Groundwater Monitoring Report, Second, Third & Fourth Quarters 2015

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Sign-Off Sheet

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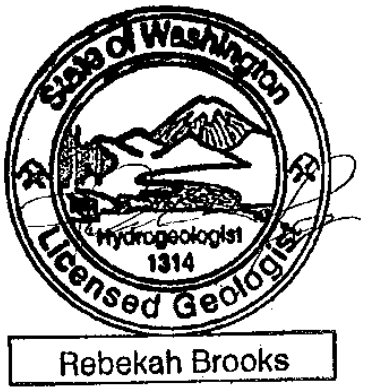

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Acronyms & Abbreviations

µg/L	micrograms per liter
2Q2015	Second Quarter 2015
3Q2015	Third Quarter 2015
4Q2015	Fourth Quarter 2015
AO	Agreed Order
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CSM	conceptual site model
DPE	dual-phase extraction
DRPH	diesel-range petroleum hydrocarbons
DTP	depth-to-product
DTW	depth-to-water
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
GRPH	gasoline-range petroleum hydrocarbons
HydroCon	HydroCon Environmental, LLC
ID	identifier
IRAWP	Interim Remedial Action Work Plan
LNAPL	light non-aqueous phase liquid
MDL	method detection limit
mL/min	milliliters per minute
MPE	multi-phase extraction
MRL	method reporting limit
MTBE	methyl tert-butyl ether
MTCA	Model Toxics Control Act
MW	monitoring well
NWTPH-Gx	Northwest Total Petroleum Hydrocarbon - Gasoline Range Organics
ORPH	oil-range petroleum hydrocarbons
PACE	PACE Engineers, Inc.
PAH	petroleum aromatic hydrocarbons
QA/QC	quality assurance/quality control
RI	remedial Investigation
ROW	right-of-way
RW	remediation well
SES	SoundEarth Strategies, Inc.
Stantec	Stantec Consulting Services Inc.
SVE	soil vapor extraction
TOC	TOC Holdings Co.
UST	underground storage tank

List of Properties – TOC Site

TOC Property	24205 56th Avenue West, Mountlake Terrace, WA
TOC/Farmasonis Property	24225 56th Avenue West, Mountlake Terrace, WA
Drake Property	24309 56th Avenue West, Mountlake Terrace, WA
56th Avenue West ROW	Right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties

List of Properties – Adjacent to TOC Site

242nd Street Southwest ROW	Right-of-way adjacent to TOC Property
Herman Property	24311 56th Avenue West, Mountlake Terrace, WA
Shin/Choi Property	24325 56th Avenue West, Mountlake Terrace, WA

1.0 INTRODUCTION

This report presents the results of the Second, Third and Fourth Quarter 2015 (2Q2015, 3Q2015 and 4Q2015) groundwater monitoring events for the interim remedial action at the TOC Holdings Co. (TOC) Facility No. 01-176 located in Mountlake Terrace, Snohomish County, Washington (**Figure 1**). Field activities and data evaluation were performed by Stantec Consulting Services Inc. (Stantec), as a subconsultant to HydroCon Environmental, LLC (HydroCon), on behalf of TOC. Field activities were also supported by HydroCon staff.

Ongoing groundwater monitoring is conducted under Agreed Order (AO) No. DE 8661, entered in October 2011 between TOC and the Washington State Department of Ecology (Ecology 2011). The groundwater monitoring scope of work is defined in the *Interim Remedial Action Work Plan* (IRAWP; SES 2011) included as Exhibit C of the AO. Per the requirements of the IRAWP, the groundwater monitoring scope of work includes one annual field event and three quarterly field events (described in **Section 6.0**). Groundwater monitoring is conducted to monitor and evaluate the performance and efficacy of three multi-phase extraction (MPE) remediation systems (described in **Section 5.0**) and their effect on groundwater quality.

This report presents a description of groundwater monitoring activities performed by Stantec and an evaluation of the field data and analytical results. The dates of the 2015 quarterly groundwater monitoring events are provided in the table below.

Dates of 2015 Quarterly Groundwater Monitoring Events

Quarter	Field Event Dates
2Q2015	June 9 to 18, 2015
3Q2015	September 22 to 28, 2015
4Q2015	December 9 to15, 2015

A description of the site, adjacent properties and site background is provided in **Section 2.0.** The geologic and hydrologic frameworks are described in **Sections 3.0 and 4.0**, respectively. A summary of the remediation system status is provided in **Section 5.0**. The scope of work for the groundwater monitoring events is described in **Section 6.0**. Field methodologies for collecting depth-to-water/depth-to-product (DTW/DTP) level measurements and groundwater samples in accordance with the IRAWP (SES 2011) or using approved modifications are described in **Section 7.0**. Groundwater monitoring results for the three quarterly events are described in **Section 8.0** and a summary of the results and a list of conclusions for the quarterly events are provided in **Section 9.0**. Future groundwater monitoring tasks are described in **Section 10.0**.

2.0 SITE DESCRIPTION & BACKGROUND

2.1 Description of TOC Site

As specified in the AO, the boundary of the "TOC Site" encompasses the following properties (**Figure 2**):

- **TOC Property:** 24205 56th Avenue West. The vacant TOC Property consists of vegetated land with the exception of an asphalt area and graveled and fenced area housing a MPE remediation system (described in **Section 5.0**).
- **TOC/Farmasonis Property:** 24225 56th Avenue West. The TOC/Farmasonis Property consists of one vacant commercial building (formerly occupied by Romio's restaurant through June 2014), an asphalt parking area, vegetated land, and a graveled and fenced area housing two MPE remediation systems (described in **Section 5.0**).
- **Drake Property:** 24309 56th Avenue West. The Drake Property consists of one commercial building (currently occupied by Getaway Tavern) and asphalt and gravel parking areas.
- **56th Avenue West Right-of-Way (ROW):** The portion of the 56th Avenue ROW included in the TOC Site is adjacent to the TOC, TOC/Farmasonis and Drake properties.

The TOC Site is bordered by 242nd Street Southwest and commercial properties to the north; by residential properties to the east and west; and by the Herman Property and Mountlake Senior Property to the south where construction began for an assisted living facility in February 2015. The Snohomish County boundary is defined by 244th Street and the King County boundary is defined by 205th Street. Descriptions of each property included within the TOC Site boundary are provided below.

2.2 Description of Adjacent Properties

In addition to the TOC Site, the scope of work for the quarterly events (described in **Section 6.0**) also includes the following adjacent properties:

- **242nd Street Southwest ROW:** The portion of the ROW included in the scope of the work is adjacent to the northern boundary of the TOC Site.
- **Herman Property:** 24311 56th Avenue West. The Herman Property consists of one commercial building (occupied by Dave's Auto Service), an asphalt parking area and vegetated land.
- **Shin/Choi Property:** The Shin/Choi Property consists of one building (occupied by the EZ Corner Mart) and an asphalt parking area.

2.3 Site Background

TOC operated a retail gasoline station on the TOC Property between 1968 and 1990. The facility included three underground storage tanks (USTs), six fuel dispensers and associated product delivery lines. One 8,000-gallon and two 6,000-gallon USTs and ancillary equipment were removed from the TOC Property in 1991 and petroleum constituents in the form of gasoline-range petroleum hydrocarbons (GRPH), benzene, and total xylenes were observed in soil and groundwater in excess of the applicable Model Toxics Control Act (MTCA) Method A cleanup levels (Ecology 2007). Between 1992 and 2013, site investigations were conducted to determine the extent of petroleum contamination and 107 monitoring and remediation wells (six of which have been decommissioned) were installed in three groundwater zones (defined as Shallow, Intermediate, and Deep and further described in **Section 4.0**).

In 1996, a dual-phase extraction (DPE) remediation system was installed at the TOC Property at six remediation wells (MW01, MW02, MW03, MW09, MW10, and MW11) to remediate groundwater impacted by petroleum hydrocarbons and remove light non-aqueous phase liquid (LNAPL) in the

Shallow Zone. The DPE system operated from February 1997 to June 2005 and was later removed following confirmation that the system effectively remediated Shallow Zone groundwater (SES 2013). In 2006, groundwater monitoring results collected by SoundEarth Strategies (SES) confirmed gasoline-related contamination in the Intermediate Zone extended directly downgradient of the TOC Property to the south (TOC/Farmasonis and Drake properties) and west (56th Avenue ROW).

In accordance with the AO (Ecology 2011), a remedial investigation (RI) was initiated at the TOC Site and three MPE remediation systems were installed between November 2011 and August 2012 to remediate residual petroleum-contaminated groundwater, soil vapor and LNAPL (if present) in the Intermediate Zone beneath the TOC Site. As shown on **Figure 3**, the MPE remediation systems are located within fenced enclosures on the TOC Property and TOC/Farmasonis Property and are served by remediation wells installed on the TOC, TOC/Farmasonis and Drake properties.

Available information regarding historical operations on the TOC/Farmasonis and Drake properties do not indicate the presence of USTs. Historical operations on the downgradient Herman and Shin/Choi properties indicate three USTs were removed from the Shin/Choi Property in 1991 and two USTs were removed from the Herman Property in 2001; however five additional USTs may still exist on the Herman Property. Available information on historical or current USTs and associated equipment located on downgradient properties is shown on **Figure 3.**

At the time of the 2015 quarterly field events, 103 active monitoring and remediation wells were located on seven properties (the four properties included within the TOC Site boundary [described in **Section 2.1**] plus the adjacent 242nd Street ROW, and Herman and Shin/Choi properties described in **Section 2.2**).

3.0 GEOLOGIC FRAMEWORK

The TOC Site is situated on the glacial upland plateau between Seattle and Everett, Washington, known as the Intercity Plateau. As documented in the *Draft RI Report* (SES 2013), the regional geology consists of Pleistocene-age glacial till locally overlain by pockets of glacial recessional outwash sand (Galster and Laprade 1991).

The recessional outwash sand, which ranges in thickness from approximately 25 to 300 feet, is generally loose to medium dense sand and gravel with little or no fines, and may include ice contact deposits and ablation till. The glacial till, which represents the ground moraine of the Vashon glaciations, ranges from a few feet to over 50 feet thick and consists of dense to very dense gravelly, sandy silt to silty sand with variable amounts of clay, cobbles, and boulders. Groundwater is perched above and within the glacial till layer. Bedrock underlying the area consists of Tertiary sediment rocks (sandstone, shale, or conglomerate) over 900 feet deep beneath the TOC Site; therefore, bedrock is not relevant for the TOC Site characterization.

Based on the results of previous investigations conducted between 1991 and 2013, subsurface soil beneath the TOC Site consists primarily of local anthropogenic fill overlying Vashon-age glacial deposits. Based on regional geologic unit interpretations for the area, the *Draft RI Report* states subsurface soil is interpreted to consist of the following geologic units, from youngest to oldest: artificial (anthropogenic) fill, Vashon glacial outwash deposits, Vashon glacial till and Vashon glacial outwash deposits (SES 2013).

4.0 HYDROGEOLOGIC FRAMEWORK

Three separate groundwater zones were identified at the TOC Site in the *Draft RI Report* (SES 2013). The zones were defined by SoundEarth Strategies, Inc. (SES) based on lithology, well screen intervals and groundwater level measurements. Stantec evaluated the data as part of updates and revisions to the Conceptual Site Model (CSM), based on comments provided by Ecology to SES on the *Draft RI Report* (Ecology 2014). Stantec will incorporate the results of the revised CSM into the final RI report for submittal to Ecology.

Stantec agrees that three groundwater zones can be identified at the TOC Site; however, these zones do not appear to be separate, but are interconnected, as evidenced by the geology, groundwater elevations and contaminant distribution data. Also, the groundwater zones do not appear to be separated by distinct confining units defined by lower permeability lithology. Stantec's conceptualization of the hydrogeology is currently based on geologic field interpretations (e.g., boring logs) provided by SES and other consultants that previously managed the project, but will be supplemented by future investigations and development of the revised CSM. Based on evaluation of the available data by Stantec, the following sections describe the three groundwater zones, as well as locations where well screen intervals intersect multiple groundwater zones. For discussion of the monitoring event results in **Sections 8.0 and 9.0**, monitoring and remediation wells are placed into five categories based on groundwater zones and well screen intervals intersecting these zones. The five categories are defined as: 1) Shallow Zone Wells; 2) Intermediate Zone Wells; 3) Deep Zone Wells; 4) Shallow-Intermediate Zone Intersect Wells; and 5) Intermediate-Deep Zone Intersect Well.

4.1 Shallow Water-Bearing Zone (Shallow Zone)

The Shallow Zone is a perched zone in the artificial fill or upper portion of the glacial outwash/till, at depths between approximately 5 to 20 feet below ground surface (bgs) throughout the TOC Site, depending on seasonal fluctuations of the water table. The saturation in these horizons can be seasonally discontinuous, as evidenced by some monitoring wells that are seasonally dry (e.g., MW04 is typically dry during the fourth quarter event), while other Shallow Zone wells monitored during the same season contain water. The primary source of recharge to the Shallow Zone is infiltration of natural precipitation through emplaced fill and native soil in unpaved areas. Other potential sources of recharge to the Shallow Zone reportedly included a former topographically closed depression, where surface runoff previously ponded, and a former stormwater infiltration pit (identified on **Figure 3**), both of which were located in the southeast portion of the TOC Property. According to a 1975 TOC blueprint (Time Oil Co. 1975), the stormwater infiltration pit is located in proximity to MW18 and MW33; measures 10 feet square by 4 feet deep; and was backfilled with coarse gravel. Surface runoff intercepted by a catch basin located near the southeast corner of the paved asphalt area on the TOC Property formerly discharged into the stormwater infiltration pit via a 6-inch-diameter drain pipe, which has been capped.

4.2 Intermediate Water-Bearing Zone (Intermediate Zone)

The Intermediate Zone is an unconfined groundwater zone that is observed at depths between approximately 20 and 60 feet bgs. As described in the *Draft RI Report* (SES 2013), the Intermediate Zone consists of glacial till deposits between approximately 20 and 40 feet bgs and discontinuous sand and/or gravel-rich glacial deposits within the lower portion of the glacial till between approximately 40 and 60 feet bgs. As discussed further in **Section 8.2.2**, groundwater elevations in the Intermediate Zone of the TOC Property appear to be mounded such that the upper boundary of the Intermediate Zone appears closer to the base of the Shallow Zone in the vicinity of the UST excavation fill area and former stormwater infiltration pit (identified on **Figure 3**). Explanations for the observed groundwater mounding are likely related to artificial recharge within the backfill of the former UST cavity, depression, and the infiltration pit; the presence of low permeability deposits near the downgradient edge of the property; and/or from localized influence of the vacuum for the remediation system located on the TOC Property

(identified on **Figure 3** and described in **Sections 2.3** and **5.0**). The low permeability deposits in the upper portion of the Intermediate Zone impede the vertical percolation of water into the Deep Zone (see **Section 4.3**) and decrease the horizontal flux of the groundwater in the immediate vicinity. The prevalence of low permeability deposits correlates with the location of steeper horizontal hydraulic gradients in this area (see **Section 8.2**). In downgradient areas where the Intermediate Zone consists primarily of higher permeability units (i.e., sands and gravels), the thickness of unsaturated materials and the distance between the Shallow and Intermediate Zones increase. The higher permeability deposits contribute to a flattening of the horizontal hydraulic gradient. The Intermediate Zone appears to receive recharge from natural precipitation via the Shallow Zone. A comparison of groundwater elevations and analytical data confirm that the Intermediate Zone is considered to be the primary contaminant transport pathway at the TOC Site; however, as described in **Section 5.0**, the remediation systems appear to be containing contaminant transport from migrating further downgradient.

4.3 Deep Water-Bearing Zone (Deep Zone)

The Deep Zone consists of glacial sand and gravel located at depths greater than 60 feet bgs, based on deep well screen intervals. Within the vicinity of the artificial recharge area on the TOC Property, the groundwater elevation data indicate that downward vertical gradients appear to exist between all three zones. In downgradient areas, the groundwater elevation data suggest that vertical gradients shift from downward (between the Shallow and Intermediate Zones) to neutral or slightly upward (between the Intermediate and Deep Zones). Based on these observations and the presence of fully saturated well screens, these groundwater level conditions could be a reflection of a higher permeability zone at the base of a single groundwater unit that includes both the Intermediate and Deep Zones or could represent semi-confined conditions in a separate, but interconnected groundwater zone; however, the presence of a low permeability confining unit between the two zones is not obvious in the available data. The presence of upward vertical gradients between the Deep and Intermediate Zones appear to be effective in inhibiting downward migration of contamination in downgradient areas and effectively bounding the extent of vertical contamination.

4.4 Well Screen Intervals Intersecting Multiple Water-Bearing Zones

Based on evaluation of available data by Stantec, 16 wells (15 of which are active and one of which was decommissioned) appear to have screen intervals that intersect multiple groundwater zones (either Shallow and Intermediate Zones or Intermediate and Deep Zones) and may not represent the individual hydrogeological conditions of either zone. Because Shallow Zone contamination in the area where these wells are located has been remediated, the potential for cross-contamination between groundwater zones does not currently exist.

5.0 REMEDIATION SYSTEM STATUS

In accordance with the AO (Ecology 2011), three MPE remediation systems were installed between November 2011 and August 2012 to remediate residual petroleum-contaminated groundwater, soil vapor and LNAPL (if present) in the Intermediate Zone beneath TOC Site. As shown on **Figure 3**, the MPE remediation systems are located within fenced enclosures on the TOC Property and TOC/Farmasonis Property and are served by remediation wells installed on the TOC, TOC/Farmasonis and Drake properties.

At the time of 2015 quarterly field events, 21 of the 22 remediation wells connected to the MPE remediation systems were actively operating. The pump in remediation well MW95 (located on the Drake Property) was turned off on April 30, 2015. Although the pump remained off for the duration of 2015, it was turned on for one day during quarterly event at the time of sampling. The table below identifies the remediation wells connected to each system and their location. As noted next to the well identifier (ID), remediation wells are either 2 or 4 inches in diameter. Operation of all three MPE remediation systems is ongoing.

MPE Remediation System Wells

System Name	System Location	Remediation Well ID	Location of Remediation Wells
Unit 1	TOC Property	• MW11 (4" RW) • MW18 (4" RW) • MW24 (4" RW) • MW27 (2" RW) • MW29 (2" RW) • MW32 (4" RW) • MW90 (4" RW) • MW91 (4" RW)	TOC Property
Unit 2	TOC/Farmasonis Property	• MW31 (2" RW) • MW41 (2" RW) • MW57 (4" RW) • MW92 (4" RW) • MW93 (4" RW) • MW94 (4" RW)	TOC/Farmasonis Property
Unit 3	TOC/Farmasonis Property	• MW69 (2" RW) • MW70 (2" RW) • MW95 (4" RW)* • MW96 (4" RW) • MW97 (4" RW) • MW98 (4" RW) • MW99 (4" RW) • MW101 (4" RW)	Drake Property

**Pump was turned off on April 30, 2015.*

Additional information describing the performance of the MPE remediation systems was provided in the *Remedial Systems Operation and Maintenance (O&M) Report* prepared quarterly and submitted to Ecology (HydroCon 2015a, HydroCon 2015b and HydroCon 2016).

6.0 GROUNDWATER MONITORING SCOPE OF WORK

The original scope of work defined in the IRAWP (SES 2011) includes the four properties located within the boundary of the TOC Site (described in **Section 2.1**) as well as a portion of the 242nd Street Southwest ROW (directly north of the TOC Site; described in **Section 2.2**). At the time the IRAWP was prepared, four monitoring wells had been decommissioned and 85 active monitoring and remediation wells were located on the TOC Site and adjacent properties. After the IRAWP was prepared, two additional monitoring wells were decommissioned (for a total of six decommissioned wells) and 20 additional wells were installed at the locations identified in the table below (for a total of 103 active monitoring and remediation wells). The 20 additional wells installed are referred to as the "post-IRAWP wells" and were incorporated into future groundwater monitoring events.

Post-IRAWP Monitoring & Remediation Wells

Property Name	Well ID	
	Installed Wells	Decommissioned Wells
TOC	• MW90 (4" RW) • MW91 (4" RW)	• MW21
TOC/Farmasonis	• MW92 (4" RW) • MW94 (4" RW) • MW93 (4" RW) • MW100	• MW83
Drake	• MW95 (4" RW) • MW97 (4" RW) • MW99 (4" RW) • MW96 (4" RW) • MW98 (4" RW) • MW101 (4" RW)	*None*
Herman	• MW102 • MW105 • MW108 • MW103 • MW106 • MW109 • MW104 • MW107	*None*

(1) Remediation wells (identified as "RW") are either 2 or 4 inches in diameter.

The IRAWP states the four active monitoring wells installed on the Shin/Choi Property (directly south of the Herman Property and two properties south of the TOC Site) are excluded from the scope work for the annual and quarterly groundwater monitoring events. However, for the purpose of obtaining additional information regarding contaminant distribution at the request of TOC, Stantec added these wells to the scope of work for all groundwater monitoring events. Additional details describing the annual and quarterly events are provided in the following sections.

6.1 Annual Event Scope of Work

The original scope of work defined in the IRAWP (SES 2011) for the annual event includes:

1) measuring depth-to-groundwater/depth-to-product (DTW/DTP) levels for all active wells; and
2) collecting groundwater samples from 81 active monitoring and remediation wells located on five properties (TOC, TOC/Farmasonis, Drake, 56th Avenue ROW, and 242nd Street ROW).

The original scope of work did not include monitoring of the four wells located on the Shin/Choi Property (two properties south of the TOC Site and directly south of the Herman Property). In addition to collecting DTW/DTP level measurements and groundwater samples from the wells identified in the IRAWP, the groundwater monitoring scope of work for the annual event was revised by Stantec at the request of TOC to also include the 20 post-IRAWP wells (described in **Section 6.0**) as well as the four wells located on the Shin/Choi Property. Six of the 109 wells installed on the TOC Site and adjacent properties have been decommissioned to date. Therefore, 103 active wells are included in the groundwater monitoring scope of work for the annual event. Groundwater samples are only collected from wells that do not contain product. Since product is typically observed at MW71 and MW72 (located on the Shin/Choi Property), and MW102 (located on the Herman Property), samples are not collected from

these locations. The annual event takes place during the first quarter of each year. The results of the 2015 annual event were provided in the *2015 Annual Groundwater Monitoring Report* (Stantec 2015).

6.2 Quarterly Event Scope of Work

The original scope of work defined in the IRAWP (SES 2011) for the quarterly events includes:

1) collecting DTW/DTP level measurements for all active wells (excluding wells located on the Shin/Choi Property and MW75 located in the 56th Avenue ROW); and
2) collecting groundwater samples from 30 active monitoring and remediation wells installed on the TOC Site.

In addition to collecting DTW/DTP level measurements and groundwater samples from the active wells identified in the IRAWP, the groundwater monitoring scope of work for the quarterly events was revised by Stantec at the request of TOC to also include:

1) measuring DTW/DTP levels from the 20 post-IRAWP wells (described in **Section 6.0**) as well as the four wells located on the Shin/Choi Property; and

2) sampling the four wells located on the Shin/Choi Property and select post-IRAWP wells.

Similar to the annual event, groundwater samples are only collected from wells that do not contain product; therefore, wells MW71 and MW72 (located on the Shin/Choi Property), and MW102 (located on the Herman Property) are typically not sampled. Quarterly events take place during the second, third and fourth quarters of each year. The results of the 2015 quarterly events are provided herein.

The table below identifies the 30 active monitoring and remediation wells scheduled for quarterly sampling (per the requirements of the IRAWP [SES 2011]). All of the wells scheduled for quarterly sampling are located in the Intermediate Zone with the exception of MW09 and MW27, which are Shallow-Intermediate Zone Intersect Wells.

Well Locations Sampled Quarterly (per IRAWP)

Sample Location/ Well ID [(1)]	Property	Sample Location/ Well ID [(1)]	Property	Sample Location/ Well ID [(1)]	Property
MW09	TOC	**MW49**	56th Ave ROW	**MW63**	56th Ave ROW
MW10	TOC	**MW50**	56th Ave ROW	**MW65**	Drake
MW15 (4" RW)	TOC	**MW51**	56th Ave ROW	**MW66**	TOC/Farmasonis
MW20	TOC	**MW52**	56th Ave ROW	**MW69 (2" RW)**	Drake
MW27 (2" RW)	TOC	**MW53**	56th Ave ROW	**MW70 (2" RW)**	Drake
MW31 (2" RW)	TOC/Farmasonis	**MW55**	56th Ave ROW	**MW77**	Drake
MW32 (4" RW)	TOC	**MW56**	TOC/Farmasonis	**MW84**	Drake
MW33	TOC	**MW58**	TOC/Farmasonis	**MW85**	Drake
MW45	56th Ave ROW	**MW59**	TOC/Farmasonis	**MW86**	Drake
MW48	56th Ave ROW	**MW60**	56th Ave ROW	**MW89**	Drake

[(1)] Remediation wells (identified as "RW") are either 2 or 4 inches in diameter.

For the purpose of obtaining additional information regarding contaminant distribution, and at the request of TOC, select sampling locations identified in the below were added to the scope of work for quarterly groundwater monitoring events.

Additional Wells Sampled Quarterly

Shallow Zone Wells		Intermediate Zone Wells	
Well ID	**Property**	**Well ID** [1]	**Property**
MW54	TOC/Farmasonis	**MW57 (4" RW)**	TOC/Farmasonis
MW67	Drake	**MW73**	Shin/Choi
MW68	Drake	**MW74**	Shin/Choi
MW71*	Shin/Choi	**MW95 (4" RW)****	Drake
MW72*	Shin/Choi	**MW96 (4" RW)**	Drake
MW102*	Herman	**MW98 (4" RW)**	Drake
MW104	Herman	**MW101 (4" RW)**	Drake
MW106	Herman	**MW103**	Herman
		MW105	Herman
		MW107	Herman
		MW108	Herman
		MW109	Herman

[1] Remediation wells are identified as "RW" and are either 2 or 4 inches in diameter.

**Sample is not collected from this location if product (LNAPL) is present.*

***MW95 pump was turned off on April 30, 2015.*

7.0 GROUNDWATER MONITORING FIELD METHODOLOGY

Field procedures used to conduct groundwater monitoring are summarized in the following sections.

7.1 DTW/DTP Level Measurements

During each field event, Stantec measured DTW/DTP levels while the remediation systems were turned off to obtain information on baseline (i.e., non-pumping) groundwater flow patterns. During 2Q2015, DTW/DTP levels were also measured at select well locations while the remediation systems were operating to evaluate the influence of the remediation system pumping on groundwater flow. System-on measurements were collected at the beginning of the 2Q2015 field event and system-off measurements were collected at the end of each quarterly field events. Site-wide system-on DTW measurements were discontinued after the 2Q2015 field event; hereafter the system-on measurements, when measured, were focused on areas where groundwater contamination is still present in the intermediate zone (e.g. in the vicinity of MW48).

Prior to collecting system-off measurements, the remediation systems were turned off and groundwater levels were allowed to recharge for at least two days. The DTW/DTP levels were measured after removing the monitoring well caps and allowing groundwater levels to equilibrate with atmospheric pressure. The DTW/DTP levels were measured relative to the top of the well casings to an accuracy of 0.01 feet using an electronic water level meter. Where LNAPL was previously observed or expected to occur, an oil/water interface probe was used to check for the presence of LNAPL and to measure the DTW/DTP level. When more than one water level meter was selected for a field event, Stantec collected a baseline measurement using each instrument at one well location to check for consistency between the instruments. Any differences between measurements were then used to calibrate the instruments and correct the groundwater elevations, if necessary.

DTW/DTP level measurements were collected from active monitoring and remediation wells located on the TOC Site, and adjacent properties (242nd Avenue ROW and the Herman and Shin/Choi properties). Measurements are not collected from 2-inch wells (MW27, MW29, MW31, MW41, MW69 and MW70) because the diameter of water probe is too large to fit past the pump tubing. MW75 (located in the 56th Avenue ROW) is only gauged during the annual (first quarter) event and is subject to the Traffic Control Plan (WSDOT 2014).

The DTW/DTP measurements were used to calculate groundwater elevations based on a monitoring well survey performed by PACE Engineers, Inc. (PACE) in April and May 2014. The groundwater elevations were then contoured to identify groundwater flow direction and hydraulic gradients.

DTW/DTP level measurements and resulting groundwater elevations for the quarterly events are discussed in **Sections 8.1 through 8.3** and presented on **Table 1-1** for system-off conditions and **Table 1-2** for system-on conditions.

7.2 Groundwater Sample Collection

During the quarterly groundwater monitoring events, 30 active wells are scheduled for groundwater sampling (per the IRAWP). As described in **Section 6.2**, Stantec collected groundwater samples from additional Shallow and Intermediate Zone well locations for the purpose of obtaining additional information regarding contaminant distribution.

Field sampling methods and procedures used to collected groundwater samples are described in the following sections. Groundwater quality results are discussed in **Section 8.4** and presented on **Tables 2-1 through 4-1**.

7.2.1 Groundwater Sampling Methods & Procedures

Groundwater sampling methods used for the quarterly events are summarized below. Methods used to collect individual samples are identified on the attached groundwater quality results tables.

- **Pneumatic Pump:** For remediation wells connected to a MPE remediation system, Stantec collected groundwater samples using a dedicated downhole pneumatic pump. The pneumatic pump delivers a pulse of groundwater to the wellhead whenever the groundwater table rises above the pump intake. One set of field parameters (e.g., temperature, pH, specific conductance, dissolved oxygen, turbidity, and oxidation-reduction potential) was collected from the remediation wells sampled with a pneumatic pump. Groundwater samples were collected from the pneumatic pump directly into laboratory-prepared sample containers using disposable polyethylene tubing.

- **Peristaltic Pump:** This sampling method was selected for monitoring wells installed in the Shallow and/or Shallow-Intermediate Intersect Zone with DTW levels less than 31 feet bgs (due to the inability of the pump to lift the water for sampling from greater depths). Purging and sampling with a peristaltic pump was performed using disposable polyethylene tubing at approximate flow rates of 0.1 liters per minute or less.

- **Submersible Pump:** This sampling method was selected for monitoring wells installed in the Intermediate, Deep, and/or Intermediate-Deep Intersect Zones with DTW levels greater than 31 feet bgs (in which case a peristaltic pump could not be used for sampling). Submersible pumps were used in wells that had insufficient groundwater recharge rates and/or insufficient water column heights. Purging and sampling with a submersible pump was performed using disposable polyethylene tubing at flow rates ranging from 0.1 to 0.5 liters per minute. If the water table was above the top of the screen and, hence, the well screen was saturated, the intake tubing or the submersible pump was placed approximately in the middle of the screen. If however the groundwater table was below the top of the screen and, hence, the well screen was not fully-saturated, the intake tubing or submersible pump was placed near the middle of the water column.

- **Bailer:** The disposable polyethylene bailer sampling method was the last selected method and was only used under the following circumstances:
    - Historical analytical results indicated that elevated turbidity associated with bailing would not be likely to result in detectable concentrations of petroleum hydrocarbons in groundwater samples.
    - Historical water columns are less than five feet and recharge makes sampling with a submersible pump problematic.

  Well purging and groundwater sampling with disposable bailers required the removal of at least three well volumes from each monitoring well prior to sampling. Following well purging, samples were collected from the bailer directly into laboratory-prepared sample containers. If fewer than three well volumes were purged when attempting to collect groundwater samples, the wells were allowed to recharge for several hours (or overnight) before samples were collected.

Samples collected with a peristaltic pump, submersible pump or bailer were collected in accordance with low-flow protocols (EPA 2010). When purging and sampling in accordance with low-flow protocols, Stantec monitored groundwater field parameters using a YSI Inc. water quality field meter equipped with a flow-through cell (except when sampling groundwater using a bailer). Field parameters, including temperature, pH, specific conductance, dissolved oxygen, turbidity, and oxidation-reduction potential were monitored and recorded.

Following purging and stabilization of the field parameters, groundwater samples were collected from the pump outlet tubing located upstream of the flow-through cell and placed directly into laboratory-prepared sample containers. Purge water generated during this sampling event was placed in appropriately labeled 55-gallon steel drums and temporarily stored on the TOC Property for transfer to the remediation systems for treatment and permitted discharge to the sanitary sewer.

Each set of sample containers was labeled with a unique sample identification number, placed on ice and stored inside of a cooler, and transported to the analytical laboratory under standard chain-of-custody protocols for laboratory analysis.

7.3 Laboratory Analyses

Groundwater samples were analyzed by Friedman & Bruya, Inc. (located in Seattle, Washington). The data were validated by Stantec and, in some cases, qualifiers were assigned. Results are reported between the method detection limits (MDLs) and the method reporting limits (MRLs) for all data packages. Results are typically reported as "not detected" when below the MRLs. In cases where the MRLs were not below MTCA Method A cleanup levels for groundwater, the results are reported between the MDL and MRL and are considered estimates that are used for informational purposes only. The types of analyses performed are identified in the table below.

Laboratory Analyses for Groundwater Samples

Analysis Type	Analysis Method	Sample Location / Well ID
Gasoline-Range Petroleum Hydrocarbons (GRPH)	NWTPH-Gx	*Analyses performed for all groundwater samples collected (as shown on Tables 2-1, 3-1 and 4-1).*
Oil-Range Petroleum Hydrocarbons (ORPH)	NWTPH-Dx	*Analyses performed for groundwater samples collected from select locations (as shown on Tables 2-1, 3-1 and 4-1).*
Diesel-Range Petroleum Hydrocarbons (DRPH)	NWTPH-Dx	
Benzene, Toluene, Ethylbenzene, & Total Xylenes (BTEX)	EPA Method 8021B or EPA Method 8260C	*Analyses performed for all groundwater samples collected (as shown on Tables 2-1, 3-1 and 4-1).*
Methyl Tertiary-Butyl Ether (MTBE)	EPA Method 8260C	*Analyses performed for groundwater samples collected from select locations (as shown on Tables 2-2 and 3-2).*
1,2-Dicholoroethane/ Ethylene Dichloride (EDC)	EPA Method 8260C	
1,2-Dibromoethane/ Ethylene Dibromide (EDB)	EPA Method 8011M	
Polycyclic Aromatic Hydrocarbons (PAH)	EPA Method 8270SIM	
Lead (Total & Dissolved)	EPA Method 200.8	

7.4 QA/QC Sampling Methods & Data Quality Review

The scope of work for groundwater monitoring events includes collection and laboratory analyses of groundwater samples for QA/QC purposes. QA/QC samples are collected to review the accuracy and precision of field sampling procedures and data supplied by the laboratory. A summary of the QA/QC samples collected each quarter is provided in the following sections. Analytical results for QA/QC samples collected during each of the quarterly events are included in the laboratory reports provided as **Appendices B, C and D**.

7.4.1 Field Blanks

In accordance with the *Groundwater Monitoring Plan* provided as an attachment to the *Annual Groundwater Monitoring Report* (Stantec 2015), field blanks collected during each groundwater monitoring event include equipment/rinsate blanks and water blanks. Equipment/rinsate blanks consist of clean water (i.e. deionized water) that is poured through non-dedicated sampling equipment (submersible pumps) following decontamination on the field days when the non-dedicated equipment is used (one per day); these samples are used to assess the thoroughness of the equipment decontamination process. Water blanks consist of the clean water used to decontaminate the non-dedicated sampling equipment poured directly into sample containers. One water blank is collected per sampling event. The sample IDs for the field blanks collected during each quarterly event are listed in the table below.

