R3217862-6 05/12/17 15:41

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Lead,Dissolved	1000	U	1000	1010	100	101	1	75-125			1	20

Method Blank (MB)

(MB) R3218511-1 05/16/17 18:45

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Lead	U		1.90	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218511-2 05/16/17 18:48 • (LCSD) R3218511-3 05/16/17 18:51

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Lead	1000	1020	1020	102	102	80-120			0	20

L908444-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L908444-04 05/16/17 18:54 • (MS) R3218511-5 05/16/17 18:59 • (MSD) R3218511-6 05/16/17 19:02

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Lead	1000	2.41	1030	1030	103	103	1	75-125			0	20

Method Blank (MB)

(MB) R3218796-3 05/13/17 01:43

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Gasoline Range Organics-NWTPH	U		31.6	100
(S) a,a,a-Trifluorotoluene(FID)	*93.3*			*77.0-122*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218796-1 05/13/17 00:37 • (LCSD) R3218796-2 05/13/17 00:59

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Gasoline Range Organics-NWTPH	5500	5810	5720	106	104	72.0-134			1.53	20
(S) a,a,a-Trifluorotoluene(FID)				*105*	*103*	*77.0-122*				

L908431-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L908431-01 05/13/17 02:28 • (MS) R3218796-4 05/13/17 02:50 • (MSD) R3218796-5 05/13/17 03:12

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Gasoline Range Organics-NWTPH	5500	U	3120	2890	56.7	52.5	1	23.0-159			7.71	20
(S) a,a,a-Trifluorotoluene(FID)					*94.1*	*93.1*		*77.0-122*				

Method Blank (MB)

(MB) R3218788-3 05/13/17 09:56

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Benzene	U		0.331	1.00
1,2-Dichloroethane	U		0.361	1.00
Ethylbenzene	U		0.384	1.00
Methyl tert-butyl ether	U		0.367	1.00
Toluene	U		0.412	1.00
Xylenes, Total	U		1.06	3.00
(S) Toluene-d8	*104*			*80.0-120*
(S) Dibromofluoromethane	*104*			*76.0-123*
(S) a,a,a-Trifluorotoluene	*103*			*80.0-120*
(S) 4-Bromofluorobenzene	*106*			*80.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218788-1 05/13/17 09:08 • (LCSD) R3218788-2 05/13/17 09:24

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Benzene	25.0	23.5	23.3	94.2	93.1	69.0-123			1.19	20
1,2-Dichloroethane	25.0	22.4	22.3	89.7	89.2	67.0-126			0.480	20
Ethylbenzene	25.0	22.6	22.9	90.2	91.6	77.0-120			1.51	20
Methyl tert-butyl ether	25.0	22.8	22.7	91.0	91.0	64.0-123			0.0500	20
Toluene	25.0	21.4	21.6	85.4	86.5	77.0-120			1.25	20
Xylenes, Total	75.0	67.2	67.7	89.6	90.3	77.0-120			0.740	20
(S) Toluene-d8				*102*	*102*	*80.0-120*				
(S) Dibromofluoromethane				*105*	*104*	*76.0-123*				
(S) a,a,a-Trifluorotoluene				*101*	*101*	*80.0-120*				
(S) 4-Bromofluorobenzene				*99.1*	*99.8*	*80.0-120*				

Method Blank (MB)

(MB) R3218183-1 05/15/17 17:31

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Ethylene Dibromide	U		0.00240	0.0100

L908317-01 Original Sample (OS) • Duplicate (DUP)

(OS) L908317-01 05/15/17 18:12 • (DUP) R3218183-3 05/15/17 18:02

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Ethylene Dibromide	U	0.000	.994	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218183-4 05/15/17 18:53 • (LCSD) R3218183-5 05/15/17 19:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Ethylene Dibromide	0.250	0.292	0.286	117	114	60.0-140			2.20	20

L908317-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L908317-02 05/15/17 17:52 • (MS) R3218183-2 05/15/17 17:42

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	ug/l	ug/l	ug/l	%		%	
Ethylene Dibromide	0.100	U	0.122	122	.997	72.0-146	

Method Blank (MB)

(MB) R3218079-1 05/13/17 11:14

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Diesel Range Organics (DRO)	U		66.7	200
Residual Range Organics (RRO)	U		83.3	250
(S) o-Terphenyl	*64.5*			*52.0-156*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218079-2 05/13/17 11:30 • (LCSD) R3218079-3 05/13/17 11:47

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Diesel Range Organics (DRO)	750	875	948	117	126	50.0-150			7.94	20
Residual Range Organics (RRO)	750	693	776	92.5	104	50.0-150			11.3	20
(S) o-Terphenyl				*98.1*	*102*	*52.0-156*				

Method Blank (MB)

(MB) R3218153-1 05/13/17 12:06

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Diesel Range Organics (DRO)	U		66.7	200
Residual Range Organics (RRO)	U		83.3	250
(S) o-Terphenyl	*61.6*			*52.0-156*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218153-2 05/13/17 12:22 • (LCSD) R3218153-3 05/13/17 12:38

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Diesel Range Organics (DRO)	750	963	985	128	131	50.0-150			2.27	20
Residual Range Organics (RRO)	750	700	693	93.3	92.4	50.0-150			0.990	20
(S) o-Terphenyl				*105*	*102*	*52.0-156*				

Method Blank (MB)

(MB) R3218469-3 05/15/17 07:06

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Benzo(a)anthracene	U		0.00410	0.0500
Benzo(a)pyrene	U		0.0116	0.0500
Benzo(b)fluoranthene	U		0.00212	0.0500
Benzo(k)fluoranthene	U		0.0136	0.0500
Chrysene	U		0.0108	0.0500
Dibenz(a,h)anthracene	U		0.00396	0.0500
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500
Naphthalene	U		0.0198	0.250
1-Methylnaphthalene	U		0.00821	0.250
2-Methylnaphthalene	U		0.00902	0.250
(S) Nitrobenzene-d5	*127*			*31.0-160*
(S) 2-Fluorobiphenyl	*122*			*48.0-148*
(S) p-Terphenyl-d14	*111*			*37.0-146*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218469-1 05/15/17 06:18 • (LCSD) R3218469-2 05/15/17 06:42

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzo(a)anthracene	2.00	1.92	1.92	96.0	96.2	59.0-134			0.190	20
Benzo(a)pyrene	2.00	1.96	1.90	97.9	95.1	61.0-145			2.86	20
Benzo(b)fluoranthene	2.00	1.88	1.81	94.1	90.4	57.0-136			3.97	20
Benzo(k)fluoranthene	2.00	2.05	2.01	102	101	57.0-141			1.89	20
Chrysene	2.00	1.98	1.86	99.1	92.8	63.0-140			6.58	20
Dibenz(a,h)anthracene	2.00	2.19	2.09	109	104	49.0-141			4.67	20
Indeno(1,2,3-cd)pyrene	2.00	2.13	2.07	106	104	53.0-141			2.62	20
Naphthalene	2.00	1.83	1.78	91.5	89.1	68.0-129			2.74	20
1-Methylnaphthalene	2.00	2.03	1.97	101	98.4	68.0-137			2.89	20
2-Methylnaphthalene	2.00	1.93	1.89	96.3	94.4	68.0-134			2.02	20
(S) Nitrobenzene-d5				*112*	*112*	*31.0-160*				
(S) 2-Fluorobiphenyl				*117*	*114*	*48.0-148*				
(S) p-Terphenyl-d14				*102*	*101*	*37.0-146*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**

***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

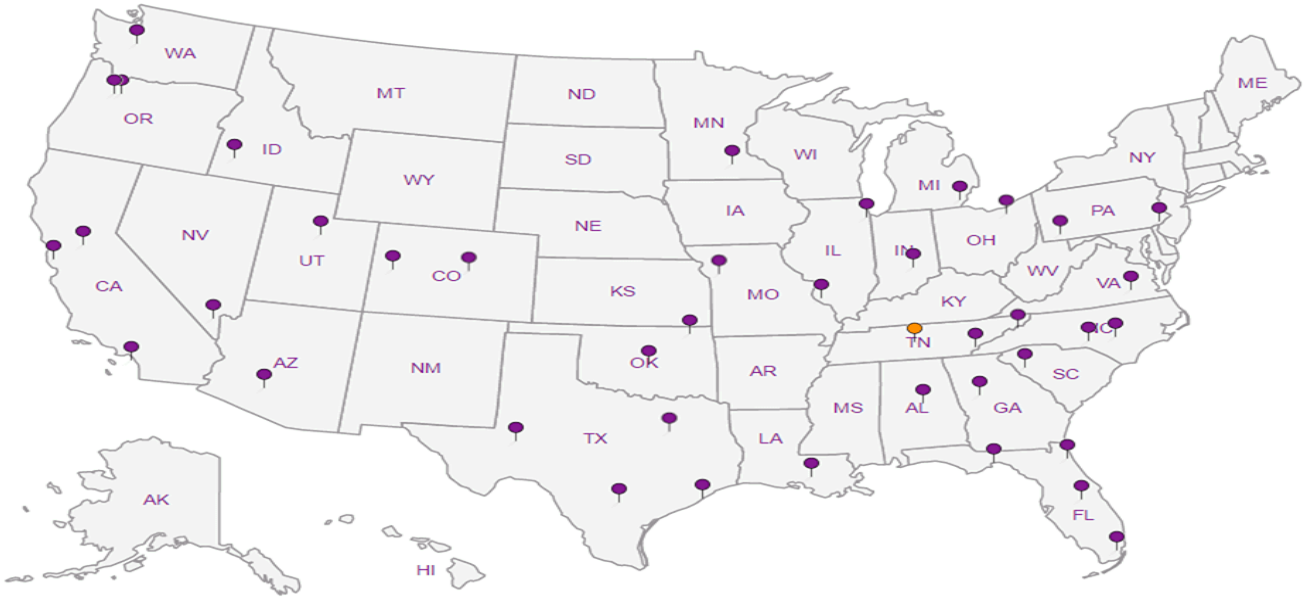
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Arcadis - Seattle, WA

1100 Olive Way
Suite 800
Seattle WA 98101

Billing Information:
Attn: Accounts Payable
630 Plaza Dr., Ste. 600
Highlands Ranch, CO 80129

Pres Chk

Report to: Ross LaGrandeur

Email To: Ross.LaGrandeur@arcadis.com; Ryan.Brauchla@arcadis.com;

Project Description: Olympia Bulk Plant

City/State Collected: Olympia / WA

Phone: 509-438-9828
Fax:

Client Project # GP09BPNA.WA60

Lab Project # ARCABPWA-BPOLY

Collected by (print): Eric Krueger (EK)

Site/Facility ID # 1120 WEST BAY DR, OLYMPIA,

P.O. # GP09BPNA.WA60

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEXM/EDC 8260C 40mlAmb-HCl	Diss Pb 6010C 250mlHDPE-NoPres	EDB 8011 40mlClr-NaThio	NWTPHDX (NO SGT) 40mlAmb-HCl-BT	NWTPHDX (SGT) 40mlAmb-HCl-BT	NWTPHGX 40mlAmb HCl	PAH-SIMD 40mlAmb-NoPres-WT	Total Pb 6010C 250mlHDPE-HNO3	trip blk BTEXM/EDC 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-7		GW		5/8/17	1035	5	X	X	X	X	X	X	X	X			-01
MW-8		GW			1115		X	X	X	X	X	X	X	X			02
MW-9		GW			1150		X	X	X	X	X	X	X	X			03
MW-13		GW			1230		X	X	X	X	X	X	X	X			04
DUP-1		GW			—		X			X	X	X	X	X			05
Trip Blank		GW		—	—	2	X					X			X		06
		GW															
		GW															

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L908444
F027

Acctnum: ARCABPWA
Template: T120673
Prelogin: P598897
TSR: 110 - Brian Ford
PB: 4-28-17

Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: Questions, call Eric Krueger (303)519-7192 pH _____ Temp _____ Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: (Yes) No HCl / MeoH TBR	If preservation required by Login: Date/Time
Alex Pinks	5/9/17	1600	FedEx	2	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.2 °C Bottles Received: 75	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 5-10-17 Time: 845	Hold: Condition: NCF / (OK)

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2425 New Holland Pike, Lancaster, PA 17601 | 717-656-2300 | Fax: 717-656-2681 | www.LancasterLabs.com

Type VI Data Package

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Project: Former Olympia Bulk Plant
Water Samples
Collected on 12/15/16

SDG# WAN02

GROUP	SAMPLE NUMBERS
1746296	8753059-8753068

PA Cert. # 36-00037
NY Cert. # 10670
NJ Cert. # PA011
NC Cert. # 521
TX Cert. # T104704194-13-10
AZ Cert. # AZ0780

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client.

Authorized by: Dana M Kauffman **Date:** **01/18/2017**

Dana M. Kauffman
Manager

Any questions or concerns you might have regarding this data package should be directed to your client representative, Stacy Hess at (717) 556-7236.

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Sample Reference List for SDG Number WAN02 with a Data Package Type of VI

13255 - Atlantic Richfield c/o ARCADIS

Project: Former Olympia Bulk Plant

Lab Sample Number	Client Sample ID	Collection Date	Date Received
8753059	MW-7	12/15/2016 09:15	12/17/2016 11:10
8753060	MW-7	12/15/2016 09:15	12/17/2016 11:10
8753061	MW-8	12/15/2016 10:15	12/17/2016 11:10
8753062	MW-8	12/15/2016 10:15	12/17/2016 11:10
8753063	MW-9	12/15/2016 11:15	12/17/2016 11:10
8753064	MW-9	12/15/2016 11:15	12/17/2016 11:10
8753065	MW-13	12/15/2016 13:15	12/17/2016 11:10
8753066	MW-13	12/15/2016 13:15	12/17/2016 11:10
8753067	DUP-1	12/15/2016 00:00	12/17/2016 11:10
8753068	Trip Blank	12/15/2016 00:00	12/17/2016 11:10

NWTPH-Dx by GC Data

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: 8753059 OLY07 Sample ID: AA **Batchnumber:** 163630023A
Sample Amount: 1044. Total Volume: 2. ml Analyst: 2027 SDG: WAN02 State: WA
Analyses: 08271

Injection Summary

Injected on : 12/30/2016 07:36:27
Instrument : CP18--18847B
Result file : D18364B.0045.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 91% (50-150) Conc.: 20.87725

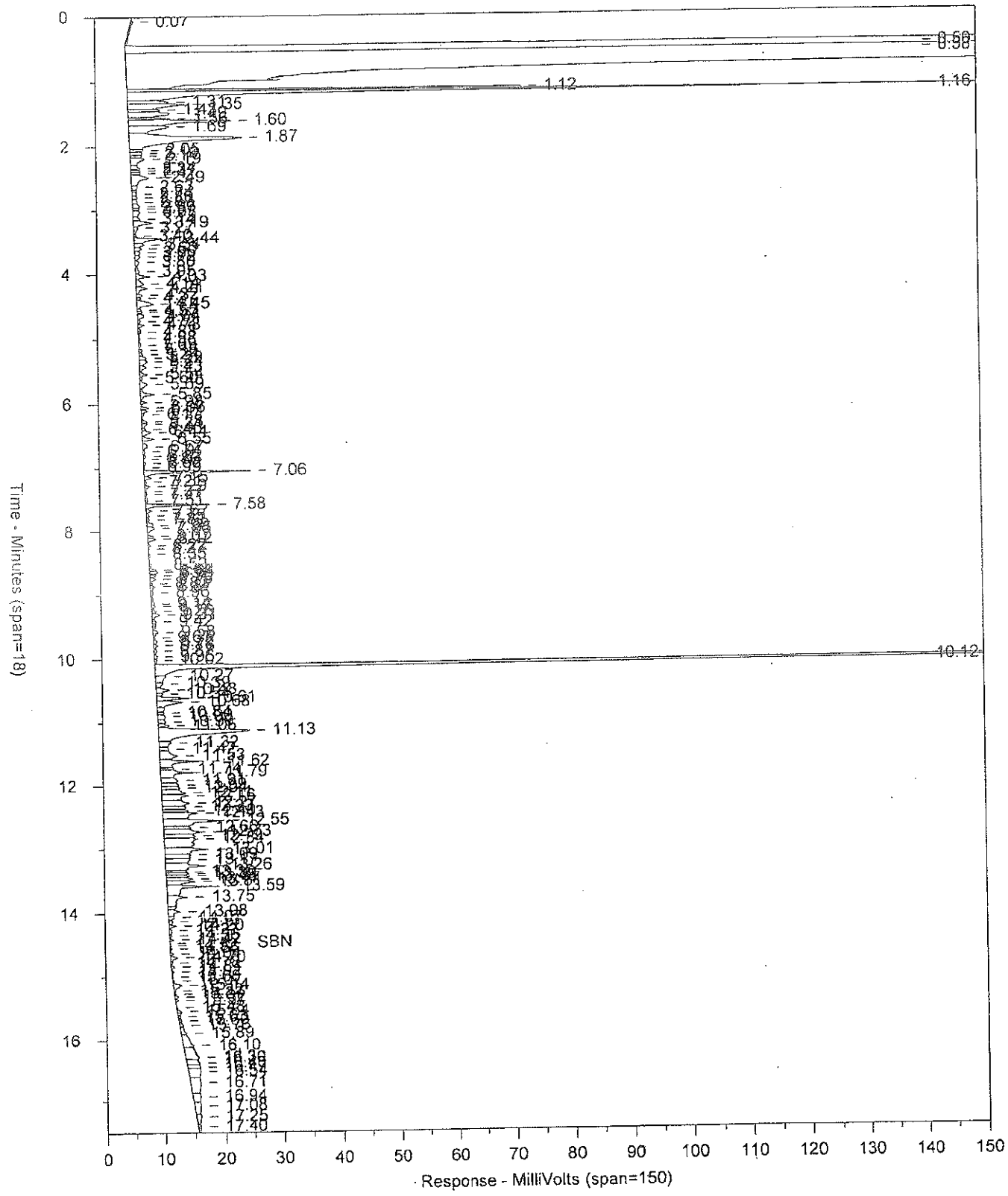
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	1169997	27.5509	<95.7854	<28.7356		ppb
☐ Heavy Range	12.57 - 16.29	355871	15.7703	<239.4636	<67.0498		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	548288	20.8773				ppb
☐ Capric Acid	6.44 (6.30 - 6.50)	3261	0.2650				ppb

Comments: _____

Reviewed by: Tom C. Wildermuth
Tom C. Wildermuth
Associate Chemist
Date: DEC 30 2016

Verified by: Heather F. Williams
Heather F. Williams
Senior Chemist
Date: DEC 30 2016

Sample: 8753059 AAOLY07 T 163630023A 08271 SW-846 8015B
File: D18364B.0045.RAW NWTPH-DX



Sample Number: 8753059 AAOLY07 T 163630023A 08271 SW-846 8015B
D18364B.0045.RAW NWTPH-DX

Injected On: 12/30/2016 7:36:27 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1044
Dilution Factor: 2
Injection Volume: 2

Analyst: 2027

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.069	0.00	5829
C-12	4.717	0.00	1255
Capric Acid	6.398	0.00	1106
C-14	6.547	0.00	4598
C-18	9.584	0.00	3493
O-terphenyl	10.118	0.02	543559
C-20	10.897	0.00	5315
C-22	11.785	0.00	23890
C-24	12.433	0.00	28410
C-26	13.006	0.00	30820
C-28	13.511	0.00	13378
C-30	13.976	0.00	7835
C-32	14.420	0.00	981
C-34	14.924	0.00	977
C-36	15.321	0.00	1248
C-38	15.689	0.00	1513
C-40	16.095	0.00	16053

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	1169998
>C24 - C40	12.57	16.29	355871
o-Terphenyl	10.11	10.21	543559

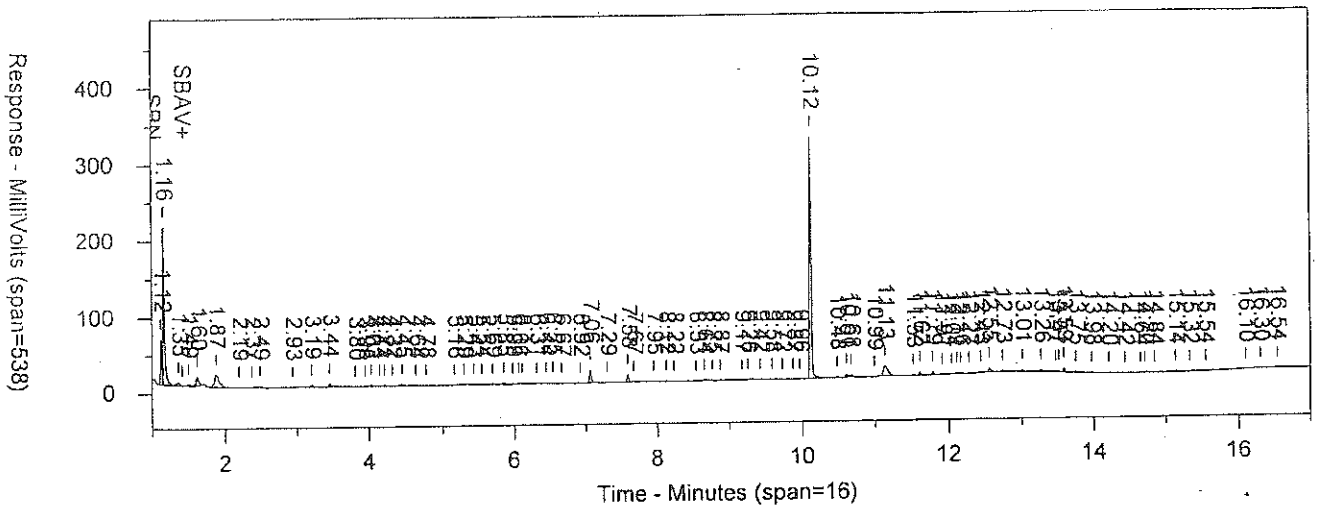
RESULTS TABLE

DX C12 - C24 AREA = 1169998 Preliminary C12 - C24 Amount = 0.028 PPM

DX >C24 - C40 AREA = 355870.7 Preliminary >C24 - C40 Amount = 0.016 PPM

FILES:
Area File: D18364B.0045.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 12/30/2016 8:15:46 AM
File Reported On: 12/30/2016 at 8:17:07 AM

8753059 AAOLY07 T 163630023A 08271 SW-846 8015B
D18364B.0045.RAW NWTPH-DX



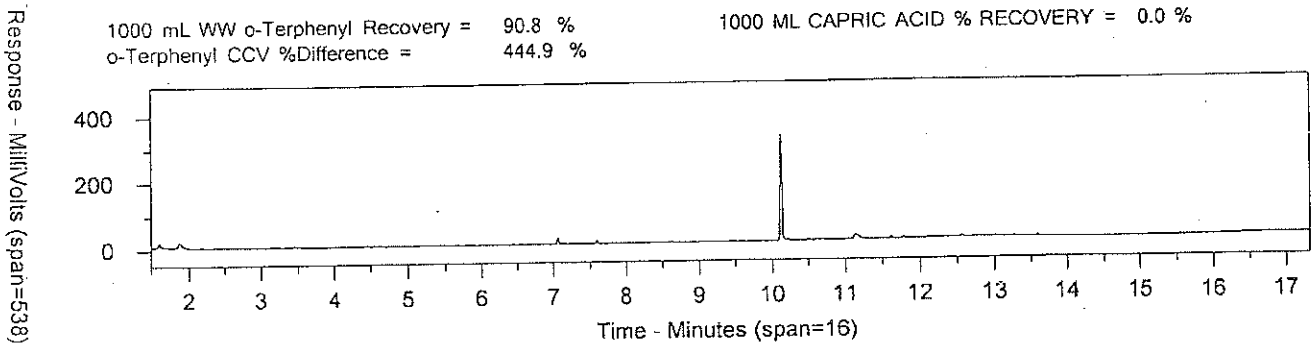
Sample Number: 8753059 AAOLY07 T 163630023A 08271 SW-846 8015B
Injected On: 12/30/2016 7:36:27 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1044
Dilution Factor: 2
Injection Volume: 2
Analyst: 2027

Compound	RT	Amount ppm	Area
C-12	4.778	0.0001	1477.407
Capric Acid	6.444	0.0003	3260.73
C-14	6.547	0.0002	3702.719
C-18	9.584	0.0001	2217.491
O-terphenyl	10.118	0.0209	548288.3
C-22	11.785	0.0004	8295.097
C-24	12.433	0.0003	5604.972
C-26	13.006	0.0003	5307.822
C-28	13.511	0.0001	2328.374
C-30	13.976	0.0001	3060.974
C-32	14.420	0.0000	1041.686
C-34	14.844	0.0001	1291.899
C-36	15.321	0.0000	761.5858
C-40	16.095	0.0001	1845.624

1000 mL WW o-Terphenyl Recovery = 90.8 %
o-Terphenyl CCV %Difference = 444.9 %

1000 ML CAPRIC ACID % RECOVERY = 0.0 %



Area File: D18364B.0045.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 12/30/2016 8:15:46 AM
File Reported On: 12/30/2016 at 8:19:05 AM
Format: 2DXREPLOTI.FMT

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: 8753061 OLY08 Sample ID: AA **Batchnumber:** 163630023A
Sample Amount: 1037. Total Volume: 2. ml Analyst:2027 SDG:WAN02 State: WA
Analyses: 08271

Injection Summary

Injected on : 12/30/2016 08:40:58
Instrument : CP18--18847B
Result file : D18364B.0048.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 62% (50-150) Conc.: 14.41349

Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	18480211	807.6989	96.432	28.9296		ppb
☐ Heavy Range	12.57 - 16.29	9322366	415.9068	241.08	67.5024		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	375996	14.4135				ppb
☐ Capric Acid	6.40 (6.30 - 6.50)	411130	33.6403				ppb

Comments: _____

Reviewed by: Tom C. Wildermuth
Associate Chemist
Date: JAN 05 2017

Verified by: Jamie L. Brillhart
Senior Chemist
Date: JAN 05 2017

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: 8753061 OLY08 Sample ID: AA **Batchnumber:** 163630023A
Sample Amount: 1037. Total Volume: 2. ml Analyst: 2027 SDG: WAN02 State: WA
Analyses: 08271

Injection Summary

Injected on : 12/30/2016 08:40:58
Instrument : CP18--18847B
Result file : D18364B.0048.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 62% (50-150) Conc.: 14.41349

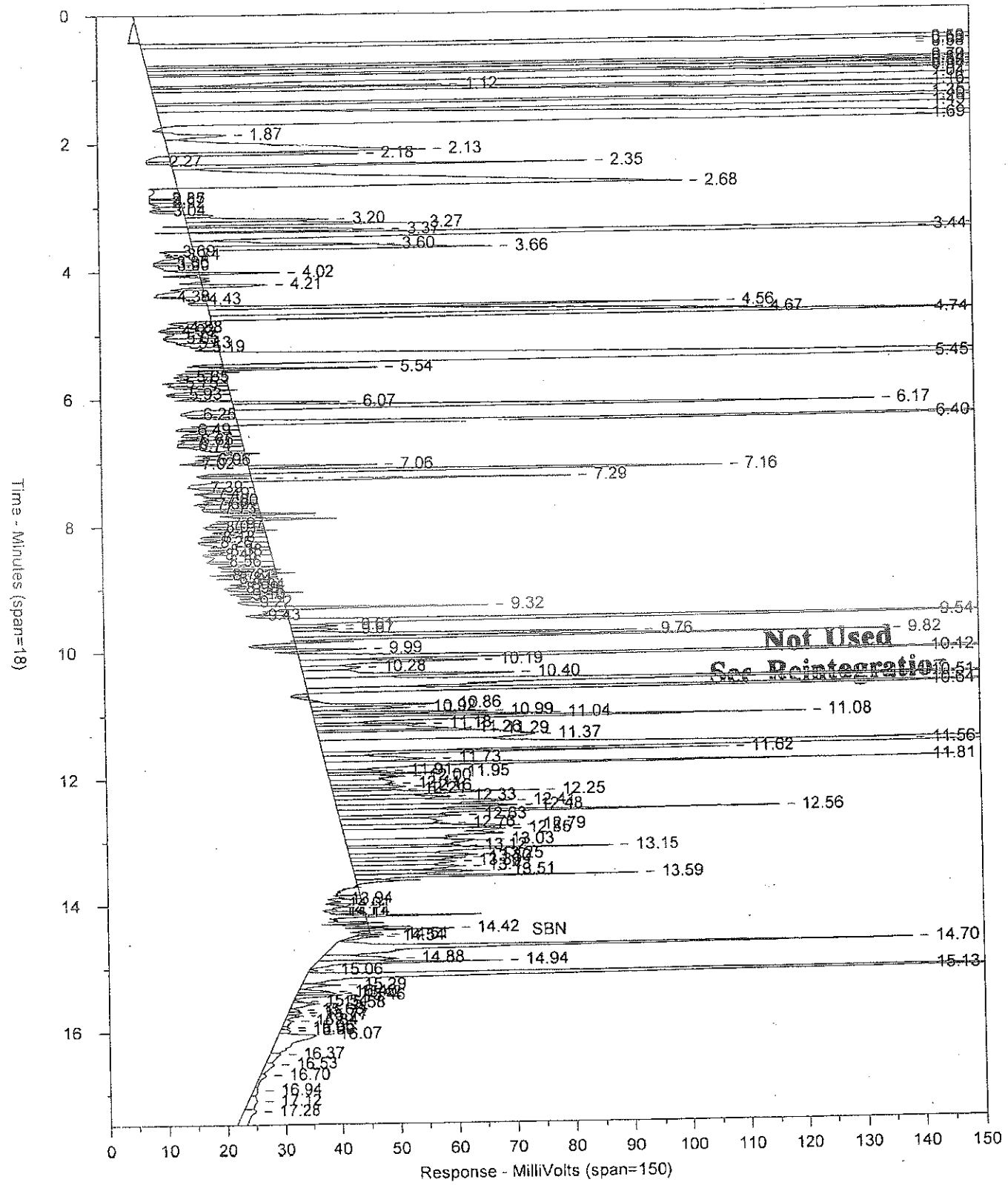
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	18480211	807.6989	96.432	28.9296		ppb
☐ Heavy Range	12.57 - 16.29	9322366	415.9068	241.08	67.5024		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	375996	14.4135				ppb
☐ Capric Acid	6.40 (6.30 - 6.50)	411130	33.6403				ppb

Comments: _____

Reviewed by: Tom C. Wildermuth
Tom C. Wildermuth
Associate Chemist
Date: JAN 05 2017

Verified by: Jamie L. Brillhart
Jamie L. Brillhart
Senior Chemist
Date: JAN 05 2017

Sample: 8753061 AAOLY08 T 163630023A 08271 SW-846 8015B
File: D18364B.0048.RAW NWTPH-DX



Sample Number: 8753061 AAOLY08 T 163630023A 08271 SW-846 8015B
D18364B.0048.RAW NWTPH-DX

Injected On: 12/30/2016 8:40:58 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1037
Dilution Factor: 2
Injection Volume: 2

Analyst: 2027

Compound	RT	Amt PPM	Area
C-12	4.745	0.02	437973
Capric Acid	6.395	0.03	315106
C-16	8.178	0.00	37787
C-18	9.607	0.00	18273
O-terphenyl	10.189	0.00	90443
C-20	10.865	0.00	46893
C-22	11.813	0.01	234414
C-24	12.481	0.01	110415
C-26	13.027	0.01	123557
C-28	13.511	0.00	59247
C-30	14.011	0.00	21720
C-32	14.424	0.00	8457
C-34	14.884	0.00	51176
C-36	15.294	0.00	16324
C-38	15.718	0.00	4834
C-40	16.066	0.00	67778

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	9780939
>C24 - C40	12.57	16.29	2236551
o-Terphenyl	10.11	10.21	487376

RESULTS TABLE

DX C12 - C24 AREA = 9780939

Preliminary C12 - C24 Amount = 0.432 PPM

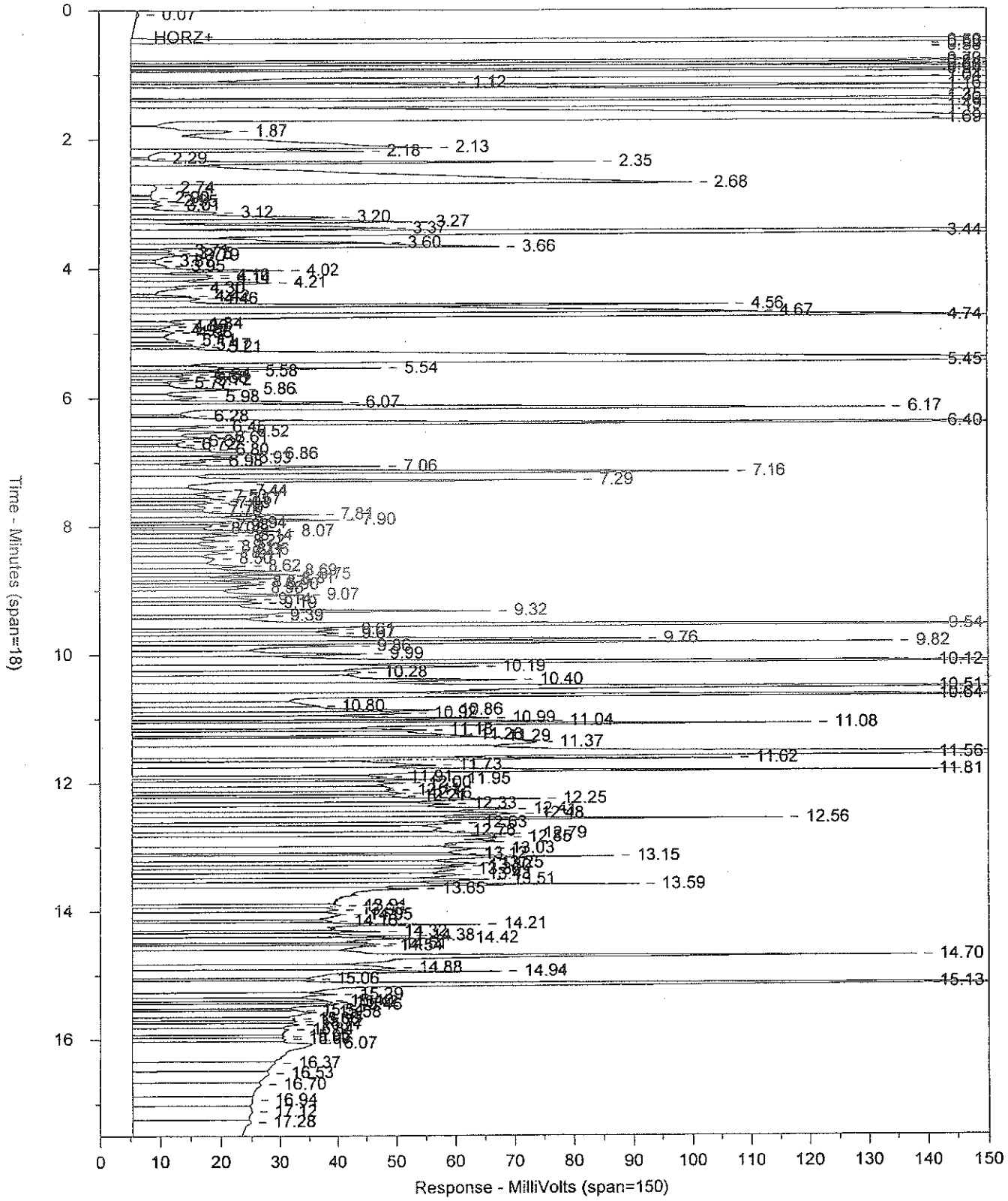
DX >C24 - C40 AREA = 2236551

Preliminary >C24 - C40 Amount = 0.100 PPM

Not Used
See Reintegration

FILES:
Area File: D18364B.0048.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 12/30/2016 8:58:42 AM
File Reported On: 12/30/2016 at 8:58:41 AM

Sample: 8753061 AAOLY08 T 163630023A 08271 SW-846 8015B
File: D18364B.0048.RAW NWTPH-DX



Sample Number: 8753061 AAOLY08 T 163630023A 08271 SW-846 8015B
D18364B.0048.RAW NWTPH-DX

Injected On: 12/30/2016 8:40:58 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1037
Dilution Factor: 2
Injection Volume: 2

Analyst: 2027

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.066	0.00	2426
C-12	4.745	0.02	540324
Capric Acid	6.395	0.04	466701
C-14	6.615	0.00	35090
C-16	8.137	0.00	63708
C-18	9.607	0.00	97140
O-terphenyl	10.189	0.01	251829
C-20	10.865	0.01	189611
C-22	11.813	0.02	487388
C-24	12.481	0.01	268752
C-26	13.027	0.02	355197
C-28	13.511	0.01	198685
C-30	13.975	0.01	147284
C-32	14.424	0.01	224080
C-34	14.884	0.01	210621
C-36	15.294 J	0.01	152824
C-38	15.718	0.00	71802
C-40	16.066	0.02	501118

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	18480210 M
>C24 - C40	12.57	16.29	9322366 M
o-Terphenyl	10.11	10.21	871433

RESULTS TABLE

DX C12 - C24 AREA = 1.848021E+07 Preliminary C12 - C24 Amount = 0.813 PPM

DX >C24 - C40 AREA = 9322366 Preliminary >C24 - C40 Amount = 0.416 PPM

FILES:
Area File: D18364B.0048.BND
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 12/30/2016 12:37:05 PM
File Reported On: 12/30/2016 at 12:37:05 PM

M = Manually Integrated
Analyst JW Gow 12/30/16
Approved by [illegible] 1-5-17
Circle Reason 1 (2) 3 4
1 = Missed Peak
2 = Improper Baseline
3 = RT Update
4 = Other _____

Chrom Perfect Chromatogram Report

Sample Number: 8753061 AAOLY08 T 163630023A 08271 SW-846 8015B
D18364B.0048.RAW NWTPH-DX

Injected On: 12/30/2016 8:40:58 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1037
Dilution Factor: 2
Injection Volume: 2

Analyst: 2027

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.066	0.00	2426
C-12	4.745	0.02	540324
Capric Acid	6.395	0.04	466701
C-14	6.615	0.00	35090
C-16	8.137	0.00	63708
C-18	9.607	0.00	97140
O-terphenyl	10.189	0.01	251829
C-20	10.865	0.01	189611
C-22	11.813	0.02	487388
C-24	12.481	0.01	268752
C-26	13.027	0.02	355197
C-28	13.511	0.01	198685
C-30	13.975	0.01	147284
C-32	14.424	0.01	224080
C-34	14.884	0.01	210621
C-36	15.294	0.01	152824
C-38	15.718	0.00	71802
C-40	16.066	0.02	501118

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	18480210 M
>C24 - C40	12.57	16.29	9322366 M
o-Terphenyl	10.11	10.21	871433

RESULTS TABLE

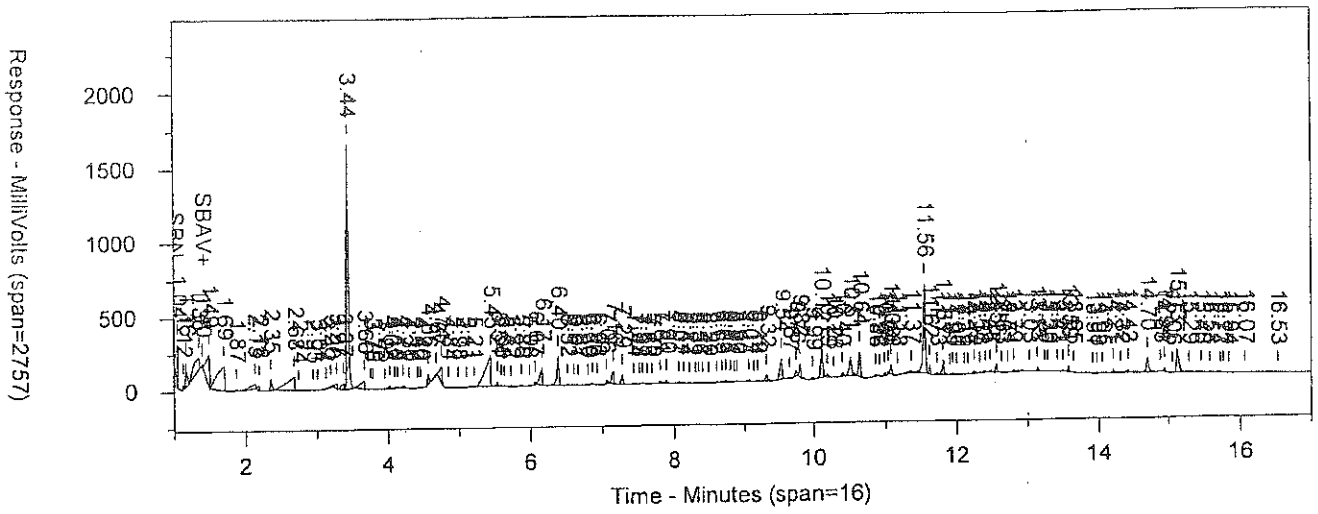
DX C12 - C24 AREA = 1.848021E+07 Preliminary C12 - C24 Amount = 0.813 PPM

DX >C24 - C40 AREA = 9322366 Preliminary >C24 - C40 Amount = 0.416 PPM

FILES:
Area File: D18364B.0048.BND
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 12/30/2016 12:37:05 PM
File Reported On: 12/30/2016 at 12:37:05 PM

M = Manually Integrated
Analyst JW 6092 12/30/16
Approved by QJB 2131 1-5-16
Circle Reason 1 (2) 3 4
1 = Missed Peak
2 = Improper Baseline
3 = RT Update
4 = Other ____________

8753061 AAOLY08 T 163630023A 08271 SW-846 8015B
D18364B.0048.RAW NWTPH-DX



Sample Number: 8753061 AAOLY08 T 163630023A 08271 SW-846 8015B
Injected On: 12/30/2016 8:40:58 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

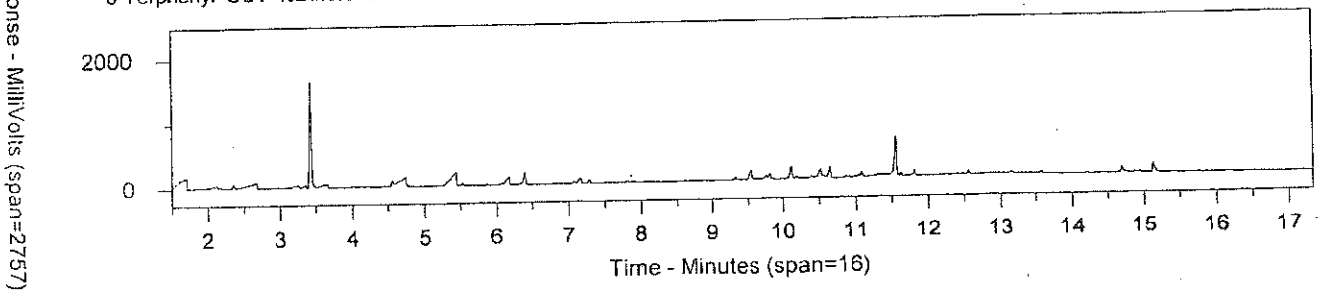
Sample Weight: 1037
Dilution Factor: 2
Injection Volume: 2
Analyst: 2027

Compound	RT	Amount ppm	Area
#2 FUEL OIL (C12-C24	0.066	0.0003	4922.811
C-12	4.745	0.0104	235041.7
Capric Acid	6.395	0.0336	411129.9
C-14	6.615	0.0003	7314.255
C-16	8.137	0.0004	8727.858
O-terphenyl	10.189	0.0017	45298.49
C-20	10.865	0.0008	19009.41
C-22	11.813	0.0077	172568.5
C-24	12.481	0.0012	25112.74
C-26	13.027	0.0007	14011.88
C-28	13.511	0.0009	18686.23
C-30	13.975	0.0002	4896.66
C-32	14.424	0.0047	101729.5
C-34	14.884	0.0005	12262.93
C-36	15.294	0.0004	9789.759
C-38	15.718	0.0002	4600.165
C-40	16.066	0.0021	48306.91

Not Used See Reintegration

1000 mL WW o-Terphenyl Recovery = 7.5 %
o-Terphenyl CCV %Difference = -55.0 %

1000 ML CAPRIC ACID % RECOVERY = 3.7 %

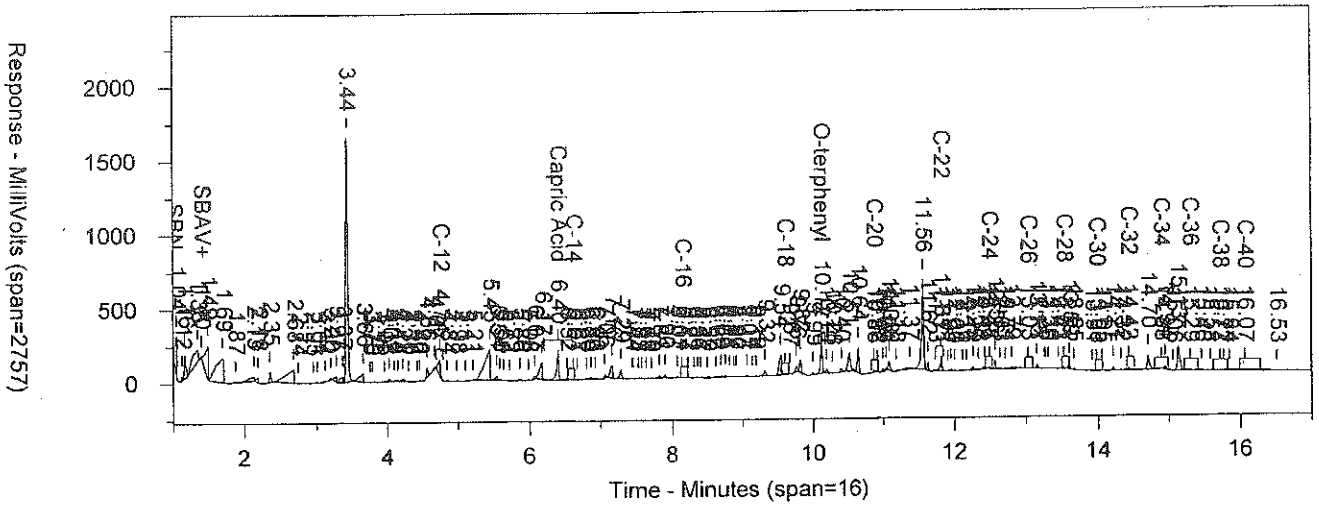


Area File: D18364B.0048.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 12/30/2016 8:58:42 AM
File Reported On: 12/30/2016 at 8:58:49 AM
Format: 2DXREPLOTI.FMT

Printed on 12/30/2016 8:58:50 AM

8753061 AAOLY08 T 163630023A 08271 SW-846 8015B
D18364B.0048.RAW NWTPH-DX



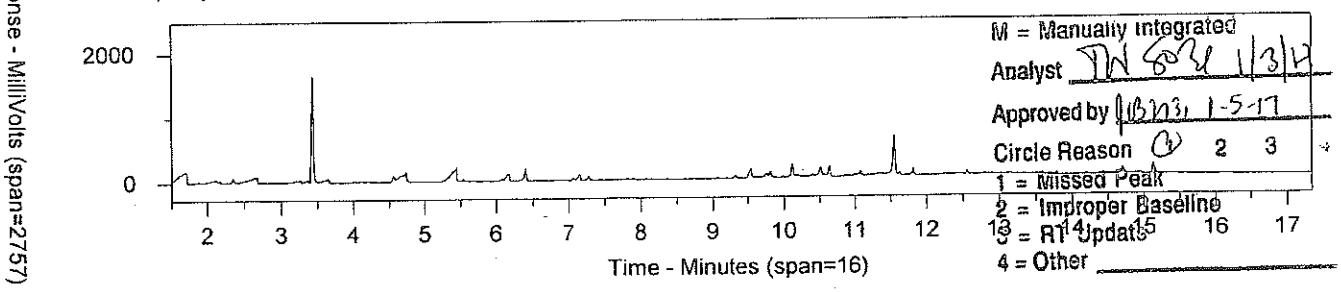
Sample Number: 8753061 AAOLY08 T 163630023A 08271 SW-846 8015B
Injected On: 12/30/2016 8:40:58 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1037
Dilution Factor: 2
Injection Volume: 2
Analyst: 2027

Compound	RT	Amount ppm	Area
#2 FUEL OIL (C12-C24	0.066	0.0003	4922.811
C-12	4.745	0.0104	235041.7
Capric Acid	6.395	0.0336	411129.9
C-14	6.615	0.0003	7314.255
C-16	8.137	0.0004	8727.858
O-terphenyl	10.115	0.0144	375995.8
C-20	10.865	0.0008	19009.41
C-22	11.813	0.0077	172568.5
C-24	12.481	0.0012	25112.74
C-26	13.027	0.0007	14011.88
C-28	13.511	0.0009	18686.23
C-30	13.975	0.0002	4806.66
C-32	14.424	0.0047	101729.5
C-34	14.884	0.0005	12252.93
C-36	15.294	0.0004	9789.759
C-38	15.718	0.0002	4600.165
C-40	16.066	0.0021	48306.91

1000 mL WW o-Terphenyl Recovery = 62.3 %
o-Terphenyl CCV %Difference = 273.7 %

1000 ML CAPRIC ACID % RECOVERY = 3.7 %



M = Manually Integrated
Analyst JN 1/3/17
Approved by [illegible] 1-5-17
Circle Reason 1 2 3
1 = Missed Peak
2 = Improper Baseline
3 = RT Update
4 = Other

Area File: D18364B.0048.BND
Method: 2DXREPLOTI.MET
Calibration File: 2DXi315A.CAL

Area File Created On: 1/3/2017 10:46:52 AM
File Reported On: 1/3/2017 at 10:46:53 AM
Format: 2DXREPLOTI.FMT

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: 8753063 OLY09 Sample ID: AA **Batchnumber:** 163630023A
Sample Amount: 1060. Total Volume: 2. ml Analyst:2027 SDG:WAN02 State: WA
Analyses: 08271

Injection Summary

Injected on : 12/30/2016 07:58:00
Instrument : CP18--18847B
Result file : D18364B.0046.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 92% (50-150) Conc.: 20.77552

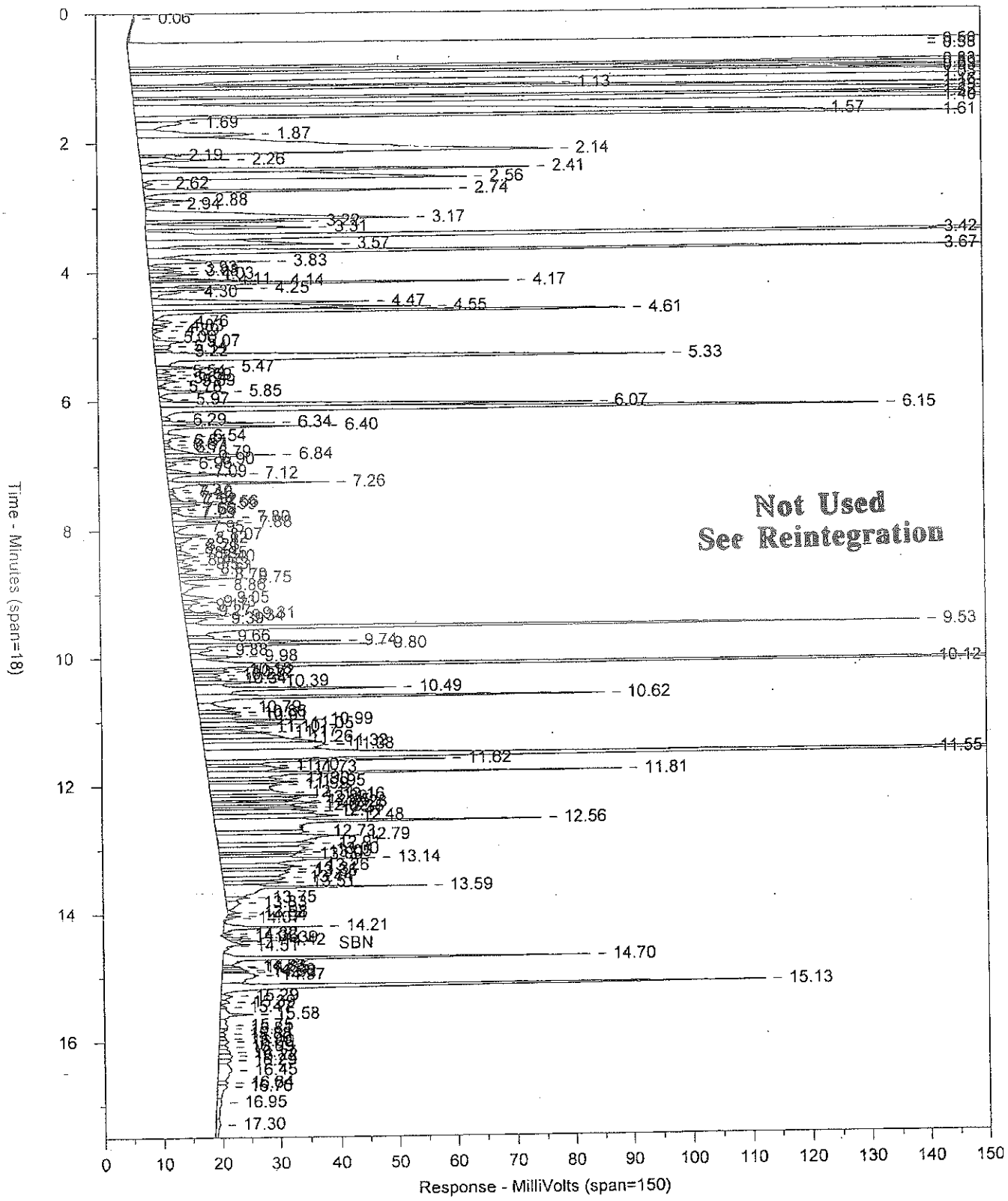
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	6535067	261.0496	94.3396	28.3019		ppb
☐ Heavy Range	12.57 - 16.29	2213705	96.6190	<235.8491	66.0377	J	ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	553978	20.7755				ppb
☐ Capric Acid	6.40 (6.30 - 6.50)	37913	3.0349				ppb

Comments: _____

Reviewed by: Joan C. Waldermuth, Associate Chemist
Date: DEC 30 2016

Verified by: Heather E. Williams, Senior Chemist
Date: DEC 30 2016

Sample: 8753063 AAOLY09 T 163630023A 08271 SW-846 8015B
File: D18364B.0046.RAW NWTPH-DX



Sample Number: 8753063 AAOLY09 T 163630023A 08271 SW-846 8015B
D18364B.0046.RAW NWTPH-DX

Injected On: 12/30/2016 7:58:00 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1060
Dilution Factor: 2
Injection Volume: 2

Analyst: 2027

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.060	0.00	5814
C-12	4.765	0.00	10143
Capric Acid	6.396	0.00	45842
C-14	6.612	0.00	2869
C-16	8.122	0.00	11223
O-terphenyl	10.184	0.00	13740
C-20	10.857	0.00	19577
C-22	11.807	0.01	135780
C-24	12.479	0.00	69983
C-26	13.048	0.00	28350
C-28	13.512	0.00	29351
C-30	14.036	0.00	3007
C-32	14.425	0.00	5745
C-34	14.891	0.00	8154
C-36	15.290	0.00	6653
C-38	15.749	0.00	9290
C-40	16.168	0.00	7339

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	5495265
>C24 - C40	12.57	16.29	1341734
o-Terphenyl	10.11	10.21	582332

RESULTS TABLE

DX C12 - C24 AREA = 5495265

Preliminary C12 - C24 Amount = 0.239 PPM

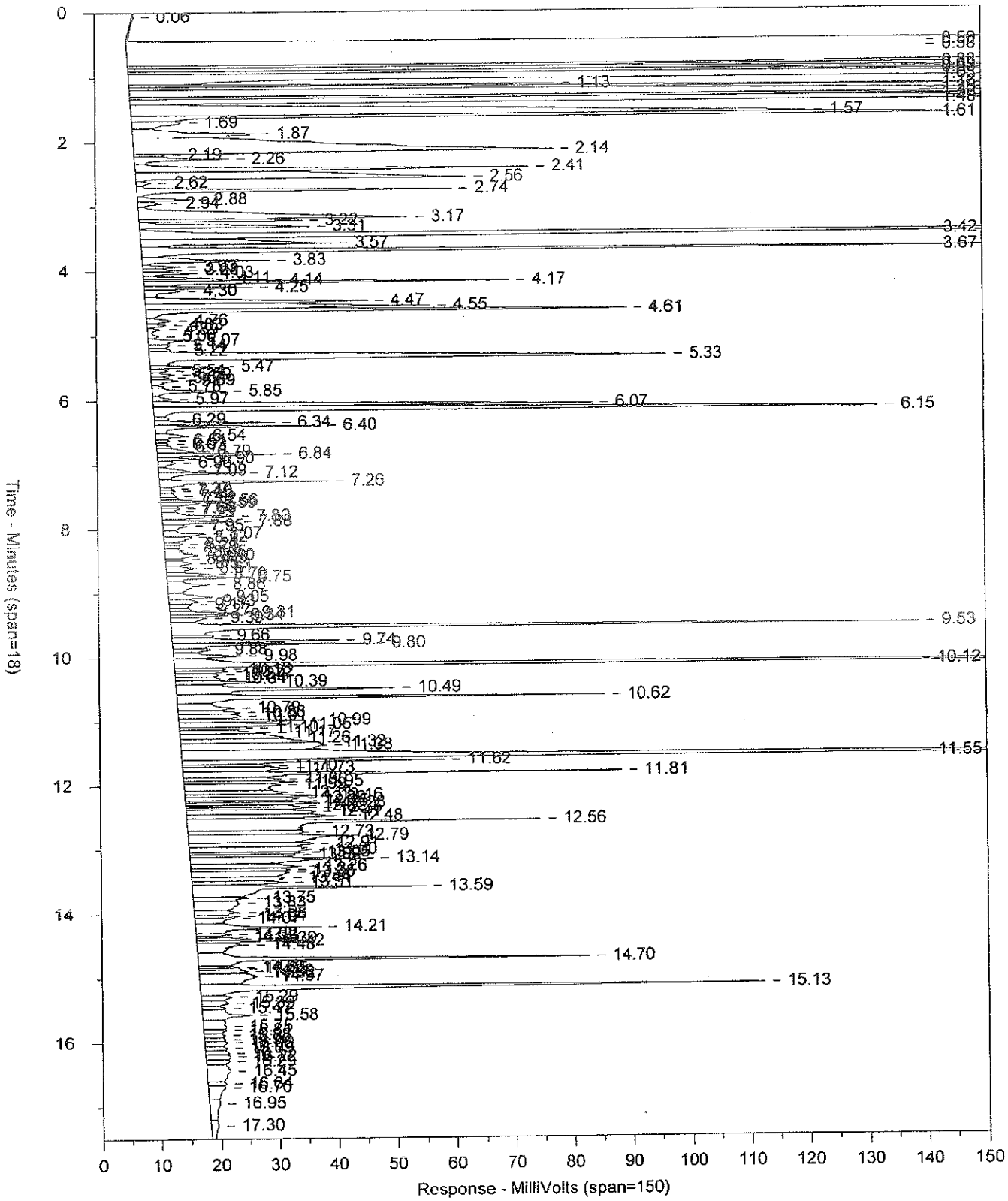
DX >C24 - C40 AREA = 1341734

Preliminary >C24 - C40 Amount = 0.059 PPM

Not Used
See Reintegration

FILES:
Area File: D18364B.0046.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 12/30/2016 8:15:46 AM
File Reported On: 12/30/2016 at 8:17:13 AM

Sample: 8753063 AAOLY09 T 163630023A 08271 SW-846 8015B
File: D18364B.0046.RAW NWTPH-DX



Sample Number: 8753063 AAOLY09 T 163630023A 08271 SW-846 8015B
D18364B.0046.RAW NWTPH-DX

Injected On: 12/30/2016 7:58:00 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1060
Dilution Factor: 2
Injection Volume: 2

Analyst: 2027

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.060	0.00	5814
C-12	4.765	0.00	14419
Capric Acid	6.396	0.00	53553
C-14	6.612	0.00	5971
C-16	8.122	0.00	20273
O-terphenyl	10.184	0.00	20979
C-20	10.857	0.00	31135
C-22	11.807	0.01	158899
C-24	12.479	0.00	87315
C-26	13.048	0.00	38529
C-28	13.512	0.00	46917
C-30	14.036	0.00	14935
C-32	14.425	0.00	18984
C-34	14.891	0.00	16100
C-36	15.290	0.00	23232
C-38	15.749	0.00	30891
C-40	16.168	0.00	15701

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	6535068 M
>C24 - C40	12.57	16.29	2213705 M
o-Terphenyl	10.11	10.21	614379

RESULTS TABLE

DX C12 - C24 AREA = 6535068

DX >C24 - C40 AREA = 2213705

Preliminary C12 - C24 Amount = 0.284 PPM

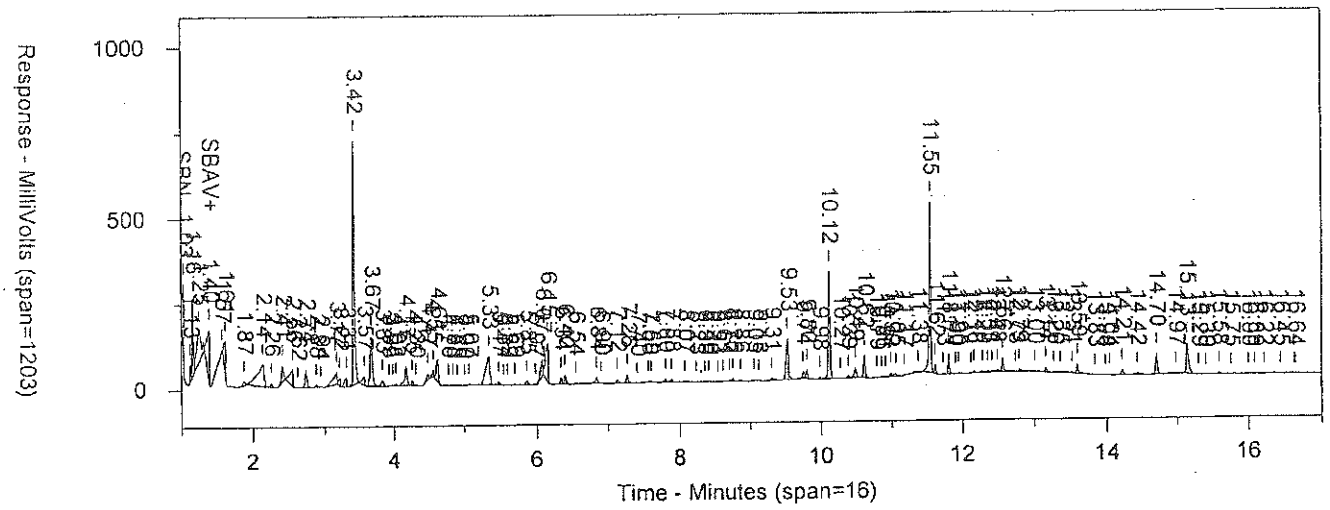
Preliminary >C24 - C40 Amount = 0.097 PPM

FILES:
Area File: D18364B.0046.BND
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 12/30/2016 12:34:54 PM
File Reported On: 12/30/2016 at 12:34:55 PM

M = Manually Integrated
Analyst TN 12/30/16
Approved by MMM 12/30/16
Circle Reason 1 2 3 4
1 = Missed Peak
2 = Improper Baseline
3 = RT Update
4 = Other _____

Chrom Perfect Chromatogram Report

8753063 AAOLY09 T 163630023A 08271 SW-846 8015B
D18364B.0046.RAW NWTPH-DX



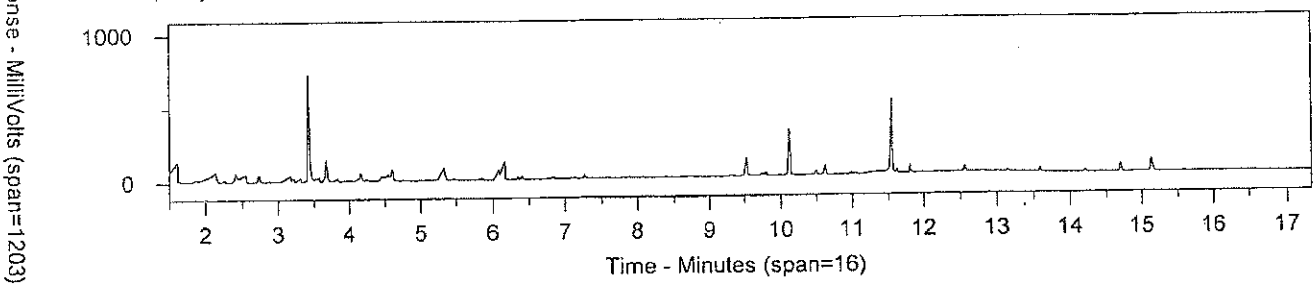
Sample Number: 8753063 AAOLY09 T 163630023A 08271 SW-846 8015B
Injected On: 12/30/2016 7:58:00 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1060
Dilution Factor: 2
Injection Volume: 2
Analyst: 2027

Compound	RT	Amount ppm	Area
C-12	4.765	0.0004	8158.843
Capric Acid	6.396	0.0050	37913.21
C-14	6.543	0.0005	10813.33
O-terphenyl	10.115	0.0208	553978.4
C-20	10.857	0.0001	2904.38
C-22	11.807	0.0034	77524.34
C-24	12.479	0.0004	9388.603
C-26	13.004	0.0005	11503.83
C-28	13.512	0.0003	6778.874
C-30	14.036	0.0003	5781.285
C-32	14.425	0.0016	34671.98
C-34	14.972	0.0014	30848.64
C-36	15.290	0.0002	3711.702
C-38	15.749	0.0001	3142.744
C-40	16.087	0.0000	777.0221

1000 mL WW o-Terphenyl Recovery = 91.8 %
o-Terphenyl CCV %Difference = 450.6 %

1000 ML CAPRIC ACID % RECOVERY = 0.3 %



Area File: D18364B.0046.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 12/30/2016 8:15:46 AM
File Reported On: 12/30/2016 at 8:19:13 AM
Format: 2DXREPLOTI.FMT

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: 8753065 OLY13 Sample ID: AA **Batchnumber:** 163630023A
Sample Amount: 1060. Total Volume: 2. ml Analyst:2027 SDG:WAN02 State: WA
Analyses: 08271