Field Blanks Collected During Quarterly Events

Sample Type	Sample ID		
	2Q2015	3Q2015	4Q2015
Water Blank	▪ WB-061215	▪ WB-092515	▪ WB-121515
Equipment/Rinsate Blank	▪ EB-061015 ▪ EB-061115 ▪ EB-061215 ▪ EB-061315 ▪ EB-061515 ▪ EB-061615 ▪ EB-061815	▪ EB-092315 ▪ EB-092415 ▪ EB-092515 ▪ EB-092615 ▪ EB-092815	▪ EB-120915 ▪ EB-121015 ▪ EB-121115 ▪ EB-121215 ▪ EB-121515

7.4.2 Blind Field Duplicate Samples

Blind field duplicate samples were collected from the locations identified in the tables provided below. Duplicate samples are typically collected from two or more wells located on the TOC Site and from one well located on the Herman Property. Duplicate sample locations are selected based on locations where concentrations of the constituents analyzed are expected to be elevated. Duplicate samples are collected to evaluate accuracy and precision and determine if sample collection methods are reproducible. These samples were collected by the same method used to collect the primary sample. Analytical results are provided in the laboratory reports and presented on **Tables 2-1 through 4-1**.

Second Quarter 2015

Sample Location/Well ID	Property	Sampling Method	Sample ID	Duplicate Sample ID
MW09	TOC	Submersible Pump	MW09	MLT-01
MW20	TOC	Submersible Pump	MW20	MLT-02
MW86	Drake	Submersible Pump	MW86	MLT-03
MW104	Herman	Peristaltic Pump	MW104	MLT-04

Third Quarter 2015

Sample Location/Well ID	Property	Sampling Method	Sample ID	Duplicate Sample ID
MW63	56th Ave ROW	Submersible Pump	MW63	MLT-05
MW86	Drake	Submersible Pump	MW86	MLT-03
MW106	Herman	Submersible Pump	MW106	MLT-06

Fourth Quarter 2015

Sample Location/Well ID	Property	Sampling Method	Sample ID	Duplicate Sample ID
MW09	TOC	Submersible Pump	MW09	MLT-01
MW86	Drake	Submersible Pump	MW86	MLT-03
MW104	Herman	Peristaltic Pump	MW104	MLT-04

7.5 New Monitoring Well Installations on the Herman Property

On June 15 and 16, 2015, TOC installed two additional monitoring wells on the Herman Property in the Intermediate Water Zone. Per Ecology's request, these two wells (identified as MW108 and MW109; **Figure 3**) were installed near the northern boundary of the Herman Property, generally south of MW84 and MW86 located on the Drake Property. MW108 and MW109 were installed for the purpose of obtaining data directly downgradient of TOC Site in order to confirm the GRPH concentrations in that area. Following installation, the new monitoring wells were sampled during each of the 2015 quarterly groundwater monitoring field events when possible. (Note: MW109 was dry during the 3Q2015 and 4Q2015 sampling events.) A technical memorandum describing well development and initial sampling activities is provided as **Appendix A**.

8.0 GROUNDWATER MONITORING RESULTS

Groundwater monitoring results for the 2015 quarterly groundwater monitoring events are organized by monitoring well categories based on groundwater zone and well screen intervals intersecting groundwater zones (see discussion in **Section 4.0**). As previously mentioned, the five monitoring well categories include:

1. Shallow Zone Wells,
2. Intermediate Zone Wells,
3. Deep Zone Wells,
4. Shallow-Intermediate Zone Intersect Wells, and
5. Intermediate-Deep Zone Intersect Wells.

8.1 DTW/DTP Level Measurements

A summary of information collected during each DTW/DTP level measurement event is provided in the table below. DTW/DTP level measurements collected and resulting groundwater elevations at individual well locations are presented on **Table 1-1**. Groundwater elevation results are discussed in **Section 8.2** and shown on groundwater elevation contour maps **(Figures 4 through 12)**.

A summary of DTW level measurement data and a list of wells where measurable LNAPL was observed for each quarterly event are provided in the table below. LNAPL measurements are presented in **Section 8.3**.

System-Off DTW/DTP Level Measurements

	2Q2015	3Q2015	4Q2015
Measurement Date	June 15, 2015	September 28, 2015	December 14, 2015
Total Dry Wells (1)	10	39	26
Total Inaccessible Wells (2)	1	0	0
Shallowest DTW Level Measurement	11.76 feet bgs (MW61, 56th Avenue ROW, Shallow Zone Well)	14.71 feet bgs (MW06, TOC Property, Shallow Zone Well)	9.91 feet bgs (MW61, 56th Avenue ROW, Shallow Zone Well)
Deepest DTW Level Measurement	46.10 feet bgs (MW16, 242nd Street ROW, Intermediate-Deep Zone Intersect Well)	46.59 feet bgs (MW26, TOC Property, Deep Zone Well)	48.98 feet bgs (MW26, TOC Property, Deep Zone Well)
Shallow Zone Wells with Measurable LNAPL	▪ MW71 (Shin/Choi) ▪ MW72 (Shin/Choi) ▪ MW102 (Herman)	▪ MW71 (Shin/Choi) ▪ MW72 (Shin/Choi) ▪ MW102 (Herman)*	▪ MW71 (Shin/Choi) ▪ MW72 (Shin/Choi) ▪ MW102 (Herman)*

**MW102 was dry during the 3Q2015 and 4Q2015 field events but is included in the table because LNAPL is typically observed at this location.*

(1) Wells did not have sufficient groundwater volume to measure DTW/DTP levels either because the well was dry (monitoring well) or the top of the pump was encountered before groundwater (remediation wells).

(2) Includes wells that were inaccessible due to a vehicle or construction equipment blocking the wellhead during both the system-off DTW/DTP measurement event and the groundwater sampling event.

As described in **Section 7.1**, DTW/DTP levels are not measured in 2-inch remediation wells (MW27, MW29, MW31, MW41, MW69, and MW70) because the diameter of the water probe is too large to fit past the pump tubing. In addition, DTP/DTW levels are only measured in MW75 during the annual (first quarter) event. DTW/DTP levels in several other wells were not measured during each quarterly field event for one of the following reasons:

1) Monitoring Wells: insufficient groundwater or the well was inaccessible (indicated as "dry" on the groundwater elevation contour maps provided as **Figures 4 through 12**).
2) Remediation Wells: the top of the remediation pump was encountered prior to groundwater and access past the pump was not possible (indicated as "dry" on the groundwater elevation contour maps).
3) Wellhead was inaccessible during the field event (indicated as "NM" on the groundwater elevation contour maps).
4) The well was not included in the scope of work for the measurement event or the diameter of the water probe was too large to fit past pump tubing in 2-inch remediation wells (indicated as "NM" on the groundwater elevation contour maps).

8.2 Groundwater Elevations

Groundwater elevations were determined for each quarterly event when the remediation systems were turned off in order to evaluate groundwater flow patterns during baseline (i.e., non-pumping) conditions. As previously mentioned in **Section 7.1**, groundwater elevations for system-on conditions were collected during 2Q2015 from additional select well locations to evaluate groundwater flow patterns during active remediation conditions. These locations were selected at the request of TOC for the purpose of evaluating the changes in groundwater flow resulting from remediation pumping in areas where residual contamination exists. Site-wide system-on DTW measurements were discontinued after the 2Q2015 field event; hereafter the system-on measurements, when measured, were focused on areas where groundwater contamination is still present in the intermediate zone (e.g. in the vicinity of MW48). A discussion of observations for the 2015 quarterly events is provided below for each groundwater zone.

8.2.1 Shallow Zone

Consistent with groundwater elevation data collected during previous events, groundwater flow in the Shallow Zone during the 2015 quarterly events appears to be predominantly to the south-southeast, as shown on **Figures 4, 5, and 6**. A relatively consistent horizontal hydraulic gradient ranging from approximately 0.02 feet/feet (during the 4Q2015 event) to 0.07 feet/feet (during the 2Q2015 and 3Q2015 events) is present across the southern portion of the TOC Site (i.e., TOC/Farmasonis and Drake Properties); however, in the northern area of the TOC Site (in the southern portion of the TOC Property), steepening of the gradient to approximately 0.09 feet/feet (during the 2Q2015 event) and 0. 2 feet/feet (during the 3Q2015 and 4Q2015 events) occurs. As discussed in **Section 4.1**, this steepening could be related to increased infiltration in this area through emplaced fill from the UST excavation or from the former topographically closed depression, where surface runoff previously ponded, and the former stormwater infiltration pit.

8.2.2 Intermediate Zone

Similar to the Shallow Zone, groundwater flow in the Intermediate Zone during baseline (system-off/non-pumping) conditions appears to be generally to the south-southeast based on previous groundwater elevations and those measured during the 2015 field events, as shown on **Figures 7, 8 and 9**. Horizontal hydraulic gradients ranging from approximately 0.02 to 1.0 feet/feet occur across the TOC Site. As discussed in **Section 4.2,** steepening in the slope of the horizontal gradient is apparent in the vicinity of

the TOC Property's southern boundary and is thought to be related to mounding of groundwater in the area of the TOC Property. This mounding could reflect the combined influences of the following: artificial recharge associated with emplaced fill in the former UST area and the stormwater infiltration pit and depression and/or the apparent presence of low permeability material restricting groundwater flow in that area. As groundwater moves downgradient and encounters higher permeability layers (e.g., gravels and sands), the horizontal hydraulic gradient flattens significantly.

8.2.3 Deep Zone

Groundwater flow in the Deep Zone appears to be generally to the southeast. The horizontal hydraulic gradient has a relatively flat range from approximately 0.005 to 0.0125 feet/feet during the 2015 quarterly events (likely because the wells are screened in high permeability material). Groundwater elevations for the monitoring wells located in the Deep Zone are shown on **Figures 10, 11 and 12**.

8.2.4 Well Screens Intersecting Multiple Zones

As previously mentioned, the well screens in 16 monitoring and remediation wells appear to intersect conditions of multiple groundwater zones. Since the groundwater level elevations for these wells do not correlate with a single groundwater zone, they appear anomalous when included with groundwater elevations representing a single groundwater zone, and therefore, were not used for groundwater elevation contouring. Data for these wells are shown on the Intermediate Zone contour maps identified in **Section 8.2.2**. The groundwater elevation data collected from the wells intersecting two groundwater zones are described below.

8.2.4.1 Shallow-Intermediate Zone Intersect Wells

Fifteen monitoring and remediation wells appear to have screened intervals that intersect both Shallow and Intermediate Zone conditions (MW08, MW09, MW18, MW22, MW24, MW27, MW28, MW29, MW37, MW38, MW43, MW82, MW83, MW88 and MW100). Groundwater elevations for these wells are typically lower than Shallow Zone wells but higher than Intermediate Zone wells due to influence of groundwater conditions from both the Shallow and Intermediate Zones.

8.2.4.2 Intermediate-Deep Zone Intersect Wells

One monitoring well (MW16) appears to have a screened interval that intersects both Intermediate and Deep Zone conditions. The well has been dry during many sampling events but, when measured, the groundwater elevations are typically lower than other Intermediate Zone wells due to influence from the Deep Zone.

8.3 LNAPL Measurements

Measurable LNAPL was observed the Shallow Zone monitoring wells identified below during each of the quarterly field events. The table below provides LNAPL thicknesses measured at these locations.

Measurable LNAPL in Shallow Zone Wells during 2015 Quarterly Events

Location/Well ID	Property	LNAPL Thickness (feet)		
		2Q2015	3Q2015	4Q2015
MW71	Shin/Choi	1.10	0.92	1.57
MW72	Shin/Choi	0.24	0.31	1.34
MW102	Herman	1.16	DRY	DRY

8.4 Groundwater Quality Results

Analytical results for the quarterly field events are provided on **Tables 2-1 through 4-1**. The types of laboratory analyses performed by Friedman & Bruya for the groundwater samples collected are described in **Section 7.3,** and analytical reports for each of the quarterly events are provided as **Appendices B, C and D**. As shown on the attached tables, the analytical results indicate several constituents were consistently detected in groundwater samples at concentrations above the MRLs (i.e., detected concentrations) and above MTCA Method A cleanup levels.

A summary of the analytical results that exceed the MTCA Method A cleanup levels for each well network are presented in the following sections. A summary of the results for each of the three quarterly events is provided in **Sections 9.1 through 9.3**, followed by a list of Conclusions in **Section 9.4**.

8.4.1 Shallow Zone

The Shallow Zone well network includes 20 active monitoring wells and one decommissioned well. The scope of work defined in the IRAWP does not require quarterly groundwater sampling of any of the wells in this zone. As previously discussed, Stantec collected samples from select Shallow Zone wells for the purpose of obtaining additional information regarding contaminant distribution. Additional sampling locations are described in **Section 6.2**.

The tables below identify sample concentrations that meet or exceed MTCA Method A cleanup levels during each of the quarterly events. **Tables 2-1 and 2-2** summarize the analytical results for the groundwater samples collected from Shallow Zone wells. Distribution maps for GRPH and benzene concentrations in the Shallow Zone are provided as **Figures 13 and 14** for the 2Q2015 event, **Figures 15 and 16** for the 3Q2015 event, and **Figures 17 and 18** for the 4Q2015 event.

2Q2015 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Shallow Zone Wells)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID	Property	Analytical Results (µg/L)
GRPH	**800 when benzene is present**	MW71 MW72 MW102 MW104*	Shin/Choi Shin/Choi Herman Herman	LNAPL (1) LNAPL (1) LNAPL (1) 41,000
ORPH	**500**	MW104*	Herman	580
DRPH (a)	**500**	MW104*	Herman	8,000
Benzene	**5**	MW71 MW72 MW102 MW104*	Shin/Choi Shin/Choi Herman Herman	LNAPL (1) LNAPL (1) LNAPL (1) 11
Ethylbenzene	**700**	MW104*	Herman	2,100
Total Xylenes	**1,000**	MW104*	Herman	11,000
EDB	**0.01**	MW104*	Herman	0.1
Acenaphthene	**0.1**	MW104*	Herman	0.16
Fluorene	**0.1**	MW104* MW106	Herman Herman	0.19 0.18
Naphthalene	**160**	MW104*	Herman	360J

3Q2015 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Shallow Zone Wells)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID	Property	Analytical Results (µg/L)
GRPH	**800 when benzene is present**	MW71	Shin/Choi	LNAPL (1)
		MW72	Shin/Choi	LNAPL (1)
		MW102	Herman	Dry / LNAPL (2)
		MW104	Herman	Dry (3)
ORPH	**500**	MW106*	Herman	500
Fluorene	**0.1**	MW106*	Herman	0.13
Benzene	**5**	MW71	Shin/Choi	LNAPL (1)
		MW72	Shin/Choi	LNAPL (1)
		MW102	Herman	Dry / LNAPL (2)
		MW104	Herman	Dry (3)

4Q2015 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Shallow Zone Wells)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID	Property	Analytical Results (µg/L)
GRPH	**800 when benzene is present**	MW71	Shin/Choi	LNAPL (1)
		MW72	Shin/Choi	LNAPL (1)
		MW102	Herman	Dry / LNAPL (2)
		MW104*	Herman	60,000
DRPH (a)	**500**	MW104*	Herman	8,400J
Benzene	**5**	MW71	Shin/Choi	LNAPL (1)
		MW72	Shin/Choi	LNAPL (1)
		MW102	Herman	Dry / LNAPL (2)
		MW104*	Herman	81
Toluene	**1,000**	MW104*	Herman	6,900
Ethylbenzene	**700**	MW104*	Herman	2,100
Total Xylenes	**1,000**	MW104*	Herman	11,000
EDB	**0.01**	MW104*	Herman	0.052
Naphthalene	**160**	MW104*	Herman	520

**Indicates duplicate sample was collected from this location. Analytical results represent maximum concentration of the two samples collected.*

***Includes all PAHs identified on Table 2-2 with the exception of Naphthalene which has a different MTCA cleanup level and is shown on the row below.*

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. Qualifier was assigned based on data validation protocol.

R = Indicates results were rejected.

U = Indicates the compound was undetected at the method reporting limit.

(a) The sample chromatographic pattern does not resemble the diesel extended analysis standard used for quantitation.

(1) Samples were not collected from well location due to presence of product (LNAPL). Exceedance of MTCA cleanup levels is expected due to the presence of LNAPL.

(2) MW102 was dry at the time of sampling during 3Q2015 and 4Q2015 but is included in the tables above because product (LNAPL) is typically observed at this location.

(3) MW104 was dry during 3Q2015 but is included in the tables above because concentrations of GRPH and benzene typically exceed MTCA cleanup levels at this location.

8.4.2 Intermediate Zone

At the time of the quarterly events, the Intermediate Zone well network included 62 active wells (18 of which serve as remediation wells) and four decommissioned wells. As indicated in **Section 5.0**, the pump in remediation well MW95 was turned off on April 30, 2015 (prior to 2Q2015), reducing the number of active remediation wells to 17. As previously mentioned, the pump was turned on for one day at the time of sampling during each quarterly field event. The scope of work defined in the IRAWP requires quarterly groundwater sampling of 28 of the 62 active wells in this zone. As previously discussed, in addition to sampling the required wells, Stantec also sampled several other select Intermediate Zone wells for the purpose of obtaining additional information regarding contaminant distribution. Additional sampling locations are described in **Section 6.2**.

The tables below identify sample concentrations that meet or exceed MTCA Method A cleanup levels during each of the quarterly events. **Tables 3-1 and 3-2** summarize the analytical results for the groundwater samples collected from Intermediate Zone wells. Distribution maps for GRPH and benzene concentrations in the Intermediate Zone are provided as **Figures 19 and 20** for the 2Q2015 event, **Figures 21 and 22** for the 3Q2015 event, and **Figures 23 and 24** for the 4Q2015 event.

2Q2015 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Intermediate Zone)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID (1)	Property	Analytical Results (µg/L)
GRPH	**800 when benzene is present**	MW48 MW69 (2" RW) MW73 MW74	56th Ave ROW Drake Shin/Choi Shin/Choi	2,200 3,100 83,000 60,000
DRPH (a)	**500**	MW73 MW74	Shin/Choi Shin/Choi	2,800 4,500
Benzene	**5**	MW55 MW73 MW74	56th Ave ROW Shin/Choi Shin/Choi	7.6 17,000 13,000
Toluene	**1,000**	MW73 MW74	Shin/Choi Shin/Choi	4,400 8,300
Ethylbenzene	**700**	MW73 MW74	Shin/Choi Shin/Choi	2,400 850
Total Xylenes	**1,000**	MW73 MW74	Shin/Choi Shin/Choi	12,000 4,000
MTBE	**20**	MW74 MW103	Shin/Choi Herman	1,300 380
EDB	**0.01**	MW73 MW74	Shin/Choi Shin/Choi	1.3 0.3
Total Lead	**15**	MW32 (4" RW) MW103	TOC Herman	32.8 17.9
Acenaphthene	**0.1**	MW73	Shin/Choi	0.12
Naphthalene	**160**	MW73	Shin/Choi	280

3Q2015 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Intermediate Zone)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID [1]	Property	Analytical Results (µg/L)
GRPH	**800 when benzene is present**	MW48 MW69 (2" RW) MW73 MW74	56th Ave ROW Drake Shin/Choi Shin/Choi	5,400 4,100 68,000 Dry [2]
DRPH [a]	**500**	MW69 (2" RW) MW73 MW108	Drake Shin/Choi Herman	510 3,500 740
Benzene	**5**	MW48 MW73 MW74	56th Ave ROW Shin/Choi Shin/Choi	5.9 12,000 Dry [2]
Toluene	**1,000**	MW73	Shin/Choi	1,500
Ethylbenzene	**700**	MW73	Shin/Choi	1,700
Total Xylenes	**1,000**	MW73	Shin/Choi	8,300
MTBE	**20**	MW73	Shin/Choi	21
EDB	**0.01**	MW73	Shin/Choi	0.1
Total Lead	**15**	MW32 (2" RW) MW48	TOC 56th Ave ROW	120 16.8
Acenaphthene	**0.1**	MW73	Shin/Choi	0.16
Naphthalene	**160**	MW73	Shin/Choi	320

4Q2015 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Intermediate Zone)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID [1]	Property	Analytical Results (µg/L)
GRPH	**800 when benzene is present**	MW48 MW69 (2" RW) MW73 MW74	56th Ave ROW Drake Shin/Choi Shin/Choi	11,000 2,700 55,000 Dry [2]
DRPH [a]	**500**	MW69 (2" RW) MW73 MW101 (4" RW)	Drake Shin/Choi Drake	530 2,300 610
Benzene	**5**	MW48 MW73 MW74	56th Ave ROW Shin/Choi Shin/Choi	32 11,000 Dry [2]
Ethylbenzene	**700**	MW73	Shin/Choi	1,500
Total Xylenes	**1,000**	MW73	Shin/Choi	6,100
MTBE	**20**	MW73	Shin/Choi	150
EDB	**0.01**	MW73	Shin/Choi	0.11
Total Lead	**15**	MW48	56th Ave ROW	25.6
Acenaphthene	**0.1**	MW73	Shin/Choi	0.12
Naphthalene	**160**	MW73	Shin/Choi	320

[a] The sample chromatographic pattern does not resemble the diesel extended analysis standard used for quantitation.

[1] Remediation wells are identified as "RW" and are either 2 or 4 inches in diameter.

[2] Although MW74 was dry during 3Q2015 and 4Q2015, it is included on the tables above because product is typically observed at this location.

8.4.3 Deep Zone

The Deep Zone well network includes six active monitoring wells. The scope of work defined in the IRAWP does not require quarterly groundwater sampling of any of the active wells installed in this zone.

8.4.4 Well Screens Intersecting Multiple Zones

As described in **Section 4.4**, 15 active wells (four of which serve as remediation wells) and one decommissioned well appear to have wells screens that intersect conditions of multiple groundwater zones. The groundwater quality results for monitoring wells in these zones are discussed in the following sections. GRPH and benzene concentrations in wells that intersect multiple groundwater zones are shown on the Intermediate Zone distribution maps provided as **Figures 19 and 20** for the 2Q2015 event, **Figures 21 and 22** for the 3Q2015 event, and **Figures 23 and 24** for the 4Q2015 event.

8.4.4.1 Shallow-Intermediate Zone Intersect Wells

The Shallow-Intermediate Zone intersect well network includes 14 active wells (four of which serve as remediation wells) and one decommissioned well. The scope of work defined in the IRAWP requires quarterly groundwater sampling of two (MW09 and MW27) of the 14 active wells in this zone. As shown on **Table 4-1**, the analytical results of the samples collected did not exceed MTCA Method A cleanup levels for 2Q2015 or 4Q2015. The table below identifies concentrations of groundwater samples that meet or exceed MTCA Method A cleanup levels during the 3Q2015 event. Since MTBE, EDC, EDB, lead and PAHs were not analyzed for these samples, a groundwater quality results table for common fuel additives is not provided for this zone.

3Q2015 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Shallow-Intermediate Zone Intersect)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID	Property	Analytical Results (µg/L)
GRPH	**800 when benzene is present**	MW27 (2" RW)	TOC	910

8.4.4.2 Intermediate-Deep Zone Intersect Wells

The scope of work defined in the IRAWP does not require quarterly groundwater monitoring for the one monitoring well (MW16 located within the 242nd Street ROW) that intersects Intermediate and Deep Zone conditions. Groundwater sampling for MW16 is performed during the annual (first quarter) event.

8.5 QA/QC & Data Quality Results

As described in **Section 6.0**, the scope of work for the quarterly groundwater monitoring events included collection and laboratory analyses of groundwater samples for QA/QC purposes. Stantec performed a QA/QC (data validation) review of the analytical results, which included a review of accuracy and precision of data supplied by the laboratory per EPA guidelines. The data validation resulted in assignment of qualifiers to several sample results. Analytical results for field duplicates and method duplicates and data validation qualifiers are provided on the attached groundwater quality results tables. Analytical results for all other QA/QC samples, including water blanks and equipment/rinsate blanks are provided in the laboratory reports provided as **Appendices B, C and D**.

9.0 SUMMARY OF RESULTS & CONCLUSIONS

A summary of the results and a list of conclusions for each of the 2015 quarterly groundwater monitoring events are provided in **Sections 9.1 and 9.2**, respectively.

9.1 Summary of 2Q2015 Results

9.1.1 DTW/DTP Level Measurements

- DTW level measurements ranged from 11.76 feet bgs for MW61 (a Shallow Zone well located within the 56th Avenue ROW) to 46.10 feet bgs for MW16 (an Intermediate-Deep Zone Intersect well located within the 242nd Street ROW).
- Measurable LNAPL was observed in three Shallow Zone monitoring wells (MW71 and MW72 located on the Shin/Choi Property and MW102 located on the Herman Property).

9.1.2 Groundwater Quality

- **Shallow Zone:** Concentrations did not exceed MTCA Method A cleanup levels in groundwater samples collected from the TOC Site. Locations of groundwater samples that exceeded MTCA cleanup levels during 2Q2015 are described below. Samples were not collected from MW71 and MW72 (located on the Shin/Choi Property) due to the presence of product in the wells.
    - As shown on **Figures 13 and 14**, GRPH and benzene concentration exceeding MTCA A cleanup levels were observed near the northern boundary of the Herman Property at MW104. Since LNAPL was observed in MW102 on the Herman Property and MW71 and MW72 on the Shin/Choi Property, additional GRPH and benzene plume areas were added to include these three locations.
    - In addition, ORPH, DRPH, ethylbenzene, total xylenes, EDB and several PAHs (acenaphthene, fluorene and naphthalene) exceeded MTCA A cleanup levels in the groundwater sample collected from MW104. Fluorene also exceeded cleanup levels in the sample collected from MW106 (located in the southeast area of the Herman Property).
- **Intermediate Zone:** Concentrations exceeding MTCA Method A cleanup levels were detected in groundwater samples collected from the Intermediate Zone wells as described below.
    - As shown on **Figures 19 and 20,** concentrations of GRPH and/or benzene exceeding MTCA cleanup levels were focused in the following areas:
        - MW48 – 56th Avenue ROW: located on the east side of the ROW, adjacent to the property line shared by the TOC/Farmasonis and Drake Properties;
        - MW55 – 56th Avenue ROW: located on the west side of the ROW (across the street from the property line shared by the TOC/Farmasonis and Drake Properties);
        - MW69 – Drake Property: located in the southwest portion of the property;
        - MW73 – Shin/Choi Property: located in the southwest portion of the property in the vicinity of the historic excavation area; and
        - MW74 – Shin/Choi Property: located in the northern portion of the property adjacent to the Herman Property.

  - Concentrations of other constituents exceeding MTCA cleanup levels were focused in the following areas:
    - MW32 – TOC Property: The concentration of total lead exceeded the cleanup level near the western property line, adjacent to the 56th Avenue ROW.
    - MW73 and MW74 – Shin/Choi Property: Concentrations of DRPH, toluene, ethylbenzene, total xylenes, MTBE, EDB, and PAHs (acenaphthene and naphthalene) exceeded cleanup levels in groundwater samples collected from at least one of these wells.
    - MW103 – Herman Property: Concentrations of MTBE and total lead exceeded cleanup levels in the southwest area of the property, downgradient from the historic UST excavation area.

- **Deep Zone:** Groundwater samples were not collected from wells located in the Deep Zone during this quarterly event (per the scope of work defined in the IRAWP).
- **Shallow-Intermediate Zone Intersect Wells:** Concentrations of samples collected from Shallow-Intermediate Zone Intersect wells during this quarterly event did not exceed MTCA cleanup levels.
- **Intermediate-Deep Zone Intersect Wells:** Groundwater samples were not collected from the well located in the Intermediate-Deep Zone during this quarterly event (per the scope of work defined in the IRAWP).

9.2 Summary of 3Q2015 Results

9.2.1 DTW/DTP Level Measurements

- DTW level measurements ranged from 14.71 feet bgs for MW06 (a Shallow Zone well located on the TOC Property) to 46.59 feet bgs for MW26 (a Deep Zone well located on the TOC Property).
- Measurable LNAPL was observed in two Shallow Zone monitoring wells (MW71 and MW72 located on the Shin/Choi Property). Measurable LNAPL is typically observed in MW102 (located on the Herman Property); however, the well was noted as “dry” during the 3Q2015 event.

9.2.2 Groundwater Quality Results

- **Shallow Zone:** Concentrations did not exceed MTCA Method A cleanup levels in groundwater samples collected from the TOC Site. Locations of groundwater samples that exceeded MTCA cleanup levels during 3Q2015 are described below. Samples were not collected from MW71 and MW72 (located on the Shin/Choi Property) due to the presence of product in the wells.
  - As shown on **Figures 15 and 16**, concentrations of GRPH and benzene did not exceed MTCA cleanup levels in any of the groundwater samples collected. Since LNAPL was observed in MW71 and MW72 on the Shin/Choi Property during the DTW/DTP measurement event and is typically observed in MW102 on the Herman Property (which was dry during the 3Q2015 event), GRPH and benzene plume areas were added to include these locations. MW104 on the Herman Property was also dry during 3Q2015 but a plume area is shown around the well because concentrations of GRPH and benzene typically exceed MTCA cleanup levels at this location.
  - Concentrations of ORPH and fluorene equaled or exceeded MTCA cleanup levels in the groundwater sample collected from MW106 (located in the southwest area of the Herman Property).

- **Intermediate Zone:** Concentrations exceeding MTCA Method A cleanup levels were detected in groundwater samples collected from the Intermediate Zone wells as described below.
    - As shown on **Figures 21and 22,** concentrations of GRPH and/or benzene exceeding MTCA A cleanup levels were focused in the following areas:
        - MW48 – 56th Avenue ROW: located on the east side of the ROW, adjacent to the property line shared by the TOC/Farmasonis and Drake Properties;
        - MW69 – Drake Property: located in the southwest portion of the property;
        - MW73 – Shin/Choi Property: the southwest portion of the property in the vicinity of the historic excavation area; and
        - MW74 – Shin/Choi Property: in the northern portion of the property adjacent to the Herman Property *(Note: Although MW74 could not be sampled due to insufficient groundwater sample volume during 3Q2015, the plume area was extended to include this location since GRPH and benzene concentrations at this location are typically observed above cleanup levels.)*
    - Concentrations of other constituents exceeding MTCA cleanup levels were focused in the following areas:
        - MW32 – TOC Property: The concentration of total lead exceeded the cleanup level near the western property line, adjacent to the 56th Avenue ROW.
        - MW48 – 56th Avenue ROW: The concentration of total lead exceeded the cleanup level on the east side of the ROW, adjacent to the property line shared by the TOC/Farmasonis and Drake Properties.
        - MW69 – Drake Property: The DRPH concentration exceeded cleanup levels in the southwest portion of the property;
        - MW73 – Shin/Choi Property: Concentrations of DRPH, toluene, ethylbenzene, total xylenes, MTBE, EDB, and PAHs (acenaphthene and napthalene) exceeded cleanup levels in the southwest portion of the property in the vicinity of the historic excavation area; and
        - MW108 – Herman Property: The concentration of DRPH exceeded the cleanup level in the northeast portion of the property.
- **Deep Zone:** Groundwater samples were not collected from wells located in the Deep Zone during this quarterly event (per the scope of work defined in the IRAWP).
- **Shallow-Intermediate Zone Intersect Wells:** As shown on **Figure 21**, the concentration of GRPH exceeded the MTCA cleanup level in the groundwater sample collected from MW27 located in the northwest portion of the TOC Property (in the vicinity of the historic excavation area).
- **Intermediate-Deep Zone Intersect Wells:** Groundwater samples were not collected from the well located in the Intermediate-Deep Zone during this quarterly event (per the scope of work defined in the IRAWP).

9.3 Summary of 4Q2015 Results

9.3.1 DTW/DTP Level Measurements

- DTW level measurements ranged from 9.91 feet bgs for MW61 (located within the 56th Avenue ROW in the Shallow Zone) to 48.98 feet bgs for MW26 (located on the TOC Property in the Deep Zone).
- Measurable LNAPL was observed in two Shallow Zone monitoring wells (MW71 and MW72 located on the Shin/Choi Property. Measurable LNAPL is typically observed in MW102 (located on the Herman Property); however, the well was noted as "dry" during the 4Q2015 event.

9.3.2 Groundwater Quality Results

- **Shallow Zone:** Concentrations did not exceed MTCA Method A cleanup levels in groundwater samples collected from the TOC Site. Locations of groundwater samples that exceeded MTCA cleanup levels during 4Q2015 are described below. Samples were not collected from MW71 and MW72 (located on the Shin/Choi Property) due to the presence of product in the wells.
    - As shown on **Figures 17 and 18,** GRPH and benzene concentrations exceeded MTCA cleanup levels in groundwater samples collected from MW104 (located near the northern boundary of the Herman Property). Since LNAPL was observed in MW71 and MW72 on the Shin/Choi Property during the DTW/DTP measurement event and is typically observed in MW102 on the Herman Property (which was dry during the 4Q2015 event), GRPH and benzene plume areas were added to include these locations.
    - Concentrations of DRPH, toluene, ethylbenzene, total xylenes, EDB and naphthalene exceeded the MTCA cleanup levels in the groundwater sample collected from MW104 on the Herman Property. Concentrations of all PAH constituents analyzed (excluding napthalene) were not detected at or above the method reporting limits (MRLs) in the sample collected from MW104; however, the MRLs were elevated due to sample dilution and exceeded the MTCA cleanup level. Since historical data do not indicate that these PAHs are typically detected at elevated concentrations at this location, the data are considered to reflect non-detect concentrations.
- **Intermediate Zone:** Concentrations exceeding MTCA Method A cleanup levels were detected in groundwater samples collected from the Intermediate Zone wells described below.
    - As shown on **Figures 23 and 24,** concentrations of GRPH and/or benzene exceeding MTCA cleanup levels were focused in the following areas:
        - MW48 – 56th Avenue ROW: located on the east side of the ROW, adjacent to the property line shared by the TOC/Farmasonis and Drake Properties;
        - MW69 – Drake Property: located in the southwest portion of the property;
        - MW73 – Shin/Choi Property: the southwest portion of the property in the vicinity of the historic excavation area; and
        - MW74 – Shin/Choi Property: in the northern portion of the property adjacent to the Herman Property. *(Note: Although MW74 could not be sampled due to insufficient groundwater sample volume during 4Q2015, the plume area was extended to include this location since GRPH and benzene concentrations at this location are typically observed above cleanup levels.)*

  - Concentrations of other constituents exceeding MTCA cleanup levels were focused in the following areas:
    - MW48 – 56th Avenue ROW: The concentration of total lead exceeded the cleanup level on the east side of the ROW, adjacent to the property line shared by the TOC/Farmasonis and Drake Properties;
    - MW69 and MW101– Drake Property: The DRPH concentration exceeded cleanup levels in the southern portion of the property;
    - MW73 – Shin/Choi Property: Concentrations of DRPH, ethylbenzene, total xylenes, MTBE, EDB, and PAHs (acenaphthene and napthalene) exceeded cleanup levels in the southwest area of the property near the historic excavation area; and

- **Deep Zone:** Groundwater samples were not collected from wells located in the Deep Zone during this quarterly event (per the scope of work defined in the IRAWP).
- **Shallow-Intermediate Zone Intersect Wells:** Concentrations of constituents analyzed did not exceed MTCA Method A cleanup levels in groundwater samples collected from Shallow-Intermediate Zone Intersect wells during this quarterly event.
- **Intermediate-Deep Zone Intersect Wells:** Groundwater samples were not collected from the well located in the Intermediate-Deep Zone during this quarterly event (per the scope of work defined in the IRAWP).

9.4 Conclusions

A list of conclusions based on the results from the 2015 quarterly events is provided below:

- The overall direction of groundwater flow through the Shallow, Intermediate, and Deep Zones is toward the south-southeast.

- Shallow Zone groundwater impacts from petroleum hydrocarbons are not currently observed at the TOC Site. Impacts to Shallow Zone groundwater exceeding MTCA Method A cleanup levels were limited to the Herman and Shin/Choi Properties during the reporting period.

- LNAPL has been consistently observed in Shallow Zone wells on the Shin/Choi Property and typically in the southernmost Shallow Zone well on the Herman Property (adjacent to the Shin/Choi Property line). Based on historical information (presented in the 2014 and 2015 Annual Groundwater Monitoring Reports [Stantec 2014 and Stantec 2015]), and the lack of current and historical measurable LNAPL in the Shallow Zone wells on the Drake Property (located directly upgradient of the wells containing LNAPL), the source of the free product in MW71, MW72 and MW102 appears to be different than that of the TOC Property and may originate from USTs historically or currently located on the Herman and Shin/Choi Properties.

- Intermediate Zone groundwater impacts from petroleum hydrocarbons on the TOC Site are isolated to the 56th Avenue ROW in the area adjacent to the Drake and TOC/Farmasonis property line and north of the shared Drake and Herman Property line. Additional impacts from petroleum hydrocarbons in the Intermediate Zone are observed on the Shin/Choi Property in the area adjacent to the Herman Property line and in the area of the historic UST excavation. Based on the current and historical concentration distribution patterns and comparison of contaminant concentrations on the TOC Site with those in the southernmost plume area (located on the Shin/Choi Property), the Intermediate Zone impacts on the TOC Site appear to be separate from those on the Shin/Choi Property.

- Impacts to groundwater from petroleum hydrocarbons were not observed in Shallow-Intermediate Zone Intersect wells sampled during the 2015 quarterly events. Since impacts to groundwater are no longer observed in Deep Zone and Intermediate-Deep Zone Intersect wells, quarterly groundwater sampling is not required. Groundwater samples are only collected from these zones during the annual (first quarter) event (per the scope of work defined in the IRAWP).

- The current vertical and lateral distributions of petroleum hydrocarbons in the three groundwater zones support the working hypothesis that contamination originating from the former USTs on the TOC Property has been mostly remediated with limited petroleum-impacted groundwater remaining within the Intermediate Zone on the TOC, TOC/Farmasonis and Drake Properties.

10.0 FUTURE GROUNDWATER TASKS

The annual/first quarter 2016 groundwater monitoring event was performed by HydroCon from February 2 through 19, 2016. The *2016 Annual Groundwater Monitoring Report* will be prepared by Stantec and submitted to Ecology by June 30, 2016. The table below identifies the month each of the 2016 quarterly groundwater monitoring events will take place. Reports for quarterly groundwater monitoring events will be submitted by the end of the following quarter.

2016 Quarterly Groundwater Monitoring Event Schedule

Quarter	Field Event Dates
2Q2016	May 2016
3Q2016	August 2016
4Q2016	November 2016

11.0 REFERENCES

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Tables

TABLE 1-1
Depth-to-Groundwater Level and Product Thickness Measurements (System Off)
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Date	Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW01	TOC	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 10/02/2009**
MW02	TOC	06/15/2015	10:22	358.71	12.78	345.93	--	
MW02	TOC	09/28/2015	10:21	358.71	16.47	342.24	--	
MW02	TOC	12/14/2015	12:57	358.71	12.76	345.95	--	
MW03	TOC	06/15/2015	10:12	361.85	14.31	347.54	--	
MW03	TOC	09/28/2015	10:11	361.85	DRY	DRY	DRY	
MW03	TOC	12/14/2015	10:31	361.85	13.78	348.07	--	
MW04	56th Ave ROW	06/15/2015	10:08	361.96	12.97	348.99	--	
MW04	56th Ave ROW	09/28/2015	10:10	361.96	DRY	DRY	DRY	
MW04	56th Ave ROW	12/14/2015	10:29	361.96	DRY	DRY	DRY	
MW05	242nd St ROW	06/15/2015	10:02	363.70	12.95	350.75	--	
MW05	242nd St ROW	09/28/2015	10:02	363.70	DRY	DRY	DRY	
MW05	242nd St ROW	12/14/2015	10:24	363.70	14.20	349.50	--	
MW06	TOC	06/15/2015	10:45	358.98	14.26	344.72	--	
MW06	TOC	09/28/2015	10:36	358.98	14.71	344.27	--	
MW06	TOC	12/14/2015	11:03	358.98	DRY	DRY	DRY	
MW07	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW08	56th Ave ROW	06/15/2015	13:36	360.34	22.89	337.45	--	
MW08	56th Ave ROW	09/28/2015	12:19	360.34	28.11	332.23	--	
MW08	56th Ave ROW	12/14/2015	12:51	360.34	24.65	335.69	--	
MW09	TOC	06/15/2015	10:15	360.32	27.02	333.30	--	
MW09	TOC	09/28/2015	10:12	360.32	DRY	DRY	DRY	
MW09	TOC	12/14/2015	10:32	360.32	30.20	330.12	--	
MW10	TOC	06/15/2015	10:17	357.91	33.24	324.67	--	
MW10	TOC	09/28/2015	10:28	357.91	DRY	DRY	DRY	
MW10	TOC	12/14/2015	10:55	357.91	DRY	DRY	DRY	
MW11 (4" RW)	TOC	06/15/2015	8:52	362.34	24.76	337.58	--	
MW11 (4" RW)	TOC	09/28/2015	9:07	362.34	24.48	337.86	--	
MW11 (4" RW)	TOC	12/14/2015	9:33	362.34	27.68	334.66	--	
MW12	56th Ave ROW	06/15/2015	11:20	357.65	11.78	345.87	--	
MW12	56th Ave ROW	09/28/2015	11:20	357.65	15.85	341.80	--	
MW12	56th Ave ROW	12/14/2015	11:54	357.65	12.15	345.50	--	
MW13	56th Ave ROW	06/15/2015	11:21	357.34	DRY	DRY	DRY	
MW13	56th Ave ROW	09/28/2015	11:21	357.34	DRY	DRY	DRY	
MW13	56th Ave ROW	12/14/2015	11:54	357.34	DRY	DRY	DRY	
MW14	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW15	TOC	06/15/2015	8:36	357.56	41.14	316.42	--	
MW15	TOC	09/28/2015	9:14	357.56	DRY	DRY	DRY	
MW15	TOC	12/14/2015	9:08	357.56	DRY	DRY	DRY	
MW16	242nd St ROW	06/15/2015	10:00	365.18	46.10	319.08	--	
MW16	242nd St ROW	09/28/2015	10:00	365.18	DRY	DRY	DRY	
MW16	242nd St ROW	12/14/2015	10:23	365.18	DRY	DRY	DRY	
MW17	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW18 (4" RW)	TOC	06/15/2015	8:33	357.91	DRY	DRY	DRY	
MW18 (4" RW)	TOC	09/28/2015	8:55	357.91	DRY	DRY	DRY	
MW18 (4" RW)	TOC	12/14/2015	9:05	357.91	DRY	DRY	DRY	
MW19	TOC	06/15/2015	10:22	358.86	14.63	344.23	--	
MW19	TOC	09/28/2015	10:24	358.86	DRY	DRY	DRY	
MW19	TOC	12/14/2015	10:52	358.86	18.21	340.65	--	
MW20	TOC	06/15/2015	10:26	359.93	33.88	326.05	--	
MW20	TOC	09/28/2015	10:19	359.93	DRY	DRY	DRY	
MW20	TOC	12/14/2015	12:56	359.93	DRY	DRY	DRY	
MW21	TOC	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 04/16/2012**
MW22	TOC	06/15/2015	10:33	358.52	29.46	329.06	--	
MW22	TOC	09/28/2015	10:22	358.52	DRY	DRY	DRY	
MW22	TOC	12/14/2015	10:56	358.52	30.14	328.38	--	
MW23	TOC	06/15/2015	10:57	357.08	39.14	317.94	--	
MW23	TOC	09/28/2015	10:41	357.08	DRY	DRY	DRY	
MW23	TOC	12/14/2015	11:09	357.08	DRY	DRY	DRY	
MW24 (4" RW)	TOC	06/15/2015	8:40	361.97	26.71	335.26	--	
MW24 (4" RW)	TOC	09/28/2015	9:01	361.97	DRY	DRY	DRY	
MW24 (4" RW)	TOC	12/14/2015	9:22	361.97	DRY	DRY	DRY	
MW25	TOC	06/15/2015	10:16	358.70	30.37	328.33	--	
MW25	TOC	09/28/2015	10:17	358.70	DRY	DRY	DRY	
MW25	TOC	12/14/2015	10:35	358.70	DRY	DRY	DRY	
MW26	TOC	06/15/2015	10:05	363.81	45.51	318.30	--	Possible water infiltration.
MW26	TOC	09/28/2015	10:07	363.81	46.59	317.22	--	
MW26	TOC	12/14/2015	10:27	363.81	48.98	314.83	--	

TABLE 1-1
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Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Date	Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW27 (2" RW)	TOC	06/15/2015	NM	362.51	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW27 (2" RW)	TOC	09/28/2015	NM	362.51	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW27 (2" RW)	TOC	12/14/2015	NM	362.51	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW28	TOC	06/15/2015	10:39	358.41	28.43	329.98	--	
MW28	TOC	09/28/2015	10:30	358.41	DRY	DRY	DRY	
MW28	TOC	12/14/2015	12:59	358.41	28.70	329.71	--	
MW29 (2" RW)	TOC	06/15/2015	NM	358.93	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW29 (2" RW)	TOC	09/28/2015	NM	358.93	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW29 (2" RW)	TOC	12/14/2015	NM	358.93	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW30	TOC/Farmasonis	06/15/2015	NM	356.46	NM	NM	NM	wellhead inaccessible (car parked over well)
MW30	TOC/Farmasonis	09/28/2015	10:50	356.46	42.20	314.26	--	
MW30	TOC/Farmasonis	12/14/2015	11:19	356.46	42.66	313.80	--	
MW31 (2" RW)	TOC/Farmasonis	06/15/2015	NM	357.08	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW31 (2" RW)	TOC/Farmasonis	09/28/2015	NM	357.08	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW31 (2" RW)	TOC/Farmasonis	12/14/2015	NM	357.08	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW32 (4" RW)	TOC	06/15/2015	8:38	359.95	24.15	335.80	--	
MW32 (4" RW)	TOC	09/28/2015	8:58	359.95	27.88	332.07	--	
MW32 (4" RW)	TOC	12/14/2015	9:19	359.95	27.46	332.49	--	
MW33	TOC	06/15/2015	10:34	358.24	DRY	DRY	DRY	
MW33	TOC	09/28/2015	10:31	358.24	DRY	DRY	DRY	
MW33	TOC	12/11/2015	10:40	358.24	34.25	323.99	--	Well was dry during measurement event on 12/14/2015. Therefore, the measurement provided was obtained at the time of sample collection.
MW34	TOC	06/15/2015	10:50	357.88	14.00	343.88	--	
MW34	TOC	09/28/2015	10:40	357.88	DRY	DRY	DRY	
MW34	TOC	12/14/2015	11:07	357.88	10.52	347.36	--	
MW35	TOC	06/15/2015	10:49	358.46	DRY	DRY	DRY	
MW35	TOC	09/28/2015	10:39	358.46	DRY	DRY	DRY	
MW35	TOC	12/14/2015	11:06	358.46	DRY	DRY	DRY	
MW36	TOC	06/15/2015	14:00	357.98	41.86	316.12	--	
MW36	TOC	09/28/2015	12:23	357.98	DRY	DRY	DRY	
MW36	TOC	12/14/2015	11:04	357.98	42.64	315.34	--	
MW37	TOC	06/15/2015	10:47	358.90	22.45	336.45	--	
MW37	TOC	09/28/2015	10:37	358.90	31.36	327.54	--	
MW37	TOC	12/14/2015	11:01	358.90	28.65	330.25	--	
MW38	TOC	06/15/2015	10:06	364.42	20.98	343.44	--	
MW38	TOC	09/28/2015	10:04	364.42	26.16	338.26	--	
MW38	TOC	12/14/2015	10:20	364.42	23.66	340.76	--	
MW39	TOC/Farmasonis	06/15/2015	11:01	355.88	39.36	316.52	--	
MW39	TOC/Farmasonis	09/28/2015	10:54	355.88	45.25	310.63	--	Data may be anomolous based on groundwater elevations for surrounding wells.
MW39	TOC/Farmasonis	12/14/2015	11:21	355.88	42.52	313.36	--	
MW40	TOC/Farmasonis	06/15/2015	11:27	356.32	39.32	317.00	--	
MW40	TOC/Farmasonis	09/28/2015	11:14	356.32	42.23	314.09	--	
MW40	TOC/Farmasonis	12/14/2015	13:01	356.32	42.61	313.71	--	
MW41 (2" RW)	TOC/Farmasonis	06/15/2015	NM	356.14	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW41 (2" RW)	TOC/Farmasonis	09/28/2015	NM	356.14	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW41 (2" RW)	TOC/Farmasonis	12/14/2015	NM	356.14	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW42	TOC/Farmasonis	06/15/2015	11:25	356.43	DRY	DRY	DRY	
MW42	TOC/Farmasonis	09/28/2015	11:25	356.43	DRY	DRY	DRY	
MW42	TOC/Farmasonis	12/14/2015	11:54	356.43	DRY	DRY	DRY	
MW43	56th Ave ROW	06/15/2015	13:40	358.84	36.20	322.64	--	
MW43	56th Ave ROW	09/28/2015	12:15	358.84	DRY	DRY	DRY	
MW43	56th Ave ROW	12/14/2015	13:04	358.84	34.77	324.07	--	
MW44	56th Ave ROW	06/15/2015	11:50	354.93	DRY	DRY	DRY	
MW44	56th Ave ROW	09/28/2015	11:42	354.93	DRY	DRY	DRY	
MW44	56th Ave ROW	12/14/2015	12:10	354.93	DRY	DRY	DRY	
MW45	56th Ave ROW	06/15/2015	11:22	356.49	DRY	DRY	DRY	
MW45	56th Ave ROW	09/28/2015	11:23	356.49	DRY	DRY	DRY	
MW45	56th Ave ROW	12/11/2015	11:15	356.49	39.37	317.12	--	Well was dry during measurement event on 12/14/2015. Therefore, the measurement provided was obtained at the time sample collection was attempted.
MW46	56th Ave ROW	06/15/2015	13:46	357.00	41.17	315.83	--	
MW46	56th Ave ROW	09/28/2015	12:11	357.00	DRY	DRY	DRY	
MW46	56th Ave ROW	12/14/2015	13:10	357.00	DRY	DRY	DRY	
MW47	56th Ave ROW	06/15/2015	13:49	355.47	41.16	314.31	--	
MW47	56th Ave ROW	09/28/2015	12:07	355.47	DRY	DRY	DRY	
MW47	56th Ave ROW	12/14/2015	13:14	355.47	41.64	313.83	--	

TABLE 1-1
Depth-to-Groundwater Level and Product Thickness Measurements (System Off)
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Date	Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW48	56th Ave ROW	06/15/2015	11:30	355.41	40.38	315.03	--	
MW48	56th Ave ROW	09/28/2015	11:29	355.41	43.38	312.03	--	
MW48	56th Ave ROW	12/14/2015	12:05	355.41	43.68	311.73	--	
MW49	56th Ave ROW	06/15/2015	11:24	356.44	41.04	315.40	--	
MW49	56th Ave ROW	09/28/2015	11:24	356.44	43.75	312.69	--	
MW49	56th Ave ROW	12/14/2015	11:57	356.44	44.11	312.33	--	
MW50	56th Ave ROW	06/15/2015	13:30	361.99	35.42	326.57	--	
MW50	56th Ave ROW	09/28/2015	12:21	361.99	DRY	DRY	DRY	
MW50	56th Ave ROW	12/14/2015	12:47	361.99	DRY	DRY	DRY	
MW51	56th Ave ROW	06/15/2015	12:33	352.66	39.41	313.25	--	
MW51	56th Ave ROW	09/28/2015	12:32	352.66	41.99	310.67	--	
MW51	56th Ave ROW	12/14/2015	13:18	352.66	42.22	310.44	--	
MW52	56th Ave ROW	06/15/2015	13:50	355.61	41.38	314.23	--	
MW52	56th Ave ROW	09/28/2015	12:07	355.61	DRY	DRY	DRY	
MW52	56th Ave ROW	12/14/2015	13:16	355.61	DRY	DRY	DRY	
MW53	56th Ave ROW	06/15/2015	13:38	359.85	41.49	318.36	--	
MW53	56th Ave ROW	09/28/2015	12:16	359.85	44.49	315.36	--	
MW53	56th Ave ROW	12/14/2015	12:53	359.85	45.26	314.59	--	
MW54	TOC/Farmasonis	06/15/2015	11:17	357.93	12.68	345.25	--	
MW54	TOC/Farmasonis	09/28/2015	11:16	357.93	16.11	341.82	--	
MW54	TOC/Farmasonis	12/14/2015	11:44	357.93	13.73	344.20	--	
MW55	56th Ave ROW	06/15/2015	13:47	356.50	40.91	315.59	--	
MW55	56th Ave ROW	09/28/2015	12:09	356.50	44.40	312.10	--	
MW55	56th Ave ROW	12/14/2015	13:12	356.50	44.74	311.76	--	
MW56	TOC/Farmasonis	06/15/2015	11:15	357.49	42.02	315.47	--	
MW56	TOC/Farmasonis	09/28/2015	11:18	357.49	44.78	312.71	--	
MW56	TOC/Farmasonis	12/14/2015	11:45	357.49	45.00	312.49	--	
MW57 (4" RW)	TOC/Farmasonis	06/15/2015	9:09	356.42	41.43	314.99	--	
MW57 (4" RW)	TOC/Farmasonis	09/28/2015	9:26	356.42	44.49	311.93	--	
MW57 (4" RW)	TOC/Farmasonis	12/14/2015	9:48	356.42	DRY	DRY	DRY	
MW58	TOC/Farmasonis	06/15/2015	NM	355.40	NM	NM	NM	wellhead inaccessible (trailer parked over well)
MW58	TOC/Farmasonis	09/28/2015	11:27	355.40	43.86	311.54	--	
MW58	TOC/Farmasonis	12/14/2015	12:02	355.40	44.02	311.38	--	
MW59	TOC/Farmasonis	06/15/2015	11:14	356.51	41.08	315.43	--	
MW59	TOC/Farmasonis	09/28/2015	11:13	356.51	44.84	311.67	--	
MW59	TOC/Farmasonis	12/14/2015	11:41	356.51	44.05	312.46	--	
MW60	56th Ave ROW	06/15/2015	13:42	358.58	41.97	316.61	--	
MW60	56th Ave ROW	09/28/2015	12:13	358.58	44.31	314.27	--	
MW60	56th Ave ROW	12/14/2015	13:05	358.58	44.97	313.61	--	
MW61	56th Ave ROW	06/15/2015	13:45	357.17	11.76	345.41	--	
MW61	56th Ave ROW	09/28/2015	12:12	357.17	15.98	341.19	--	
MW61	56th Ave ROW	12/14/2015	13:08	357.17	9.91	347.26	--	
MW62	56th Ave ROW	06/15/2015	13:35	360.50	13.58	346.92	--	
MW62	56th Ave ROW	09/28/2015	12:18	360.50	DRY	DRY	DRY	
MW62	56th Ave ROW	12/14/2015	12:51	360.50	11.03	349.47	--	
MW63	56th Ave ROW	06/15/2015	11:51	355.11	40.69	314.42	--	
MW63	56th Ave ROW	09/28/2015	11:41	355.11	43.60	311.51	--	
MW63	56th Ave ROW	12/14/2015	12:09	355.11	43.86	311.25	--	
MW64	56th Ave ROW	06/15/2015	11:54	355.18	38.65	316.53	--	
MW64	56th Ave ROW	09/28/2015	11:40	355.18	40.72	314.46	--	
MW64	56th Ave ROW	12/14/2015	12:08	355.18	41.49	313.69	--	
MW65	Drake	06/15/2015	12:02	353.08	39.49	313.59	--	
MW65	Drake	09/28/2015	11:50	353.08	42.39	310.69	--	
MW65	Drake	12/14/2015	12:17	353.08	42.36	310.72	--	
MW66	TOC/Farmasonis	06/15/2015	11:00	355.75	40.34	315.41	--	
MW66	TOC/Farmasonis	09/28/2015	10:53	355.75	43.05	312.70	--	
MW66	TOC/Farmasonis	12/14/2015	11:18	355.75	43.20	312.55	--	
MW67	Drake	06/15/2015	11:57	355.73	14.00	341.73	--	
MW67	Drake	09/28/2015	11:45	355.73	18.49	337.24	--	
MW67	Drake	12/14/2015	12:12	355.73	15.51	340.22	--	
MW68	Drake	06/15/2015	11:59	355.11	13.80	341.31	--	
MW68	Drake	09/28/2015	11:48	355.11	18.14	336.97	--	
MW68	Drake	12/14/2015	12:15	355.11	15.06	340.05	--	
MW69 (2" RW)	Drake	06/15/2015	NM	353.76	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW69 (2" RW)	Drake	09/28/2015	NM	353.76	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW69 (2" RW)	Drake	12/14/2015	NM	353.76	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.

TABLE 1-1
Depth-to-Groundwater Level and Product Thickness Measurements (System Off)
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Date	Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW70 (2" RW)	Drake	06/15/2015	NM	354.17	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW70 (2" RW)	Drake	09/28/2015	NM	354.17	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW70 (2" RW)	Drake	12/14/2015	NM	354.17	NM	NM	NM	Water probe is too large to fit past 2" pump tubing.
MW71	Shin/Choi	06/15/2015	12:38	347.92	14.85	333.95	1.10	
MW71	Shin/Choi	09/28/2015	12:52	347.92	17.66	331.00	0.92	
MW71	Shin/Choi	12/14/2015	13:47	347.92	16.48	332.70	1.57	
MW72	Shin/Choi	06/15/2015	12:43	347.38	16.25	331.32	0.24	
MW72	Shin/Choi	09/28/2015	12:57	347.38	20.19	327.44	0.31	
MW72	Shin/Choi	12/14/2015	13:45	347.38	19.84	328.61	1.34	
MW73	Shin/Choi	06/15/2015	12:41	347.33	37.21	310.12	--	
MW73	Shin/Choi	09/28/2015	12:55	347.33	39.76	307.57	--	
MW73	Shin/Choi	12/14/2015	13:42	347.33	40.11	307.22	--	
MW74	Shin/Choi	06/15/2015	12:35	347.94	36.60	311.34	--	
MW74	Shin/Choi	09/28/2015	12:50	347.94	DRY	DRY	DRY	
MW74	Shin/Choi	12/14/2015	13:48	347.94	39.36	308.58	--	
MW75	56th Ave ROW	NM	NM	354.78	NM	NM	NM	Well is only measured during annual (first quarter) event and is subject to Traffic Control Plan (WSDOT 2014).
MW76	Drake	06/15/2015	12:13	351.69	37.51	314.18	--	
MW76	Drake	09/28/2015	12:02	351.69	40.78	310.91	--	
MW76	Drake	12/14/2015	12:33	351.69	40.61	311.08	--	
MW77	Drake	06/15/2015	12:10	349.95	36.78	313.17	--	
MW77	Drake	09/28/2015	11:55	349.95	39.68	310.27	--	
MW77	Drake	12/14/2015	12:23	349.95	39.55	310.40	--	
MW78	Drake	06/15/2015	12:11	349.90	35.27	314.63	--	
MW78	Drake	09/28/2015	11:56	349.90	37.79	312.11	--	
MW78	Drake	12/14/2015	12:25	349.90	37.92	311.98	--	
MW79	TOC/Farmasonis	06/15/2015	11:06	353.98	15.60	338.38	--	
MW79	TOC/Farmasonis	09/28/2015	11:01	353.98	DRY	DRY	DRY	
MW79	TOC/Farmasonis	12/14/2015	11:32	353.98	DRY	DRY	DRY	
MW80	TOC/Farmasonis	06/15/2015	11:04	353.83	16.08	337.75	--	
MW80	TOC/Farmasonis	09/28/2015	11:07	353.83	22.25	331.58	--	
MW80	TOC/Farmasonis	12/14/2015	11:33	353.83	20.15	333.68	--	
MW81	TOC/Farmasonis	06/15/2015	11:12	355.60	40.58	315.02	--	
MW81	TOC/Farmasonis	09/28/2015	10:57	355.60	43.22	312.38	--	
MW81	TOC/Farmasonis	12/14/2015	11:27	355.60	43.31	312.29	--	
MW82	TOC/Farmasonis	06/15/2015	11:08	355.59	29.04	326.55	--	
MW82	TOC/Farmasonis	09/28/2015	10:59	355.59	29.40	326.19	--	
MW82	TOC/Farmasonis	12/14/2015	11:29	355.59	DRY	DRY	DRY	
MW83	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/21/2011 (REPLACED WITH MW100)**
MW84	Drake	06/15/2015	9:19	353.75	40.24	313.51	--	
MW84	Drake	09/24/2015	9:20	353.75	42.57	311.18	--	Wellhead inaccessible during measurement event on 09/28/2015. Therefore, the measurement provided was obtained at the time of sample collection.
MW84	Drake	12/14/2015	9:57	353.75	43.24	310.51	--	
MW85	Drake	06/15/2015	12:06	351.28	38.00	313.28	--	
MW85	Drake	09/28/2015	11:53	351.28	40.85	310.43	--	
MW85	Drake	12/14/2015	12:21	351.28	40.79	310.49	--	
MW86	Drake	06/15/2015	12:04	352.72	39.39	313.33	--	
MW86	Drake	09/28/2015	11:51	352.72	42.29	310.43	--	
MW86	Drake	12/14/2015	12:19	352.72	42.20	310.52	--	
MW87	Drake	06/15/2015	12:12	349.72	36.82	312.90	--	
MW87	Drake	09/28/2015	11:58	349.72	39.65	310.07	--	
MW87	Drake	12/14/2015	12:28	349.72	39.45	310.27	--	
MW88	Drake	06/15/2015	12:14	351.63	18.55	333.08	--	
MW88	Drake	09/28/2015	12:02	351.63	25.80	325.83	--	
MW88	Drake	12/14/2015	12:33	351.63	23.83	327.80	--	
MW89	Drake	06/15/2015	11:47	353.86	40.25	313.61	--	
MW89	Drake	09/28/2015	11:46	353.86	43.13	310.73	--	
MW89	Drake	12/14/2015	12:36	353.86	43.30	310.56	--	
MW90 (4" RW)	TOC	06/15/2015	8:58	362.87	25.29	337.58	--	
MW90 (4" RW)	TOC	09/28/2015	9:10	362.87	35.37	327.50	--	
MW90 (4" RW)	TOC	12/14/2015	9:35	362.87	32.36	330.51	--	
MW91 (4" RW)	TOC	06/15/2015	8:50	362.67	25.85	336.82	--	
MW91 (4" RW)	TOC	09/28/2015	9:05	362.67	29.77	332.90	--	
MW91 (4" RW)	TOC	12/14/2015	9:32	362.67	28.91	333.76	--	
MW92 (4" RW)	TOC/Farmasonis	06/15/2015	9:04	357.91	42.19	315.72	--	
MW92 (4" RW)	TOC/Farmasonis	09/28/2015	9:23	357.91	45.05	312.86	--	
MW92 (4" RW)	TOC/Farmasonis	12/14/2015	9:45	357.91	DRY	DRY	DRY	

TABLE 1-1
Depth-to-Groundwater Level and Product Thickness Measurements (System Off)
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Date	Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW93 (4" RW)	TOC/Farmasonis	06/15/2015	9:02	355.97	40.34	315.63	--	
MW93 (4" RW)	TOC/Farmasonis	09/28/2015	9:31	355.97	DRY	DRY	DRY	
MW93 (4" RW)	TOC/Farmasonis	12/14/2015	9:39	355.97	DRY	DRY	DRY	
MW94 (4" RW)	TOC/Farmasonis	06/15/2015	13:57	357.94	DRY	DRY	DRY	
MW94 (4" RW)	TOC/Farmasonis	09/28/2015	9:20	357.94	DRY	DRY	DRY	
MW94 (4" RW)	TOC/Farmasonis	12/14/2015	9:41	357.94	DRY	DRY	DRY	
MW95 (4" RW)	Drake	06/15/2015	9:15	354.67	40.50	314.17	--	Remediation pump turned off 04/30/2015.
MW95 (4" RW)	Drake	09/28/2015	9:38	354.67	43.37	311.30	--	Remediation pump is turned off.
MW95 (4" RW)	Drake	12/14/2015	9:55	354.67	43.59	311.08	--	Remediation pump is turned off.
MW96 (4" RW)	Drake	06/15/2015	9:11	356.00	41.24	314.76	--	
MW96 (4" RW)	Drake	09/28/2015	9:36	356.00	44.15	311.85	--	
MW96 (4" RW)	Drake	12/14/2015	9:52	356.00	44.40	311.60	--	
MW97 (4" RW)	Drake	06/15/2015	9:33	354.29	40.11	314.18	--	
MW97 (4" RW)	Drake	09/28/2015	9:43	354.29	DRY	DRY	DRY	
MW97 (4" RW)	Drake	12/14/2015	10:02	354.29	DRY	DRY	DRY	
MW98 (4" RW)	Drake	06/15/2015	9:29	354.75	DRY	DRY	DRY	
MW98 (4" RW)	Drake	09/28/2015	9:42	354.75	DRY	DRY	DRY	
MW98 (4" RW)	Drake	12/14/2015	9:59	354.75	DRY	DRY	DRY	
MW99 (4" RW)	Drake	06/15/2015	9:40	353.58	DRY	DRY	DRY	
MW99 (4" RW)	Drake	09/28/2015	9:47	353.58	DRY	DRY	DRY	
MW99 (4" RW)	Drake	12/14/2015	10:06	353.58	DRY	DRY	DRY	
MW100	TOC/Farmasonis	06/15/2015	11:10	355.75	18.30	337.45	--	
MW100	TOC/Farmasonis	09/28/2015	10:56	355.75	25.59	330.16	--	
MW100	TOC/Farmasonis	12/14/2015	11:23	355.75	22.75	333.00	--	
MW101 (4" RW)	Drake	06/15/2015	9:41	352.05	38.64	313.41	--	
MW101 (4" RW)	Drake	09/28/2015	9:50	352.05	41.53	310.52	--	
MW101 (4" RW)	Drake	12/14/2015	10:08	352.05	41.50	310.55	--	
MW102	Herman	06/15/2015	12:52	352.39	16.85	336.47	1.16	
MW102	Herman	09/28/2015	12:44	352.39	DRY	DRY	DRY	
MW102	Herman	12/14/2015	13:53	352.39	DRY	DRY	DRY	Well was dry during the DTW/DTP measurement event on 12/14/2015. A DTW measurement was recorded at the time sample collection was attempted on 12/11/2015 but the measurement is likely representative of water in the end cap rather than actual groundwater conditions. Therefore, the well is considered dry.
MW103	Herman	06/15/2015	12:50	352.21	40.97	311.24	--	
MW103	Herman	09/28/2015	12:46	352.21	43.98	308.23	--	
MW103	Herman	12/14/2015	13:31	352.21	44.43	307.78	--	
MW104	Herman	06/15/2015	12:29	353.00	13.91	339.09	--	
MW104	Herman	09/28/2015	12:36	353.00	17.20	335.80	--	
MW104	Herman	12/14/2015	13:24	353.00	15.38	337.62	--	
MW105	Herman	06/15/2015	12:28	353.05	39.81	313.24	--	
MW105	Herman	09/28/2015	12:36	353.05	DRY	DRY	DRY	
MW105	Herman	12/11/2015	14:35	353.05	42.28	310.77	--	Well was dry during measurement event on 12/14/2015. Therefore, the measurement provided was obtained at the time of sample collection.
MW106	Herman	06/13/2015	NM	349.24	16.54	332.70	--	Wellhead was inaccessible during measurement event on 06/15/2015 due to construction activities on the Mountlake Senior Property. Therefore, the measurement provided was obtained at the time of sample collection.
MW106	Herman	09/26/2015	11:15	349.24	18.85	330.39	--	Wellhead was inaccessible during measurement event on 09/28/2015 due to construction activities on the Mountlake Senior Property. Therefore, the measurement provided was obtained at the time of sample collection.
MW106	Herman	12/12/2015	10:35	349.24	12.87	336.37	--	Wellhead was inaccessible during measurement event on 12/14/2015 due to construction activities on the Mountlake Senior Property. Therefore, the measurement provided was obtained at the time of sample collection.
MW107	Herman	06/13/2015	NM	349.56	37.74	311.82	--	
MW107	Herman	09/26/2015	9:50	349.56	39.28	310.28	--	Wellhead was inaccessible during measurement event on 09/28/2015 due to construction activities on the Mountlake Senior Property. Therefore, the measurement provided was obtained at the time of sample collection.
MW107	Herman	12/12/2015	9:30	349.56	40.25	309.31	--	Wellhead was inaccessible during measurement event on 12/14/2015 due to construction activities on the Mountlake Senior Property. Therefore, the measurement provided was obtained at the time of sample collection.

TABLE 1-1
Depth-to-Groundwater Level and Product Thickness Measurements (System Off)
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Date	Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW108	Herman	06/18/2015	9:45	351.09	38.15	312.94	--	Well installed on 06/15/2015.
MW108	Herman	09/28/2015	12:39	351.09	40.83	310.26	--	
MW108	Herman	12/14/2015	13:27	351.09	40.71	310.38	--	
MW109	Herman	06/18/2015	NM	353.35	40.35	313.00	--	Well installed on 06/15/2015.
MW109	Herman	09/28/2015	12:34	353.35	DRY	DRY	DRY	
MW109	Herman	12/11/2015	14:30	353.35	40.66	312.69	--	Well was dry during measurement event on 12/14/2015. Measurement provided was collected at the time sample collection was attempted.

Notes:

(a) Remediation wells (identified as "RW") are 2 or 4 inches in diameter and are connected to a multi-phase extraction system. Measurements are not collected from 2" RWs because the diameter of the water probe is too large to fit past pump tubing.

(b) Reference elevation is the north side of the top of the well casing (except for MW25 where the reference elevation is the high point on the PVC casing and for MW99 where the reference elevation is the top of the well cap). Elevations are measured in feet above mean sea level (North American Vertical Datum of 1988 [NAVD 88]). PACE Engineers, Inc. performed well location and elevation surveys for all active wells in April and May 2014.

(c) DTW/DTP was measured from surveyed reference elevation [see note (b)].

(d) Where product (LNAPL) thickness was measured, groundwater elevation was adjusted to account for the presence of LNAPL using the method from "Estimation of Free Hydrocarbon Volume from Fluid Levels in Monitoring Wells" (Lenhard & Parker 1990). Product thickness is calculated using DTP level measured concurrently with DTW level.

(e) Groundwater elevation represents "system off" data (i.e., natural site conditions).

Definitions:

-- = No measurable product or odor observed.

DRY = Unable to measure DTW due to insufficient groundwater (in monitoring well) or groundwater level was below the top of pump (in remediation well).

Trace = Observed <0.01 feet of LNAPL.