Injection Summary

Injected on : 12/30/2016 08:19:30
Instrument : CP18--18847B
Result file : D18364B.0047.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 57% (50-150) Conc.: 12.84273

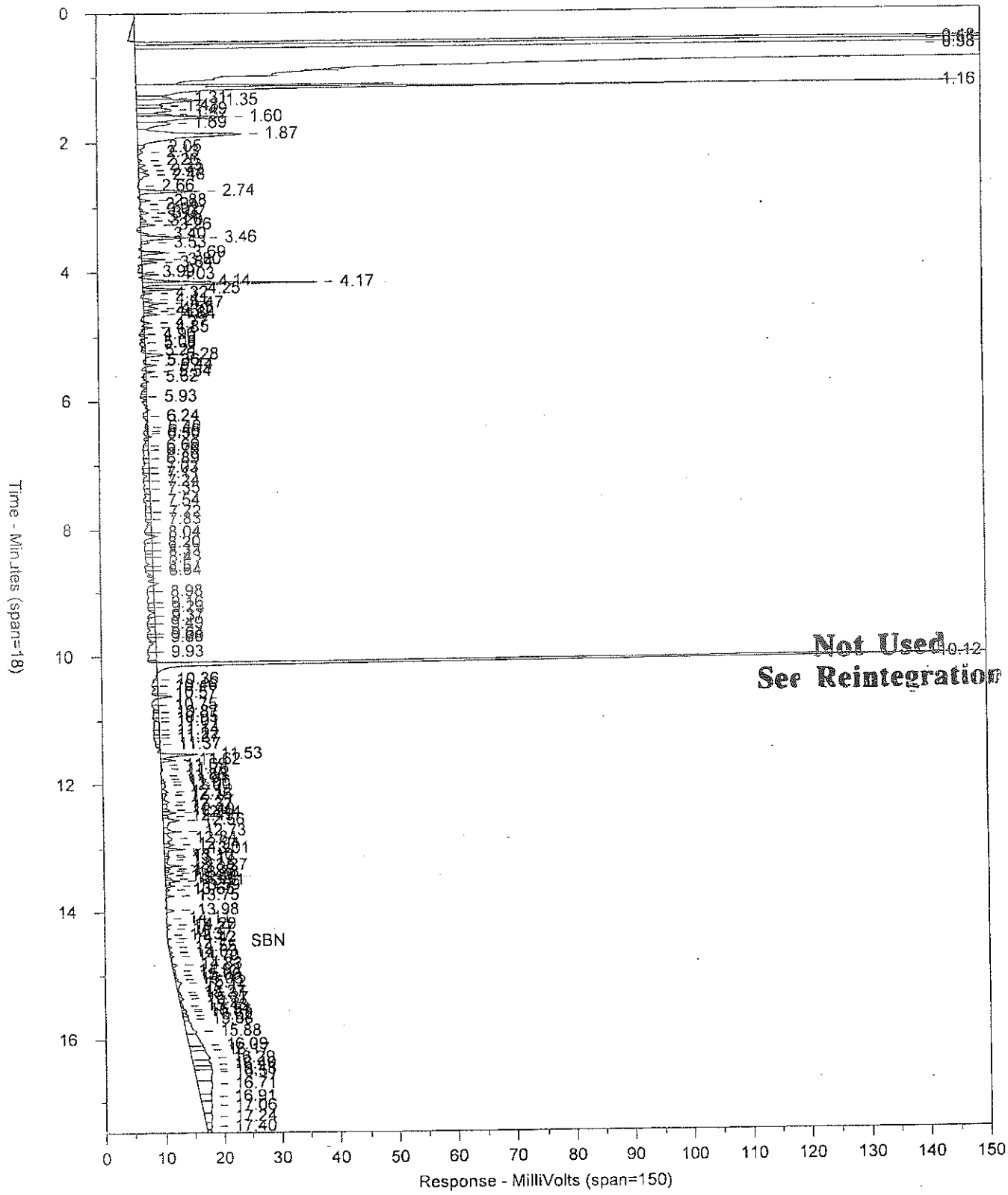
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	668259	14.2202	<94.3396	<28.3019		ppb
☐ Heavy Range	12.57 - 16.29	175521	7.6608	<235.8491	<66.0377		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	342451	12.8427				ppb
☐ Capric Acid	6.31 (6.30 - 6.50)	1183	0.0947				ppb

Comments: _____

Reviewed by: Tom C. Wildermuth
Tom C. Wildermuth
Associate Chemist
Date: DEC 30 2016

Verified by: Heather E Williams
Heather E. Williams
Senior Chemist
Date: DEC 30 2016

Sample: 8753065 AAOLY13 T 163630023A 08271 SW-846 8015B
File: D18364B.0047.RAW NWTPH-DX



Sample Number: 8753065 AAOLY13 T 163630023A 08271 SW-846 8015B
D18364B.0047.RAW NWTPH-DX

Injected On: 12/30/2016 8:19:30 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1060
Dilution Factor: 2
Injection Volume: 2

Analyst: 2027

Compound	RT	Amt PPM	Area
C-12	4.775	0.00	879
Capric Acid	6.400	0.00	920
C-16	8.202	0.00	8769
C-18	9.643	0.00	7001
O-terphenyl	10.117	0.01	323843
C-20	10.868	0.00	2139
C-22	11.759	0.00	682
C-24	12.490	0.00	1995
C-26	13.005	0.00	7825
C-28	13.511	0.00	5260
C-30	13.976	0.00	2429
C-32	14.419	0.00	722
C-34	14.928	0.00	1058
C-36	15.312	0.00	1302
C-38	15.684	0.00	3034
C-40	16.169	0.00	10249

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	634563
>C24 - C40	12.57	16.29	139723
o-Terphenyl	10.11	10.21	323843

RESULTS TABLE

DX C12 - C24 AREA = 634563.1

Preliminary C12 - C24 Amount = 0.014 PPM

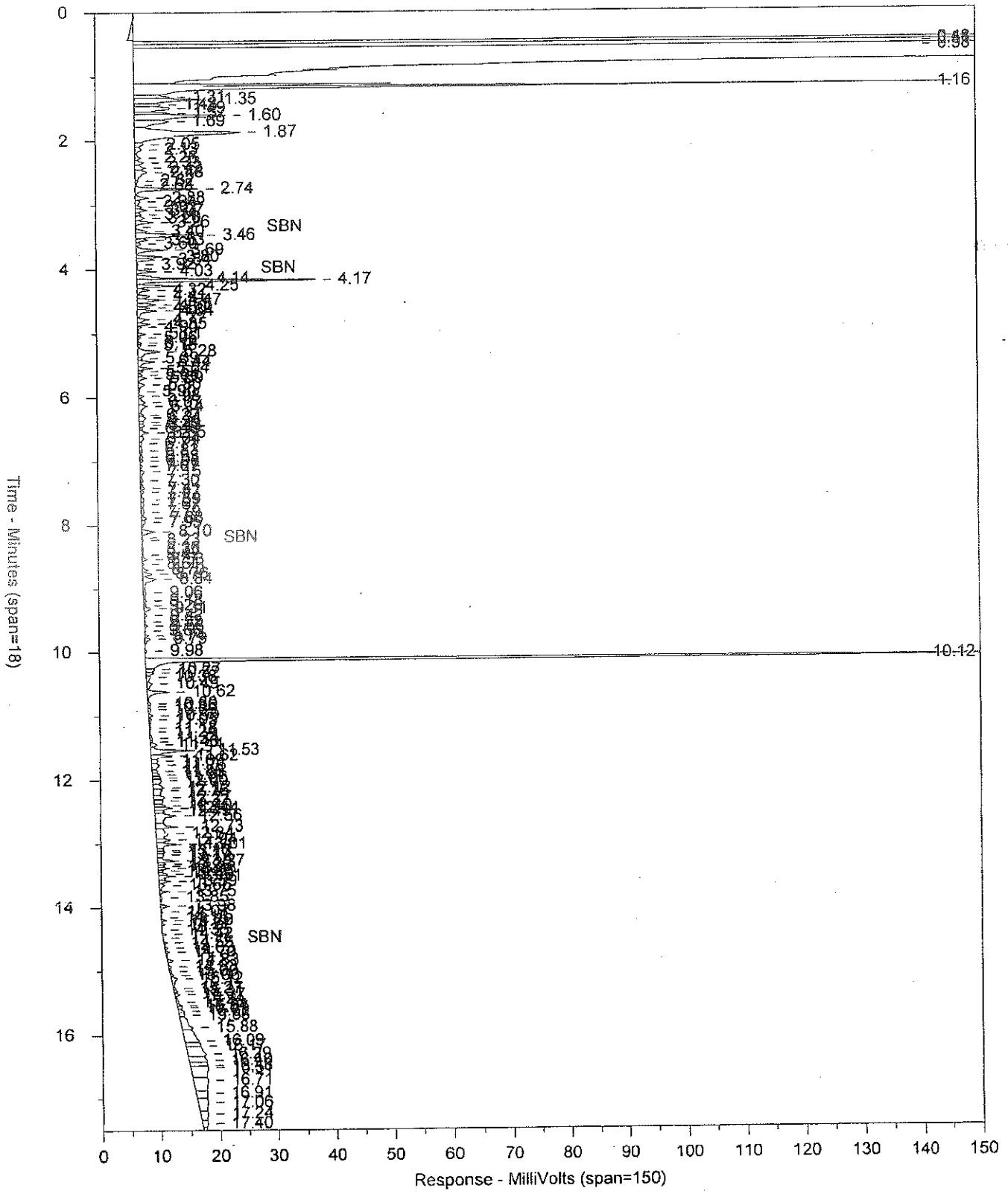
DX >C24 - C40 AREA = 139723

Preliminary >C24 - C40 Amount = 0.006 PPM

Not Used
See Reintegration

FILES:
Area File: D18364B.0047.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 12/30/2016 8:37:15 AM
File Reported On: 12/30/2016 at 8:37:17 AM

Sample: 8753065 AAOLY13 T 163630023A 08271 SW-846 8015B
File: D18364B.0047.RAW NWTPH-DX



Chrom Perfect Chromatogram Report

Sample Number: 8753065 AAOLY13 T 163630023A 08271 SW-846 8015B
D18364B.0047.RAW NWTPH-DX

Injected On: 12/30/2016 8:19:30 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1060
Dilution Factor: 2
Injection Volume: 2

Analyst: 2027

Compound	RT	Amt PPM	Area
C-12	4.775	0.00	5290
Capric Acid	6.386	0.00	1690
C-14	6.548	0.00	4970
C-18	9.582	0.00	1388
O-terphenyl	10.117	0.01	340892
C-20	10.889	0.00	1461
C-22	11.759	0.00	6116
C-24	12.490	0.00	3643
C-26	13.005	0.00	11013
C-28	13.511	0.00	6964
C-30	13.976	0.00	3805
C-32	14.419	0.00	950
C-34	14.928	0.00	1058
C-36	15.312	0.00	1302
C-38	15.684	0.00	3034
C-40	16.169	0.00	10249

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	668259 M
>C24 - C40	12.57	16.29	175521 M
o-Terphenyl	10.11	10.21	340892

RESULTS TABLE

DX C12 - C24 AREA = 668259

Preliminary C12 - C24 Amount = 0.014 PPM

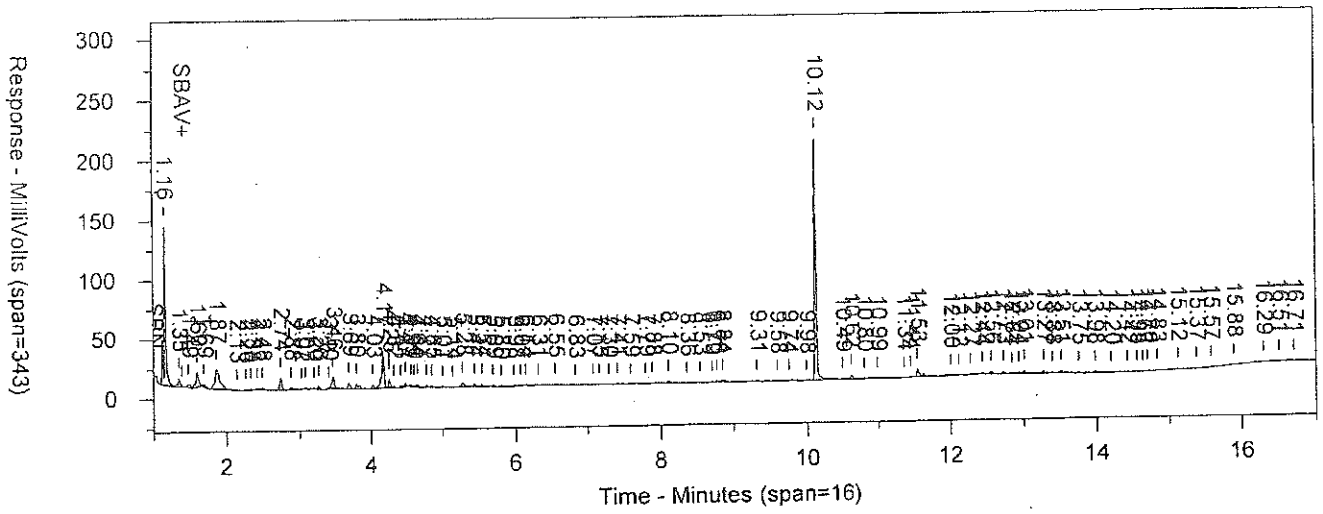
DX >C24 - C40 AREA = 175521.2

Preliminary >C24 - C40 Amount = 0.008 PPM

FILES:
Area File: D18364B.0047.BND
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 12/30/2016 12:36:11 PM
File Reported On: 12/30/2016 at 12:36:11 PM

M = Manually Integrated
Analyst [signature] 12/30/16
Approved by [signature] 12/30/16
Circle Reason 1 (2) 3 4
1 = Missed Peak
2 = Improper Baseline
3 = RT Update
4 = Other ______

8753065 AAOLY13 T 163630023A 08271 SW-846 8015B
D18364B.0047.RAW NWTPH-DX



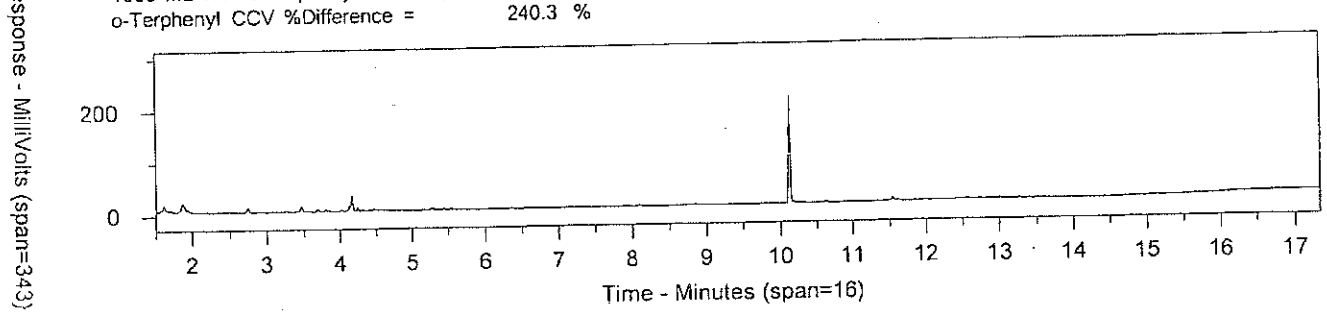
Sample Number: 8753065 AAOLY13 T 163630023A 08271 SW-846 8015B
Injected On: 12/30/2016 8:19:30 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1060
Dilution Factor: 2
Injection Volume: 2
Analyst: 2027

Compound	RT	Amount ppm	Area
C-12	4.775	0.0002	3544.662
Capric Acid	6.313	0.0001	1183.330
C-14	6.548	0.0001	2279.713
C-18	8.582	0.0001	1580.616
O-terphenyl	10.117	0.0128	342450.9
C-24	12.437	0.0001	1946.751
C-26	13.005	0.0002	4152.232
C-28	13.511	0.0003	7233.528
C-30	13.976	0.0002	3509.747
C-32	14.419	0.0000	918.6391
C-34	14.832	0.0001	2018.386
C-36	15.366	0.0001	1593.936

1000 mL WW o-Terphenyl Recovery = 56.7 %
o-Terphenyl CCV %Difference = 240.3 %

1000 ML CAPRIC ACID % RECOVERY = 0.0 %



Area File: D18364B.0047.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 12/30/2016 8:37:15 AM
File Reported On: 12/30/2016 at 8:37:27 AM
Format: 2DXREPLOTI.FMT

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: BLANKA 12/29/16 PBLK23363 Sample ID: AA **Batchnumber:** 163630023A
Sample Amount: 1000. Total Volume: 2. ml Analyst: 2027 SDG: State:
Analyses: 08271

Injection Summary

Injected on : 12/30/2016 06:31:53
Instrument : CP18--18847B
Result file : D18364B.0042.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 91% (50-150) Conc.: 21.97391

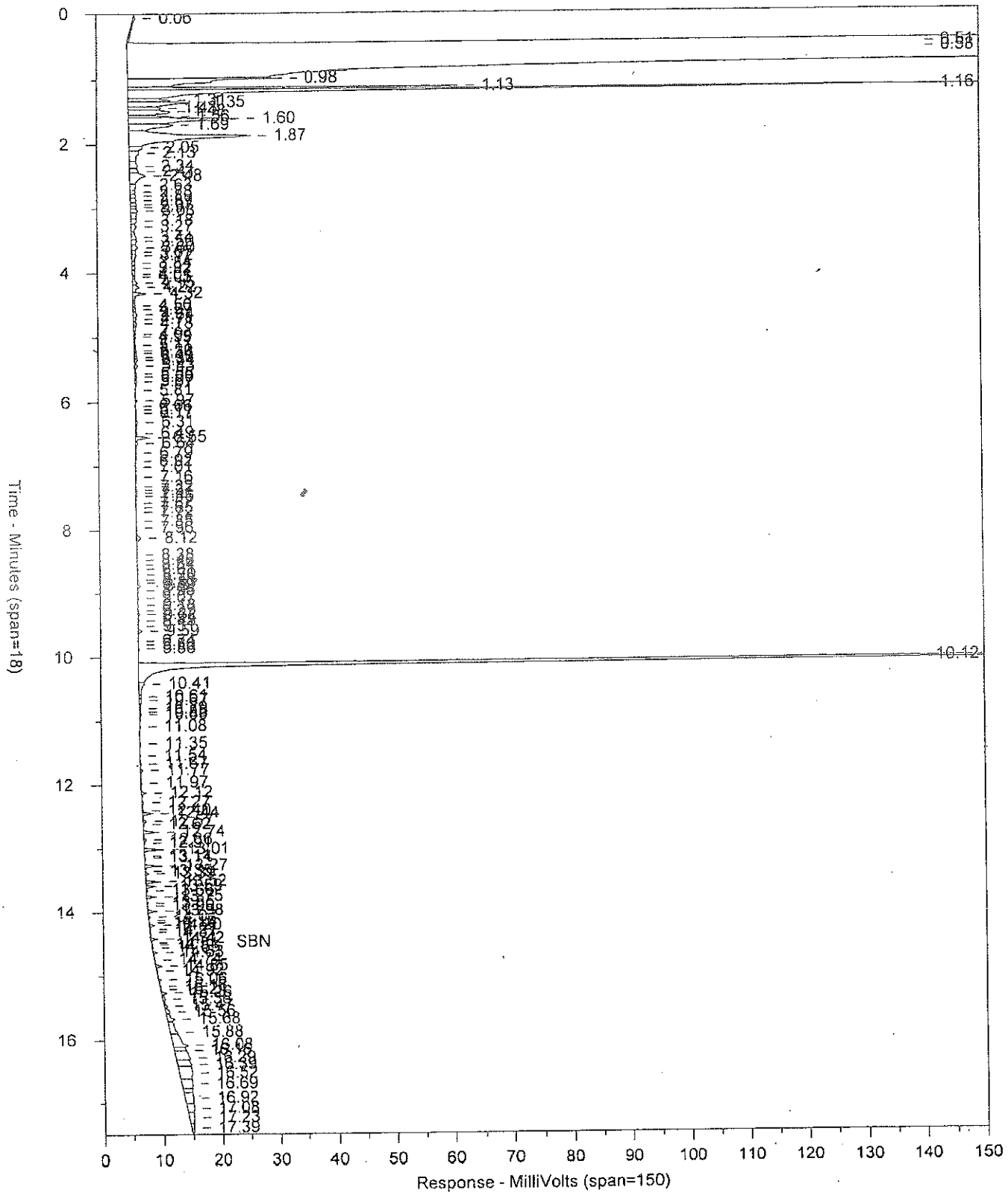
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
Diesel Range	4.64 - 12.57	630155	3.5803	<100	<30		ppb
Heavy Range	12.57 - 16.29	114305	5.2883	<250	<70		ppb
O-terphenyl	10.12 (10.11 - 10.21)	552767	21.9739				ppb
Capric Acid	6.31 (6.30 - 6.50)	1067	0.0905				ppb

Comments: _____

Reviewed by: Tom L. Wildermuth, Associate Chemist Date: DEC 30 2016

Verified by: Heather E. Williams, Senior Chemist Date: DEC 30 2016

Sample: BLANKA 12/29/16 AAPBLK23363 BLK 163630023A 08271 SW-846 8015B
File: D18364B.0042.RAW NWTPH-DX



Sample Number: BLANKA 12/29/16 AAPBLK23363 BLK 163630023A 08271 SW-846 8015B
D18364B.0042.RAW NWTPH-DX

Injected On: 12/30/2016 6:31:53 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2

Analyst: 2027

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.061	0.00	5069
C-12	4.714	0.00	1518
Capric Acid	6.488	0.00	654
C-14	6.551	0.00	4774
C-18	9.587	0.00	1832
O-terphenyl	10.117	0.02	561230
C-20	10.891	0.00	628
C-22	11.766	0.00	1047
C-24	12.440	0.00	2751
C-26	13.009	0.00	4774
C-28	13.517	0.00	3769
C-30	13.981	0.00	2531
C-32	14.421	0.00	1913
C-34	14.920	0.00	411
C-36	15.263	0.00	1474
C-38	15.676	0.00	5443
C-40	16.162	0.00	7067

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	630155
>C24 - C40	12.57	16.29	114305
o-Terphenyl	10.11	10.21	561230

RESULTS TABLE

DX C12 - C24 AREA = 630154.8

Preliminary C12 - C24 Amount = 0.003 PPM

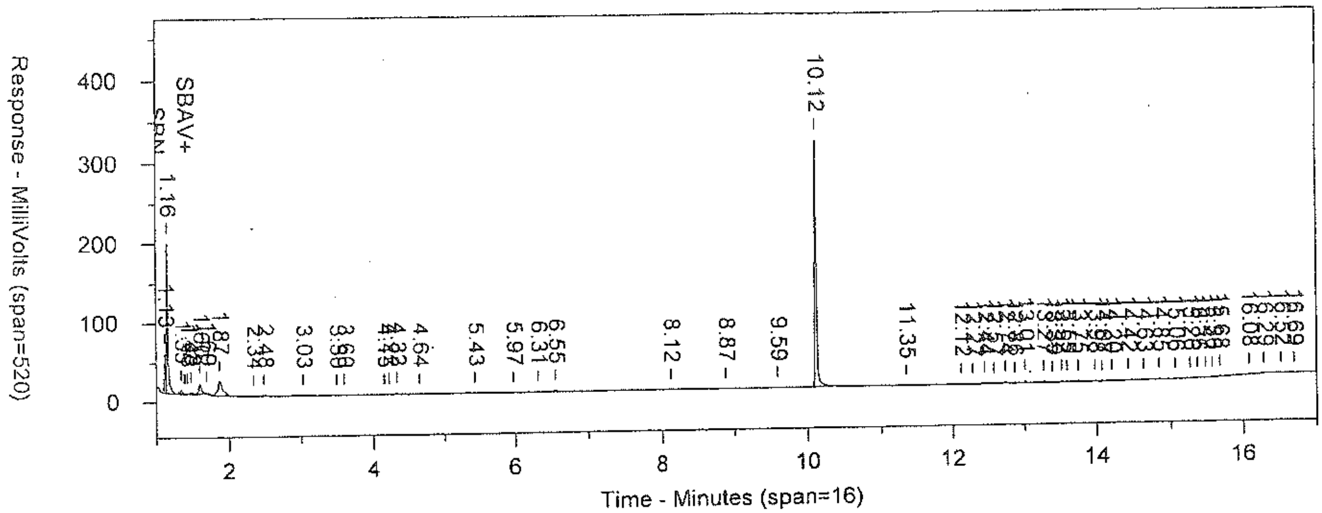
DX >C24 - C40 AREA = 114305.2

Preliminary >C24 - C40 Amount = 0.005 PPM

FILES:
Area File: D18364B.0042.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 12/30/2016 8:15:46 AM
File Reported On: 12/30/2016 at 8:16:49 AM

Chrom Perfect Chromatogram Report

BLANKA 12/29/16 AAPBLK23363 BLK 163630023A 08271 SW-846 8015B
D18364B.0042.RAW NWTPH-DX



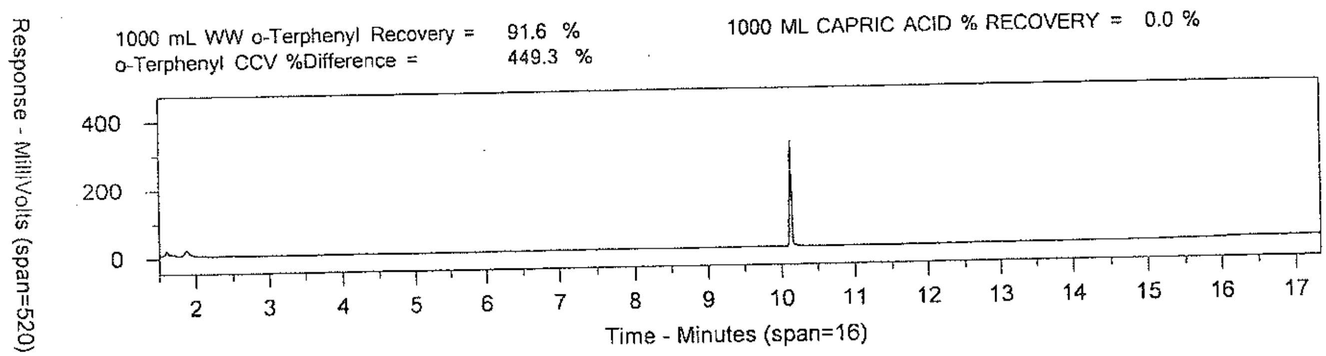
Sample Number: BLANKA 12/29/16 AAPBLK23363 BLK 163630023A 08271
Injected On: 12/30/2016 6:31:53 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

SW-846 8015B
Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2
Analyst: 2027

Compound	RT	Amount ppm	Area
Capric Acid	6.308	0.0001	1066.553
C-14	6.551	0.0002	3932.84
C-18	9.587	0.0001	1592.576
O-terphenyl	10.117	0.0220	552767.4
C-24	12.440	0.0001	2236.989
C-26	13.009	0.0002	4773.994
C-28	13.517	0.0002	3635.537
C-30	13.981	0.0001	2531.288
C-32	14.421	0.0001	1912.665
C-34	14.845	0.0001	2625.615
C-36	15.263	0.0000	1018.738
C-38	15.676	0.0001	1248.885
C-40	16.080	0.0001	1226.978

1000 mL WW o-Terphenyl Recovery = 91.6 %
o-Terphenyl CCV %Difference = 449.3 %

1000 ML CAPRIC ACID % RECOVERY = 0.0 %



Area File: D18364B.0042.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 12/30/2016 8:15:46 AM
File Reported On: 12/30/2016 at 8:18:41 AM
Format: 2DXREPLOTI.FMT

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: LCSA 12/29/16 LCS23363 Sample ID: AA **Batchnumber:** 163630023A
Sample Amount: 1000. Total Volume: 2. ml Analyst:2027 SDG: State:
Analyses: 08271

Injection Summary

Injected on : 12/30/2016 06:53:34
Instrument : CP18--18847B
Result file : D18364B.0043.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 95% (50-150) Conc.: 22.70186

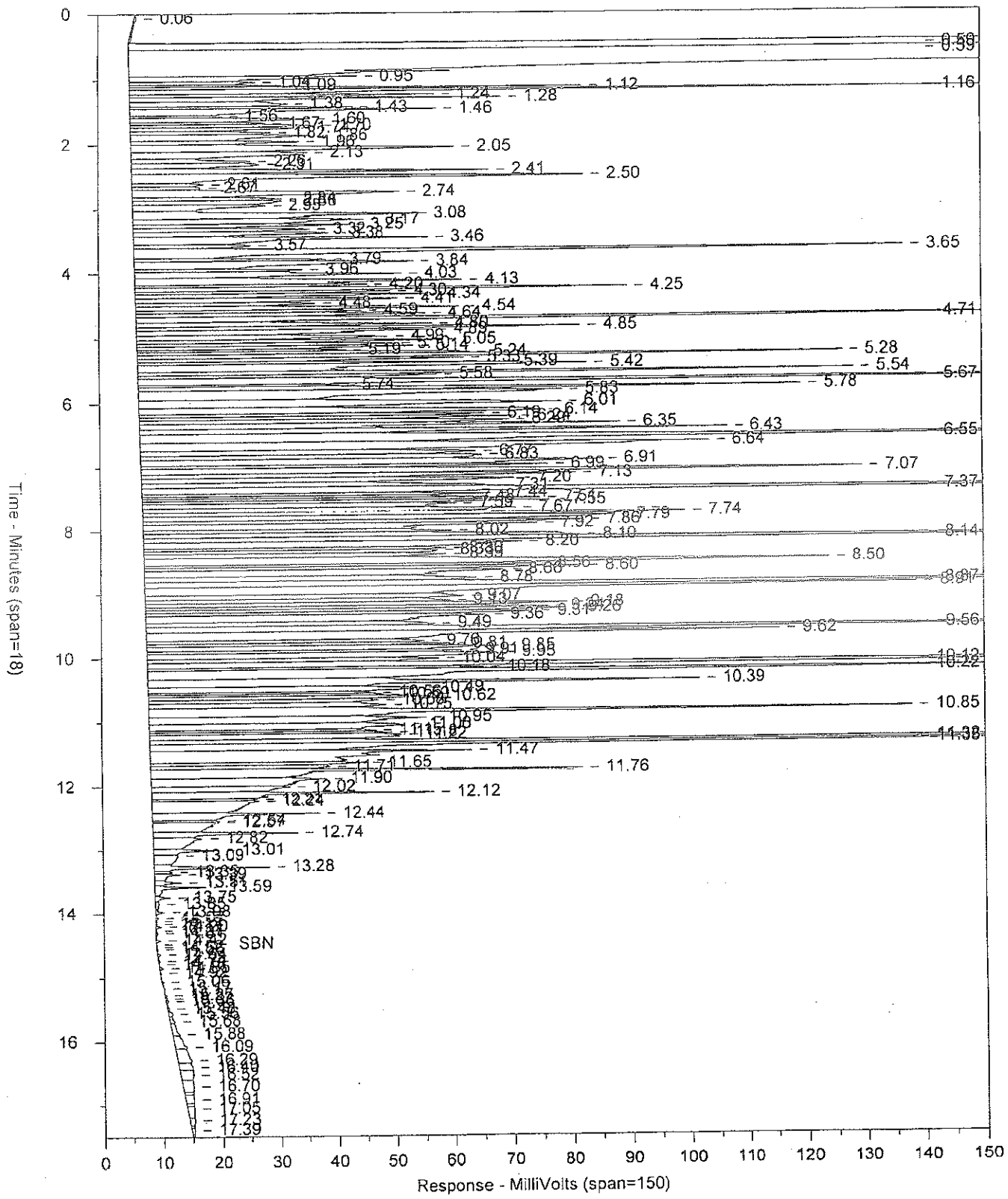
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	26449384	1197.2488	100	30		ppb
☐ Heavy Range	12.57 - 16.29	390773	18.0789	<250	<70		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	571079	22.7019				ppb
☐ Capric Acid	6.43 (6.30 - 6.50)	106516	9.0380				ppb

Comments: _____

Reviewed by: Tom C. Wildermuth Associate Chemist
Date: DEC 30 2016

Verified by: Heather E. Williams Senior Chemist
Date: DEC 30 2016

Sample: LCSA 12/29/16 AALCS23363 LCS 163630023A 08271 SW-846 8015B
File: D18364B.0043.RAW NWTPH-DX



Sample Number: LCSA 12/29/16 AALCS23363 LCS 163630023A 08271 SW-846 8015B
D18364B.0043.RAW NWTPH-DX

Injected On: 12/30/2016 6:53:34 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2

Analyst: 2027

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.062	0.00	5899
C-12	4.708	0.02	353586
Capric Acid	6.428	0.02	286987
C-14	6.547	0.03	753315
C-16	8.140	0.03	564350
C-18	9.624	0.02	485922
O-terphenyl	10.175	0.00	114858
C-20	10.848	0.02	479296
C-22	11.760	0.01	279355
C-24	12.439	0.01	101918
C-26	13.009	0.00	33979
C-28	13.513	0.00	10914
C-30	13.978	0.00	3137
C-32	14.421	0.00	1187
C-34	14.920	0.00	603
C-36	15.323	0.00	747
C-38	15.681	0.00	4072
C-40	16.086	0.00	19430

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	26449380
>C24 - C40	12.57	16.29	390773
o-Terphenyl	10.11	10.21	915976

RESULTS TABLE

DX C12 - C24 AREA = 2.644938E+07

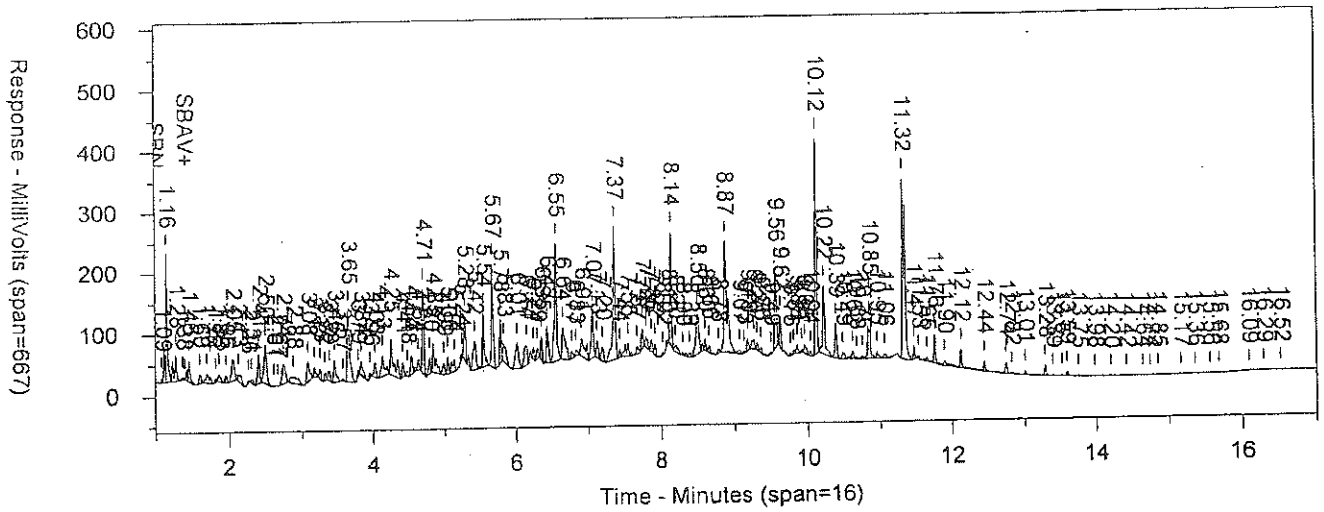
Preliminary C12 - C24 Amount = 1.218 PPM

DX >C24 - C40 AREA = 390772.9

Preliminary >C24 - C40 Amount = 0.018 PPM

FILES:
Area File: D18364B.0043.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 12/30/2016 8:15:46 AM
File Reported On: 12/30/2016 at 8:16:55 AM

LCSA 12/29/16 AALCS23363 LCS 163630023A 08271 SW-846 8015B
D18364B.0043.RAW NWTPH-DX



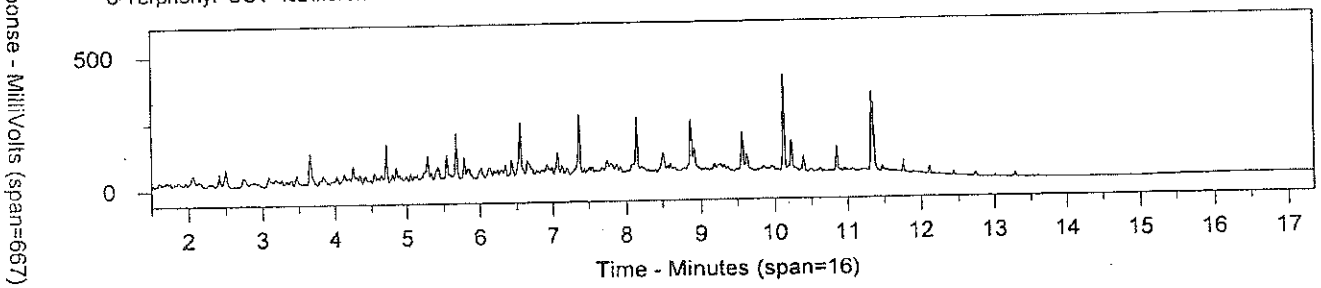
Sample Number: LCSA 12/29/16 AALCS23363 LCS 163630023A 08271 SW-846 8015B
Injected On: 12/30/2016 6:53:34 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2
Analyst: 2027

Compound	RT	Amount ppm	Area
C-12	4.708	0.0104	226581.2
Capric Acid	6.428	0.0090	106515.6
C-14	6.547	0.0188	410814.7
C-16	8.140	0.0132	292336.7
C-18	9.624	0.0036	81073.69
O-terphenyl	10.120	0.0227	571079.4
C-20	10.848	0.0076	172353.4
C-22	11.760	0.0031	67309.77
C-24	12.439	0.0012	23661.64
C-26	13.009	0.0005	9640.138
C-28	13.513	0.0002	4016.515
C-30	13.978	0.0001	2114.293
C-32	14.421	0.0001	1187.138
C-34	14.847	0.0001	1264.932
C-36	15.361	0.0001	1914.57
C-38	15.681	0.0000	605.5247
C-40	16.086	0.0000	687.498

1000 mL WW o-Terphenyl Recovery = 94.6 %
o-Terphenyl CCV %Difference = 467.5 %

1000 ML CAPRIC ACID % RECOVERY = 0.9 %



Area File: D18364B.0043.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 12/30/2016 8:15:46 AM
File Reported On: 12/30/2016 at 8:18:49 AM
Format: 2DXREPLOTI.FMT

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: LCSDA 12/29/16 LCSD23363 Sample ID: AA **Batchnumber:** 163630023A
Sample Amount: 1000. Total Volume: 2. ml Analyst: 2027 SDG: State:
Analyses: 08271

Injection Summary

Injected on : 12/30/2016 07:15:03
Instrument : CP18--18847B
Result file : D18364B.0044.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 92% (50-150) Conc.: 22.21243

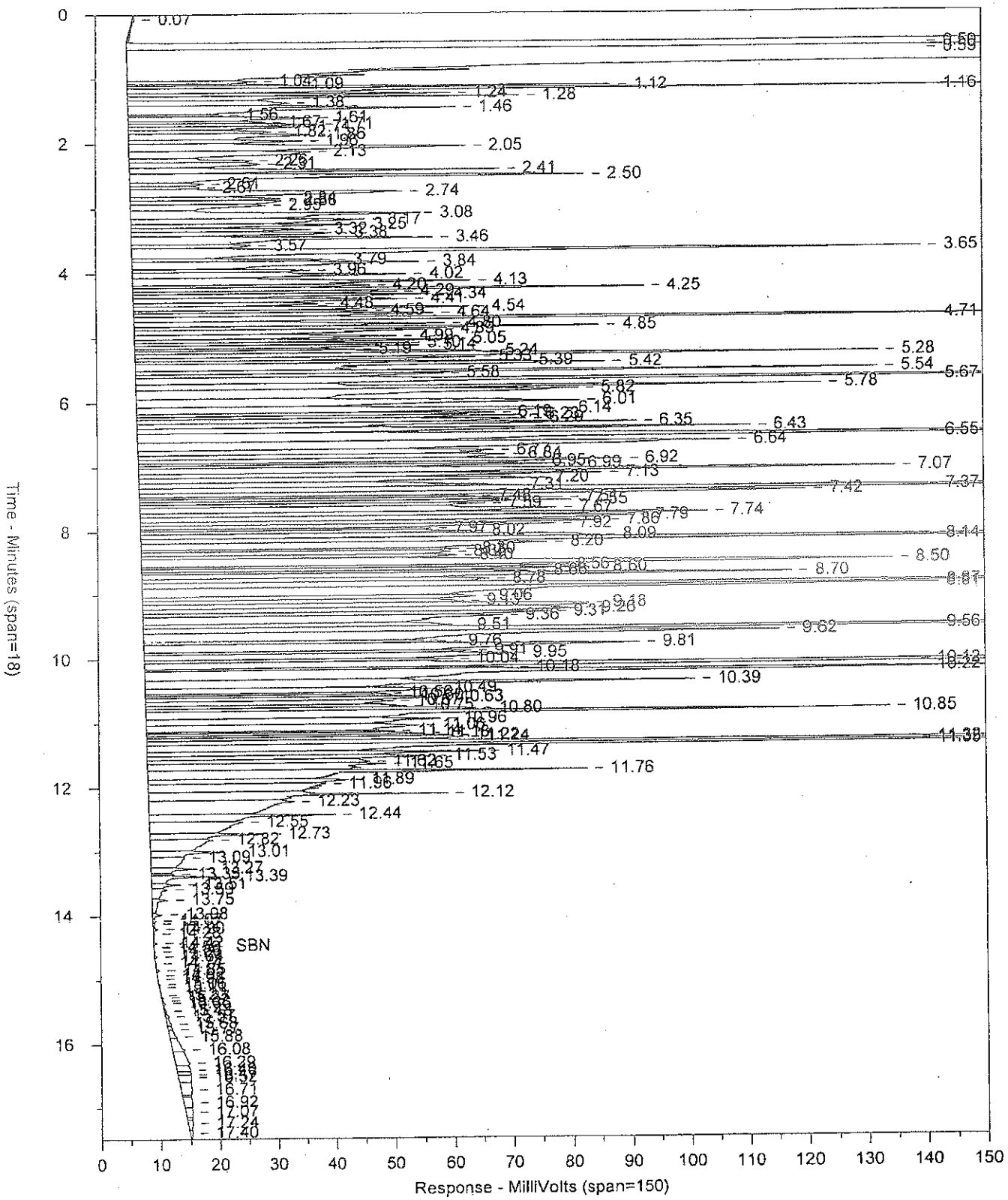
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	28306678	1283.7453	100	30		ppb
☐ Heavy Range	12.57 - 16.29	410390	18.9865	<250	<70		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	558767	22.2124				ppb
☐ Capric Acid	6.43 (6.30 - 6.50)	108426	9.2001				ppb

Comments: _____

Reviewed by: Tom C. Widermuth
Tom C. Widermuth
Associate Chemist
Date: DEC 30 2016

Verified by: Heather E Williams
Heather E. Williams
Senior Chemist
Date: DEC 30 2016

Sample: LCSDA 12/29/16 AALCSD23363 LCSD 163630023A 08271 SW-846 8015B
File: D18364B.0044.RAW NWTPH-DX



Sample Number: LCSDA 12/29/16 AALCSD23363 LCSD 163630023A 08271 SW-846 8015B
D18364B.0044.RAW NWTPH-DX

Injected On: 12/30/2016 7:15:03 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2

Analyst: 2027

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.072	0.00	5572
C-12	4.708	0.02	364579
Capric Acid	6.429	0.03	312919
C-14	6.547	0.04	773204
C-16	8.203	0.02	368492
C-18	9.625	0.02	524685
O-terphenyl	10.178	0.00	104677
C-20	10.846	0.02	422164
C-22	11.759	0.01	314066
C-24	12.435	0.01	126992
C-26	13.008	0.00	42374
C-28	13.513	0.00	13535
C-30	13.980	0.00	3939
C-32	14.424	0.00	1063
C-34	14.922	0.00	279
C-36	15.318	0.00	496
C-38	15.681	0.00	3776
C-40	16.083	0.00	19288

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	28306680
>C24 - C40	12.57	16.29	410390
o-Terphenyl	10.11	10.21	951926

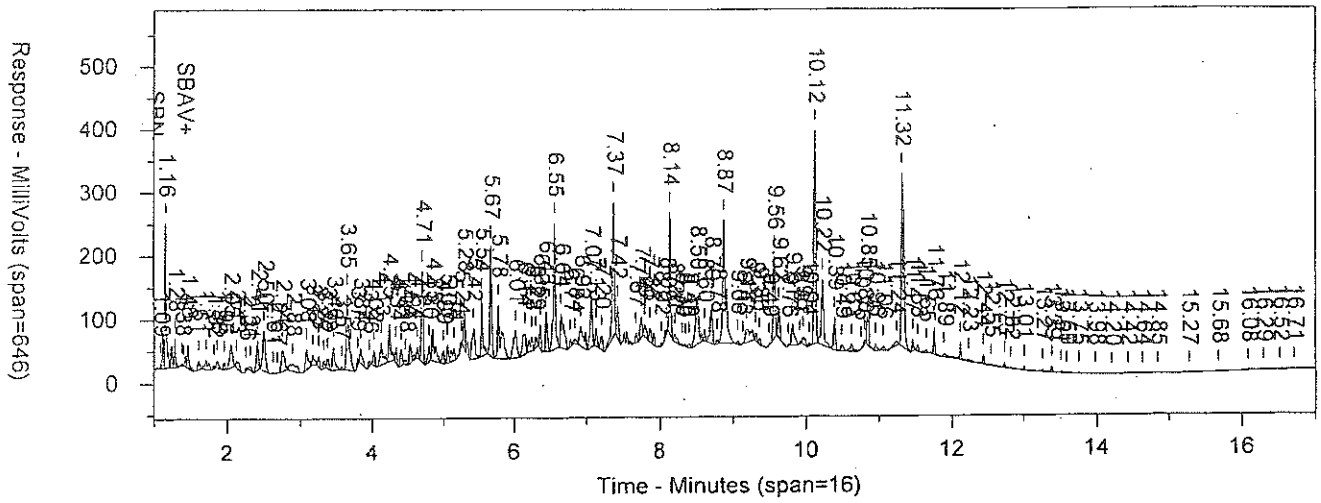
RESULTS TABLE

DX C12 - C24 AREA = 2.830668E+07 Preliminary C12 - C24 Amount = 1.305 PPM

DX >C24 - C40 AREA = 410389.9 Preliminary >C24 - C40 Amount = 0.019 PPM

FILES:
Area File: D18364B.0044.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 12/30/2016 8:15:46 AM
File Reported On: 12/30/2016 at 8:17:01 AM

LCSDA 12/29/16 AALCSD23363 LCSD 163630023A 08271 SW-846 8015B
D18364B.0044.RAW NWTPH-DX



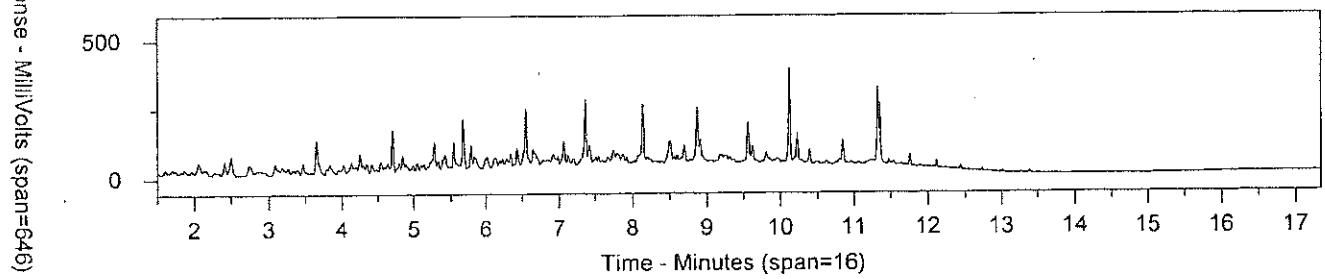
Sample Number: LCSDA 12/29/16 AALCSD23363 LCSD 163630023A 08271 SW-846 8015B
Injected On: 12/30/2016 7:15:03 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2
Analyst: 2027

Compound	RT	Amount ppm	Area
#2 FUEL OIL (C12-C24	0.072	0.0003	5484.946
C-12	4.708	0.0108	235010.4
Capric Acid	6.429	0.0092	108426.2
C-14	6.547	0.0188	411677.7
C-16	8.203	0.0016	36247.06
C-18	9.625	0.0035	79314.65
O-terphenyl	10.119	0.0222	558767.4
C-20	10.846	0.0053	118797.4
C-22	11.759	0.0026	57120.72
C-24	12.435	0.0011	21503.9
C-26	13.008	0.0004	8342.169
C-28	13.513	0.0002	3944.843
C-30	13.980	0.0001	1980.532
C-32	14.424	0.0001	1063.04
C-34	14.845	0.0001	1203.939
C-36	15.270	0.0000	456.3398
C-38	15.681	0.0001	1653.803
C-40	16.083	0.0001	1242.791

1000 mL WW o-Terphenyl Recovery = 92.6 %
o-Terphenyl CCV %Difference = 455.3 %

1000 ML CAPRIC ACID % RECOVERY = 0.9 %



Area File: D18364B.0044.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 12/30/2016 8:15:46 AM
File Reported On: 12/30/2016 at 8:18:57 AM
Format: 2DXREPLOTI.FMT

NWTPH-Dx by GC with Silica Gel Data

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: 8753059S OLY07 Sample ID: AB **Batchnumber:** 163630024A
Sample Amount: 1044. Total Volume: 2. ml Analyst: 10210 SDG: WAN02 State: WA
Analyses: 02211

Injection Summary

Injected on : 1/4/2017 05:15:56
Instrument : CP18--18847B
Result file : D18003B.0028.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 96% (50-150) Conc.: 22.00281

Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	797240	9.7223	<95.7854	<28.7356		ppb
☐ Heavy Range	12.57 - 16.29	114690	5.0825	<239.4636	<67.0498		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	577848	22.0028				ppb
☐ Capric Acid	6.45 (6.30 - 6.50)	1394	0.1133				ppb

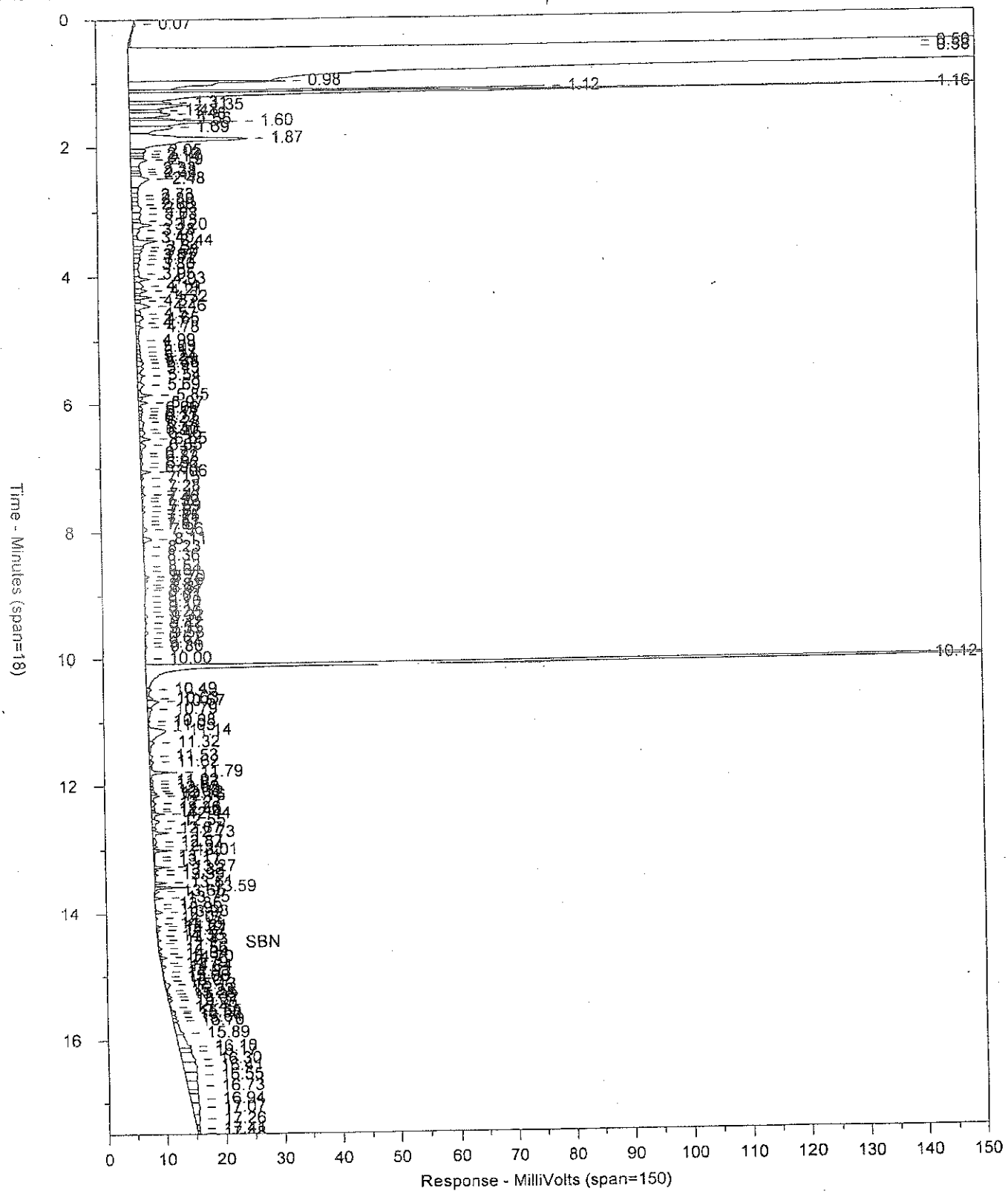
Comments: _____

Reviewed by: AED 10210
Date: 1/5/17

Verified by: Jamie L. Gallagher
Date: Jamie L. Gallagher
Senior Chemist

JAN 06 2017

Sample: 8753059S ABOLY07 T 163630024A 02211 ECY 97-602 NWTPH-Dx modifiec
File: D18003B.0028.RAW NWTPH-DX



Sample Number: 8753059S ABOLY07 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0028.RAW NWTPH-DX

Injected On: 1/4/2017 5:15:56 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1044
Dilution Factor: 2
Injection Volume: 2

Analyst: 10210

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.066	0.00	5411
C-12	4.713	0.00	2169
Capric Acid	6.398	0.00	1192
C-14	6.547	0.00	5172
C-18	9.582	0.00	1516
O-terphenyl	10.117	0.02	583131
C-22	11.788	0.00	10017
C-24	12.437	0.00	5242
C-26	13.007	0.00	5171
C-28	13.515	0.00	2909
C-30	13.978	0.00	2502
C-32	14.427	0.00	930
C-34	14.931	0.00	699
C-36	15.324	0.00	1386
C-38	15.697	0.00	2716
C-40	16.175	0.00	8565

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	797240
>C24 - C40	12.57	16.29	114690
o-Terphenyl	10.11	10.21	583131

RESULTS TABLE

DX C12 - C24 AREA = 797240

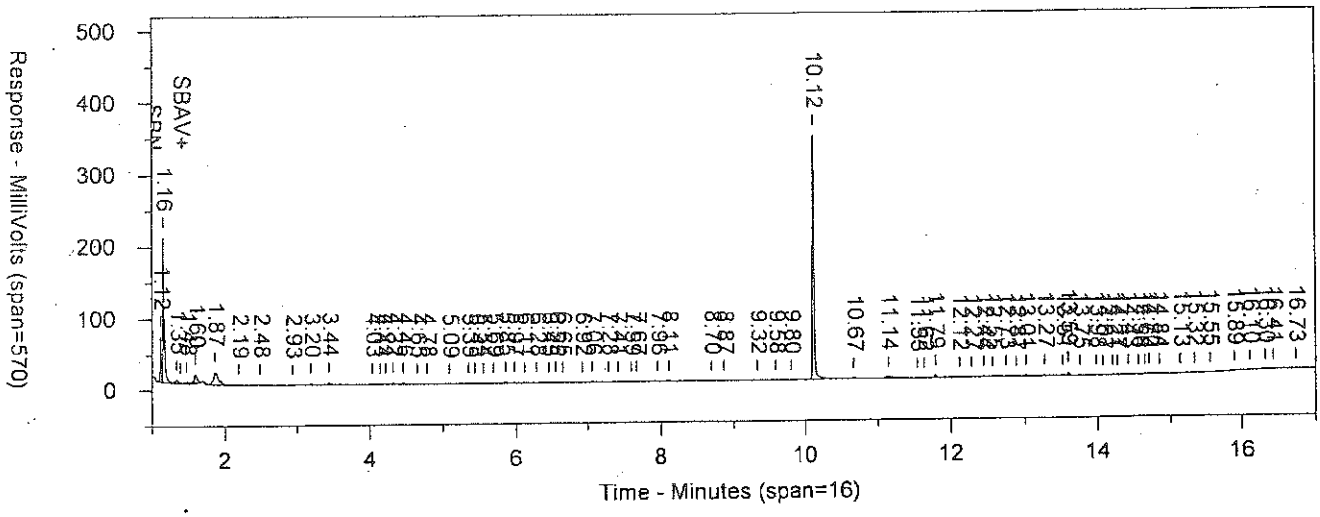
DX >C24 - C40 AREA = 114690.2

Preliminary C12 - C24 Amount = 0.009 PPM

Preliminary >C24 - C40 Amount = 0.005 PPM

FILES:
Area File: D18003B.0028.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 1/4/2017 5:33:39 AM
File Reported On: 1/4/2017 at 5:33:46 AM

8753059S ABOLY07 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0028.RAW NWTPH-DX



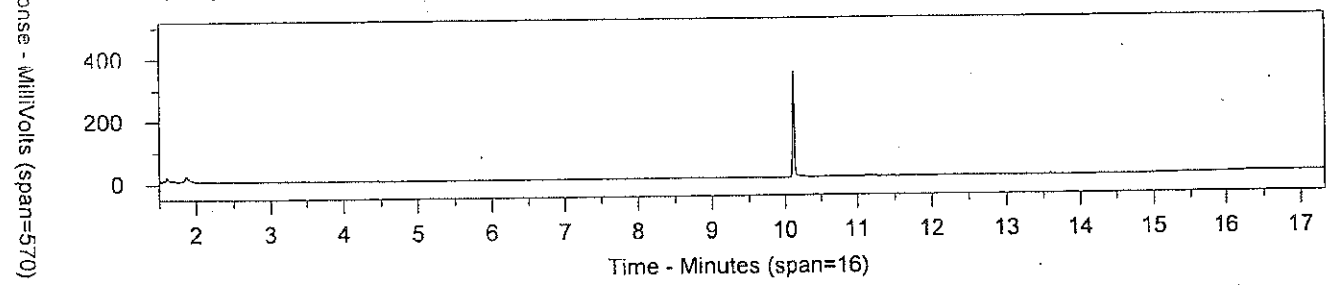
Sample Number: 8753059S ABOLY07 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
Injected On: 1/4/2017 5:15:56 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1044
Dilution Factor: 2
Injection Volume: 2
Analyst: 10210

Compound	RT	Amount ppm	Area
C-12	4.780	0.0001	1696.05
Capric Acid	6.454	0.0001	1393.617
C-14	6.547	0.0001	3252.807
C-18	9.582	0.0001	1516.199
O-terphenyl	10.117	0.0220	577848.2
C-22	11.788	0.0003	7048.41
C-24	12.437	0.0001	2265.73
C-26	13.007	0.0002	4249.451
C-28	13.515	0.0001	2909.224
C-30	13.978	0.0001	2501.853
C-32	14.427	0.0000	928.6616
C-34	14.840	0.0001	1737.87
C-36	15.324	0.0001	1210.971
C-40	16.104	0.0000	651.8262

1000 mL WW o-Terphenyl Recovery = 95.7 %
o-Terphenyl CCV %Difference = 474.3 %

1000 ML CAPRIC ACID % RECOVERY = 0.0 %



Area File: D18003B.0028.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 1/4/2017 5:33:39 AM
File Reported On: 1/4/2017 at 5:33:56 AM
Format: 2DXREPLOTI.FMT

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: 8753061S OLY08 Sample ID: AB **Batchnumber:** 163630024A
Sample Amount: 1037. Total Volume: 2. ml Analyst: 10210 SDG: WAN02 State: WA
Analyses: 02211

Injection Summary

Injected on : 1/4/2017 05:37:29
Instrument : CP18--18847B
Result file : D18003B.0029.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 67% (50-150) Conc.: 15.51119

Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	5209350	214.3571	96.432	28.9296		ppb
☐ Heavy Range	12.57 - 16.29	1453365	64.8402	<241.08	<67.5024		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	404631	15.5112				ppb
☐ Capric Acid	6.39 (6.30 - 6.50)	260238	21.2938				ppb

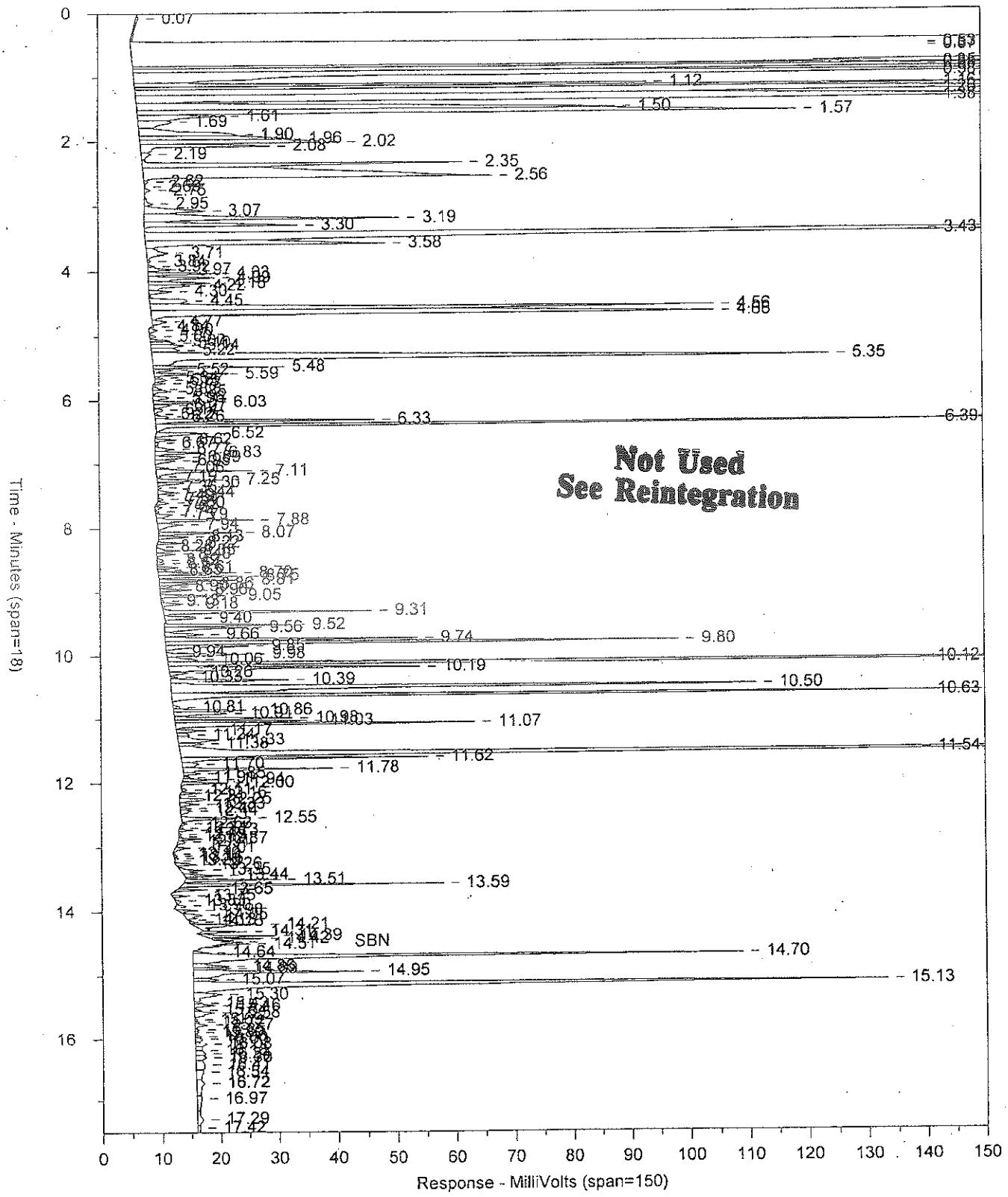
Comments: _____

Reviewed by: DE/10210
Date: 1/5/17

Verified by: _____
Date: _____
Jamie L. Grillhart
Senior Chemist

JAN 06 2017

Sample: 8753061S ABOLY08 T 163630024A 02211 ECY 97-602 NWTPH-Dx modifie
File: D18003B.0029.RAW NWTPH-DX



Chrom Perfect Chromatogram Report

Sample Number: 8753061S ABOLY08 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0029.RAW NWTPH-DX

Injected On: 1/4/2017 5:37:29 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1037
Dilution Factor: 2
Injection Volume: 2

Analyst: 10210

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.070	0.00	5753
C-12	4.769	0.00	6517
Capric Acid	6.394	0.02	263338
C-14	6.616	0.00	6005
C-16	8.133	0.00	9887
C-18	9.558	0.00	31523
O-terphenyl	10.191	0.00	95009
C-20	10.859	0.00	22878
C-22	11.784	[illegible]	39253
C-24	12.437	0.00	[illegible]
C-26	13.006	0.00	5031
C-28	13.507	0.00	28343
C-30	13.976	0.00	5748
C-32	14.423	0.00	9421
C-34	14.890	0.00	12325
C-36	15.295	0.00	18753
C-38	15.724	0.00	1320
C-40	16.181	0.00	4680

Not Used
See Reintegration

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	4516889
>C24 - C40	12.57	16.29	974194
o-Terphenyl	10.11	10.21	519988