Sheen = Iridescence on surface of groundwater that is indicative of LNAPL.

Acronyms:

DTP = depth-to-product
DTW = depth-to-groundwater
LNAPL = liquid non-aqueous phase liquid
NA = not available
NM = not measured
RW = remediation well

List of Properties:

TOC = 24205 56th Avenue West, Mountlake Terrace WA
TOC/Farmasonis = 24225 56th Avenue West, Mountlake Terrace WA
Drake = 24309 56th Avenue West, Mountlake Terrace WA
Herman = 24311 56th Avenue West, Mountlake Terrace WA
Shin/Choi = 24325 56th Avenue West, Mountlake Terrace WA
56th Ave ROW = right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties
242nd St ROW = portion of right-of-way adjacent to TOC Property

TABLE 1-2
Depth-to-Groundwater Level and Product Thickness Measurements (System On)
Second Quarter 2015
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Well type	Date	Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW01	TOC	NA	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 10/02/2009**
MW02	TOC	Monitoring Well	NM	NM	358.71	NM	NM	NM	
MW03	TOC	Monitoring Well	NM	NM	361.85	NM	NM	NM	
MW04	56th Ave ROW	Monitoring Well	NM	NM	361.96	NM	NM	NM	
MW05	242nd St ROW	Monitoring Well	NM	NM	363.70	NM	NM	NM	
MW06	TOC	Monitoring Well	NM	NM	358.98	NM	NM	NM	
MW07	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW08	56th Ave ROW	Monitoring Well	NM	NM	360.34	NM	NM	NM	
MW09	TOC	Monitoring Well	NM	NM	360.32	NM	NM	NM	
MW10	TOC	Monitoring Well	NM	NM	357.91	NM	NM	NM	
MW11 (4" RW)	TOC	4" Remediation Well	NM	NM	362.34	NM	NM	NM	
MW12	56th Ave ROW	Monitoring Well	NM	NM	357.65	NM	NM	NM	
MW13	56th Ave ROW	Monitoring Well	NM	NM	357.34	NM	NM	NM	
MW14	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW15	TOC	Monitoring Well	NM	NM	357.56	NM	NM	NM	
MW16	242nd St ROW	Monitoring Well	NM	NM	365.18	NM	NM	NM	
MW17	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW18 (4" RW)	TOC	4" Remediation Well	NM	NM	357.91	NM	NM	NM	
MW19	TOC	Monitoring Well	NM	NM	358.86	NM	NM	NM	
MW20	TOC	Monitoring Well	NM	NM	359.93	NM	NM	NM	
MW21	TOC	NA	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 04/16/2012**
MW22	TOC	Monitoring Well	NM	NM	358.52	NM	NM	NM	
MW23	TOC	Monitoring Well	NM	NM	357.08	NM	NM	NM	
MW24 (4" RW)	TOC	4" Remediation Well	NM	NM	361.97	NM	NM	NM	
MW25	TOC	Monitoring Well	NM	NM	358.70	NM	NM	NM	
MW26	TOC	Monitoring Well	NM	NM	363.81	NM	NM	NM	
MW27 (2" RW)	TOC	2" Remediation Well	NM	NM	362.51	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW28	TOC	Monitoring Well	NM	NM	358.41	NM	NM	NM	
MW29 (2" RW)	TOC	2" Remediation Well	NM	NM	358.93	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW30	TOC/Farmasonis	Monitoring Well	NM	NM	356.46	NM	NM	NM	
MW31 (2" RW)	TOC/Farmasonis	2" Remediation Well	NM	NM	357.08	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW32 (4" RW)	TOC	4" Remediation Well	NM	NM	359.95	NM	NM	NM	
MW33	TOC	Monitoring Well	NM	NM	358.24	NM	NM	NM	
MW34	TOC	Monitoring Well	NM	NM	357.88	NM	NM	NM	
MW35	TOC	Monitoring Well	NM	NM	358.46	NM	NM	NM	
MW36	TOC	Monitoring Well	NM	NM	357.98	NM	NM	NM	
MW37	TOC	Monitoring Well	NM	NM	358.90	NM	NM	NM	
MW38	TOC	Monitoring Well	NM	NM	364.42	NM	NM	NM	
MW39	TOC/Farmasonis	Monitoring Well	NM	NM	355.88	NM	NM	NM	
MW40	TOC/Farmasonis	Monitoring Well	NM	NM	356.32	NM	NM	NM	
MW41 (2" RW)	TOC/Farmasonis	2" Remediation Well	NM	NM	356.14	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW42	TOC/Farmasonis	Monitoring Well	NM	NM	356.43	NM	NM	NM	
MW43	56th Ave ROW	Monitoring Well	NM	NM	358.84	NM	NM	NM	
MW44	56th Ave ROW	Monitoring Well	06/10/2015	9:38	354.93	DRY	DRY	DRY	
MW45	56th Ave ROW	Monitoring Well	06/10/2015	9:48	356.49	DRY	DRY	DRY	
MW46	56th Ave ROW	Monitoring Well	NM	NM	357.00	NM	NM	NM	
MW47	56th Ave ROW	Monitoring Well	NM	NM	355.47	NM	NM	NM	
MW48	56th Ave ROW	Monitoring Well	06/10/2015	9:30	355.41	40.84	314.57	--	
MW49	56th Ave ROW	Monitoring Well	06/10/2015	9:44	356.44	41.65	314.79	--	
MW50	56th Ave ROW	Monitoring Well	NM	NM	361.99	NM	NM	NM	
MW51	56th Ave ROW	Monitoring Well	NM	NM	352.66	NM	NM	NM	
MW52	56th Ave ROW	Monitoring Well	NM	NM	355.61	NM	NM	NM	
MW53	56th Ave ROW	Monitoring Well	NM	NM	359.85	NM	NM	NM	
MW54	TOC/Farmasonis	Monitoring Well	NM	NM	357.93	NM	NM	NM	
MW55	56th Ave ROW	Monitoring Well	NM	NM	356.50	NM	NM	NM	
MW56	TOC/Farmasonis	Monitoring Well	NM	NM	357.49	NM	NM	NM	
MW57 (4" RW)	TOC/Farmasonis	4" Remediation Well	06/10/2015	9:19	356.42	44.97	311.45	--	
MW58	TOC/Farmasonis	Monitoring Well	NM	NM	355.40	NM	NM	NM	
MW59	TOC/Farmasonis	Monitoring Well	NM	NM	356.51	NM	NM	NM	
MW60	56th Ave ROW	Monitoring Well	NM	NM	358.58	NM	NM	NM	
MW61	56th Ave ROW	Monitoring Well	NM	NM	357.17	NM	NM	NM	
MW62	56th Ave ROW	Monitoring Well	NM	NM	360.50	NM	NM	NM	
MW63	56th Ave ROW	Monitoring Well	06/10/2015	9:35	355.11	42.09	313.02	--	
MW64	56th Ave ROW	Monitoring Well	NM	NM	355.18	NM	NM	NM	
MW65	Drake	Monitoring Well	NM	NM	353.08	NM	NM	NM	
MW66	TOC/Farmasonis	Monitoring Well	NM	NM	355.75	NM	NM	NM	
MW67	Drake	Monitoring Well	NM	NM	355.73	NM	NM	NM	
MW68	Drake	Monitoring Well	NM	NM	355.11	NM	NM	NM	
MW69 (2" RW)	Drake	2" Remediation Well	NM	NM	353.76	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW70 (2" RW)	Drake	2" Remediation Well	NM	NM	354.17	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW71	Shin/Choi	Monitoring Well	NM	NM	347.92	NM	NM	NM	
MW72	Shin/Choi	Monitoring Well	NM	NM	347.38	NM	NM	NM	

TABLE 1-2
Depth-to-Groundwater Level and Product Thickness Measurements (System On)
Second Quarter 2015
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Well type	Date	Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW73	Shin/Choi	Monitoring Well	NM	NM	347.33	NM	NM	NM	
MW74	Shin/Choi	Monitoring Well	NM	NM	347.94	NM	NM	NM	
MW75	56th Ave ROW	Monitoring Well	NM	NM	354.78	NM	NM	NM	Well is only measured during annual (first quarter) event and is subject to Traffic Control Plan (WSDOT 2014).
MW76	Drake	Monitoring Well	NM	NM	351.69	NM	NM	NM	
MW77	Drake	Monitoring Well	NM	NM	349.95	NM	NM	NM	
MW78	Drake	Monitoring Well	NM	NM	349.90	NM	NM	NM	
MW79	TOC/Farmasonis	Monitoring Well	NM	NM	353.98	NM	NM	NM	
MW80	TOC/Farmasonis	Monitoring Well	NM	NM	353.83	NM	NM	NM	
MW81	TOC/Farmasonis	Monitoring Well	NM	NM	355.60	NM	NM	NM	
MW82	TOC/Farmasonis	Monitoring Well	NM	NM	355.59	NM	NM	NM	
MW83	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/21/2011 (REPLACED WITH MW100)**
MW84	Drake	Monitoring Well	NM	NM	353.75	NM	NM	NM	
MW85	Drake	Monitoring Well	NM	NM	351.28	NM	NM	NM	
MW86	Drake	Monitoring Well	NM	NM	352.72	NM	NM	NM	
MW87	Drake	Monitoring Well	NM	NM	349.72	NM	NM	NM	
MW88	Drake	Monitoring Well	NM	NM	351.63	NM	NM	NM	
MW89	Drake	Monitoring Well	NM	NM	353.86	NM	NM	NM	
MW90 (4" RW)	TOC	4" Remediation Well	NM	NM	362.87	NM	NM	NM	
MW91 (4" RW)	TOC	4" Remediation Well	NM	NM	362.67	NM	NM	NM	
MW92 (4" RW)	TOC/Farmasonis	4" Remediation Well	NM	NM	357.91	NM	NM	NM	
MW93 (4" RW)	TOC/Farmasonis	4" Remediation Well	NM	NM	355.97	NM	NM	NM	
MW94 (4" RW)	TOC/Farmasonis	4" Remediation Well	NM	NM	357.94	NM	NM	NM	
MW95 (4" RW)	Drake	4" Remediation Well	NM	NM	354.67	NM	NM	NM	Remediation pump turned off 04/30/2015.
MW96 (4" RW)	Drake	4" Remediation Well	06/10/2015	9:14	356.00	DRY	DRY	DRY	
MW97 (4" RW)	Drake	4" Remediation Well	NM	NM	354.29	NM	NM	NM	
MW98 (4" RW)	Drake	4" Remediation Well	NM	NM	354.75	NM	NM	NM	
MW99 (4" RW)	Drake	4" Remediation Well	NM	NM	353.58	NM	NM	NM	
MW100	TOC/Farmasonis	Monitoring Well	NM	NM	355.75	NM	NM	NM	
MW101 (4" RW)	Drake	4" Remediation Well	NM	NM	352.05	NM	NM	NM	
MW102	Herman	Monitoring Well	NM	NM	352.39	NM	NM	NM	
MW103	Herman	Monitoring Well	NM	NM	352.21	NM	NM	NM	
MW104	Herman	Monitoring Well	NM	NM	353.00	NM	NM	NM	
MW105	Herman	Monitoring Well	NM	NM	353.05	NM	NM	NM	
MW106	Herman	Monitoring Well	NM	NM	349.24	NM	NM	NM	
MW107	Herman	Monitoring Well	NM	NM	349.56	NM	NM	NM	
MW108	Herman	Monitoring Well	NM	NM	351.09	NM	NM	NM	Well installed on 06/15/2015.
MW109	Herman	Monitoring Well	NM	NM	353.35	NM	NM	NM	Well installed on 06/15/2015.

Notes:

Select locations where DTW/DTP level measurements were attempted during 2Q2015 are shaded gray.

(a) Remediation wells (identified as "RW") are 2 or 4 inches in diameter and are connected to a multi-phase extraction system.
Measurements are not collected from 2" RWs because the diameter of the water probe is too large to fit past pump tubing.

(b) Reference elevation is the north side of the top of the well casing (except for MW25 where the reference elevation is the high point on the PVC casing and for MW99 where the reference elevation is the top of the well cap). Elevations are measured in feet above mean sea level (North American Vertical Datum of 1988 [NAVD 88]).
PACE Engineers, Inc. performed well location and elevation surveys for all active wells in April and May 2014.

(c) DTW/DTP was measured from surveyed reference elevation [see note (b)].

(d) Where product (LNAPL) thickness was measured, groundwater elevation was adjusted to account for the presence of LNAPL using the method from "Estimation of Free Hydrocarbon Volume from Fluid Levels in Monitoring Wells" (Lenhard & Parker 1990). Product thickness is calculated using DTP level measured concurrently with DTW level.

(e) Groundwater elevation represents "system on" data (i.e., pumping conditions).

Definitions:

-- = No measurable product or odor observed.
DRY = Unable to measure DTW due to insufficient groundwater (in monitoring well) or groundwater level was below the top of pump (in remediation well).
Trace = Observed <0.01 feet of LNAPL.
Sheen = Iridescence on surface of groundwater that is indicative of LNAPL.

Acronyms:

DTP = depth-to-product
DTW = depth-to-groundwater
LNAPL = liquid non-aqueous phase liquid
NA = not available
NM = not measured
RW = remediation well

List of Properties:

TOC = 24205 56th Avenue West, Mountlake Terrace WA
TOC/Farmasonis = 24225 56th Avenue West, Mountlake Terrace WA
Drake = 24309 56th Avenue West, Mountlake Terrace WA
Herman = 24311 56th Avenue West, Mountlake Terrace WA
Shin/Choi = 24325 56th Avenue West, Mountlake Terrace WA
56th Ave ROW = right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties
242nd St ROW = portion of right-of-way adjacent to TOC Property

TABLE 2-1
Groundwater Quality Results for Select Constituents
Shallow Zone Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)								
					Total Petroleum Hydrocarbons			Volatile Organic Compounds					
					Method NWTPH-Gx	Method NWTPH-Dx		Method SW8021B / SW8260C[1]					
					Gasoline-Range (GRPH)	Motor Oil-Range (ORPH)	Diesel-Range (DRPH)[2]	Benzene	Toluene	Ethylbenzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)					**1,000/800[3]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[4]**	**NE[4]**
MW54	TOC/Farmasonis	6/10/2015	MW54	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW54	TOC/Farmasonis	9/23/2015	MW54	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW54	TOC/Farmasonis	12/15/2015	MW54	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW67	Drake	6/11/2015	MW67	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW67	Drake	9/24/2015	MW67	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW67	Drake	12/15/2015	MW67	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW68	Drake	6/11/2015	MW68	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW68	Drake	9/24/2015	MW68	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW68	Drake	12/15/2015	MW68	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW71	Shin/Choi	6/12/2015	--	--	LNAPL								
MW71	Shin/Choi	9/25/2015	--	--	LNAPL								
MW71	Shin/Choi	12/14/2015	--	--	LNAPL								
MW72	Shin/Choi	6/12/2015	--	--	LNAPL								
MW72	Shin/Choi	9/25/2015	--	--	LNAPL								
MW72	Shin/Choi	12/14/2015	--	--	LNAPL								
MW102	Herman	6/15/2015	--	--	LNAPL								
MW102	Herman	9/25/2015	--	--	Dry / LNAPL[a]								
MW102	Herman	12/11/2015	--	--	Dry / LNAPL[a]								
MW104	Herman	6/12/2015	MW104	Peristaltic Pump	**40,000**	**580**	**8,000**	**9.5**	**720**	**2,000**	**10,000**	NA	NA
MW104	Herman	6/12/2015	MLT-04	Peristaltic Pump	**41,000**	**580**	**7,700**	**11**	**830**	**2,100**	**11,000**	NA	NA
MW104	Herman	9/25/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW104	Herman	12/15/2015	MW104	Peristaltic Pump	**60,000**	**400**	**8,400J**	**78**	**6,300**	**2,100**	**11,000**	NA	NA
MW104	Herman	12/15/2015	MLT-04*	Peristaltic Pump	**59,000**	**410**	**6,200J**	**81**	**6,900**	**2,000**	**10,000**	NA	NA
MW106	Herman	6/13/2015	MW106	Submersible Pump	100U	500U	**480**	1U	1U	1U	3U	NA	NA
MW106	Herman	9/26/2015	MW106	Submersible Pump	100U	250U	**490**	1U	1U	1U	3U	NA	NA
MW106	Herman	9/26/2015	MLT-06*	Submersible Pump	100U	300U	**500**	1U	1U	1U	3U	NA	NA
MW106	Herman	12/12/2015	MW106	Submersible Pump	100U	250U	50U	1U	1U	1U	3U	NA	NA

TABLE 2-1
Groundwater Quality Results for Select Constituents
Shallow Zone Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

NOTES & DEFINITIONS:

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels, Table 720-1 of WAC 173-340-900, revised October 12, 2007.

Groundwater samples were analyzed by Friedman & Bruya, Inc. The analytical laboratory reports are included as an appendix.

Red denotes sample concentration equals or exceeds MTCA Method A Cleanup Levels for groundwater.

Black denotes sample concentration was detected but does not exceed MTCA Method A Cleanup Levels for groundwater.

Gray denotes sample concentration was undetected at the method reporting limit, the constituent was not analyzed, or the well was dry.

(1) If samples were analyzed by two methods, the maximum concentration of the two results is reported.

(2) For groundwater samples with detected concentrations of DRPH, the sample chromatographic pattern does not resemble the diesel extended analysis standard used for quantitation.

(3) Cleanup level is 1,000 µg/L when benzene is not present and 800 µg/L when benzene is present.

(4) Cleanup levels for individual xylenes have not been established.

(a) Well was dry but LNAPL is typically observed at this location.

-- = Sample was not collected.

* = Indicates blind field duplicate sample was collected for quality assurance/quality control purposes.

Dry = Indicates well could not be sampled due to insufficient groundwater sample volume.

LNAPL = Indicates well was not sampled due to presence of product (LNAPL).

NA = Indicates the compound was not analyzed.

NE = Indicates MTCA Method A Cleanup Level has not been established.

LABORATORY NOTES:

U = Indicates the compound was undetected at the method reporting limit.

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. Qualifier was assigned based on data validation protocol.

LIST OF PROPERTIES:

TOC = 24205 56th Avenue West, Mountlake Terrace WA

TOC/Farmasonis = 24225 56th Avenue West, Mountlake Terrace WA

Drake = 24309 56th Avenue West, Mountlake Terrace WA

56th Ave ROW = right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties

Herman = 24311 56th Avenue West, Mountlake Terrace WA

Shin/Choi = 24325 56th Avenue West, Mountlake Terrace WA

ACRONYMS:

µg/L = micrograms per liter

LNAPL = light non-aqueous phase liquid

MTCA = Model Toxics Control Act

NWTPH-Dx = Northwest Total Petroleum Hydrocarbon - diesel-range organics

NWTPH-Gx = Northwest Total Petroleum Hydrocarbon - gasoline-range organics

WAC = Washington Administrative Code

TABLE 2-2
Groundwater Quality Results for Common Fuel Additives
Shallow Zone Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)																					
					Volatile Organic Compounds			Metals		Semivolatile Organic Compounds / Polycyclic Aromatic Hydrocarbons[1]															
					Method SW8260C		Method 8011M	Method 200.8		EPA Method 8270D SIM															
					Methyl t-butyl ether (MTBE)	1,2-Dichloroethane (EDC)	1,2-Dibromoethane (EDB)	Dissolved Lead	Total Lead	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MTCA Method A Cleanup Level (µg/L)					**20**	**5**	**0.01**	**15**	**15**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**160**	**0.1**	**0.1**
MW54	TOC/Farmasonis	6/10/2015	MW54	Peristaltic Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW54	TOC/Farmasonis	9/23/2015	MW54	Peristaltic Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW54	TOC/Farmasonis	12/15/2015	MW54	Peristaltic Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW67	Drake	6/11/2015	MW67	Peristaltic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW67	Drake	9/24/2015	MW67	Peristaltic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW67	Drake	12/15/2015	MW67	Peristaltic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW68	Drake	6/11/2015	MW68	Peristaltic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW68	Drake	9/24/2015	MW68	Peristaltic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW68	Drake	12/15/2015	MW68	Peristaltic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW71	Shin/Choi	6/12/2015	--	--	**LNAPL**																					
MW71	Shin/Choi	9/25/2015	--	--	**LNAPL**																					
MW71	Shin/Choi	12/14/2015	--	--	**LNAPL**																					
MW72	Shin/Choi	6/12/2015	--	--	**LNAPL**																					
MW72	Shin/Choi	9/25/2015	--	--	**LNAPL**																					
MW72	Shin/Choi	12/14/2015	--	--	**LNAPL**																					
MW102	Herman	6/15/2015	--	--	**LNAPL**																					
MW102	Herman	9/25/2015	--	--	**Dry / LNAPL[a]**																					
MW102	Herman	12/11/2015	--	--	**Dry / LNAPL[a]**																					
MW104	Herman	6/12/2015	MW104	Peristaltic Pump	1U	1U	**0.098**	1U	1U	**0.16**	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	**0.19**	0.1U	**360J**	0.1U	0.1U
MW104	Herman	6/12/2015	MLT-04	Peristaltic Pump	1U	1U	**0.1**	1U	1U	**0.15**	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	**0.17**	0.1U	**260J**	0.1U	0.1U
MW104	Herman	9/25/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW104	Herman	12/15/2015	MW104 [b]	Peristaltic Pump	1U	1U	**0.05**	1U	1U	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	**520**	***0.6U***	***0.6U***
MW104	Herman	12/15/2015	MLT-04* [b]	Peristaltic Pump	1U	1U	**0.052**	1U	1U	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	***0.6U***	**500**	***0.6U***	***0.6U***
MW106	Herman	6/13/2015	MW106	Submersible Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	**0.18**	0.1U	0.1U	0.1U	0.1U
MW106	Herman	9/26/2015	MW106	Submersible Pump	1U	1U	0.01U	1U	***R***	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**0.13**	0.06U	0.06U	0.06U	0.06U
MW106	Herman	9/26/2015	MLT-06*	Submersible Pump	1U	1U	0.01U	1U	***R***	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**0.11**	0.06U	0.06U	0.06U	0.06U
MW106	Herman	12/12/2015	MW106	Submersible Pump	1U	1U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U

NOTES & DEFINITIONS:

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels, Table 720-1 of WAC 173-340-900, revised October 12, 2007.

Groundwater samples were analyzed by Friedman & Bruya, Inc. The analytical laboratory reports are included as an appendix.

Red denotes sample concentration equals or exceeds MTCA Method A Cleanup Levels for groundwater.

Black denotes sample concentration was detected but does not exceed MTCA Method A Cleanup Levels for groundwater.

Italic denotes the constituent was not detected at or above the method reporting limit (MRL); however, the MRL was elevated due to sample dilution and exceeds the MTCA cleanup level.

Gray denotes sample concentration was undetected at the method reporting limit, the constituent was not analyzed, or the well was dry.

[1] With the exception of Napthalene, preliminary screening results for carcinogenic PAHs are compared to the MTCA Method A Cleanup Level provided for benzo(a)pyrene on Table 720-1 of WAC 173-340-900. Per MTCA, this value represents the total concentration that all PAHs must meet using the toxicity equivalency methodology of WAC 173-340-708(8).

[a] Well was dry but LNAPL is typically observed at this location.

[b] Concentrations of all PAH constituents analyzed (excluding napthalene) were not detected at or above the MRLs in the sample collected from MW104; however, the MRLs were elevated due to sample dilution and exceeded the MTCA cleanup level.

-- = Sample was not collected.

* = Indicates blind field duplicate sample was collected for quality assurance/quality control purposes.

Dry = Indicates well could not be sampled due to insufficient groundwater sample volume.

NA = Indicates the compound was not analyzed.

R = Total lead results for samples MW106 and MLT-06 were rejected based on data review and data validation and are considered unusable.

LABORATORY NOTES:

U = Indicates the compound was undetected at the method reporting limit.

ACRONYMS:

µg/L = micrograms per liter

MTCA = Model Toxics Control Act

PAH = Polycyclic Aromatic Hydrocarbons

WAC = Washington Administrative Code

LIST OF PROPERTIES:

TOC = 24205 56th Avenue West, Mountlake Terrace WA

TOC/Farmasonis = 24225 56th Avenue West, Mountlake Terrace WA

Drake = 24309 56th Avenue West, Mountlake Terrace WA

56th Ave ROW = right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties

Shin/Choi = 24325 56th Avenue West, Mountlake Terrace WA

Stantec

TABLE 3-1

Groundwater Quality Results for Select Constituents

Intermediate Zone Wells

Second, Third and Fourth Quarters 2015

TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)								
					Total Petroleum Hydrocarbons			Volatile Organic Compounds					
					Method NWTPH-Gx	Method NWTPH-Dx		Method SW8021B / SW8260C[2]					
					Gasoline-Range (GRPH)	Motor Oil-Range (ORPH)	Diesel-Range (DRPH)[3]	Benzene	Toluene	Ethylbenzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)					**1,000/800[4]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[5]**	**NE[5]**
MW10	TOC	6/10/2015	MW10	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW10	TOC	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW10	TOC	12/14/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW15	TOC	6/10/2015	MW15	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW15	TOC	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW15	TOC	12/14/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW20	TOC	6/11/2015	MW20	Submersible Pump	100U	500U	**100**	1U	1U	1U	**4.5**	NA	NA
MW20	TOC	6/11/2015	MLT-02	Submersible Pump	100U	500U	100U	1U	1U	1U	**3.8**	NA	NA
MW20	TOC	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW20	TOC	12/10/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW31 (2" RW)	TOC/Farmasonis	6/9/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW31 (2" RW)	TOC/Farmasonis	9/22/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW31 (2" RW)	TOC/Farmasonis	12/10/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW32 (4" RW)	TOC	6/9/2015	MW32	Pneumatic Pump	**410**	NA	NA	**2.6**	**3.5**	**11**	**28**	NA	NA
MW32 (4" RW)	TOC	9/22/2015	MW32	Pneumatic Pump	**140**	NA	NA	1U	1U	1U	**4.4**	NA	NA
MW32 (4" RW)	TOC	12/10/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW33	TOC	6/10/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW33	TOC	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW33	TOC	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW45	56th Ave ROW	6/10/158	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW45	56th Ave ROW	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW45	56th Ave ROW	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW48	56th Ave ROW	6/11/2015	MW48	Bailer	**2,200**	NA	NA	1U	**4.5**	1U	**110**	NA	NA
MW48	56th Ave ROW	9/23/2015	MW48	Bailer	**5,400**	NA	NA	**5.9**	**14**	**20**	**83**	NA	NA
MW48	56th Ave ROW	12/11/2015	MW48	Bailer	**11,000**	NA	NA	**32**	**30**	**61**	**480**	NA	NA
MW49	56th Ave ROW	6/10/2015	MW49	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW49	56th Ave ROW	9/23/2015	MW49	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA

TABLE 3-1

Groundwater Quality Results for Select Constituents

Intermediate Zone Wells

Second, Third and Fourth Quarters 2015

TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)								
					Total Petroleum Hydrocarbons			Volatile Organic Compounds					
					Method NWTPH-Gx	Method NWTPH-Dx		Method SW8021B / SW8260C[2]					
					Gasoline-Range (GRPH)	Motor Oil-Range (ORPH)	Diesel-Range (DRPH)[3]	Benzene	Toluene	Ethylbenzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)					**1,000/800[4]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[5]**	**NE[5]**
MW49	56th Ave ROW	12/9/2015	MW49	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW50	56th Ave ROW	6/11/2015	MW50	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW50	56th Ave ROW	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW50	56th Ave ROW	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW51	56th Ave ROW	6/16/2015	MW51	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW51	56th Ave ROW	9/23/2015	MW51	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW51	56th Ave ROW	12/11/2015	MW51	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW52	56th Ave ROW	6/12/2015	MW52	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW52	56th Ave ROW	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW52	56th Ave ROW	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW53	56th Ave ROW	6/11/2015	MW53	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW53	56th Ave ROW	9/25/2015	MW53	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW53	56th Ave ROW	12/15/2015	MW53	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW55	56th Ave ROW	6/15/2015	MW55	Submersible Pump	**120**	NA	NA	**7.6**	**3.2**	**1.8**	**8.4**	NA	NA
MW55	56th Ave ROW	9/24/2015	MW55	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW55	56th Ave ROW	12/10/2015	MW55	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW56	TOC/Farmasonis	6/10/2015	MW56	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW56	TOC/Farmasonis	9/23/2015	MW56	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW56	TOC/Farmasonis	12/9/2015	MW56	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW57 (4" RW)	TOC/Farmasonis	6/9/2015	MW57	Pneumatic Pump	**280**	NA	NA	1U	1U	**6.4**	**60**	NA	NA
MW57 (4" RW)	TOC/Farmasonis	9/22/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW57 (4" RW)	TOC/Farmasonis	12/10/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW58	TOC/Farmasonis	6/10/2015	MW58	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW58	TOC/Farmasonis	9/23/2015	MW58	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW58	TOC/Farmasonis	12/9/2015	MW58	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW59	TOC/Farmasonis	6/10/2015	MW59	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW59	TOC/Farmasonis	9/23/2015	MW59	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW59	TOC/Farmasonis	12/9/2015	MW59	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW60	56th Ave ROW	6/11/2015	MW60	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA

TABLE 3-1

Groundwater Quality Results for Select Constituents

Intermediate Zone Wells

Second, Third and Fourth Quarters 2015

TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)								
					Total Petroleum Hydrocarbons			Volatile Organic Compounds					
					Method NWTPH-Gx	Method NWTPH-Dx		Method SW8021B / SW8260C[2]					
					Gasoline-Range (GRPH)	Motor Oil-Range (ORPH)	Diesel-Range (DRPH)[3]	Benzene	Toluene	Ethylbenzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)					**1,000/800[4]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[5]**	**NE[5]**
MW60	56th Ave ROW	9/26/2015	MW60	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW60	56th Ave ROW	12/10/2015	MW60	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW63	56th Ave ROW	6/12/2015	MW63	Submersible Pump	100U	NA	NA	**2.9**	**1.2**	1U	**3.5**	NA	NA
MW63	56th Ave ROW	9/25/2015	MW63	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW63	56th Ave ROW	9/25/2015	MLT-05*	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW63	56th Ave ROW	12/11/2015	MW63	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW65	Drake	6/16/2015	MW65	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW65	Drake	9/25/2015	MW65	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW65	Drake	12/11/2015	MW65	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW66	TOC/Farmasonis	6/10/2015	MW66	Bailer	100U	500U	100U	1U	1U	1U	3U	NA	NA
MW66	TOC/Farmasonis	9/24/2015	MW66	Bailer	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW66	TOC/Farmasonis	12/11/2015	MW66	Bailer	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW69 (2" RW)	Drake	6/10/2015	MW69	Pneumatic Pump	**3,100**	500U	**290**	1U	**1.4**	**12**	**200**	NA	NA
MW69 (2" RW)	Drake	9/22/2015	MW69	Pneumatic Pump	**4,100**	250U	**510**	1U	**1.3**	1U	**230**	NA	NA
MW69 (2" RW)	Drake	12/10/2015	MW69	Pneumatic Pump	**2,700**	250U	**530**	1U	**1.4**	1U	**120**	NA	NA
MW70 (2" RW)	Drake	6/10/2015	MW70	Pneumatic Pump	100U	500U	100U	1U	1U	1U	3U	NA	NA
MW70 (2" RW)	Drake	9/23/2015	MW70	Pneumatic Pump	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW70 (2" RW)	Drake	12/10/2015	MW70	Pneumatic Pump	100U	300U	**250**	1U	1U	1U	3U	NA	NA
MW73	Shin/Choi	6/12/2015	MW73	Submersible Pump	**83,000**	500U	**2,800**	**17,000**	**4,400**	**2,400**	**12,000**	NA	NA
MW73	Shin/Choi	9/25/2015	MW73	Bailer	**68,000**	250U	**3,500**	**12,000**	**1,500**	**1,700**	**8,300**	NA	NA
MW73	Shin/Choi	12/11/2015	MW73	Bailer	**55,000**	**280**	**2,300**	**11,000**	**590**	**1,500**	**6,100**	NA	NA
MW74	Shin/Choi	6/12/2015	MW74	Bailer	**60,000**	500U	**4,500**	**13,000**	**8,300**	**850**	**4,000**	NA	NA
MW74	Shin/Choi	9/25/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW74	Shin/Choi	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW77	Drake	6/13/2015	MW77	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW77	Drake	9/28/2015	MW77	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW77	Drake	12/12/2015	MW77	Submersible Pump	100U	330U	65U	1U	1U	1U	3U	NA	NA
MW84	Drake	6/15/2015	MW84	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW84	Drake	9/24/2015	MW84	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA

TABLE 3-1
Groundwater Quality Results for Select Constituents
Intermediate Zone Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)								
					Total Petroleum Hydrocarbons			Volatile Organic Compounds					
					Method NWTPH-Gx	Method NWTPH-Dx		Method SW8021B / SW8260C[2]					
					Gasoline-Range (GRPH)	Motor Oil-Range (ORPH)	Diesel-Range (DRPH)[3]	Benzene	Toluene	Ethylbenzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)					**1,000/800[4]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[5]**	**NE[5]**
MW84	Drake	12/10/2015	MW84	Submersible Pump	100U	350U	70U	1U	1U	1U	3U	NA	NA
MW85	Drake	6/11/2015	MW85	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW85	Drake	9/24/2015	MW85	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW85	Drake	12/11/2015	MW85	Submersible Pump	100U	500U	100U	1U	1U	1U	3U	NA	NA
MW86	Drake	6/12/2015	MW86	Submersible Pump	100U	500U	100U	**1.1**	1U	1U	3U	NA	NA
MW86	Drake	6/12/2015	MLT-03	Submersible Pump	100U	500U	100U	**1.1**	1U	1U	3U	NA	NA
MW86	Drake	9/25/2015	MW86	Submersible Pump	100U	300U	60U	1U	1U	1U	3U	NA	NA
MW86	Drake	9/25/2015	MLT-03*	Submersible Pump	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW86	Drake	12/11/2015	MW86	Submersible Pump	100U	330U	65U	1U	1U	1U	3U	NA	NA
MW86	Drake	12/11/2015	MLT-03*	Submersible Pump	100U	330U	65U	1U	1U	1U	3U	NA	NA
MW89	Drake	6/15/2015	MW89	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW89	Drake	9/24/2015	MW89	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW89	Drake	12/10/2015	MW89	Submersible Pump	100U	300U	60U	1U	1U	1U	3U	NA	NA
MW95 (4" RW)	Drake	6/11/2015	MW95	Pneumatic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW95 (4" RW)	Drake	9/23/2015	MW95	Pneumatic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW95 (4" RW)	Drake	12/10/2015	MW95	Pneumatic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW96 (4" RW)	Drake	6/10/2015	MW96	Pneumatic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW96 (4" RW)	Drake	9/22/2015	MW96	Pneumatic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW96 (4" RW)	Drake	12/10/2015	MW96	Pneumatic Pump	**130**	NA	NA	1U	**1.1**	**3.5**	**26**	NA	NA
MW98 (4" RW)	Drake	6/9/2015	MW98	Pneumatic Pump	**380**	NA	NA	1U	1U	**3.1**	**17**	NA	NA
MW98 (4" RW)	Drake	9/22/2015	MW98	Pneumatic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW98 (4" RW)	Drake	12/10/2015	MW98	Pneumatic Pump	**110**	NA	NA	1U	1U	**1.1**	**4.4**	NA	NA
MW101 (4" RW)	Drake	12/10/2015	MW101	Pneumatic Pump	100U	250U	**610**	1U	1U	1U	3U	NA	NA
MW103	Herman	6/16/2015	MW103	Bailer	100U	250U	**350**	**0.37**	1U	1U	3U	2U	1U
MW103	Herman	9/25/2015	MW103	Bailer	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW103	Herman	12/11/2015	MW103	Bailer	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW105	Herman	6/12/2015	MW105	Bailer	100U	500U	100U	1U	1U	1U	3U	NA	NA
MW105	Herman	9/25/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

TABLE 3-1

Groundwater Quality Results for Select Constituents

Intermediate Zone Wells

Second, Third and Fourth Quarters 2015

TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)								
					Total Petroleum Hydrocarbons			Volatile Organic Compounds					
					Method NWTPH-Gx	Method NWTPH-Dx		Method SW8021B / SW8260C[2]					
					Gasoline-Range (GRPH)	Motor Oil-Range (ORPH)	Diesel-Range (DRPH)[3]	Benzene	Toluene	Ethylbenzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)					**1,000/800[4]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[5]**	**NE[5]**
MW105	Herman	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW107	Herman	6/13/2015	MW107	Submersible Pump	100U	500U	100U	1U	1U	1U	3U	NA	NA
MW107	Herman	9/26/2015	MW107	Submersible Pump	100U	300U	**77**	1U	1U	1U	3U	NA	NA
MW107	Herman	12/12/2015	MW107	Submersible Pump	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW108	Herman	6/18/2015	MW108	Submersible Pump	**110**	NA	NA	1U	1U	1U	3U	NA	NA
MW108	Herman	9/25/2015	MW108	Bailer	**500**	250U	**740**	1U	**1.5**	1U	3U	NA	NA
MW108	Herman	12/15/2015	MW108	Bailer	100U	250U	**140**	1U	1U	1U	3U	NA	NA
MW109	Herman	6/19/2015	MW109	Bailer	**130**	NA	NA	0.35U	1U	1U	NA	2U	1U
MW109	Herman	9/25/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW109	Herman	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

NOTES & DEFINITIONS:

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels, Table 720-1 of WAC 173-340-900, revised October 12, 2007.