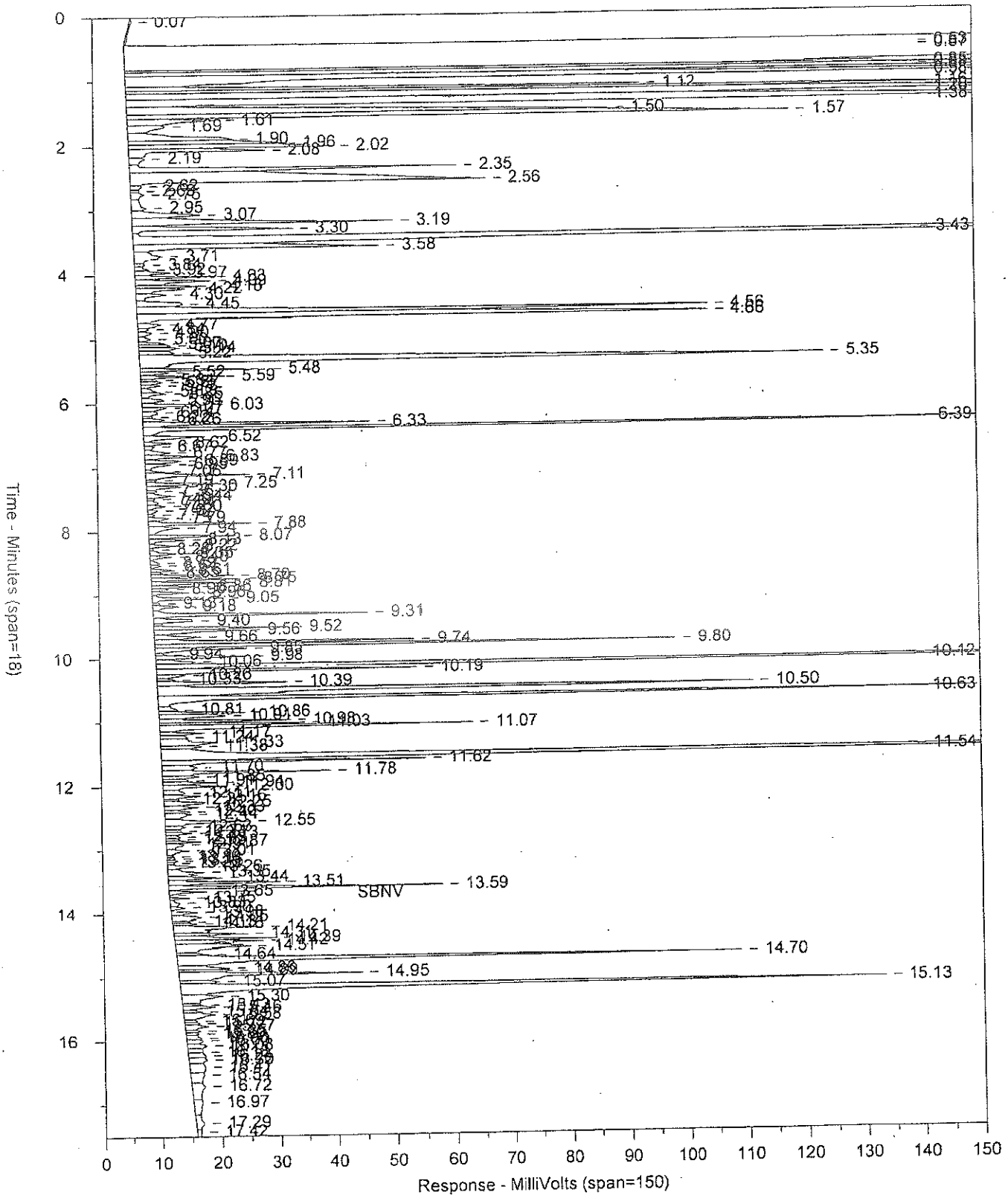
RESULTS TABLE

DX C12 - C24 AREA = 4516889 Preliminary C12 - C24 Amount = 0.197 PPM

DX >C24 - C40 AREA = 974194.4 Preliminary >C24 - C40 Amount = 0.043 PPM

FILES:
Area File: D18003B.0029.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 1/4/2017 5:55:13 AM
File Reported On: 1/4/2017 at 8:39:10 PM

Sample: 8753061S ABOLY08 T 163630024A 02211 ECY 97-602 NWTPH-Dx modifie
File: D18003B.0029.RAW NWTPH-DX



Sample Number: 8753061S ABOLY08 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0029.RAW NWTPH-DX

Injected On: 1/4/2017 5:37:29 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1037
Dilution Factor: 2
Injection Volume: 2

Analyst: 10210

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.070	0.00	5753
C-12	4.769	0.00	14355
Capric Acid	6.394	0.02	273857
C-14	6.818	0.00	10222
C-16	8.133	0.00	13996
C-18	9.558	0.00	36785
O-terphenyl	10.191	0.00	103857
C-20	10.859	0.00	29624
C-22	11.784	0.00	55655
C-24	12.437	0.00	17897
C-26	13.006	0.00	10917
C-28	13.507	0.00	40770
C-30	13.976	0.00	10313
C-32	14.423	0.00	36203
C-34	14.890	0.00	17546
C-36	15.295	0.00	36633
C-38	15.724	0.00	5069
C-40	16.181	0.00	10192

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	5209350 M
>C24 - C40	12.57	16.29	1453366
o-Terphenyl	10.11	10.21	535912

RESULTS TABLE

DX C12 - C24 AREA = 5209350

DX >C24 - C40 AREA = 1453366

Preliminary C12 - C24 Amount = 0.228 PPM

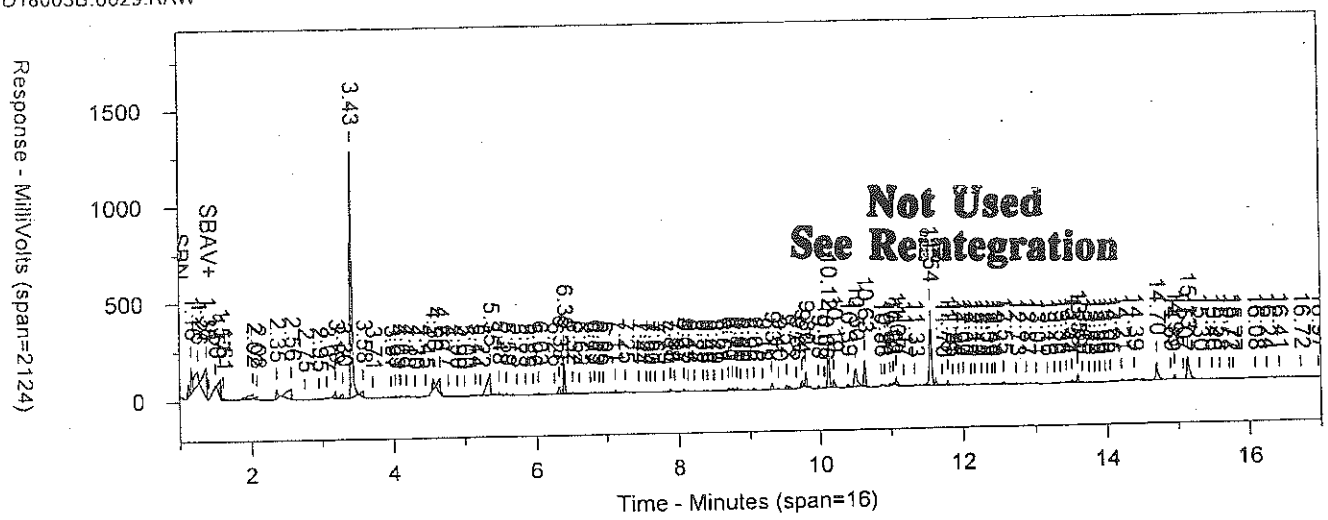
Preliminary >C24 - C40 Amount = 0.065 PPM

FILES:
Area File: D18003B.0029.BND
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 1/4/2017 8:39:46 PM
File Reported On: 1/4/2017 at 8:39:48 PM

M = Manually Integrated
Analyst QE10210 1/4/17
Approved by [illegible] 1-6-17
Circle Reason 1 (2) 3 4
1 = Missed Peak
2 = Improper Baseline
3 = RT Update
4 = Other _____

Printed on 1/4/2017 8:39:49 PM

8753061S ABOLY08 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0029.RAW NWTPH-DX



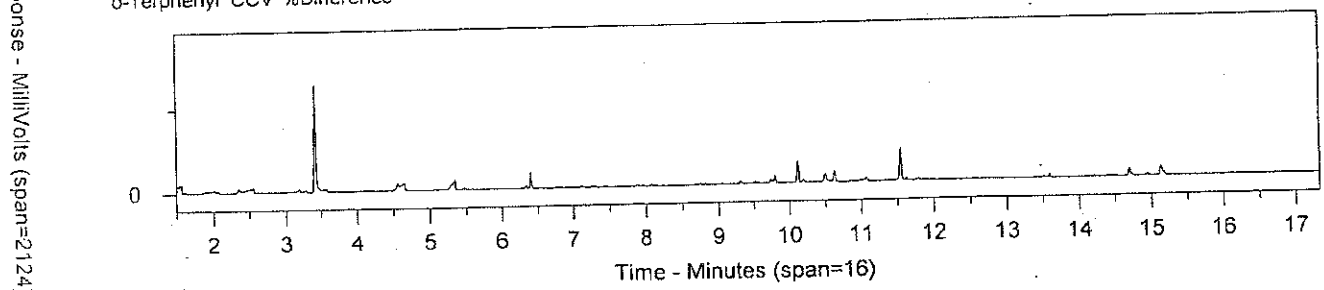
Sample Number: 8753061S ABOLY08 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
Injected On: 1/4/2017 5:37:29 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1037
Dilution Factor: 2
Injection Volume: 2
Analyst: 10210

Compound	RT	Amount ppm	Area
C-12	4.769	0.0003	7006.676
Capric Acid	6.394	0.0213	260238.3
C-14	6.616	0.0003	7470.071
C-16	8.133	0.0003	6374.91
O-terphenyl	10.191	0.0031	79581.41
C-20	10.859	0.0005	11236.98
C-22	11.784	0.0014	31316.94
C-24	12.437	0.0001	3012.411
C-26	13.006	0.0002	5031.315
C-28	13.507	0.0014	28343.3
C-30	13.976	0.0003	5748.057
C-34	14.890	0.0003	7775.364
C-36	15.295	0.0004	8417.466
C-38	15.724	0.0000	651.5795
C-40	16.078	0.0001	2833.444

1000 mL WW o-Terphenyl Recovery = 13.2 %
o-Terphenyl CCV %Difference = -20.9 %

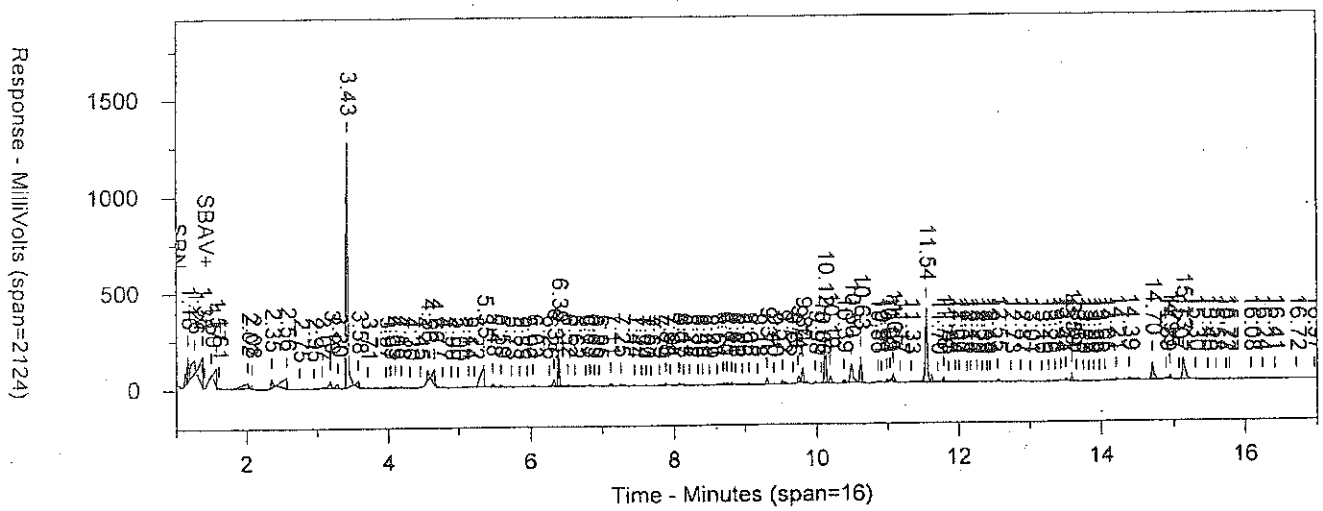
1000 ML CAPRIC ACID % RECOVERY = 2.3 %



Area File: D18003B.0029.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 1/4/2017 5:55:13 AM
File Reported On: 1/4/2017 at 8:39:18 PM
Format: 2DXREPLOTI.FMT

8753061S ABOLY08 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0029.RAW NWTPH-DX



Sample Number: 8753061S ADOLY08 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
Injected On: 1/4/2017 5:37:29 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

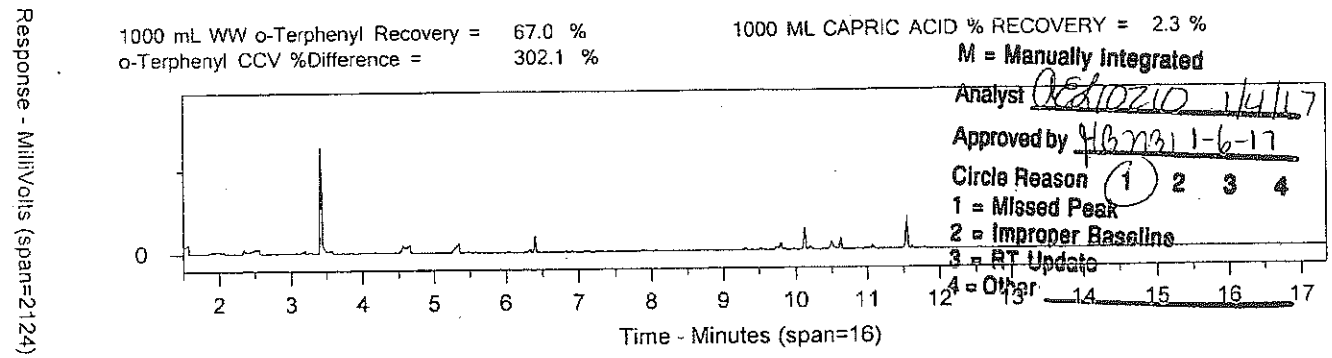
Sample Weight: 1037
Dilution Factor: 2
Injection Volume: 2
Analyst: 10210

Compound	RT	Amount ppm	Area
C-12	4.769	0.0003	7006.676
Capric Acid	6.394	0.0213	260238.3
C-14	6.616	0.0003	7470.071
C-16	8.133	0.0003	6374.91
O-terphenyl	10.115	0.0155	404630.8 M
C-20	10.859	0.0005	11236.98
C-22	11.784	0.0014	31316.94
C-24	12.437	0.0001	3012.411
C-26	13.006	0.0002	5031.315
C-28	13.507	0.0014	28343.3
C-30	13.976	0.0003	5748.057
C-34	14.890	0.0003	7775.364
C-36	15.295	0.0004	8417.466
C-38	15.724	0.0000	651.5795
C-40	16.078	0.0001	2833.444

1000 mL WW o-Terphenyl Recovery = 67.0 %
o-Terphenyl CCV %Difference = 302.1 %

1000 ML CAPRIC ACID % RECOVERY = 2.3 %

M = Manually Integrated
Analyst 10210 1/4/17
Approved by [illegible] 1-6-17
Circle Reason (1) 2 3 4
1 = Missed Peak
2 = Improper Baseline
3 = RT Update
4 = Other



Area File: D18003B.0029.BND
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 1/4/2017 8:41:11 PM
File Reported On: 1/4/2017 at 8:41:14 PM
Format: 2DXREPLOTI.FMT

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: 8753063S OLY09 Sample ID: AB **Batchnumber:** 163630024A
Sample Amount: 1060. Total Volume: 2. ml Analyst: 10210 SDG: WAN02 State: WA
Analyses: 02211

Injection Summary

Injected on : 1/4/2017 05:59:02
Instrument : CP18--18847B
Result file : D18003B.0030.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 93% (50-150) Conc.: 21.01007

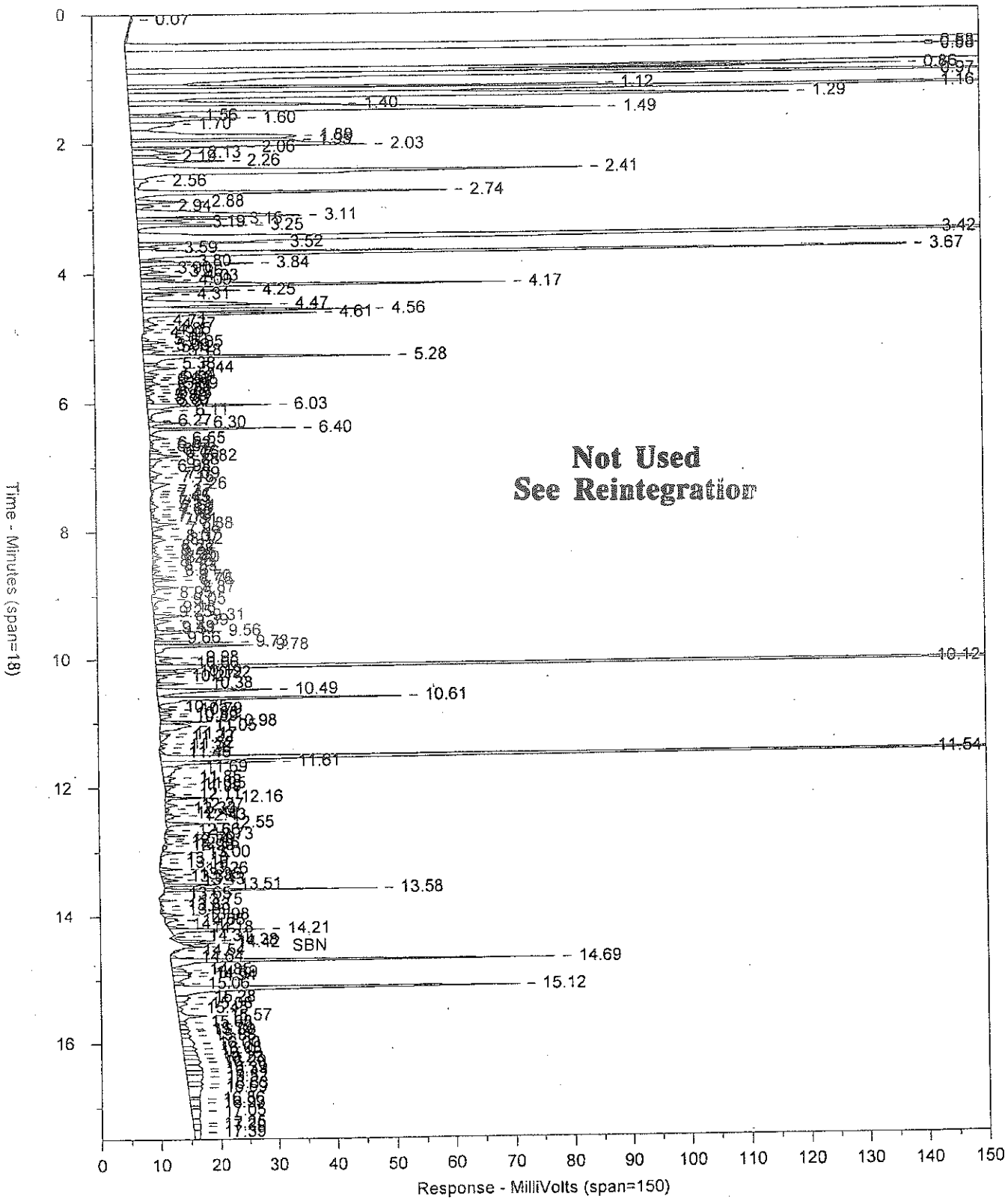
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	2568417	87.6488	<94.3396	28.3019	J	ppb
☐ Heavy Range	12.57 - 16.29	757059	33.0425	<235.8491	<66.0377		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	560233	21.0101				ppb
☐ Capric Acid	6.40 (6.30 - 6.50)	34986	2.8006				ppb

Comments: ______________________

Reviewed by: 0210210 Verified by: Janis L. Brillhart Senior Chemist
Date: 1/5/17 Date:

JAN 06 2017

Sample: 8753063S ABOLY09 T 163630024A 02211 ECY 97-602 NWTPH-Dx modifie
File: D18003B.0030.RAW NWTPH-DX



Sample Number: 8753063S ABOLY09 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0030.RAW NWTPH-DX

Injected On: 1/4/2017 5:59:02 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1060
Dilution Factor: 2
Injection Volume: 2

Analyst: 10210

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.068	0.00	5466
C-12	4.711	0.00	1643
Capric Acid	6.397	0.00	38151
C 14	6.545	0.00	7881
C-18	9.558	0.00	18093
O-terphenyl	10.190	0.00	5547
C-20	10.893	0.00	4878
C-24	12.434	0.00	5634
C-26	13.004	0.00	6039
C-28	13.508	0.00	15072
C-30	13.975	0.00	6262
C-32	14.420	0.00	6898
C-34	14.887	0.00	10074
C-36	15.276	0.00	10443
C-38	15.676	0.00	3210
C-40	16.165	0.00	9010

Not Used
See Reintegration

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	1896209
>C24 - C40	12.57	16.29	597804
o-Terphenyl	10.11	10.21	579018

RESULTS TABLE

DX C12 - C24 AREA = 1896209

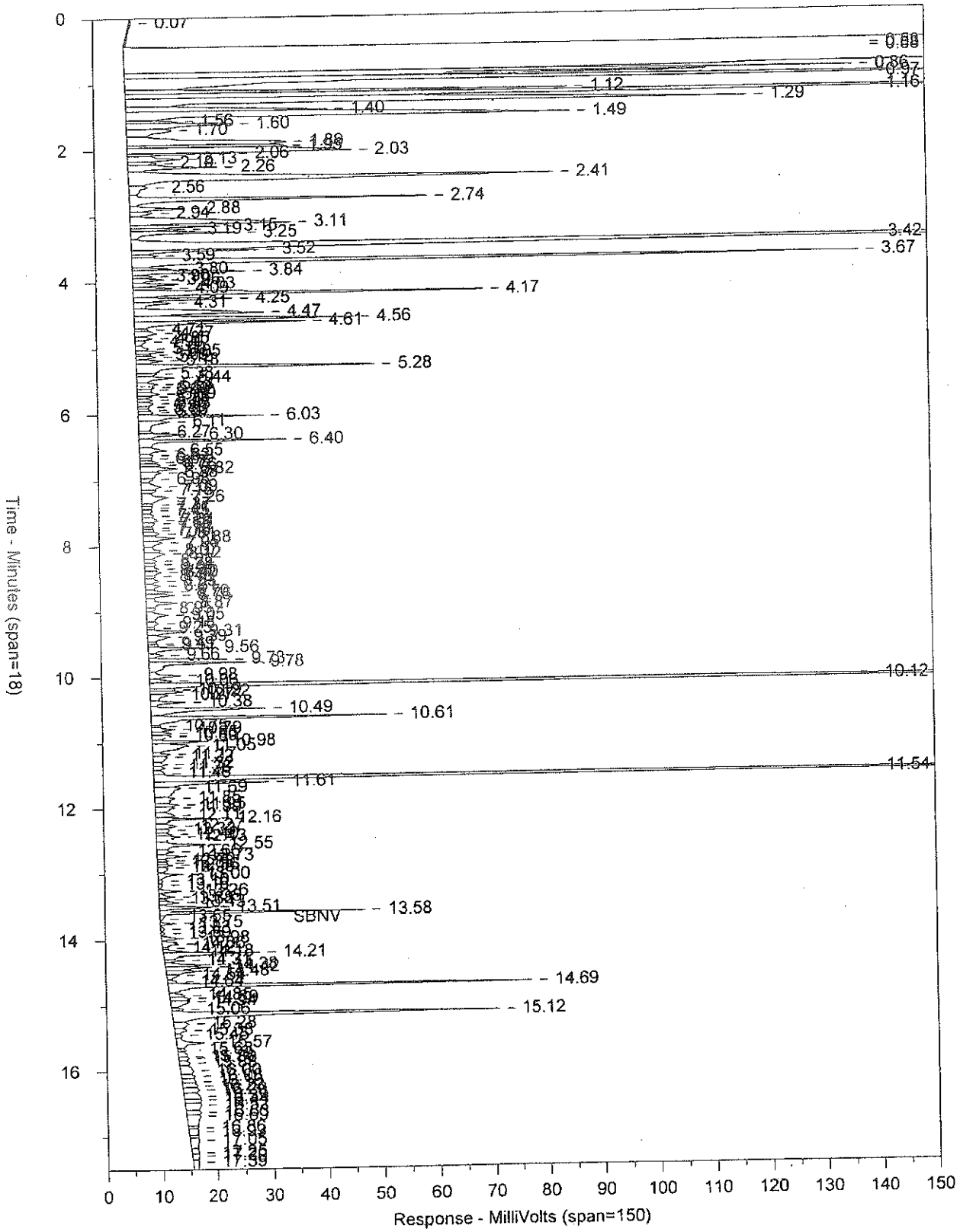
DX >C24 - C40 AREA = 597804

Preliminary C12 - C24 Amount = 0.083 PPM

Preliminary >C24 - C40 Amount = 0.026 PPM

FILES:
Area File: D18003B.0030.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 1/4/2017 6:16:43 AM
File Reported On: 1/4/2017 at 6:16:48 AM

Sample: 8753063S ABOLY09 T 163630024A 02211 ECY 97-602 NWTPH-D
File: D18003b.0030.RAW NWTPH-DX



Sample Number: 8753063S ABOLY09 T 163630024A . 02211 ECY 97-602 NWTPH-Dx mo
D18003b.0030.RAW NWTPH-DX

Injected On: 1/4/2017 5:59:02 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1060
Dilution Factor: 2
Injection Volume: 2

Analyst: 10210

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.068	0.00	5466
C-12	4.711	0.00	4468
Capric Acid	6.397	0.00	51451
C-14	6.545	0.00	19272
C-18	9.558	0.00	26543
O-terphenyl	10.190	0.00	7795
C-20	10.893	0.00	11846
C-24	12.434	0.00	15020
C-26	13.004	0.00	10576
C-28	13.508	0.00	19850
C-30	13.975	0.00	7971
C-32	14.420	0.00	19099
C-34	14.887	0.00	11905
C-36	15.276	0.00	12836
C-38	15.676	0.00	4262
C-40	16.165	0.00	10158

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	2568417 M
>C24 - C40	12.57	16.29	757059
o-Terphenyl	10.11	10.21	588118

RESULTS TABLE

DX C12 - C24 AREA = 2568417

DX >C24 - C40 AREA = 757058.8

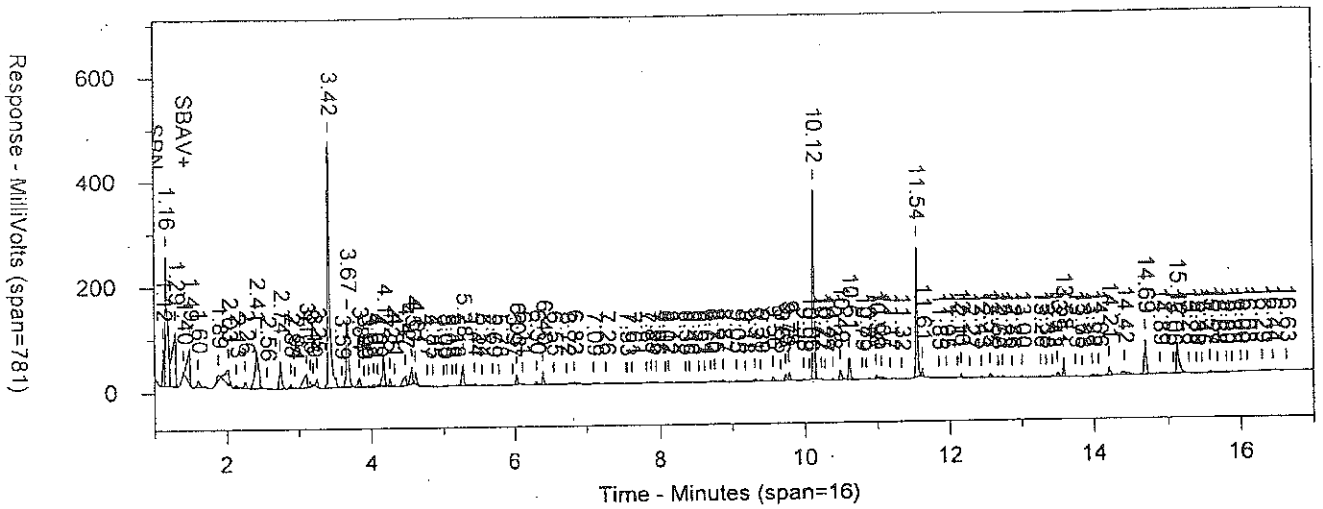
Preliminary C12 - C24 Amount = 0.112 PPM

Preliminary >C24 - C40 Amount = 0.033 PPM

FILES:
Area File: D18003b.0030.BND
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 1/4/2017 8:13:44 PM
File Reported On: 1/4/2017 at 8:13:46 PM

M = Manually Integrated
Analyst QE10210 1/4/17
Approved by QBZ131 1-6-17
Circle Reason 1 (2) 3 4
1 = Missed Peak
2 = Improper Baseline
3 = RT Update
4 = Other _____

8753063S ABOLY09 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0030.RAW NWTPH-DX



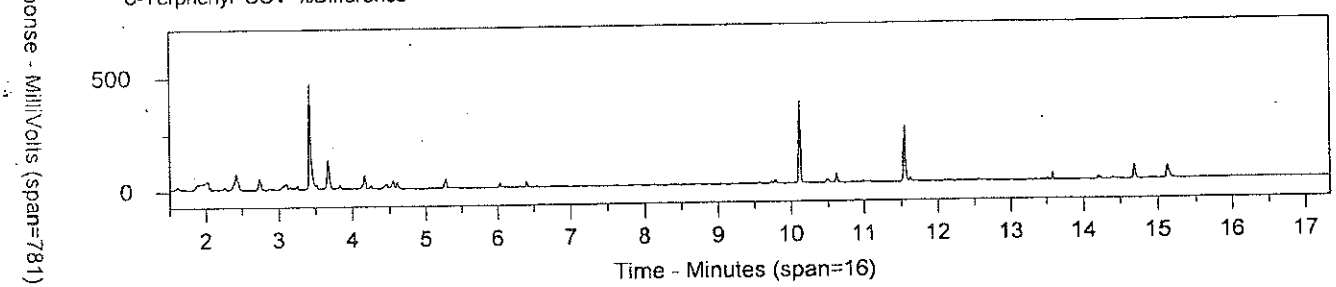
Sample Number: 8753063S ABOLY09 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
Injected On: 1/4/2017 5:59:02 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1060
Dilution Factor: 2
Injection Volume: 2
Analyst: 10210

Compound	RT	Amount ppm	Area
C-12	4.771	0.0002	4888.419
Capric Acid	6.397	0.0028	34985.7
C-14	6.545	0.0003	7061.784
C-18	9.558	0.0007	17227.34
O-terphenyl	10.116	0.0210	560232.9
C-20	10.854	0.0001	1540.431
C-24	12.434	0.0003	7271.216
C-26	13.004	0.0003	6038.521
C-28	13.508	0.0007	15071.77
C-30	13.975	0.0003	6262.107
C-32	14.420	0.0020	44786.5
C-34	14.887	0.0009	20219.27
C-36	15.276	0.0001	2860.243
C-38	15.676	0.0000	618.8045
C-40	16.082	0.0000	847.9033

1000 mL WW o-Terphenyl Recovery = 92.8 %
o-Terphenyl CCV %Difference = 456.8 %

1000 ML CAPRIC ACID % RECOVERY = 0.3 %



Area File: D18003B.0030.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 1/4/2017 6:16:43 AM
File Reported On: 1/4/2017 at 6:16:56 AM
Format: 2DXREPLOTI.FMT

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: 8753065S OLY13 Sample ID: AB **Batchnumber:** 163630024A
Sample Amount: 1060. Total Volume: 2. ml Analyst: 10210 SDG: WAN02 State: WA
Analyses: 02211

Injection Summary

Injected on : 1/4/2017 06:20:34
Instrument : CP18--18847B
Result file : D18003B.0031.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

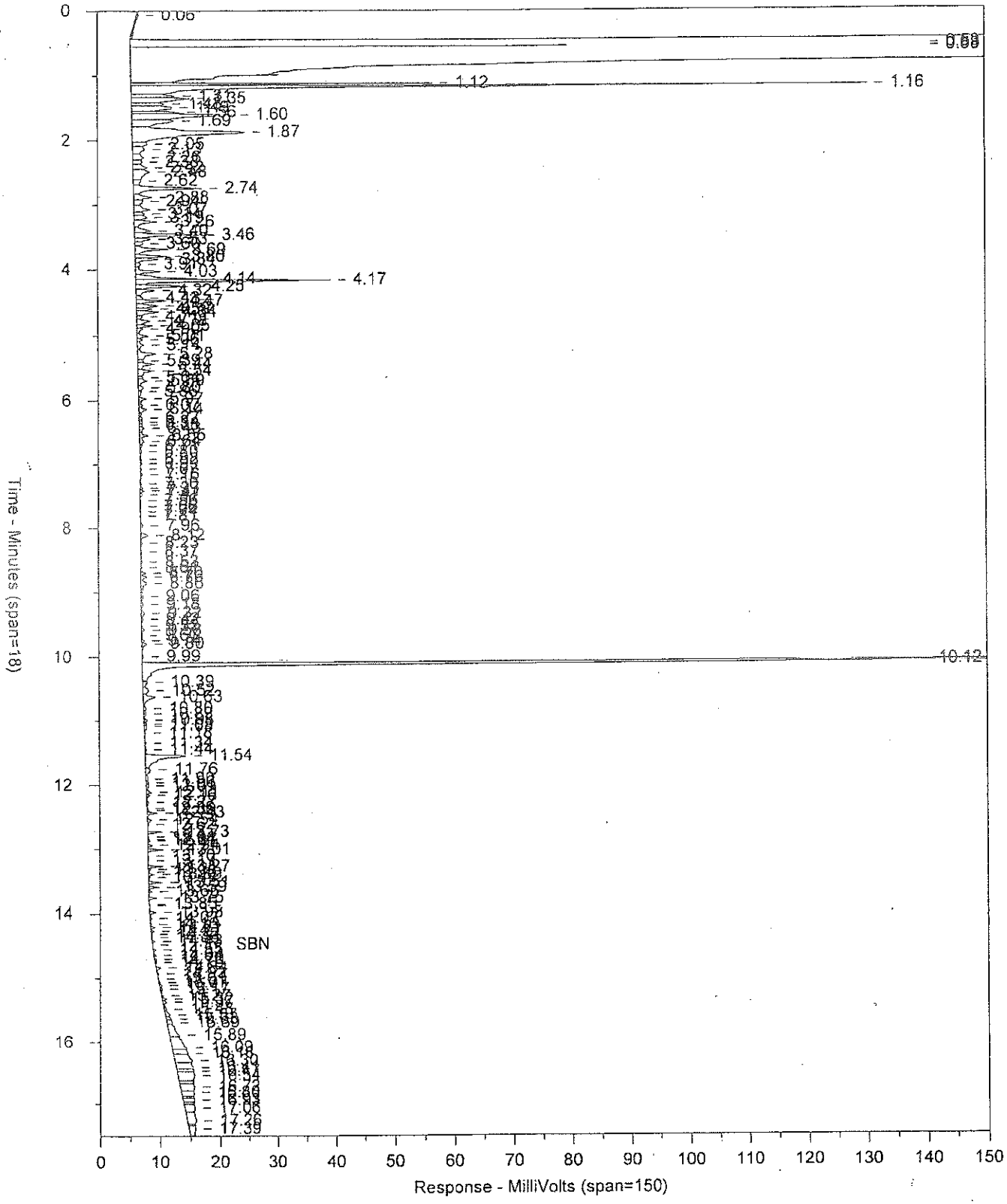
O-TERPHENYL 62% (50-150) Conc.: 14.07101

Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	603569	9.9672	<94.3396	<28.3019		ppb
☐ Heavy Range	12.57 - 16.29	102151	4.4585	<235.8491	<66.0377		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	375203	14.0710				ppb
☐ Capric Acid	6.43 (6.30 - 6.50)	864	0.0692				ppb

Comments: _____

Reviewed by: DH 10210 Verified by: Jamie L. Brillhart
Senior Chemist
Date: 1/5/17 Date: JAN 06 2017

Sample: 8753065S ABOLY13 T 163630024A 02211 ECY 97-602 NWTPH-Dx modifie
File: D18003B.0031.RAW NWTPH-DX



Sample Number: 8753065S ABOLY13 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0031.RAW NWTPH-DX

Injected On: 1/4/2017 6:20:34 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1060
Dilution Factor: 2
Injection Volume: 2

Analyst: 10210

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.065	0.00	5450
C-12	4.710	0.00	2441
Capric Acid	6.382	0.00	1143
C-14	6.549	0.00	3733
C-18	9.585	0.00	1609
O-terphenyl	10.116	0.01	381457
C-20	10.885	0.00	1942
C-22	11.755	0.00	3981
C-24	12.435	0.00	2810
C-26	13.007	0.00	3899
C-28	13.514	0.00	3240
C-30	13.978	0.00	2139
C-32	14.426	0.00	815
C-34	14.928	0.00	489
C-36	15.324	0.00	1308
C-38	15.691	0.00	3205
C-40	16.183	0.00	10834

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	603569
>C24 - C40	12.57	16.29	102151
o-Terphenyl	10.11	10.21	381457

RESULTS TABLE

DX C12 - C24 AREA = 603569.4

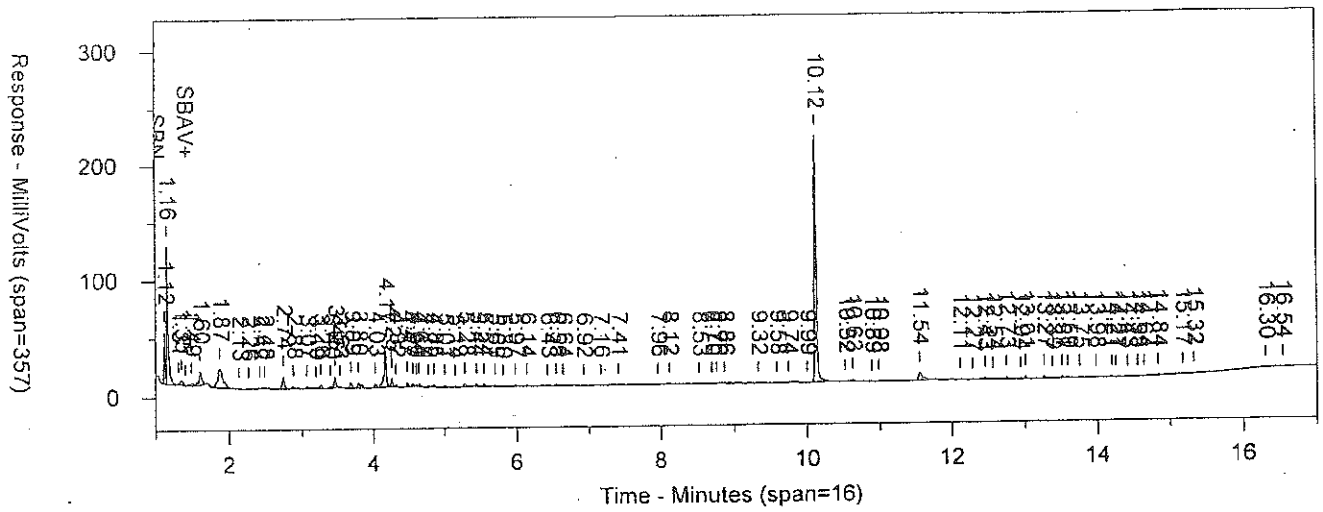
Preliminary C12 - C24 Amount = 0.010 PPM

DX >C24 - C40 AREA = 102150.9

Preliminary >C24 - C40 Amount = 0.004 PPM

FILES:
Area File: D18003B.0031.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 1/4/2017 6:38:19 AM
File Reported On: 1/4/2017 at 6:38:20 AM

8753065S ABOLY13 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0031.RAW NWTPH-DX



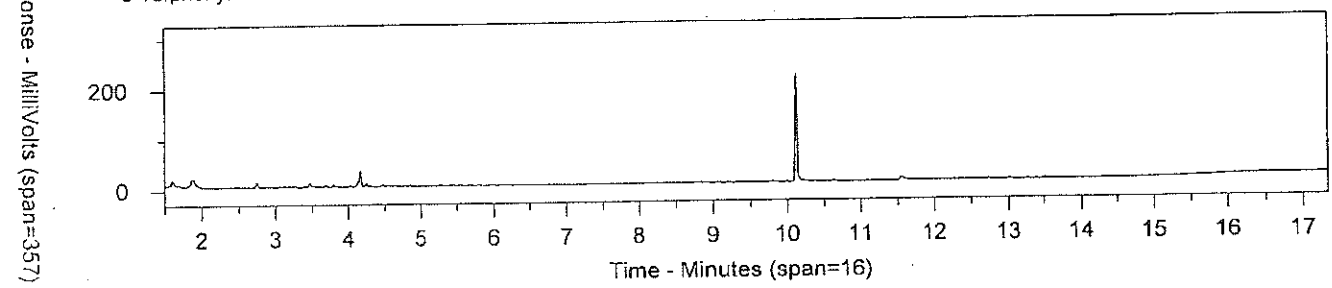
Sample Number: 8753065S ABOLY13 T 163630024A 02211 ECY 97-602 NWTPH-Dx modified
Injected On: 1/4/2017 6:20:34 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1060
Dilution Factor: 2
Injection Volume: 2
Analyst: 10210

Compound	RT	Amount ppm	Area
C-12	4.775	0.0001	3432.899
Capric Acid	6.433	0.0001	863.8936
C-14	6.549	0.0001	2049.804
C-18	9.585	0.0001	1375.908
O-terphenyl	10.116	0.0141	375203
C-20	10.885	0.0001	1834.314
C-24	12.435	0.0001	2118.713
C-26	13.007	0.0002	3898.794
C-28	13.514	0.0002	3160.794
C-30	13.978	0.0001	2139.483
C-32	14.426	0.0000	812.4982
C-34	14.838	0.0001	1578.862
C-36	15.324	0.0000	645.9571

1000 mL WW o-Terphenyl Recovery = 62.1 %
o-Terphenyl CCV %Difference = 272.9 %

1000 ML CAPRIC ACID % RECOVERY = 0.0 %



Area File: D18003B.0031.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 1/4/2017 6:38:19 AM
File Reported On: 1/4/2017 at 6:38:28 AM
Format: 2DXREPLOTI.FMT

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: BLANKA 12/29/16 S PBLK24363 Sample ID: AB **Batchnumber:** 163630024A
Sample Amount: 1000. Total Volume: 2. ml Analyst: 10210 SDG: State:
Analyses: 02211

Injection Summary

Injected on : 1/4/2017 04:11:22
Instrument : CP18--18847B
Result file : D18003B.0025.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 99% (50-150) Conc.: 23.87244

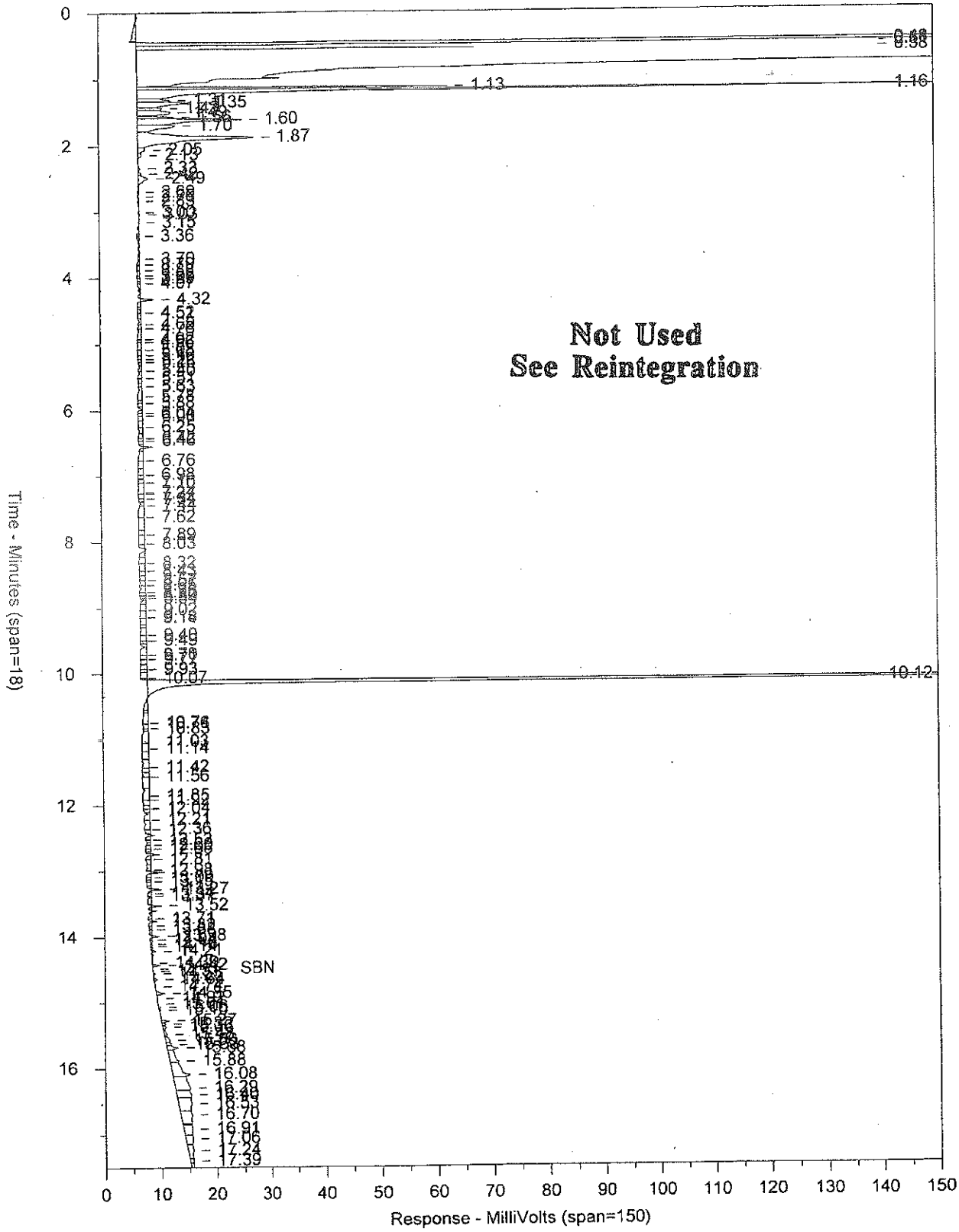
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	671446	3.2811	<100	<30		ppb
☐ Heavy Range	12.57 - 16.29	101393	4.6909	<250	<70		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	600526	23.8724				ppb
☐ Capric Acid	6.31 (6.30 - 6.50)	935	0.0794				ppb

Comments: _____

Reviewed by: DEB 1/5/2017
Date: 1/5/17

Verified by: Jamie L. Brillhart
Jamie L. Brillhart
Senior Chemist
Date: JAN 06 2017

Sample: BLANKA 12/29/16 S ABPBLK24363 BLK 163630024A 02211 ECY 97-602 NW
File: D18003B.0025.RAW NWTPH-DX



Sample Number: BLANKA 12/29/16 S ABPBLK24363 BLK 163630024A 02211 ECY 97-602 NWTPH-I
D18003B.0025.RAW NWTPH-DX

Injected On: 1/4/2017 4:11:22 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2

Analyst: 10210

Compound	RT	Amt PPM	Area
C-12	4.758	0.00	2030
Capric Acid	6.418	0.00	1814
O-terphenyl	10.117	0.02	580530
C-24	12.515	0.00	1846
C-28	13.516	0.00	334
C-30	14.038	0.00	1091
C-32	14.423	0.00	1817
C-34	14.925	0.00	308
C-36	15.316	0.00	1162
C-38	15.678	0.00	5526
C-40	16.084	0.00	25581

Not Used
See Integration

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	929603
>C24 - C40	12.57	16.29	100560
o-Terphenyl	10.11	10.21	580530

RESULTS TABLE

DX C12 - C24 AREA = 929602.7

Preliminary C12 - C24 Amount = 0.016 PPM

DX >C24 - C40 AREA = 100559.6

Preliminary >C24 - C40 Amount = 0.005 PPM

FILES:
Area File: D18003B.0025.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 1/4/2017 4:30:34 AM
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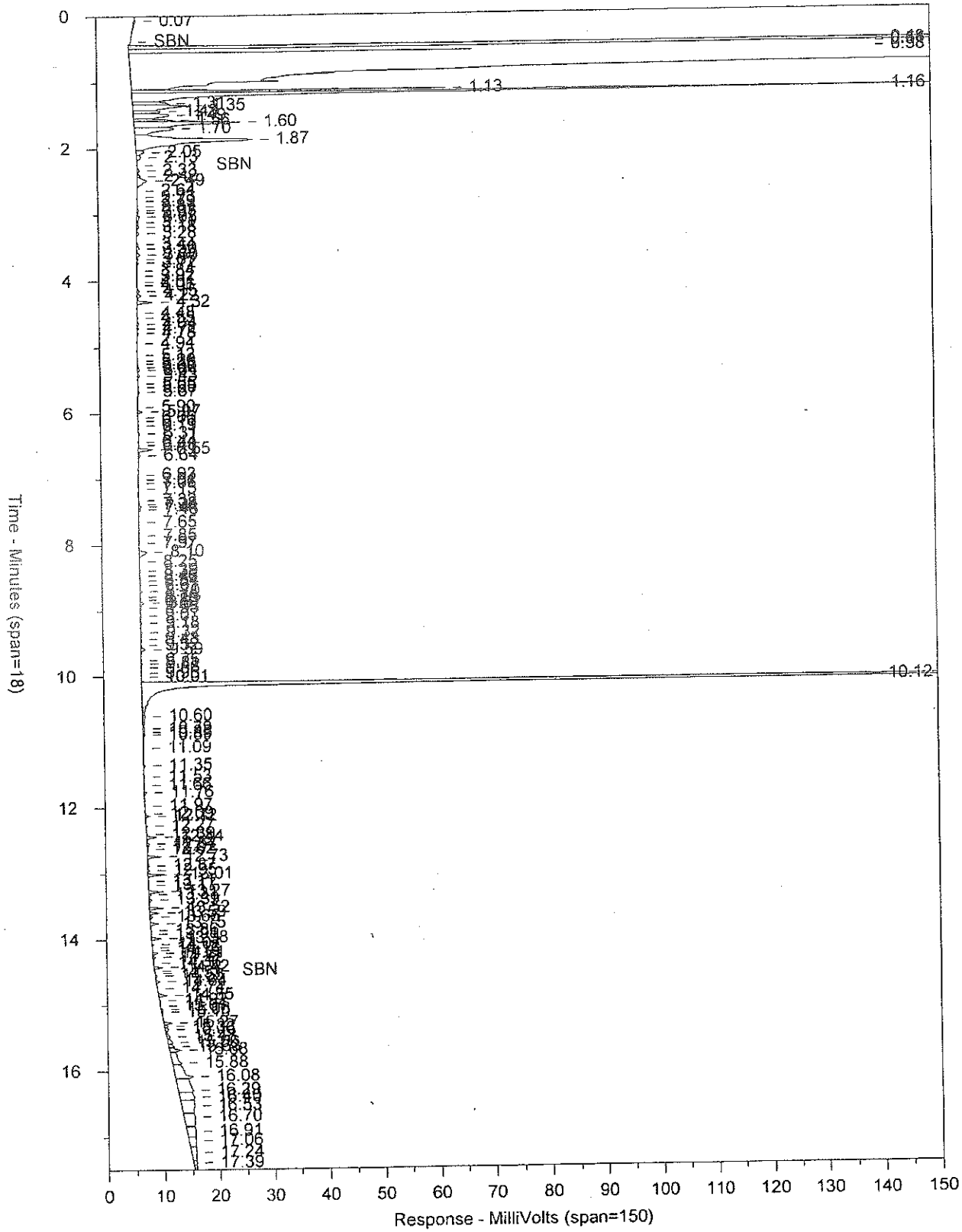
Sample: BLANKA 12/29/16 S ABPBLK24363 BLK 163630024A 02211 ECY 97-602 NW
File: D18003b.0025.RAW NWTPH-DX



Chrom Perfect Chromatogram Report

Sample Number: BLANKA 12/29/16 S ABPBLK24363 BLK 163630024A 02211 ECY 97-602 NWTPH-I
D18003b.0025.RAW NWTPH-DX

Injected On: 1/4/2017 4:11:22 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2

Analyst: 10210

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.068	0.00	1891
C-12	4.715	0.00	613
Capric Acid	6.437	0.00	81
C-14	6.549	0.00	5002
C-18	9.587	0.00	2136
O-terphenyl	10.117	0.02	616434
C-20	10.886	0.00	1050
C-22	11.764	0.00	935
C-24	12.441	0.00	3029
C-26	13.009	0.00	4764
C-28	13.516	0.00	3566
C-30	13.980	0.00	3135
C-32	14.423	0.00	2351
C-34	14.925	0.00	308
C-36	15.316	0.00	1162
C-38	15.678	0.00	5526
C-40	16.084	0.00	25581

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	671446 M
>C24 - C40	12.57	16.29	101393
o-Terphenyl	10.11	10.21	616434

RESULTS TABLE

DX C12 - C24 AREA = 671446.1

Preliminary C12 - C24 Amount = 0.003 PPM

DX >C24 - C40 AREA = 101393

Preliminary >C24 - C40 Amount = 0.005 PPM

FILES:
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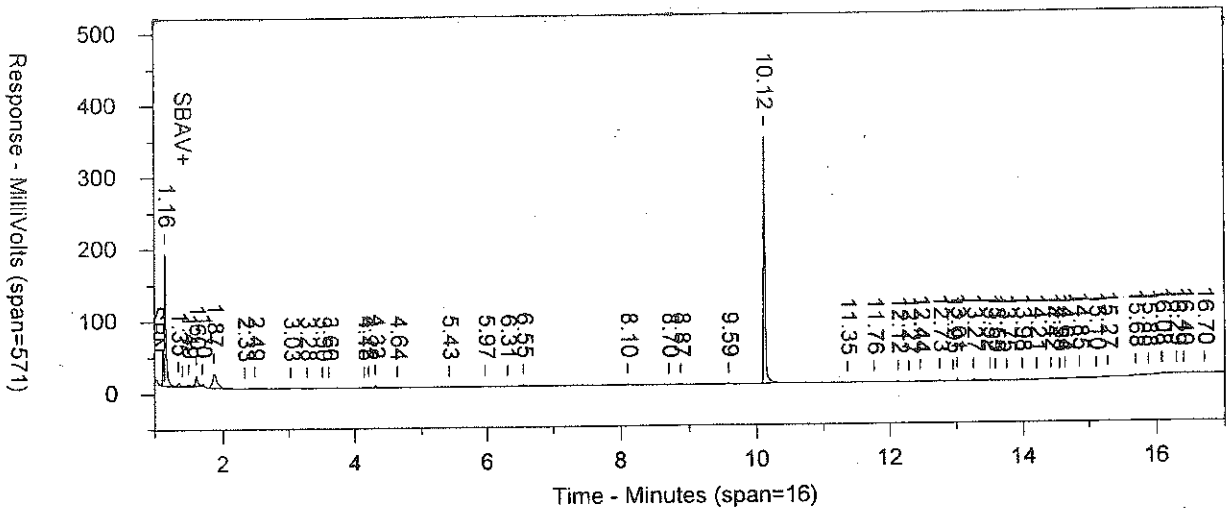
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 1/4/2017 8:12:15 PM
File Reported On: 1/4/2017 at 8:12:18 PM

M = Manually Integrated
Analyst 10210 1/4/17
Approved by [illegible] 1-6-17
Circle Reason 1 (2) 3 4
1 = Missed Peak
2 = Improper Baseline
3 = RT Update
4 = Other

BLANKA 12/29/16 S ABPBLK24363 BLK 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0025.RAW NWTPH-DX



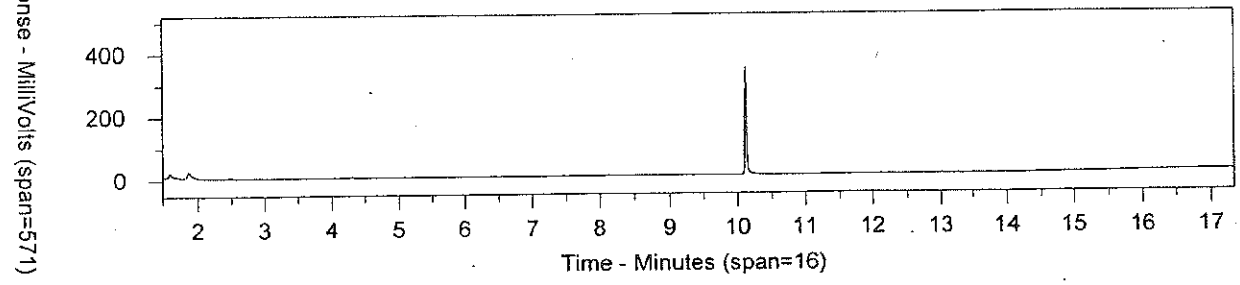
Sample Number: BLANKA 12/29/16 S ABPBLK24363 BLK 163630024A 02211 ECY 97-602 NWTF
Injected On: 1/4/2017 4:11:22 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2
Analyst: 10210

Compound	RT	Amount ppm	Area
Capric Acid	6.308	0.0001	935.3076
C-14	6.549	0.0002	4435.006
C-18	9.587	0.0001	1990.505
O-terphenyl	10.117	0.0239	600526.1
C-22	11.764	0.0000	934.9427
C-24	12.441	0.0001	2537.173
C-26	13.009	0.0002	4764.465
C-28	13.516	0.0002	3371.441
C-30	13.980	0.0002	3134.771
C-32	14.423	0.0001	2325.807
C-34	14.852	0.0001	2904.61
C-36	15.268	0.0001	2373.237
C-38	15.678	0.0001	3142.649
C-40	16.084	0.0001	1872.861

1000 mL WW o-Terphenyl Recovery = 99.5 %
o-Terphenyl CCV %Difference = 496.8 %

1000 ML CAPRIC ACID % RECOVERY = 0.0 %



Area File: D18003B.0025.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 1/4/2017 4:30:34 AM
File Reported On: 1/4/2017 at 8:06:38 PM
Format: 2DXREPLOTI.FMT

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: LCSA 12/29/16 S LCS24363 Sample ID: AB **Batchnumber:** 163630024A
Sample Amount: 1000. Total Volume: 2. ml Analyst: 10210 SDG: State:
Analyses: 02211

Injection Summary

Injected on : 1/4/2017 04:32:53
Instrument : CP18--18847B
Result file : D18003B.0026.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 105% (50-150) Conc.: 25.15765

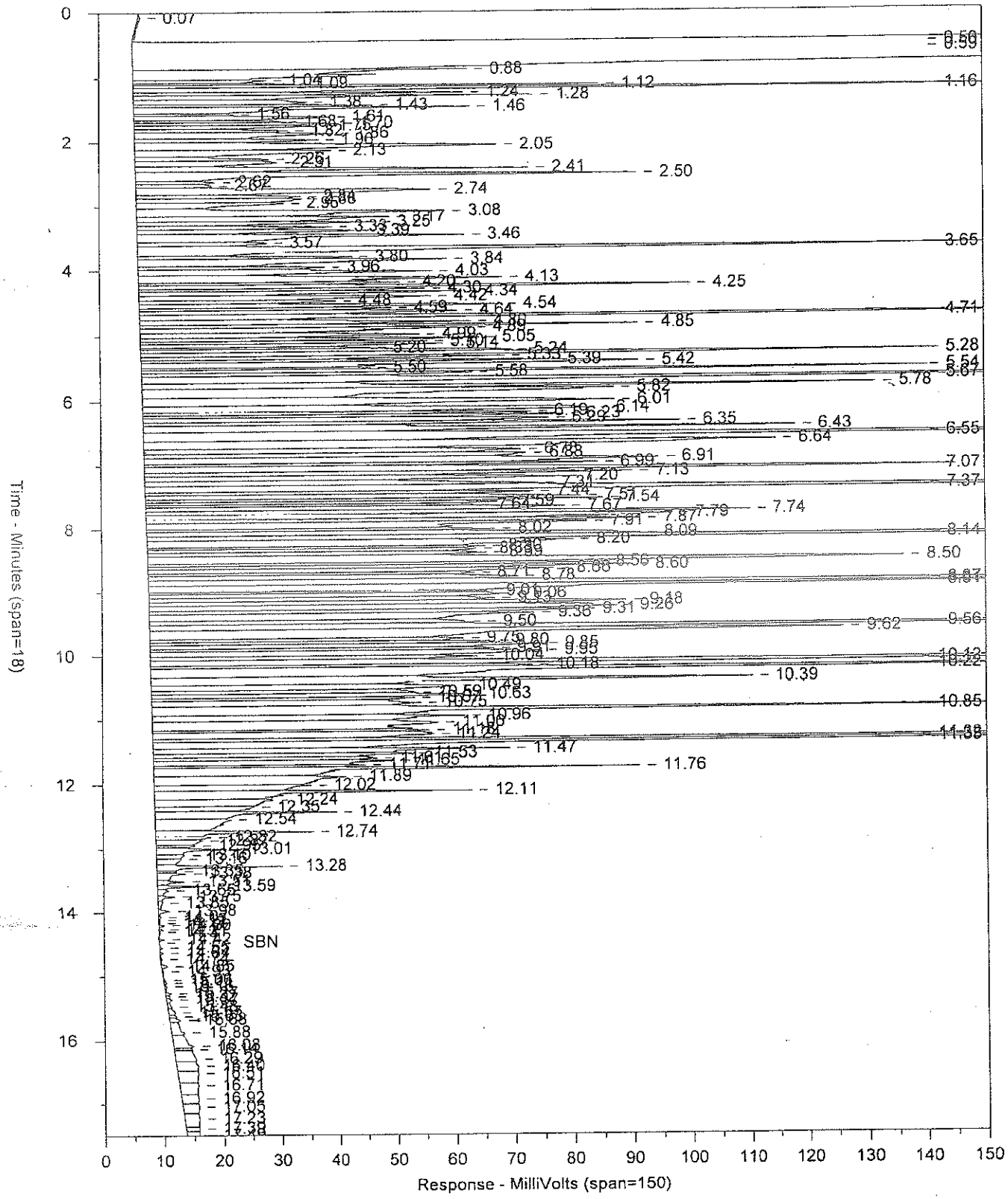
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	29504091	1335.7154	100	30		ppb
☐ Heavy Range	12.57 - 16.29	478145	22.1212	<250	<70		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	632856	25.1577				ppb
☐ Capric Acid	6.43 (6.30 - 6.50)	116904	9.9195				ppb

Comments: _____

Reviewed by: DE10210
Date: 1/5/17

Verified by: James L. Brillhart
James L. Brillhart
Senior Chemist
Date: JAN 06 2017

Sample: LCSA 12/29/16 S ABLCS24363 LCS 163630024A 02211 ECY 97-602 NWTPH-Dx mc
File: D18003B.0026.RAW NWTPH-DX



Sample Number: LCSA 12/29/16 S ABLCS24363 LCS 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0026.RAW NWTPH-DX

Injected On: 1/4/2017 4:32:53 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2

Analyst: 10210

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.068	0.00	5119
C-12	4.709	0.02	395564
Capric Acid	6.429	0.03	389879
C-14	6.547	0.04	850932
C-16	8.200	0.02	399563
C-18	9.623	0.03	580333
O-terphenyl	10.177	0.01	143694
C-20	10.846	0.02	540166
C-22	11.757	0.01	296915
C-24	12.436	0.01	112852
C-26	13.006	0.00	39858
C-28	13.513	0.00	10948
C-30	13.978	0.00	4782
C-32	14.422	0.00	1482
C-34	14.926	0.00	668
C-36	15.315	0.00	1486
C-38	15.683	0.00	6054
C-40	16.141	0.00	6083

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	29504090
>C24 - C40	12.57	16.29	478145
o-Terphenyl	10.11	10.21	1035972

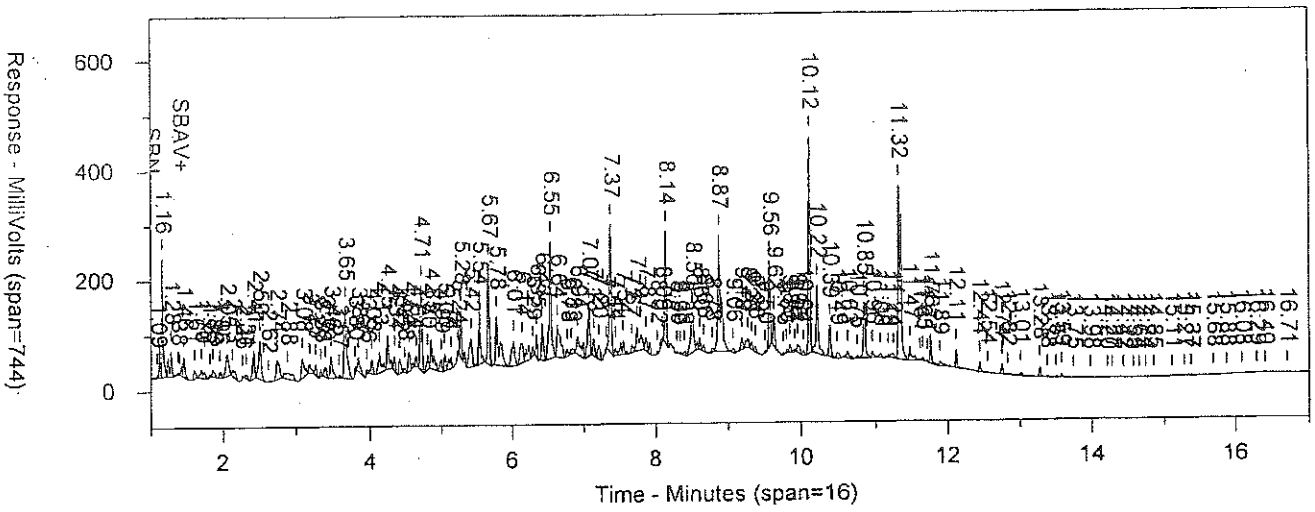
RESULTS TABLE

DX C12 - C24 AREA = 2.950409E+07 Preliminary C12 - C24 Amount = 1.358 PPM

DX >C24 - C40 AREA = 478145 Preliminary >C24 - C40 Amount = 0.022 PPM

FILES:
Area File: D18003B.0026.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 1/4/2017 4:50:38 AM
File Reported On: 1/4/2017 at 4:50:40 AM