Groundwater samples were analyzed by Friedman & Bruya, Inc. The analytical laboratory reports are included as an appendix.

Red denotes sample concentration equals or exceeds MTCA Method A Cleanup Levels for groundwater.

Black denotes sample concentration was detected but does not exceed MTCA Method A Cleanup Levels for groundwater.

Gray denotes sample concentration was undetected at the method reporting limit, the constituent was not analyzed, or the well was dry.

[1] Remediation wells (identified as "RW") are either 2 or 4 inches in diameter and are connected to a multi-phase extraction system.

[2] If samples were analyzed by two methods, the maximum concentration of the two results is reported.

[3] For groundwater samples with detected concentrations of DRPH, the sample chromatographic pattern does not resemble the diesel extended analysis standard used for quantitation.

[4] Cleanup level is 1,000 µg/L when benzene is not present and 800 µg/L when benzene is present.

[5] Cleanup levels for individual xylenes have not been established.

-- = Sample was not collected.

* = Indicates blind field duplicate sample was collected for quality assurance/quality control purposes.

Dry = Indicates well could not be sampled due to insufficient groundwater sample volume.

NA = Indicates the compound was not analyzed.

NE = Indicates MTCA Method A Cleanup Level has not been established.

TABLE 3-1
Groundwater Quality Results for Select Constituents
Intermediate Zone Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)								
					Total Petroleum Hydrocarbons			Volatile Organic Compounds					
					Method NWTPH-Gx	Method NWTPH-Dx		Method SW8021B / SW8260C[2]					
					Gasoline-Range (GRPH)	Motor Oil-Range (ORPH)	Diesel-Range (DRPH)[3]	Benzene	Toluene	Ethylbenzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)					**1,000/800[4]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[5]**	**NE[5]**

LABORATORY NOTES:
U = Indicates the compound was undetected at the reported concentration.

ACRONYMS:
µg/L = micrograms per liter
MTCA = Model Toxics Control Act
NWTPH-Dx = Northwest Total Petroleum Hydrocarbon - diesel-range organics
NWTPH-Gx = Northwest Total Petroleum Hydrocarbon - gasoline-range organics
WAC = Washington Administrative Code

LIST OF PROPERTIES:
TOC = 24205 56th Avenue West, Mountlake Terrace WA
TOC/Farmasonis = 24225 56th Avenue West, Mountlake Terrace WA
Drake = 24309 56th Avenue West, Mountlake Terrace WA
56th Ave ROW = right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties
Herman = 24311 56th Avenue West, Mountlake Terrace WA
Shin/Choi = 24325 56th Avenue West, Mountlake Terrace WA

TABLE 3-2
Groundwater Quality Results for Common Fuel Additives
Intermediate Zone Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)																					
					Volatile Organic Compounds			Metals		Semivolatile Organic Compounds / Polycyclic Aromatic Hydrocarbons[2]																
					Method SW8260C		Method 8011M	Method 200.8		EPA Method 8270D SIM																
					Methyl t-butyl ether (MTBE)	1,2-Dichloroethane (EDC)	1,2-Dibromoethane (EDB)	Dissolved Lead	Total Lead	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MTCA Method A Cleanup Level (µg/L)					**20**	**5**	**0.01**	**15**	**15**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**160**	**0.1**	**0.1**
MW10	TOC	6/10/2015	MW10	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW10	TOC	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW10	TOC	12/14/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW15	TOC	6/10/2015	MW15	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW15	TOC	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW15	TOC	12/14/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW20	TOC	6/11/2015	MW20	Submersible Pump	1U	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW20	TOC	6/11/2015	MLT-02	Submersible Pump	1U	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW20	TOC	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW20	TOC	12/10/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW31 (2" RW)	TOC/Farmasonis	6/9/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW31 (2" RW)	TOC/Farmasonis	9/22/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW31 (2" RW)	TOC/Farmasonis	12/10/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW32 (4" RW)	TOC	6/9/2015	MW32	Pneumatic Pump	NA	NA	NA	**1.18**	**32.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW32 (4" RW)	TOC	9/22/2015	MW32	Pneumatic Pump	NA	NA	NA	1U	**120**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW32 (4" RW)	TOC	12/10/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW33	TOC	6/10/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW33	TOC	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW33	TOC	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW45	56th Ave ROW	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW45	56th Ave ROW	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW45	56th Ave ROW	6/10/158	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW48	56th Ave ROW	6/11/2015	MW48	Bailer	NA	NA	NA	**1.2**	**7.06**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW48	56th Ave ROW	9/23/2015	MW48	Bailer	NA	NA	NA	**4.85**	**16.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW48	56th Ave ROW	12/11/2015	MW48	Bailer	NA	NA	NA	**13.4**	**25.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW49	56th Ave ROW	6/10/2015	MW49	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW49	56th Ave ROW	9/23/2015	MW49	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW49	56th Ave ROW	12/9/2015	MW49	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW50	56th Ave ROW	6/11/2015	MW50	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW50	56th Ave ROW	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW50	56th Ave ROW	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW51	56th Ave ROW	6/16/2015	MW51	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW51	56th Ave ROW	9/23/2015	MW51	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW51	56th Ave ROW	12/11/2015	MW51	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW52	56th Ave ROW	6/12/2015	MW52	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW52	56th Ave ROW	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW52	56th Ave ROW	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW53	56th Ave ROW	6/11/2015	MW53	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW53	56th Ave ROW	9/25/2015	MW53	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW53	56th Ave ROW	12/15/2015	MW53	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW55	56th Ave ROW	6/15/2015	MW55	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW55	56th Ave ROW	9/24/2015	MW55	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW55	56th Ave ROW	12/10/2015	MW55	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW56	TOC/Farmasonis	6/10/2015	MW56	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW56	TOC/Farmasonis	9/23/2015	MW56	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW56	TOC/Farmasonis	12/9/2015	MW56	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW57 (4" RW)	TOC/Farmasonis	6/9/2015	MW57	Pneumatic Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW57 (4" RW)	TOC/Farmasonis	9/22/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW57 (4" RW)	TOC/Farmasonis	12/10/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

TABLE 3-2
Groundwater Quality Results for Common Fuel Additives
Intermediate Zone Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)																					
					Volatile Organic Compounds			Metals		Semivolatile Organic Compounds / Polycyclic Aromatic Hydrocarbons[2]															
					Method SW8260C		Method 8011M	Method 200.8		EPA Method 8270D SIM															
					Methyl t-butyl ether (MTBE)	1,2-Dichloroethane (EDC)	1,2-Dibromoethane (EDB)	Dissolved Lead	Total Lead	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MTCA Method A Cleanup Level (µg/L)					**20**	**5**	**0.01**	**15**	**15**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**160**	**0.1**	**0.1**
MW58	TOC/Farmasonis	6/10/2015	MW58	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW58	TOC/Farmasonis	9/23/2015	MW58	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW58	TOC/Farmasonis	12/9/2015	MW58	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW59	TOC/Farmasonis	6/10/2015	MW59	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW59	TOC/Farmasonis	9/23/2015	MW59	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW59	TOC/Farmasonis	12/9/2015	MW59	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW60	56th Ave ROW	6/11/2015	MW60	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW60	56th Ave ROW	9/26/2015	MW60	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW60	56th Ave ROW	12/10/2015	MW60	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW63	56th Ave ROW	6/12/2015	MW63	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW63	56th Ave ROW	9/25/2015	MW63	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW63	56th Ave ROW	9/25/2015	MLT-05*	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW63	56th Ave ROW	12/11/2015	MW63	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW65	Drake	6/16/2015	MW65	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW65	Drake	9/25/2015	MW65	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW65	Drake	12/11/2015	MW65	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW66	TOC/Farmasonis	6/10/2015	MW66	Bailer	1U	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW66	TOC/Farmasonis	9/24/2015	MW66	Bailer	NA	NA	NA	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW66	TOC/Farmasonis	12/11/2015	MW66	Bailer	1U	NA	NA	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW69 (2" RW)	Drake	6/10/2015	MW69	Pneumatic Pump	1U	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	**11**	0.1U	0.1U
MW69 (2" RW)	Drake	9/22/2015	MW69	Pneumatic Pump	1U	NA	NA	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**0.79**	0.06U	0.06U
MW69 (2" RW)	Drake	12/10/2015	MW69	Pneumatic Pump	1U	NA	NA	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**11**	0.06U	0.06U
MW70 (2" RW)	Drake	6/10/2015	MW70	Pneumatic Pump	1U	NA	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW70 (2" RW)	Drake	9/23/2015	MW70	Pneumatic Pump	1U	1U	0.01U	1U	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW70 (2" RW)	Drake	12/10/2015	MW70	Pneumatic Pump	1U	NA	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW73	Shin/Choi	6/12/2015	MW73	Submersible Pump	**7.2**	1U	**1.3**	1U	1U	**0.12**	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	**280**	0.1U	0.1U
MW73	Shin/Choi	9/25/2015	MW73	Bailer	**21**	1U	**0.1**	1U	**2.89**	**0.16**	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**320**	0.06U	0.06U
MW73	Shin/Choi	12/11/2015	MW73	Bailer	**150**	1U	**0.11**	1U	**5.3**	**0.12**	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**320**	0.06U	0.06U
MW74	Shin/Choi	6/12/2015	MW74	Bailer	**1,300**	1U	**0.3**	**9.72**	**11**	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	**97**	0.1U	0.1U
MW74	Shin/Choi	9/25/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW74	Shin/Choi	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW77	Drake	6/13/2015	MW77	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW77	Drake	9/28/2015	MW77	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW77	Drake	12/12/2015	MW77	Submersible Pump	1U	NA	NA	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW84	Drake	6/15/2015	MW84	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW84	Drake	9/24/2015	MW84	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW84	Drake	12/10/2015	MW84	Submersible Pump	1U	NA	NA	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW85	Drake	6/11/2015	MW85	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW85	Drake	9/24/2015	MW85	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW85	Drake	12/11/2015	MW85	Submersible Pump	1U	NA	NA	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW86	Drake	6/12/2015	MW86	Submersible Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW86	Drake	6/12/2015	MLT-03	Submersible Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW86	Drake	9/25/2015	MW86	Submersible Pump	1U	1U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW86	Drake	9/25/2015	MLT-03*	Submersible Pump	1U	1U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW86	Drake	12/11/2015	MW86	Submersible Pump	1U	1U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW86	Drake	12/11/2015	MLT-03*	Submersible Pump	1U	1U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW89	Drake	6/15/2015	MW89	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW89	Drake	9/24/2015	MW89	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW89	Drake	12/10/2015	MW89	Submersible Pump	1U	NA	NA	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW95 (4" RW)	Drake	6/11/2015	MW95	Pneumatic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW95 (4" RW)	Drake	9/23/2015	MW95	Pneumatic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 3-2
Groundwater Quality Results for Common Fuel Additives
Intermediate Zone Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)																						
					Volatile Organic Compounds			Metals		Semivolatile Organic Compounds / Polycyclic Aromatic Hydrocarbons[2]																
					Method SW8260C		Method 8011M	Method 200.8		EPA Method 8270D SIM																
					Methyl t-butyl ether (MTBE)	1,2-Dichloroethane (EDC)	1,2-Dibromoethane (EDB)	Dissolved Lead	Total Lead	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MTCA Method A Cleanup Level (µg/L)					**20**	**5**	**0.01**	**15**	**15**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**160**	**0.1**	**0.1**
MW95 (4" RW)	Drake	12/10/2015	MW95	Pneumatic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW96 (4" RW)	Drake	6/10/2015	MW96	Pneumatic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW96 (4" RW)	Drake	9/22/2015	MW96	Pneumatic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW96 (4" RW)	Drake	12/10/2015	MW96	Pneumatic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW98 (4" RW)	Drake	6/9/2015	MW98	Pneumatic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW98 (4" RW)	Drake	9/22/2015	MW98	Pneumatic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW98 (4" RW)	Drake	12/10/2015	MW98	Pneumatic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW101 (4" RW)	Drake	12/10/2015	MW101	Pneumatic Pump	1U	NA	NA	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW103	Herman	6/16/2015	MW103	Bailer	**380**	1U	0.01U	**14.8**	**17.9**	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW103	Herman	9/25/2015	MW103	Bailer	1U	1U	0.01U	1U	**3.47**	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW103	Herman	12/11/2015	MW103	Bailer	**3.1**	1U	0.01U	1U	**5.39**	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW105	Herman	6/12/2015	MW105	Bailer	1U	1U	0.01U	1U	**4.58**	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW105	Herman	9/25/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW105	Herman	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW107	Herman	6/13/2015	MW107	Submersible Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW107	Herman	9/26/2015	MW107	Submersible Pump	1U	1U	0.01U	1U	**1.13**	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW107	Herman	12/12/2015	MW107	Submersible Pump	1U	1U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW108	Herman	6/18/2015	MW108	Submersible Pump	1U	1U	0.01U	1U	**6.24**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW108	Herman	9/25/2015	MW108	Bailer	1U	1U	0.01U	1U	**1.14**	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**0.22**	0.06U	0.06U
MW108	Herman	12/15/2015	MW108	Bailer	1U	1U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**0.076**	0.06U	0.06U
MW109	Herman	6/19/2015	MW109	Bailer	1U	1U	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW109	Herman	9/25/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW109	Herman	12/11/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

NOTES & DEFINITIONS:

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels, Table 720-1 of WAC 173-340-900, revised October 12, 2007.

Groundwater samples were analyzed by Friedman & Bruya, Inc. The analytical laboratory reports are included as an appendix.

Red denotes sample concentration equals or exceeds MTCA Method A Cleanup Levels for groundwater.

Black denotes sample concentration was detected but does not exceed MTCA Method A Cleanup Levels for groundwater.

Gray denotes sample concentration was undetected at the method reporting limit, the constituent was not analyzed, or the well was dry.

[1] Remediation wells (identified as "RW") are either 2 or 4 inches in diameter and are connected to a multi-phase extraction system.

[2] With the exception of Napthalene, preliminary screening results for carcinogenic PAHs are compared to the MTCA Method A Cleanup Level provided for benzo(a)pyrene on Table 720-1 of WAC 173-340-900. Per MTCA, this value represents the total concentration that all PAHs must meet using the toxicity equivalency methodology of WAC 173-340-708(8).

-- = Sample was not collected.

* = Indicates blind field duplicate sample was collected for quality assurance/quality control purposes.

Dry = Indicates well could not be sampled due to insufficient groundwater sample volume.

NA = Indicates the compound was not analyzed.

LABORATORY NOTES:

U = Indicates the compound was undetected at the reported concentration.

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. Qualifier was assigned based on data validation protocol.

LIST OF PROPERTIES:

TOC = 24205 56th Avenue West, Mountlake Terrace WA

TOC/Farmasonis = 24225 56th Avenue West, Mountlake Terrace WA

Drake = 24309 56th Avenue West, Mountlake Terrace WA

56th Ave ROW = right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties

Herman = 24311 56th Avenue West, Mountlake Terrace WA

Shin/Choi = 24325 56th Avenue West, Mountlake Terrace WA

ACRONYMS:

µg/L = micrograms per liter

PAH = Polycyclic Aromatic Hydrocarbons

MTCA = Model Toxics Control Act

WAC = Washington Administrative Code

TABLE 4-1
Groundwater Quality Results for Select Constituents
Shallow-Intermediate Zone Intersect Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)								
					Total Petroleum Hydrocarbons			Volatile Organic Compounds					
					Method NWTPH-Gx	Method NWTPH-Dx		Method SW8021B / SW8260C[2]					
					Gasoline-Range (GRPH)	Motor Oil-Range (ORPH)	Diesel-Range (DRPH)	Benzene	Toluene	Ethylbenzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)					**1,000/800[3]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[4]**	**NE[4]**
MW09	TOC	6/16/2015	MW09	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW09	TOC	6/16/2015	MLT-01	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW09	TOC	9/23/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW09	TOC	12/10/2015	MW09	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW09	TOC	12/10/2015	MLT-01	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW27 (2" RW)	TOC	6/9/2015	MW27	Pneumatic Pump	**740**	NA	NA	1U	**6.7**	**21**	**140**	NA	NA
MW27 (2" RW)	TOC	9/22/2015	MW27	Pneumatic Pump	**910**	NA	NA	1U	**1.6**	1U	**22**	NA	NA
MW27 (2" RW)	TOC	12/10/2015	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

NOTES & DEFINITIONS:

Well screens intersect Shallow and Intermediate Zone conditions.

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels, Table 720-1 of WAC 173-340-900, revised October 12, 2007.

Groundwater samples were analyzed by Friedman & Bruya, Inc. The analytical laboratory reports are included as an appendix.

Red denotes sample concentration equals or exceeds MTCA Method A Cleanup Levels for groundwater.

Black denotes sample concentration was detected but does not exceed MTCA Method A Cleanup Levels for groundwater.

Gray denotes sample concentration was undetected at the method reporting limit, the constituent was not analyzed, or the well was dry.

[1] Remediation wells (identified as "RW") are either 2 or 4 inches in diameter and are connected to a multi-phase extraction system.

[2] If samples were analyzed by two methods, the maximum concentration of the two results is reported.

[3] Cleanup level is 1,000 µg/L when benzene is not present and 800 µg/L when benzene is present.

[4] Cleanup levels for individual xylenes have not been established.

-- = Sample was not collected.

* = Indicates blind field duplicate sample was collected for quality assurance/quality control purposes.

Dry = Indicates well could not be sampled due to insufficient groundwater sample volume.

NA = Indicates the compound was not analyzed.

NE = Indicates MTCA Method A Cleanup Level has not been established.

ACRONYMS:

µg/L = micrograms per liter

MTCA = Model Toxics Control Act

NWTPH-Dx = Northwest Total Petroleum Hydrocarbon - diesel-range organics

NWTPH-Gx = Northwest Total Petroleum Hydrocarbon - gasoline-range organics

WAC = Washington Administrative Code

LABORATORY NOTES:

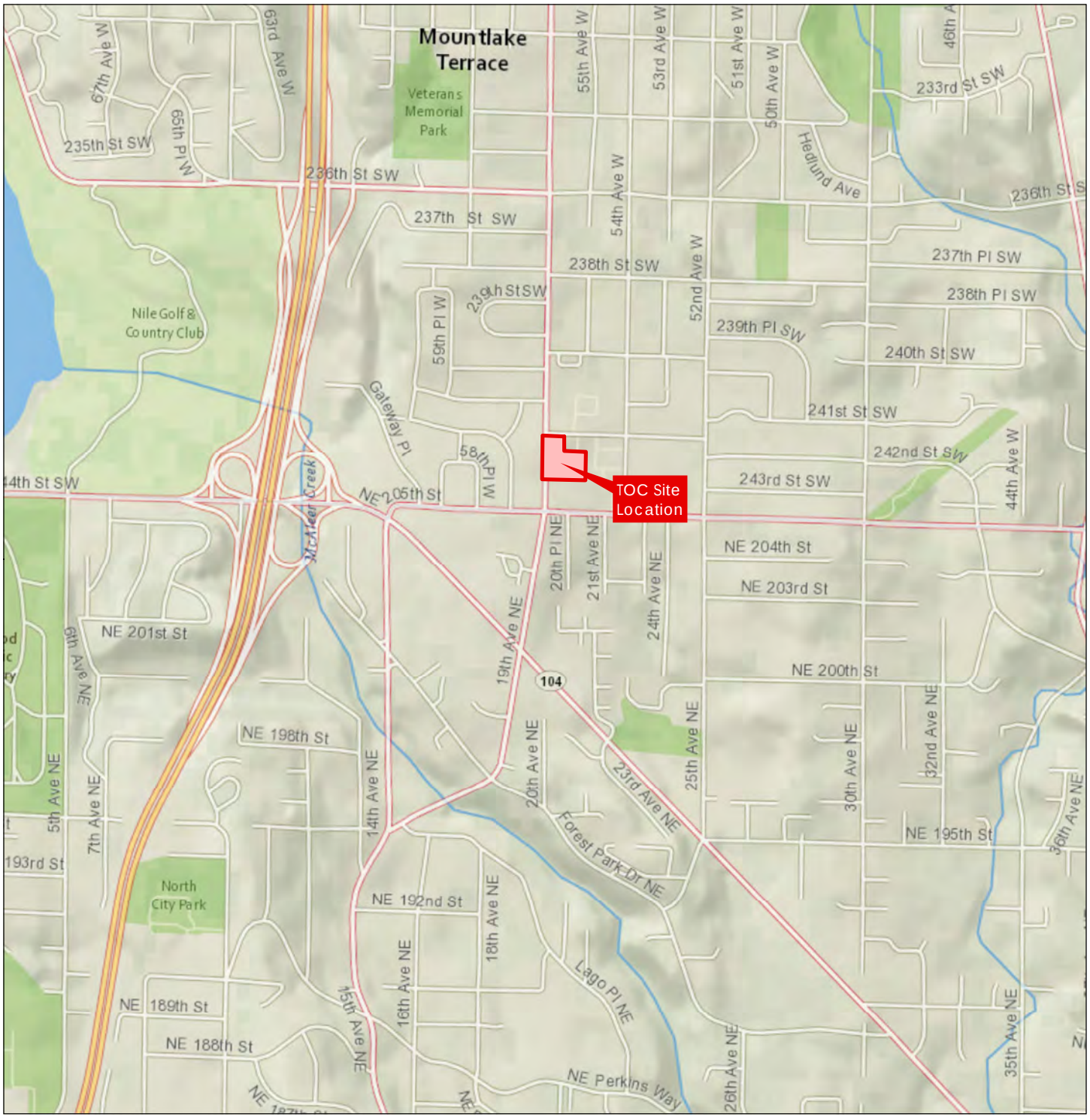
U = Indicates the compound was undetected at the reported concentration.

LIST OF PROPERTIES:

TOC = 24205 56th Avenue West, Mountlake Terrace WA

Figures

U:\Pre_MED\AD\WA\Clients\Time_Oil\TOC-Mountlaketerrace_BA1402800\MXDs\2015 Report\Fig_1_ProjectLocation.mxd Revised: 2016-03-11 By: jonevill



Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

TOC Site Location

Figure No.
1

Title
Project Location

Client/Project
TOC Holdings Co.

Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace,
Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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U:\Pre MEDAD\WA\Clients\Time Oil\TOC-MountlakeTerrace BA\402800\MXDs\2015 Report\Fig 2_SiteMap.mxd Revised: 2016-03-14 By: jonevill

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend
- Parcel Boundary
- Site Boundary
- County Boundary

Figure No.
2

Title
Site Map

Client/Project
TOC Holdings Co.

Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace,
Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

242nd Street Southwest
56th Avenue West
Tanks Removed 1991
TOC Property
Unit 1 Treatment System
Stormwater Infiltration Pit (1975)
Unit 3 Treatment System
Utility Shed
TOC/Farmasonis Property
Vacant
Drake Property
Gateway Tavern
Herman Property
Tanks Removed 2001
Dave's Auto Repair
Unconfirmed UST Locations (Status Unknown)
Unconfirmed UST Locations (Status Unknown)
Unconfirmed UST Location (Status Unknown, Identified in 2001)
Ez Corner Mart
Shin/Choi Property
Tanks Removed 1996
Mountlake Senior Property

MW16 MW05 MW26 MW38 MW90 MW27 MW04 MW50 MW03 MW11 MW91 MW37 MW24 MW29 MW06 MW09 MW08 MW62 MW32 MW25 MW28 MW35 MW36 MW34 MW53 MW20 MW19 MW01 MW15 MW02 MW18 MW33 MW22 MW23 MW21 MW31 MW30 MW54 MW43 MW93 MW94 MW14 MW60 MW12 MW56 MW07 MW66 MW59 MW13 MW92 MW41 MW39 MW82 MW17 MW83 MW40 MW45 MW81 MW79 MW61 MW49 MW100 MW80 MW46 MW57 MW42 MW58 MW55 MW48 MW96 MW64 MW67 MW68 MW97 MW70 MW98 MW63 MW44 MW47 MW52 MW95 MW99 MW65 MW75 MW69 MW101 MW78 MW89 MW84 MW77 MW87 MW86 MW85 MW51 MW109 MW105 MW104 MW108 MW103 MW102 MW107 MW106 MW74 MW71 MW72 MW73

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Legend

- Shallow Groundwater Zone Monitoring Well Location
- Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones)
- Intermediate Groundwater Zone Monitoring Well Location
- Deep Groundwater Zone Monitoring Well Location
- Abandoned Monitoring Well Location
- Historic Underground Storage Tank
- Fiber Optic Line
- Gas Line
- Sewer Line
- Stormwater Line
- Water Line
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Stormwater Pit
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
3

Title
Locations of Wells and Remediation Systems

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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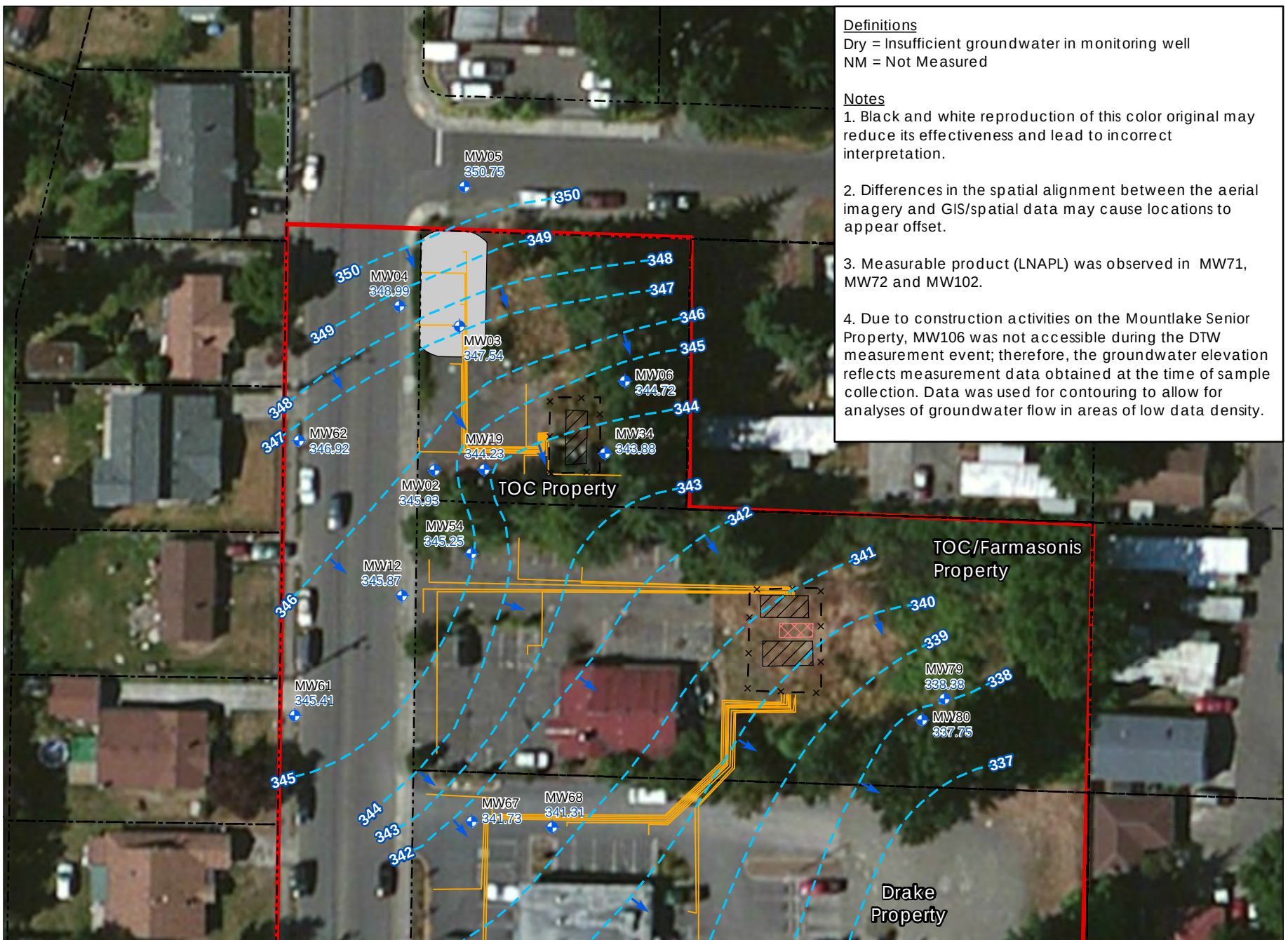

Definitions
Dry = Insufficient groundwater in monitoring well
NM = Not Measured

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. Measurable product (LNAPL) was observed in MW71, MW72 and MW102.

4. Due to construction activities on the Mountlake Senior Property, MW106 was not accessible during the DTW measurement event; therefore, the groundwater elevation reflects measurement data obtained at the time of sample collection. Data was used for contouring to allow for analyses of groundwater flow in areas of low data density.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/ Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Legend

- MW72 331.32 — Shallow Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
4

Title
Groundwater Elevation Contours, Shallow Zone (System Off), June 15, 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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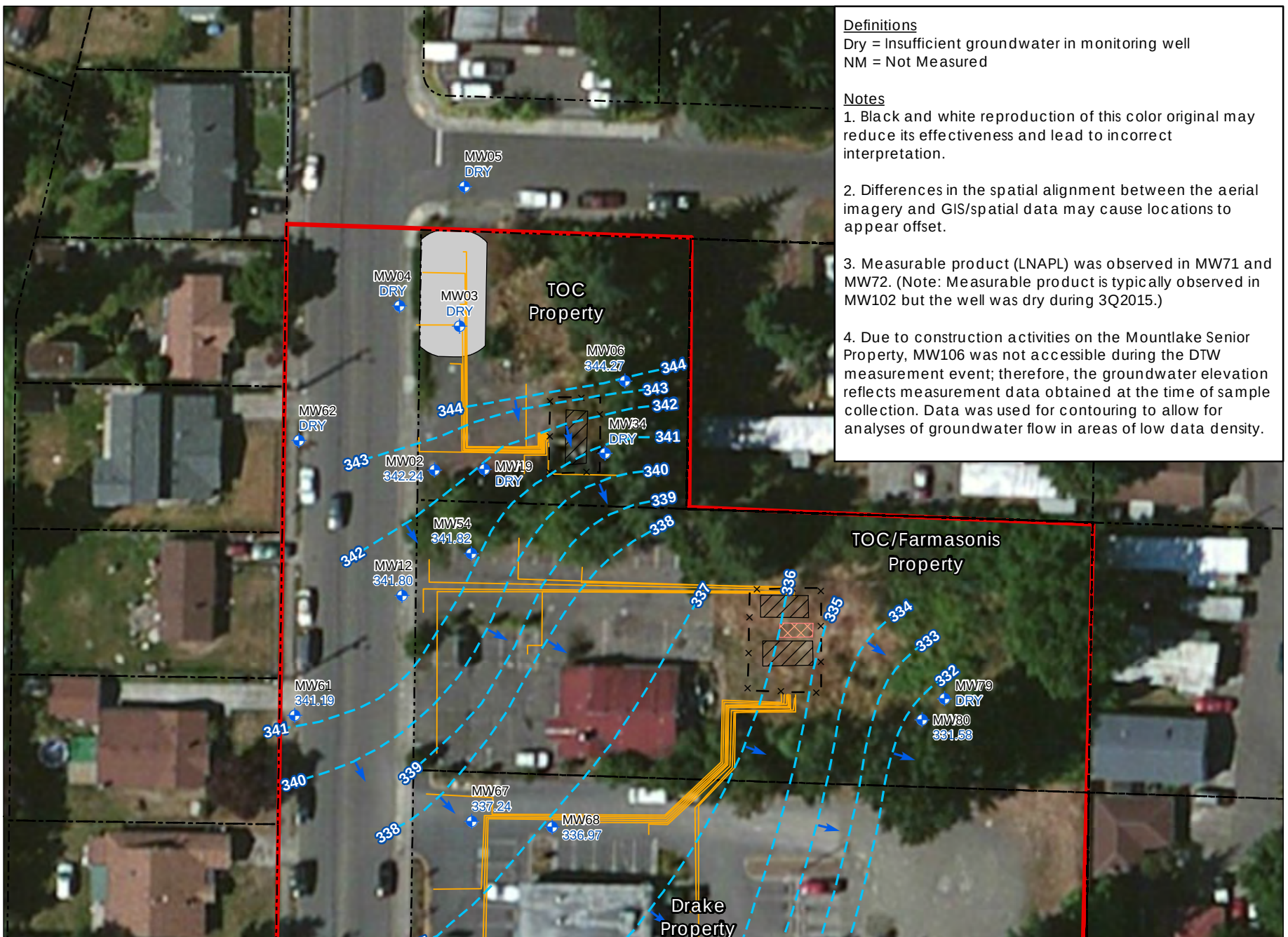

Definitions
Dry = Insufficient groundwater in monitoring well
NM = Not Measured

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. Measurable product (LNAPL) was observed in MW71 and MW72. (Note: Measurable product is typically observed in MW102 but the well was dry during 3Q2015.)

4. Due to construction activities on the Mountlake Senior Property, MW106 was not accessible during the DTW measurement event; therefore, the groundwater elevation reflects measurement data obtained at the time of sample collection. Data was used for contouring to allow for analyses of groundwater flow in areas of low data density.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Legend

- MW72 331.32 — Shallow Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
5

Title
Groundwater Elevation Contours, Shallow Zone (System Off), September 28, 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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Definitions
Dry = Insufficient groundwater in monitoring well
NM = Not Measured

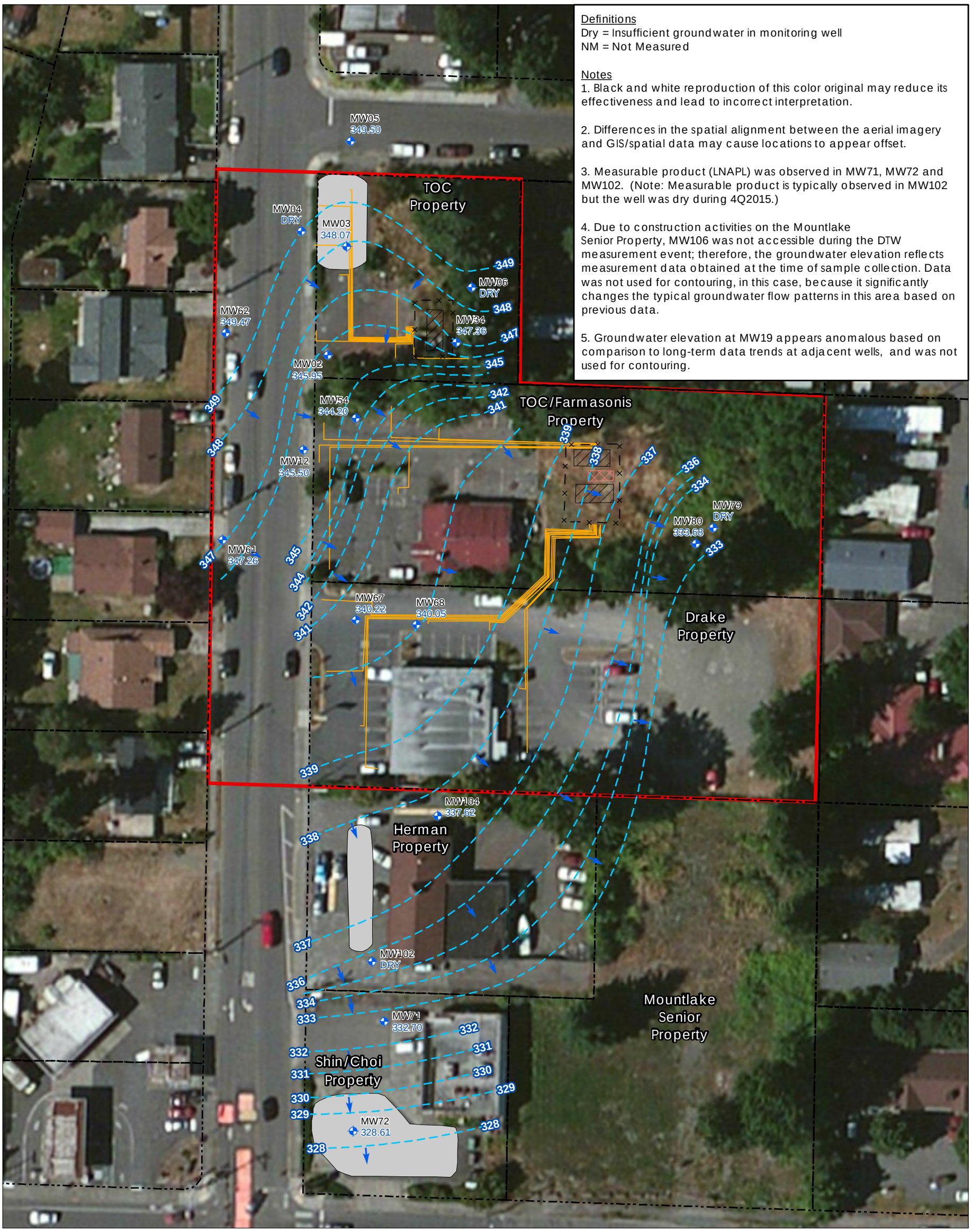
Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. Measurable product (LNAPL) was observed in MW71, MW72 and MW102. (Note: Measurable product is typically observed in MW102 but the well was dry during 4Q2015.)

4. Due to construction activities on the Mountlake Senior Property, MW106 was not accessible during the DTW measurement event; therefore, the groundwater elevation reflects measurement data obtained at the time of sample collection. Data was not used for contouring, in this case, because it significantly changes the typical groundwater flow patterns in this area based on previous data.

5. Groundwater elevation at MW19 appears anomalous based on comparison to long-term data trends at adjacent wells, and was not used for contouring.



Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Legend

- MW72 331.32 — Shallow Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
6

Title
Groundwater Elevation Contours, Shallow Zone (System Off), December 14, 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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Definitions
Dry = Insufficient groundwater volume in monitoring well or the top of pump was encountered prior to the groundwater level in remediation wells.
NM = Not Measured

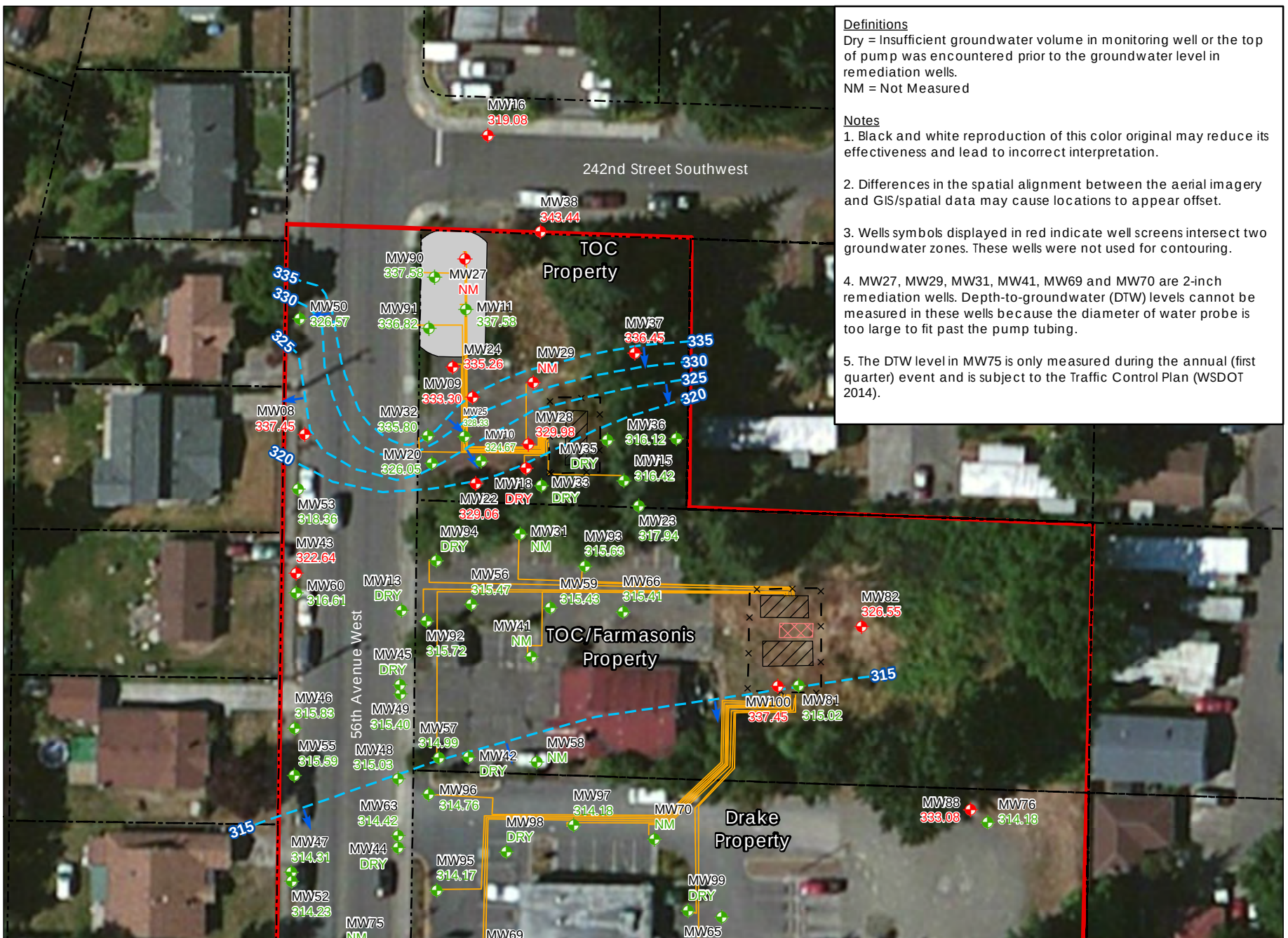
Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. Wells symbols displayed in red indicate well screens intersect two groundwater zones. These wells were not used for contouring.

4. MW27, MW29, MW31, MW41, MW69 and MW70 are 2-inch remediation wells. Depth-to-groundwater (DTW) levels cannot be measured in these wells because the diameter of water probe is too large to fit past the pump tubing.

5. The DTW level in MW75 is only measured during the annual (first quarter) event and is subject to the Traffic Control Plan (WSDOT 2014).



Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Legend

- MW72 331.32 — Intermediate Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- MW72 331.32 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
7

Title
Groundwater Elevation Contours, Intermediate Zone (System Off), June 15, 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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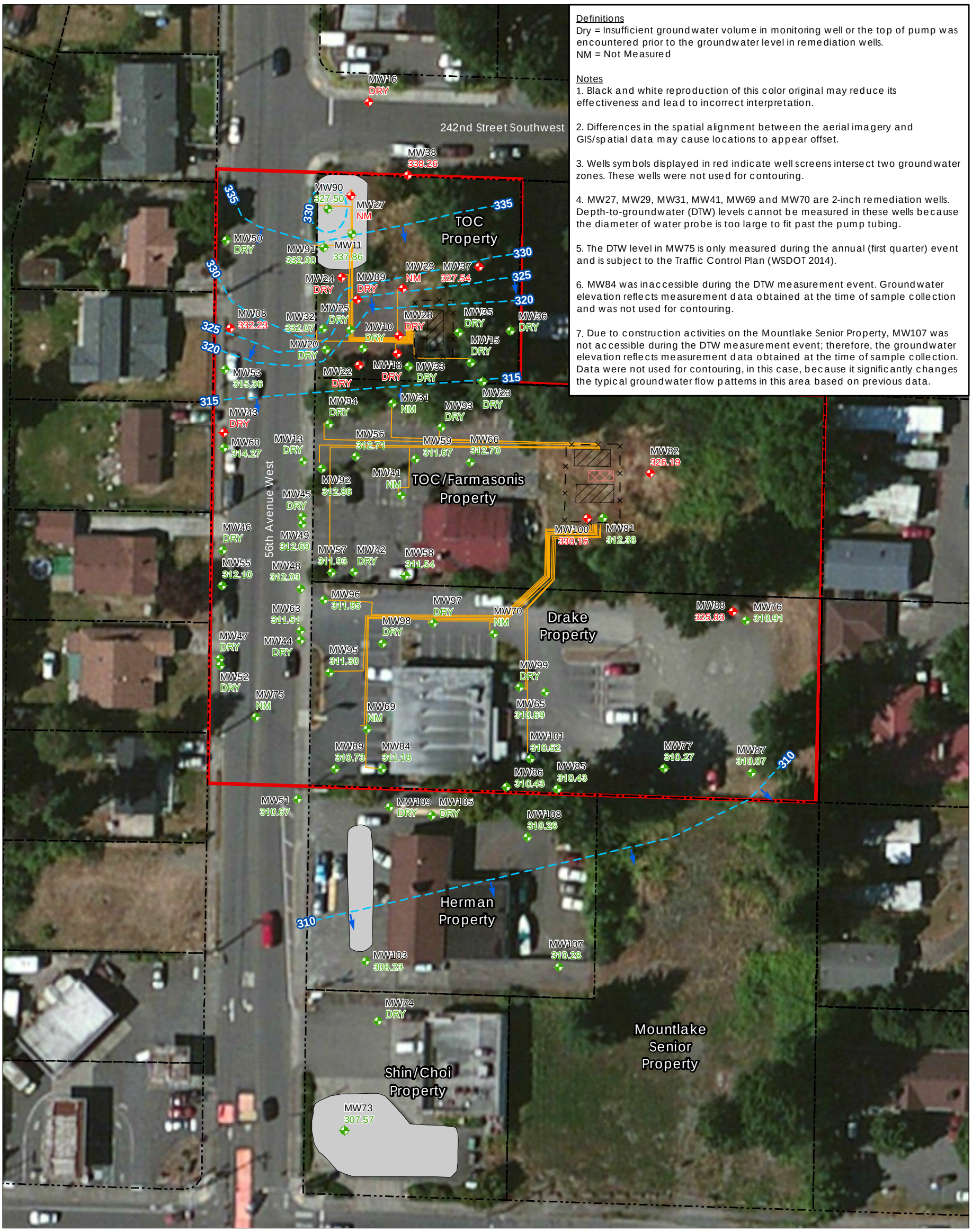

Definitions
Dry = Insufficient groundwater volume in monitoring well or the top of pump was encountered prior to the groundwater level in remediation wells.
NM = Not Measured

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. Wells symbols displayed in red indicate well screens intersect two groundwater zones. These wells were not used for contouring.

4. MW27, MW29, MW31, MW41, MW69 and MW70 are 2-inch remediation wells. Depth-to-groundwater (DTW) levels cannot be measured in these wells because the diameter of water probe is too large to fit past the pump tubing.

5. The DTW level in MW75 is only measured during the annual (first quarter) event and is subject to the Traffic Control Plan (WSDOT 2014).

6. MW84 was inaccessible during the DTW measurement event. Groundwater elevation reflects measurement data obtained at the time of sample collection and was not used for contouring.

7. Due to construction activities on the Mountlake Senior Property, MW107 was not accessible during the DTW measurement event; therefore, the groundwater elevation reflects measurement data obtained at the time of sample collection. Data were not used for contouring, in this case, because it significantly changes the typical groundwater flow patterns in this area based on previous data.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Legend

- MW72 331.32 — Intermediate Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- MW72 331.32 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
8

Title
Groundwater Elevation Contours, Intermediate Zone (System Off), September 28, 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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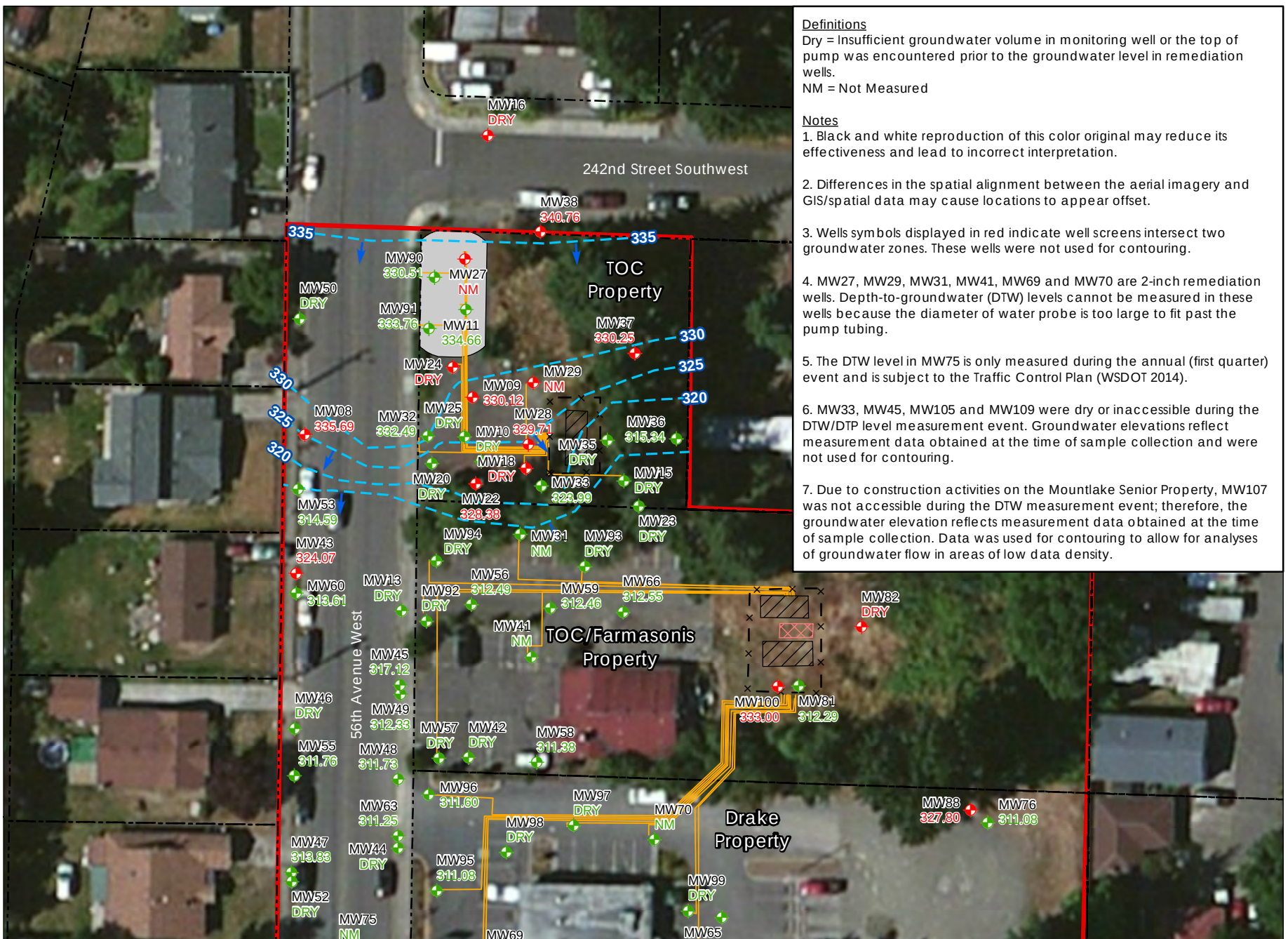

Definitions

Dry = Insufficient groundwater volume in monitoring well or the top of pump was encountered prior to the groundwater level in remediation wells.
NM = Not Measured

Notes

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2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. Wells symbols displayed in red indicate well screens intersect two groundwater zones. These wells were not used for contouring.

4. MW27, MW29, MW31, MW41, MW69 and MW70 are 2-inch remediation wells. Depth-to-groundwater (DTW) levels cannot be measured in these wells because the diameter of water probe is too large to fit past the pump tubing.

5. The DTW level in MW75 is only measured during the annual (first quarter) event and is subject to the Traffic Control Plan (WSDOT 2014).

6. MW33, MW45, MW105 and MW109 were dry or inaccessible during the DTW/DTP level measurement event. Groundwater elevations reflect measurement data obtained at the time of sample collection and were not used for contouring.

7. Due to construction activities on the Mountlake Senior Property, MW107 was not accessible during the DTW measurement event; therefore, the groundwater elevation reflects measurement data obtained at the time of sample collection. Data was used for contouring to allow for analyses of groundwater flow in areas of low data density.

Map Details

1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Legend

- MW72 331.32 — Intermediate Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- MW72 331.32 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
9

Title
Groundwater Elevation Contours, Intermediate Zone (System Off), December 14, 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
1:720 (At Original document size of 11x17)

N

Stantec

Definitions
Dry = Insufficient groundwater in monitoring well
NM = Not Measured

Notes
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Map Details
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Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

- MW72 331.32 — Deep Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
10

Title
Groundwater Elevation Contours, Deep Zone (System Off), June 15, 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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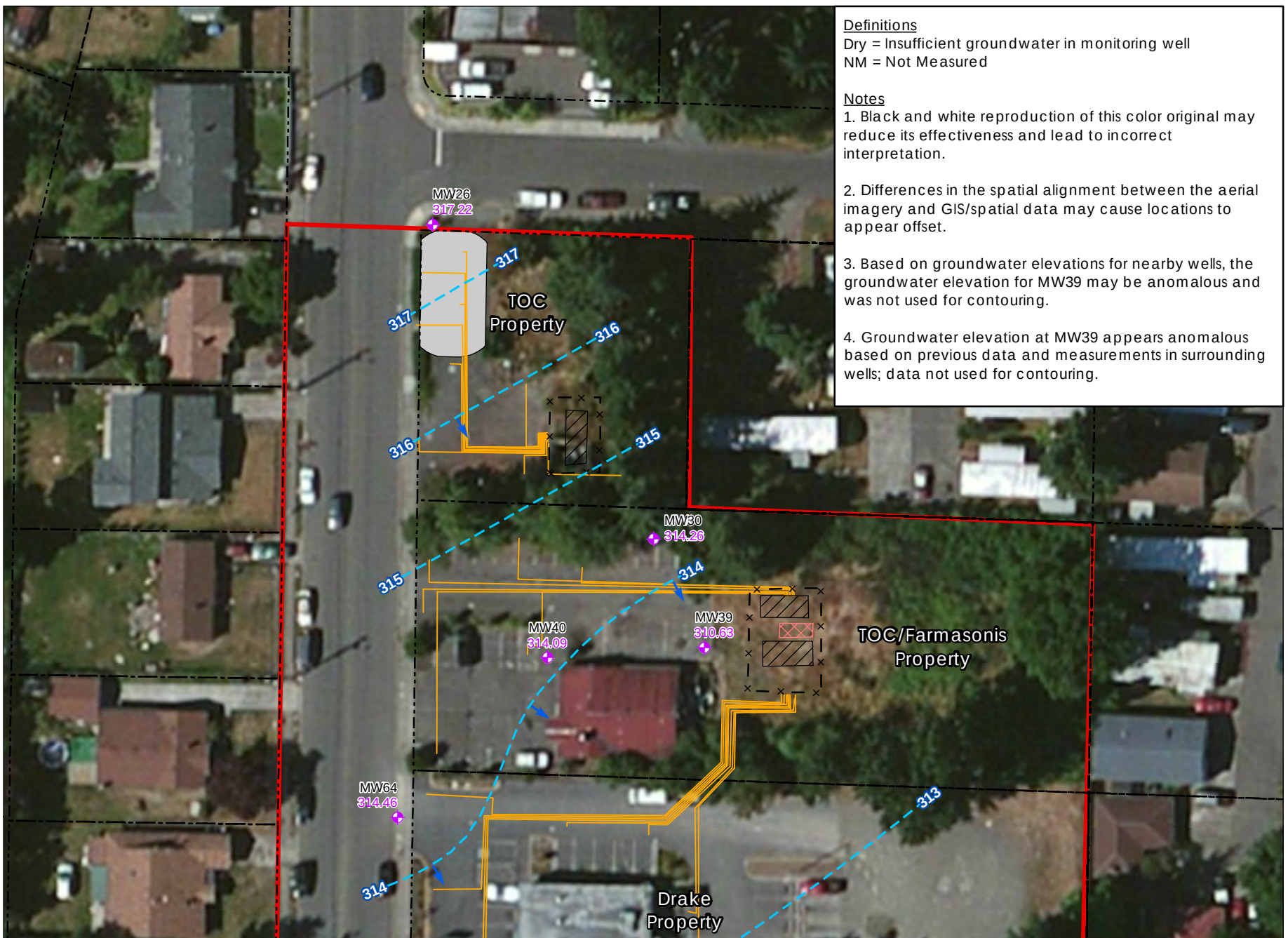

Definitions
Dry = Insufficient groundwater in monitoring well
NM = Not Measured

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. Based on groundwater elevations for nearby wells, the groundwater elevation for MW39 may be anomalous and was not used for contouring.

4. Groundwater elevation at MW39 appears anomalous based on previous data and measurements in surrounding wells; data not used for contouring.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

- MW72 331.32 — Deep Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
11

Title
Groundwater Elevation Contours, Deep Zone (System Off), September 28, 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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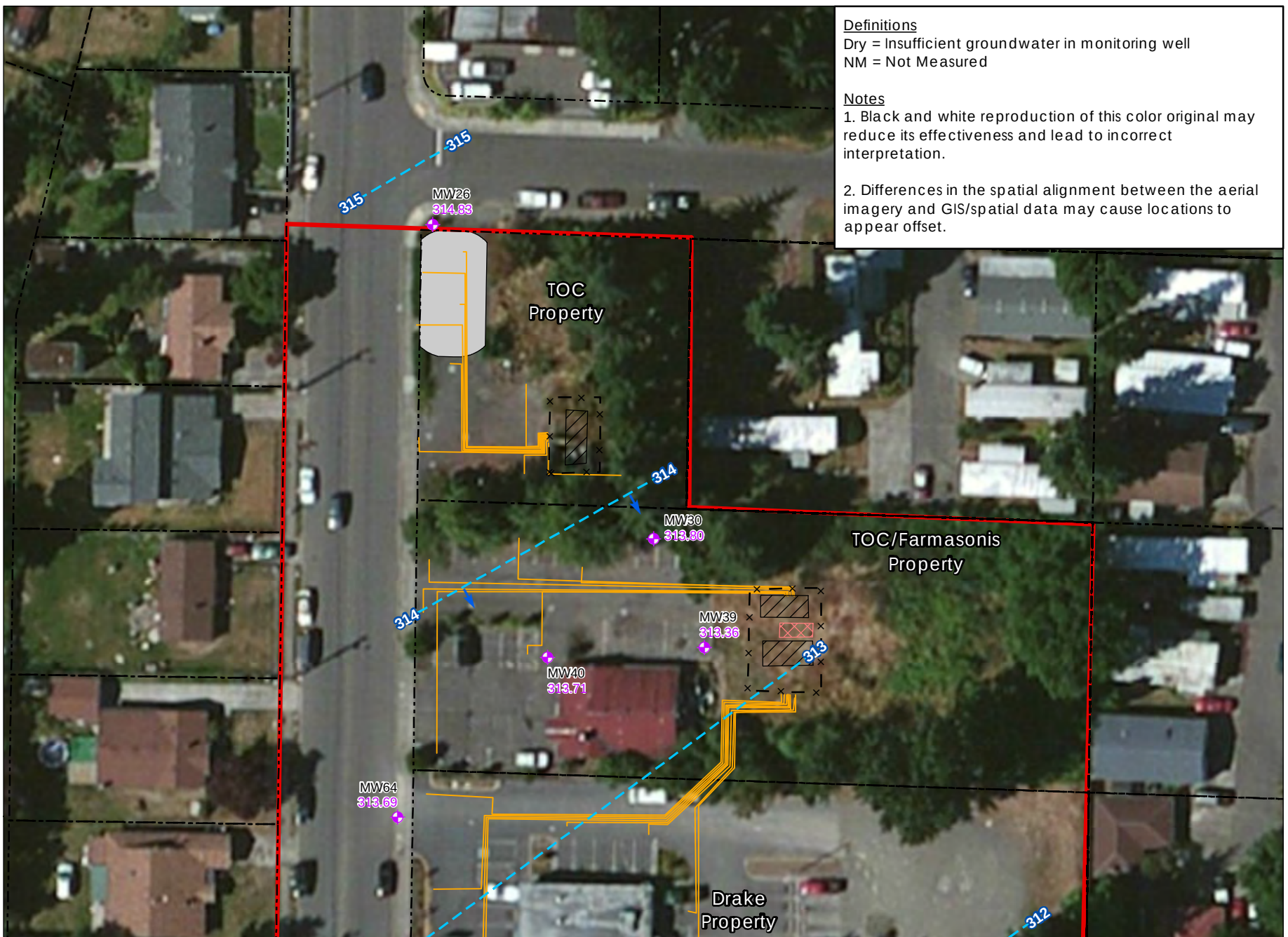

Definitions
Dry = Insufficient groundwater in monitoring well
NM = Not Measured

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

- MW72 331.32 — Deep Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
12

Title
Groundwater Elevation Contours, Deep Zone (System Off), December 14, 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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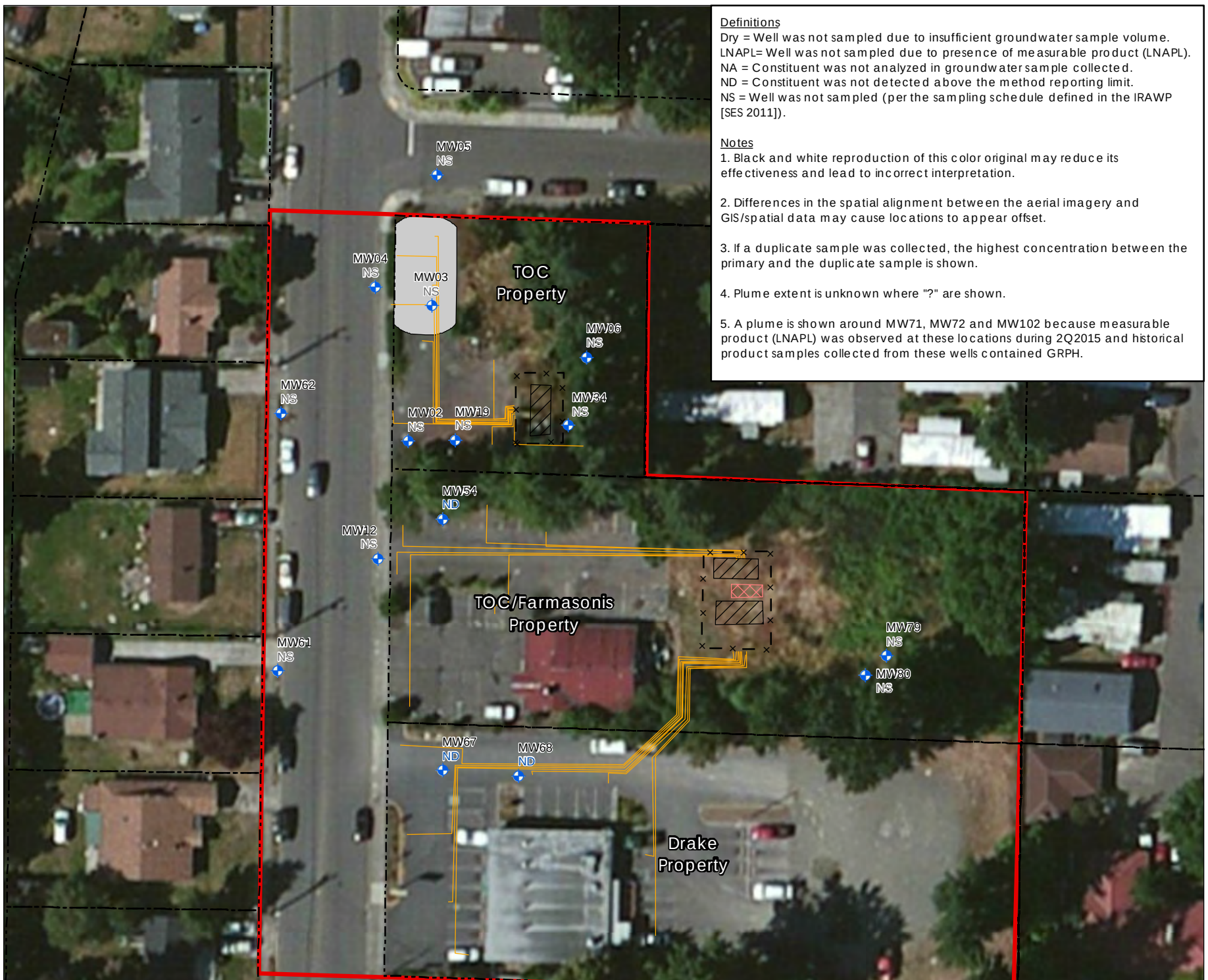
Stantec

U:\Pre_MED\AD\WA\Clients\Time_Oil\TOC-MountlakeTerrace_BA1402800\MXDs\2015 Report\Fig_13_2Q15_GRPH_SZ_map.mxd Revised: 2016-03-14 By: nfaust



Definitions
Dry = Well was not sampled due to insufficient groundwater sample volume.
LNAPL= Well was not sampled due to presence of measurable product (LNAPL).
NA = Constituent was not analyzed in groundwater sample collected.
ND = Constituent was not detected above the method reporting limit.
NS = Well was not sampled (per the sampling schedule defined in the IRAWP [SES 2011]).

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

4. Plume extent is unknown where "?" are shown.

5. A plume is shown around MW71, MW72 and MW102 because measurable product (LNAPL) was observed at these locations during 2Q2015 and historical product samples collected from these wells contained GRPH.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

MW72 800 — Shallow Groundwater Zone Monitoring Well Location & GRPH Concentration (µg/L)

Remediation System Piping

Sample Concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)

Parcel Boundary

Site Boundary

Estimated Historic Soil Excavation

Remediation System Compound

Compound Fence

Equipment Shed

Figure No.
13

Title
GRPH Concentrations
Shallow Zone,
Second Quarter 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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Definitions
Dry = Well was not sampled due to insufficient groundwater sample volume.
LNAPL = Well was not sampled due to presence of measurable product (LNAPL).
NA = Constituent was not analyzed in groundwater sample collected.
ND = Constituent was not detected above the method reporting limit.
NS = Well was not sampled (per the sampling schedule defined in the IRAWP [SES 2011]).

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

4. Plume extent is unknown where "?" are shown.

5. A plume is shown around MW71, MW72 and MW102 because measurable product (LNAPL) was observed at these locations during 2Q2015 and historical product samples collected from these wells contained benzene.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Legend

- MW72 / 5 — Shallow Groundwater Zone Monitoring Well Location & Benzene Concentration (µg/L)
- Remediation System Piping
- Minimum Preliminary Screening Level for Benzene (5 µg/L; MTCA Method A Cleanup Level)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
14

Title
Benzene Concentrations
Shallow Zone,
Second Quarter 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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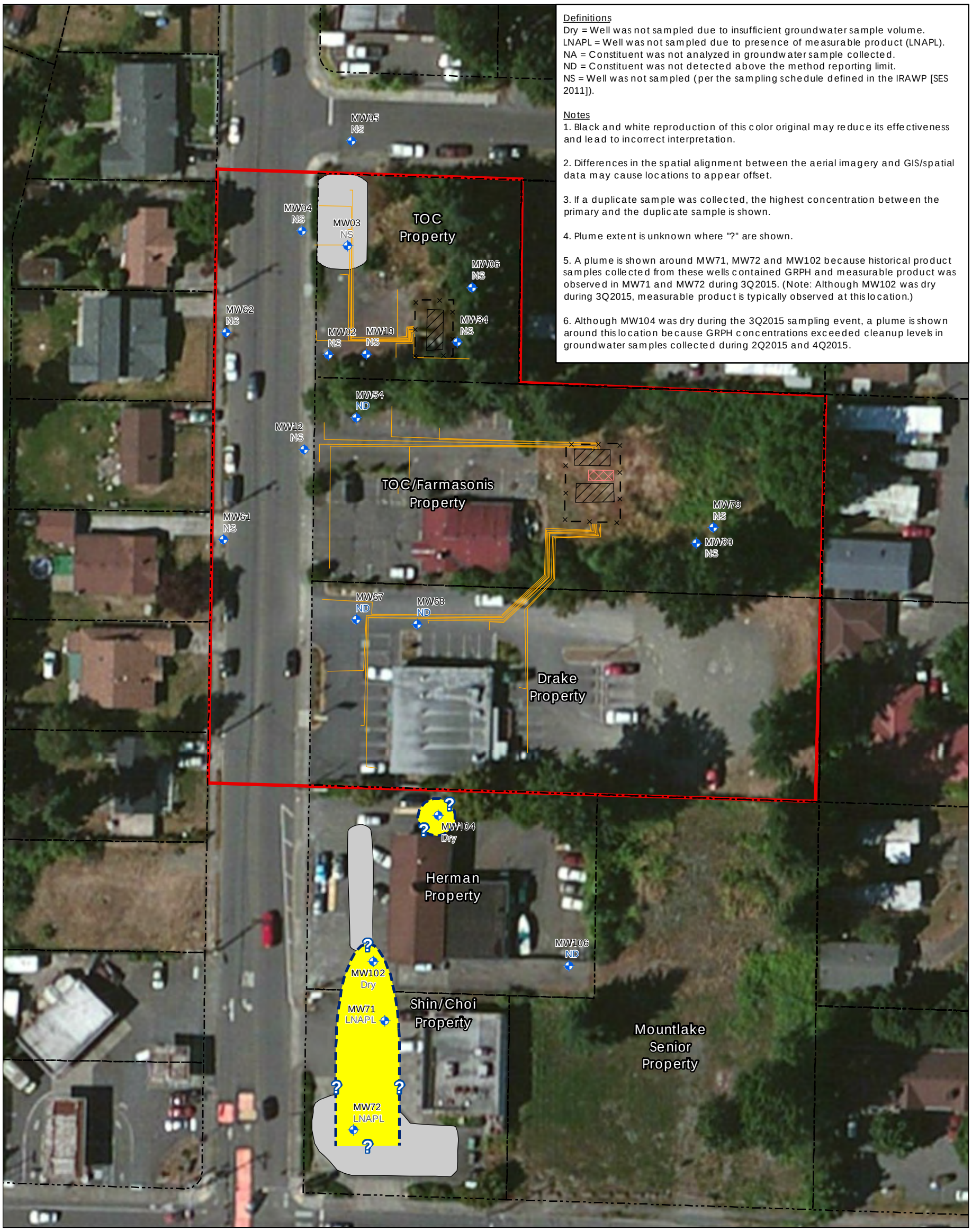
Stantec

U:\Pre_MED\ADI\WA\Clients\Time_Oil\TOC-Mountlake Terrace_BA 1402800\MXDs\2015 Report\Fig_15_3Q15_GRPH_SZ_map.mxd Revised: 2016-03-14 By: nfaust



Definitions
Dry = Well was not sampled due to insufficient groundwater sample volume.
LNAPL = Well was not sampled due to presence of measurable product (LNAPL).
NA = Constituent was not analyzed in groundwater sample collected.
ND = Constituent was not detected above the method reporting limit.
NS = Well was not sampled (per the sampling schedule defined in the IRAWP [SES 2011]).