LCSA 12/29/16 S ABLCS24363 LCS 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0026.RAW NWTPH-DX



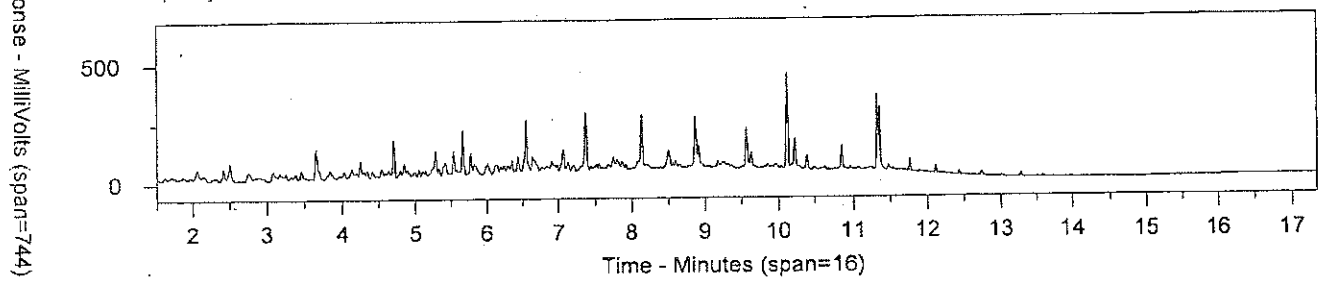
Sample Number: LCSA 12/29/16 S ABLCS24363 LCS 163630024A 02211 ECY 97-602 NWTPH-Dx modifie
Injected On: 1/4/2017 4:32:53 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2
Analyst: 10210

Compound	RT	Amount ppm	Area
C-12	4.709	0.0117	253325.4
Capric Acid	6.429	0.0099	116903.9
C-14	6.547	0.0208	455293.6
C-16	8.138	0.0146	324191.8
C-18	9.623	0.0041	91091.72
O-terphenyl	10.120	0.0252	632856.4
C-20	10.846	0.0085	193326.9
C-22	11.757	0.0035	75525.21
C-24	12.436	0.0013	26207.29
C-26	13.006	0.0005	9496.904
C-28	13.513	0.0002	3753.698
C-30	13.978	0.0001	2967.6
C-32	14.422	0.0001	1442.598
C-34	14.849	0.0001	2212.762
C-36	15.271	0.0000	984.8896
C-38	15.683	0.0001	3019.23
C-40	16.084	0.0001	1228.04

1000 mL WW o-Terphenyl Recovery = 104.8 %
o-Terphenyl CCV %Difference = 528.9 %

1000 ML CAPRIC ACID % RECOVERY = 1.0 %



Area File: D18003B.0026.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 1/4/2017 4:50:38 AM
File Reported On: 1/4/2017 at 4:50:50 AM
Format: 2DXREPLOTI.FMT

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: LCSDA 12/29/16 S LCSD24363 Sample ID: AB **Batchnumber:** 163630024A
Sample Amount: 1000. Total Volume: 2. ml Analyst: 10210 SDG: State:
Analyses: 02211

Injection Summary

Injected on : 1/4/2017 04:54:20
Instrument : CP18--18847B
Result file : D18003B.0027.RAW
Calibration files : 2DXI315A.CAL
Method files : 2DXI.MET 2DXREPLOTI.MET
Setting : 2DXI315AW(V)

Surrogate Recoveries

O-TERPHENYL 100% (50-150) Conc.: 24.03862

Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Diesel Range	4.64 - 12.57	29737469	1347.8149	100	30		ppb
☐ Heavy Range	12.57 - 16.29	481781	22.2894	<250	<70		ppb
☐ O-terphenyl	10.12 (10.11 - 10.21)	604706	24.0386				ppb
☐ Capric Acid	6.43 (6.30 - 6.50)	114047	9.6770				ppb

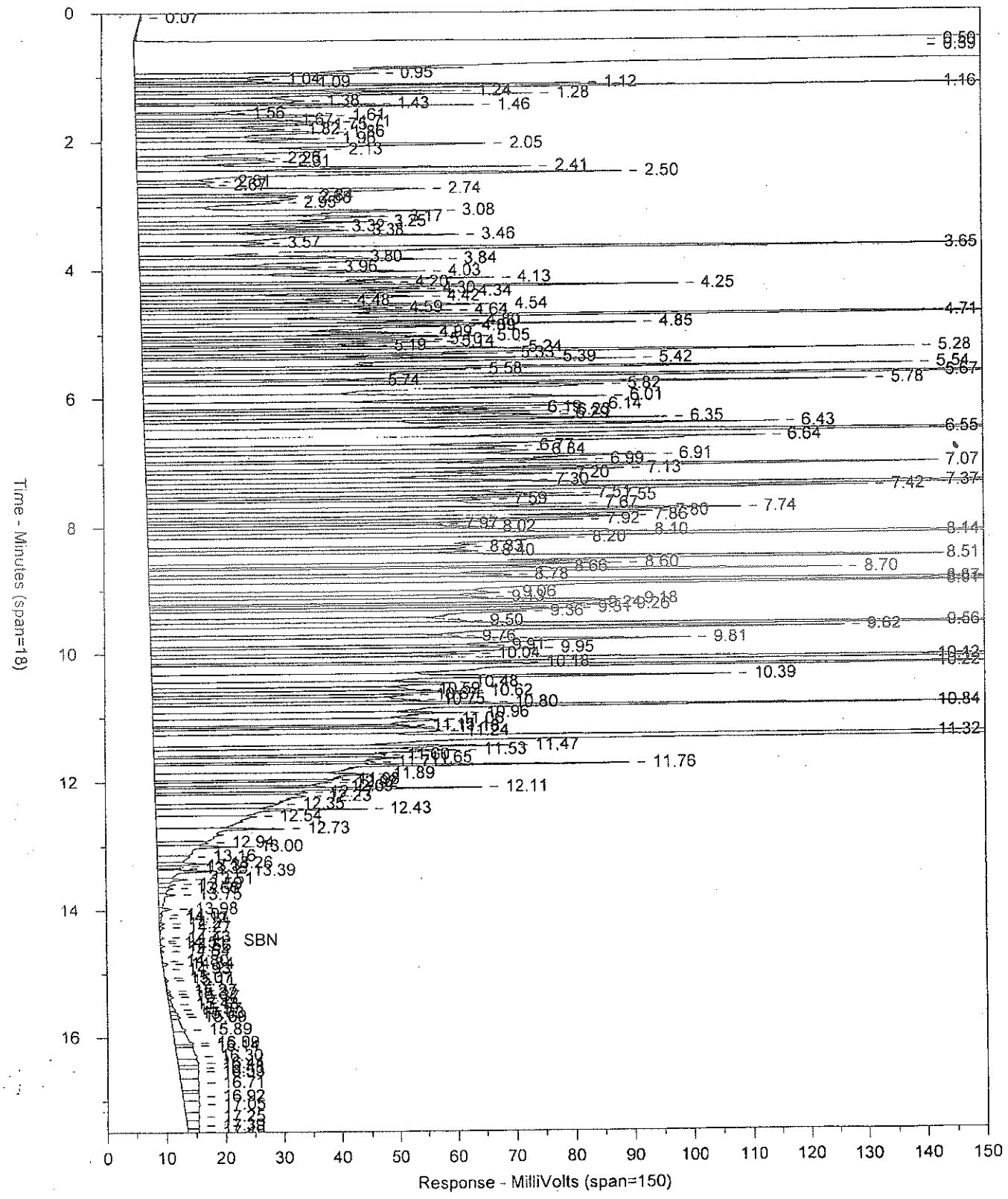
Comments: _____

Reviewed by: QEA 10210
Date: 1/5/17

Verified by: Jamie L. Brillhart
Date: Jamie L. Brillhart Senior Chemist

JAN 06 2017

Sample: LCSDA 12/29/16 S ABLCSD24363 LCSD 163630024A 02211 ECY 97-602 NWTPH-Dx
File: D18003B.0027.RAW NWTPH-DX



Sample Number: LCSDA 12/29/16 S ABLCSD24363 LCSD 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0027.RAW NWTPH-DX

Injected On: 1/4/2017 4:54:20 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2

Analyst: 10210

Compound	RT	Amt PPM	Area
#2 FUEL OIL (C12-C24	0.067	0.00	5186
C-12	4.709	0.02	387151
Capric Acid	6.428	0.03	391396
C-14	6.547	0.04	822138
C-16	8.138	0.03	610385
C-18	9.622	0.02	527006
O-terphenyl	10.176	0.01	141084
C-20	10.845	0.02	455082
C-22	11.758	0.01	316166
C-24	12.434	0.01	138213
C-26	13.005	0.00	58332
C-28	13.512	0.00	14399
C-30	13.976	0.00	5574
C-32	14.425	0.00	1235
C-34	14.926	0.00	243
C-36	15.324	0.00	1265
C-38	15.686	0.00	4739
C-40	16.138	0.00	7779

Range	Start Time	Stop Time	Area
C12 - C24	4.64	12.57	29737470
>C24 - C40	12.57	16.29	481781
o-Terphenyl	10.11	10.21	1003778

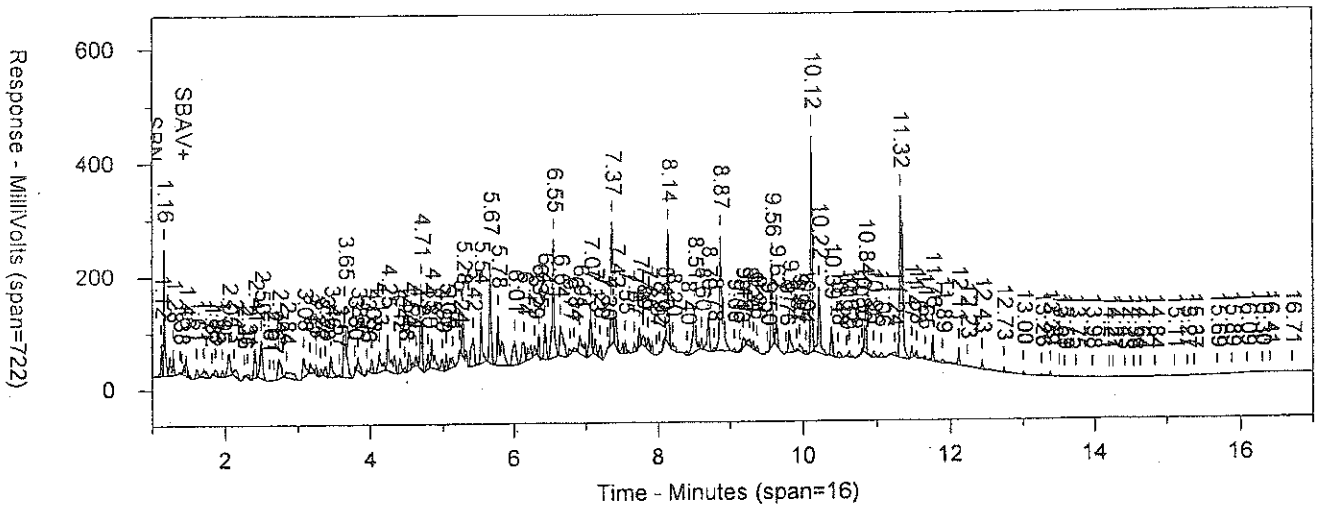
RESULTS TABLE

DX C12 - C24 AREA = 2.973747E+07 Preliminary C12 - C24 Amount = 1.369 PPM

DX >C24 - C40 AREA = 481780.6 Preliminary >C24 - C40 Amount = 0.022 PPM

FILES:
Area File: D18003B.0027.RAW
Method: 2DXI.MET
Calibration File: 2DXI315A.CAL
Format: 2DXI.FMT
Area File Created On: 1/4/2017 5:12:04 AM
File Reported On: 1/4/2017 at 5:12:10 AM

LCSDA 12/29/16 S ABLCSD24363 LCSD 163630024A 02211 ECY 97-602 NWTPH-Dx modified
D18003B.0027.RAW NWTPH-DX



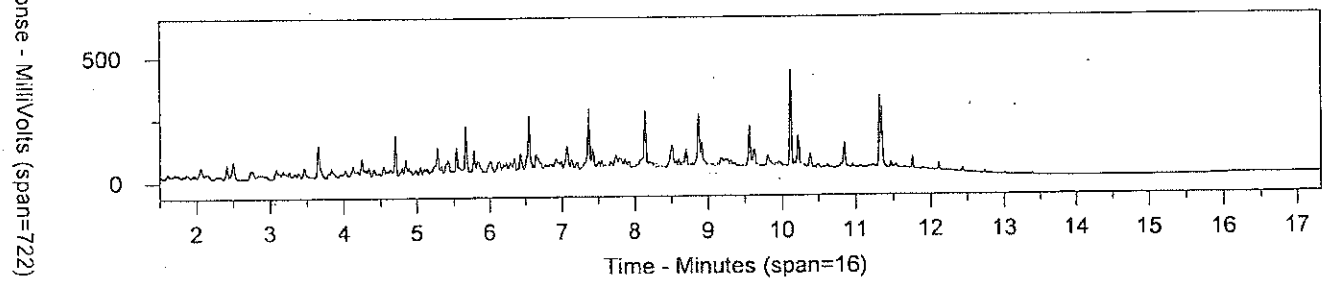
Sample Number: LCSDA 12/29/16 S ABLCSD24363 LCSD 163630024A 02211 ECY 97-602 NWTPH-Dx mod
Injected On: 1/4/2017 4:54:20 AM
Instrument ID: CP18-18847
Oven Parameters: 60C for 1.0min; 15C/min to 190C; 30C/min to 340C, hold 2min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 1000
Dilution Factor: 2
Injection Volume: 2
Analyst: 10210

Compound	RT	Amount ppm	Area
C-12	4.709	0.0115	248862.5
Capric Acid	6.428	0.0097	114046.6
C-14	6.547	0.0203	444044.1
C-16	8.138	0.0141	312892.5
C-18	9.622	0.0039	86546.59
O-terphenyl	10.118	0.0240	604706.4
C-20	10.845	0.0062	139530.4
C-22	11.758	0.0033	72296.61
C-24	12.434	0.0013	26531.56
C-26	13.005	0.0005	9289.823
C-28	13.512	0.0002	3606.195
C-30	13.976	0.0001	3011.023
C-32	14.425	0.0001	1234.831
C-34	14.840	0.0001	2277.267
C-36	15.274	0.0000	607.548
C-38	15.686	0.0001	2253.285
C-40	16.093	0.0001	1369.386

1000 mL WW o-Terphenyl Recovery = 100.2 %
o-Terphenyl CCV %Difference = 501.0 %

1000 ML CAPRIC ACID % RECOVERY = 1.0 %



Area File: D18003B.0027.RAW
Method: 2DXREPLOTI.MET
Calibration File: 2DXI315A.CAL

Area File Created On: 1/4/2017 5:12:04 AM
File Reported On: 1/4/2017 at 5:12:20 AM
Format: 2DXREPLOTI.FMT

TPH-DRO by GC Data

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: 8753067 OLYFD Sample ID: AA **Batchnumber:** 163570036A
Sample Amount: 247. Total Volume: 2. ml Analyst: 10210 SDG:WAN02 State: WA
Analyses: 12899

Injection Summary

Injected on : 1/7/2017 00:21:08
Instrument : CP30--19507B
Result file : D30006B.0022.RAW
Calibration files : 4FUL30B354A.CAL
Method files : 4FUEL30B.MET 4REPLOT30B.MET
Setting : 4FUL30B354A(V)

Surrogate Recoveries

O-TERPHENYL 78% (50-150) Conc.: 18.95675

Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Total DRO C10-C28	2.09 - 13.77	5638075	547.2468	101.2146	45.5466		ppb
☐ ORO >C28-C35	13.77 - 15.37	130818	13.2334	<101.2146	<45.5466		ppb
☐ ORO >C28-C40	13.77 - 16.46	245930	24.8780	<101.2146	<45.5466		ppb
☐ DRO C13-C22	4.95 - 12.03	852851	78.1429	<101.2146	45.5466	J	ppb
☐ WY DRO C10-C32	2.09 - 14.69	5719097	555.4429	101.2146	45.5466		ppb
☑ DX DRO C12-C24	4.75 - 12.70	921251	64.9255	<101.2146	45.5466	J	ppb
☑ DX HRO C24-C40	12.70 - 16.46	4791672	448.9442	253.0364	101.2146		ppb
☐ DX C12-C40	4.75 - 16.46	5712923	513.8697				ppb
☐ o-Terphenyl	10.36 (10.32 - 10.42)	228289	18.9568				ppb
☐ Capric Acid	6.51 (6.39 - 6.59)	5460	512.0759				ppb

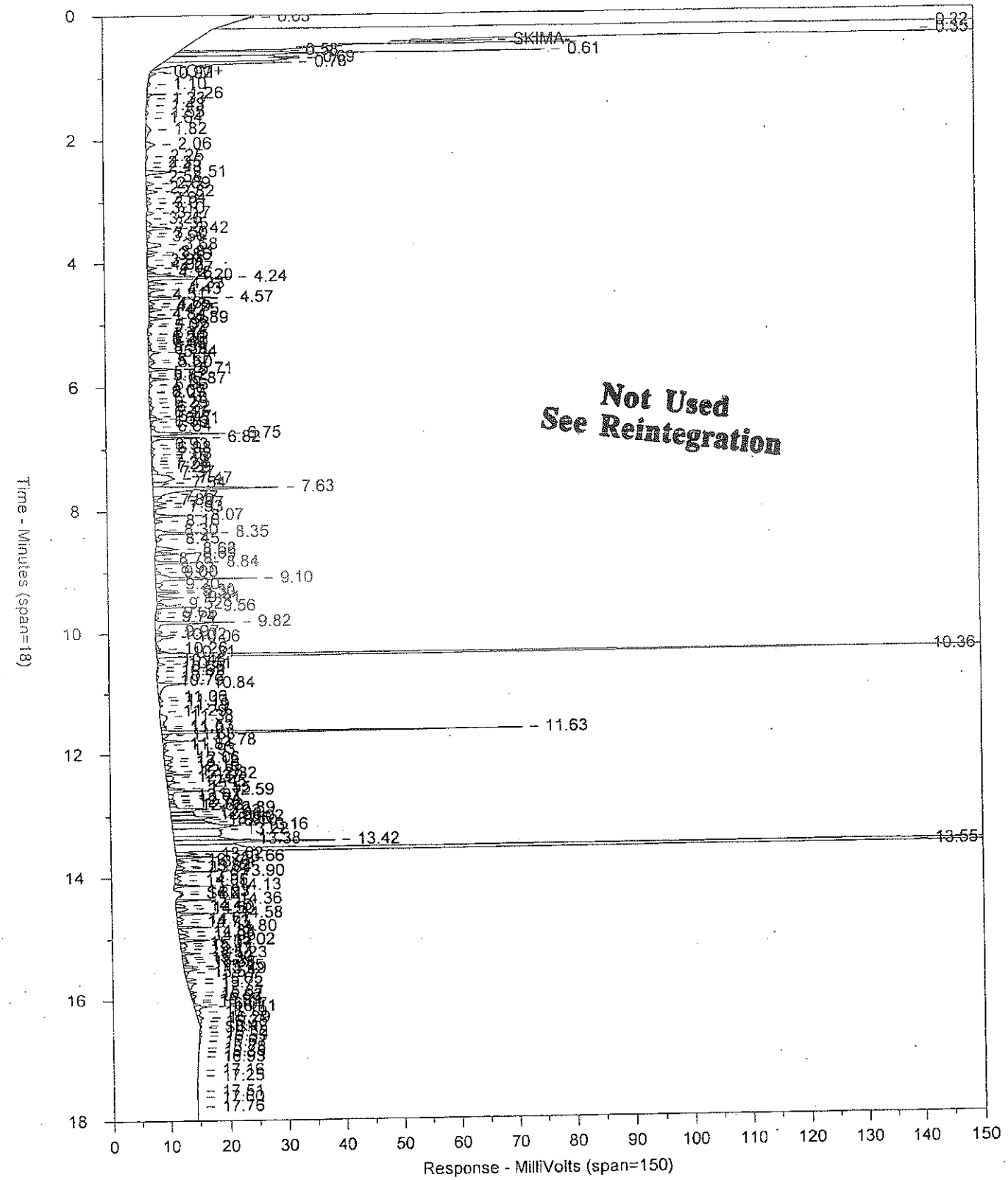
Comments: ______

Reviewed by: QEd10210 Verified by: Jamie L. Brillhart
Senior Chemist

Date: 1/9/17 Date:

JAN 17 2017

8753067 AAOLYFD T 163570036A 12899 SW-846 8015B
D30006B.0022.RAW 10UL DRO



Sample Number: 8753067 AAOLYFD T 163570036A 12899 SW-846 8015B
Injected On: 1/7/2017 12:21:08 AM Sample Weight: 247
Instrument ID: CP30-19507 Dilution Factor: 2
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min Injection Volume: 4ul
GC Column: HP-5 30m x 0.32mm x 0.25um Analyst: 10210

Compound	RT	Amt PPM	Area
C10	2.252	0.0001	1348
C12	4.836	0.0000	157
Capric Acid	6.510	0.0041	4801
C14	6.750	0.0023	25473
C16	8.348	0.0019	20027
C18	9.822	0.0027	27852
O-Terphenyl	10.362	0.0188	226799
C20	11.061	0.0001	542
C22	11.927	0.0002	1884
C24	12.593	0.0010	10120
C26	13.159	0.0052	50591
C28	13.664	0.0010	10234
C30	14.132	0.0009	9384
C32	14.582	0.0011	10685
C34	15.019	0.0007	7864
C36	15.489	0.0006	5948
C38	15.865	0.0002	1952
C40	16.286	0.0002	2585

Not Used
See reintegration

Range	Start Time	Stop Time	Area
Total DRO C10-C28	2.09	13.77	5506990
ORO >C28-C35	13.77	15.37	108185
ORO >C28-C40	13.77	16.46	151546
Total DRO C13-C22	4.95	12.03	781742
WY DRO C10-C32	2.09	14.69	5573088
Total DRO C12-C24	4.75	12.70	839179
HRO >C24-C40	12.70	16.46	4664929
DX C12-C40	4.75	16.46	5504108
O-Terphenyl	10.32	10.42	226799

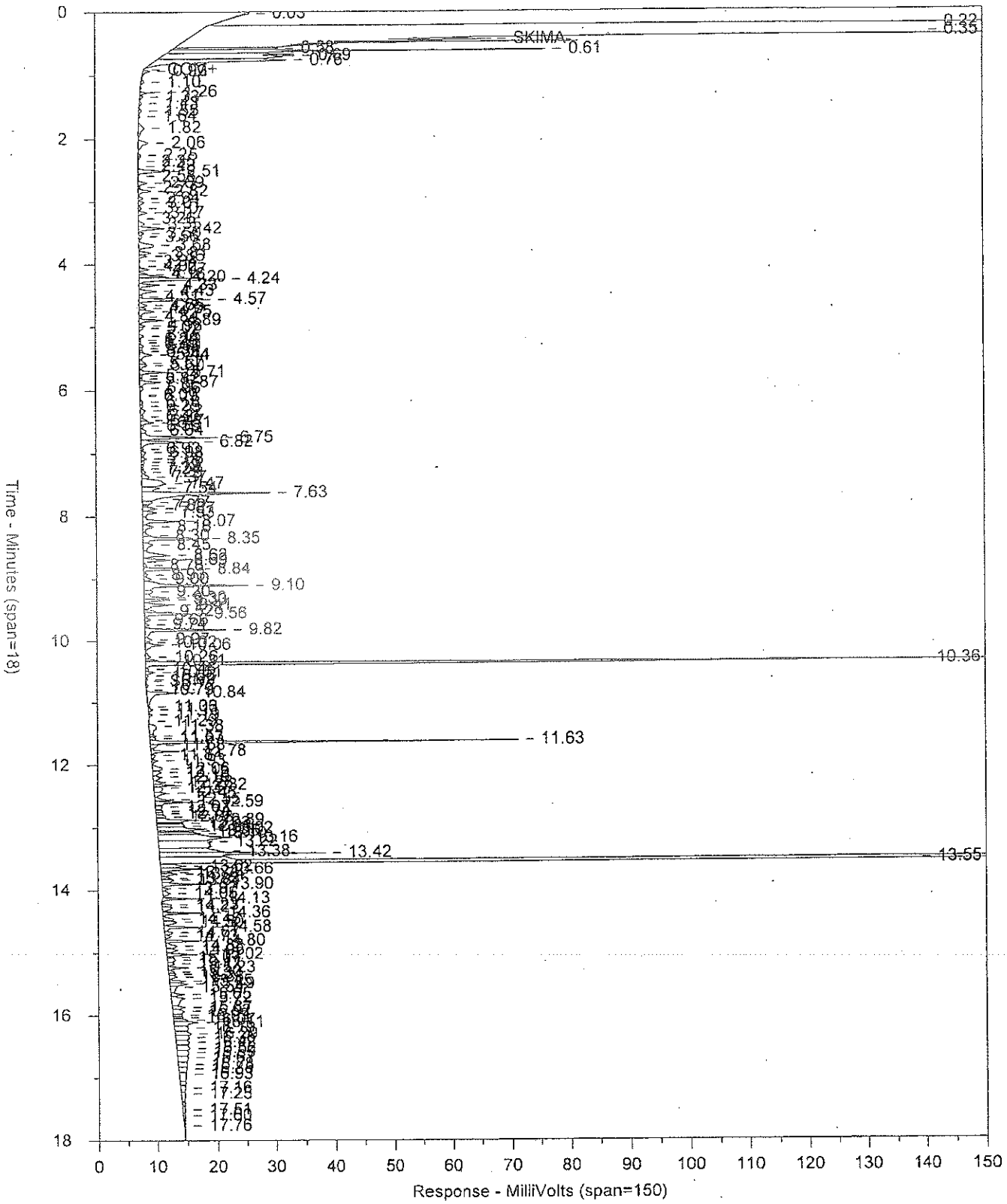
********** RESULTS TABLE **********

	Surrogate Adjusted Areas	Preliminary Amounts (w/ surrogate)
Total DRO C10-C28 AREA =	5280191	0.56 PPM
ORO>C28-C35 AREA =	108184.5	0.01 PPM
ORO>C28-C40 AREA =	151545.8	0.01 PPM
Total DRO C13-C22 AREA =	554942.6	0.10 PPM
C10-C25 AREA =	5346289	0.56 PPM
Total DRO C12-C24 AREA =	612379.6	0.08 PPM
HRO >C24-C40 AREA =	4664929	0.44 PPM
DX C12-C40 AREA =	5277309	0.52 PPM

Dx C12-C40 Level 3 %D = -98.901% #2 Fuel Level 3 %D = -99.89%

Area File: D30006B.0022.RAW
Method: 4FUEL30B.MET
Calibration File: 4FUL30B354A.CAL
Format: 4FUEL30B.FMT
Area File Created On: 1/7/2017 12:39:10 AM
File Reported On: 1/7/2017 at 12:39:13 AM

8753067 AAOLYFD T 163570036A 12899 SW-846 8015B
D30006B.0022.RAW 10UL DRO



Sample Number: 8753067 AAOLYFD T 163570036A 12899 SW-846 8015B
Injected On: 1/7/2017 12:21:08 AM Sample Weight: 247
Instrument ID: CP30-19507 Dilution Factor: 2
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min Injection Volume: 4ul
GC Column: HP-5 30m x 0.32mm x 0.25um Analyst: 10210

Compound	RT	Amt PPM	Area
C10	2.252	0.0002	1916
C12	4.836	0.0001	997
Capric Acid	6.510	0.0041	5241
C14	6.750	0.0024	26644
C16	8.348	0.0022	23214
C18	9.822	0.0027	27902
O-Terphenyl	10.362	0.0189	227849
C20	11.061	0.0001	545
C22	11.927	0.0003	2572
C24	12.593	0.0012	11320
C26	13.159	0.0055	53440
C28	13.664	0.0013	12472
C30	14.132	0.0009	9384
C32	14.582	0.0011	11194
C34	15.019	0.0008	8615
C36	15.489	0.0007	7380
C38	15.865	0.0005	5265
C40	16.286	0.0009	9510

Range	Start Time	Stop Time	Area
Total DRO C10-C28	2.09	13.77	5638074 M
ORO >C28-C35	13.77	15.37	130818
ORO >C28-C40	13.77	16.46	245930
Total DRO C13-C22	4.95	12.03	852851
WY DRO C10-C32	2.09	14.69	5719097
Total DRO C12-C24	4.75	12.70	921252 M
HRO >C24-C40	12.70	16.46	4791672 M
DX C12-C40	4.75	16.46	5712923
O-Terphenyl	10.32	10.42	227849

QE 10210 1/9/17

********** RESULTS TABLE **********

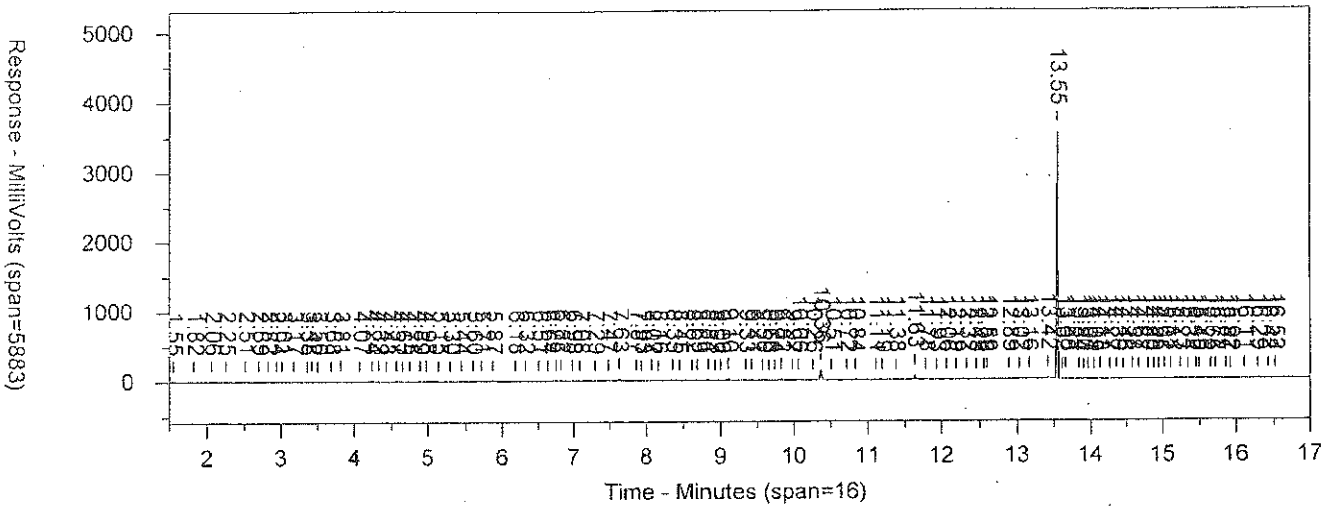
	Surrogate Adjusted Areas	Preliminary Amounts (w/ surrogate)
Total DRO C10-C28 AREA =	5410226	0.57 PPM
ORO>C28-C35 AREA =	130817.9	0.01 PPM
ORO>C28-C40 AREA =	245930	0.02 PPM
Total DRO C13-C22 AREA =	625002.6	0.11 PPM
C10-C25 AREA =	5491248	0.58 PPM
Total DRO C12-C24 AREA =	693402.9	0.09 PPM
HRO >C24-C40 AREA =	4791672	0.45 PPM
DX C12-C40 AREA =	5485075	0.54 PPM

Dx C12-C40 Level 3 %D = -98.858% #2 Fuel Level 3 %D = -99.89%

Area File: D30006B.0022.BND
Method: 4FUEL30B.MET
Calibration File: 4FUL30B354A.CAL
Format: 4FUEL30B.FMT
Area File Created On: 1/9/2017 5:35:24 PM
File Reported On: 1/9/2017 at 5:35:26 PM

M = Manually Integrated
Analyst QE 10210 1/9/17
Approved by JB 1-17-17
Circle Reason 1 (2) 3 4
1 = Missed Peak
2 = Improper Baseline
3 = RT Update
4 = Other _____

8753067 AAOLYFD T 163570036A 12899 SW-846 8015B
D30006B.0022.RAW 10ul surrogate report

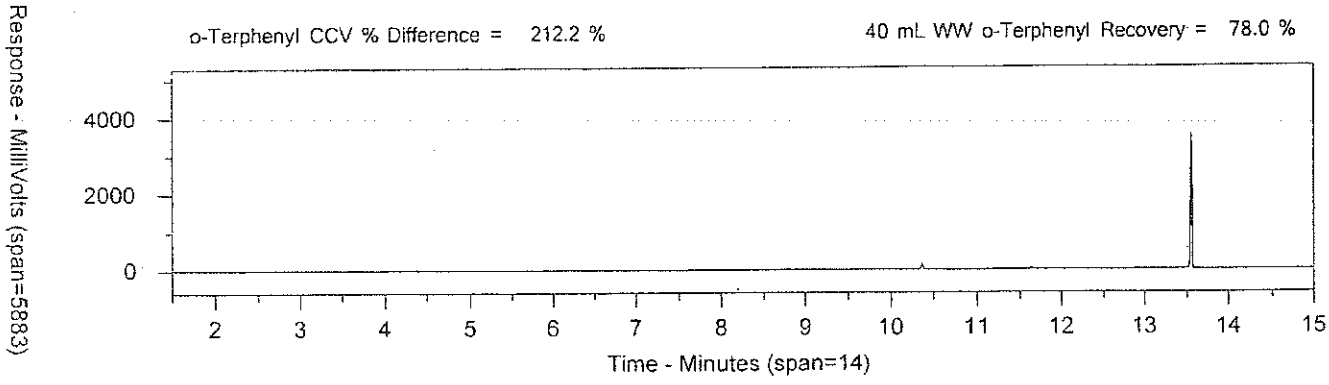


Sample Number: 8753067 AAOLYFD T 163570036A 12899 SW-846 8015B
Injected On: 1/7/2017 12:21:08 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um
Sample Weight: 247
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt ppm	Area
C10	2.252	0.0001	1348.139
C12	4.892	0.0006	7067.57
Capric Acid	6.510	0.0041	5459.575
C14	6.750	0.0020	21400.58
C16	8.348	0.0018	19313.86
C18	9.822	0.0025	25704.52
O-Terphenyl	10.362	0.0190	228286.6
C20	11.111	0.0001	1114.753
C22	11.927	0.0002	1883.967
C24	12.593	0.0008	7428.858
C26	13.159	0.0026	25560.74
C28	13.664	0.0007	7349.931
C30	14.132	0.0009	9383.903
C32	14.582	0.0009	8928.095
C34	15.019	0.0005	5772.919
C36	15.489	0.0004	4596.869
C38	15.865	0.0002	1630.015
C40	16.286	0.0001	1044.057

o-Terphenyl CCV % Difference = 212.2 %

40 mL WW o-Terphenyl Recovery = 78.0 %



Area File: D30006B.0022.RAW
Method: 4REPLOT30b.MET
Calibration File: 4FUL30B354A.CAL

Format: 4REPLOT30B.FMT
Area File Created On: 1/7/2017 12:39:10 AM
File Reported On: 1/7/2017 at 12:39:21 AM

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: BLANKA 12/23/16 PBLK36357 Sample ID: AA **Batchnumber:** 163570036A
Sample Amount: 250. Total Volume: 2. ml Analyst: 10210 SDG: State:
Analyses: 12899

Injection Summary

Injected on : 12/28/2016 10:47:58
Instrument : CP30--19507B
Result file : D30363B.0005.RAW
Calibration files : 4FUL30B354A.CAL
Method files : 4FUEL30B.MET 4REPLOT30B.MET
Setting : 4FUL30B354A(V)

Surrogate Recoveries

O-TERPHENYL 87% (50-150) Conc.: 20.89097

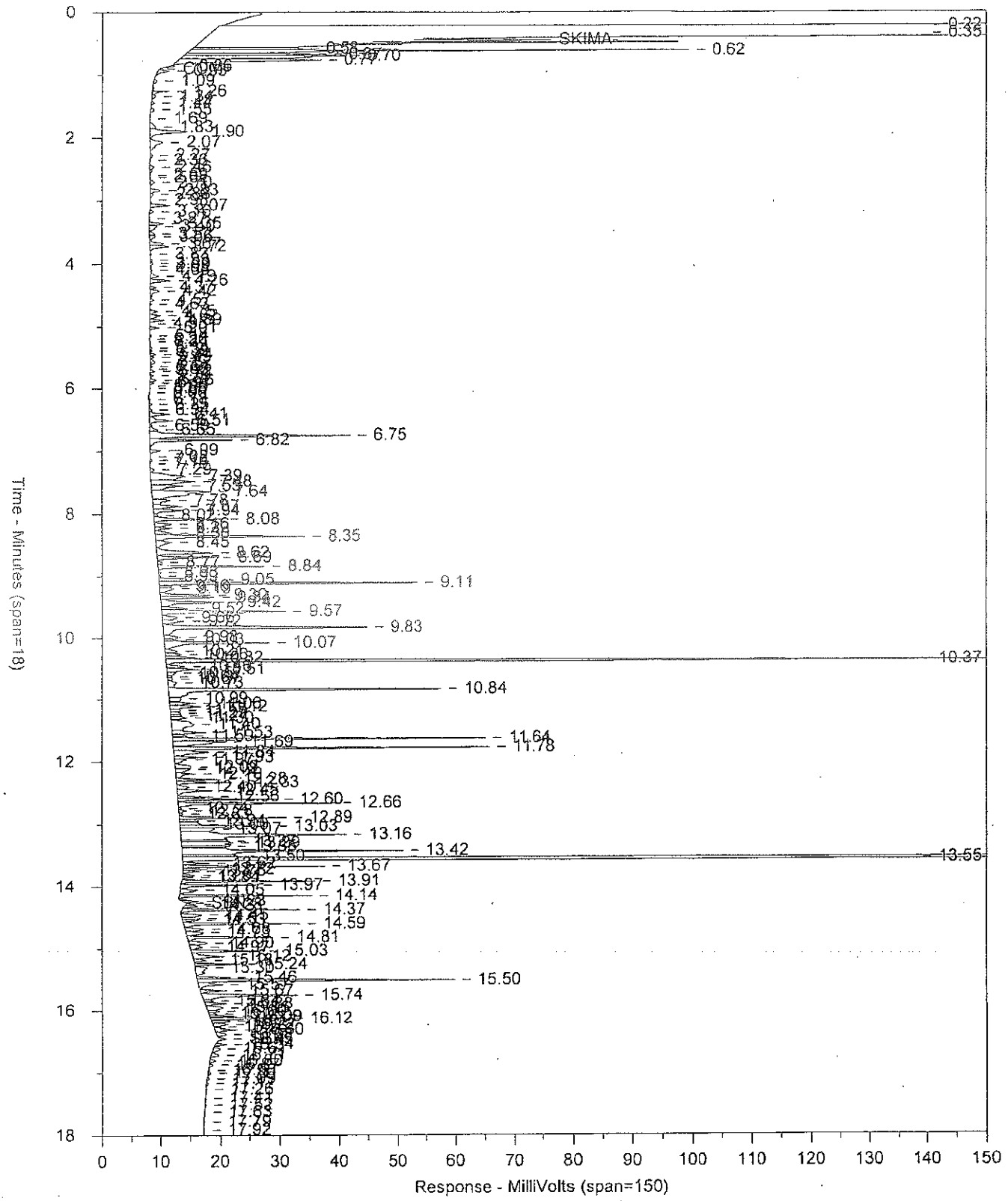
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
Total DRO C10-C28	2.09 - 13.77	5015708	475.8442	100	45		ppb
ORO >C28-C35	13.77 - 15.37	276480	27.6327	<100	<45		ppb
ORO >C28-C40	13.77 - 16.46	477949	47.7685	<100	45	J	ppb
DRO C13-C22	4.95 - 12.03	1530317	157.6929	100	45		ppb
WY DRO C10-C32	2.09 - 14.69	5193006	493.5642	100	45		ppb
DX DRO C12-C24	4.75 - 12.70	1667292	130.7670	100	45		ppb
DX HRO C24-C40	12.70 - 16.46	3752598	347.3715	250	100		ppb
DX C12-C40	4.75 - 16.46	5419889	478.1386				ppb
o-Terphenyl	10.37 (10.32 - 10.42)	254637	20.8910				ppb
Capric Acid	6.51 (6.39 - 6.59)	7754	552.0485				ppb

Comments: report results <MDL @ 10x blank

Reviewed by: Tom C. Wildermuth, Associate Chemist
Date: DEC 30 2016

Verified by: Heather E. Williams, Senior Chemist
Date: DEC 30 2016

BLANKA 12/23/16 AAPBLK36357 BLK 163570036A 12899 SW-846 8015B
D30363B.0005.RAW 10UL DRO



Sample Number: BLANKA 12/23/16 AAPBLK36357 BLK 163570036A 12899 SW-846 8015B
Injected On: 12/28/2016 10:47:58 AM Sample Weight: 250
Instrument ID: CP30-19507 Dilution Factor: 2
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min Injection Volume: 4ul
GC Column: HP-5 30m x 0.32mm x 0.25um Analyst: 10210

Compound	RT	Amt PPM	Area
C10	2.272	0.0001	1326
C12	4.816	0.0004	5000
Capric Acid	6.513	0.0048	10414
C14	6.752	0.0066	72673
C16	8.353	0.0047	50783
C18	9.826	0.0070	73426
O-Terphenyl	10.369	0.0208	253871
C20	11.064	0.0009	8980
C22	11.931	0.0008	8149
C24	12.597	0.0021	20215
C26	13.163	0.0087	85202
C28	13.667	0.0028	27776
C30	14.138	0.0029	28517
C32	14.589	0.0028	28451
C34	15.028	0.0016	16498
C36	15.458	0.0007	7755
C38	15.877	0.0006	6403
C40	16.303	0.0007	7757

Range	Start Time	Stop Time	Area
Total DRO C10-C28	2.09	13.77	5015708
ORO >C28-C35	13.77	15.37	276480
ORO >C28-C40	13.77	16.46	477949
Total DRO C13-C22	4.95	12.03	1530317
WY DRO C10-C32	2.09	14.69	5193006
Total DRO C12-C24	4.75	12.70	1667292
HRO >C24-C40	12.70	16.46	3752597
DX C12-C40	4.75	16.46	5419889
O-Terphenyl	10.32	10.42	253871

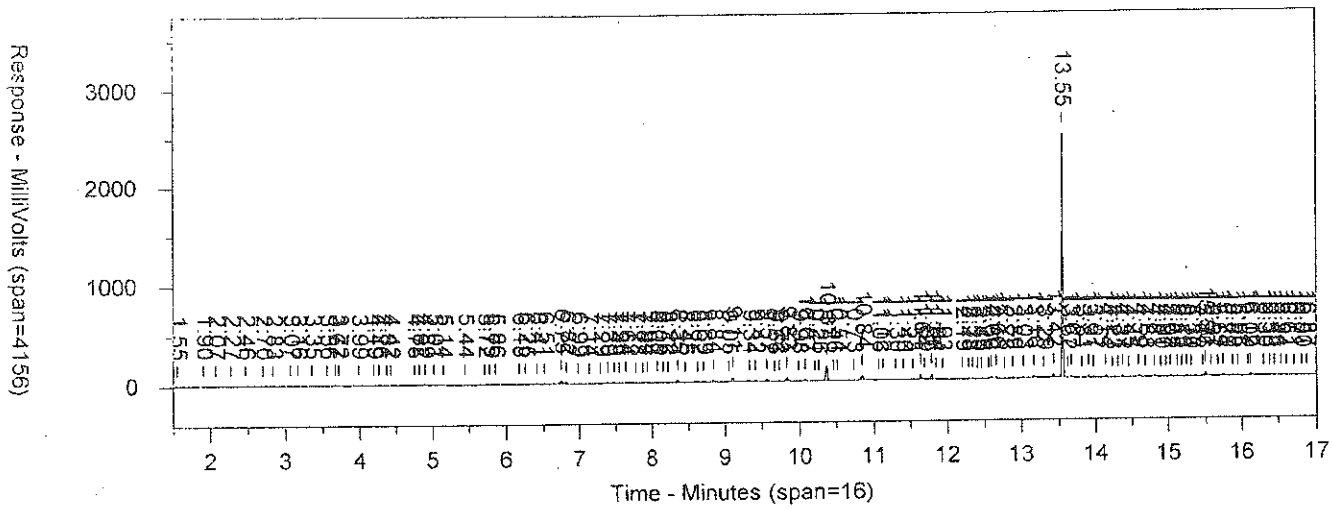
********** RESULTS TABLE **********

	Surrogate Adjusted Areas	Preliminary Amounts (w/ surrogate)
Total DRO C10-C28 AREA =	4761837	0.50 PPM
ORO>C28-C35 AREA =	276479.8	0.03 PPM
ORO>C28-C40 AREA =	477948.7	0.04 PPM
Total DRO C13-C22 AREA =	1276446	0.19 PPM
C10-C25 AREA =	4939135	0.52 PPM
Total DRO C12-C24 AREA =	1413421	0.15 PPM
HRO >C24-C40 AREA =	3752597	0.35 PPM
DX C12-C40 AREA =	5166018	0.50 PPM

Dx C12-C40 Level 3 %D = -98.937% #2 Fuel Level 3 %D = -99.90%

Area File: D30363B.0005.RAW
Method: 4FUEL30B.MET
Calibration File: 4FUL30B354A.CAL
Format: 4FUEL30B.FMT
Area File Created On: 12/28/2016 11:06:01 AM
File Reported On: 12/28/2016 at 11:06:12 AM

BLANKA 12/23/16 AAPBLK36357 BLK 163570036A 12899 SW-846 8015B
D30363B.0005.RAW 10ul surrogate report



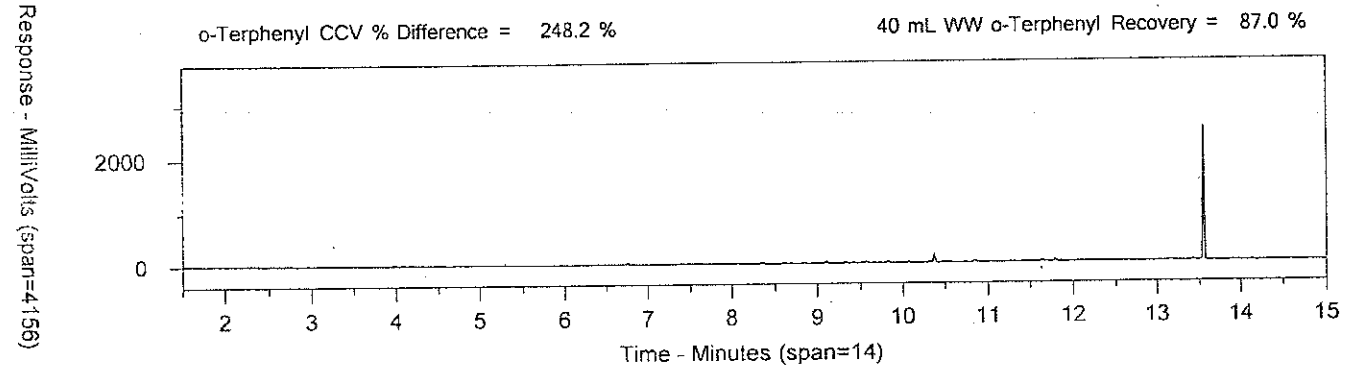
Sample Number: BLANKA 12/23/16 AAPBLK36357 BLK 163570036A 12899 SW-846 8015B
Injected On: 12/28/2016 10:47:58 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 250
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt ppm	Area
C10	2.272	0.0001	1325.693
C12	4.816	0.0003	3279.715
Capric Acid	6.513	0.0044	7754.184
C14	6.752	0.0061	67799.04
C16	8.353	0.0046	50017.75
C18	9.826	0.0062	65271.91
O-Terphenyl	10.369	0.0209	254637.3
C20	11.064	0.0004	3718.379
C22	11.931	0.0008	8257.741
C24	12.597	0.0017	16701.35
C26	13.163	0.0038	37196.59
C28	13.667	0.0026	25844.37
C30	14.138	0.0029	28516.51
C32	14.589	0.0027	27226.24
C34	15.028	0.0014	14718.9
C36	15.458	0.0004	4354.812
C38	15.877	0.0004	4219.636
C40	16.303	0.0004	4961.023

o-Terphenyl CCV % Difference = 248.2 %

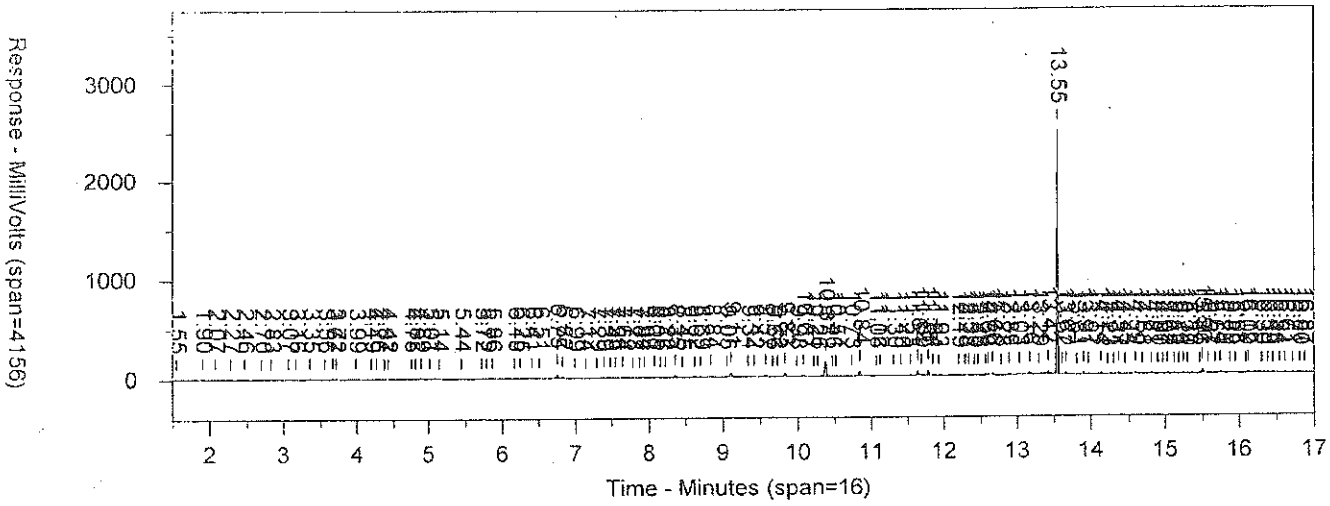
40 mL WW o-Terphenyl Recovery = 87.0 %



Area File: D30363B.0005.RAW
Method: 4REPLOT30b.MET
Calibration File: 4FUL30B354A.CAL

Format: 4REPLOT30B.FMT
Area File Created On: 12/28/2016 11:06:01 AM
File Reported On: 12/28/2016 at 11:06:28 AM

BLANKA 12/23/16 AAPBLK36357 BLK 163570036A 12899 SW-846 8015B
D30363B.0005.RAW 10ul surrogate report



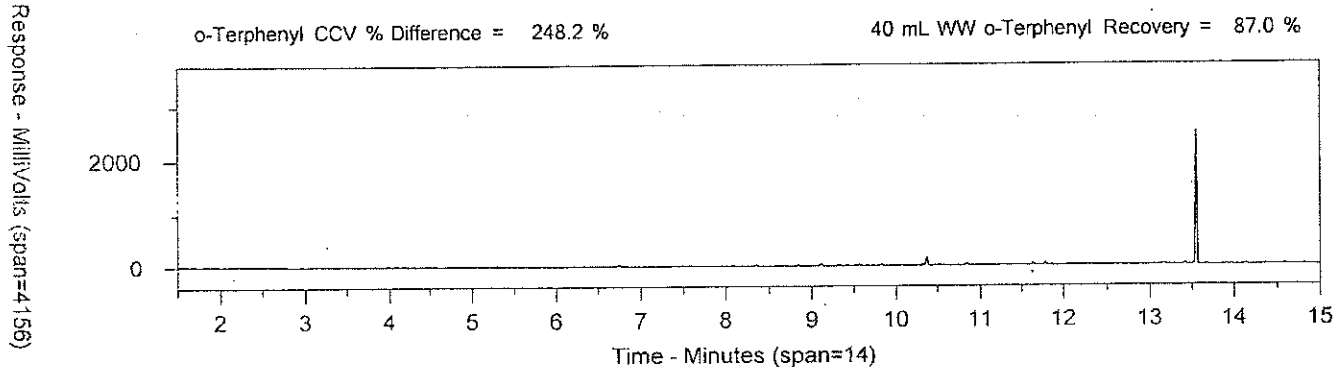
Sample Number: BLANKA 12/23/16 AAPBLK36357 BLK 163570036A 12899 SW-846 8015B
Injected On: 12/28/2016 10:47:58 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 250
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt ppm	Area
C10	2.272	0.0001	1325.693
C12	4.816	0.0003	3279.715
Capric Acid	6.513	0.0044	7754.184
C14	6.752	0.0061	67799.04
C16	8.353	0.0046	50017.75
C18	9.826	0.0062	65271.91
O-Terphenyl	10.369	0.0209	254637.3
C20	11.064	0.0004	3718.379
C22	11.931	0.0008	8257.741
C24	12.597	0.0017	16701.35
C26	13.163	0.0038	37196.59
C28	13.667	0.0026	25844.37
C30	14.138	0.0029	28516.51
C32	14.589	0.0027	27226.24
C34	15.028	0.0014	14718.9
C36	15.458	0.0004	4354.812
C38	15.877	0.0004	4219.636
C40	16.303	0.0004	4961.023

o-Terphenyl CCV % Difference = 248.2 %

40 mL WW o-Terphenyl Recovery = 87.0 %



Area File: D30363B.0005.RAW
Method: 4REPLOT30b.MET
Calibration File: 4FUL30B354A.CAL

Format: 4REPLOT30B.FMT
Area File Created On: 12/28/2016 11:06:01 AM
File Reported On: 12/28/2016 at 11:06:28 AM

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: LCSA 12/23/16 LCS36357 Sample ID: AA **Batchnumber:** 163570036A
Sample Amount: 250. Total Volume: 2. ml Analyst: 10210 SDG: State:
Analyses: 12899

Injection Summary

Injected on : 12/28/2016 11:11:20
Instrument : CP30--19507B
Result file : D30363B.0006.RAW
Calibration files : 4FUL30B354A.CAL
Method files : 4FUEL30B.MET 4REPLOT30B.MET
Setting : 4FUL30B354A(V)

Surrogate Recoveries

O-TERPHENYL 88% (50-150) Conc.: 21.16457

Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
Total DRO C10-C28	2.09 - 13.77	4611956	435.1579	100	45		ppb
ORO >C28-C35	13.77 - 15.37	12668	1.2661	<100	<45		ppb
ORO >C28-C40	13.77 - 16.46	21247	2.1235	<100	<45		ppb
DRO C13-C22	4.95 - 12.03	3847511	443.7202	100	45		ppb
WY DRO C10-C32	2.09 - 14.69	4620338	435.9957	100	45		ppb
DX DRO C12-C24	4.75 - 12.70	4036468	349.7689	100	45		ppb
DX HRO C24-C40	12.70 - 16.46	79031	7.3158	<250	<100		ppb
DX C12-C40	4.75 - 16.46	4115499	357.0847				ppb
o-Terphenyl	10.37 (10.32 - 10.42)	257972	21.1646				ppb
Capric Acid	6.49 (6.39 - 6.59)	6122	523.6231				ppb

Comments:

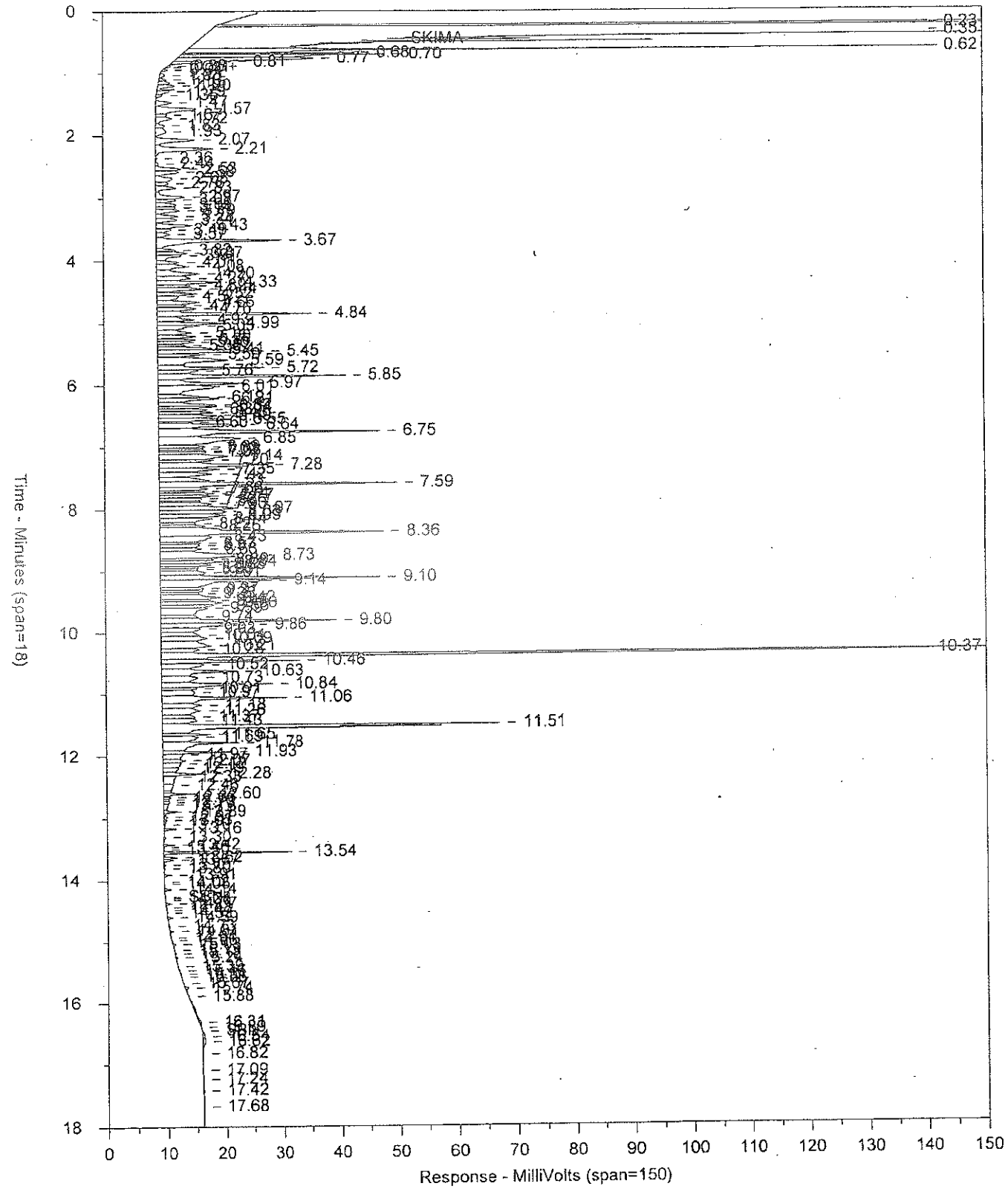
Tom C. Wildermuth
Associate Chemist

Reviewed by: _____
Date: DEC 30 2016

Heather E Williams
Senior Chemist

Verified by: _____
Date: DEC 30 2016

LCSA 12/23/16 AALCS36357 LCS 163570036A 12899 SW-846 8015B
D30363B.0006.RAW 10UL DRO



Sample Number: LCSA 12/23/16 AALCS36357 LCS 163570036A 12899 SW-846 8015B
Injected On: 12/28/2016 11:11:20 AM Sample Weight: 250
Instrument ID: CP30-19507 Dilution Factor: 2
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min Injection Volume: 4ul
GC Column: HP-5 30m x 0.32mm x 0.25um Analyst: 10210

Compound	RT	Amt PPM	Area
C10	2.213	0.0029	34350
C12	4.843	0.0053	60103
Capric Acid	6.487	0.0077	30974
C14	6.753	0.0106	116983
C16	8.365	0.0118	128116
C18	9.798	0.0071	74675
O-Terphenyl	10.368	0.0248	301945
C20	11.062	0.0065	66813
C22	11.930	0.0023	22699
C24	12.596	0.0010	9893
C26	13.162	0.0003	3229
C28	13.666	0.0003	2640
C30	14.138	0.0002	1883
C32	14.589	0.0001	1447
C34	15.027	0.0001	904
C36	15.456	0.0000	342
C38	15.880	0.0000	371
C40	16.309	0.0004	4667

Range	Start Time	Stop Time	Area
Total DRO C10-C28	2.09	13.77	4611956
ORO >C28-C35	13.77	15.37	12668
ORO >C28-C40	13.77	16.46	21247
Total DRO C13-C22	4.95	12.03	3847511
WY DRO C10-C32	2.09	14.69	4620338
Total DRO C12-C24	4.75	12.70	4036468
HRO >C24-C40	12.70	10.40	79031
DX C12-C40	4.75	16.46	4115499
O-Terphenyl	10.32	10.42	301945

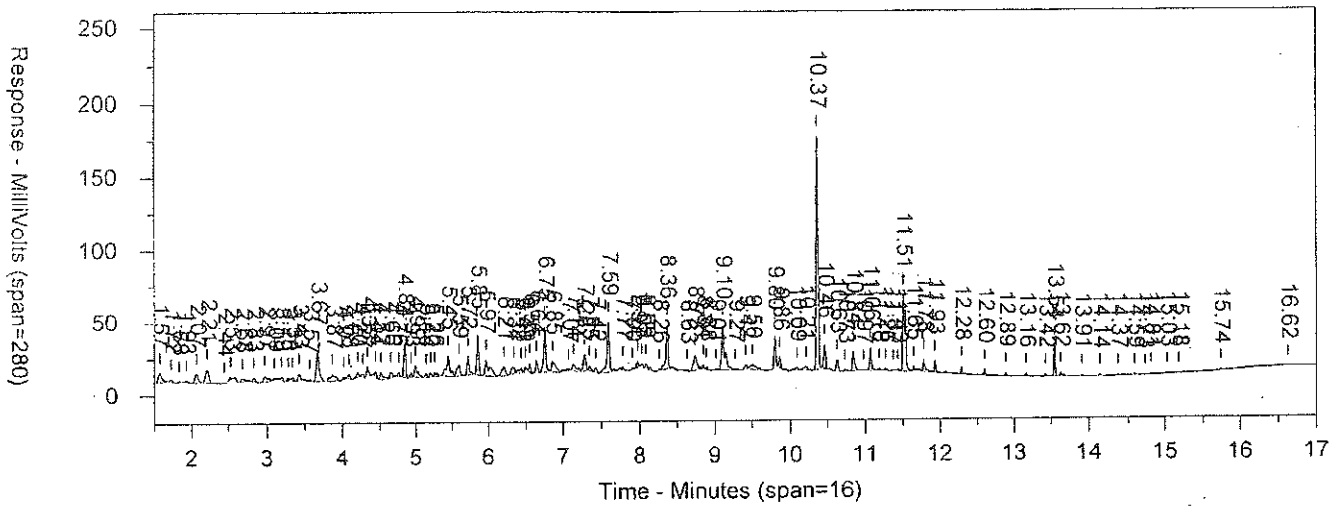
********** RESULTS TABLE **********

	Surrogate Adjusted Areas	Preliminary Amounts (w/ surrogate)
Total DRO C10-C28 AREA =	4310011	0.46 PPM
ORO>C28-C35 AREA =	12668.2	0.00 PPM
ORO>C28-C40 AREA =	21246.97	0.00 PPM
Total DRO C13-C22 AREA =	3545566	0.48 PPM
C10-C25 AREA =	4318393	0.46 PPM
Total DRO C12-C24 AREA =	3734523	0.37 PPM
HRO >C24-C40 AREA =	79031.36	0.01 PPM
DX C12-C40 AREA =	3813554	0.38 PPM

Dx C12-C40 Level 3 %D = -99.216% #2 Fuel Level 3 %D = -99.91%

Area File: D30363B.0006.RAW
Method: 4FUEL30B.MET
Calibration File: 4FUL30B354A.CAL
Format: 4FUEL30B.FMT
Area File Created On: 12/28/2016 11:29:22 AM
File Reported On: 12/28/2016 at 11:29:32 AM

LCSA 12/23/16 AALCS36357 LCS 163570036A 12899 SW-846 8015B
D30363B.0006.RAW 10ul surrogate report