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

4. Plume extent is unknown where "?" are shown.

5. A plume is shown around MW71, MW72 and MW102 because historical product samples collected from these wells contained GRPH and measurable product was observed in MW71 and MW72 during 3Q2015. (Note: Although MW102 was dry during 3Q2015, measurable product is typically observed at this location.)

6. Although MW104 was dry during the 3Q2015 sampling event, a plume is shown around this location because GRPH concentrations exceeded cleanup levels in groundwater samples collected during 2Q2015 and 4Q2015.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

- MW72 / 800 — Shallow Groundwater Zone Monitoring Well Location & GRPH Concentration (µg/L)
- Remediation System Piping
- Sample Concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
15

Title
GRPH Concentrations
Shallow Zone,
Third Quarter 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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Stantec

Definitions
Dry = Well was not sampled due to insufficient groundwater sample volume.
LNAPL = Well was not sampled due to presence of measurable product (LNAPL).
NA = Constituent was not analyzed in groundwater sample collected.
ND = Constituent was not detected above the method reporting limit.
NS = Well was not sampled (per the sampling schedule defined in the IRAWP [SES 2011]).

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

4. Plume extent is unknown where "?" are shown.

5. A plume is shown around MW71, MW72 and MW102 because historical product samples collected from these wells contained benzene and measurable product was observed in MW71 and MW72 during 3Q2015. (Note: Although MW102 was dry during 3Q2015, measurable product is typically observed at this location.)

6. Although MW104 was dry during the 3Q2015 sampling event, a plume is shown around this location because benzene concentrations exceeded cleanup levels in groundwater samples collected during 2Q2015 and 4Q2015.

MW05 NS
MW04 NS
MW03 NS
MW06 NS
TOC Property
MW62 NS
MW02 NS
MW19 NS
MW34 NS
TOC/Farmasonis Property
MW54 ND
MW12 NS
MW61 NS
MW79 NS
MW80 NS
MW67 ND
MW68 ND
Drake Property
MW104 Dry
Herman Property
MW106 ND
MW102 Dry
MW71 LNAPL
Shin/Choi Property
Mountlake Senior Property
MW72 LNAPL

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

- MW72 5 — Shallow Groundwater Zone Monitoring Well Location & Benzene Concentration (µg/L)
- Remediation System Piping
- Minimum Preliminary Screening Level for Benzene (5 µg/L; MTCA Method A Cleanup Level)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
16

Title
Benzene Concentrations
Shallow Zone,
Third Quarter 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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Stantec

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Definitions
Dry = Well was not sampled due to insufficient groundwater sample volume.
LNAPL= Well was not sampled due to presence of measurable product (LNAPL).
NA = Constituent was not analyzed in groundwater sample collected.
ND = Constituent was not detected above the method reporting limit.
NS = Well was not sampled (per the sampling schedule defined in the IRAWP [SES 2011]).

Notes
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2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

4. Plume extent is unknown where "?" are shown.

5. A plume is shown around MW71, MW72 and MW102 because historical product samples collected from these wells contained GRPH and measurable product was observed in MW71 and MW72 during 4Q2015. (Note: Although groundwater volume was minimal and measurable LNAPL was not observed in MW102 during 4Q2015, measurable product is typically observed at this location.)

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Legend

- MW72 / 800 — Shallow Groundwater Zone Monitoring Well Location & GRPH Concentration (µg/L)
- Remediation System Piping
- Sample Concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
17

Title
GRPH Concentrations
Shallow Zone,
Fourth Quarter 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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Stantec

Definitions
Dry = Well was not sampled due to insufficient groundwater sample volume.
LNAPL = Well was not sampled due to presence of measurable product (LNAPL).
NA = Constituent was not analyzed in groundwater sample collected.
ND = Constituent was not detected above the method reporting limit.
NS = Well was not sampled (per the sampling schedule defined in the IRAWP [SES 2011]).

Notes
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2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

4. Plume extent is unknown where "?" are shown.

5. A plume is shown around MW71, MW72 and MW102 because historical product samples collected from these wells contained benzene and measurable product was observed in MW71 and MW72 during 4Q2015. (Note: Although groundwater volume was minimal and measurable LNAPL was not observed in MW102 during 4Q2015, measurable product is typically observed at this location.)

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

- MW72 5 — Shallow Groundwater Zone Monitoring Well Location & Benzene Concentration (µg/L)
- Remediation System Piping
- Minimum Preliminary Screening Level for Benzene (5 µg/L; MTCA Method A Cleanup Level)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
18

Title
Benzene Concentrations
Shallow Zone,
Fourth Quarter 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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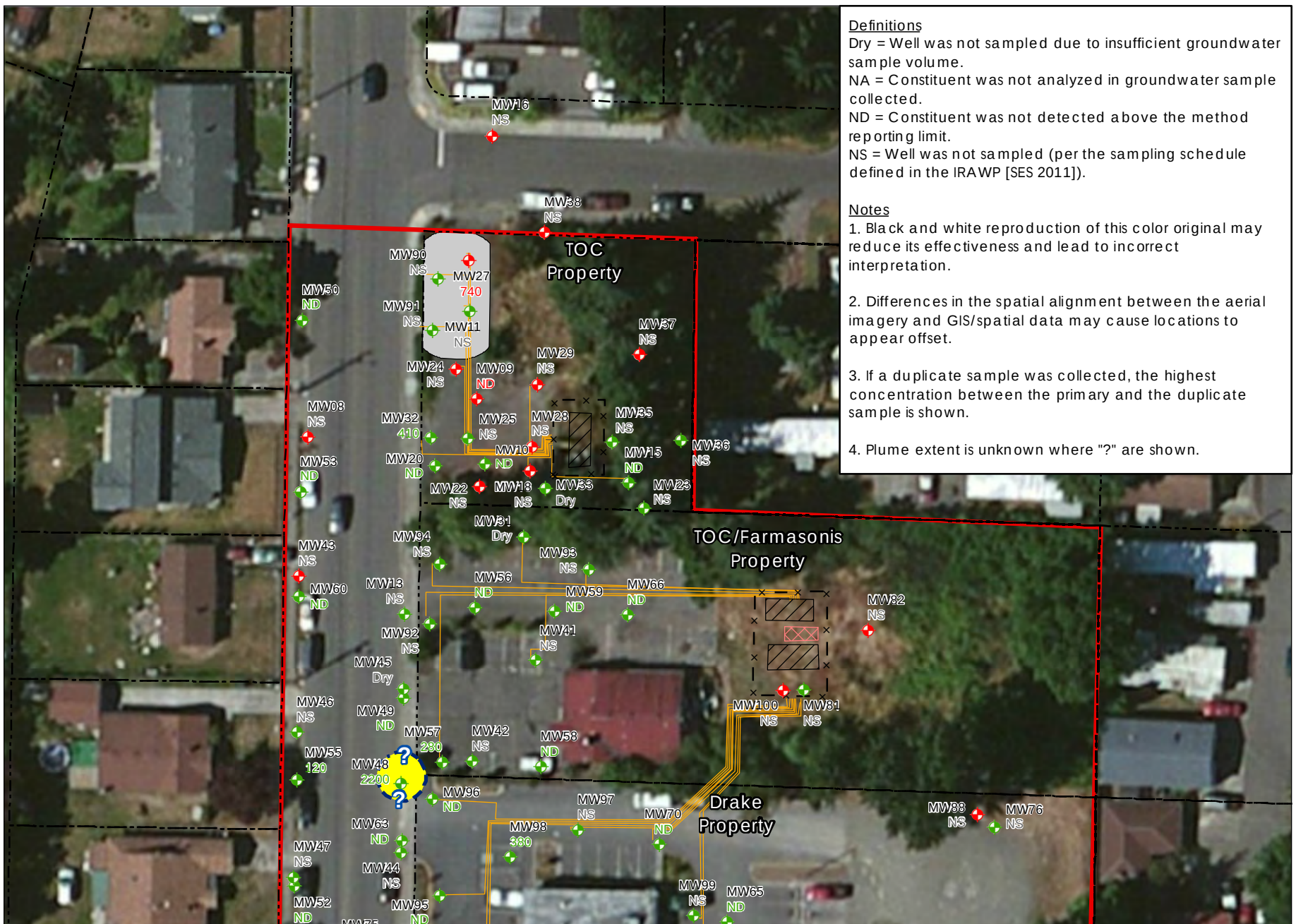
Stantec



Definitions

Dry = Well was not sampled due to insufficient groundwater sample volume.
NA = Constituent was not analyzed in groundwater sample collected.
ND = Constituent was not detected above the method reporting limit.
NS = Well was not sampled (per the sampling schedule defined in the IRAWP [SES 2011]).

Notes

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2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

4. Plume extent is unknown where "?" are shown.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

- MW72 800 — Intermediate Groundwater Zone Monitoring Well Location & GRPH Concentration (µg/L)
- MW72 800 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & GRPH Concentration (µg/L)
- Remediation System Piping
- Sample Concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
19

Title
GRPH Concentrations
Intermediate Zone,
Second Quarter 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
1:720 (At Original document size of 11x17)

N

Stantec

Definitions
Dry = Well was not sampled due to insufficient groundwater sample volume.
NA = Constituent was not analyzed in groundwater sample collected.
ND = Constituent was not detected above the method reporting limit.
NS = Well was not sampled (per the sampling schedule defined in the IRAWP [SES 2011]).

Notes
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2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

4. Plume extent is unknown where "?" are shown.

TOC Property
TOC/Farmasonis Property
Drake Property
Herman Property
Shin/Choi Property
Mountlake Senior Property

MW16 NS
MW38 NS
MW90 NS
MW27 ND
MW50 ND
MW91 NS
MW11 NS
MW37 NS
MW29 NS
MW24 NS
MW09 ND
MW08 NS
MW32 2.6
MW28 NS
MW35 NS
MW10 ND
MW36 NS
MW53 ND
MW20 ND
MW15 ND
MW22 NS
MW18 NS
MW33 Dry
MW23 NS
MW31 Dry
MW94 NS
MW43 NS
MW93 NS
MW56 ND
MW59 ND
MW66 ND
MW60 ND
MW13 NS
MW82 NS
MW92 NS
MW41 NS
MW81 NS
MW45 Dry
MW46 NS
MW49 ND
MW100 NS
MW42 NS
MW58 ND
MW55 7.6
MW57 ND
MW48 ND
MW96 ND
MW97 NS
MW70 ND
MW88 NS
MW76 NS
MW63 2.9
MW98 ND
MW47 NS
MW44 NS
MW99 NS
MW65 ND
MW52 ND
MW95 ND
MW75 NS
MW69 ND
MW101 NS
MW77 ND
MW87 NS
MW84 ND
MW39 ND
MW86 1.1
MW85 ND
MW51 ND
MW109 ND
MW105 ND
MW108 ND
MW103 0.37
MW107 ND
MW74 13000
MW73 17000

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

- MW72 5 — Intermediate Groundwater Zone Monitoring Well Location & Benzene Concentration (µg/L)
- MW72 5 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & Benzene Concentration (µg/L)
- Remediation System Piping
- Minimum Preliminary Screening Level for Benzene (5 µg/L; MTCA Method A Cleanup Level)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
20

Title
Benzene Concentrations
Intermediate Zone,
Second Quarter 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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N

Stantec

Definitions
Dry = Well was not sampled due to insufficient groundwater sample volume.
NA = Constituent was not analyzed in groundwater sample collected.
ND = Constituent was not detected above the method reporting limit.
NS = Well was not sampled (per the sampling schedule defined in the IRAWP [SES 2011]).

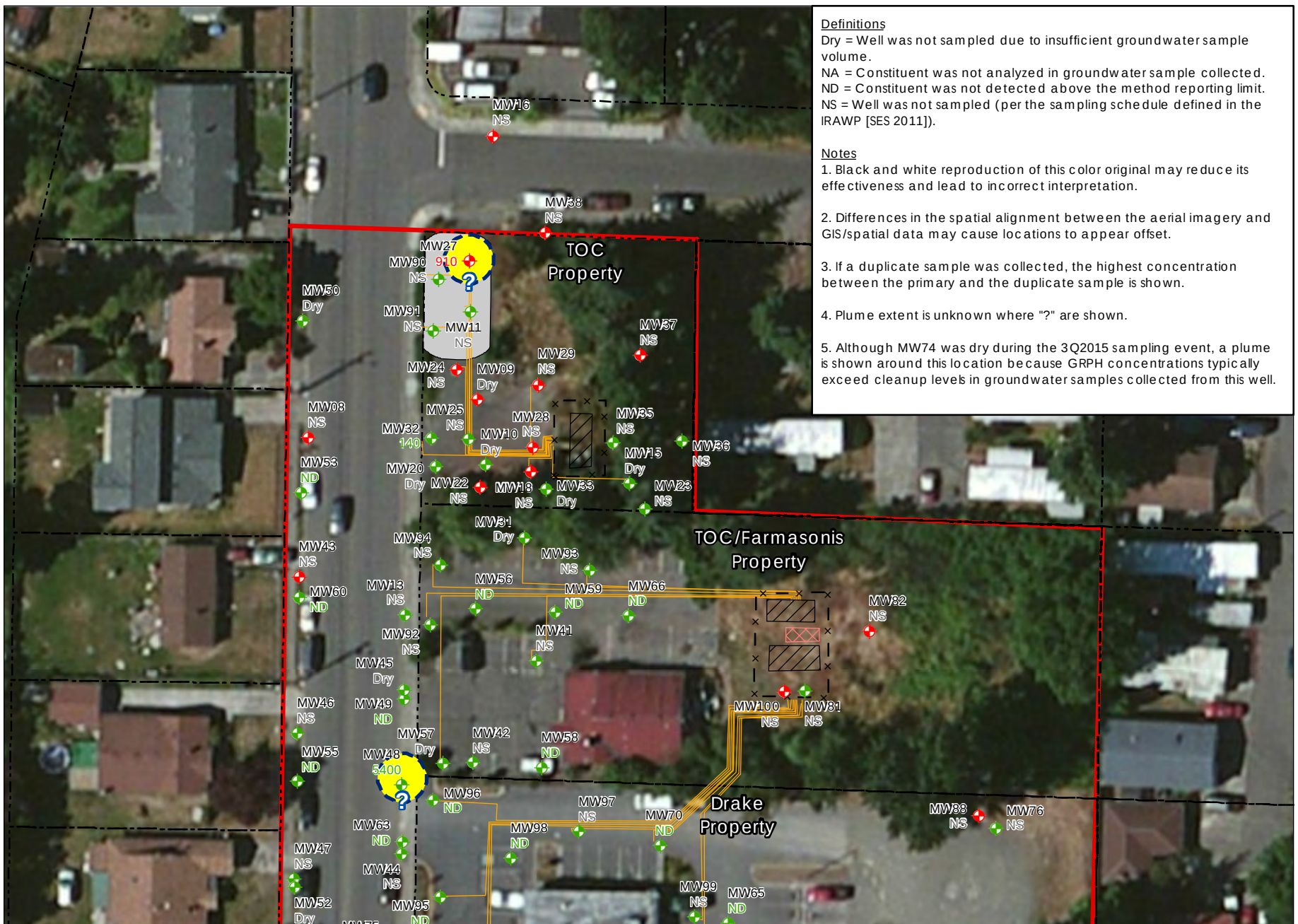
Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

4. Plume extent is unknown where "?" are shown.

5. Although MW74 was dry during the 3Q2015 sampling event, a plume is shown around this location because GRPH concentrations typically exceed cleanup levels in groundwater samples collected from this well.



Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

- MW72 800 — Intermediate Groundwater Zone Monitoring Well Location & GRPH Concentration (µg/L)
- MW72 800 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & GRPH Concentration (µg/L)
- Remediation System Piping
- Sample Concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
21

Title
GRPH Concentrations
Intermediate Zone,
Third Quarter 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
1:720 (At Original document size of 11x17)

N

Stantec

Definitions
Dry = Well was not sampled due to insufficient groundwater sample volume.
NA = Constituent was not analyzed in groundwater sample collected.
ND = Constituent was not detected above the method reporting limit.
NS = Well was not sampled (per the sampling schedule defined in the IRAWP [SES 2011]).

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

4. Plume extent is unknown where "?" are shown.

5. Although MW74 was dry during the 3Q2015 sampling event, a plume is shown around this location because GRPH concentrations typically exceed cleanup levels in groundwater samples collected from this well.

MW16 NS
MW38 NS
MW90 NS
MW27 ND
MW50 Dry
MW11 NS
TOC Property
MW91 NS
MW37 NS
MW24 NS
MW09 Dry
MW29 NS
MW08 NS
MW25 NS
MW28 NS
MW35 NS
MW36 NS
MW32 ND
MW10 Dry
MW15 Dry
MW53 ND
MW20 Dry
MW18 NS
MW33 Dry
MW22 NS
MW23 NS
MW94 NS
MW31 Dry
MW93 NS
MW43 NS
MW56 ND
MW59 ND
MW66 ND
MW60 ND
MW13 NS
MW92 NS
MW82 NS
MW41 NS
TOC/Farmasonis Property
MW45 Dry
MW81 NS
MW46 NS
MW100 NS
MW49 ND
MW57 Dry
MW42 NS
MW58 ND
MW55 ND
MW48 5.9
MW96 ND
MW97 NS
MW70 ND
Drake Property
MW88 NS
MW76 NS
MW63 ND
MW98 ND
MW47 NS
MW44 NS
MW95 ND
MW99 NS
MW65 ND
MW52 Dry
MW75 NS
MW69 ND
MW101 NS
MW89 ND
MW84 ND
MW77 ND
MW87 NS
MW86 ND
MW85 ND
MW51 ND
MW109 Dry
MW105 Dry
MW108 ND
Herman Property
MW103 ND
MW107 ND
MW74 Dry
Shin/Choi Property
Mountlake Senior Property
MW73 12000

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend
- MW72 5 — Intermediate Groundwater Zone Monitoring Well Location & Benzene Concentration (µg/L)
- MW72 5 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & Benzene Concentration (µg/L)
- Remediation System Piping
- Minimum Preliminary Screening Level for Benzene (5 µg/L; MTCA Method A Cleanup Level)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
22

Title
Benzene Concentrations
Intermediate Zone,
Third Quarter 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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Stantec

Definitions
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NA = Constituent was not analyzed in groundwater sample collected.
ND = Constituent was not detected above the method reporting limit.
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Notes
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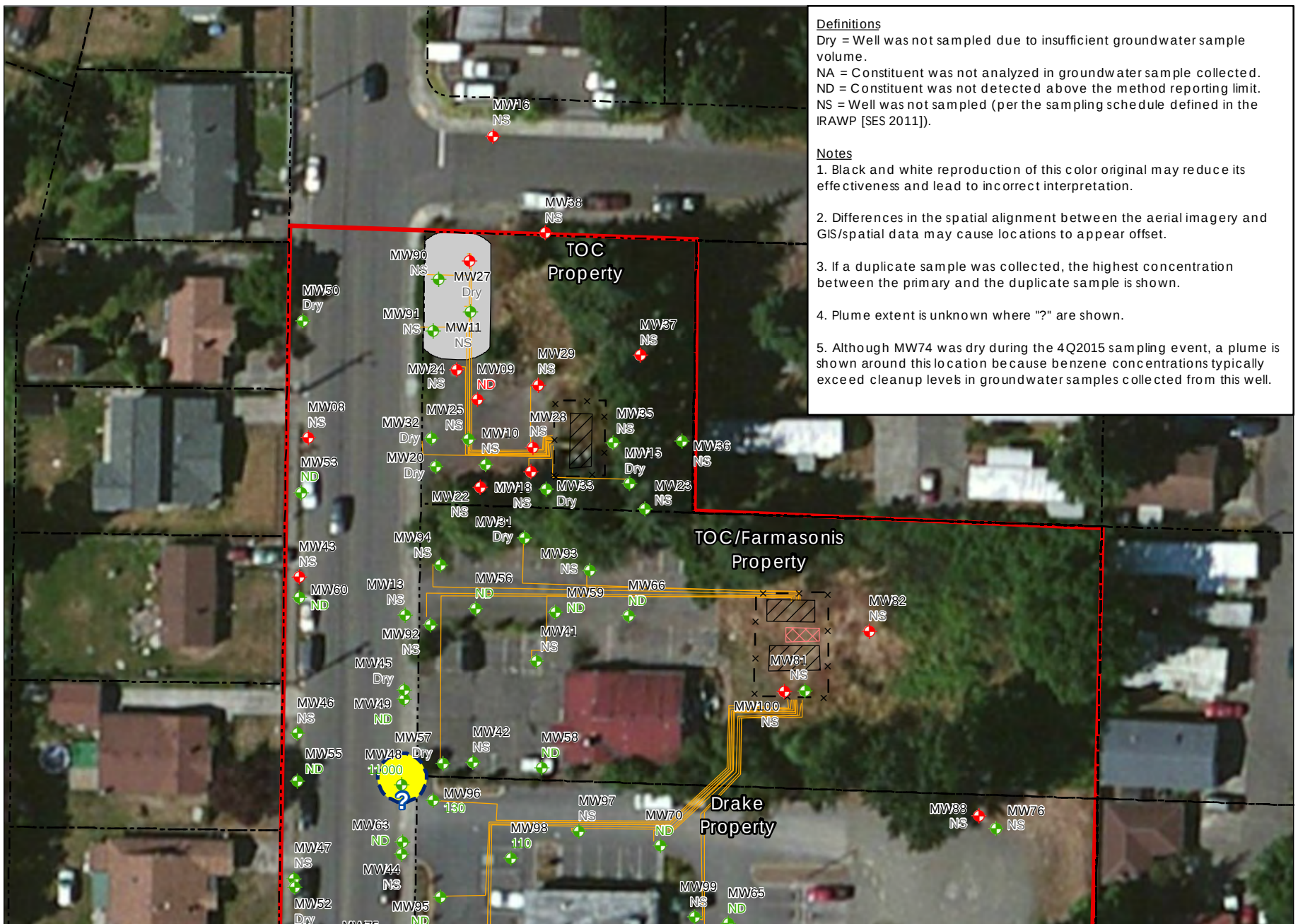
3. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

4. Plume extent is unknown where "?" are shown.

5. Although MW74 was dry during the 4Q2015 sampling event, a plume is shown around this location because benzene concentrations typically exceed cleanup levels in groundwater samples collected from this well.



Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Legend

- MW72 800 — Intermediate Groundwater Zone Monitoring Well Location & GRPH Concentration (µg/L)
- MW72 800 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & GRPH Concentration (µg/L)
- Remediation System Piping
- Sample Concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
23

Title
GRPH Concentrations
Intermediate Zone,
Fourth Quarter 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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Stantec

Definitions
Dry = Well was not sampled due to insufficient groundwater sample volume.
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3. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

4. Plume extent is unknown where "?" are shown.

5. Although MW74 was dry during the 4Q2015 sampling event, a plume is shown around this location because benzene concentrations typically exceed cleanup levels in groundwater samples collected from this well.

MW16 NS
MW38 NS
TOC Property
MW90 NS
MW27 Dry
MW50 Dry
MW11 NS
MW91 NS
MW37 NS
MW29 NS
MW09 ND
MW24 NS
MW08 NS
MW25 NS
MW35 NS
MW36 NS
MW32 Dry
MW28 NS
MW15 Dry
MW53 ND
MW20 Dry
MW18 NS
MW33 Dry
MW23 NS
MW22 NS
TOC/Farmasonis Property
MW94 NS
MW31 Dry
MW43 NS
MW60 ND
MW13 NS
MW92 NS
MW59 ND
MW93 NS
MW66 ND
MW82 NS
MW56 ND
MW41 NS
MW45 Dry
MW81 NS
MW46 NS
MW49 ND
MW100 NS
MW57 Dry
MW42 NS
MW58 ND
MW55 ND
MW48 32
MW96 ND
MW97 NS
MW70 ND
Drake Property
MW88 NS
MW76 NS
MW63 ND
MW98 ND
MW47 NS
MW44 NS
MW95 ND
MW99 NS
MW65 ND
MW52 Dry
MW75 NS
MW69 ND
MW101 ND
MW39 ND
MW84 ND
MW77 ND
MW87 NS
MW86 ND
MW85 ND
MW51 ND
MW104 Dry
MW105 Dry
MW108 ND
Herman Property
MW103 ND
MW107 ND
Shin/Choi Property
MW74 Dry
MW73 11000
Mountlake Senior Property

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Legend

- MW72 5 — Intermediate Groundwater Zone Monitoring Well Location & Benzene Concentration (µg/L)
- MW72 5 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & Benzene Concentration (µg/L)
- Remediation System Piping
- Minimum Preliminary Screening Level for Benzene (5 µg/L; MTCA Method A Cleanup Level)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
24

Title
Benzene Concentrations
Intermediate Zone,
Fourth Quarter 2015

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
1:720 (At Original document size of 11x17)

N

Stantec

Appendix A

Technical Memorandum: Well Installations on Herman Property, June 2015

TECHNICAL MEMORANDUM

To: Mark Chandler, Vice President Environmental Services, TOC Holdings Co.
2737 W. Commodore Way; Seattle, Washington 98199

From: Craig Hultgren

Date: July 28, 2015

Subject: TOC Holdings Co; Facility No. 01-176; 24205 56th Avenue West, Mountlake Terrace, Washington; Well Installations on Herman Property, June 2015

HydroCon Environmental, LLC (HydroCon) prepared this technical memorandum to document the objectives, methodology, and results of the installation of two new monitoring wells on the Herman Property, located at 24311 56th Avenue West, Mountlake Terrace, WA.

OBJECTIVES

The objective of this investigation was to install additional groundwater monitoring wells to evaluate the downgradient extent of petroleum hydrocarbon contamination potentially exceeding the Model Toxics Control Act (MTCA) Method A cleanup levels in the intermediate-zone aquifer. To achieve this objective, TOC Holdings Co. requested and received access to drill two intermediate-zone wells on the Herman Property located at 24311 56th Avenue West. The wells were located at the presumed downgradient edge of the intermediate zone plume of petroleum hydrocarbons that historically originated from releases of hydrocarbons on the TOC Holdings Co. properties located at 24205 & 24225 56th Avenue West, and the Drake property located at 24309 56th Avenue West, Mountlake Terrace, WA. Two wells, identified as wells MW108 and MW109 were installed in the locations shown on Figure 1. Work was performed in general accordance to a work plan prepared by Stantec Consulting Services, Inc. (Stantec) dated June 11, 2015. Departures to the work plan are documented below.

DRILLING METHODOLOGY

Wells were installed using the sonic drilling method by Cascade Drilling Company on June 15 and 16, 2015. The sonic drilling method utilizes high frequency mechanical vibration to advance the borehole to the target depth. Soil in the borehole is extruded into a 4-inch diameter core barrel as the boring is advanced. Soil within the core barrel is routinely extruded into plastic bags and then inspected and sampled by the field geologist as needed to document soil lithology and groundwater conditions. Due to elevated concentrations of contaminants near the wells each boring was drilled using the "step down" method. This method includes drilling with two different diameters of conductor casing and drill bits. The upper portion of each boring is drilled using 8-inch diameter conductor casing and tooling. An approximate 3 foot bentonite seal was placed at the selected casing point at each well, hydrated with potable water, and allowed to set over night. Drilling was resumed the following day to the target depth using 6-inch diameter tooling and conductor casing. This "telescoping" method is an industry standard protection for drilling through contaminated or potentially-contaminated aquifers.

FIELD SCREENING

Soil samples produced during the drilling process were observed and field screened for the presence of petroleum hydrocarbon contamination by a geologist. Field screening consisted of measuring total volatile organic vapor concentrations using a photoionization detector (PID), sheen testing, visual observations (staining, etc.), and olfactory observations. A portion of each soil sample was placed in a sealed Ziploc® baggie. The tip of the PID was inserted into the Ziploc® bag in the airspace above the soil sample and the PID measurement was recorded. The PID was calibrated at the site before use to a test gas standard consisting of 100 parts per million volume (ppmv) isobutylene. Sheen testing consisted of placing a small portion of soil in clear water and observing the water for the presence of hydrocarbon sheen. Because several factors can affect PID readings (e.g. moisture, temperature, and background conditions), HydroCon determined that a value of 1 ppm or greater may indicate the presence of organic vapors originating from contaminants at the site.

WELL CONSTRUCTION

Groundwater monitoring wells were installed in both borings. Monitoring wells were constructed in accordance with Ecology well drilling and installation guidelines as outlined in WAC 173-360 WAC, Minimum Standards for Construction and Maintenance of Wells. Each well was fitted with 2-inch diameter threaded Schedule 40 PVC casings, and a 10-foot length of 0.010-inch machine-slotted casing with a flush threaded 0.3 foot long bottom cap.

The annular space between the filter screen and the borehole was filled with clean graded 10-20 sand pack to a depth approximately three feet above the top of the screen. The bentonite seal consisted of hydrated bentonite placed to within approximately one foot below ground surface. Well construction details are provided on the well logs (Attachment A).

Each monitoring well assembly was measured prior to placement in the borehole. The well materials were steam-cleaned prior to placement. Each well was fitted with a locking compression cap and the wells were covered with a traffic-rated steel monument set in concrete and finished flush to grade.

MONITORING WELL DEVELOPMENT

Stantec performed well development at the site. Each monitoring well was developed by surging and pumping techniques. The wells were surged repeatedly with a clean stainless steel bailer. The sediment produced during development was removed using the bailer. New LDPE tubing was placed down the well and attached to a trash pump. Due to a lack of water in the wells, 5 gallons of lab-grade deionized water was introduced into MW108 and 10 gallons was introduced into MW109 to complete well development surging and sediment removal. A total of 11 gallons of water was removed from MW108 and 8.2 gallons of water was removed from MW109 during well development. The water generated from well development was placed in labeled and sealed 55-gallon drum that was temporarily stored at the site pending disposal.

HydroCon recommends that additional well development procedures be implemented at both wells when seasonal rising water conditions are observed (Fall 2015 or Winter 2016).

SURVEYING

TOC contracted with a licensed surveyor (Pace Engineers) to measure the following features and survey them relative to the nearest elevation benchmark:

- The surface elevation of each flush-mounted monument lid.
- The top surface of each PVC well casing at the inscribed reference mark.

The horizontal coordinates are relative to the Lambert Grid Washington North Zone [equivalent to North American Datum, 1983 (NAD83)] and the vertical coordinates are relative to the North American Vertical Datum, 1988 (NAVD88). The survey data is recorded in the attached boring logs.

DISPOSAL OF INVESTIGATION DERIVED WASTE

Investigation derived waste (IDW) generated during drilling, well installation, well development, and groundwater sampling activities consisted of soil, purge water, PVC well material, well construction debris (bags used to store the filter pack, bentonite seal, concrete, well materials), etc. The soil and purge water were placed in separate labeled 55-gallon. All other nonhazardous solid waste was placed in a dumpster at the drilling contractor's yard for disposal into a subtitle D landfill.

The drums containing soil and groundwater generated during the fieldwork are temporarily being stored at the site pending disposal at Cemex' facility in Everett, Washington. HydroCon will provide disposal documentation under separate cover.