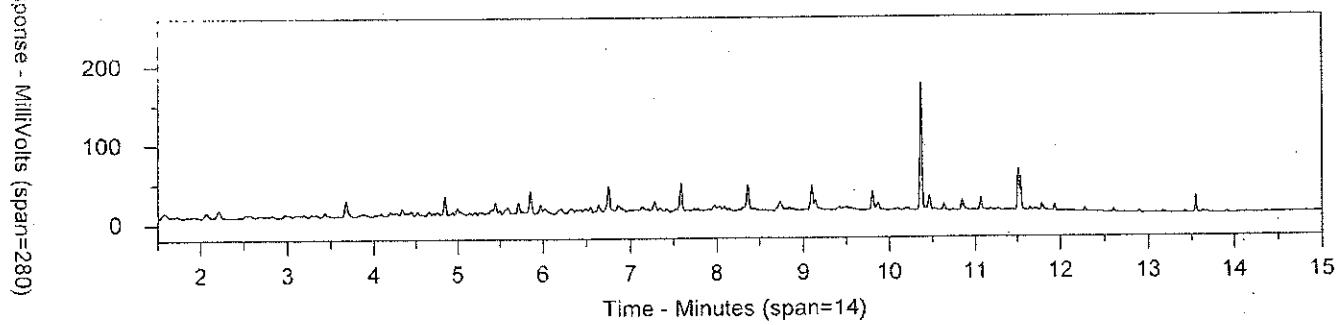
Sample Number: LCSA 12/23/16 AALCS36357 LCS 163570036A 12899 SW-846 8015B
Injected On: 12/28/2016 11:11:20 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 250
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt ppm	Area
C10	2.213	0.0026	30408.85
C12	4.843	0.0038	42800.98
Capric Acid	6.487	0.0042	6122.434
C14	6.753	0.0062	68010.88
C16	8.365	0.0058	63285.35
C18	9.798	0.0035	36608.43
O-Terphenyl	10.368	0.0212	257972.1
C20	11.062	0.0027	27718.23
C22	11.930	0.0011	11265.02
C24	12.596	0.0008	7454.223
C26	13.162	0.0003	3025.074
C28	13.624	0.0006	6179.347
C30	14.138	0.0002	1883.321
C32	14.589	0.0001	1447.192
C34	15.027	0.0001	903.6851

o-Terphenyl CCV % Difference = 252.7 %

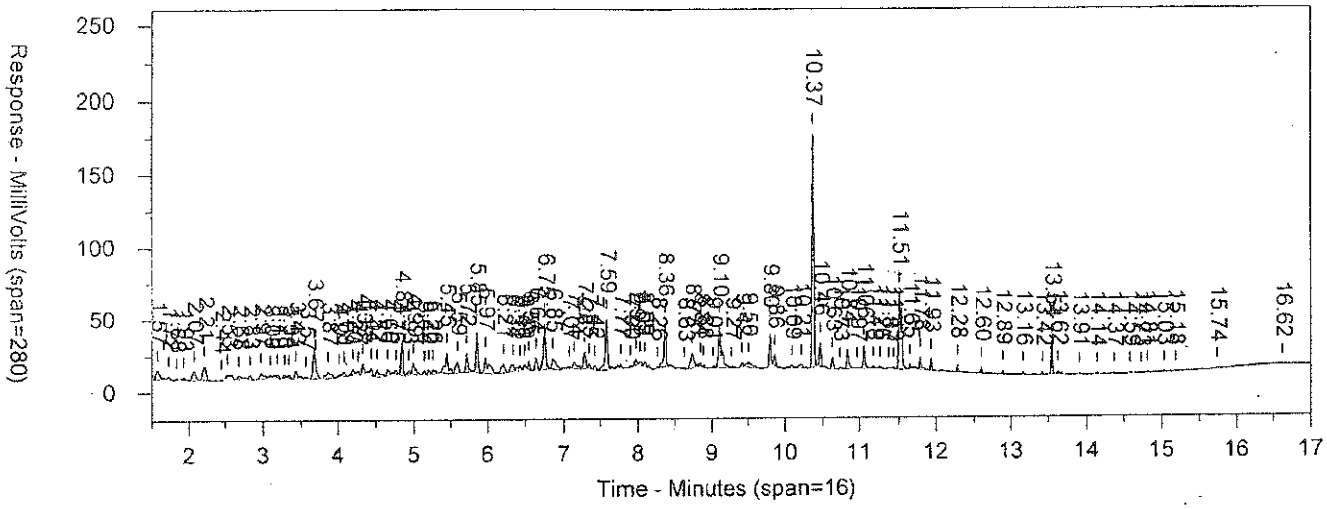
40 mL WW o-Terphenyl Recovery = 88.2 %



Area File: D30363B.0006.RAW
Method: 4REPLOT30b.MET
Calibration File: 4FUL30B354A.CAL

Format: 4REPLOT30B.FMT
Area File Created On: 12/28/2016 11:29:22 AM
File Reported On: 12/28/2016 at 11:29:48 AM

LCSA 12/23/16 AALCS36357 LCS 163570036A 12899 SW-846 8015B
D30363B.0006.RAW 10ul surrogate report



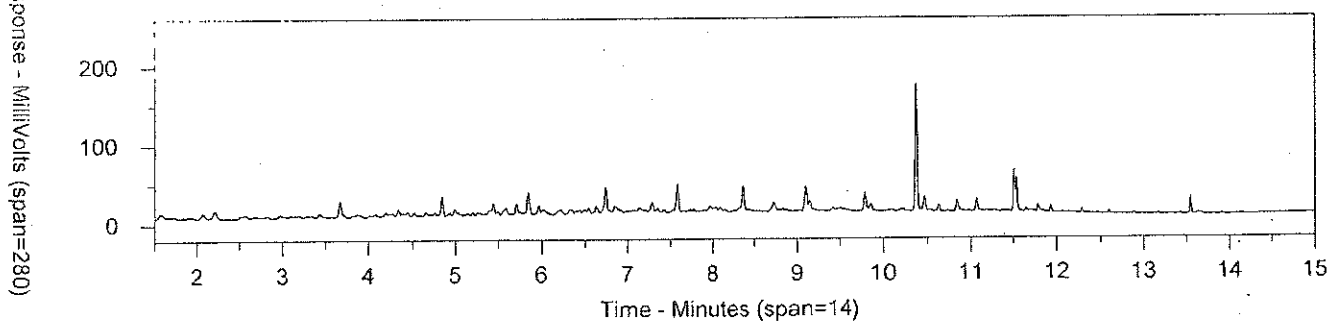
Sample Number: LCSA 12/23/16 AALCS36357 LCS 163570036A 12899 SW-846 8015B
Injected On: 12/28/2016 11:11:20 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 250
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt ppm	Area
C10	2.213	0.0026	30408.85
C12	4.843	0.0038	42800.98
Capric Acid	6.487	0.0042	6122.434
C14	6.753	0.0062	68010.88
C16	8.365	0.0058	63285.35
C18	9.798	0.0035	36608.43
O-Terphenyl	10.368	0.0212	257972.1
C20	11.062	0.0027	27718.23
C22	11.930	0.0011	11265.02
C24	12.596	0.0008	7454.223
C26	13.162	0.0003	3025.074
C28	13.624	0.0006	6179.347
C30	14.138	0.0002	1883.321
C32	14.589	0.0001	1447.192
C34	15.027	0.0001	903.6851

o-Terphenyl CCV % Difference = 252.7 %

40 mL WW o-Terphenyl Recovery = 88.2 %



Area File: D30363B.0006.RAW
Method: 4REPLOT30b.MET
Calibration File: 4FUL30B354A.CAL

Format: 4REPLOT30B.FMT
Area File Created On: 12/28/2016 11:29:22 AM
File Reported On: 12/28/2016 at 11:29:48 AM

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: LCSDA 12/23/16 LCSD36357 Sample ID: AA **Batchnumber:** 163570036A
Sample Amount: 250. Total Volume: 2. ml Analyst: 10210 SDG: State:
Analyses: 12899

Injection Summary

Injected on : 12/28/2016 11:34:56
Instrument : CP30--19507B
Result file : D30363B.0007.RAW
Calibration files : 4FUL30B354A.CAL
Method files : 4FUEL30B.MET 4REPLOT30B.MET
Setting : 4FUL30B354A(V)

Surrogate Recoveries

O-TERPHENYL 83% (50-150) Conc.: 19.95642

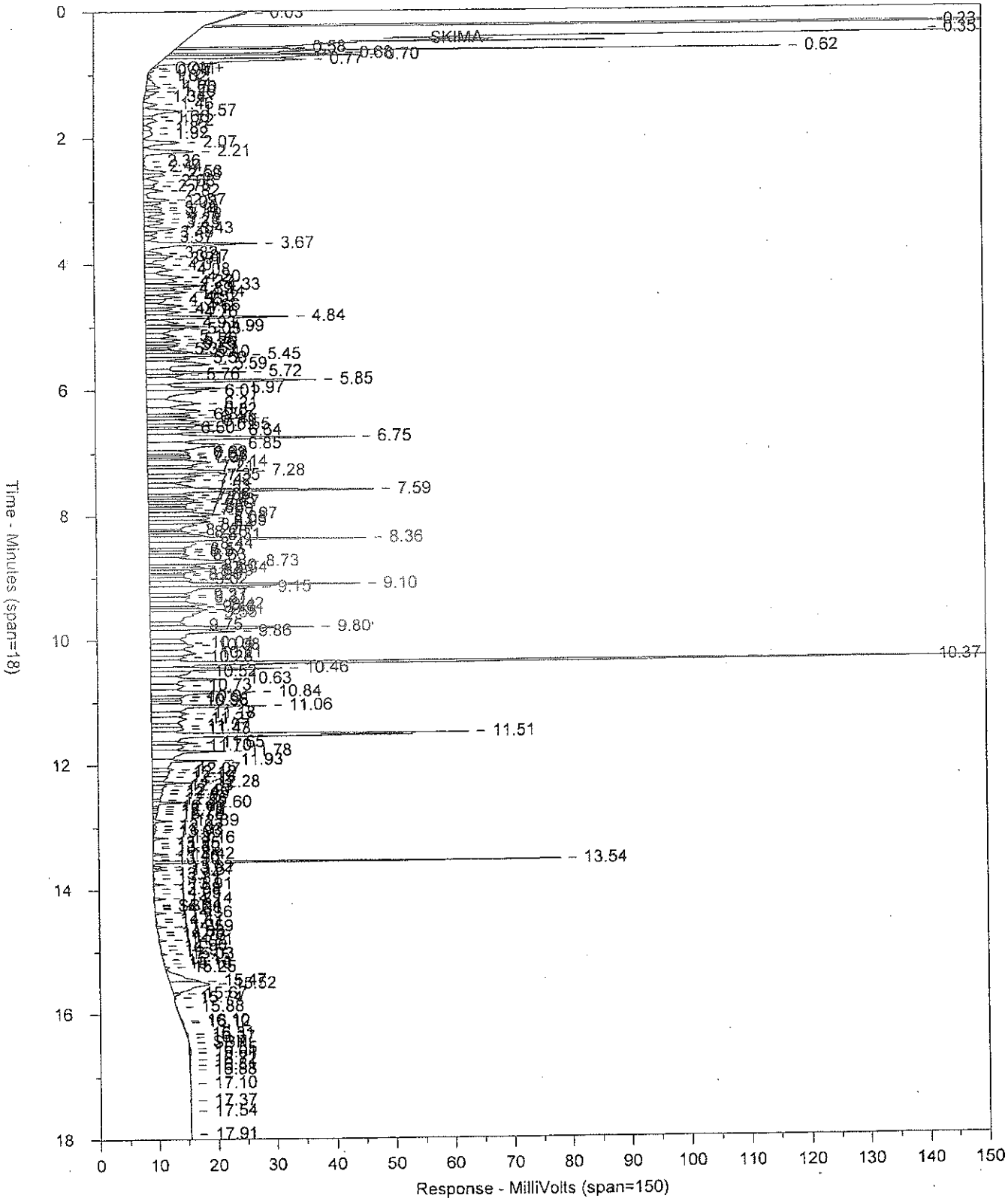
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
Total DRO C10-C28	2.09 - 13.77	4295106	404.9623	100	45		ppb
ORO >C28-C35	13.77 - 15.37	20567	2.0556	<100	<45		ppb
ORO >C28-C40	13.77 - 16.46	101934	10.1878	<100	<45		ppb
DRO C13-C22	4.95 - 12.03	3548307	408.5545	100	45		ppb
WY DRO C10-C32	2.09 - 14.69	4308638	406.3147	100	45		ppb
DX DRO C12-C24	4.75 - 12.70	3724603	322.2633	100	45		ppb
DX HRO C24-C40	12.70 - 16.46	208928	19.3401	<250	<100		ppb
DX C12-C40	4.75 - 16.46	3933532	341.6034				ppb
o-Terphenyl	10.37 (10.32 - 10.42)	243246	19.9564				ppb
Capric Acid	6.49 (6.39 - 6.59)	5691	516.1124				ppb

Comments: _____

Reviewed by: Tom C. Wildermuth, Associate Chemist
Date: DEC 30 2016

Verified by: Heather E. Williams, Senior Chemist
Date: DEC 30 2016

LCSDA 12/23/16 AALCSD36357 LCSD 163570036A 12899 SW-846 8015B
D30363B.0007.RAW 10UL DRO



Sample Number: LCSDA 12/23/16 AALCSD36357 LCSD 163570036A 12899 SW-846 8015B
Injected On: 12/28/2016 11:34:56 AM Sample Weight: 250
Instrument ID: CP30-19507 Dilution Factor: 2
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min Injection Volume: 4ul
GC Column: HP-5 30m x 0.32mm x 0.25um Analyst: 10210

Compound	RT	Amt PPM	Area
C10	2.208	0.0026	31011
C12	4.842	0.0048	54631
Capric Acid	6.490	0.0072	27429
C14	6.753	0.0098	108522
C16	8.364	0.0086	94050
C18	9.798	0.0064	67109
O-Terphenyl	10.369	0.0233	283894
C20	11.062	0.0064	64917
C22	11.931	0.0037	36581
C24	12.596	0.0010	9420
C26	13.161	0.0004	3557
C28	13.667	0.0003	3469
C30	14.138	0.0003	2896
C32	14.590	0.0002	2454
C34	15.031	0.0001	1473
C36	15.466	0.0027	28426
C38	15.882	0.0000	334
C40	16.312	0.0002	2050

Range	Start Time	Stop Time	Area
Total DRO C10-C28	2.09	13.77	4295106
ORO >C28-C35	13.77	15.37	20567
ORO >C28-C40	13.77	16.46	101934
Total DRO C13-C22	4.95	12.03	3548307
WY DRO C10-C32	2.09	14.69	4308638
Total DRO C12-C24	4.75	12.70	3724604
HRO >C24-C40	12.70	16.46	208928
DX C12-C40	4.75	16.46	3933532
O-Terphenyl	10.32	10.42	283894

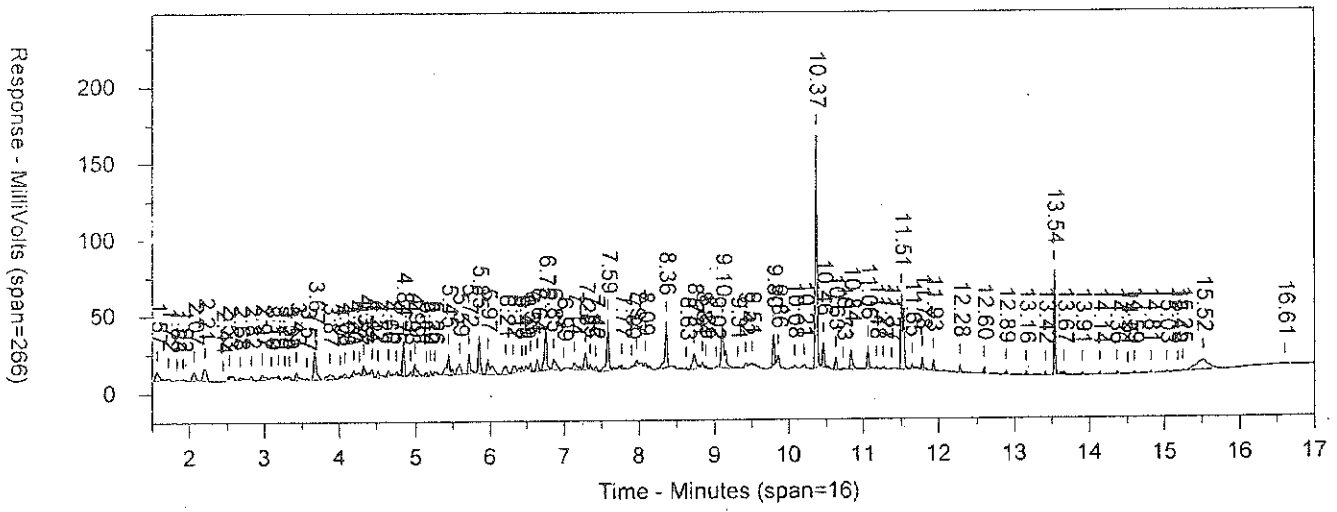
********** RESULTS TABLE **********

	Surrogate Adjusted Areas	Preliminary Amounts (w/ surrogate)
Total DRO C10-C28 AREA =	4011212	0.43 PPM
ORO>C28-C35 AREA =	20566.87	0.00 PPM
ORO>C28-C40 AREA =	101934.4	0.01 PPM
Total DRO C13-C22 AREA =	3264413	0.44 PPM
C10-C25 AREA =	4024744	0.43 PPM
Total DRO C12-C24 AREA =	3440710	0.34 PPM
HRO >C24-C40 AREA =	208928.2	0.02 PPM
DX C12-C40 AREA =	3649638	0.36 PPM

Dx C12-C40 Level 3 %D = -99.249% #2 Fuel Level 3 %D = -99.91%

Area File: D30363B.0007.RAW
Method: 4FUEL30B.MET
Calibration File: 4FUL30B354A.CAL
Format: 4FUEL30B.FMT
Area File Created On: 12/28/2016 11:52:58 AM
File Reported On: 12/28/2016 at 11:53:06 AM

LCSDA 12/23/16 AALCSD36357 LCSD 163570036A 12899 SW-846 8015B
D30363B.0007.RAW 10ul surrogate report



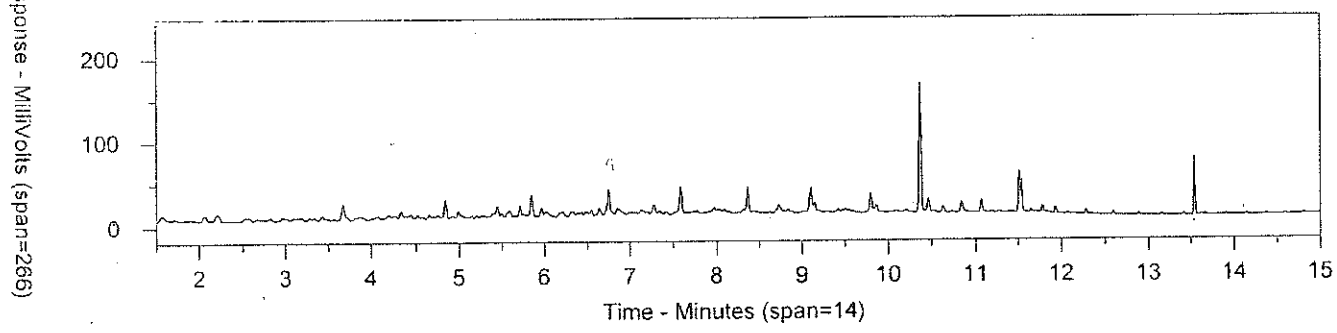
Sample Number: LCSDA 12/23/16 AALCSD36357 LCSD 163570036A 12899 SW-846 8015B
Injected On: 12/28/2016 11:34:56 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 250
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt ppm	Area
C10	2.208	0.0023	26584.26
C12	4.842	0.0035	39197.03
Capric Acid	6.490	0.0041	5691.287
C14	6.753	0.0057	63012.63
C16	8.364	0.0058	63644.86
C18	9.798	0.0031	32905.2
O-Terphenyl	10.369	0.0200	243246.1
C20	11.062	0.0026	26073.54
C22	11.931	0.0011	11000.65
C24	12.596	0.0006	5582.246
C26	13.161	0.0004	3557.366
C28	13.667	0.0007	6711.603
C30	14.138	0.0003	2895.976
C32	14.590	0.0002	2453.912
C34	15.031	0.0001	1510.85
C36	15.516	0.0068	72770.21

o-Terphenyl CCV % Difference = 232.6 %

40 mL WW o-Terphenyl Recovery = 83.2 %



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Method: 4REPLOT30b.MET
Calibration File: 4FUL30B354A.CAL

Format: 4REPLOT30B.FMT
Area File Created On: 12/28/2016 11:52:58 AM
File Reported On: 12/28/2016 at 11:53:22 AM

TPH-DRO by GC with Silica Gel Data

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: 8753067S OLYFD **Sample ID:** AB **Batchnumber:** 163570039A
Sample Amount: 247. Total Volume: 2. ml Analyst: 10210 SDG: WAN02 State: WA
Analyses: 12908

Injection Summary

Injected on : 12/29/2016 02:38:45
Instrument : CP30--19507B
Result file : D30363B.0045.RAW
Calibration files : 4FUL30B354A.CAL
Method files : 4FUEL30B.MET 4REPLOT30B.MET
Setting : 4FUL30B354A(V)

Surrogate Recoveries

O-TERPHENYL 83% (50-150) Conc.: 20.2094

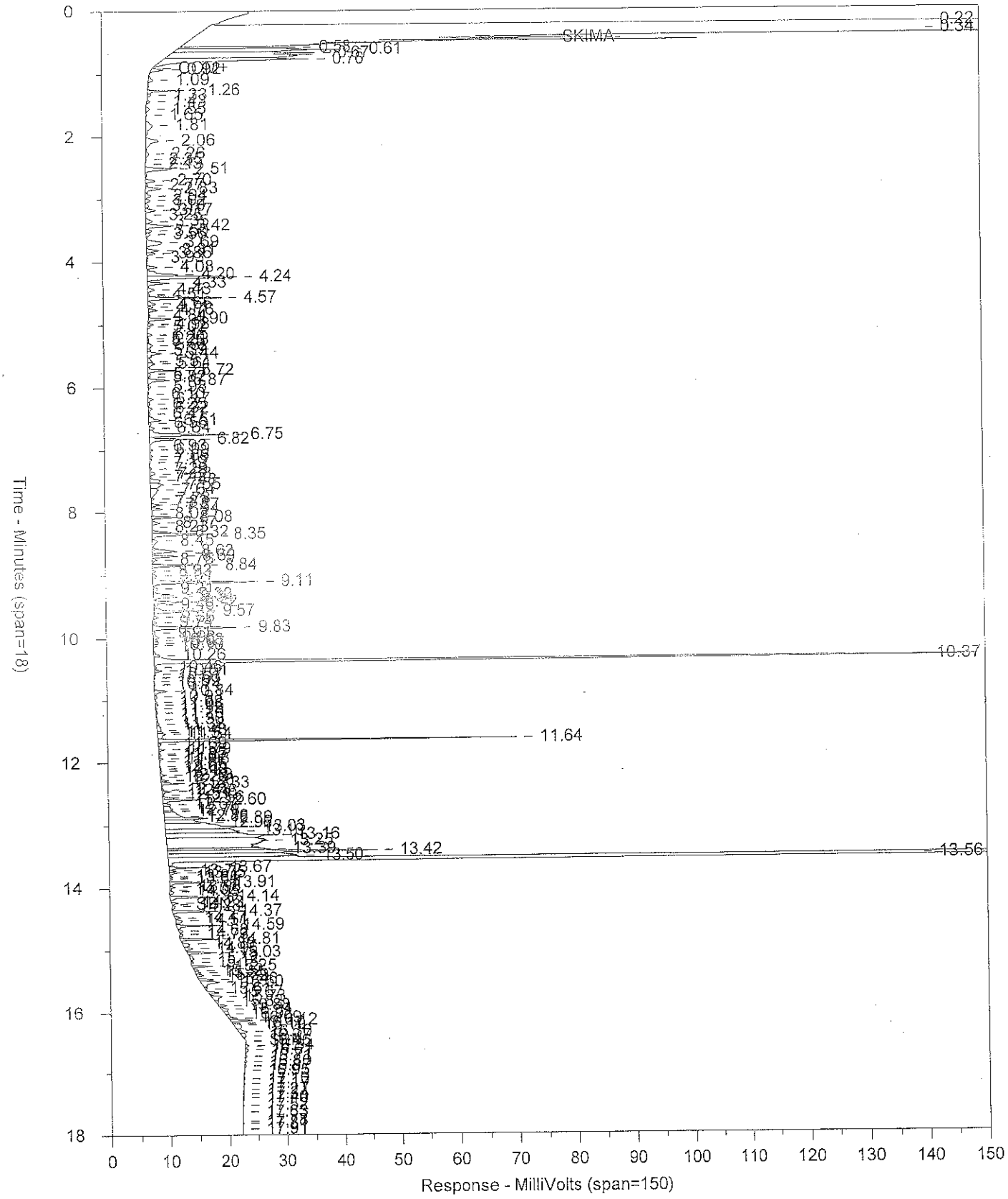
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
☐ Total DRO C10-C28	2.09 - 13.77	5755014	557.5503	101.2146	45.5466		ppb
☐ ORO >C28-C35	13.77 - 15.37	88109	8.9130	<101.2146	<45.5466		ppb
☐ ORO >C28-C40	13.77 - 16.46	146113	14.7806				ppb
☐ DRO C13-C22	4.95 - 12.03	682011	54.8806	<101.2146	45.5466	J	ppb
☐ WY DRO C10-C32	2.09 - 14.69	5810468	563.1599	101.2146	45.5466		ppb
☑ DX DRO C12-C24	4.75 - 12.70	723628	44.9963	<101.2146	<45.5466		ppb
☑ DX HRO C24-C40	12.70 - 16.46	5012046	469.5916	253.0364	101.2146		ppb
☐ DX C12-C40	4.75 - 16.46	5735674	514.5879				ppb
☐ o-Terphenyl	10.37 (10.32 - 10.42)	243374	20.2094				ppb
☐ Capric Acid	6.51 (6.39 - 6.59)	5253	508.4758				ppb

Comments: _____

Reviewed by: AE/10210
Date: 1/11/17

Verified by: Jamie L. Brillhart
Senior Chemist
Date: JAN 18 2017

8753067S ABOLYFD T 163570039A 12908 SW-846 8015B
D30363B.0045.RAW 10UL DRO



Sample Number: 8753067S ABOLYFD T 163570039A 12908 SW-846 8015B
Injected On: 12/29/2016 2:38:45 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 247
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt PPM	Area
C10	2.262	0.0002	1857
C12	4.844	0.0000	514
Capric Acid	6.515	0.0042	5904
C14	6.753	0.0025	27600
C16	8.353	0.0018	19291
C18	9.827	0.0025	25860
O-Terphenyl	10.368	0.0201	241902
C20	11.064	0.0001	819
C22	11.932	0.0001	1233
C24	12.597	0.0010	9809
C26	13.164	0.0074	71343
C28	13.669	0.0008	8355
C30	14.139	0.0011	10966
C32	14.590	0.0011	10853
C34	15.029	0.0006	6431
C36	15.458	0.0003	3644
C38	15.876	0.0002	2318
C40	16.302	0.0004	4086

Range	Start Time	Stop Time	Area
Total DRO C10-C28	2.09	13.77	5755014
ORO >C28-C35	13.77	15.37	88109
ORO >C28-C40	13.77	16.46	146113
Total DRO C13-C22	4.95	12.03	682011
WY DRO C10-C32	2.09	14.69	5810468
Total DRO C12-C24	4.75	12.70	723628
HRO >C24-C40	12.70	16.46	5012046
DX C12-C40	4.75	16.46	5735674
O-Terphenyl	10.32	10.42	241902

********** RESULTS TABLE **********

	Surrogate Adjusted Areas	Preliminary Amounts (w/ surrogate)
Total DRO C10-C28 AREA =	5513112	0.58 PPM
ORO>C28-C35 AREA =	88109.43	0.01 PPM
ORO>C28-C40 AREA =	146113.4	0.01 PPM
Total DRO C13-C22 AREA =	440108.8	0.09 PPM
C10-C25 AREA =	5568566	0.59 PPM
Total DRO C12-C24 AREA =	481726.3	0.07 PPM
HRO >C24-C40 AREA =	5012046	0.47 PPM
DX C12-C40 AREA =	5493772	0.54 PPM

Dx C12-C40 Level 3 %D = -98.856% #2 Fuel Level 3 %D = -99.88%

Area File: D30363B.0045.RAW
Method: 4FUEL30B.MET
Calibration File: 4FUL30B354A.CAL
Format: 4FUEL30B.FMT
Area File Created On: 12/29/2016 2:56:49 AM
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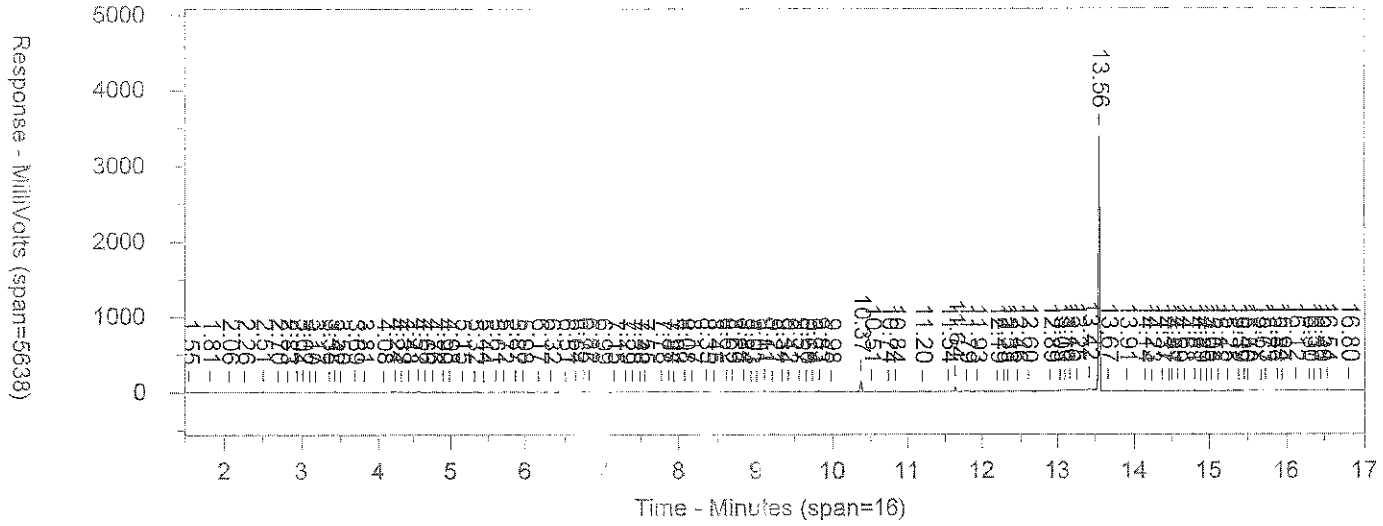
8753067S ABOLYFD T 163570039A 12908 SW-846 8015B
D30363B.0045.RAW 10ul surrogate report



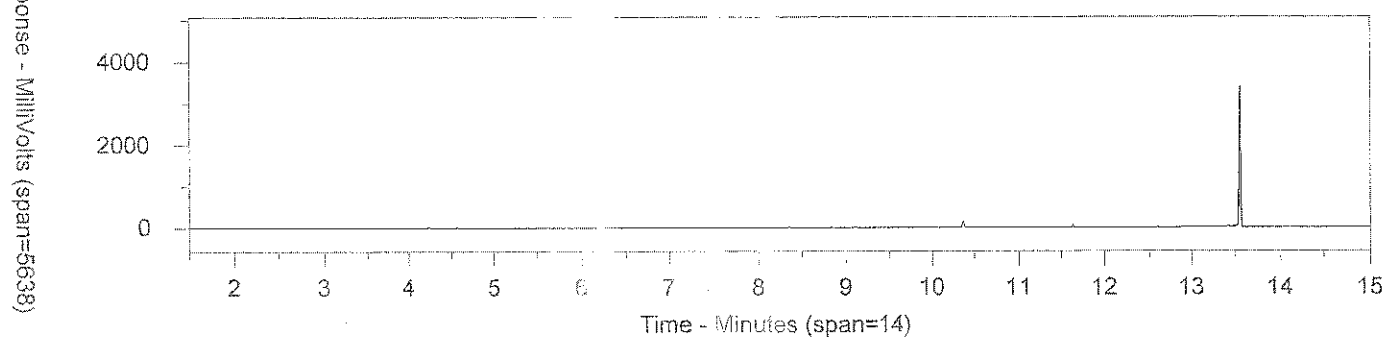
Sample Number: 8753067S ABOLYFD T 163570039A 12908 SW-846 8015B
Injected On: 12/29/2016 2:38:45 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 247
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt ppm	Area
C10	2.262	0.0001	1600.085
C12	4.897	0.0006	6995.504
Capric Acid	6.515	0.0041	5252.911
C14	6.753	0.0021	23319.44
C16	8.353	0.0022	23683.67
C18	9.827	0.0024	24751.29
O-Terphenyl	10.368	0.0202	243373.7
C22	11.932	0.0002	1545.979
C24	12.597	0.0010	9978.454
C26	13.164	0.0009	8349.763
C28	13.669	0.0012	11467.65
C30	14.139	0.0011	10966.37
C32	14.590	0.0011	10853.21
C34	15.029	0.0006	6430.949
C36	15.458	0.0002	2589.179
C38	15.876	0.0002	1631.08
C40	16.302	0.0001	1195.607

o-Terphenyl CCV % Difference = 232.8 %

40 mL WW o-Terphenyl Recovery = 83.2 %



Area File: D30363B.0045.BND
Method: 4REPLOT30b.MET
Calibration File: 4FUL30B354A.CAL

Format: 4REPLOT30B.FMT
Area File Created On: 12/30/2016 9:20:47 AM
File Reported On: 12/30/2016 at 9:20:47 AM

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: BLANKA 12/23/16 S PBLK39357 Sample ID: AB **Batchnumber:** 163570039A
Sample Amount: 250. Total Volume: 2. ml Analyst: 10210 SDG: State:
Analyses: 12908

Injection Summary

Injected on : 12/29/2016 01:28:28
Instrument : CP30--19507B
Result file : D30363B.0042.RAW
Calibration files : 4FUL30B354A.CAL
Method files : 4FUEL30B.MET 4REPLOT30B.MET
Setting : 4FUL30B354A(V)

Surrogate Recoveries

O-TERPHENYL 86% (50-150) Conc.: 20.65731

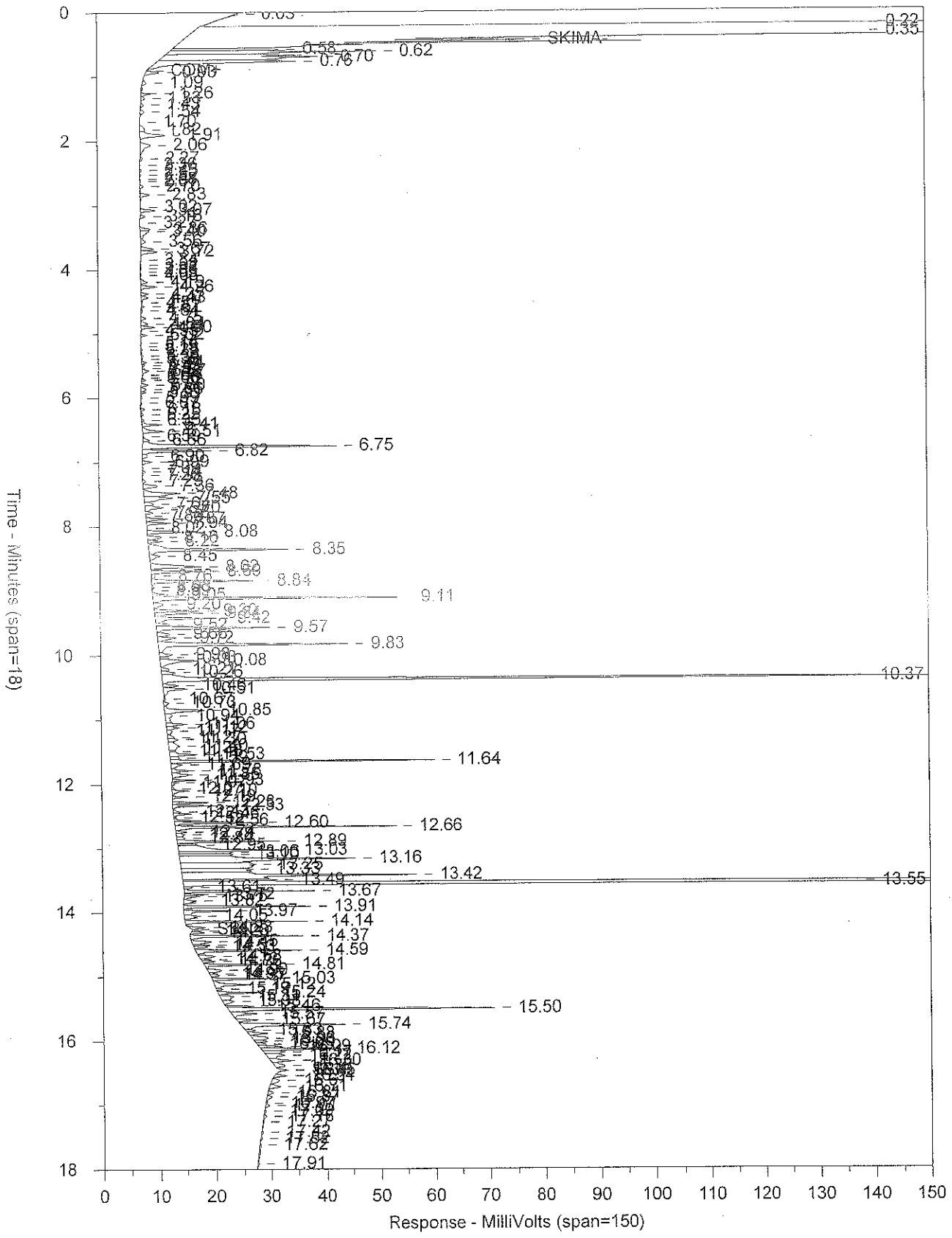
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
Total DRO C10-C28	2.09 - 13.77	4800942	454.6640	100	45		ppb
ORO >C28-C35	13.77 - 15.37	256356	25.6215	<100	<45		ppb
ORO >C28-C40	13.77 - 16.46	490132	48.9861				ppb
DRO C13-C22	4.95 - 12.03	1156880	111.8827	100	45		ppb
WY DRO C10-C32	2.09 - 14.69	4973922	471.9526	100	45		ppb
DX DRO C12-C24	4.75 - 12.70	1278820	95.0705	<100	45	J	ppb
DX HRO C24-C40	12.70 - 16.46	3948657	365.5205	250	100		ppb
DX C12-C40	4.75 - 16.46	5227478	460.5910				ppb
o-Terphenyl	10.37 (10.32 - 10.42)	251789	20.6573				ppb
Capric Acid	6.51 (6.39 - 6.59)	7804	552.9084				ppb

Comments: _____

Reviewed by: Qd10210
Date: 1/17/17

Verified by: Jamie L. Grillhart
Jamie L. Grillhart
Senior Chemist
Date: JAN 18 2017

BLANKA 12/23/16 S ABPBLK39357 BLK 163570039A 12908 SW-846 8015B
D30363B.0042.RAW 10UL DRO



Sample Number: BLANKA 12/23/16 S ABPBLK39357 BLK 163570039A 12908 SW-846 8015B
Injected On: 12/29/2016 1:28:28 AM Sample Weight: 250
Instrument ID: CP30-19507 Dilution Factor: 2
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min Injection Volume: 4ul
GC Column: HP-5 30m x 0.32mm x 0.25um Analyst: 10210

Compound	RT	Amt PPM	Area
C10	2.266	0.0001	1369
C12	4.841	0.0003	3119
Capric Acid	6.514	0.0046	8771
C14	6.753	0.0066	73421
C16	8.353	0.0052	57117
C18	9.828	0.0069	72191
O-Terphenyl	10.368	0.0215	261903
C20	11.062	0.0007	7330
C22	11.933	0.0005	5289
C24	12.597	0.0020	19845
C26	13.163	0.0106	103813
C28	13.669	0.0028	27941
C30	14.140	0.0030	29576
C32	14.590	0.0027	27487
C34	15.029	0.0013	14218
C36	15.455	0.0007	7044
C38	15.878	0.0006	6332
C40	16.302	0.0009	9982

Range	Start Time	Stop Time	Area
Total DRO C10-C28	2.09	13.77	4800942
ORO >C28-C35	13.77	15.37	256356
ORO >C28-C40	13.77	16.46	490132
Total DRO C13-C22	4.95	12.03	1156880
WY DRO C10-C32	2.09	14.69	4973923
Total DRO C12-C24	4.75	12.70	1278820
HRO >C24-C40	12.70	16.46	3948658
DX C12-C40	4.75	16.46	5227478
O-Terphenyl	10.32	10.42	261903

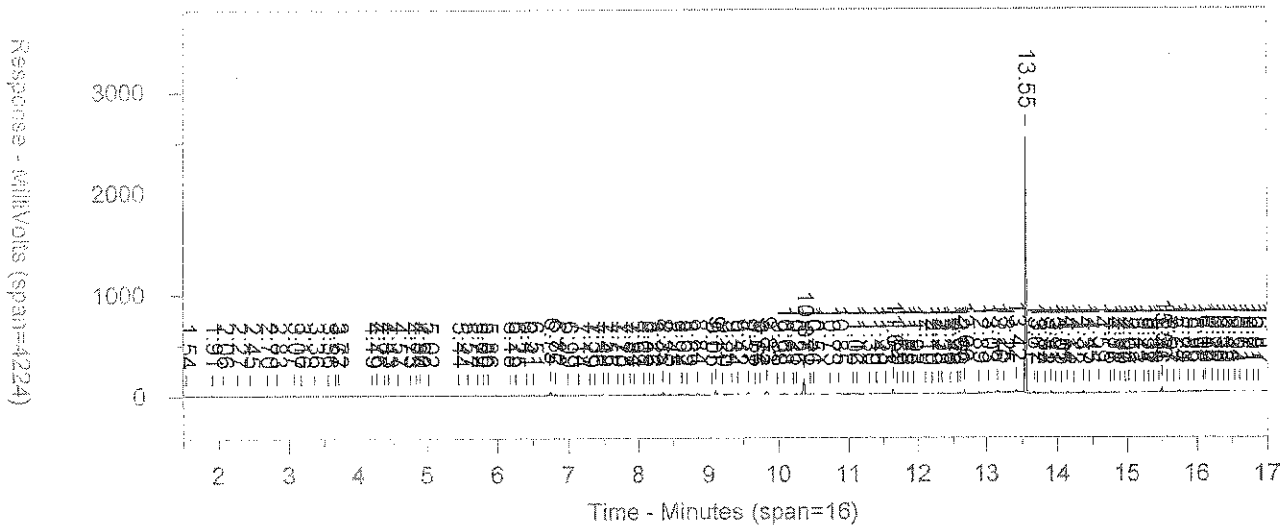
********** RESULTS TABLE **********

	Surrogate Adjusted Areas	Preliminary Amounts (w/ surrogate)
Total DRO C10-C28 AREA =	4539039	0.48 PPM
ORO>C28-C35 AREA =	256356.3	0.02 PPM
ORO>C28-C40 AREA =	490131.5	0.05 PPM
Total DRO C13-C22 AREA =	894977.4	0.14 PPM
C10-C25 AREA =	4712020	0.50 PPM
Total DRO C12-C24 AREA =	1016917	0.12 PPM
HRO >C24-C40 AREA =	3948658	0.37 PPM
DX C12-C40 AREA =	4965575	0.48 PPM

Dx C12-C40 Level 3 %D = -98.979% #2 Fuel Level 3 %D = -99.90%

Area File: D30363B.0042.RAW
Method: 4FUEL30B.MET
Calibration File: 4FUL30B354A.CAL
Format: 4FUEL30B.FMT
Area File Created On: 1/17/2017 2:05:06 PM
File Reported On: 1/17/2017 at 2:05:31 PM

BLANKA 12/23/16 S ABPBLK39357 BLK 163570039A 12908 SW-846 8015B
D30363B.0042.RAW 10ul surrogate report

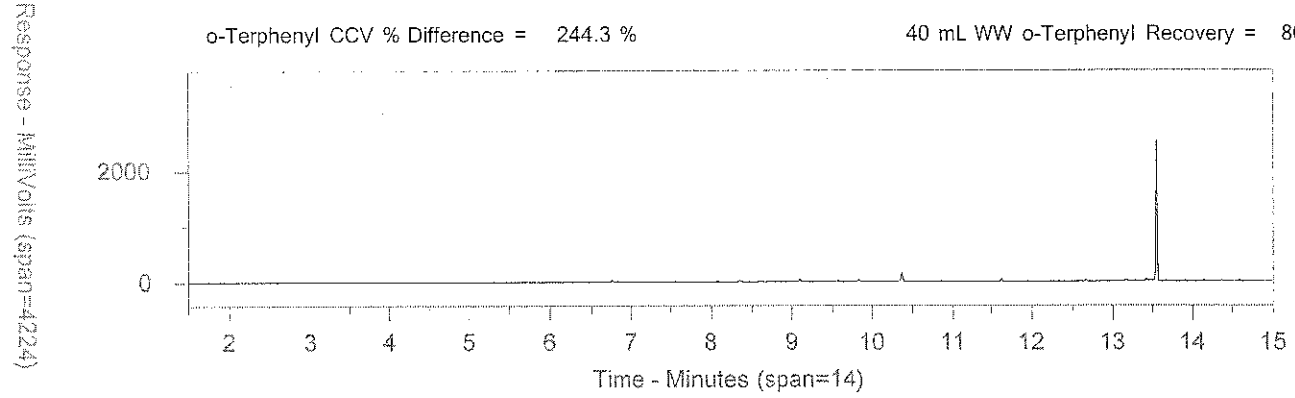


Sample Number: BLANKA 12/23/16 S ABPBLK39357 BLK 163570039A 12908 SW-846 8015B
Injected On: 12/29/2016 1:28:28 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 250
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt ppm	Area
C10	2.266	0.0001	1368.592
C12	4.841	0.0002	2044.908
Capric Acid	6.514	0.0044	7803.545
C14	6.753	0.0063	69812.85
C16	8.353	0.0049	53118.49
C18	9.828	0.0062	64952.46
O-Terphenyl	10.368	0.0207	251789.2
C20	11.062	0.0004	4166.885
C22	11.933	0.0008	7519.613
C24	12.597	0.0017	16375.91
C26	13.163	0.0037	35794.45
C28	13.669	0.0027	26968.6
C30	14.140	0.0030	29576.33
C32	14.590	0.0027	27487.05
C34	15.029	0.0013	13612.79
C36	15.455	0.0004	3841.563
C38	15.878	0.0004	4301.84
C40	16.302	0.0005	5147.134

o-Terphenyl CCV % Difference = 244.3 % 40 mL WW o-Terphenyl Recovery = 86.1 %



Area File: D30363B.0042.RAW
Method: 4REPLOT30b.MET
Calibration File: 4FUL30B354A.CAL

Format: 4REPLOT30B.FMT
Area File Created On: 1/17/2017 2:05:06 PM
File Reported On: 1/17/2017 at 2:05:58 PM

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: LCSA 12/23/16 S LCS39357 Sample ID: AB **Batchnumber:** 163570039A
Sample Amount: 250. Total Volume: 2. ml Analyst: 10210 SDG: State:
Analyses: 12908

Injection Summary

Injected on : 12/29/2016 01:51:59
Instrument : CP30--19507B
Result file : D30363B.0043.RAW
Calibration files : 4FUL30B354A.CAL
Method files : 4FUEL30B.MET 4REPLOT30B.MET
Setting : 4FUL30B354A(V)

Surrogate Recoveries

O-TERPHENYL 87% (50-150) Conc.: 21.00362

Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
Total DRO C10-C28	2.09 - 13.77	4113041	385.4901	100	45		ppb
ORO >C28-C35	13.77 - 15.37	11958	1.1951	<100	<45		ppb
ORO >C28-C40	13.77 - 16.46	22755	2.2742				ppb
DRO C13-C22	4.95 - 12.03	3435333	393.0114	100	45		ppb
WY DRO C10-C32	2.09 - 14.69	4121773	386.3627	100	45		ppb
DX DRO C12-C24	4.75 - 12.70	3584474	308.1102	100	45		ppb
DX HRO C24-C40	12.70 - 16.46	68568	6.3472	<250	<100		ppb
DX C12-C40	4.75 - 16.46	3653042	314.4575				ppb
o-Terphenyl	10.37 (10.32 - 10.42)	256010	21.0036				ppb
Capric Acid	6.49 (6.39 - 6.59)	6431	528.9945				ppb

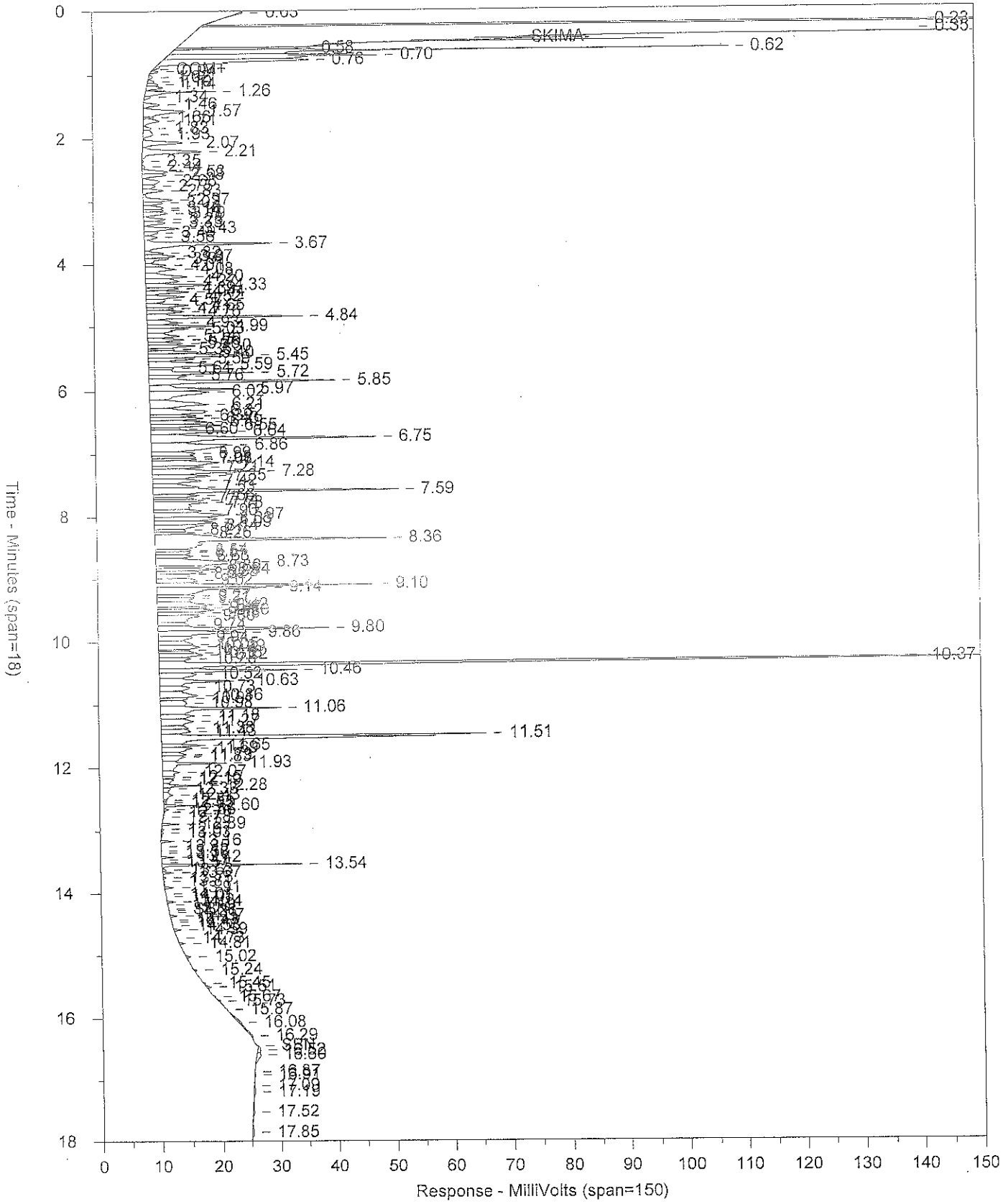
Comments:

Reviewed by: JE 10210
Date: 1/11/17

Verified by: Signed by Brilhart
Janie L. Brilhart
Senior Chemist
Date:

JAN 18 2017

LCSA 12/23/16 S ABLCS39357 LCS 163570039A 12908 SW-846 8015B
D30363B.0043.RAW 10UL DRO



Sample Number: LCSA 12/23/16 S ABLCS39357 LCS 163570039A 12908 SW-846 8015B
Injected On: 12/29/2016 1:51:59 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 250
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt PPM	Area
C10	2.208	0.0029	34667
C12	4.844	0.0052	58209
Capric Acid	6.488	0.0073	28618
C14	6.752	0.0103	113317
C16	8.365	0.0148	161526
C18	9.800	0.0067	70436
O-Terphenyl	10.370	0.0240	292665
C20	11.063	0.0060	60835
C22	11.931	0.0030	29524
C24	12.597	0.0007	6493
C26	13.163	0.0003	3204
C28	13.669	0.0003	2504
C30	14.139	0.0002	1959
C32	14.589	0.0001	1461
C34	15.024	0.0001	1211
C36	15.450	0.0000	438
C38	15.873	0.0001	689
C40	16.289	0.0003	3816

Range	Start Time	Stop Time	Area
Total DRO C10-C28	2.09	13.77	4113041
ORO >C28-C35	13.77	15.37	11958
ORO >C28-C40	13.77	16.46	22755
Total DRO C13-C22	4.95	12.03	3435333
WY DRO C10-C32	2.09	14.69	4121773
Total DRO C12-C24	4.75	12.70	3584474
HRO >C24-C40	12.70	16.46	68568
DX C12-C40	4.75	16.46	3653042
O-Terphenyl	10.32	10.42	292665

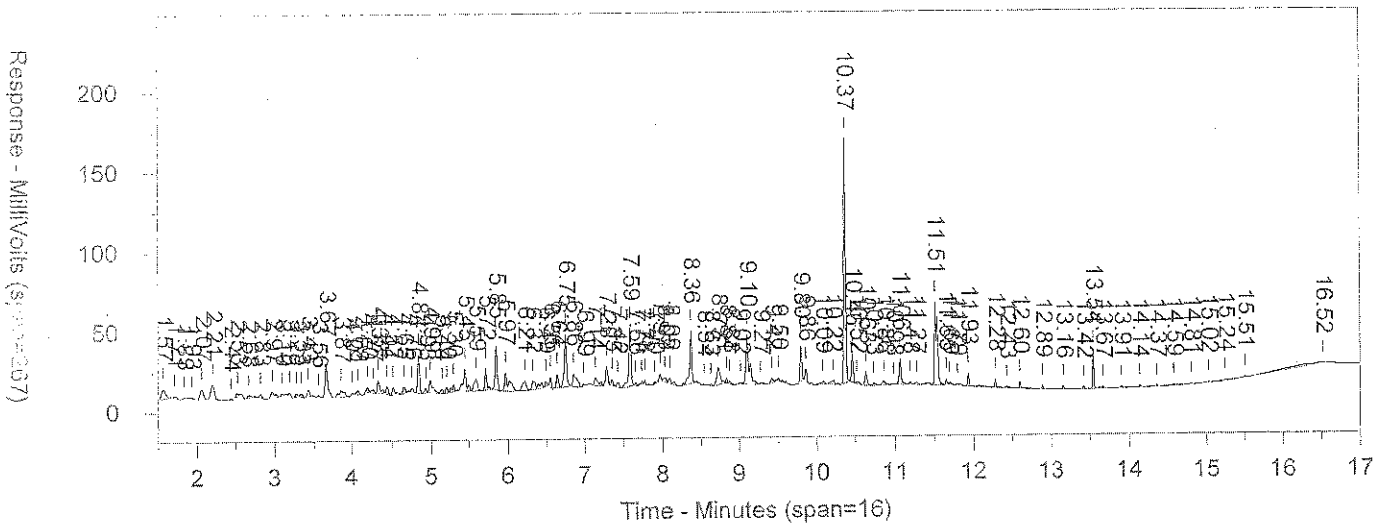
********** RESULTS TABLE **********

	Surrogate Adjusted Areas	Preliminary Amounts (w/ surrogate)
Total DRO C10-C28 AREA =	3820376	0.41 PPM
ORO>C28-C35 AREA =	11957.92	0.00 PPM
ORO>C28-C40 AREA =	22754.72	0.00 PPM
Total DRO C13-C22 AREA =	3142668	0.42 PPM
C10-C25 AREA =	3829108	0.41 PPM
Total DRO C12-C24 AREA =	3291809	0.33 PPM
HRO >C24-C40 AREA =	68568.19	0.01 PPM
DX C12-C40 AREA =	3360377	0.34 PPM

Dx C12-C40 Level 3 %D = -99.309% #2 Fuel Level 3 %D = -99.92%

Area File: D30363B.0043.RAW
Method: 4FUEL30B.MET
Calibration File: 4FUL30B354A.CAL
Format: 4FUEL30B.FMT
Area File Created On: 12/29/2016 2:10:20 AM
File Reported On: 12/29/2016 at 2:10:27 AM

LCSA 12/23/16 S ABLCS39357 LCS 163570039A 12908 SW-846 8015B
D30363B.0043.RAW 10ul surrogate report



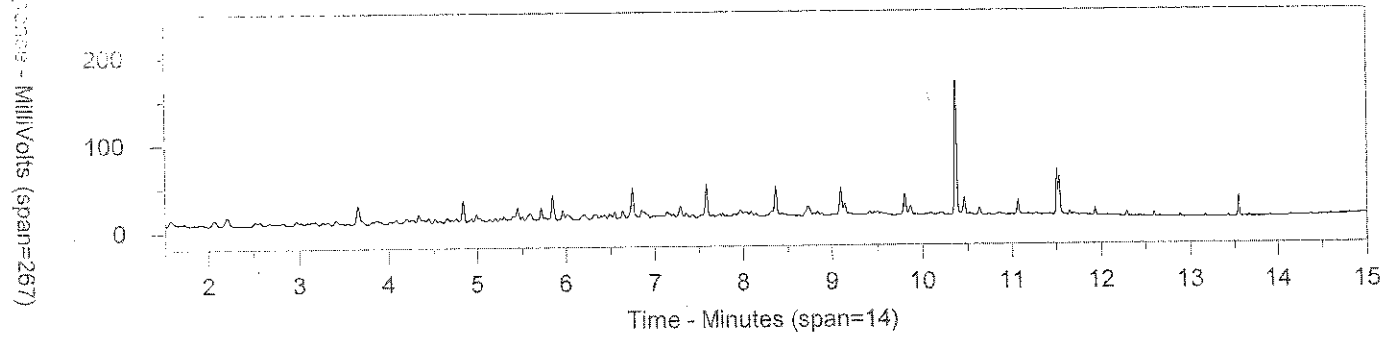
Sample Number: LCSA 12/23/16 S ABLCS39357 LCS 163570039A 12908 SW-846 8015B
Injected On: 12/29/2016 1:51:59 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 250
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt ppm	Area
C10	2.208	0.0027	31525.76
C12	4.844	0.0039	43749.68
Capric Acid	6.488	0.0042	6430.778
C14	6.752	0.0063	69094.63
C16	8.365	0.0065	71099.36
C18	9.800	0.0036	37274.67
O-Terphenyl	10.370	0.0210	256010.4
C20	11.063	0.0028	28705.53
C22	11.931	0.0013	12403.33
C24	12.597	0.0006	5646.867
C26	13.163	0.0003	3204.373
C28	13.669	0.0003	3044.979
C30	14.139	0.0002	1879.752
C32	14.589	0.0001	1460.863
C34	15.024	0.0001	1211.047
C36	15.506	0.0002	1733.209

o-Terphenyl CCV % Difference = 250.1 %

40 mL WW o-Terphenyl Recovery = 87.5 %



Area File: D30363B.0043.RAW
Method: 4REPLOT30b.MET
Calibration File: 4FUL30B354A.CAL

Format: 4REPLOT30B.FMT
Area File Created On: 12/29/2016 2:10:20 AM
File Reported On: 12/29/2016 at 2:10:43 AM

Eurofins Lancaster Laboratories-Range Data Summary

Sample Name: LCSDA 12/23/16 S LCSD39357 Sample ID: AB **Batchnumber:** 163570039A
Sample Amount: 250. Total Volume: 2. ml Analyst:10210 SDG: State:
Analyses: 12908

Injection Summary

Injected on : 12/29/2016 02:15:30
Instrument : CP30--19507B
Result file : D30363B.0044.RAW
Calibration files : 4FUL30B354A.CAL
Method files : 4FUEL30B.MET 4REPLOT30B.MET
Setting : 4FUL30B354A(V)

Surrogate Recoveries

O-TERPHENYL 84% (50-150) Conc.: 20.10409

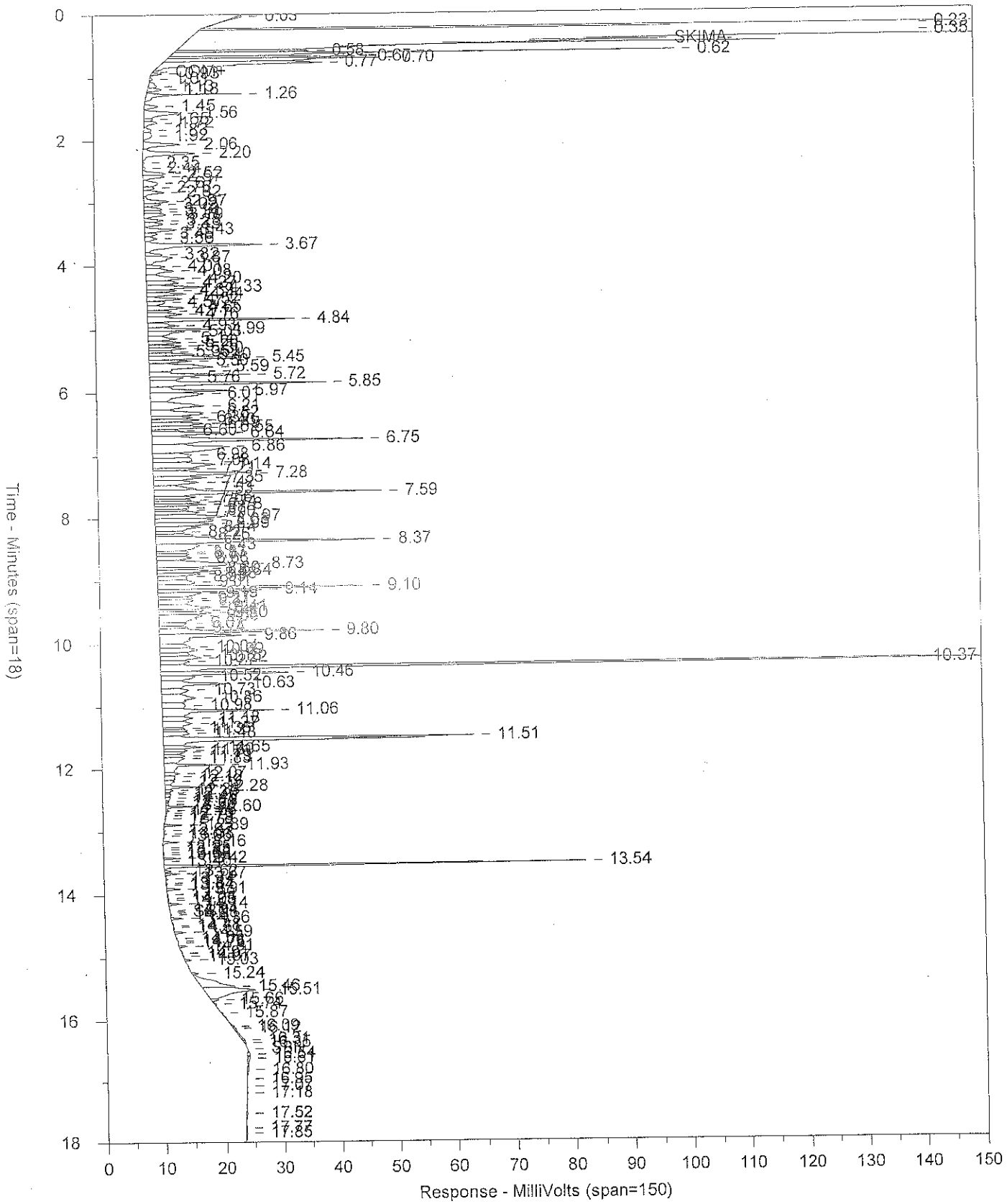
Range	Retention Times	Area	Amount	LOQ	MDL	Flags	Units
Total DRO C10-C28	2.09 - 13.77	3920764	367.3688	100	45		ppb
ORO >C28-C35	13.77 - 15.37	21401	2.1389	<100	<45		ppb
ORO >C28-C40	13.77 - 16.46	117876	11.7811				ppb
DRO C13-C22	4.95 - 12.03	3232634	369.3102	100	45		ppb
WY DRO C10-C32	2.09 - 14.69	3935982	368.8898	100	45		ppb
DX DRO C12-C24	4.75 - 12.70	3371423	289.4034	100	45		ppb
DX HRO C24-C40	12.70 - 16.46	220348	20.3972	<250	<100		ppb
DX C12-C40	4.75 - 16.46	3591771	309.8006				ppb
o-Terphenyl	10.37 (10.32 - 10.42)	245046	20.1041				ppb
Capric Acid	6.49 (6.39 - 6.59)	6307	526.8339				ppb

Comments: _____

Reviewed by: DE/10210
Date: 1/11/17

Verified by: James L. Brillhart
James L. Brillhart
Senior Chemist
Date: JAN 18 2017

LCSDA 12/23/16 S ABLCSD39357 LCSD 163570039A 12908 SW-846 8015B
D30363B.0044.RAW 10UL DRO



Sample Number: LCSDA 12/23/16 S ABLCSD39357 LCSD 163570039A 12908 SW-846 8015B
Injected On: 12/29/2016 2:15:30 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 250
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt PPM	Area
C10	2.204	0.0027	32058
C12	4.843	0.0049	54816
Capric Acid	6.490	0.0071	26817
C14	6.752	0.0096	105913
C16	8.365	0.0102	110666
C18	9.799	0.0065	68284
O-Terphenyl	10.369	0.0229	278813
C20	11.061	0.0055	56385
C22	11.931	0.0028	27373
C24	12.596	0.0007	6497
C26	13.161	0.0004	3804
C28	13.667	0.0003	3269
C30	14.137	0.0003	3091
C32	14.589	0.0003	2770
C34	15.026	0.0002	1655
C36	15.455	0.0032	33824
C38	15.873	0.0000	277
C40	16.305	0.0004	4184

Range	Start Time	Stop Time	Area
Total DRO C10-C28	2.09	13.77	3920764
ORO >C28-C35	13.77	15.37	21401
ORO >C28-C40	13.77	16.46	117877
Total DRO C13-C22	4.95	12.03	3232635
WY DRO C10-C32	2.09	14.69	3935982
Total DRO C12-C24	4.75	12.70	3371423
HRO >C24-C40	12.70	16.46	220348
DX C12-C40	4.75	16.46	3591771
O-Terphenyl	10.32	10.42	278813

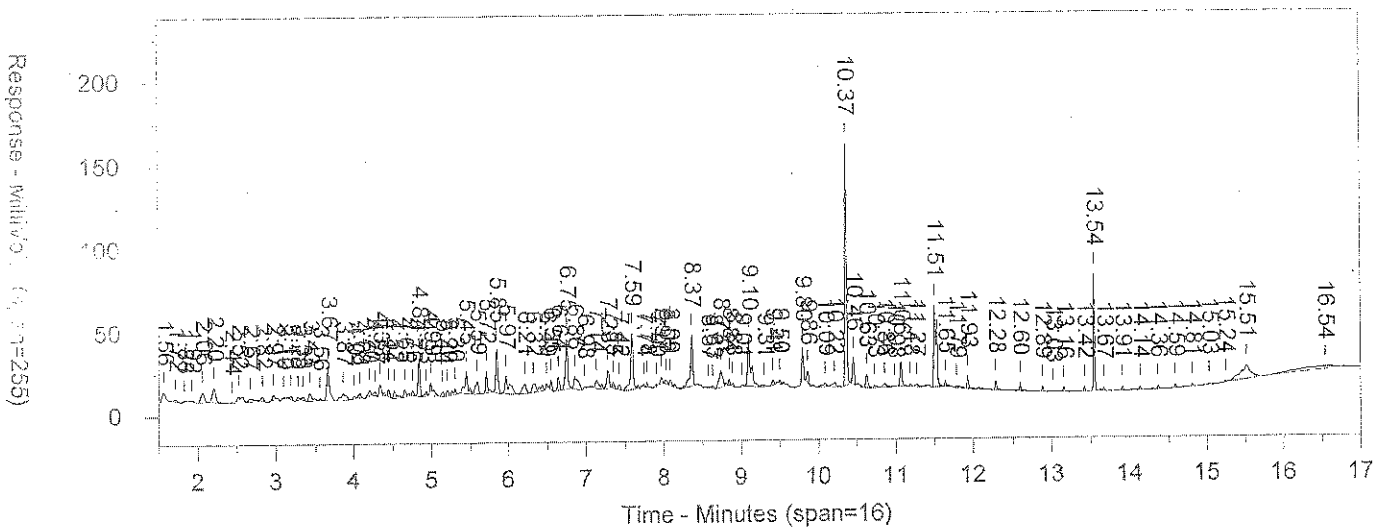
********** RESULTS TABLE **********

	Surrogate Adjusted Areas	Preliminary Amounts (w/ surrogate)
Total DRO C10-C28 AREA =	3641951	0.39 PPM
ORO>C28-C35 AREA =	21400.85	0.00 PPM
ORO>C28-C40 AREA =	117876.5	0.01 PPM
Total DRO C13-C22 AREA =	2953821	0.40 PPM
C10-C25 AREA =	3657169	0.39 PPM
Total DRO C12-C24 AREA =	3092610	0.31 PPM
HRO >C24-C40 AREA =	220347.8	0.02 PPM
DX C12-C40 AREA =	3312958	0.33 PPM

Dx C12-C40 Level 3 %D = -99.319% #2 Fuel Level 3 %D = -99.92%

Area File: D30363B.0044.RAW
Method: 4FUEL30B.MET
Calibration File: 4FUL30B354A.CAL
Format: 4FUEL30B.FMT
Area File Created On: 12/29/2016 2:33:31 AM
File Reported On: 12/29/2016 at 2:33:41 AM

LCSDA 12/23/16 S ABLCSD39357 LCSD 163570039A 12908 SW-846 8015B
D30363B.0044.RAW 10ul surrogate report



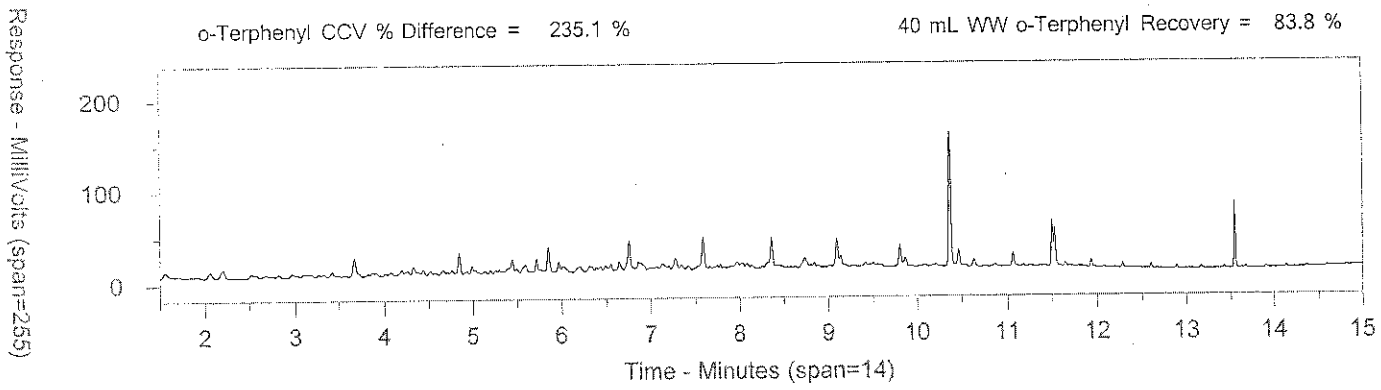
Sample Number: LCSDA 12/23/16 S ABLCSD39357 LCSD 163570039A 12908 SW-846 8015B
Injected On: 12/29/2016 2:15:30 AM
Instrument ID: CP30-19507
Oven Parameters: 60C for 2.0min; 15C/min to 190C; 30C/min to 340C, hold 3min
GC Column: HP-5 30m x 0.32mm x 0.25um

Sample Weight: 250
Dilution Factor: 2
Injection Volume: 4ul
Analyst: 10210

Compound	RT	Amt ppm	Area
C10	2.204	0.0024	28102.67
C12	4.843	0.0037	41304.04
Capric Acid	6.490	0.0042	6306.75
C14	6.752	0.0059	65383.99
C16	8.365	0.0063	68709.65
C18	9.799	0.0033	34280.51
O-Terphenyl	10.369	0.0201	245046
C20	11.061	0.0027	27130.45
C22	11.931	0.0012	11799.98
C24	12.596	0.0006	5608.396
C26	13.161	0.0004	3804.209
C28	13.667	0.0004	4205.65
C30	14.137	0.0003	3090.751
C32	14.589	0.0003	2770.288
C34	15.026	0.0002	2519.216
C36	15.512	0.0077	81798.38

o-Terphenyl CCV % Difference = 235.1 %

40 mL WW o-Terphenyl Recovery = 83.8 %



Area File: D30363B.0044.RAW
Method: 4REPLOT30b.MET
Calibration File: 4FUL30B354A.CAL

Format: 4REPLOT30B.FMT
Area File Created On: 12/29/2016 2:33:31 AM
File Reported On: 12/29/2016 at 2:34:29 AM

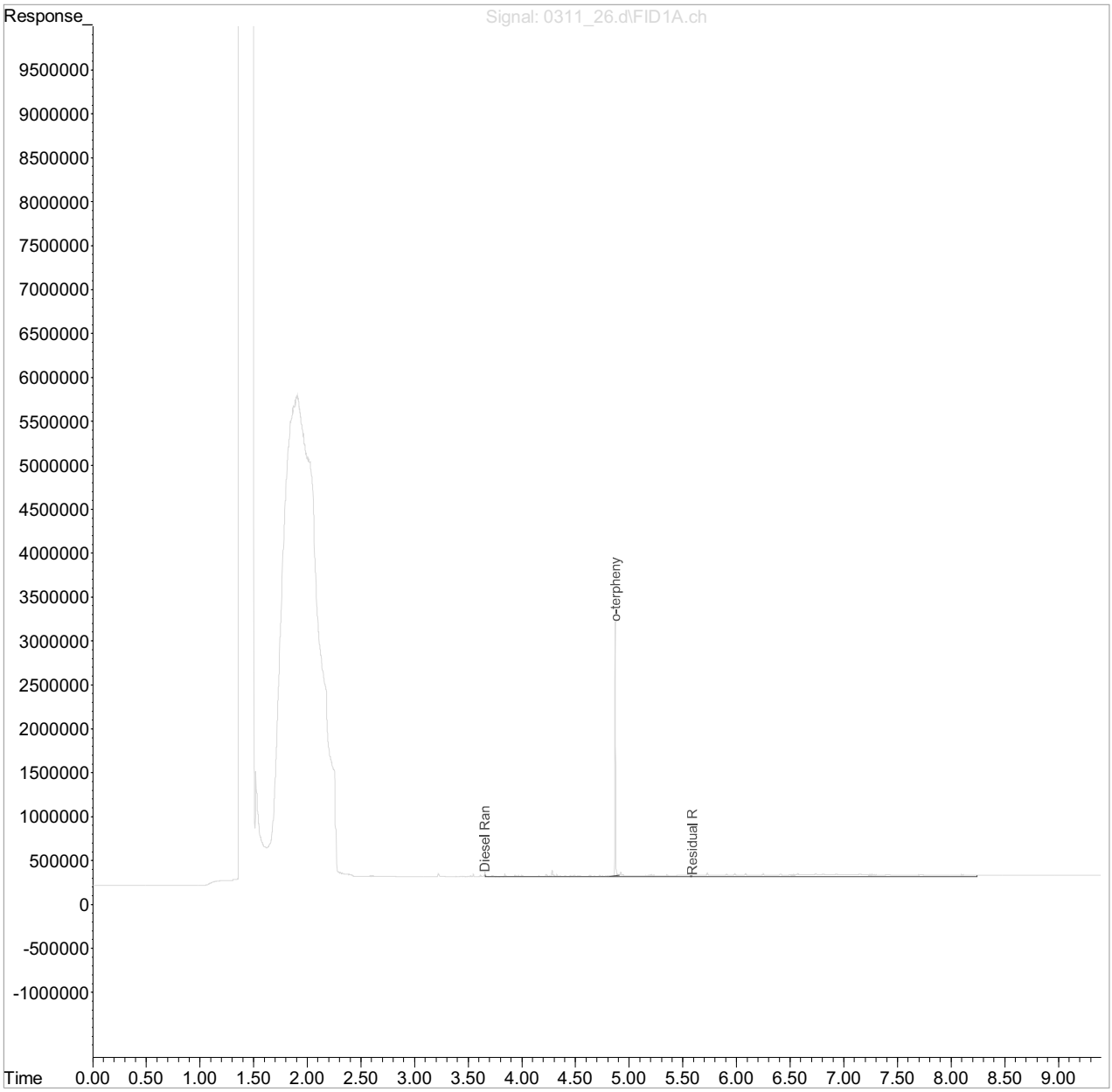
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031117\
Data File : 0311 26.d
Signal(s) : FID1A.ch
Acq On : 11 Mar 2017 5:39 pm
Operator : 614
Sample : L895193-01 1x WG960019 40-2
Misc : water
ALS Vial : 23 Sample Multiplier: 0.05
InstName : SVGC31

no SGT

Integration File: events.e
Quant Time: Mar 13 15:03:58 2017
Quant Method : C:\msdchem\1\methods\EP31C08Q.M
Quant Title :
QLast Update : Thu Mar 09 15:14:45 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



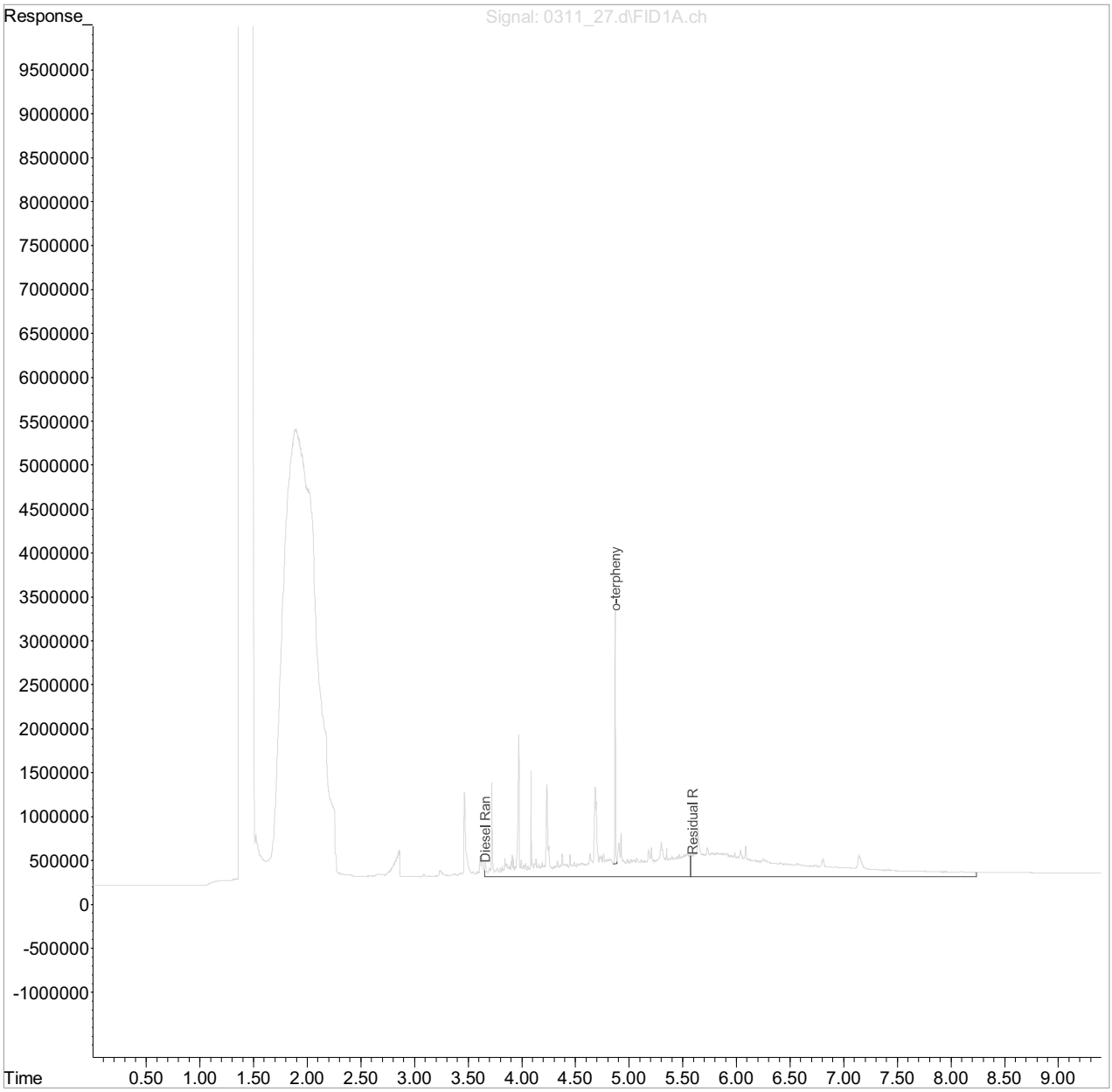
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031117\
Data File : 0311 27.d
Signal(s) : FID1A.ch
Acq On : 11 Mar 2017 5:56 pm
Operator : 614
Sample : L895193-02 1x WG960019 40-2
Misc : water
ALS Vial : 24 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: Mar 13 15:04:30 2017
Quant Method : C:\msdchem\1\methods\EP31C08Q.M
Quant Title :
QLast Update : Thu Mar 09 15:14:45 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :



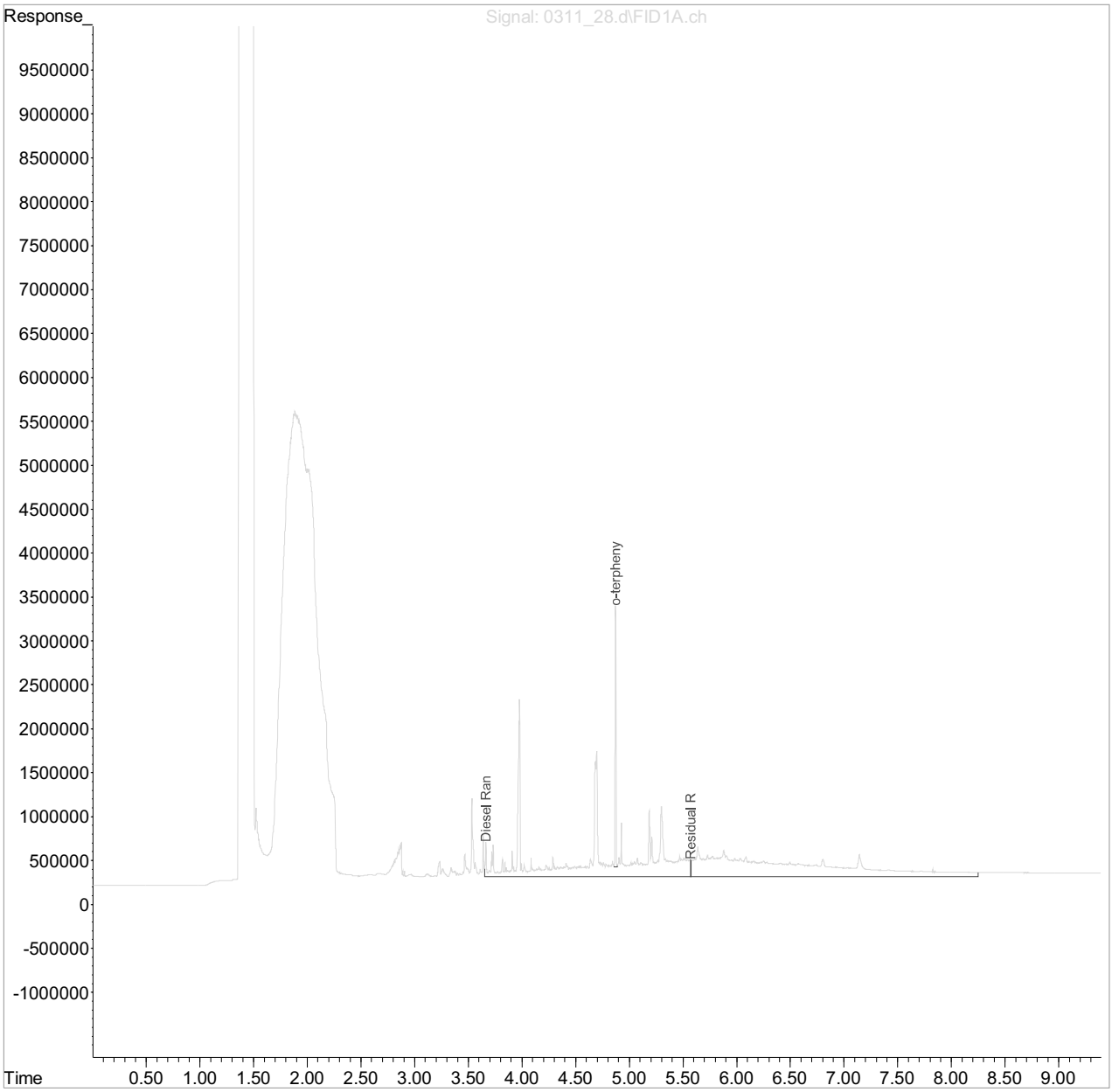
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031117\
Data File : 0311 28.d
Signal(s) : FID1A.ch
Acq On : 11 Mar 2017 6:13 pm
Operator : 614
Sample : L895193-03 1x WG960019 40-2
Misc : water
ALS Vial : 25 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: Mar 13 15:05:11 2017
Quant Method : C:\msdchem\1\methods\EP31C08Q.M
Quant Title :
QLast Update : Thu Mar 09 15:14:45 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :



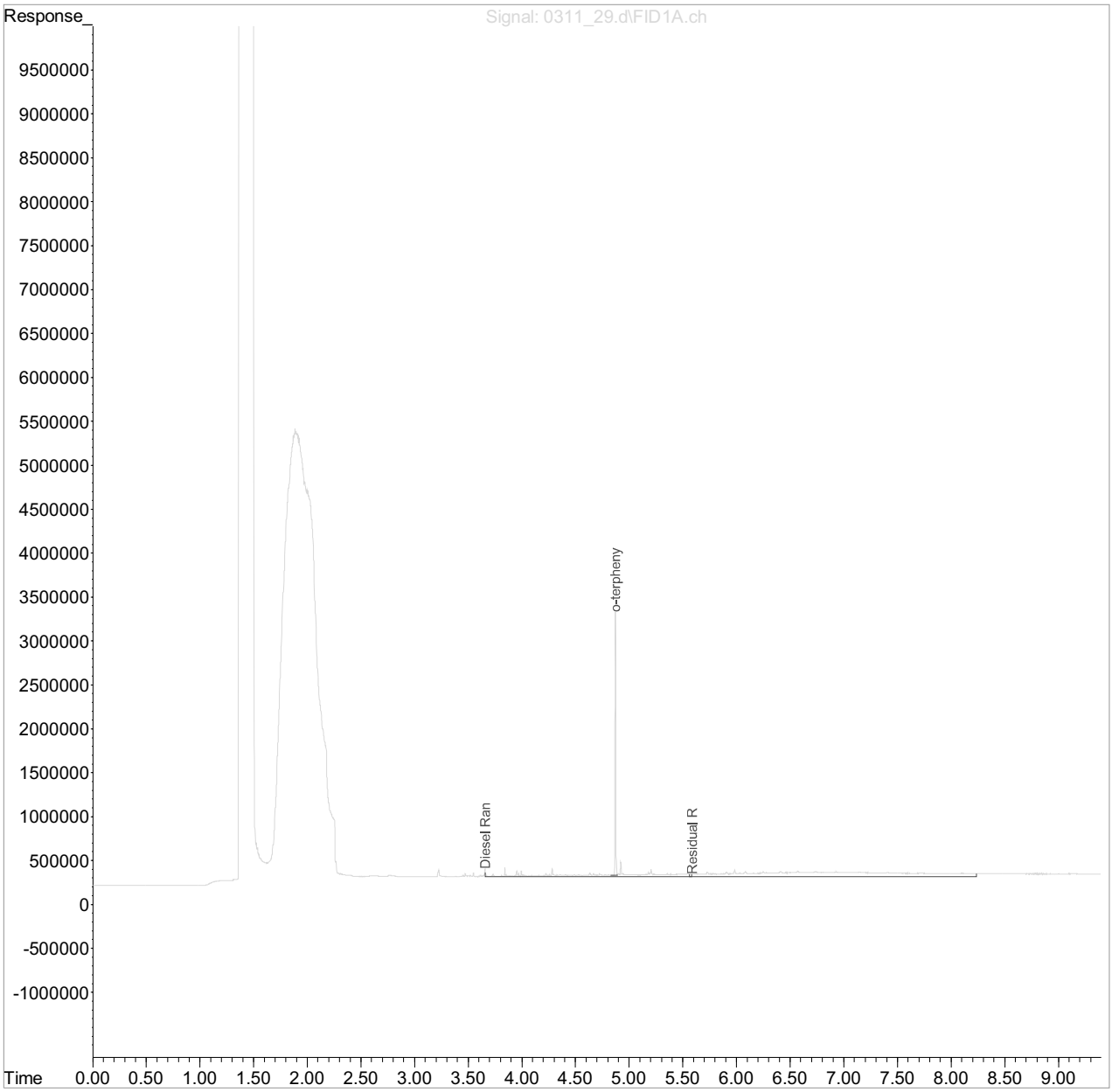
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031117\
Data File : 0311 29.d
Signal(s) : FID1A.ch
Acq On : 11 Mar 2017 6:30 pm
Operator : 614
Sample : L895193-04 1x WG960019 40-2
Misc : water
ALS Vial : 26 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: Mar 13 15:05:37 2017
Quant Method : C:\msdchem\1\methods\EP31C08Q.M
Quant Title :
QLast Update : Thu Mar 09 15:14:45 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :



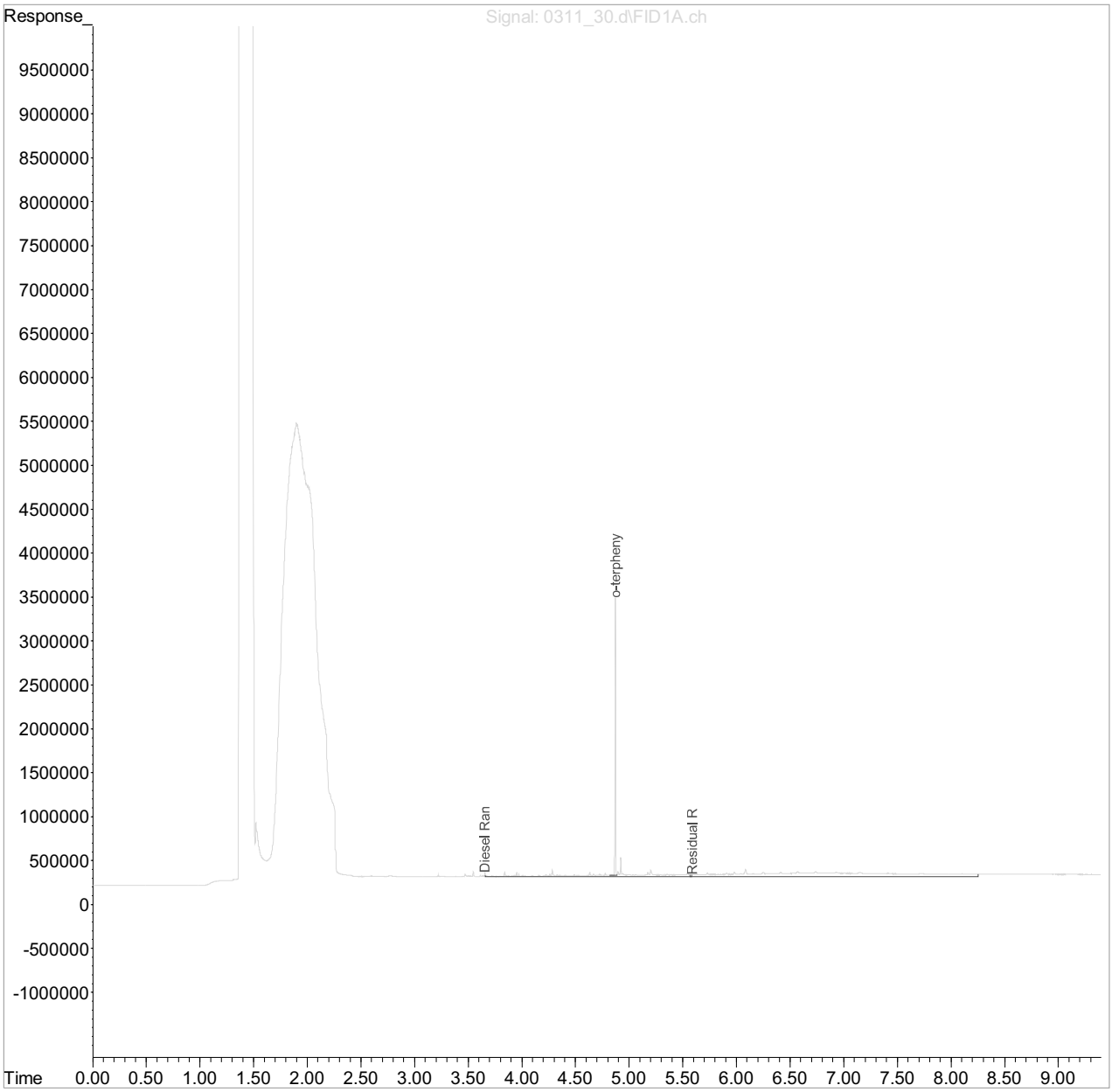
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031117\
Data File : 0311 30.d
Signal(s) : FID1A.ch
Acq On : 11 Mar 2017 6:47 pm
Operator : 614
Sample : L895193-05 1x WG960019 40-2
Misc : water
ALS Vial : 27 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: Mar 13 15:08:56 2017
Quant Method : C:\msdchem\1\methods\EP31C08Q.M
Quant Title :
QLast Update : Thu Mar 09 15:14:45 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :



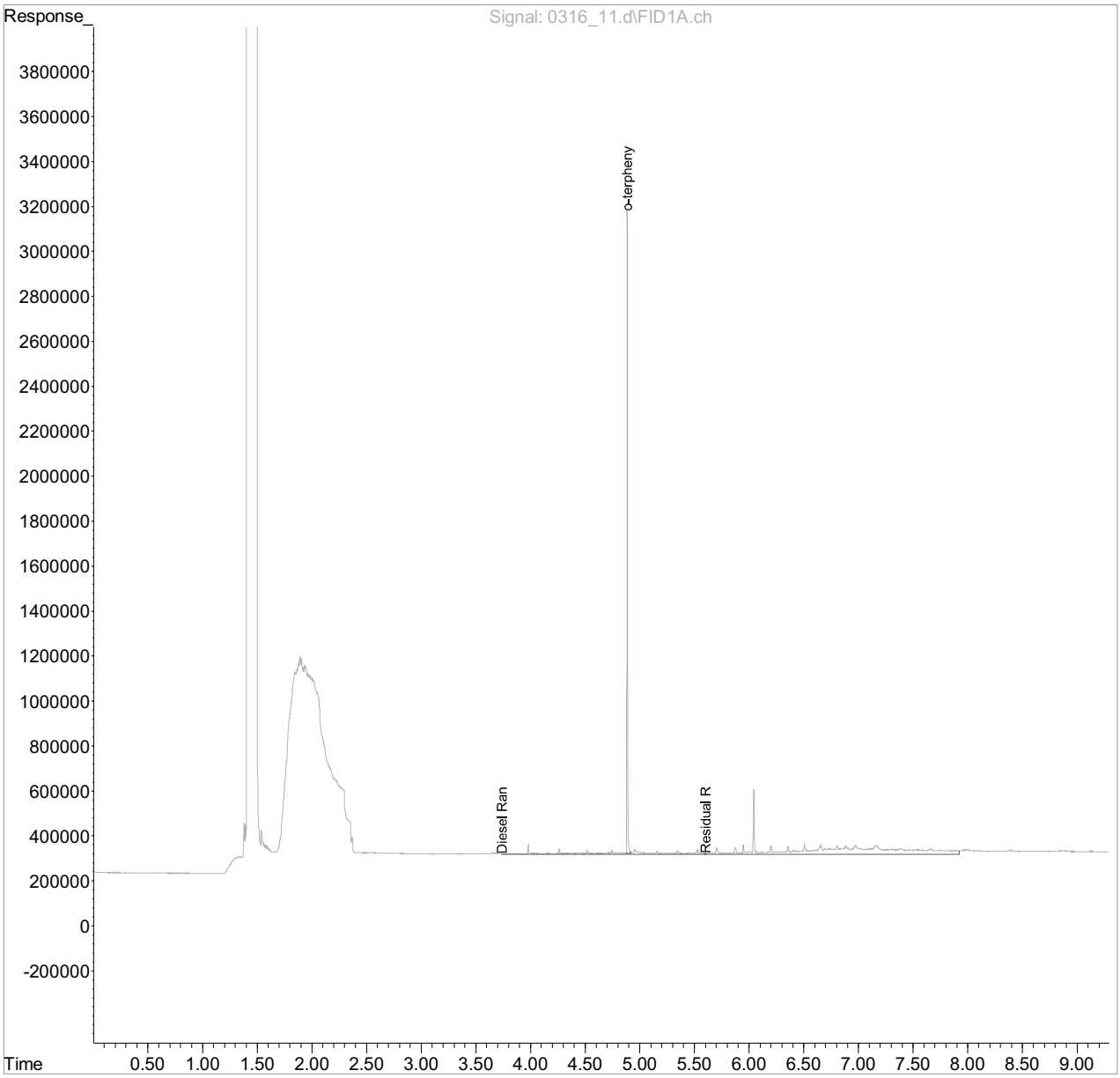
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031617\
Data File : 0316 11.d
Signal(s) : FID1A.ch
Acq On : 16 Mar 2017 1:03 pm
Operator : 765
Sample : L895193-01 1x WG961524 40-2
Misc : water
ALS Vial : 8 Sample Multiplier: 0.05
InstName : SVGC27

SGT

Integration File: events.e
Quant Time: Mar 16 13:42:24 2017
Quant Method : C:\msdchem\1\methods\EP27A25Q.M
Quant Title :
QLast Update : Wed Jan 25 13:17:51 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



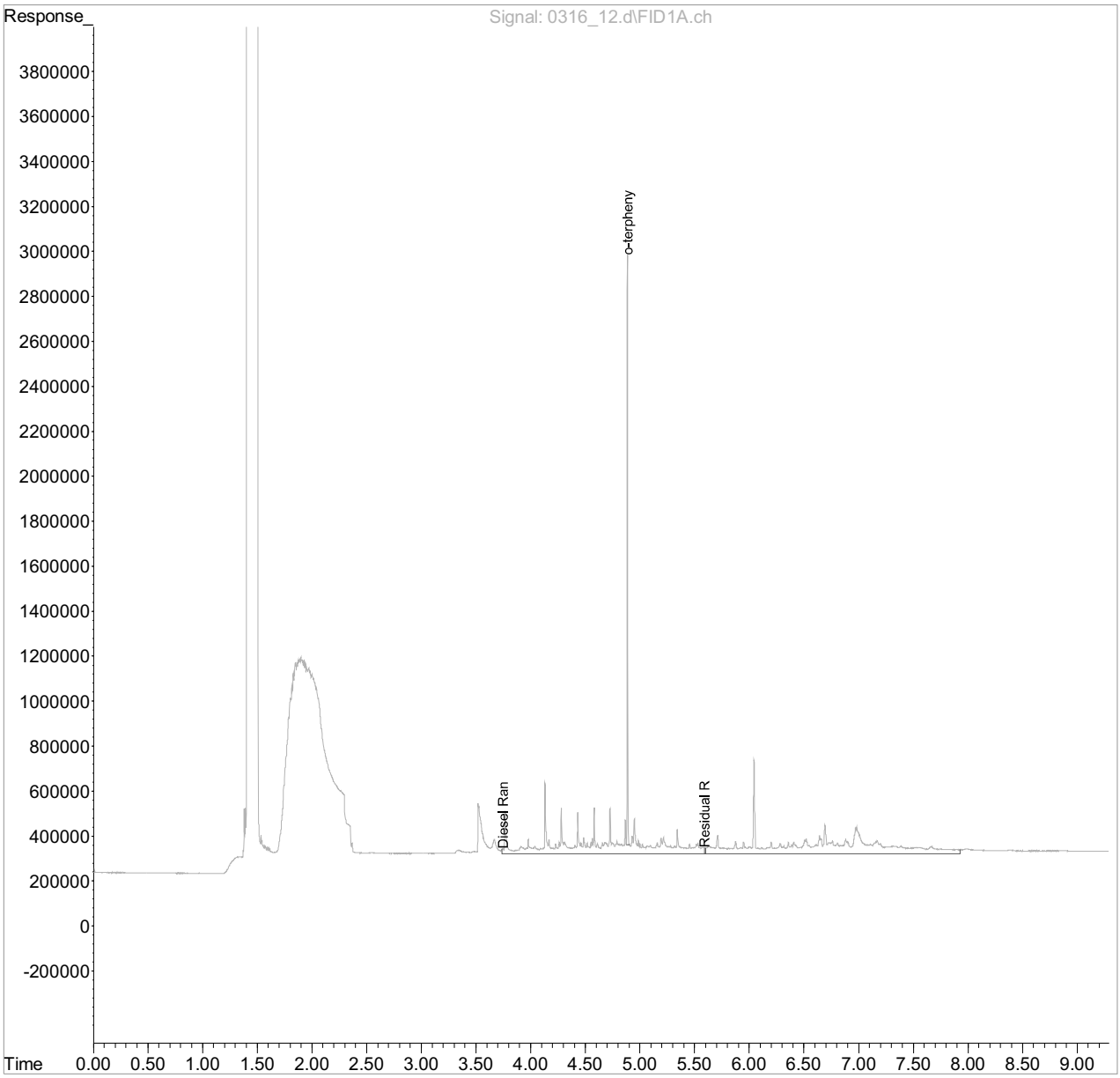
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031617\
Data File : 0316 12.d
Signal(s) : FID1A.ch
Acq On : 16 Mar 2017 1:20 pm
Operator : 765
Sample : L895193-02 1x WG961524 40-2
Misc : water
ALS Vial : 9 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: Mar 16 13:44:39 2017
Quant Method : C:\msdchem\1\methods\EP27A25Q.M
Quant Title :
QLast Update : Wed Jan 25 13:17:51 2017
Response via : Initial Calibration
Integrator: ChemStation

SGT

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



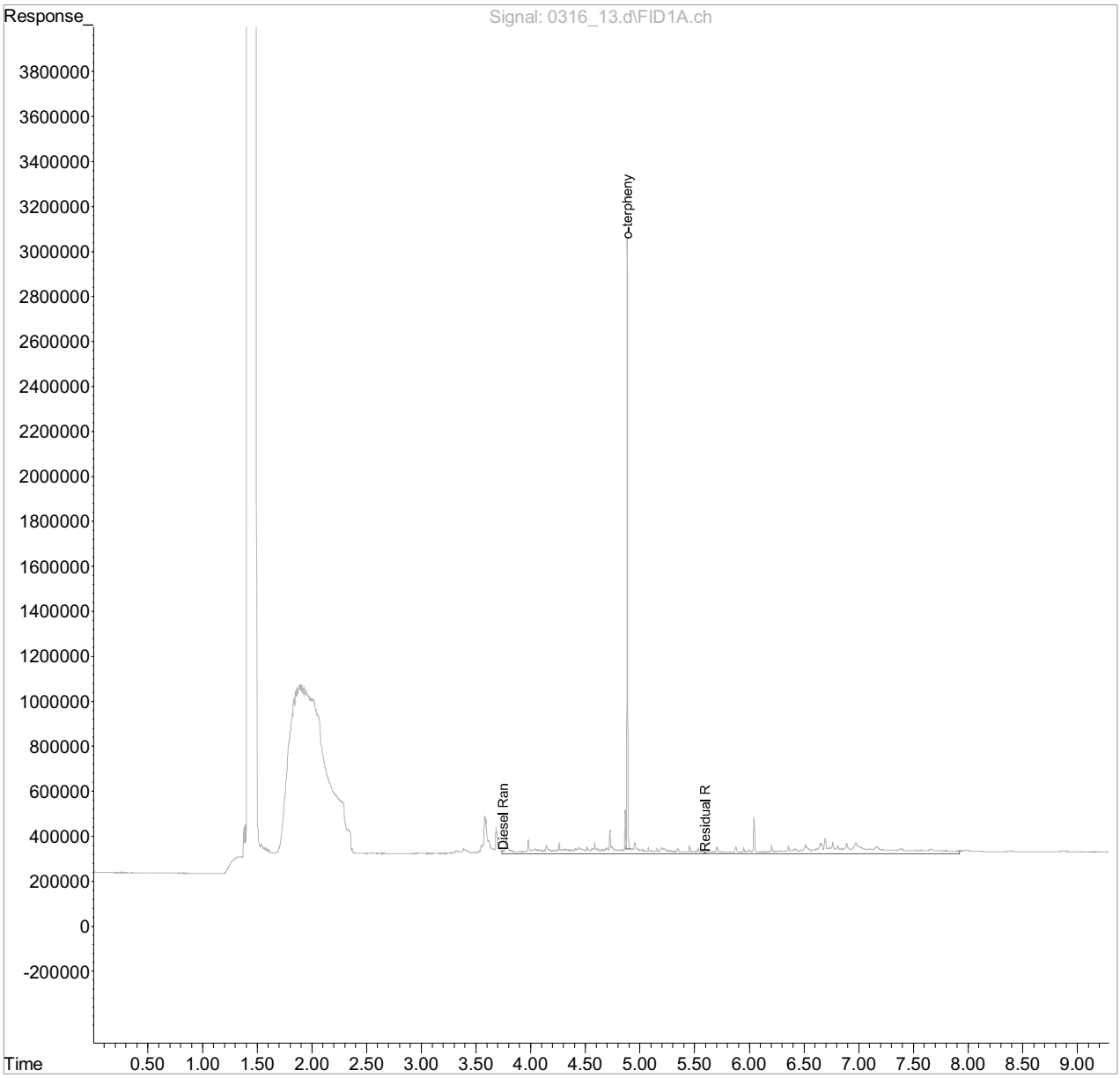
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031617\
Data File : 0316 13.d
Signal(s) : FID1A.ch
Acq On : 16 Mar 2017 1:36 pm
Operator : 765
Sample : L895193-03 1x WG961524 40-2
Misc : water
ALS Vial : 10 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: Mar 16 14:12:17 2017
Quant Method : C:\msdchem\1\methods\EP27A25Q.M
Quant Title :
QLast Update : Wed Jan 25 13:17:51 2017
Response via : Initial Calibration
Integrator: ChemStation

SGT

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



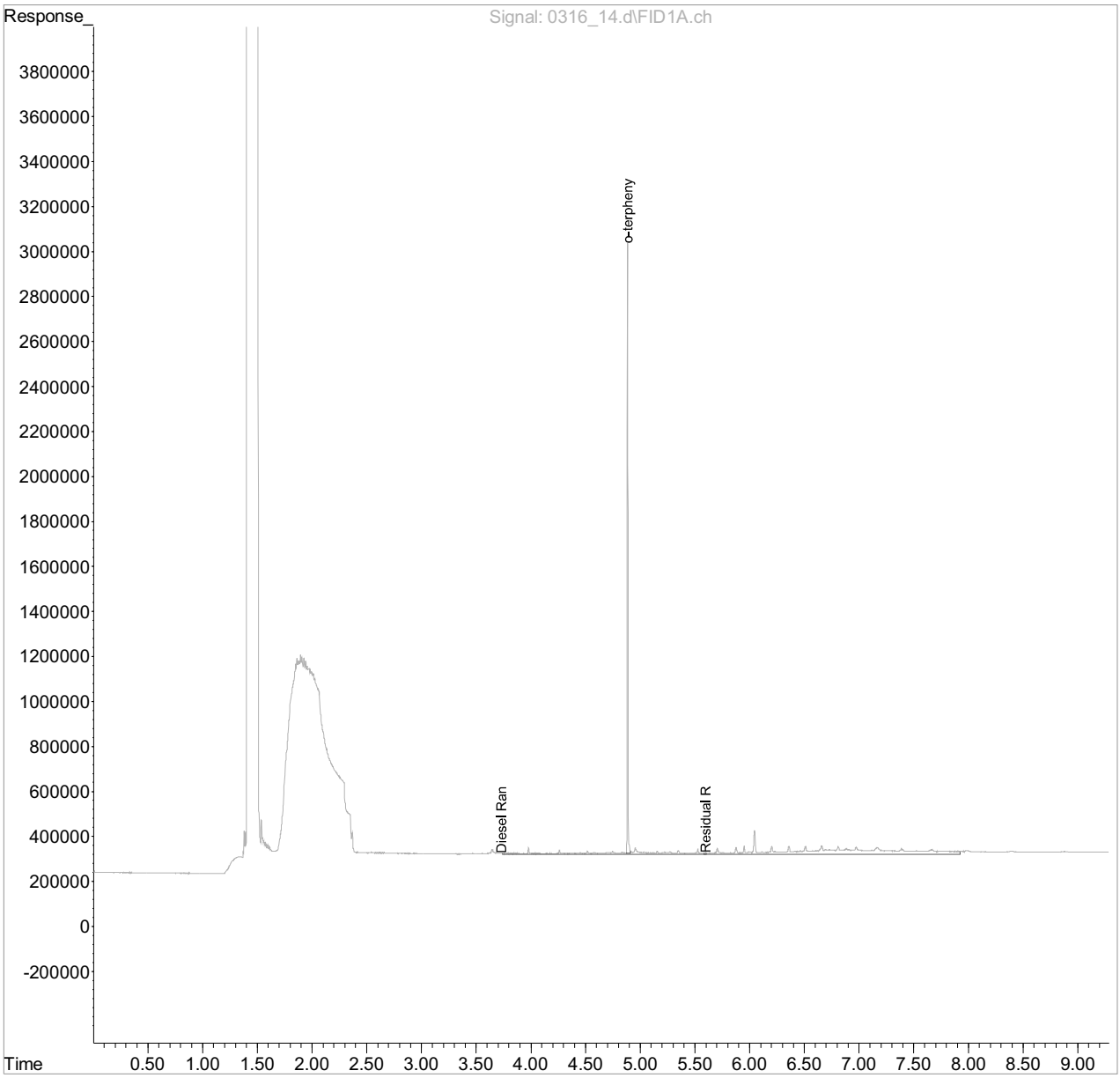
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031617\
Data File : 0316 14.d
Signal(s) : FID1A.ch
Acq On : 16 Mar 2017 1:53 pm
Operator : 765
Sample : L895193-04 1x WG961524 40-2
Misc : water
ALS Vial : 11 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: Mar 16 14:12:59 2017
Quant Method : C:\msdchem\1\methods\EP27A25Q.M
Quant Title :
QLast Update : Wed Jan 25 13:17:51 2017
Response via : Initial Calibration
Integrator: ChemStation

SGT

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



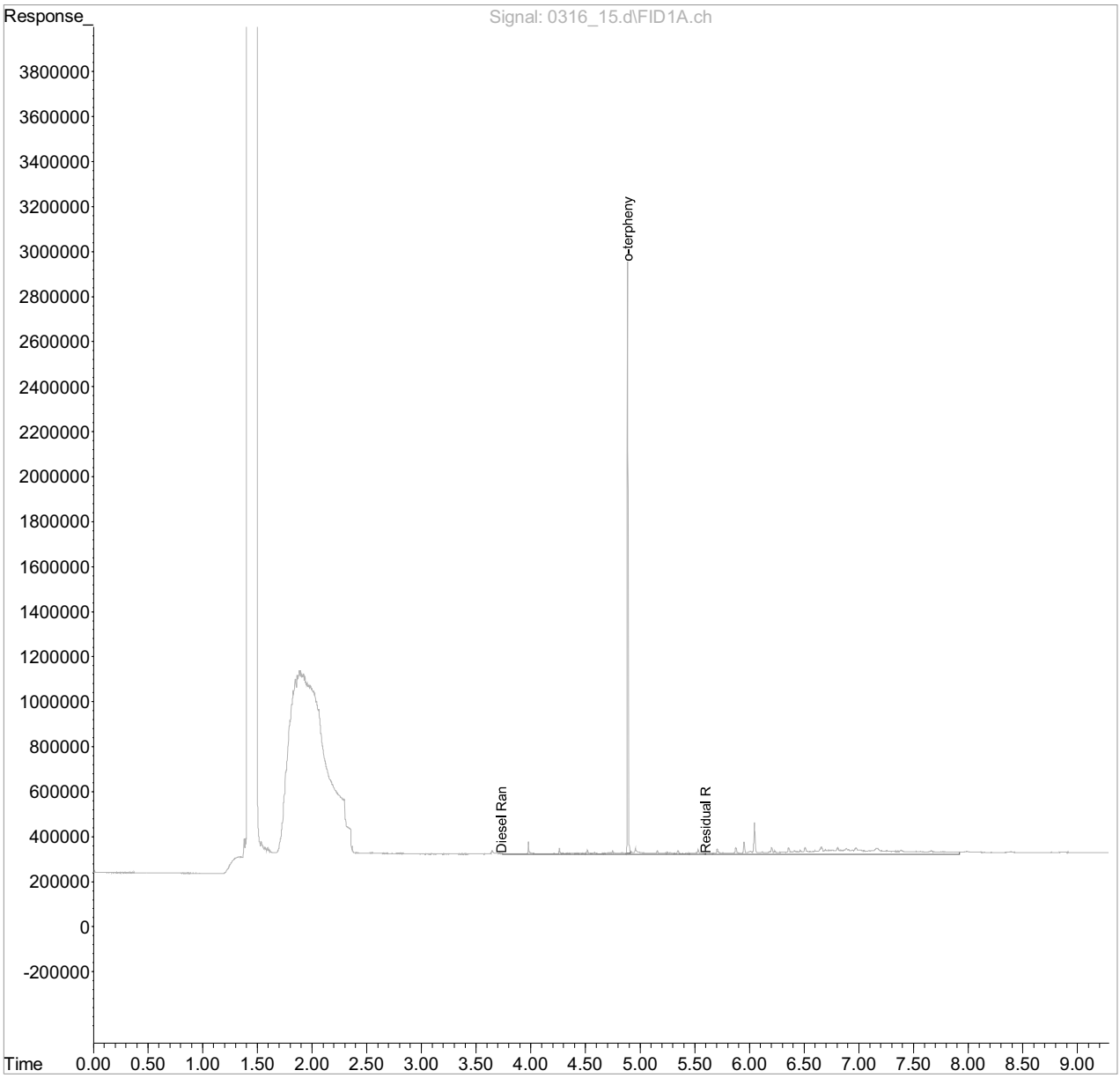
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031617\
Data File : 0316 15.d
Signal(s) : FID1A.ch
Acq On : 16 Mar 2017 2:09 pm
Operator : 765
Sample : L895193-05 1x WG961524 40-2
Misc : water
ALS Vial : 12 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: Mar 16 14:31:00 2017
Quant Method : C:\msdchem\1\methods\EP27A25Q.M
Quant Title :
QLast Update : Wed Jan 25 13:17:51 2017
Response via : Initial Calibration
Integrator: ChemStation

SGT

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



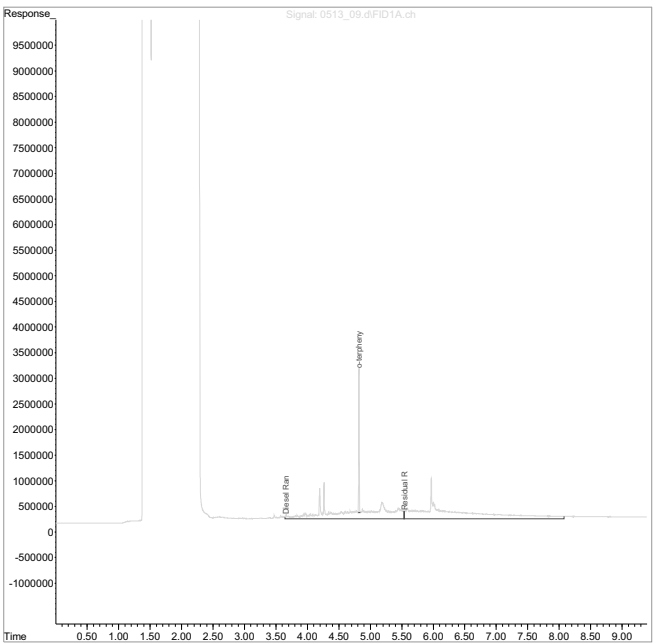
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_09.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 12:04 pm
Operator : 614
Sample : L908444-01 1x WG979247 40-2
Misc : water
ALS Vial : 8 Sample Multiplier: 0.05
InstName : SVGC31

no SGT

Integration File: events.e
Quant Time: May 15 12:36:45 2017
Quant Method : C:\msdchem\1\methods\EP31D14Q.M
Quant Title :
QLast Update : Wed Apr 12 14:09:24 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

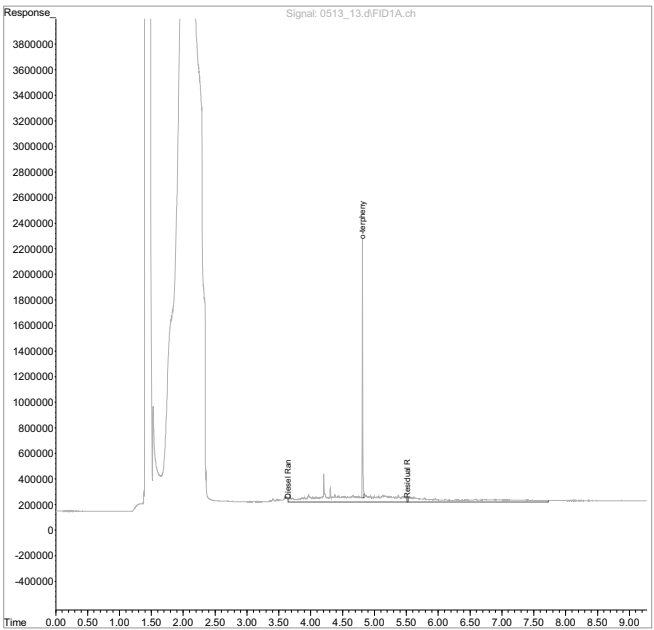


Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_13.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 12:55 pm
Operator : 784
Sample : L908444-01 1x WG978857 40-2
Misc : water
ALS Vial : 34 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: May 15 15:04:31 2017
Quant Method : C:\msdchem\1\methods\EP27E08Q.M
Quant Title :
QLast Update : Mon May 08 12:31:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



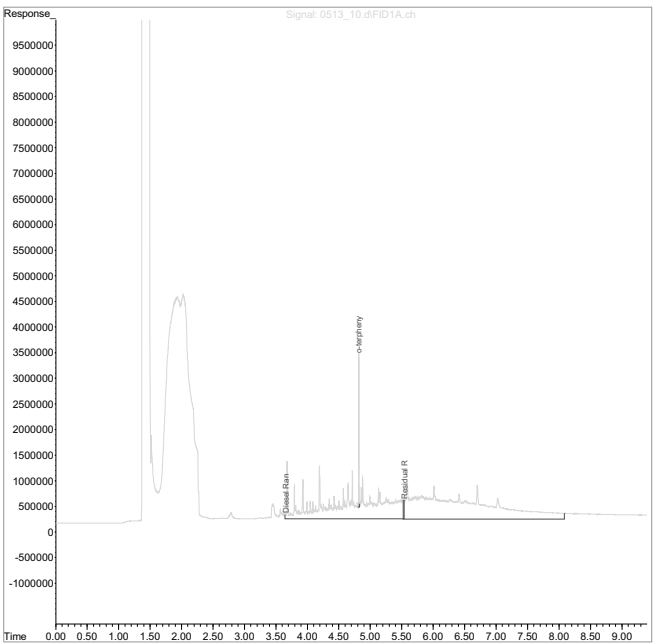
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_10.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 12:21 pm
Operator : 614
Sample : L908444-02 1x WG979247 40-2
Misc : water
ALS Vial : 9 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: May 15 12:37:30 2017
Quant Method : C:\msdchem\1\methods\EP31D14Q.M
Quant Title :
QLast Update : Wed Apr 12 14:09:24 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :

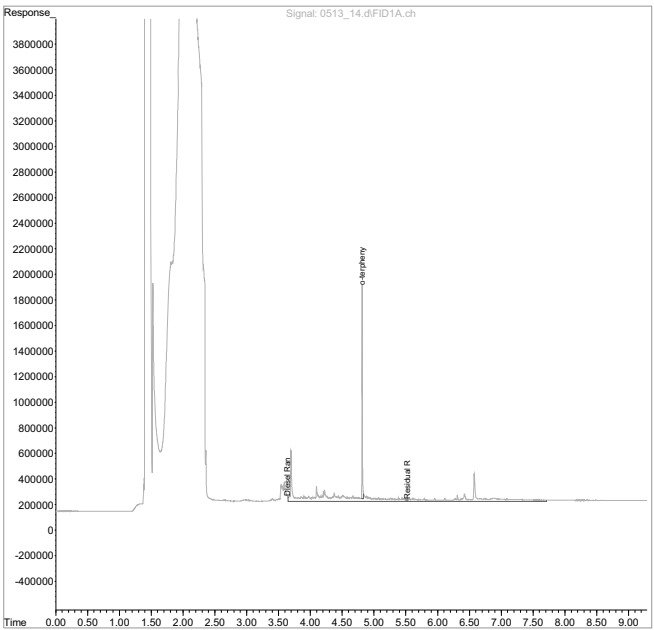


Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_14.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 1:11 pm
Operator : 784
Sample : L908444-02 1x WG978857 40-2
Misc : water
ALS Vial : 35 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: May 15 15:05:03 2017
Quant Method : C:\msdchem\1\methods\EP27E08Q.M
Quant Title :
QLast Update : Mon May 08 12:31:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



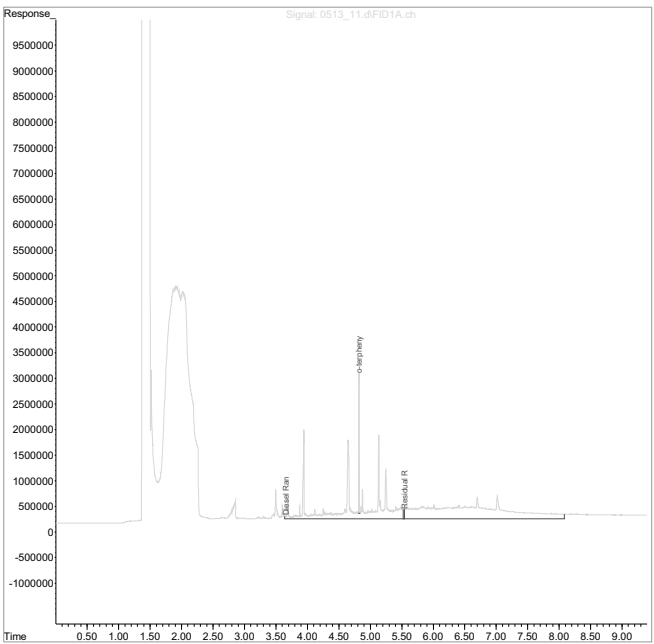
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_11.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 12:37 pm
Operator : 614
Sample : L908444-03 1x WG979247 40-2
Misc : water
ALS Vial : 10 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: May 15 12:38:46 2017
Quant Method : C:\msdchem\1\methods\EP31D14Q.M
Quant Title :
QLast Update : Wed Apr 12 14:09:24 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :

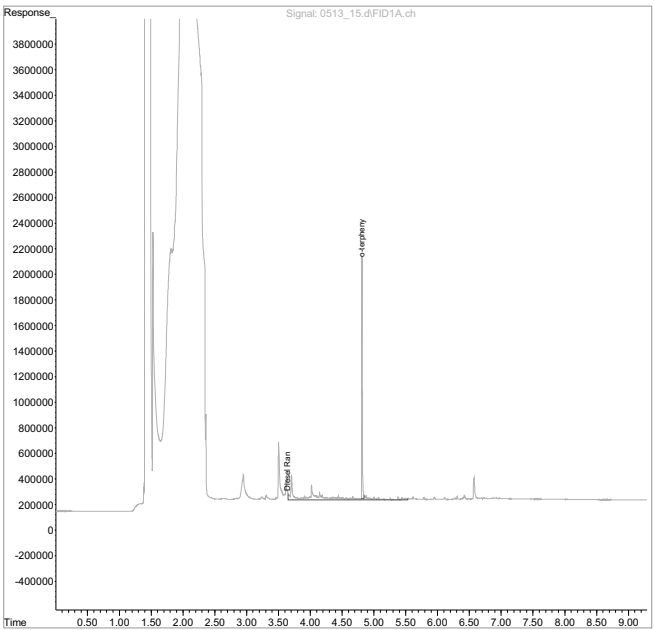


Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_15.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 1:27 pm
Operator : 784
Sample : L908444-03 1x WG978857 40-2
Misc : water
ALS Vial : 36 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: May 15 15:05:42 2017
Quant Method : C:\msdchem\1\methods\EP27E08Q.M
Quant Title :
QLast Update : Mon May 08 12:31:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



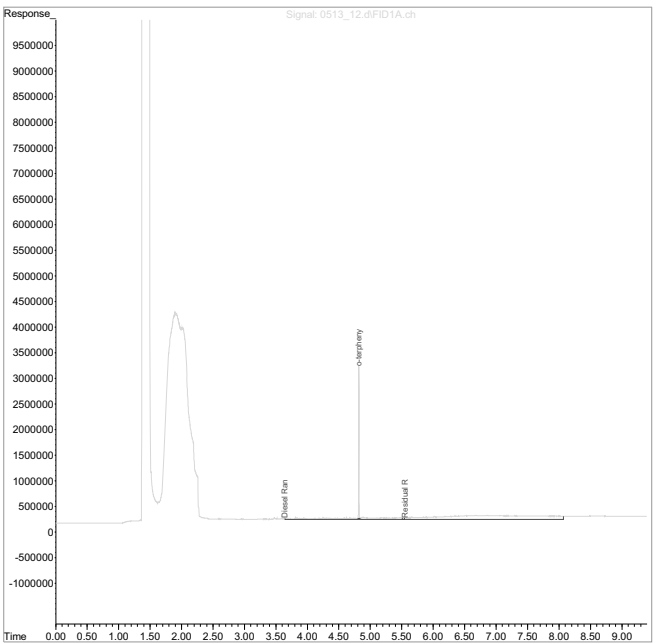
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_12.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 12:54 pm
Operator : 614
Sample : L908444-04 1x WG979247 40-2
Misc : water
ALS Vial : 11 Sample Multiplier: 0.05
InstName : SVGC31

no SGT

Integration File: events.e
Quant Time: May 15 12:40:18 2017
Quant Method : C:\msdchem\1\methods\EP31D14Q.M
Quant Title :
QLast Update : Wed Apr 12 14:09:24 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

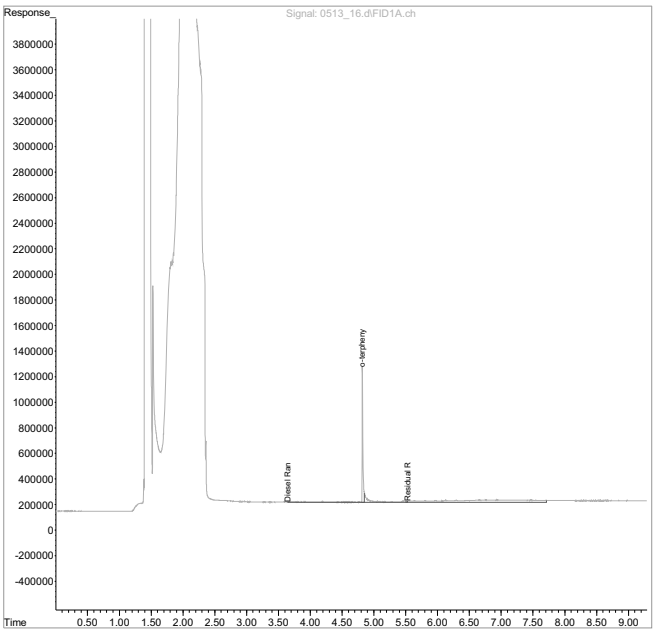


Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_16.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 1:44 pm
Operator : 784
Sample : L908444-04 1x WG978857 40-2
Misc : water
ALS Vial : 37 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: May 15 15:17:21 2017
Quant Method : C:\msdchem\1\methods\EP27E08Q.M
Quant Title :
QLast Update : Mon May 08 12:31:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



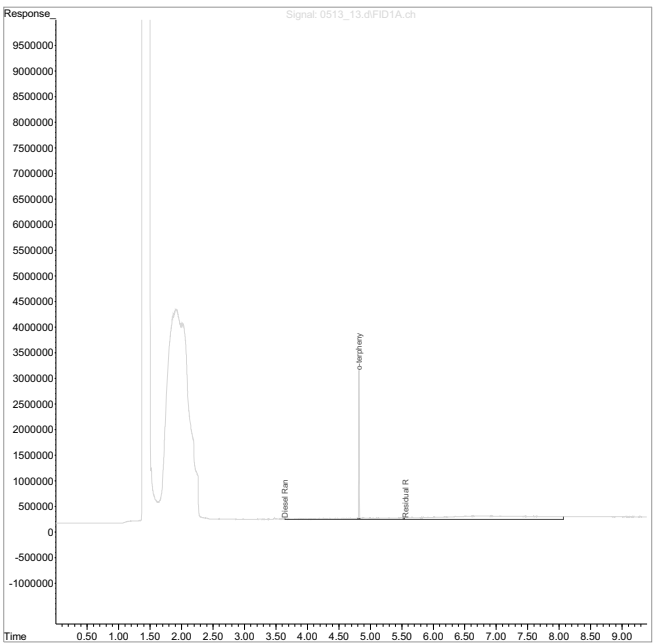
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_13.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 1:11 pm
Operator : 614
Sample : L908444-05 1x WG979247 40-2
Misc : water
ALS Vial : 12 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: May 15 12:41:22 2017
Quant Method : C:\msdchem\1\methods\EP31D14Q.M
Quant Title :
QLast Update : Wed Apr 12 14:09:24 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :

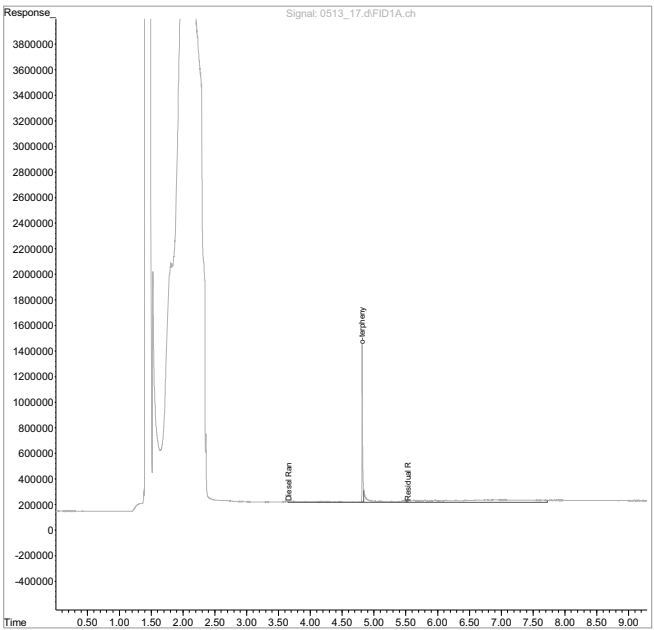


Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_17.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 2:00 pm
Operator : 784
Sample : L908444-05 1x WG978857 40-2
Misc : water
ALS Vial : 38 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: May 15 15:28:42 2017
Quant Method : C:\msdchem\1\methods\EP27E08Q.M
Quant Title :
QLast Update : Mon May 08 12:31:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



ANALYTICAL REPORT

March 17, 2017

Arcadis - Seattle, WA

Sample Delivery Group:	L895193
Samples Received:	03/10/2017
Project Number:	GP09BPNA.WA60
Description:	Olympia Bulk Plant
Site:	1120 WEST BAY DR, OLYMPIA, WA
Report To:	Ross LaGrandeur 1100 Olive Way Suite 800 Seattle, WA 98101

Entire Report Reviewed By:

Brian Ford

Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

MW-7 L895193-01 GW

Collected by: Eric Krueger
Collected date/time: 03/09/17 12:25
Received date/time: 03/10/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG960587	1	03/13/17 21:09	03/14/17 02:21	LTB
Metals (ICP) by Method 6010C	WG961400	1	03/15/17 23:03	03/16/17 03:47	CCE
Volatile Organic Compounds (GC) by Method NWTPHGX	WG960176	1	03/16/17 03:51	03/16/17 03:51	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG959917	1	03/13/17 05:49	03/13/17 05:49	BMB
EDB / DBCP by Method 8011	WG960326	1	03/13/17 07:39	03/14/17 06:44	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG960019	1	03/11/17 00:06	03/11/17 17:39	TRF
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG961524	1	03/14/17 12:54	03/16/17 13:03	TRF
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG960332	1	03/14/17 05:43	03/14/17 11:10	FMB

MW-8 L895193-02 GW

Collected by: Eric Krueger
Collected date/time: 03/09/17 13:20
Received date/time: 03/10/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG960587	1	03/13/17 21:09	03/14/17 02:23	LTB
Metals (ICP) by Method 6010C	WG961400	1	03/15/17 23:03	03/16/17 03:50	CCE
Volatile Organic Compounds (GC) by Method NWTPHGX	WG960176	1	03/16/17 04:12	03/16/17 04:12	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG959917	1	03/13/17 06:11	03/13/17 06:11	BMB
EDB / DBCP by Method 8011	WG960326	1	03/13/17 07:39	03/14/17 06:55	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG960019	1	03/11/17 00:06	03/11/17 17:56	TRF
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG961524	1	03/14/17 12:54	03/16/17 13:20	TRF
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG960332	1	03/14/17 05:43	03/14/17 11:32	FMB

MW-9 L895193-03 GW

Collected by: Eric Krueger
Collected date/time: 03/09/17 13:50
Received date/time: 03/10/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG960587	1	03/13/17 21:09	03/14/17 02:26	LTB
Metals (ICP) by Method 6010C	WG961400	1	03/15/17 23:03	03/16/17 03:53	CCE
Volatile Organic Compounds (GC) by Method NWTPHGX	WG960176	1	03/16/17 04:33	03/16/17 04:33	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG959917	1	03/13/17 06:32	03/13/17 06:32	BMB
EDB / DBCP by Method 8011	WG960326	1	03/13/17 07:39	03/14/17 07:06	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG960019	1	03/11/17 00:06	03/11/17 18:13	TRF
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG961524	1	03/14/17 12:54	03/16/17 13:36	TRF
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG960332	1	03/14/17 05:43	03/14/17 11:55	FMB

MW-13 L895193-04 GW

Collected by: Eric Krueger
Collected date/time: 03/09/17 14:35
Received date/time: 03/10/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG960587	1	03/13/17 21:09	03/14/17 02:29	LTB
Metals (ICP) by Method 6010C	WG961400	1	03/15/17 23:03	03/16/17 04:01	CCE
Volatile Organic Compounds (GC) by Method NWTPHGX	WG960176	1	03/16/17 04:54	03/16/17 04:54	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG959917	1	03/13/17 06:54	03/13/17 06:54	BMB
EDB / DBCP by Method 8011	WG960326	1	03/13/17 07:39	03/14/17 07:17	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG960019	1	03/11/17 00:06	03/11/17 18:30	TRF
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG961524	1	03/14/17 12:54	03/16/17 13:53	TRF
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG960332	1	03/14/17 05:43	03/14/17 12:18	FMB

DUP-1 L895193-05 GW

Collected by: Eric Krueger
Collected date/time: 03/09/17 00:00
Received date/time: 03/10/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method NWTPHGX	WG960176	1	03/16/17 05:15	03/16/17 05:15	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG959917	1	03/13/17 07:15	03/13/17 07:15	BMB
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG960019	1	03/11/17 00:06	03/11/17 18:47	TRF
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG961524	1	03/14/17 12:54	03/16/17 14:09	TRF

TRIP BLANK L895193-06 GW

Collected by: Eric Krueger
Collected date/time: 03/09/17 00:00
Received date/time: 03/10/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG959917	1	03/13/17 01:32	03/13/17 01:32	BMB

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford
Technical Service Representative

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	3.48	J	1.90	5.00	1	03/14/2017 02:21	WG960587
Lead,Dissolved	U		1.90	5.00	1	03/16/2017 03:47	WG961400

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	03/16/2017 03:51	WG960176
(S) a,a,a-Trifluorotoluene(FID)	*100*			*77.0-122*		*03/16/2017 03:51*	WG960176

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	03/13/2017 05:49	WG959917
Toluene	U		0.412	1.00	1	03/13/2017 05:49	WG959917
Ethylbenzene	U		0.384	1.00	1	03/13/2017 05:49	WG959917
Total Xylenes	U		1.06	3.00	1	03/13/2017 05:49	WG959917
Methyl tert-butyl ether	U		0.367	1.00	1	03/13/2017 05:49	WG959917
1,2-Dichloroethane	U		0.361	1.00	1	03/13/2017 05:49	WG959917
(S) Toluene-d8	*110*			*80.0-120*		*03/13/2017 05:49*	WG959917
(S) Dibromofluoromethane	*111*			*76.0-123*		*03/13/2017 05:49*	WG959917
(S) a,a,a-Trifluorotoluene	*105*			*80.0-120*		*03/13/2017 05:49*	WG959917
(S) 4-Bromofluorobenzene	*94.1*			*80.0-120*		*03/13/2017 05:49*	WG959917

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00240	0.0100	1	03/14/2017 06:44	WG960326

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/11/2017 17:39	WG960019
Residual Range Organics (RRO)	U		165	500	1	03/11/2017 17:39	WG960019
(S) o-Terphenyl	*94.3*			*52.0-156*		*03/11/2017 17:39*	WG960019

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/16/2017 13:03	WG961524
Residual Range Organics (RRO)	U		165	500	1	03/16/2017 13:03	WG961524
(S) o-Terphenyl	*121*			*52.0-156*		*03/16/2017 13:03*	WG961524

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	03/14/2017 11:10	WG960332
Benzo(a)pyrene	U		0.0116	0.0500	1	03/14/2017 11:10	WG960332
Benzo(b)fluoranthene	U		0.00212	0.0500	1	03/14/2017 11:10	WG960332
Benzo(k)fluoranthene	U		0.0136	0.0500	1	03/14/2017 11:10	WG960332
Chrysene	U		0.0108	0.0500	1	03/14/2017 11:10	WG960332
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	03/14/2017 11:10	WG960332
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	03/14/2017 11:10	WG960332

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Naphthalene	0.120	B J	0.0198	0.250	1	03/14/2017 11:10	WG960332
1-Methylnaphthalene	0.0245	J	0.00821	0.250	1	03/14/2017 11:10	WG960332
2-Methylnaphthalene	0.0359	J	0.00902	0.250	1	03/14/2017 11:10	WG960332
(S) Nitrobenzene-d5	*119*			*31.0-160*		*03/14/2017 11:10*	WG960332
(S) 2-Fluorobiphenyl	*94.1*			*48.0-148*		*03/14/2017 11:10*	WG960332
(S) p-Terphenyl-d14	*93.1*			*37.0-146*		*03/14/2017 11:10*	WG960332

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	U		1.90	5.00	1	03/14/2017 02:23	WG960587
Lead,Dissolved	U		1.90	5.00	1	03/16/2017 03:50	WG961400

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	03/16/2017 04:12	WG960176
(S) a,a,a-Trifluorotoluene(FID)	*100*			*77.0-122*		*03/16/2017 04:12*	WG960176

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	03/13/2017 06:11	WG959917
Toluene	6.00		0.412	1.00	1	03/13/2017 06:11	WG959917
Ethylbenzene	U		0.384	1.00	1	03/13/2017 06:11	WG959917
Total Xylenes	U		1.06	3.00	1	03/13/2017 06:11	WG959917
Methyl tert-butyl ether	U		0.367	1.00	1	03/13/2017 06:11	WG959917
1,2-Dichloroethane	U		0.361	1.00	1	03/13/2017 06:11	WG959917
(S) Toluene-d8	*108*			*80.0-120*		*03/13/2017 06:11*	WG959917
(S) Dibromofluoromethane	*111*			*76.0-123*		*03/13/2017 06:11*	WG959917
(S) a,a,a-Trifluorotoluene	*103*			*80.0-120*		*03/13/2017 06:11*	WG959917
(S) 4-Bromofluorobenzene	*95.9*			*80.0-120*		*03/13/2017 06:11*	WG959917

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00240	0.0100	1	03/14/2017 06:55	WG960326

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	390		82.5	250	1	03/11/2017 17:56	WG960019
Residual Range Organics (RRO)	419	J	165	500	1	03/11/2017 17:56	WG960019
(S) o-Terphenyl	*101*			*52.0-156*		*03/11/2017 17:56*	WG960019

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	87.6	J	82.5	250	1	03/16/2017 13:20	WG961524
Residual Range Organics (RRO)	U		165	500	1	03/16/2017 13:20	WG961524
(S) o-Terphenyl	*108*			*52.0-156*		*03/16/2017 13:20*	WG961524

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	03/14/2017 11:32	WG960332
Benzo(a)pyrene	U		0.0116	0.0500	1	03/14/2017 11:32	WG960332
Benzo(b)fluoranthene	U		0.00212	0.0500	1	03/14/2017 11:32	WG960332
Benzo(k)fluoranthene	U		0.0136	0.0500	1	03/14/2017 11:32	WG960332
Chrysene	U		0.0108	0.0500	1	03/14/2017 11:32	WG960332
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	03/14/2017 11:32	WG960332
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	03/14/2017 11:32	WG960332

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Naphthalene	0.0608	B J	0.0198	0.250	1	03/14/2017 11:32	WG960332
1-Methylnaphthalene	0.0269	J	0.00821	0.250	1	03/14/2017 11:32	WG960332
2-Methylnaphthalene	0.0134	J	0.00902	0.250	1	03/14/2017 11:32	WG960332
(S) Nitrobenzene-d5	*116*			*31.0-160*		*03/14/2017 11:32*	WG960332
(S) 2-Fluorobiphenyl	*90.2*			*48.0-148*		*03/14/2017 11:32*	WG960332
(S) p-Terphenyl-d14	*84.8*			*37.0-146*		*03/14/2017 11:32*	WG960332

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	2.72	J	1.90	5.00	1	03/14/2017 02:26	WG960587
Lead,Dissolved	U		1.90	5.00	1	03/16/2017 03:53	WG961400

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	03/16/2017 04:33	WG960176
(S) a,a,a-Trifluorotoluene(FID)	*100*			*77.0-122*		*03/16/2017 04:33*	WG960176

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	03/13/2017 06:32	WG959917
Toluene	3.42		0.412	1.00	1	03/13/2017 06:32	WG959917
Ethylbenzene	U		0.384	1.00	1	03/13/2017 06:32	WG959917
Total Xylenes	U		1.06	3.00	1	03/13/2017 06:32	WG959917
Methyl tert-butyl ether	U		0.367	1.00	1	03/13/2017 06:32	WG959917
1,2-Dichloroethane	U		0.361	1.00	1	03/13/2017 06:32	WG959917
(S) Toluene-d8	*108*			*80.0-120*		*03/13/2017 06:32*	WG959917
(S) Dibromofluoromethane	*110*			*76.0-123*		*03/13/2017 06:32*	WG959917
(S) a,a,a-Trifluorotoluene	*104*			*80.0-120*		*03/13/2017 06:32*	WG959917
(S) 4-Bromofluorobenzene	*95.6*			*80.0-120*		*03/13/2017 06:32*	WG959917

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00240	0.0100	1	03/14/2017 07:06	WG960326

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	347		82.5	250	1	03/11/2017 18:13	WG960019
Residual Range Organics (RRO)	376	J	165	500	1	03/11/2017 18:13	WG960019
(S) o-Terphenyl	*104*			*52.0-156*		*03/11/2017 18:13*	WG960019

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/16/2017 13:36	WG961524
Residual Range Organics (RRO)	U		165	500	1	03/16/2017 13:36	WG961524
(S) o-Terphenyl	*109*			*52.0-156*		*03/16/2017 13:36*	WG961524

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	03/14/2017 11:55	WG960332
Benzo(a)pyrene	U		0.0116	0.0500	1	03/14/2017 11:55	WG960332
Benzo(b)fluoranthene	U		0.00212	0.0500	1	03/14/2017 11:55	WG960332
Benzo(k)fluoranthene	U		0.0136	0.0500	1	03/14/2017 11:55	WG960332
Chrysene	U		0.0108	0.0500	1	03/14/2017 11:55	WG960332
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	03/14/2017 11:55	WG960332
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	03/14/2017 11:55	WG960332

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Naphthalene	1.07		0.0198	0.250	1	03/14/2017 11:55	WG960332
1-Methylnaphthalene	0.105	J	0.00821	0.250	1	03/14/2017 11:55	WG960332
2-Methylnaphthalene	0.0488	J	0.00902	0.250	1	03/14/2017 11:55	WG960332
(S) Nitrobenzene-d5	*119*			*31.0-160*		*03/14/2017 11:55*	WG960332
(S) 2-Fluorobiphenyl	*97.1*			*48.0-148*		*03/14/2017 11:55*	WG960332
(S) p-Terphenyl-d14	*92.2*			*37.0-146*		*03/14/2017 11:55*	WG960332

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	2.14	J	1.90	5.00	1	03/14/2017 02:29	WG960587
Lead,Dissolved	U		1.90	5.00	1	03/16/2017 04:01	WG961400

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	03/16/2017 04:54	WG960176
(S) a,a,a-Trifluorotoluene(FID)	*100*			*77.0-122*		*03/16/2017 04:54*	WG960176

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	03/13/2017 06:54	WG959917
Toluene	U		0.412	1.00	1	03/13/2017 06:54	WG959917
Ethylbenzene	U		0.384	1.00	1	03/13/2017 06:54	WG959917
Total Xylenes	U		1.06	3.00	1	03/13/2017 06:54	WG959917
Methyl tert-butyl ether	U		0.367	1.00	1	03/13/2017 06:54	WG959917
1,2-Dichloroethane	U		0.361	1.00	1	03/13/2017 06:54	WG959917
(S) Toluene-d8	*107*			*80.0-120*		*03/13/2017 06:54*	WG959917
(S) Dibromofluoromethane	*110*			*76.0-123*		*03/13/2017 06:54*	WG959917
(S) a,a,a-Trifluorotoluene	*104*			*80.0-120*		*03/13/2017 06:54*	WG959917
(S) 4-Bromofluorobenzene	*96.1*			*80.0-120*		*03/13/2017 06:54*	WG959917

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00240	0.0100	1	03/14/2017 07:17	WG960326

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/11/2017 18:30	WG960019
Residual Range Organics (RRO)	U		165	500	1	03/11/2017 18:30	WG960019
(S) o-Terphenyl	*104*			*52.0-156*		*03/11/2017 18:30*	WG960019

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/16/2017 13:53	WG961524
Residual Range Organics (RRO)	U		165	500	1	03/16/2017 13:53	WG961524
(S) o-Terphenyl	*114*			*52.0-156*		*03/16/2017 13:53*	WG961524

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	03/14/2017 12:18	WG960332
Benzo(a)pyrene	U		0.0116	0.0500	1	03/14/2017 12:18	WG960332
Benzo(b)fluoranthene	U		0.00212	0.0500	1	03/14/2017 12:18	WG960332
Benzo(k)fluoranthene	U		0.0136	0.0500	1	03/14/2017 12:18	WG960332
Chrysene	U		0.0108	0.0500	1	03/14/2017 12:18	WG960332
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	03/14/2017 12:18	WG960332
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	03/14/2017 12:18	WG960332

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Naphthalene	0.0482	B J	0.0198	0.250	1	03/14/2017 12:18	WG960332
1-Methylnaphthalene	0.0100	J	0.00821	0.250	1	03/14/2017 12:18	WG960332
2-Methylnaphthalene	U		0.00902	0.250	1	03/14/2017 12:18	WG960332
(S) Nitrobenzene-d5	*120*			*31.0-160*		*03/14/2017 12:18*	WG960332
(S) 2-Fluorobiphenyl	*95.9*			*48.0-148*		*03/14/2017 12:18*	WG960332
(S) p-Terphenyl-d14	*91.2*			*37.0-146*		*03/14/2017 12:18*	WG960332

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	03/16/2017 05:15	WG960176
(S) a,a,a-Trifluorotoluene(FID)	*100*			*77.0-122*		*03/16/2017 05:15*	WG960176

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	03/13/2017 07:15	WG959917
Toluene	U		0.412	1.00	1	03/13/2017 07:15	WG959917
Ethylbenzene	U		0.384	1.00	1	03/13/2017 07:15	WG959917
Total Xylenes	U		1.06	3.00	1	03/13/2017 07:15	WG959917
Methyl tert-butyl ether	U		0.367	1.00	1	03/13/2017 07:15	WG959917
1,2-Dichloroethane	U		0.361	1.00	1	03/13/2017 07:15	WG959917
(S) Toluene-d8	*107*			*80.0-120*		*03/13/2017 07:15*	WG959917
(S) Dibromofluoromethane	*108*			*76.0-123*		*03/13/2017 07:15*	WG959917
(S) a,a,a-Trifluorotoluene	*104*			*80.0-120*		*03/13/2017 07:15*	WG959917
(S) 4-Bromofluorobenzene	*94.6*			*80.0-120*		*03/13/2017 07:15*	WG959917

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/11/2017 18:47	WG960019
Residual Range Organics (RRO)	U		165	500	1	03/11/2017 18:47	WG960019
(S) o-Terphenyl	*105*			*52.0-156*		*03/11/2017 18:47*	WG960019

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		82.5	250	1	03/16/2017 14:09	WG961524
Residual Range Organics (RRO)	U		165	500	1	03/16/2017 14:09	WG961524
(S) o-Terphenyl	*108*			*52.0-156*		*03/16/2017 14:09*	WG961524

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	03/13/2017 01:32	WG959917
Toluene	U		0.412	1.00	1	03/13/2017 01:32	WG959917
Ethylbenzene	U		0.384	1.00	1	03/13/2017 01:32	WG959917
Total Xylenes	U		1.06	3.00	1	03/13/2017 01:32	WG959917
Methyl tert-butyl ether	U		0.367	1.00	1	03/13/2017 01:32	WG959917
1,2-Dichloroethane	U		0.361	1.00	1	03/13/2017 01:32	WG959917
(S) Toluene-d8	*107*			*80.0-120*		*03/13/2017 01:32*	WG959917
(S) Dibromofluoromethane	*108*			*76.0-123*		*03/13/2017 01:32*	WG959917
(S) a,a,a-Trifluorotoluene	*104*			*80.0-120*		*03/13/2017 01:32*	WG959917
(S) 4-Bromofluorobenzene	*95.4*			*80.0-120*		*03/13/2017 01:32*	WG959917

Method Blank (MB)

(MB) R3202970-1 03/14/17 01:49

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Lead	U		1.90	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3202970-2 03/14/17 01:51 • (LCSD) R3202970-3 03/14/17 01:54

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Lead	1000	990	984	99	98	80-120			1	20

L895608-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L895608-03 03/14/17 01:57 • (MS) R3202970-5 03/14/17 02:02 • (MSD) R3202970-6 03/14/17 02:04

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Lead	1000	5.58	994	997	99	99	1	75-125			0	20

Method Blank (MB)

(MB) R3203719-1 03/16/17 03:28

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Lead,Dissolved	U		1.90	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3203719-2 03/16/17 03:30 • (LCSD) R3203719-3 03/16/17 03:33

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Lead,Dissolved	1000	1020	1010	102	101	80-120			1	20

L895608-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L895608-01 03/16/17 03:36 • (MS) R3203719-5 03/16/17 03:41 • (MSD) R3203719-6 03/16/17 03:44

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Lead,Dissolved	1000	ND	1000	1010	100	101	1	75-125			1	20

Method Blank (MB)

(MB) R3203738-3 03/15/17 21:47

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Gasoline Range Organics-NWTPH	U		31.6	100
(S) a,a,a-Trifluorotoluene(FID)	*101*			*77.0-122*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3203738-1 03/15/17 20:44 • (LCSD) R3203738-2 03/15/17 21:05

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Gasoline Range Organics-NWTPH	5500	6130	6590	111	120	72.0-134			7.24	20
(S) a,a,a-Trifluorotoluene(FID)				*103*	*104*	*77.0-122*				

L895193-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L895193-01 03/16/17 03:51 • (MS) R3203738-4 03/16/17 02:47 • (MSD) R3203738-5 03/16/17 03:09

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Gasoline Range Organics-NWTPH	5500	U	6610	6480	120	118	1	23.0-159			1.99	20
(S) a,a,a-Trifluorotoluene(FID)					*103*	*103*		*77.0-122*				

Method Blank (MB)

(MB) R3203135-3 03/13/17 01:10

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Benzene	U		0.331	1.00
1,2-Dichloroethane	U		0.361	1.00
Ethylbenzene	U		0.384	1.00
Methyl tert-butyl ether	U		0.367	1.00
Toluene	U		0.412	1.00
Xylenes, Total	U		1.06	3.00
(S) Toluene-d8	*109*			*80.0-120*
(S) Dibromofluoromethane	*111*			*76.0-123*
(S) a,a,a-Trifluorotoluene	*103*			*80.0-120*
(S) 4-Bromofluorobenzene	*95.0*			*80.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3203135-1 03/13/17 00:06 • (LCSD) R3203135-2 03/13/17 00:27

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Benzene	25.0	27.2	28.4	109	114	69.0-123			4.23	20
1,2-Dichloroethane	25.0	28.5	27.6	114	110	67.0-126			3.35	20
Ethylbenzene	25.0	23.4	26.0	93.8	104	77.0-120			10.5	20
Methyl tert-butyl ether	25.0	27.5	26.8	110	107	64.0-123			2.58	20
Toluene	25.0	25.2	26.4	101	105	77.0-120			4.30	20
Xylenes, Total	75.0	75.7	80.1	101	107	77.0-120			5.65	20
(S) Toluene-d8				*103*	*102*	*80.0-120*				
(S) Dibromofluoromethane				*109*	*110*	*76.0-123*				
(S) a,a,a-Trifluorotoluene				*98.8*	*97.8*	*80.0-120*				
(S) 4-Bromofluorobenzene				*96.8*	*99.8*	*80.0-120*				

L895138-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L895138-01 03/13/17 02:57 • (MS) R3203135-4 03/13/17 01:53 • (MSD) R3203135-5 03/13/17 02:14

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Benzene	25.0	49.2	634	646	117	119	20	34.0-147			1.81	20
1,2-Dichloroethane	25.0	ND	581	598	116	120	20	47.0-141			2.94	20
Ethylbenzene	25.0	34.5	614	608	116	115	20	42.0-147			0.950	20
Methyl tert-butyl ether	25.0	ND	558	604	112	121	20	42.0-142			7.83	20
Toluene	25.0	113	680	691	113	116	20	42.0-141			1.57	20
Xylenes, Total	75.0	1420	3670	3550	150	142	20	41.0-148	J5		3.32	20
(S) Toluene-d8					*103*	*104*		*80.0-120*				

L895138-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L895138-01 03/13/17 02:57 • (MS) R3203135-4 03/13/17 01:53 • (MSD) R3203135-5 03/13/17 02:14

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
(S) Dibromofluoromethane					*104*	*110*		*76.0-123*				
(S) a,a,a-Trifluorotoluene					*99.9*	*97.6*		*80.0-120*				
(S) 4-Bromofluorobenzene					*104*	*104*		*80.0-120*				

Method Blank (MB)

(MB) R3203299-1 03/14/17 05:06

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Ethylene Dibromide	U		0.00240	0.0100

L895470-01 Original Sample (OS) • Duplicate (DUP)

(OS) L895470-01 03/14/17 05:50 • (DUP) R3203299-3 03/14/17 05:39

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Ethylene Dibromide	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3203299-4 03/14/17 07:28 • (LCSD) R3203299-5 03/14/17 09:28

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Ethylene Dibromide	0.250	0.275	0.252	110	101	60.0-140			8.51	20

L895470-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L895470-02 03/14/17 05:28 • (MS) R3203299-2 03/14/17 05:17

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	ug/l	ug/l	ug/l	%		%	
Ethylene Dibromide	0.100	0.623	0.720	97.6	1	60.0-140	E

Method Blank (MB)

(MB) R3202852-1 03/11/17 13:29

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Diesel Range Organics (DRO)	U		83.3	250
Residual Range Organics (RRO)	U		167	500
(S) o-Terphenyl	*98.4*			*52.0-156*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3202852-2 03/11/17 13:46 • (LCSD) R3202852-3 03/11/17 14:02

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Diesel Range Organics (DRO)	750	869	912	116	122	50.0-150			4.86	20
Residual Range Organics (RRO)	750	669	701	89.1	93.5	50.0-150			4.76	20
(S) o-Terphenyl				*102*	*105*	*52.0-156*				

Method Blank (MB)

(MB) R3203861-1 03/16/17 12:14

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Diesel Range Organics (DRO)	U		83.3	250
Residual Range Organics (RRO)	U		167	500
(S) o-Terphenyl	*119*			*52.0-156*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3203861-2 03/16/17 12:30 • (LCSD) R3203861-3 03/16/17 12:47

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Diesel Range Organics (DRO)	750	973	874	130	116	50.0-150			10.7	20
Residual Range Organics (RRO)	750	859	794	115	106	50.0-150			7.91	20
(S) o-Terphenyl				*127*	*114*	*52.0-156*				

Method Blank (MB)

(MB) R3203231-3 03/14/17 10:00

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Benzo(a)anthracene	U		0.00410	0.0500
Benzo(a)pyrene	U		0.0116	0.0500
Benzo(b)fluoranthene	0.00233	J	0.00212	0.0500
Benzo(k)fluoranthene	U		0.0136	0.0500
Chrysene	U		0.0108	0.0500
Dibenz(a,h)anthracene	U		0.00396	0.0500
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500
Naphthalene	0.0496	J	0.0198	0.250
1-Methylnaphthalene	U		0.00821	0.250
2-Methylnaphthalene	U		0.00902	0.250
(S) Nitrobenzene-d5	*144*			*31.0-160*
(S) 2-Fluorobiphenyl	*120*			*48.0-148*
(S) p-Terphenyl-d14	*126*			*37.0-146*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3203231-1 03/14/17 09:14 • (LCSD) R3203231-2 03/14/17 09:37

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzo(a)anthracene	2.00	2.14	2.20	107	110	59.0-134			3.06	20
Benzo(a)pyrene	2.00	2.08	2.17	104	109	61.0-145			4.43	20
Benzo(b)fluoranthene	2.00	2.16	2.12	108	106	57.0-136			2.01	20
Benzo(k)fluoranthene	2.00	1.92	2.16	96.0	108	57.0-141			11.6	20
Chrysene	2.00	1.95	2.01	97.5	101	63.0-140			3.10	20
Dibenz(a,h)anthracene	2.00	2.15	2.22	107	111	49.0-141			3.37	20
Indeno(1,2,3-cd)pyrene	2.00	2.12	2.20	106	110	53.0-141			3.88	20
Naphthalene	2.00	2.11	2.21	105	110	68.0-129			4.51	20
1-Methylnaphthalene	2.00	2.05	2.14	103	107	68.0-137			4.16	20
2-Methylnaphthalene	2.00	1.94	2.02	97.0	101	68.0-134			4.26	20
(S) Nitrobenzene-d5				*120*	*124*	*31.0-160*				
(S) 2-Fluorobiphenyl				*99.4*	*103*	*48.0-148*				
(S) p-Terphenyl-d14				*101*	*104*	*37.0-146*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

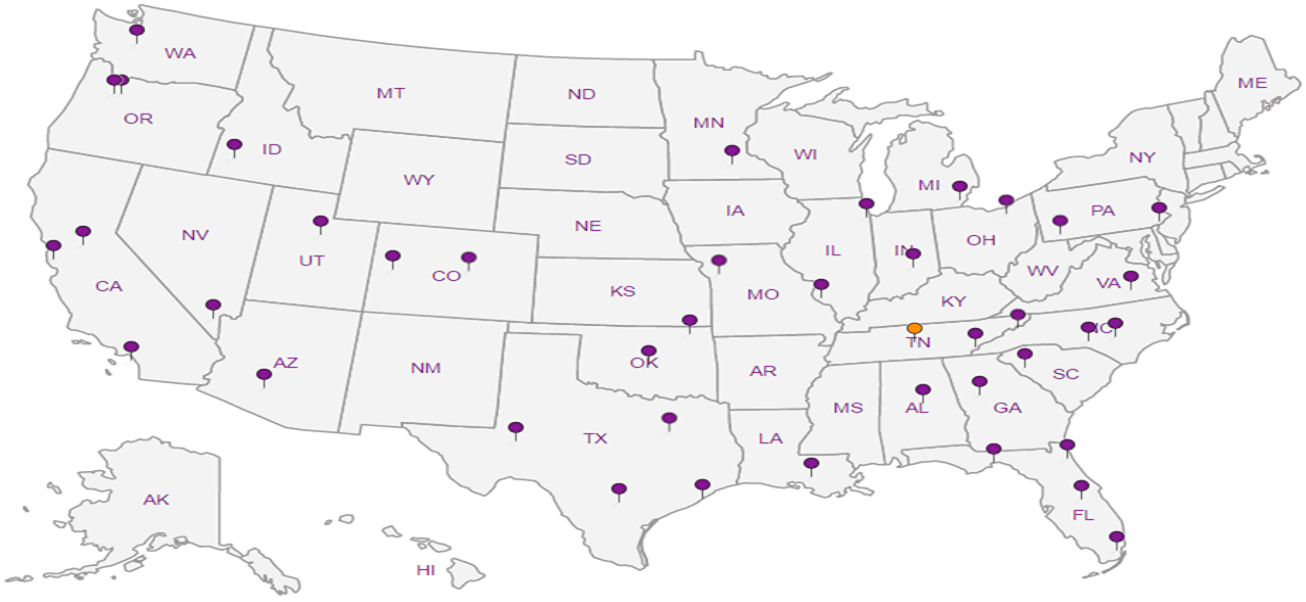
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1.] Drinking Water [2.] Underground Storage Tanks [3.] Aquatic Toxicity [4.] Chemical/Microbiological [5.] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Arcadis - Seattle, WA

1100 Olive Way
Suite 800
Seattle WA 98101

Billing Information:
Attn: Accounts Payable
630 Plaza Dr., Ste. 600
Highlands Ranch, CO 80129

Pres Chk

Report to: Ross LaGrandeur

Email To: Ross.LaGrandeur@arcadis.com; Ryan.Brauchla@arcadis.com;

Project Description: Olympia Bulk Plant

City/State Collected:

Phone: 509-438-9828
Fax:

Client Project # GP09BPNA.WA60

Lab Project # ARCABPWA-BPOLY

Collected by (print): Eric Krueger (EK)

Site/Facility ID # 1120 WEST BAY DR, OLYMPIA,

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day X Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed

Quote #

No. of Cntrs

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEXM/EDC 8260C 40mlAmb-HCl	Diss Pb 6010C 250mlHDPE-NoPres	EDB 8011 40mlClr-NaThio	NWTPHDX (NO SGT) 40mlAmb-HCl-BT	NWTPHDX (SGT) 40mlAmb-HCl-BT	NWTPHGX 40mlAmb HCl	PAH-SIMD 40mlAmb-NoPres-WT	Total Pb 6010C 250mlHDPE-HNO3	trip blk BTEXM/EDC 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-7		GW		3/9/17	1225	15	X	X	X	X	X	X	X	X			-01
MW-8		GW			1320	15	X	X	X	X	X	X	X	X			-02
MW-9		GW			1350	15	X	X	X	X	X	X	X	X			-03
MW-13		GW			1435	15	X	X	X	X	X	X	X	X			-04
DUP-1		GW			—	8	X			X	X	X		X			-05
Trip Blank		GW		—	—	2									X		-06
		GW															
		GW															

Chain of Custody Page ___ of ___

ESC LABORATORIES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L895193

F164

Acctnum: ARCABPWA
Template: T120673
Prelogin: P588878
TSR: 110 - Brian Ford
PB:
Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	3/9/17	1600	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCl / MeoH
TBR

Temp: 2.4 °C Bottles Received: TAT 68

Date: 3-10-17 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Andy Vann

ESC LAB SCIENCES
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Login #:L895193	Client: ARCABPWA	Date:03/10/17	Evaluated by:Andy Vann

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time	x	Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Couri
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: Dup-1 marked for PBICP, but we did not receive the total metals container for that id.

Client informed by:		Call		Email	x	Voice Mail		Date:03/10/17	Time:1455
TSR Initials:bjf	Client Contact: Ross.LaGrandeur@arcadis.com; Ryan.Brauchla@arcadis.com; Alexander.Pink@arcadis.com								

Login Instructions:

Proceed with all other analyses.

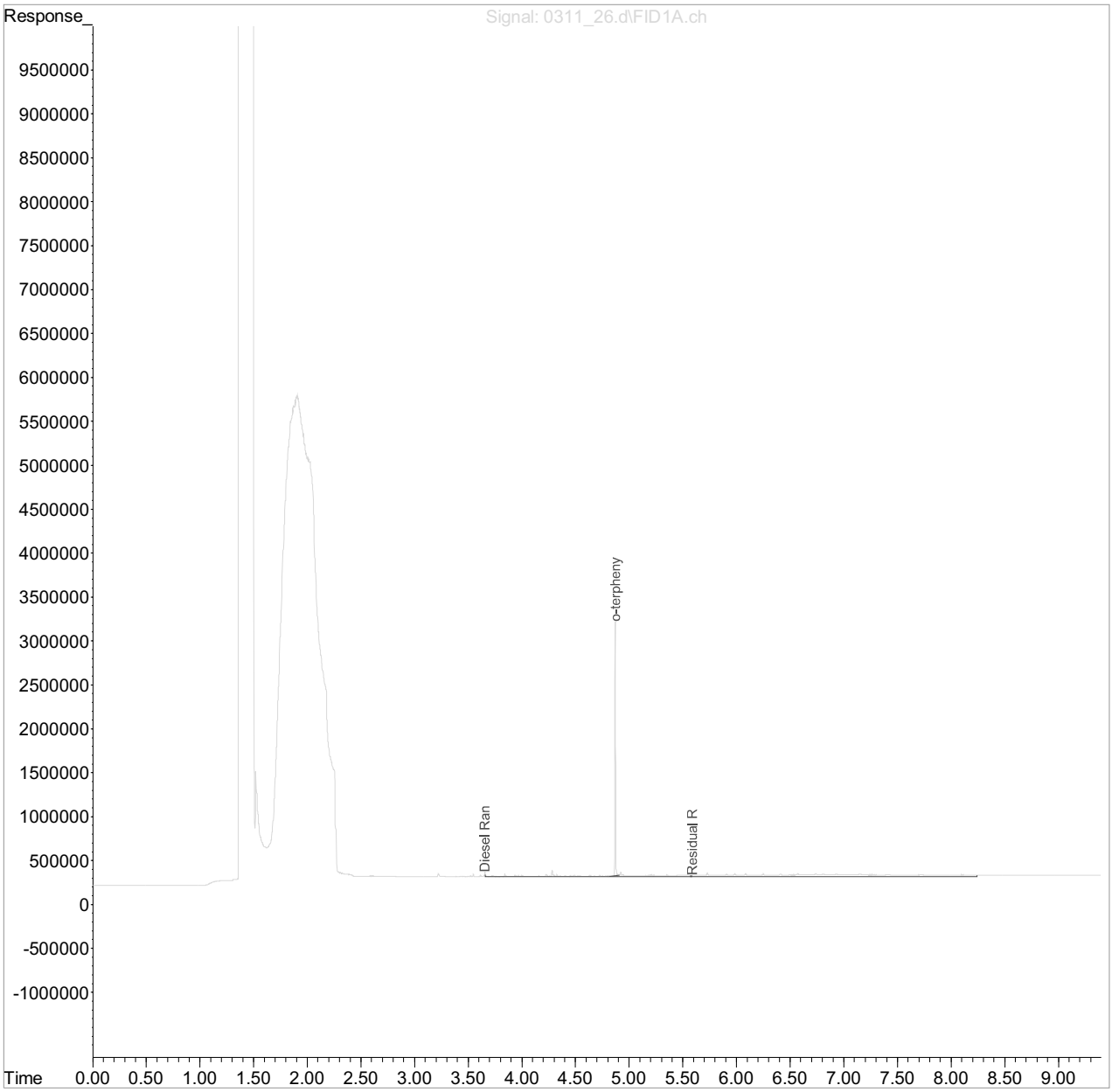
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031117\
Data File : 0311 26.d
Signal(s) : FID1A.ch
Acq On : 11 Mar 2017 5:39 pm
Operator : 614
Sample : L895193-01 1x WG960019 40-2
Misc : water
ALS Vial : 23 Sample Multiplier: 0.05
InstName : SVGC31

no SGT

Integration File: events.e
Quant Time: Mar 13 15:03:58 2017
Quant Method : C:\msdchem\1\methods\EP31C08Q.M
Quant Title :
QLast Update : Thu Mar 09 15:14:45 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



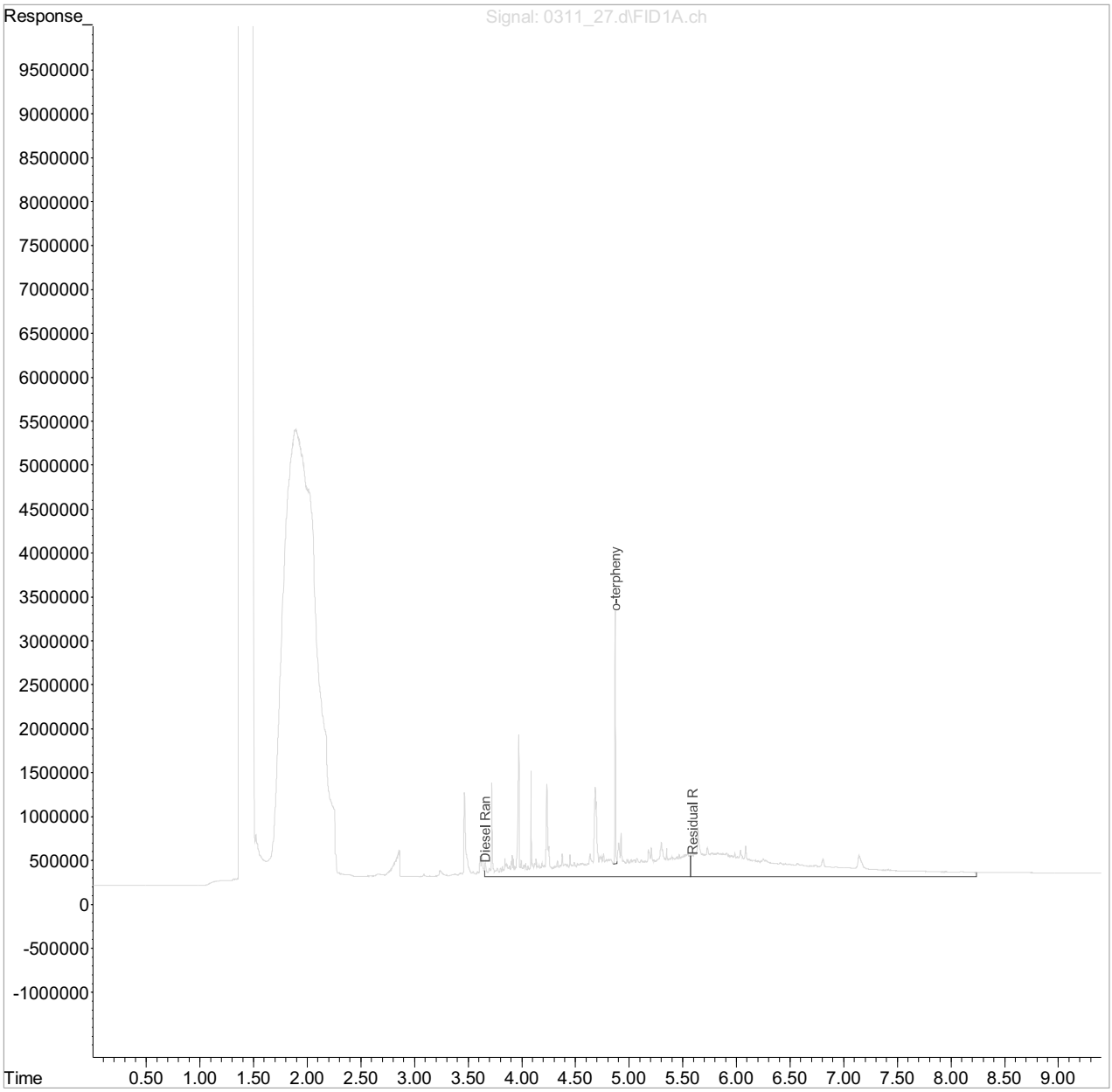
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031117\
Data File : 0311 27.d
Signal(s) : FID1A.ch
Acq On : 11 Mar 2017 5:56 pm
Operator : 614
Sample : L895193-02 1x WG960019 40-2
Misc : water
ALS Vial : 24 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: Mar 13 15:04:30 2017
Quant Method : C:\msdchem\1\methods\EP31C08Q.M
Quant Title :
QLast Update : Thu Mar 09 15:14:45 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :



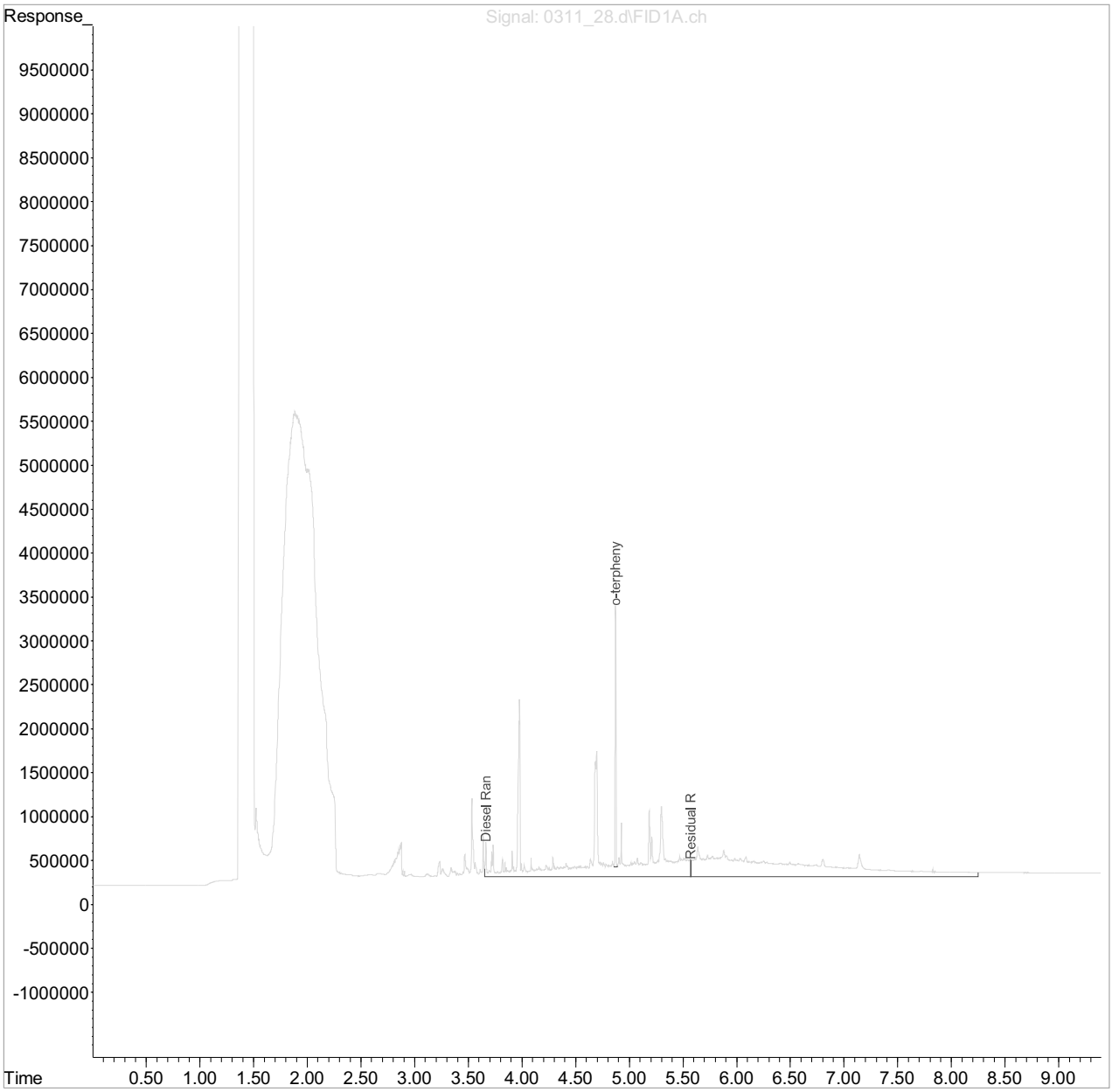
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031117\
Data File : 0311 28.d
Signal(s) : FID1A.ch
Acq On : 11 Mar 2017 6:13 pm
Operator : 614
Sample : L895193-03 1x WG960019 40-2
Misc : water
ALS Vial : 25 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: Mar 13 15:05:11 2017
Quant Method : C:\msdchem\1\methods\EP31C08Q.M
Quant Title :
QLast Update : Thu Mar 09 15:14:45 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :



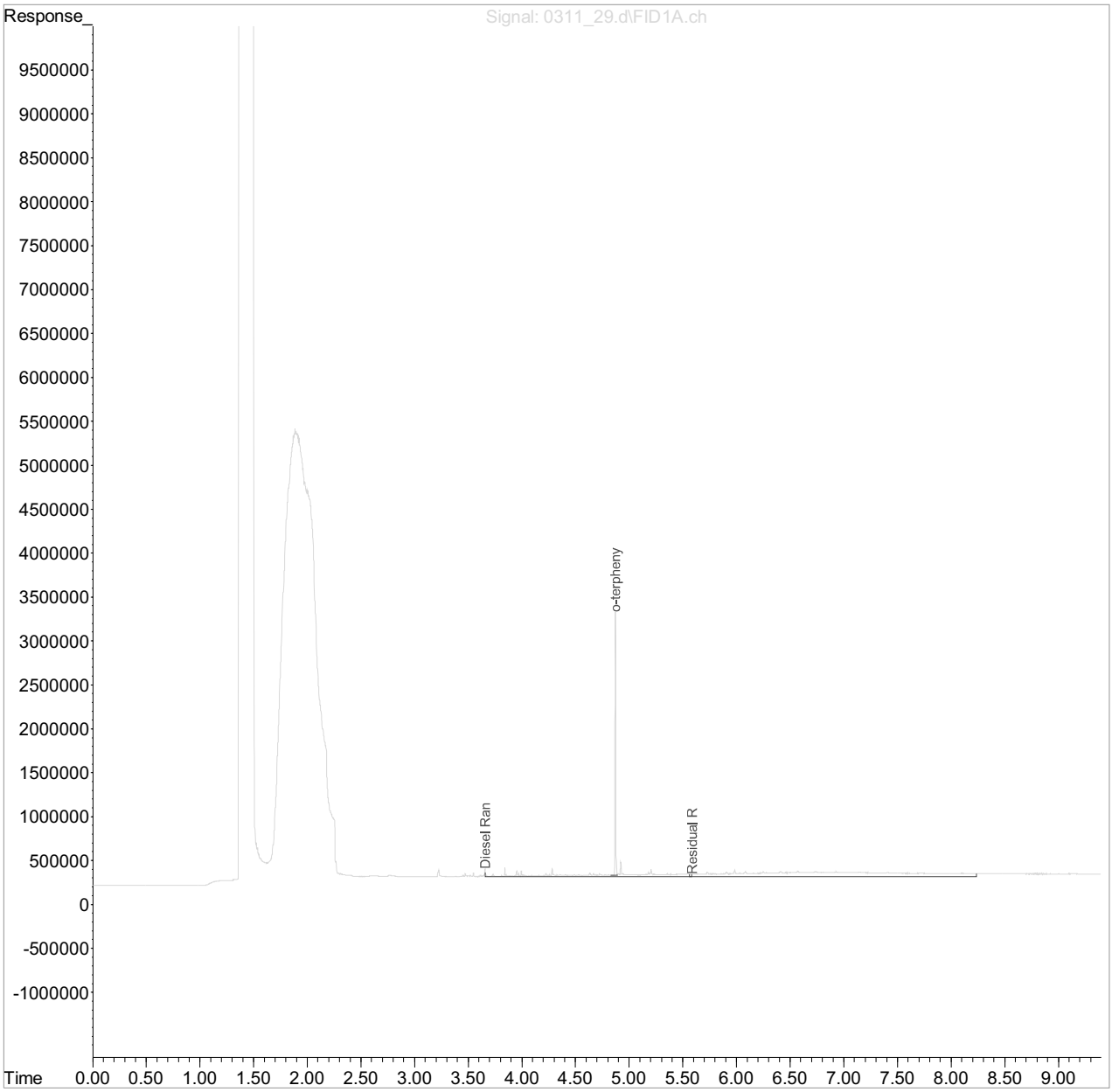
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031117\
Data File : 0311 29.d
Signal(s) : FID1A.ch
Acq On : 11 Mar 2017 6:30 pm
Operator : 614
Sample : L895193-04 1x WG960019 40-2
Misc : water
ALS Vial : 26 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: Mar 13 15:05:37 2017
Quant Method : C:\msdchem\1\methods\EP31C08Q.M
Quant Title :
QLast Update : Thu Mar 09 15:14:45 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :



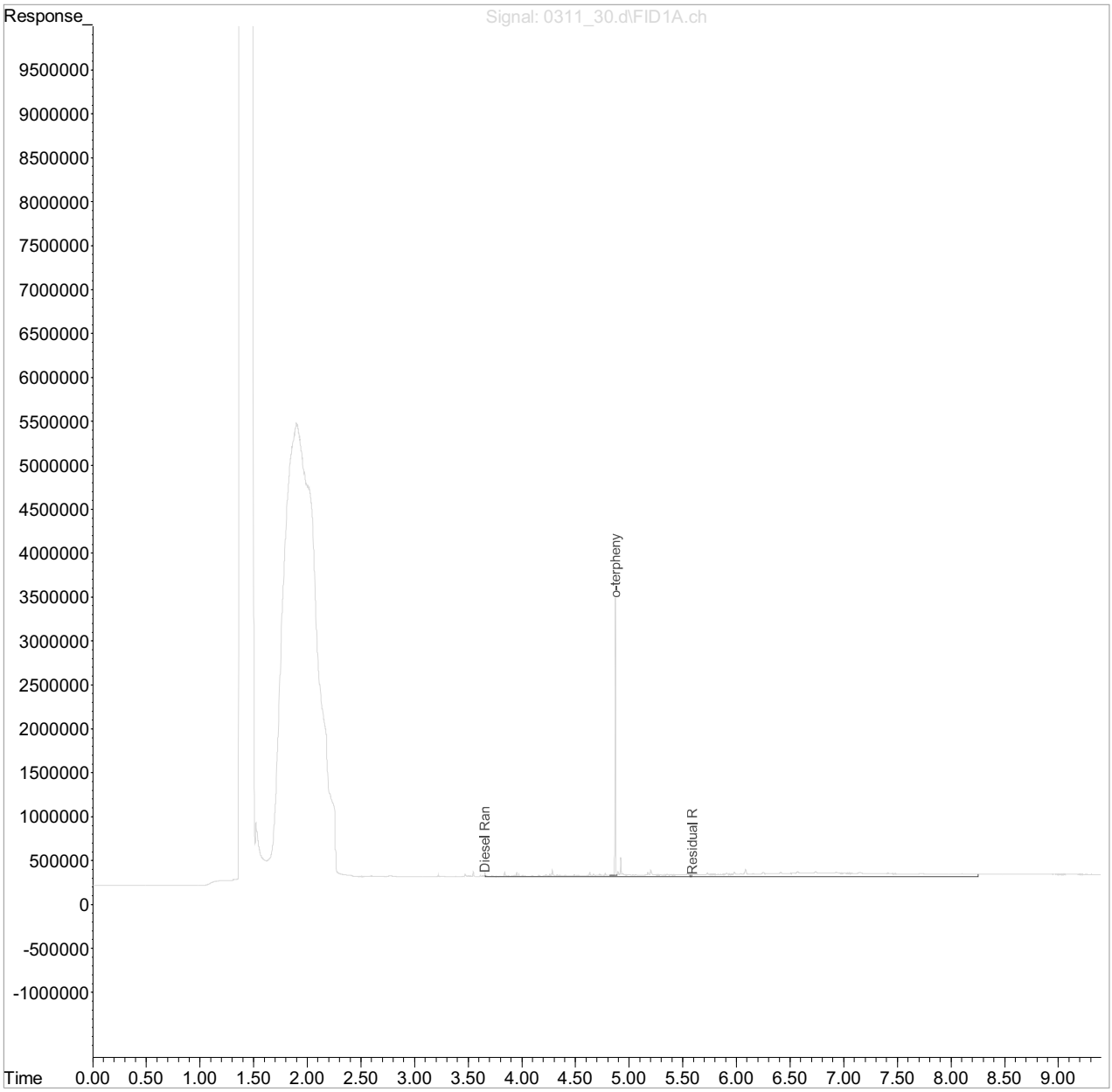
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031117\
Data File : 0311 30.d
Signal(s) : FID1A.ch
Acq On : 11 Mar 2017 6:47 pm
Operator : 614
Sample : L895193-05 1x WG960019 40-2
Misc : water
ALS Vial : 27 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: Mar 13 15:08:56 2017
Quant Method : C:\msdchem\1\methods\EP31C08Q.M
Quant Title :
QLast Update : Thu Mar 09 15:14:45 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :



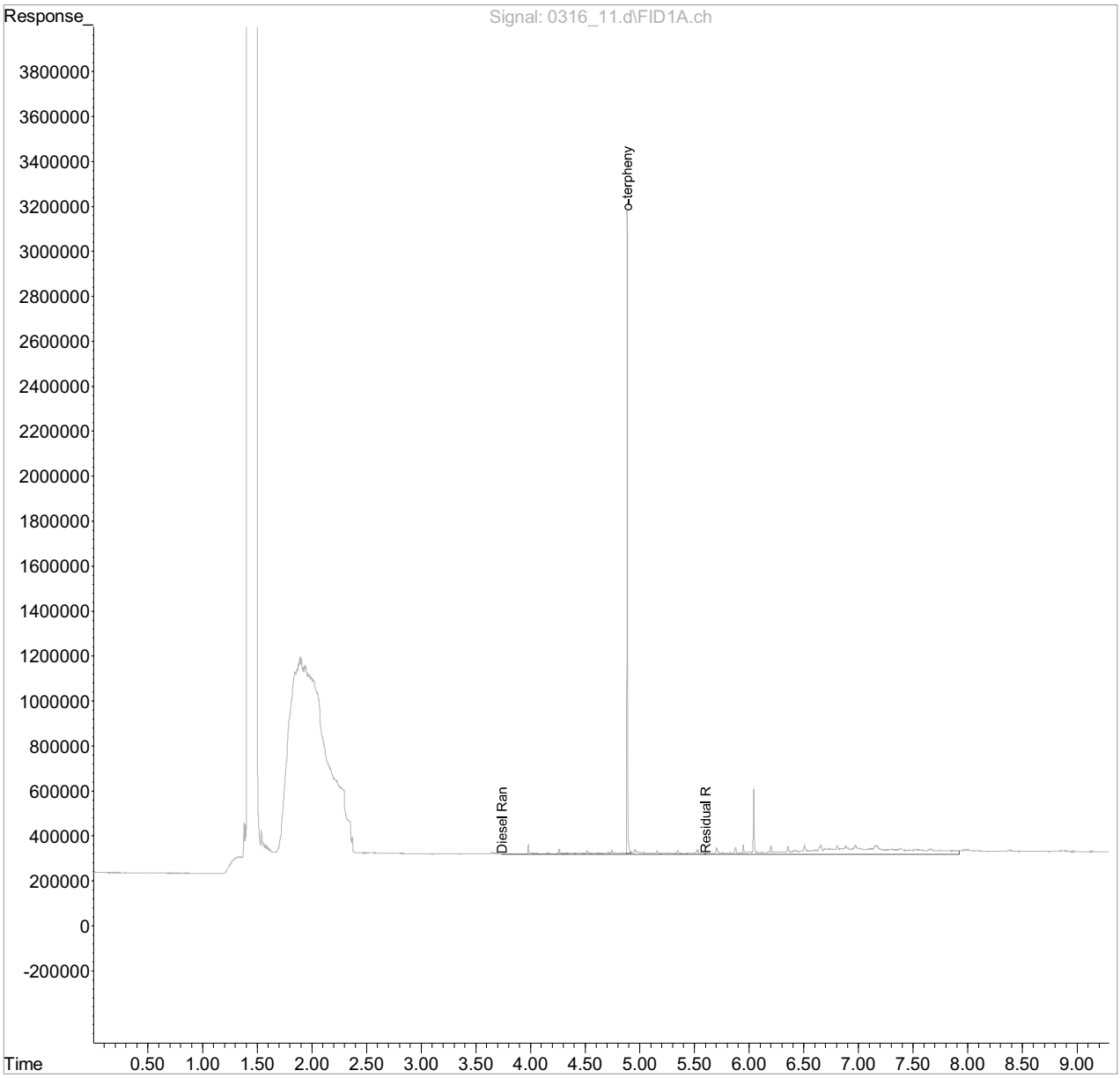
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031617\
Data File : 0316 11.d
Signal(s) : FID1A.ch
Acq On : 16 Mar 2017 1:03 pm
Operator : 765
Sample : L895193-01 1x WG961524 40-2
Misc : water
ALS Vial : 8 Sample Multiplier: 0.05
InstName : SVGC27

SGT

Integration File: events.e
Quant Time: Mar 16 13:42:24 2017
Quant Method : C:\msdchem\1\methods\EP27A25Q.M
Quant Title :
QLast Update : Wed Jan 25 13:17:51 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



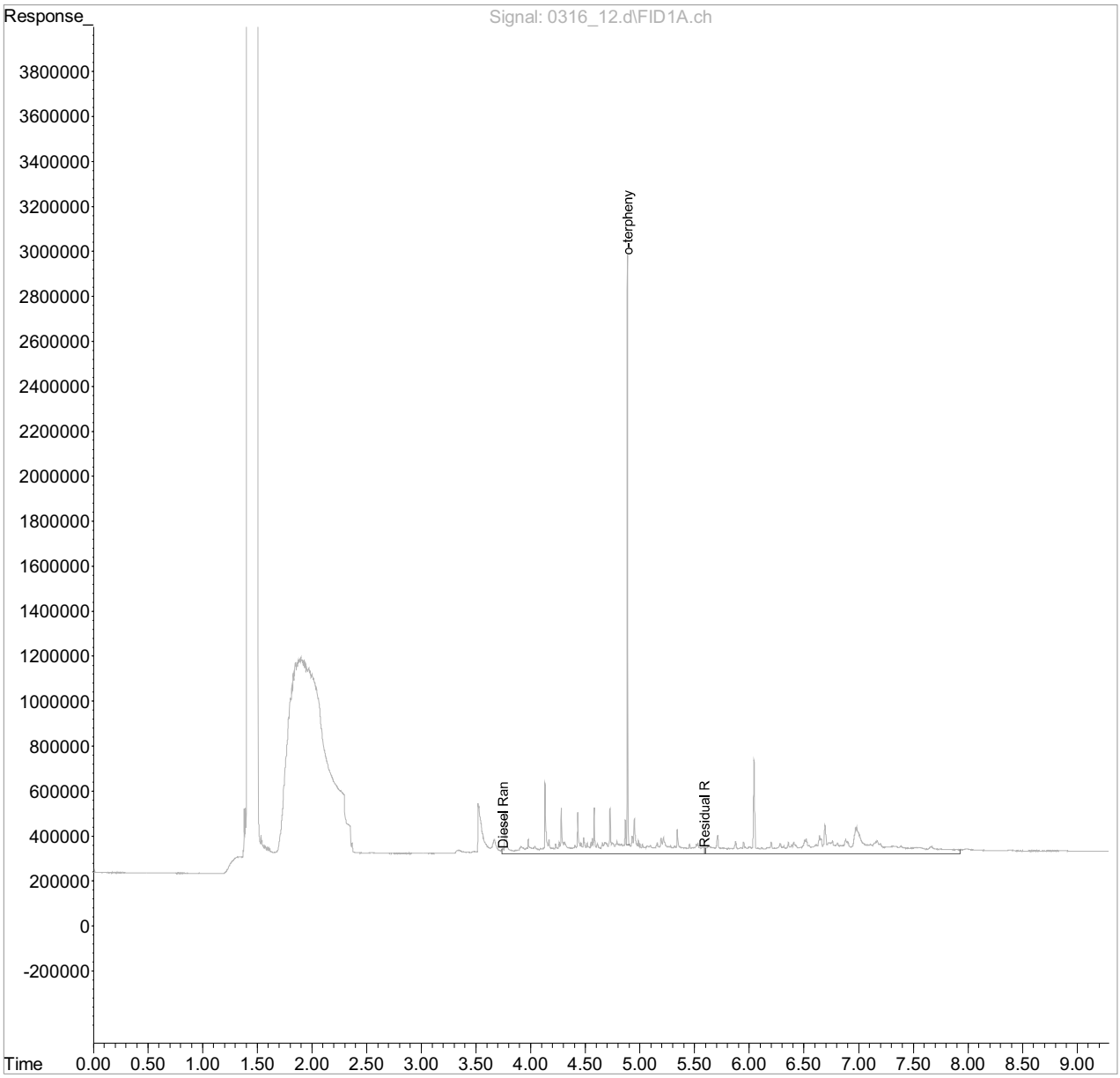
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031617\
Data File : 0316 12.d
Signal(s) : FID1A.ch
Acq On : 16 Mar 2017 1:20 pm
Operator : 765
Sample : L895193-02 1x WG961524 40-2
Misc : water
ALS Vial : 9 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: Mar 16 13:44:39 2017
Quant Method : C:\msdchem\1\methods\EP27A25Q.M
Quant Title :
QLast Update : Wed Jan 25 13:17:51 2017
Response via : Initial Calibration
Integrator: ChemStation

SGT

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



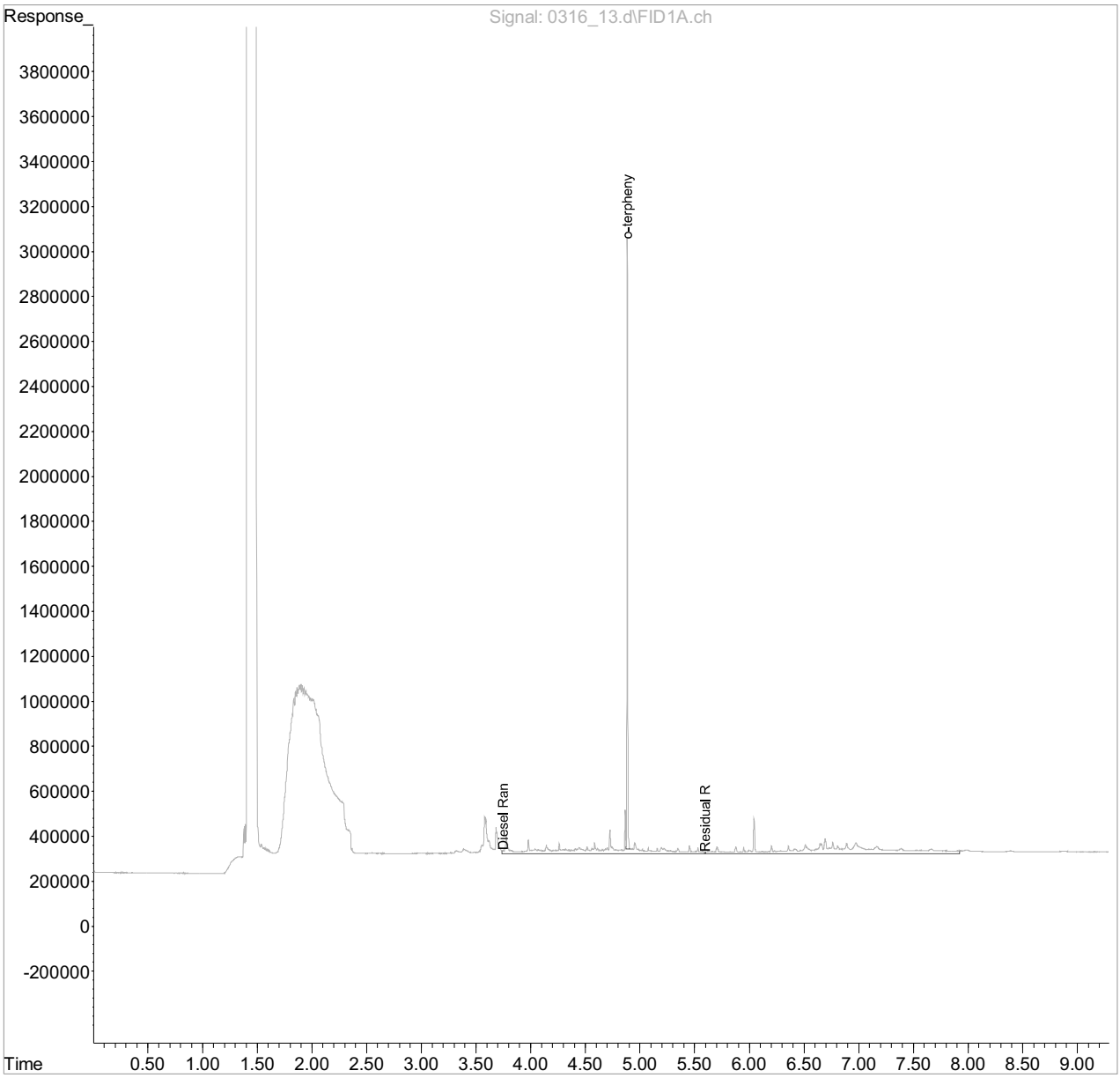
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031617\
Data File : 0316 13.d
Signal(s) : FID1A.ch
Acq On : 16 Mar 2017 1:36 pm
Operator : 765
Sample : L895193-03 1x WG961524 40-2
Misc : water
ALS Vial : 10 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: Mar 16 14:12:17 2017
Quant Method : C:\msdchem\1\methods\EP27A25Q.M
Quant Title :
QLast Update : Wed Jan 25 13:17:51 2017
Response via : Initial Calibration
Integrator: ChemStation

SGT

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



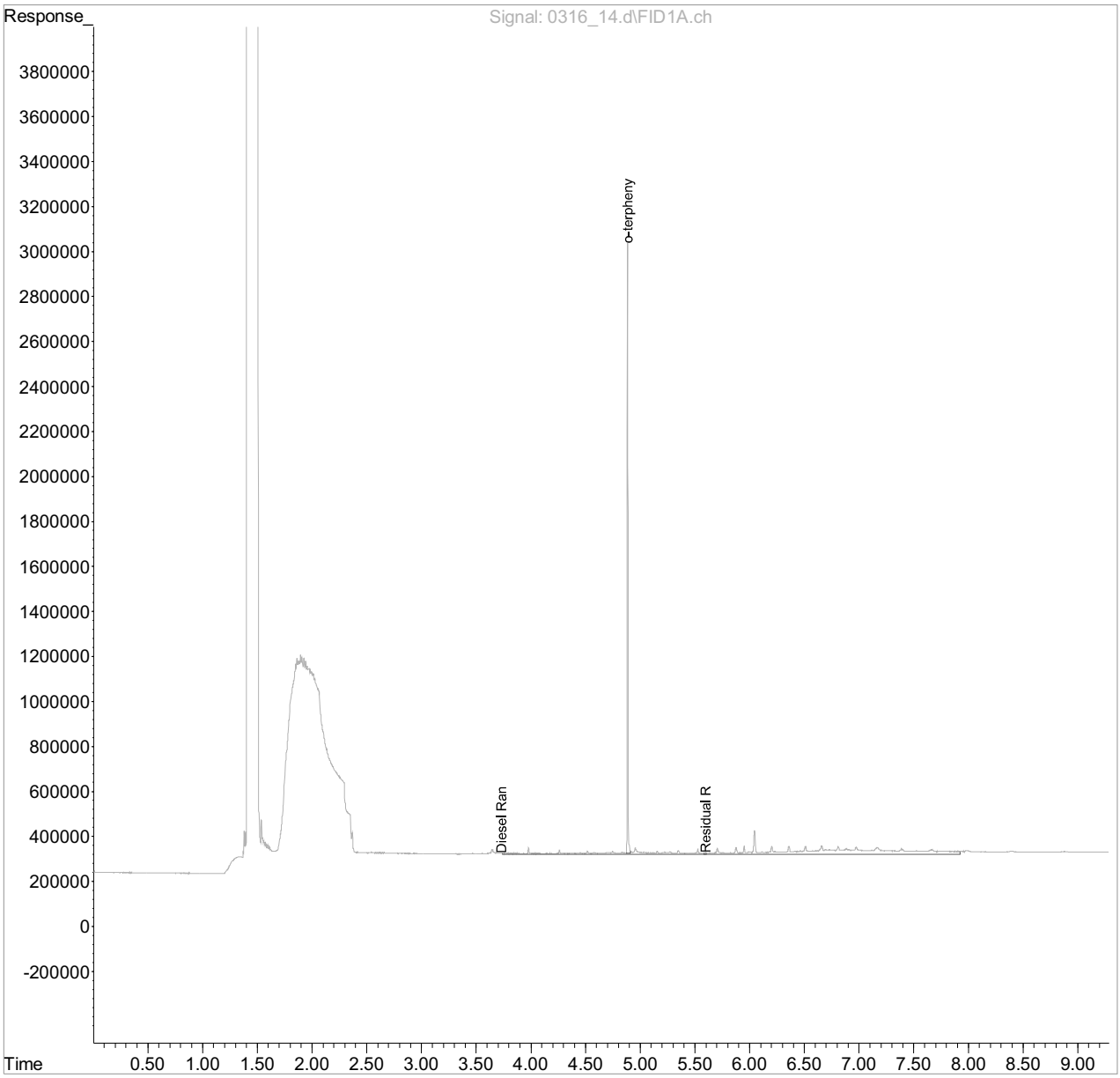
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031617\
Data File : 0316 14.d
Signal(s) : FID1A.ch
Acq On : 16 Mar 2017 1:53 pm
Operator : 765
Sample : L895193-04 1x WG961524 40-2
Misc : water
ALS Vial : 11 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: Mar 16 14:12:59 2017
Quant Method : C:\msdchem\1\methods\EP27A25Q.M
Quant Title :
QLast Update : Wed Jan 25 13:17:51 2017
Response via : Initial Calibration
Integrator: ChemStation

SGT

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



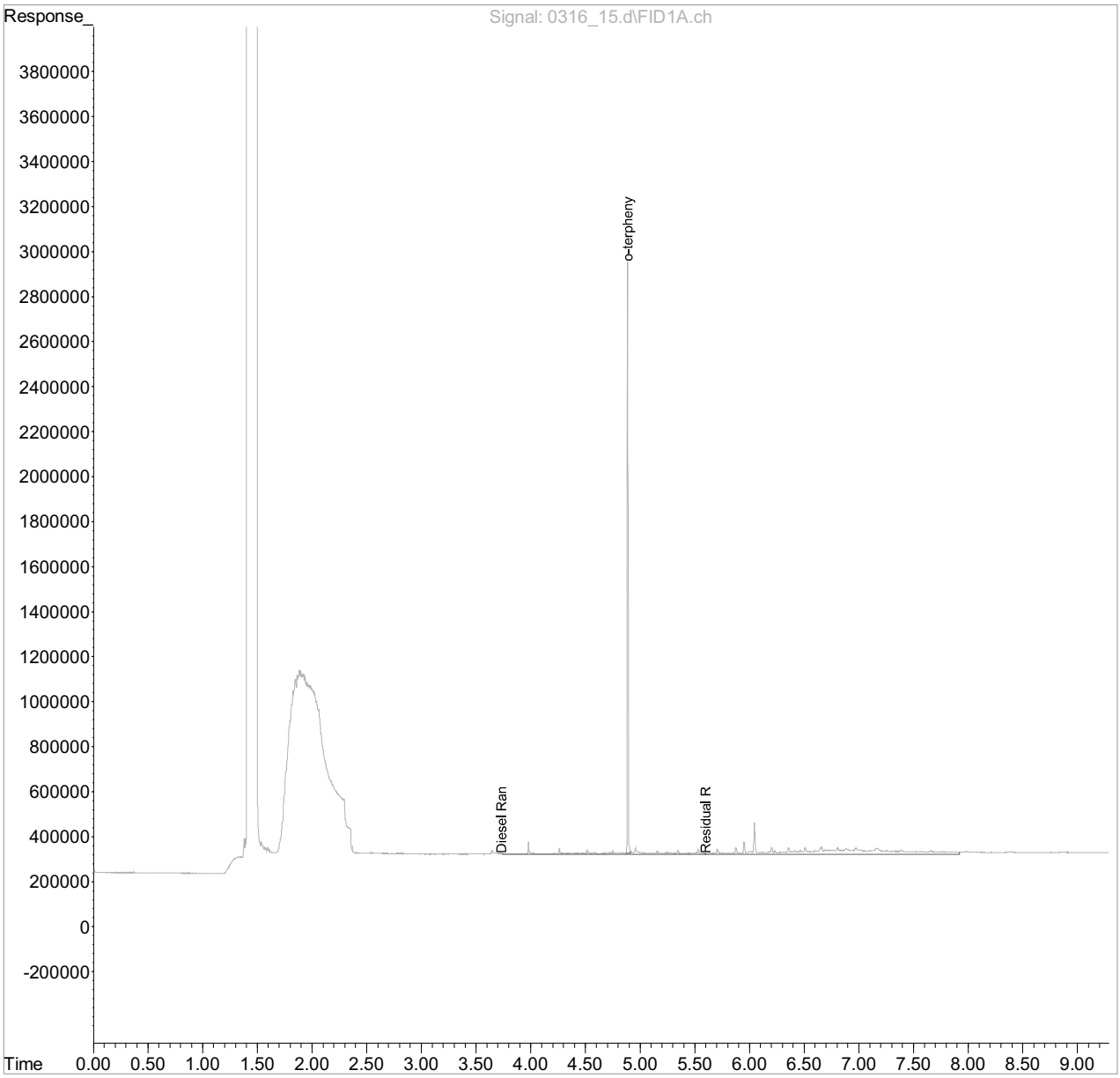
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\031617\
Data File : 0316 15.d
Signal(s) : FID1A.ch
Acq On : 16 Mar 2017 2:09 pm
Operator : 765
Sample : L895193-05 1x WG961524 40-2
Misc : water
ALS Vial : 12 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: Mar 16 14:31:00 2017
Quant Method : C:\msdchem\1\methods\EP27A25Q.M
Quant Title :
QLast Update : Wed Jan 25 13:17:51 2017
Response via : Initial Calibration
Integrator: ChemStation

SGT

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



ANALYTICAL REPORT

May 22, 2017

Arcadis - Seattle, WA

Sample Delivery Group:	L908444
Samples Received:	05/10/2017
Project Number:	GP09BPNA.WA60
Description:	Olympia Bulk Plant
Site:	1120 WEST BAY DR, OLYMPIA, WA
Report To:	Ross LaGrandeur 1100 Olive Way Suite 800 Seattle, WA 98101

Entire Report Reviewed By:

Brian Ford

Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

MW-7 L908444-01 GW

Collected by: Eric Krueger
Collected date/time: 05/08/17 10:35
Received date/time: 05/10/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG978898	1	05/12/17 11:27	05/12/17 16:19	ST
Metals (ICP) by Method 6010C	WG979889	1	05/16/17 17:59	05/16/17 19:05	ST
Volatile Organic Compounds (GC) by Method NWTPHGX	WG979070	1	05/13/17 06:54	05/13/17 06:54	ACG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG979368	1	05/13/17 14:26	05/13/17 14:26	LRL
EDB / DBCP by Method 8011	WG979504	.992	05/14/17 08:37	05/15/17 21:44	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG979247	1	05/13/17 02:19	05/13/17 12:04	TH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG978857	1	05/12/17 09:18	05/13/17 12:55	TH
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG978858	1	05/12/17 09:20	05/15/17 07:54	FMB

MW-8 L908444-02 GW

Collected by: Eric Krueger
Collected date/time: 05/08/17 11:15
Received date/time: 05/10/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG978898	1	05/12/17 11:27	05/12/17 16:22	ST
Metals (ICP) by Method 6010C	WG979889	1	05/16/17 17:59	05/16/17 19:08	ST
Volatile Organic Compounds (GC) by Method NWTPHGX	WG979070	1	05/13/17 07:16	05/13/17 07:16	ACG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG979368	1	05/13/17 14:41	05/13/17 14:41	LRL
EDB / DBCP by Method 8011	WG979504	.992	05/14/17 08:37	05/15/17 21:54	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG979247	1	05/13/17 02:19	05/13/17 12:21	TH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG978857	1	05/12/17 09:18	05/13/17 13:11	TH
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG978858	2	05/12/17 09:20	05/15/17 08:19	FMB

MW-9 L908444-03 GW

Collected by: Eric Krueger
Collected date/time: 05/08/17 11:50
Received date/time: 05/10/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG978898	1	05/12/17 11:27	05/12/17 16:25	ST
Metals (ICP) by Method 6010C	WG979889	1	05/16/17 17:59	05/16/17 19:11	ST
Volatile Organic Compounds (GC) by Method NWTPHGX	WG979070	1	05/13/17 07:38	05/13/17 07:38	ACG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG979368	1	05/13/17 14:57	05/13/17 14:57	LRL
EDB / DBCP by Method 8011	WG979504	.994	05/14/17 08:37	05/15/17 22:04	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG979247	1	05/13/17 02:19	05/13/17 12:37	TH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG978857	1	05/12/17 09:18	05/13/17 13:27	TH
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG978858	1	05/12/17 09:20	05/15/17 08:43	FMB

MW-13 L908444-04 GW

Collected by: Eric Krueger
Collected date/time: 05/08/17 12:30
Received date/time: 05/10/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG978898	1	05/12/17 11:27	05/12/17 16:34	ST
Metals (ICP) by Method 6010C	WG979889	1	05/16/17 17:59	05/16/17 18:54	ST
Volatile Organic Compounds (GC) by Method NWTPHGX	WG979070	1	05/13/17 08:00	05/13/17 08:00	ACG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG979368	1	05/13/17 15:12	05/13/17 15:12	LRL
EDB / DBCP by Method 8011	WG979504	.994	05/14/17 08:37	05/15/17 22:14	HMH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG979247	1	05/13/17 02:19	05/13/17 12:54	TH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG978857	1	05/12/17 09:18	05/13/17 13:44	TH
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG978858	1	05/12/17 09:20	05/15/17 09:07	FMB

DUP-1 L908444-05 GW

Collected by: Eric Krueger
Collected date/time: 05/08/17 00:00
Received date/time: 05/10/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG979889	1	05/16/17 17:59	05/16/17 19:19	ST
Volatile Organic Compounds (GC) by Method NWTPHGX	WG979070	1	05/13/17 08:23	05/13/17 08:23	ACG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG979368	1	05/13/17 15:28	05/13/17 15:28	LRL
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG979247	1	05/13/17 02:19	05/13/17 13:11	TH
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG978857	1	05/12/17 09:18	05/13/17 14:00	TH
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG978858	1	05/12/17 09:20	05/15/17 09:31	FMB

TRIP BLANK L908444-06 GW

Collected by: Eric Krueger
Collected date/time: 05/08/17 00:00
Received date/time: 05/10/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method NWTPHGX	WG979070	1	05/13/17 02:05	05/13/17 02:05	ACG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG979368	1	05/13/17 10:49	05/13/17 10:49	LRL

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford
Technical Service Representative

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	2.06	J	1.90	5.00	1	05/16/2017 19:05	WG979889
Lead,Dissolved	U		1.90	5.00	1	05/12/2017 16:19	WG978898

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	05/13/2017 06:54	WG979070
(S) a,a,a-Trifluorotoluene(FID)	*92.9*			*77.0-122*		*05/13/2017 06:54*	WG979070

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	05/13/2017 14:26	WG979368
Toluene	U		0.412	1.00	1	05/13/2017 14:26	WG979368
Ethylbenzene	U		0.384	1.00	1	05/13/2017 14:26	WG979368
Total Xylenes	U		1.06	3.00	1	05/13/2017 14:26	WG979368
Methyl tert-butyl ether	U		0.367	1.00	1	05/13/2017 14:26	WG979368
1,2-Dichloroethane	U		0.361	1.00	1	05/13/2017 14:26	WG979368
(S) Toluene-d8	*105*			*80.0-120*		*05/13/2017 14:26*	WG979368
(S) Dibromofluoromethane	*101*			*76.0-123*		*05/13/2017 14:26*	WG979368
(S) a,a,a-Trifluorotoluene	*105*			*80.0-120*		*05/13/2017 14:26*	WG979368
(S) 4-Bromofluorobenzene	*108*			*80.0-120*		*05/13/2017 14:26*	WG979368

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00238	0.00992	.992	05/15/2017 21:44	WG979504

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	233		66.0	200	1	05/13/2017 12:04	WG979247
Residual Range Organics (RRO)	292		82.5	250	1	05/13/2017 12:04	WG979247
(S) o-Terphenyl	*97.7*			*52.0-156*		*05/13/2017 12:04*	WG979247

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	81.4	J	66.0	200	1	05/13/2017 12:55	WG978857
Residual Range Organics (RRO)	U		82.5	250	1	05/13/2017 12:55	WG978857
(S) o-Terphenyl	*102*			*52.0-156*		*05/13/2017 12:55*	WG978857

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	05/15/2017 07:54	WG978858
Benzo(a)pyrene	U		0.0116	0.0500	1	05/15/2017 07:54	WG978858
Benzo(b)fluoranthene	U		0.00212	0.0500	1	05/15/2017 07:54	WG978858
Benzo(k)fluoranthene	U		0.0136	0.0500	1	05/15/2017 07:54	WG978858
Chrysene	U		0.0108	0.0500	1	05/15/2017 07:54	WG978858
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	05/15/2017 07:54	WG978858
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	05/15/2017 07:54	WG978858

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Naphthalene	0.109	J	0.0198	0.250	1	05/15/2017 07:54	WG978858
1-Methylnaphthalene	0.0895	J	0.00821	0.250	1	05/15/2017 07:54	WG978858
2-Methylnaphthalene	0.0555	J	0.00902	0.250	1	05/15/2017 07:54	WG978858
(S) Nitrobenzene-d5	*126*			*31.0-160*		*05/15/2017 07:54*	WG978858
(S) 2-Fluorobiphenyl	*113*			*48.0-148*		*05/15/2017 07:54*	WG978858
(S) p-Terphenyl-d14	*104*			*37.0-146*		*05/15/2017 07:54*	WG978858

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	U		1.90	5.00	1	05/16/2017 19:08	WG979889
Lead,Dissolved	U		1.90	5.00	1	05/12/2017 16:22	WG978898

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	05/13/2017 07:16	WG979070
(S) a,a,a-Trifluorotoluene(FID)	*94.7*			*77.0-122*		*05/13/2017 07:16*	WG979070

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	05/13/2017 14:41	WG979368
Toluene	5.02		0.412	1.00	1	05/13/2017 14:41	WG979368
Ethylbenzene	U		0.384	1.00	1	05/13/2017 14:41	WG979368
Total Xylenes	U		1.06	3.00	1	05/13/2017 14:41	WG979368
Methyl tert-butyl ether	U		0.367	1.00	1	05/13/2017 14:41	WG979368
1,2-Dichloroethane	U		0.361	1.00	1	05/13/2017 14:41	WG979368
(S) Toluene-d8	*106*			*80.0-120*		*05/13/2017 14:41*	WG979368
(S) Dibromofluoromethane	*104*			*76.0-123*		*05/13/2017 14:41*	WG979368
(S) a,a,a-Trifluorotoluene	*107*			*80.0-120*		*05/13/2017 14:41*	WG979368
(S) 4-Bromofluorobenzene	*105*			*80.0-120*		*05/13/2017 14:41*	WG979368

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00238	0.00992	.992	05/15/2017 21:54	WG979504

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	524		66.0	200	1	05/13/2017 12:21	WG979247
Residual Range Organics (RRO)	874		82.5	250	1	05/13/2017 12:21	WG979247
(S) o-Terphenyl	*95.4*			*52.0-156*		*05/13/2017 12:21*	WG979247

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	68.8	J	66.0	200	1	05/13/2017 13:11	WG978857
Residual Range Organics (RRO)	U		82.5	250	1	05/13/2017 13:11	WG978857
(S) o-Terphenyl	*84.4*			*52.0-156*		*05/13/2017 13:11*	WG978857

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00820	0.100	2	05/15/2017 08:19	WG978858
Benzo(a)pyrene	U		0.0232	0.100	2	05/15/2017 08:19	WG978858
Benzo(b)fluoranthene	U		0.00424	0.100	2	05/15/2017 08:19	WG978858
Benzo(k)fluoranthene	U		0.0272	0.100	2	05/15/2017 08:19	WG978858
Chrysene	U		0.0216	0.100	2	05/15/2017 08:19	WG978858
Dibenz(a,h)anthracene	U		0.00792	0.100	2	05/15/2017 08:19	WG978858
Indeno(1,2,3-cd)pyrene	U		0.0296	0.100	2	05/15/2017 08:19	WG978858

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Naphthalene	0.0706	J	0.0396	0.500	2	05/15/2017 08:19	WG978858
1-Methylnaphthalene	0.0314	J	0.0164	0.500	2	05/15/2017 08:19	WG978858
2-Methylnaphthalene	U		0.0180	0.500	2	05/15/2017 08:19	WG978858
(S) Nitrobenzene-d5	*116*			*31.0-160*		*05/15/2017 08:19*	WG978858
(S) 2-Fluorobiphenyl	*113*			*48.0-148*		*05/15/2017 08:19*	WG978858
(S) p-Terphenyl-d14	*93.8*			*37.0-146*		*05/15/2017 08:19*	WG978858

Sample Narrative:

8270D-SIM L908444-02 WG978858: Cannot run at lower dilution due to viscosity of extract

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	2.72	J	1.90	5.00	1	05/16/2017 19:11	WG979889
Lead,Dissolved	U		1.90	5.00	1	05/12/2017 16:25	WG978898

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	05/13/2017 07:38	WG979070
(S) a,a,a-Trifluorotoluene(FID)	*93.3*			*77.0-122*		*05/13/2017 07:38*	WG979070

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	05/13/2017 14:57	WG979368
Toluene	1.55		0.412	1.00	1	05/13/2017 14:57	WG979368
Ethylbenzene	U		0.384	1.00	1	05/13/2017 14:57	WG979368
Total Xylenes	U		1.06	3.00	1	05/13/2017 14:57	WG979368
Methyl tert-butyl ether	U		0.367	1.00	1	05/13/2017 14:57	WG979368
1,2-Dichloroethane	U		0.361	1.00	1	05/13/2017 14:57	WG979368
(S) Toluene-d8	*106*			*80.0-120*		*05/13/2017 14:57*	WG979368
(S) Dibromofluoromethane	*107*			*76.0-123*		*05/13/2017 14:57*	WG979368
(S) a,a,a-Trifluorotoluene	*104*			*80.0-120*		*05/13/2017 14:57*	WG979368
(S) 4-Bromofluorobenzene	*107*			*80.0-120*		*05/13/2017 14:57*	WG979368

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00238	0.00994	.994	05/15/2017 22:04	WG979504

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	330		66.0	200	1	05/13/2017 12:37	WG979247
Residual Range Organics (RRO)	544		82.5	250	1	05/13/2017 12:37	WG979247
(S) o-Terphenyl	*93.6*			*52.0-156*		*05/13/2017 12:37*	WG979247

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.0	200	1	05/13/2017 13:27	WG978857
Residual Range Organics (RRO)	U		82.5	250	1	05/13/2017 13:27	WG978857
(S) o-Terphenyl	*96.8*			*52.0-156*		*05/13/2017 13:27*	WG978857

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	05/15/2017 08:43	WG978858
Benzo(a)pyrene	0.0126	J	0.0116	0.0500	1	05/15/2017 08:43	WG978858
Benzo(b)fluoranthene	U		0.00212	0.0500	1	05/15/2017 08:43	WG978858
Benzo(k)fluoranthene	U		0.0136	0.0500	1	05/15/2017 08:43	WG978858
Chrysene	U		0.0108	0.0500	1	05/15/2017 08:43	WG978858
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	05/15/2017 08:43	WG978858
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	05/15/2017 08:43	WG978858

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Naphthalene	0.915		0.0198	0.250	1	05/15/2017 08:43	WG978858
1-Methylnaphthalene	0.0942	J	0.00821	0.250	1	05/15/2017 08:43	WG978858
2-Methylnaphthalene	0.0921	J	0.00902	0.250	1	05/15/2017 08:43	WG978858
(S) Nitrobenzene-d5	*120*			*31.0-160*		*05/15/2017 08:43*	WG978858
(S) 2-Fluorobiphenyl	*108*			*48.0-148*		*05/15/2017 08:43*	WG978858
(S) p-Terphenyl-d14	*94.2*			*37.0-146*		*05/15/2017 08:43*	WG978858

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	2.41	J	1.90	5.00	1	05/16/2017 18:54	WG979889
Lead,Dissolved	U		1.90	5.00	1	05/12/2017 16:34	WG978898

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	05/13/2017 08:00	WG979070
(S) a,a,a-Trifluorotoluene(FID)	*92.5*			*77.0-122*		*05/13/2017 08:00*	WG979070

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	05/13/2017 15:12	WG979368
Toluene	0.569	J	0.412	1.00	1	05/13/2017 15:12	WG979368
Ethylbenzene	U		0.384	1.00	1	05/13/2017 15:12	WG979368
Total Xylenes	U		1.06	3.00	1	05/13/2017 15:12	WG979368
Methyl tert-butyl ether	U		0.367	1.00	1	05/13/2017 15:12	WG979368
1,2-Dichloroethane	U		0.361	1.00	1	05/13/2017 15:12	WG979368
(S) Toluene-d8	*106*			*80.0-120*		*05/13/2017 15:12*	WG979368
(S) Dibromofluoromethane	*103*			*76.0-123*		*05/13/2017 15:12*	WG979368
(S) a,a,a-Trifluorotoluene	*101*			*80.0-120*		*05/13/2017 15:12*	WG979368
(S) 4-Bromofluorobenzene	*106*			*80.0-120*		*05/13/2017 15:12*	WG979368

EDB / DBCP by Method 8011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Ethylene Dibromide	U		0.00238	0.00994	.994	05/15/2017 22:14	WG979504

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.0	200	1	05/13/2017 12:54	WG979247
Residual Range Organics (RRO)	132	J	82.5	250	1	05/13/2017 12:54	WG979247
(S) o-Terphenyl	*102*			*52.0-156*		*05/13/2017 12:54*	WG979247

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.0	200	1	05/13/2017 13:44	WG978857
Residual Range Organics (RRO)	U		82.5	250	1	05/13/2017 13:44	WG978857
(S) o-Terphenyl	*79.6*			*52.0-156*		*05/13/2017 13:44*	WG978857

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	05/15/2017 09:07	WG978858
Benzo(a)pyrene	U		0.0116	0.0500	1	05/15/2017 09:07	WG978858
Benzo(b)fluoranthene	U		0.00212	0.0500	1	05/15/2017 09:07	WG978858
Benzo(k)fluoranthene	U		0.0136	0.0500	1	05/15/2017 09:07	WG978858
Chrysene	U		0.0108	0.0500	1	05/15/2017 09:07	WG978858
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	05/15/2017 09:07	WG978858
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	05/15/2017 09:07	WG978858

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Naphthalene	0.0460	J	0.0198	0.250	1	05/15/2017 09:07	WG978858
1-Methylnaphthalene	0.0142	J	0.00821	0.250	1	05/15/2017 09:07	WG978858
2-Methylnaphthalene	0.0127	J	0.00902	0.250	1	05/15/2017 09:07	WG978858
(S) Nitrobenzene-d5	*118*			*31.0-160*		*05/15/2017 09:07*	WG978858
(S) 2-Fluorobiphenyl	*117*			*48.0-148*		*05/15/2017 09:07*	WG978858
(S) p-Terphenyl-d14	*107*			*37.0-146*		*05/15/2017 09:07*	WG978858

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Lead	U		1.90	5.00	1	05/16/2017 19:19	WG979889

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Gasoline Range Organics-NWTPH	U		31.6	100	1	05/13/2017 08:23	WG979070
(S) a,a,a-Trifluorotoluene(FID)	*92.5*			*77.0-122*		*05/13/2017 08:23*	WG979070

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.331	1.00	1	05/13/2017 15:28	WG979368
Toluene	0.515	J	0.412	1.00	1	05/13/2017 15:28	WG979368
Ethylbenzene	U		0.384	1.00	1	05/13/2017 15:28	WG979368
Total Xylenes	U		1.06	3.00	1	05/13/2017 15:28	WG979368
Methyl tert-butyl ether	U		0.367	1.00	1	05/13/2017 15:28	WG979368
1,2-Dichloroethane	U		0.361	1.00	1	05/13/2017 15:28	WG979368
(S) Toluene-d8	*106*			*80.0-120*		*05/13/2017 15:28*	WG979368
(S) Dibromofluoromethane	*103*			*76.0-123*		*05/13/2017 15:28*	WG979368
(S) a,a,a-Trifluorotoluene	*101*			*80.0-120*		*05/13/2017 15:28*	WG979368
(S) 4-Bromofluorobenzene	*105*			*80.0-120*		*05/13/2017 15:28*	WG979368

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.0	200	1	05/13/2017 13:11	WG979247
Residual Range Organics (RRO)	102	J	82.5	250	1	05/13/2017 13:11	WG979247
(S) o-Terphenyl	*99.2*			*52.0-156*		*05/13/2017 13:11*	WG979247

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.0	200	1	05/13/2017 14:00	WG978857
Residual Range Organics (RRO)	U		82.5	250	1	05/13/2017 14:00	WG978857
(S) o-Terphenyl	*83.7*			*52.0-156*		*05/13/2017 14:00*	WG978857

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)anthracene	U		0.00410	0.0500	1	05/15/2017 09:31	WG978858
Benzo(a)pyrene	U		0.0116	0.0500	1	05/15/2017 09:31	WG978858
Benzo(b)fluoranthene	U		0.00212	0.0500	1	05/15/2017 09:31	WG978858
Benzo(k)fluoranthene	U		0.0136	0.0500	1	05/15/2017 09:31	WG978858
Chrysene	U		0.0108	0.0500	1	05/15/2017 09:31	WG978858
Dibenz(a,h)anthracene	U		0.00396	0.0500	1	05/15/2017 09:31	WG978858
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500	1	05/15/2017 09:31	WG978858
Naphthalene	0.0439	J	0.0198	0.250	1	05/15/2017 09:31	WG978858
1-Methylnaphthalene	0.0173	J	0.00821	0.250	1	05/15/2017 09:31	WG978858
2-Methylnaphthalene	0.0133	J	0.00902	0.250	1	05/15/2017 09:31	WG978858
(S) Nitrobenzene-d5	*117*			*31.0-160*		*05/15/2017 09:31*	WG978858
(S) 2-Fluorobiphenyl	*116*			*48.0-148*		*05/15/2017 09:31*	WG978858
(S) p-Terphenyl-d14	*103*			*37.0-146*		*05/15/2017 09:31*	WG978858

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	U		31.6	100	1	05/13/2017 02:05	WG979070
(S) a,a,a-Trifluorotoluene(FID)	*92.5*			*77.0-122*		*05/13/2017 02:05*	WG979070

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Benzene	U		0.331	1.00	1	05/13/2017 10:49	WG979368
Toluene	U		0.412	1.00	1	05/13/2017 10:49	WG979368
Ethylbenzene	U		0.384	1.00	1	05/13/2017 10:49	WG979368
Total Xylenes	U		1.06	3.00	1	05/13/2017 10:49	WG979368
Methyl tert-butyl ether	U		0.367	1.00	1	05/13/2017 10:49	WG979368
1,2-Dichloroethane	U		0.361	1.00	1	05/13/2017 10:49	WG979368
(S) Toluene-d8	*104*			*80.0-120*		*05/13/2017 10:49*	WG979368
(S) Dibromofluoromethane	*101*			*76.0-123*		*05/13/2017 10:49*	WG979368
(S) a,a,a-Trifluorotoluene	*103*			*80.0-120*		*05/13/2017 10:49*	WG979368
(S) 4-Bromofluorobenzene	*106*			*80.0-120*		*05/13/2017 10:49*	WG979368

Method Blank (MB)

(MB) R3217862-1 05/12/17 15:22

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Lead,Dissolved	U		1.90	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3217862-2 05/12/17 15:27 • (LCSD) R3217862-3 05/12/17 15:29

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Lead,Dissolved	1000	995	994	99	99	80-120			0	20

L908431-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L908431-01 05/12/17 15:32 • (MS) R3217862-5 05/12/17 15:38 • (MSD) R3217862-6 05/12/17 15:41

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Lead,Dissolved	1000	U	1000	1010	100	101	1	75-125			1	20

Method Blank (MB)

(MB) R3218511-1 05/16/17 18:45

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Lead	U		1.90	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218511-2 05/16/17 18:48 • (LCSD) R3218511-3 05/16/17 18:51

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Lead	1000	1020	1020	102	102	80-120			0	20

L908444-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L908444-04 05/16/17 18:54 • (MS) R3218511-5 05/16/17 18:59 • (MSD) R3218511-6 05/16/17 19:02

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Lead	1000	2.41	1030	1030	103	103	1	75-125			0	20

Method Blank (MB)

(MB) R3218796-3 05/13/17 01:43

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Gasoline Range Organics-NWTPH	U		31.6	100
(S) a,a,a-Trifluorotoluene(FID)	*93.3*			*77.0-122*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218796-1 05/13/17 00:37 • (LCSD) R3218796-2 05/13/17 00:59

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Gasoline Range Organics-NWTPH	5500	5810	5720	106	104	72.0-134			1.53	20
(S) a,a,a-Trifluorotoluene(FID)				*105*	*103*	*77.0-122*				

L908431-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L908431-01 05/13/17 02:28 • (MS) R3218796-4 05/13/17 02:50 • (MSD) R3218796-5 05/13/17 03:12

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Gasoline Range Organics-NWTPH	5500	U	3120	2890	56.7	52.5	1	23.0-159			7.71	20
(S) a,a,a-Trifluorotoluene(FID)					*94.1*	*93.1*		*77.0-122*				

Method Blank (MB)

(MB) R3218788-3 05/13/17 09:56

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Benzene	U		0.331	1.00
1,2-Dichloroethane	U		0.361	1.00
Ethylbenzene	U		0.384	1.00
Methyl tert-butyl ether	U		0.367	1.00
Toluene	U		0.412	1.00
Xylenes, Total	U		1.06	3.00
(S) Toluene-d8	*104*			*80.0-120*
(S) Dibromofluoromethane	*104*			*76.0-123*
(S) a,a,a-Trifluorotoluene	*103*			*80.0-120*
(S) 4-Bromofluorobenzene	*106*			*80.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218788-1 05/13/17 09:08 • (LCSD) R3218788-2 05/13/17 09:24

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Benzene	25.0	23.5	23.3	94.2	93.1	69.0-123			1.19	20
1,2-Dichloroethane	25.0	22.4	22.3	89.7	89.2	67.0-126			0.480	20
Ethylbenzene	25.0	22.6	22.9	90.2	91.6	77.0-120			1.51	20
Methyl tert-butyl ether	25.0	22.8	22.7	91.0	91.0	64.0-123			0.0500	20
Toluene	25.0	21.4	21.6	85.4	86.5	77.0-120			1.25	20
Xylenes, Total	75.0	67.2	67.7	89.6	90.3	77.0-120			0.740	20
(S) Toluene-d8				*102*	*102*	*80.0-120*				
(S) Dibromofluoromethane				*105*	*104*	*76.0-123*				
(S) a,a,a-Trifluorotoluene				*101*	*101*	*80.0-120*				
(S) 4-Bromofluorobenzene				*99.1*	*99.8*	*80.0-120*				

Method Blank (MB)

(MB) R3218183-1 05/15/17 17:31

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Ethylene Dibromide	U		0.00240	0.0100

L908317-01 Original Sample (OS) • Duplicate (DUP)

(OS) L908317-01 05/15/17 18:12 • (DUP) R3218183-3 05/15/17 18:02

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Ethylene Dibromide	U	0.000	.994	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218183-4 05/15/17 18:53 • (LCSD) R3218183-5 05/15/17 19:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Ethylene Dibromide	0.250	0.292	0.286	117	114	60.0-140			2.20	20

L908317-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L908317-02 05/15/17 17:52 • (MS) R3218183-2 05/15/17 17:42

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	ug/l	ug/l	ug/l	%		%	
Ethylene Dibromide	0.100	U	0.122	122	.997	72.0-146	

Method Blank (MB)

(MB) R3218079-1 05/13/17 11:14

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Diesel Range Organics (DRO)	U		66.7	200
Residual Range Organics (RRO)	U		83.3	250
(S) o-Terphenyl	*64.5*			*52.0-156*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218079-2 05/13/17 11:30 • (LCSD) R3218079-3 05/13/17 11:47

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Diesel Range Organics (DRO)	750	875	948	117	126	50.0-150			7.94	20
Residual Range Organics (RRO)	750	693	776	92.5	104	50.0-150			11.3	20
(S) o-Terphenyl				*98.1*	*102*	*52.0-156*				

Method Blank (MB)

(MB) R3218153-1 05/13/17 12:06

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Diesel Range Organics (DRO)	U		66.7	200
Residual Range Organics (RRO)	U		83.3	250
(S) o-Terphenyl	*61.6*			*52.0-156*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218153-2 05/13/17 12:22 • (LCSD) R3218153-3 05/13/17 12:38

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Diesel Range Organics (DRO)	750	963	985	128	131	50.0-150			2.27	20
Residual Range Organics (RRO)	750	700	693	93.3	92.4	50.0-150			0.990	20
(S) o-Terphenyl				*105*	*102*	*52.0-156*				

Method Blank (MB)

(MB) R3218469-3 05/15/17 07:06

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Benzo(a)anthracene	U		0.00410	0.0500
Benzo(a)pyrene	U		0.0116	0.0500
Benzo(b)fluoranthene	U		0.00212	0.0500
Benzo(k)fluoranthene	U		0.0136	0.0500
Chrysene	U		0.0108	0.0500
Dibenz(a,h)anthracene	U		0.00396	0.0500
Indeno(1,2,3-cd)pyrene	U		0.0148	0.0500
Naphthalene	U		0.0198	0.250
1-Methylnaphthalene	U		0.00821	0.250
2-Methylnaphthalene	U		0.00902	0.250
(S) Nitrobenzene-d5	*127*			*31.0-160*
(S) 2-Fluorobiphenyl	*122*			*48.0-148*
(S) p-Terphenyl-d14	*111*			*37.0-146*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3218469-1 05/15/17 06:18 • (LCSD) R3218469-2 05/15/17 06:42

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzo(a)anthracene	2.00	1.92	1.92	96.0	96.2	59.0-134			0.190	20
Benzo(a)pyrene	2.00	1.96	1.90	97.9	95.1	61.0-145			2.86	20
Benzo(b)fluoranthene	2.00	1.88	1.81	94.1	90.4	57.0-136			3.97	20
Benzo(k)fluoranthene	2.00	2.05	2.01	102	101	57.0-141			1.89	20
Chrysene	2.00	1.98	1.86	99.1	92.8	63.0-140			6.58	20
Dibenz(a,h)anthracene	2.00	2.19	2.09	109	104	49.0-141			4.67	20
Indeno(1,2,3-cd)pyrene	2.00	2.13	2.07	106	104	53.0-141			2.62	20
Naphthalene	2.00	1.83	1.78	91.5	89.1	68.0-129			2.74	20
1-Methylnaphthalene	2.00	2.03	1.97	101	98.4	68.0-137			2.89	20
2-Methylnaphthalene	2.00	1.93	1.89	96.3	94.4	68.0-134			2.02	20
(S) Nitrobenzene-d5				*112*	*112*	*31.0-160*				
(S) 2-Fluorobiphenyl				*117*	*114*	*48.0-148*				
(S) p-Terphenyl-d14				*102*	*101*	*37.0-146*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**

***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

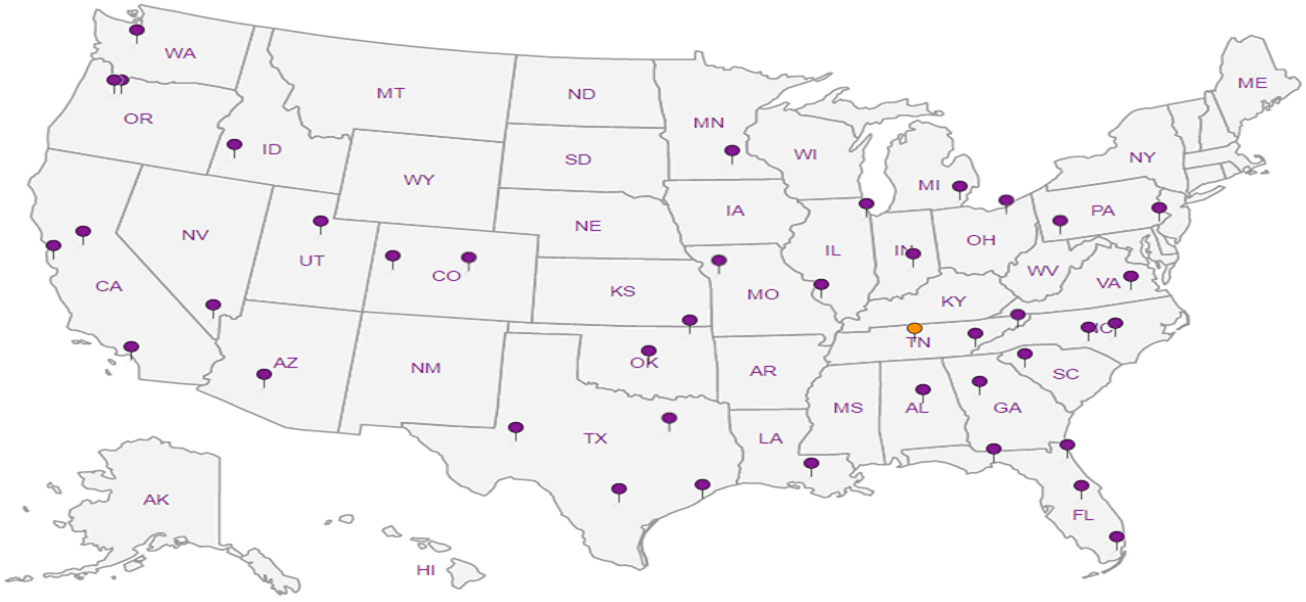
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Arcadis - Seattle, WA

1100 Olive Way
Suite 800
Seattle WA 98101

Billing Information:
Attn: Accounts Payable
630 Plaza Dr., Ste. 600
Highlands Ranch, CO 80129

Pres Chk

Report to: Ross LaGrandeur

Email To: Ross.LaGrandeur@arcadis.com; Ryan.Brauchla@arcadis.com;

Project Description: Olympia Bulk Plant

City/State Collected: Olympia / WA

Phone: 509-438-9828
Fax:

Client Project # GP09BPNA.WA60

Lab Project # ARCABPWA-BPOLY

Collected by (print): Eric Krueger (EK)

Site/Facility ID # 1120 WEST BAY DR, OLYMPIA,

P.O. # GP09BPNA.WA60

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEXM/EDC 8260C 40mlAmb-HCl	Diss Pb 6010C 250mlHDPE-NoPres	EDB 8011 40mlClr-NaThio	NWTPHDX (NO SGT) 40mlAmb-HCl-BT	NWTPHDX (SGT) 40mlAmb-HCl-BT	NWTPHGX 40mlAmb HCl	PAH-SIMD 40mlAmb-NoPres-WT	Total Pb 6010C 250mlHDPE-HNO3	trip blk BTEXM/EDC 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-7		GW		5/8/17	1035	5	X	X	X	X	X	X	X	X			-01
MW-8		GW			1115		X	X	X	X	X	X	X	X			02
MW-9		GW			1150		X	X	X	X	X	X	X	X			03
MW-13		GW			1230		X	X	X	X	X	X	X	X			04
DUP-1		GW			—		X			X	X	X	X	X			05
Trip Blank		GW		—	—	2	X					X			X		06
		GW															
		GW															

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L908444
F027

Acctnum: ARCABPWA
Template: T120673
Prelogin: P598897
TSR: 110 - Brian Ford
PB: 4-28-17

Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: Questions, call Eric Krueger (303)519-7192 pH _____ Temp _____ Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: (Yes) No HCl / MeoH TBR	If preservation required by Login: Date/Time
Alex Pinks	5/9/17	1600	FedEx	2	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.2 °C Bottles Received: 75	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 5-10-17 Time: 845	Hold: Condition: NCF / (OK)

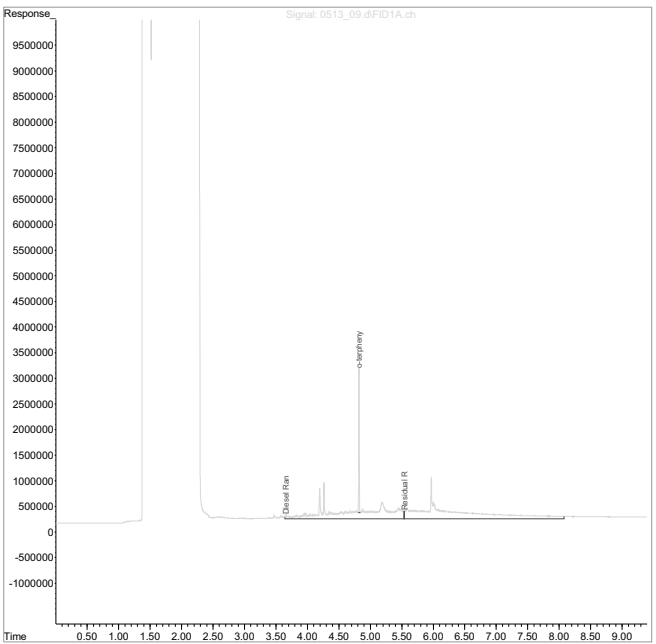
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_09.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 12:04 pm
Operator : 614
Sample : L908444-01 1x WG979247 40-2
Misc : water
ALS Vial : 8 Sample Multiplier: 0.05
InstName : SVGC31

no SGT

Integration File: events.e
Quant Time: May 15 12:36:45 2017
Quant Method : C:\msdchem\1\methods\EP31D14Q.M
Quant Title :
QLast Update : Wed Apr 12 14:09:24 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

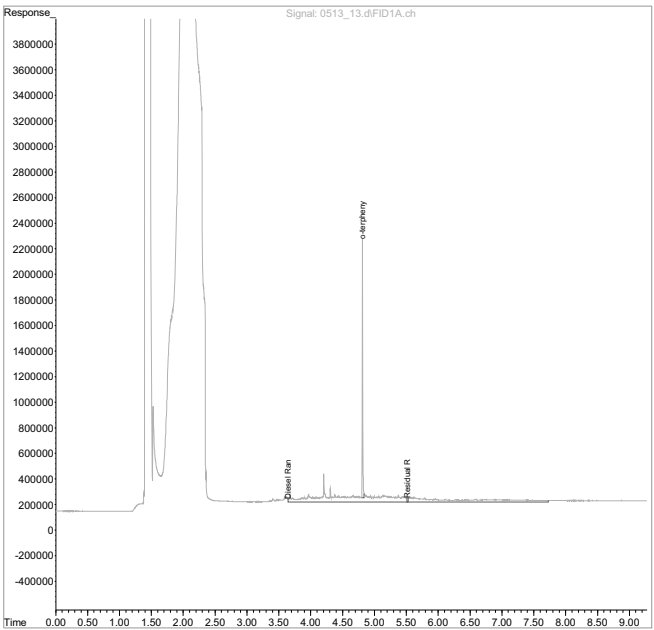


Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_13.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 12:55 pm
Operator : 784
Sample : L908444-01 1x WG978857 40-2
Misc : water
ALS Vial : 34 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: May 15 15:04:31 2017
Quant Method : C:\msdchem\1\methods\EP27E08Q.M
Quant Title :
QLast Update : Mon May 08 12:31:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



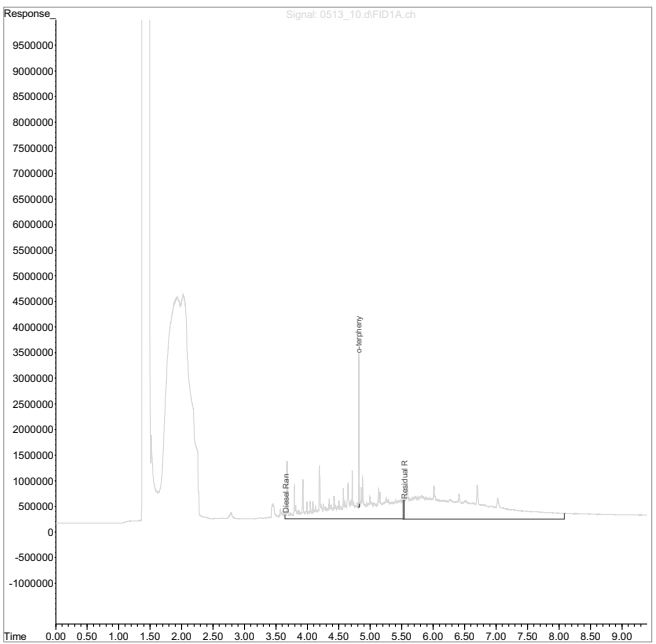
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_10.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 12:21 pm
Operator : 614
Sample : L908444-02 1x WG979247 40-2
Misc : water
ALS Vial : 9 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: May 15 12:37:30 2017
Quant Method : C:\msdchem\1\methods\EP31D14Q.M
Quant Title :
QLast Update : Wed Apr 12 14:09:24 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :

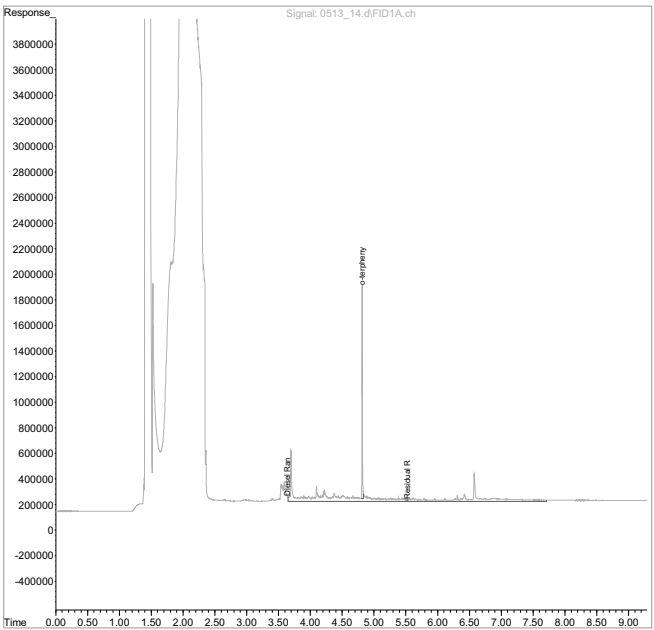


Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_14.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 1:11 pm
Operator : 784
Sample : L908444-02 1x WG978857 40-2
Misc : water
ALS Vial : 35 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: May 15 15:05:03 2017
Quant Method : C:\msdchem\1\methods\EP27E08Q.M
Quant Title :
QLast Update : Mon May 08 12:31:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



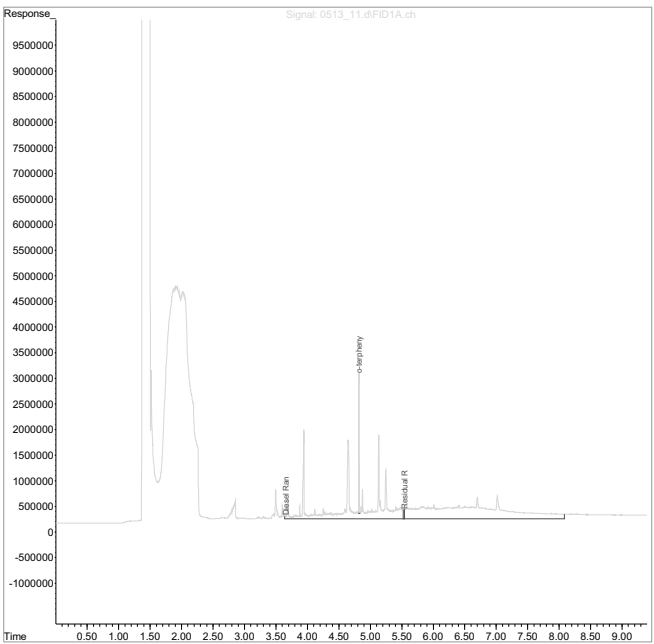
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_11.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 12:37 pm
Operator : 614
Sample : L908444-03 1x WG979247 40-2
Misc : water
ALS Vial : 10 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: May 15 12:38:46 2017
Quant Method : C:\msdchem\1\methods\EP31D14Q.M
Quant Title :
QLast Update : Wed Apr 12 14:09:24 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :

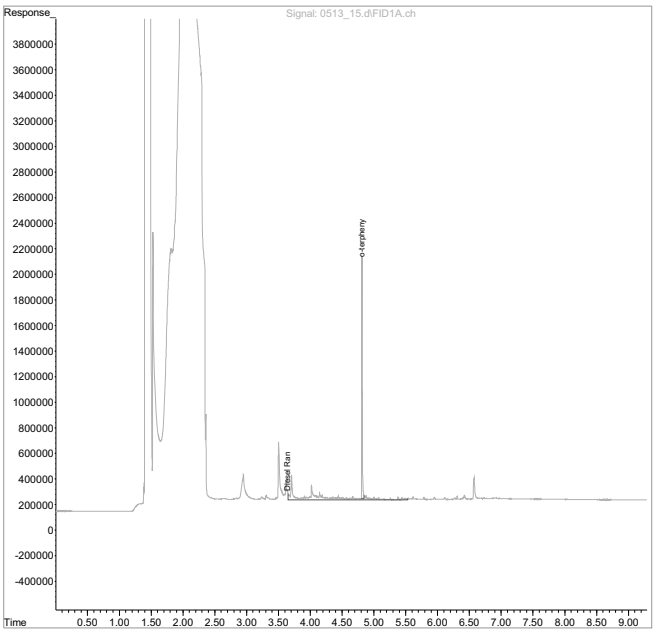


Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_15.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 1:27 pm
Operator : 784
Sample : L908444-03 1x WG978857 40-2
Misc : water
ALS Vial : 36 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: May 15 15:05:42 2017
Quant Method : C:\msdchem\1\methods\EP27E08Q.M
Quant Title :
QLast Update : Mon May 08 12:31:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



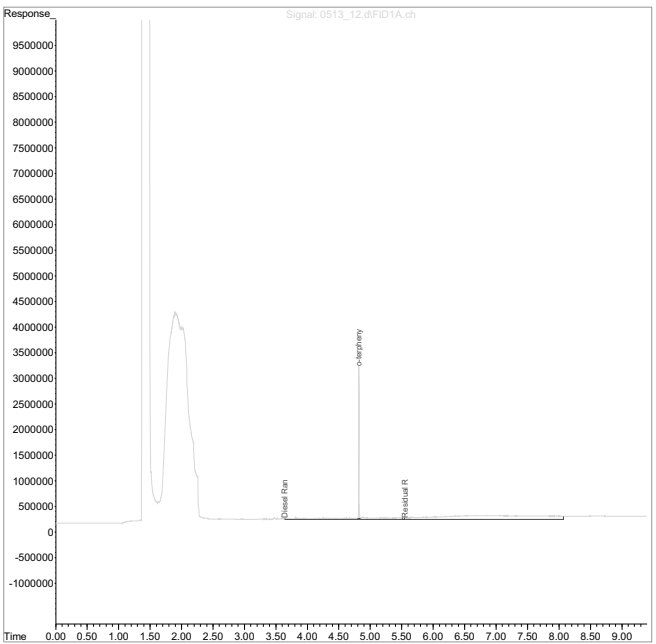
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_12.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 12:54 pm
Operator : 614
Sample : L908444-04 1x WG979247 40-2
Misc : water
ALS Vial : 11 Sample Multiplier: 0.05
InstName : SVGC31

no SGT

Integration File: events.e
Quant Time: May 15 12:40:18 2017
Quant Method : C:\msdchem\1\methods\EP31D14Q.M
Quant Title :
QLast Update : Wed Apr 12 14:09:24 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

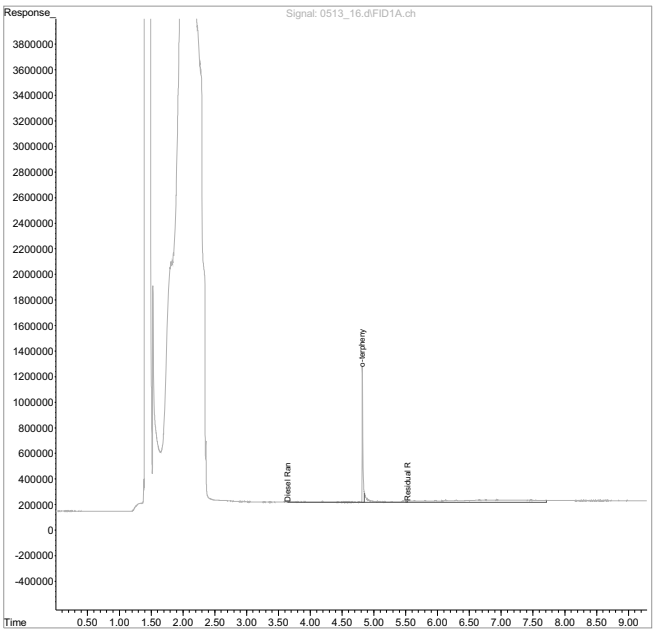


Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_16.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 1:44 pm
Operator : 784
Sample : L908444-04 1x WG978857 40-2
Misc : water
ALS Vial : 37 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: May 15 15:17:21 2017
Quant Method : C:\msdchem\1\methods\EP27E08Q.M
Quant Title :
QLast Update : Mon May 08 12:31:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



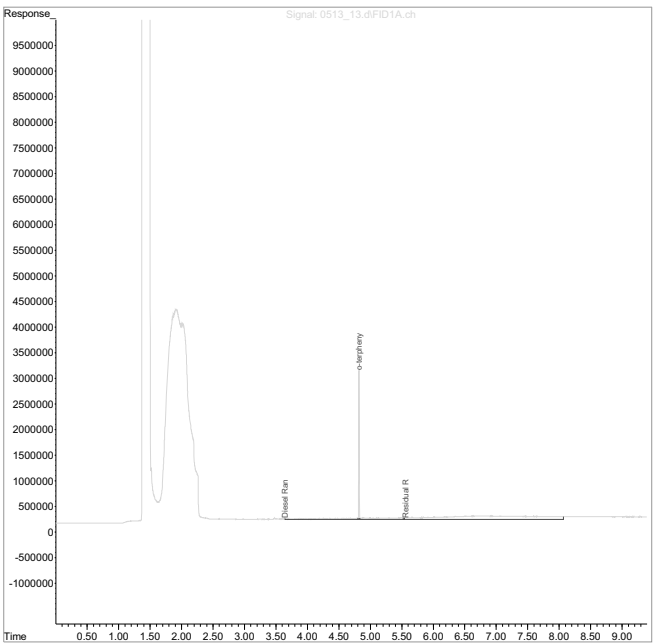
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_13.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 1:11 pm
Operator : 614
Sample : L908444-05 1x WG979247 40-2
Misc : water
ALS Vial : 12 Sample Multiplier: 0.05
InstName : SVGC31

Integration File: events.e
Quant Time: May 15 12:41:22 2017
Quant Method : C:\msdchem\1\methods\EP31D14Q.M
Quant Title :
QLast Update : Wed Apr 12 14:09:24 2017
Response via : Initial Calibration
Integrator: ChemStation

no SGT

Volume Inj. :
Signal Phase :
Signal Info :

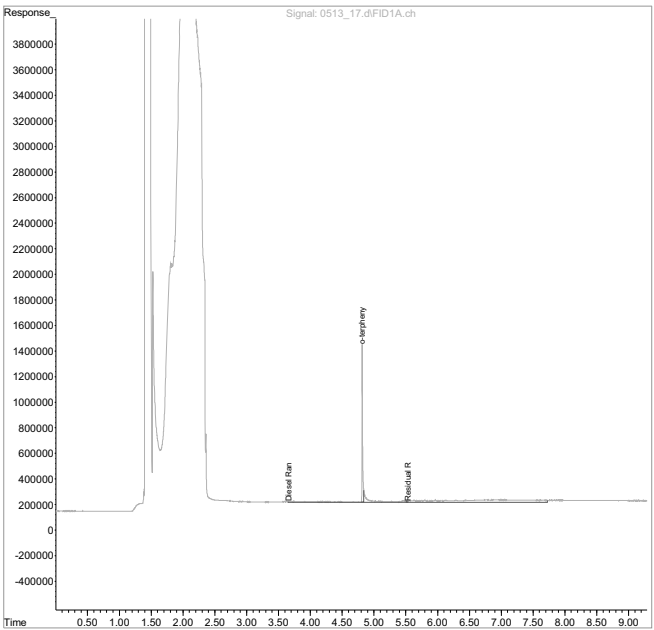


Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\051317\
Data File : 0513_17.d
Signal(s) : FID1A.ch
Acq On : 13 May 2017 2:00 pm
Operator : 784
Sample : L908444-05 1x WG978857 40-2
Misc : water
ALS Vial : 38 Sample Multiplier: 0.05
InstName : SVGC27

Integration File: events.e
Quant Time: May 15 15:28:42 2017
Quant Method : C:\msdchem\1\methods\EP27E08Q.M
Quant Title :
QLast Update : Mon May 08 12:31:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :
DataAcq Meth:EPH27Z2.M



APPENDIX E

Terrestrial Ecological Evaluation Exclusion

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation.

Completion of this form is not sufficient to document your evaluation. You still need to document your analysis and the basis for your conclusion in your cleanup plan or report.

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to www.ecy.wa.gov/programs/tcp/policies/terrestrial/TEEHome.htm.

Step 1: IDENTIFY HAZARDOUS WASTE SITE	
Please identify below the hazardous waste site for which you are documenting an evaluation.	
Facility/Site Name: Industrial Petroleum Distributors	
Facility/Site Address: 1120 West Bay Drive Northwest, Olympia, Washington 98502	
Facility/Site No: 1436	VCP Project No.: Not applicable (N/A)

Step 2: IDENTIFY EVALUATOR			
Please identify below the person who conducted the evaluation and their contact information.			
Name: Rory Henneck			Title: Staff Scientist
Organization: Arcadis U.S., Inc.			
Mailing address: 1100 Olive Way, Suite 800			
City: Seattle		State: WA	Zip code: 98101
Phone: 206-726-4732	Fax: 206-325-8218	E-mail: rory.henneck@arcadis.com	

Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

A. Exclusion from further evaluation.

1. Does the Site qualify for an exclusion from further evaluation?

☐ Yes *If you answered **"YES,"** then answer **Question 2**.*

☒ No or Unknown *If you answered **"NO" or "UKNOWN,"** then skip to **Step 3B** of this form.*

2. What is the basis for the exclusion? *Check all that apply. Then skip to **Step 4** of this form.*

Point of Compliance: WAC 173-340-7491(1)(a)

☐ All soil contamination is, or will be,* at least 15 feet below the surface.

☐ All soil contamination is, or will be,* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

☐ All contaminated soil, is or will be,* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

☐ There is less than 0.25 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.

☐ For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

☐ Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

[±] "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

[#] "Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

B. Simplified evaluation.

1. Does the Site qualify for a simplified evaluation?

☒ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No or Unknown *If you answered **"NO"** or **"UNKNOWN,"** then skip to **Step 3C** of this form.*

2. Did you conduct a simplified evaluation?

☒ Yes *If you answered **"YES,"** then answer **Question 3** below.*

☐ No *If you answered **"NO,"** then skip to **Step 3C** of this form.*

3. Was further evaluation necessary?

☐ Yes *If you answered **"YES,"** then answer **Question 4** below.*

☒ No *If you answered **"NO,"** then answer **Question 5** below.*

4. If further evaluation was necessary, what did you do?

☐ Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*

☐ Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

5. If no further evaluation was necessary, what was the reason? *Check all that apply. Then skip to **Step 4** of this form.*

Exposure Analysis: WAC 173-340-7492(2)(a)

☒ Area of soil contamination at the Site is not more than 350 square feet.

☐ Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

Pathway Analysis: WAC 173-340-7492(2)(b)

☐ No potential exposure pathways from soil contamination to ecological receptors.

Contaminant Analysis: WAC 173-340-7492(2)(c)

☒ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

C. Site-specific evaluation. A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. *See* WAC 173-340-7493(1)(c).

1. Was there a problem? *See* WAC 173-340-7493(2).

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No *If you answered **"NO,"** then identify the reason here and then skip to **Question 5** below:*

- ☐ No issues were identified during the problem formulation step.
- ☐ While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

2. What did you do to resolve the problem? *See* WAC 173-340-7493(3).

- ☐ Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*
- ☐ Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

3. If you conducted further site-specific evaluations, what methods did you use?
Check all that apply. See WAC 173-340-7493(3).

- ☐ Literature surveys.
- ☐ Soil bioassays.
- ☐ Wildlife exposure model.
- ☐ Biomarkers.
- ☐ Site-specific field studies.
- ☐ Weight of evidence.
- ☐ Other methods approved by Ecology. If so, please specify:

4. What was the result of those evaluations?

- ☐ Confirmed there was no problem.
- ☐ Confirmed there was a problem and established site-specific cleanup levels.

5. Have you already obtained Ecology's approval of both your problem formulation and problem resolution steps?

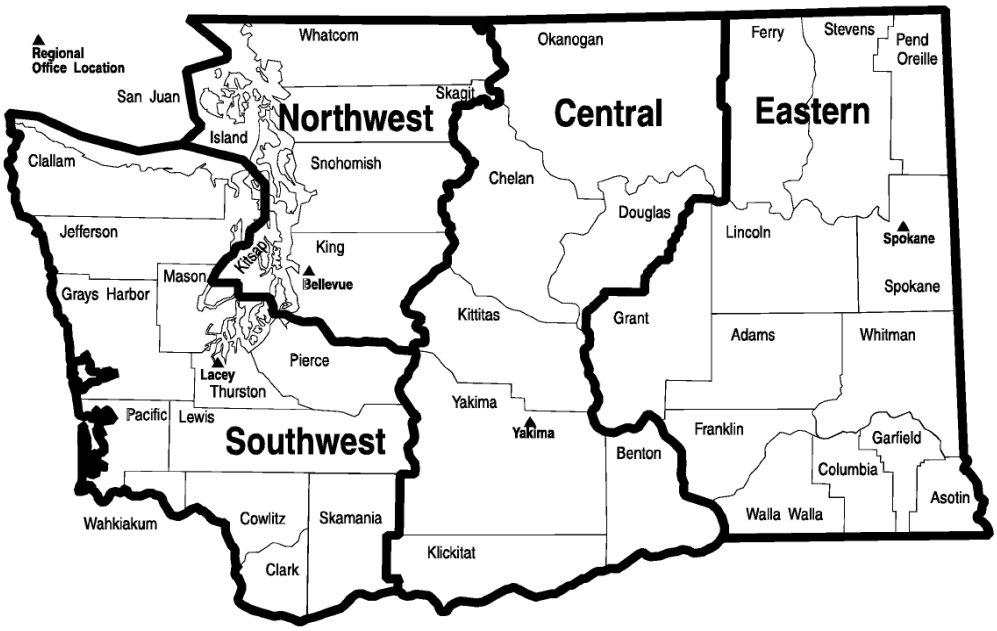
☐ Yes If so, please identify the Ecology staff who approved those steps:

☐ No

Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.

Northwest Region: Attn: VCP Coordinator 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: VCP Coordinator 1250 West Alder St. Union Gap, WA 98903-0009
Southwest Region: Attn: VCP Coordinator P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Attn: VCP Coordinator N. 4601 Monroe Spokane WA 99205-1295



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