LABORATORY ANALYSIS

Selected soil samples were submitted to Friedman & Bruya laboratory for the following analyses:

- Gasoline-range petroleum hydrocarbons (GRPH) by Method NWTPH-Gx
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260
- Total lead by EPA Method 6020
- Ethylene dibromide (EDB) by EPA Method 8260
- Ethylene dichloride (EDC) by EPA Method 8260
- Methyl tertiary butyl ether (MTBE) by EPA Method 8260

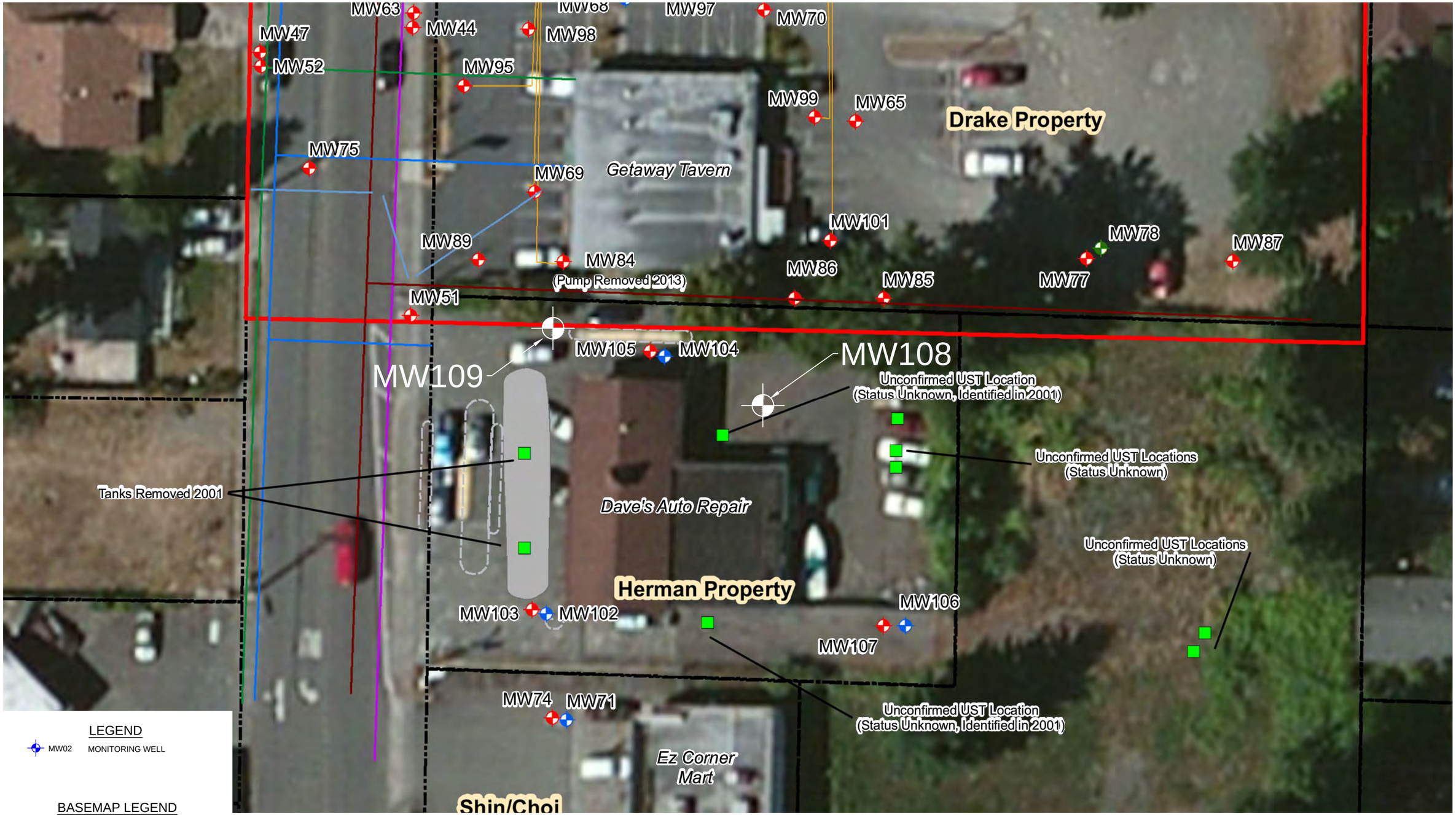
SUMMARY OF FIELD ACTIVITIES

JUNE 15, 2015

Drilling commenced on the morning of June 15 at boring MW108, located 7 feet south and 27 feet east of the northeast corner of the site building (see Figure 1). The first five feet of the borehole were removed with a Vactor truck as a precautionary measure to avoid damage to potential buried utilities in the boring area. The Vactor truck uses high velocity air to remove soil from the boring.

For the MW108 boring, soil samples were collected continuously as planned. Samples were containerized for potential analysis from depths of 10, 14, 20, and 25 feet before the drilling ceased and the conductor casing was set a depth of 26 feet bgs. A photograph of the drill rig set up on the MW108 location is provided in Attachment B.

FIGURE



LEGEND

MW02 MONITORING WELL

BASEMAP LEGEND

- Site Boundary
- Historic Pump Islands (Removed)
- Parcels
- Remediation System Piping
- Compound Fence
- Historic Excavation
- Historic UST Location
- System Compound
- Abandoned Well
- Deep Well
- Intermediate Well
- Shallow Well
- Mix Zone Well
- Stormwater Infiltration Pit

N W E S

0 30 60

SCALE IN FEET
1" = 30'

HydroCon
510 Allen St. Suite B Kelso, WA 98626, Ph(360) 703-6079

DATE: 07-15-15
DWN: MG
CHK: MS
APPROVED:
PRJ. MGR: CH
PROJECT NO: 01-176

FIGURE 1
SITE FEATURES

TOC HOLDINGS CO. FACILITY NO. 01-176
24205 56th Avenue West
Mountlake Terrace, WA

\\SBSSERVER\RedirectedFolders\MaxG\My Documents\Project Files_local\TOC\01-176 Mt. Lake Terrace\01-176 logs.dwg 2.17.2014

TABLE

Table 1
Soil Analytical Results
Well Installations MW108 and MW109
TOC Holdings Co. Facility No. 01-176
24205 56th Avenue West
Mountlake Terrace, Washington

Sample ID	Sample Date	Analytical Results (mg/kg) GRPH[1]	Benzene[2]	Toluene[2]	Ethylbenzene[2]	Total Xylenes[2]	Ethylene Dibromide[3]	Ethylene Dichloride[3]	MTBE[3]
MTCA Method A Cleanup Level for Soil[4]		**30**	**0.03**	**7**	**6**	**9**	**0.005**	**11[5]**	**0.10**
HydroCon Soil Sampling June 15 and 16, 2015									
MW108-14	6/15/2015	<2.0	<0.02	<0.02	<0.02	<0.06	--	--	--
MW109-13	6/15/2015	<2.0	<0.02	<0.02	<0.02	<0.06	--	--	--
MW109-34	6/16/2015	<2.0	<0.02	<0.02	<0.02	<0.06	**<0.05**	<0.05	<0.05
MW109-44	6/16/2015	<2.0	<0.02	<0.02	<0.02	<0.06	**<0.05**	<0.05	<0.05
MW108-32	6/16/2015	<2.0	<0.02	<0.02	<0.02	<0.06	**<0.05**	<0.05	<0.05
MW108-44	6/16/2015	<2.0	<0.02	<0.02	<0.02	<0.06	**<0.05**	<0.05	<0.05

NOTES:

Red denotes concentration exceeds MTCA Method A cleanup level.

Bold denotes concentration exceeds the Method Reporting Level (MRL) or Method Detection Level (MDL)

Samples analyzed by Friedman & Bruya, Inc., of Seattle, Washington.

[1]Analyzed by Method NWTPH-Gx.

[2]Analyzed by U.S. Environmental Protection Agency Method 8021B.

[3]Analyzed by U.S. Environmental Protection Agency Method 8260C

[4]Table 740-1, Washington Administrative Code (WAC) §173-340-900.

[5]There is no promulgated MTCA Method A value for ethylene dichloride (1,2 dichloroethane). Value listed is Method B carcinogenic standard

-- = not analyzed

< = not detected at a concentration exceeding the laboratory MRL or MDL

mg/kg = milligrams per kilogram

GRPH = gasoline-range petroleum hydrocarbons

MTBE = methyl tertiary butyl ether

MTCA = Washington State Model Toxics Control Act

NWTPH = Northwest Total Petroleum Hydrocarbons Analytical Method

ATTACHMENT A

BORING LOGS

GUIDE TO BOREHOLE LOGS*

MAJOR DIVISIONS		SYMBOLS		TYPICAL NAMES
		GW		Well-graded gravels or gravel-sand mixtures, little to no fines.
COARSE GRAINED SOILS (more than 1/2 of soil >No. 200 sieve size)	GRAVELS more than 50% coarse fraction > no.4 sieve	GP		Poorly-graded gravels or gravel-sand mixtures, little to no fines.
		GM		Silty gravels, gravel-sand-silt mixtures.
		GC		Clayey gravels or gravel-sand-clay mixtures
	SANDS less than 50% coarse fraction > no.4 sieve	SW		Well-sorted sands or gravelly sands, little to no fines.
		SP		Poorly-sorted sands or gravelly sands, little to no fines.
		SM		Silty sands, sand-silt mixtures.
		SC		Clayey sands, sand-clay mixtures.
FINED GRAINED SOILS (more than 1/2 of soil < No. 200 sieve size)	SILTS & CLAYS Liquid Limit* less than 50%	ML		Inorganic silts and very fine sands, silty or clayey fine sands or clayey silts with slight plasticity.
		CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy or silty clays, lean clays.
		OL		Organic silts and organic silty clays of low plasticity.
	SILTS & CLAYS Liquid Limit* greater than 50%	MH		Inorganic silts, micaceous or diatomaceous fine sand or silty soils, elastic silts.
		CH		Inorganic clays of high plasticity, fat clays.
		OH		Organic clays of medium to high plasticity, organic silty clay, organic silts.
HIGHLY ORGANIC SOILS		Pt		Peat or other highly organic soils.
		Conc		Concrete
		Fill		Fill
		Asph		Asphalt

* Liquid Limit represents the moisture content (in percent) of a soil at which point the soil no longer behaves like a plastic and starts to behave like a liquid.

BORING LOG SYMBOLS

SAMPLE LOCATION
SAMPLE INTERVAL
SAMPLE RECOVERY
GROUNDWATER, FIRST OBSERVED

SAMPLE TYPES:
SS - Split Spoon
G - Grab
ST - Shelby Tube
GS - Geoprobe Sampler

SHEEN TYPES:
NS - No Sheen observed
SS - Slight Sheen observed (Spotty coverage of sheen pan, no iridescence)
MS - Moderate Sheen (full coverage of sheen pan, no iridescence) pan, iridescent)
HS - Heavy Sheen (full coverage of sheen

PERCENTAGES:
Trace - Particles are present but estimated to be less than 5% Few - 5 to 10%
Little - 15 to 25%
Some - 30 to 45%
Mostly - 50 to 100%

SAMPLE PLASTICITY (FINE-GRAINED SOILS):
Nonplastic - Cannot be rolled at any moisture content
Low - Barely rolled, lump cannot be formed when drier than plastic limit
Medium - Easily rolled, lump crumbles when drier than plastic limit
High - Easily rolled yet takes considerable time to reach the plastic limit, molded shape can be formed without crumbling when drier than the plastic limit

PARTICLE SIZE RANGE (COARSE-GRAINED SOILS):
Gravel - Fine, Coarse
Sand - Fine, Medium, Coarse

SAMPLE MOISTURE:
Dry - No moisture, dry to touch
Moist - Damp but no visible moisture
Wet - Visible free water

*Based on Unified Soil Classification System and ASTM Standard D2487 and D2488

HydroCon
510 Allen Street
Kelso, WA 98626
Phone: 360-703-6079

WELL/BORING NUMBER MW108

PROJECT NAME: TOC Mt. Lake Terrace
PROJECT NUMBER: 01-176
PROJECT LOCATION: Mt. Lake Terrace, WA
LOGGED BY: R. Honsberger
REVIEWED BY: C. Hultgren
DATE:06-15-15

LOCATION MAP

DESCRIPTION (USCS Classification, Depth Interval, Color, Grain Size, Plasticity, Shapes, Mineral Composition, Density or Consistency, Moisture, Odor, Geological Interpretation)	DEPTH (FT.)	SYMBOL	WELL DETAILS	SAMPLE ID	PID	FIRST WATER	BLOW COUNTS	BOREHOLE/WELL CONSTRUCTION DETAILS
ASPHALT 3" thick at ground surface	0							
Excavate borehole to 5' bgs with Vactor Truck. Soil type observed was a silty fine sand with gravel and cobbles, brown.								
SILTY SAND (SM), brown, 65% fine sand, 25% low plastic silt, and 10% medium to coarse subrounded gravel up to 3" in diameter, no hydrocarbon odor, damp.	5				0.5 0.7 0.5			
SILTY SAND (SM), brown, 50% fine sand, 35% low plastic silt, and 15% medium to coarse subrounded gravel and cobbles up to 6" in diameter, no hydrocarbon odor, moist.	10			MW108-10 MW108-14	1.4 2.0 3.3 7.5			
SILTY SAND (SM), brown, 45% low plastic silt, 45% fine sand, and 10% medium to coarse subrounded gravel up to 1" diameter, no hydrocarbon odor, damp.	15				3.0 1.7 1.2			
SILTY SAND (SM), brown, 40% fine sand, 40% low plastic silt, and 20% medium to coarse subrounded gravel and cobbles up to 6" in diameter, no hydrocarbon odor, dry.	20			MW108-20	0.5 0.3 0.3			
SILTY SAND (SM), grey, 55% fine sand, 35% low plastic silt, and 10% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, damp. Set conductor casing at 26' bgs.	25			MW108-25	0.4 0.5 0.6			
CONTINUED ON NEXT PAGE	30				0.6			

WELL CONSTRUCTION

Depths (feet bgs)

Borehole: 49
Sump: 44.25 - 44.55
Screen: 34.25 - 44.25
Casing: 0 - 44.25
Backfill: 44.5 - 49
Sand Pack: 32 - 44.5
Bentonite: 1 - 32
Concrete: 0 - 1
Stabilizers:

MATERIALS USED

Casing: 2" dia. PVC
Well Screen: 0.01 slot
End Cap: 2" Cone
Sand Pack: 7 50# bags
Bentonite: 11 50# bags
Concrete: 2 50# bags
Monument: Flush
Well Cap: Locking J Plug
Other:

Note: 8" casing shoe set at 26'. Bentonite plug set from 23' to 26'. Reduce borehole size to 6" diameter

LEGEND:

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS/BACKFILL
- WATER LEVEL DURING DRILLING
- WATER LEVEL AFTER DRILLING
- FINAL WATER LEVEL

DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic LAR
BOREHOLE DIAMETER: 8" to 6"
SAMPLING METHOD: Continuous
START CARD NUMBER: BIM540

CASING ELEVATION: 351.09
GROUND SURFACE ELEVATION: 351.56
COORDINATES (Northing): 287332.29
COORDINATES (Easting): 1277929.74

HydroCon
510 Allen Street
Kelso, WA 98626
Phone: 360-703-6079

WELL/BORING NUMBER MW108

PROJECT NAME: TOC Mt. Lake Terrace
PROJECT NUMBER: 01-176
PROJECT LOCATION: Mt. Lake Terrace, WA
LOGGED BY: R. Honsberger
REVIEWED BY: C. Hultgren
DATE:06-15-15

LOCATION MAP

DESCRIPTION (USCS Classification, Depth Interval, Color, Grain Size, Plasticity, Shapes, Mineral Composition, Density or Consistency, Moisture, Odor, Geological Interpretation)	DEPTH (FT.)	SYMBOL	WELL DETAILS	SAMPLE ID	PID	FIRST WATER	BLOW COUNTS	BOREHOLE/WELL CONSTRUCTION DETAILS
CONTINUED FROM PREVIOUS PAGE								
SILTY SAND (SM), grey, 55% fine sand, 40% low plastic silt, and 5% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, moist.	30			MW108-32	0.6			
SILTY SAND (SM), grey, 70% fine sand, 20% low plastic silt, and 10% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, wet. Becomes moist at 36' bgs.					0.6			
	35				0.6			
SILTY SAND (SM), grey, 45% fine sand, 20% low plastic silt, and 25% medium to coarse subrounded gravel up to 3" in diameter, no hydrocarbon odor, moist.					0.6			
				MW108-39	0.6			
SILTY SAND (SM), grey, 80% fine sand and 20% low plastic silt, no hydrocarbon odor, wet.	40				0.6			
					0.6			
				MW108-44	0.2			
SILTY SAND (SM), grey, 60% fine sand, 30% low plastic silt, and 10% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, damp.	45				0.2			
					0.2			
				MW108-49	0.2			
BOTTOM OF BOREHOLE AT 49' bgs.	50							
	55							
	60							

WELL CONSTRUCTION

Depths (feet bgs)

Borehole: 49
Sump: 44.25 - 44.55
Screen: 34.25 - 44.25
Casing: 0 - 44.25
Backfill: 44.5 - 49
Sand Pack: 32 - 44.5
Bentonite: 1 - 32
Concrete: 0 - 1
Stabilizers:

MATERIALS USED

Casing: 2" dia. PVC
Well Screen: 0.01 slot
End Cap: 2" Cone
Sand Pack: 7 50# bags
Bentonite: 11 50# bags
Concrete: 2 50# bags
Monument: Flush
Well Cap: Locking J Plug
Other:

LEGEND:

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS/BACKFILL
- WATER LEVEL DURING DRILLING
- WATER LEVEL AFTER DRILLING
- FINAL WATER LEVEL

DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic LAR
BOREHOLE DIAMETER: 8" to 6"
SAMPLING METHOD: Continuous
START CARD NUMBER: BIM540

CASING ELEVATION: 351.09
GROUND SURFACE ELEVATION: 351.56
COORDINATES (Northing): 287332.29
COORDINATES (Easting): 1277929.74

Hydro Con
510 Allen Street
Kelso, WA 98626
Phone: 360-703-6079

WELL/BORING NUMBER MW109

PROJECT NAME: TOC Mt. Lake Terrace
PROJECT NUMBER: 01-176
PROJECT LOCATION: Mt. Lake Terrace, WA
LOGGED BY: R. Honsberger
REVIEWED BY: C. Hultgren
DATE:06-15-15

LOCATION MAP

DESCRIPTION (USCS Classification, Depth Interval, Color, Grain Size, Plasticity, Shapes, Mineral Composition, Density or Consistency, Moisture, Odor, Geological Interpretation)	DEPTH (FT.)	SAMPLE ID	PID	FIRST WATER	BLOW COUNTS
ASPHALT 3" thick at ground surface	0				
Excavate borehole to 5' bgs with Vactor Truck. Soil type observed was a silty fine sand with gravel and cobbles, brown.					
SILTY SAND (SM), brown, 70% fine sand, 20% low plastic silt, and 10% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, damp.	5		0.6		
			0.6		
SILTY SAND (SM), brown, 60% fine sand, 30% low plastic silt, and 10% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, damp. Turns wet at 13'.	10	MW109-10	4.0		
			0.6		
SILTY SAND (SM), brown, 55% fine sand, 35% low plastic silt, and 10% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, wet.		MW109-13	2.8		
	15		0.5		
			0.5		
		MW109-17	1.6		
			0.5		
SAND WITH SILT (SP-SM), brown, 80% fine sand, 10% low plastic silt, and 10% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, wet.	20		0.5		
			0.1		
SILTY SAND (SM), grey, 55% fine sand, 35% low plastic silt, and 10% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, damp. Set conductor casing at 24' bgs.			0.3		
			0.4		
	25	MW109-25	0.4		
			0.6		
			3.0		
		MW109-29	1.8		
	30				
CONTINUED ON NEXT PAGE.					

WELL CONSTRUCTION

Depths (feet bgs)

Borehole: 44
Sump: 41.02 - 41.32
Screen: 31.02 - 41.02
Casing: 0 - 31.02
Backfill: 41.5 - 43
Sand Pack: 29 - 41.5
Bentonite: 1 - 29
Concrete: 0 - 1
Stabilizers:

MATERIALS USED

Casing: 2" dia. PVC
Well Screen: 0.01 slot
End Cap: 2" Cone
Sand Pack: 4 50# bags
Bentonite: 13 50# bags
Concrete: 2 50# bags
Monument: Flush
Well Cap: Locking J Plug
Other:

Note: 8" casing shoe set at 24'. Bentonite plug set at 21' to 24'. Reduce borehole size to 6" diameter

LEGEND:

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS/BACKFILL
- WATER LEVEL DURING DRILLING
- WATER LEVEL AFTER DRILLING
- FINAL WATER LEVEL

DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic LAR
BOREHOLE DIAMETER: 8" to 6"
SAMPLING METHOD: Continuous
START CARD NUMBER: BIM541

CASING ELEVATION: 353.35
GROUND SURFACE ELEVATION: 353.72
COORDINATES (Northing): 287349.84
COORDINATES (Easting): 1277848.44

HydroCon
510 Allen Street
Kelso, WA 98626
Phone: 360-703-6079

WELL/BORING NUMBER MW109

PROJECT NAME: TOC Mt. Lake Terrace
PROJECT NUMBER: 01-176
PROJECT LOCATION: Mt. Lake Terrace, WA
LOGGED BY: R. Honsberger
REVIEWED BY: C. Hultgren
DATE:06-15-15

LOCATION MAP

DESCRIPTION (USCS Classification, Depth Interval, Color, Grain Size, Plasticity, Shapes, Mineral Composition, Density or Consistency, Moisture, Odor, Geological Interpretation)	DEPTH (FT.)	SYMBOL	WELL DETAILS	SAMPLE ID	PID	FIRST WATER	BLOW COUNTS	BOREHOLE/WELL CONSTRUCTION DETAILS
CONTINUED FROM PREVIOUS PAGE								
SILTY SAND (SM), grey, 55% fine sand, 35% low plastic silt, and 10% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, damp.	30				0.9			
					0.9			
SAND WITH SILT (SP-SM), grey, 75% fine sand, 15% low plastic silt, and 10% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, moist.				MW109-34	12.5			
	35							
SAND (SP), grey, 90% fine sand, 10% low plastic silt, no hydrocarbon odor, wet.				MW109-36	0.2			
					0.4			
SILTY SAND (SM), grey, 50% fine sand, 40% low plastic silt, and 10% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, moist.					0.5			
	40							
SAND WITH SILT (SP-SM), grey, 75% fine sand, 15% low plastic silt, and 10% medium to coarse subrounded gravel up to 1" in diameter, no hydrocarbon odor, moist.					0.1			
					0.1			
BOTTOM OF BOREHOLE AT 44' bgs.				MW109-44	1.6			
	45							
	50							
	55							
	60							

WELL CONSTRUCTION

Depths (feet bgs)

Borehole: 44
Sump: 41.02 - 41.32
Screen: 31.02 - 41.02
Casing: 0 - 31.02
Backfill: 41.5 - 43
Sand Pack: 29 - 41.5
Bentonite: 1 - 29
Concrete: 0 - 1
Stabilizers:

MATERIALS USED

Casing: 2" dia. PVC
Well Screen: 0.01 slot
End Cap: 2" Cone
Sand Pack: 4 50# bags
Bentonite: 13 50# bags
Concrete: 2 50# bags
Monument: Flush
Well Cap: Locking J Plug
Other:

LEGEND:

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS/BACKFILL
- WATER LEVEL DURING DRILLING
- WATER LEVEL AFTER DRILLING
- FINAL WATER LEVEL

DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic LAR
BOREHOLE DIAMETER: 8" to 6"
SAMPLING METHOD: Continuous
START CARD NUMBER: BIM541

CASING ELEVATION: 353.35
GROUND SURFACE ELEVATION: 353.72
COORDINATES (Northing): 287349.84
COORDINATES (Easting): 1277848.44

ATTACHMENT B

PHOTOGRAPHS

Photograph 1: Looking southeast at drill rig set up on well MW108

Photograph 2: Looking northwest at Vactor truck clearing well MW109

ATTACHMENT C

LABORATORY REPORTS WITH CHAIN-OF-CUSTODY DOCUMENTATION

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 25, 2015

Craig Hultgren, Project Manager
HydroCon
510 Allen St, Suite B
Kelso, WA 98626

Dear Mr. Hultgren:

Included are the results from the testing of material submitted on June 16, 2015 from the TOC_01-176, WORFDB8 F&BI 506309 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Rob Honsberger, Allison Greiner
HDC0625R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 16, 2015 by Friedman & Bruya, Inc. from the HydroCon TOC_01-176, WORFDB8 F&BI 506309 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	HydroCon
506309 -01	MW108-10
506309 -02	MW108-14
506309 -03	MW108-20
506309 -04	MW108-25
506309 -05	MW109-10
506309 -06	MW109-13
506309 -07	MW109-17
506309 -08	MW109-25

All quality control requirements were acceptable.

Date of Report: 06/25/15
Date Received: 06/16/15
Project: TOC_01-176, WORFDB8 F&BI 506309
Date Extracted: 06/19/15
Date Analyzed: 06/19/15

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
MW108-14 506309-02	<0.02	<0.02	<0.02	<0.06	<2	96
MW109-13 506309-06	<0.02	<0.02	<0.02	<0.06	<2	96
Method Blank 05-1293 MB2	<0.02	<0.02	<0.02	<0.06	<2	94

Date of Report: 06/25/15
Date Received: 06/16/15
Project: TOC_01-176, WORFDB8 F&BI 506309

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506354-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	99	69-120
Toluene	mg/kg (ppm)	0.5	99	70-117
Ethylbenzene	mg/kg (ppm)	0.5	101	65-123
Xylenes	mg/kg (ppm)	1.5	98	66-120
Gasoline	mg/kg (ppm)	20	95	71-131

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

506309

SAMPLE CHAIN OF CUSTODY

ME 06/16/15

USZ

Page # 1 of 1

Send Report To Craig Huttgren

Company Hydrocon

Address 510 Allen St. Suite B

City, State, ZIP Kelso WA 98102

Phone # 360-703-6079 Fax # 360-703-6068

SAMPLERS (signature)

PROJECT NAME/NO. Tx 01-16

PO#

REMARKS

✓-per RH 6/18/15 EY

TURNAROUND TIME
- ☑ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
MW108-10	01 A-D	6-15-15	1155	Soil	4													Hold
MW108-14	02		1215		4		✓	✓										Hold
MW108-20	03		1230		4													Hold
MW108-25	04		1250		4													Hold
MW109-10	05		1520		4													Hold
MW109-13	06		1545		4		✓	✓										Hold
MW109-17	07		1555		4													Hold
MW109-25	08		1615		4													Hold

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Warren Rajkovich	Hydrocon	6/16/15	0930
Received by:	Nhan Phan	FEBI	✓	✓
Relinquished by:				
Received by:		Samples received at 3 °C		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
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fbi@isomedia.com
www.friedmanandbruya.com

July 13, 2015

Craig Hultgren, Project Manager
HydroCon
510 Allen St, Suite B
Kelso, WA 98626

Dear Mr. Hultgren:

Included are the additional results from the testing of material submitted on June 17, 2015 from the TOC_01-176, WORFDB8 F&BI 506326 project. There are 6 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Rob Honsberger, Allison Greiner
HDC0713R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 17, 2015 by Friedman & Bruya, Inc. from the HydroCon TOC_01-176, WORFDB8 F&BI 506326 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	HydroCon
506326 -01	MW109-29
506326 -02	MW109-34
506326 -03	MW109-36
506326 -04	MW109-44
506326 -05	MW108-32
506326 -06	MW108-39
506326 -07	MW108-44
506326 -08	MW108-49

All quality control requirements were acceptable.

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW109-34	Client:	HydroCon
Date Received:	06/17/15	Project:	TOC_01-176, WORFDB8 F&BI 506326
Date Extracted:	06/30/15	Lab ID:	506326-02
Date Analyzed:	06/30/15	Data File:	063015.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	89	113
Toluene-d8	98	64	137
4-Bromofluorobenzene	101	81	119

Compounds:	Concentration mg/kg (ppm)
Methyl t-butyl ether (MTBE)	<0.05
1,2-Dibromoethane (EDB)	<0.05
1,2-Dichloroethane (EDC)	<0.05

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW108-44	Client:	HydroCon
Date Received:	06/17/15	Project:	TOC_01-176, WORFDB8 F&BI 506326
Date Extracted:	06/30/15	Lab ID:	506326-07
Date Analyzed:	06/30/15	Data File:	063016.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	89	113
Toluene-d8	98	64	137
4-Bromofluorobenzene	102	81	119

Compounds:	Concentration mg/kg (ppm)
Methyl t-butyl ether (MTBE)	<0.05
1,2-Dibromoethane (EDB)	<0.05
1,2-Dichloroethane (EDC)	<0.05

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	HydroCon
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506326
Date Extracted:	06/30/15	Lab ID:	05-1168 mb
Date Analyzed:	06/30/15	Data File:	063014.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	89	113
Toluene-d8	98	64	137
4-Bromofluorobenzene	101	81	119

Compounds:	Concentration mg/kg (ppm)
Methyl t-butyl ether (MTBE)	<0.05
1,2-Dibromoethane (EDB)	<0.05
1,2-Dichloroethane (EDC)	<0.05

Date of Report: 07/13/15
Date Received: 06/17/15
Project: TOC_01-176, WORFDB8 F&BI 506326

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 506541-21 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	65	66	17-134	2
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	60	60	22-124	0
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	63	63	32-126	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	95	72-122
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	88	73-111
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	94	77-117

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

506326 [redacted]

SAMPLE CHAIN OF CUSTODY

ME 06/17/15 [redacted] US3

[redacted] of 1

Send Report To Craig Hultgren

Company Hydrocon

Address 510 Allen Street Suite B

City, State, ZIP Kelso WA 98626

Phone # 360 703-6079 Fax # 360-703-6068

SAMPLERS (signature)

PROJECT NAME/NO. TOC 07-176

PO#

REMARKS

✓ - per RH 6/18/15 ey

TURNAROUND TIME
- ☑ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE, EDB, EDC						Notes (* - per CH 6/30/15 ME)
MW109-29	01 A-D	6-16-15	1030	Soil	4													~~Hold~~
MW109-34	02		1035		4		✓	✓				*						~~Hold~~
MW109-36	03		1055		4													~~Hold~~
MW109-44	04		1115		4		✓	✓										~~Hold~~
MW108-32	05		1555		4		✓	✓										~~Hold~~
MW108-39	06		1600		4													~~Hold~~
MW108-44	07		1620		4		✓	✓				*						~~Hold~~
MW108-49	08		1630		4													~~Hold~~

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Robert A Hirsberger	Hydrocon	6-17-15	0850
Received by:	Nhan Phan	FeBI	6/17/15	0850
Relinquished by:				
Received by:		Samples received at 4 °C		

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 25, 2015

Craig Hultgren, Project Manager
HydroCon
510 Allen St, Suite B
Kelso, WA 98626

Dear Mr. Hultgren:

Included are the results from the testing of material submitted on June 17, 2015 from the TOC_01-176, WORFDB8 F&BI 506326 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Rob Honsberger, Allison Greiner
HDC0625R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 17, 2015 by Friedman & Bruya, Inc. from the HydroCon TOC_01-176, WORFDB8 F&BI 506326 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	HydroCon
506326 -01	MW109-29
506326 -02	MW109-34
506326 -03	MW109-36
506326 -04	MW109-44
506326 -05	MW108-32
506326 -06	MW108-39
506326 -07	MW108-44
506326 -08	MW108-49

All quality control requirements were acceptable.

Date of Report: 06/25/15
Date Received: 06/17/15
Project: TOC_01-176, WORFDB8 F&BI 506326
Date Extracted: 06/19/15
Date Analyzed: 06/19/15

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
MW109-34 506326-02	<0.02	<0.02	<0.02	<0.06	<2	97
MW109-44 506326-04	<0.02	<0.02	<0.02	<0.06	<2	97
MW108-32 506326-05	<0.02	<0.02	<0.02	<0.06	<2	96
MW108-44 506326-07	<0.02	<0.02	<0.02	<0.06	<2	97
Method Blank 05-1296 MB	<0.02	<0.02	<0.02	<0.06	<2	96

Date of Report: 06/25/15
Date Received: 06/17/15
Project: TOC_01-176, WORFDB8 F&BI 506326

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506326-02 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	82	69-120
Toluene	mg/kg (ppm)	0.5	96	70-117
Ethylbenzene	mg/kg (ppm)	0.5	97	65-123
Xylenes	mg/kg (ppm)	1.5	95	66-120
Gasoline	mg/kg (ppm)	20	100	71-131

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

506326

SAMPLE CHAIN OF CUSTODY

ME 06/17/15 VS3

[redacted] of 1

Send Report To Craig Hultgren

Company Hydrocon

Address 510 Allen Street Suite B

City, State, ZIP Kelso WA 98626

Phone # 360 703-6079 Fax # 360-703-6068

SAMPLERS (signature)

PROJECT NAME/NO. TOC 07-176

PO#

REMARKS

✓- per RH 6/18/15 ey

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
MW109-29	01 A-D	6-16-15	1030	Soil	4													Hold
MW109-34	02		1035		4		✓	✓										Hold
MW109-36	03		1055		5													Hold
MW109-44	04		1115		5		✓	✓										Hold
MW108-32	05		1555		5		✓	✓										Hold
MW108-39	06		1600		5													Hold
MW108-44	07		1620		4		✓	✓										Hold
MW108-49	08		1630		4													Hold

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
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SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Robert A. Hirsberger	Hydrocon	6-17-15	0850
Received by:	Nhan Phan	FeBI	6/17/15	0850
Relinquished by:				
Received by:		Samples received at 4 °C		

FORMS\COC\COC.DOC

Appendix B

Laboratory Analytical Reports – Groundwater Samples, Second Quarter 2015

Stantec

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 30, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 12, 2015 from the TOC_01-176, WORFDB8 F&BI 506265 project. There are 23 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0630R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 12, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506265 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506265 -01	MW57
506265 -02	MW32
506265 -03	MW27
506265 -04	MW15
506265 -05	MW56
506265 -06	MW59
506265 -07	MW54
506265 -08	MW66
506265 -09	MW58
506265 -10	MW10
506265 -11	MW20
506265 -12	MLT-02

All quality control requirements were acceptable.

Date of Report: 06/30/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506265
Date Extracted: 06/12/15
Date Analyzed: 06/12/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW57 506265-01	<1	<1	6.4	60	280	103
MW32 506265-02	2.6	3.5	11	28	410	107
MW27 506265-03	<1	6.7	21	140	740	112
MW15 506265-04	<1	<1	<1	<3	<100	105
MW56 506265-05	<1	<1	<1	<3	<100	107
MW59 506265-06	<1	<1	<1	<3	<100	102
MW54 506265-07	<1	<1	<1	<3	<100	108
MW66 506265-08	<1	<1	<1	<3	<100	108
MW58 506265-09	<1	<1	<1	<3	<100	111
MW10 506265-10	<1	<1	<1	<3	<100	107
MW20 506265-11	<1	<1	<1	4.5	<100	104

Date of Report: 06/30/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506265
Date Extracted: 06/12/15
Date Analyzed: 06/12/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MLT-02 506265-12	<1	<1	<1	3.8	<100	105
Method Blank 05-1285 MB	<1	<1	<1	<3	<100	104

Date of Report: 06/30/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506265
Date Extracted: 06/15/15
Date Analyzed: 06/15/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW66 506265-08 1/2	<100	<500	63
MW20 506265-11 1/2	100	<500	91
MLT-02 506265-12 1/2	<100	<500	77
Method Blank 05-1109 MB	<50	<250	95

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW32	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506265
Date Extracted:	06/25/15	Lab ID:	506265-02
Date Analyzed:	06/25/15	Data File:	506265-02.023
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

Analyte:	Concentration ug/L (ppb)
Lead	1.18

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506265
Date Extracted:	06/25/15	Lab ID:	I5-371 mb
Date Analyzed:	06/25/15	Data File:	I5-371 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW32	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506265
Date Extracted:	06/18/15	Lab ID:	506265-02
Date Analyzed:	06/25/15	Data File:	506265-02.008
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Lead	32.8

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506265
Date Extracted:	06/18/15	Lab ID:	I5-357 mb
Date Analyzed:	06/25/15	Data File:	I5-357 mb.007
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW66	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506265
Date Extracted:	06/12/15	Lab ID:	506265-08
Date Analyzed:	06/12/15	Data File:	061227.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW20	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506265
Date Extracted:	06/12/15	Lab ID:	506265-11
Date Analyzed:	06/12/15	Data File:	061228.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-02	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506265
Date Extracted:	06/12/15	Lab ID:	506265-12
Date Analyzed:	06/12/15	Data File:	061229.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	94	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506265
Date Extracted:	06/12/15	Lab ID:	05-1091 mb
Date Analyzed:	06/12/15	Data File:	061219.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW66	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506265
Date Extracted:	06/15/15	Lab ID:	506265-08 1/2
Date Analyzed:	06/16/15	Data File:	061607.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	90	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW20	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506265
Date Extracted:	06/15/15	Lab ID:	506265-11 1/2
Date Analyzed:	06/16/15	Data File:	061608.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	31	160
Benzo(a)anthracene-d12	92	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-02	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506265
Date Extracted:	06/15/15	Lab ID:	506265-12 1/2
Date Analyzed:	06/16/15	Data File:	061609.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	31	160
Benzo(a)anthracene-d12	93	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506265
Date Extracted:	06/15/15	Lab ID:	05-1107 mb
Date Analyzed:	06/16/15	Data File:	061605.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	31	160
Benzo(a)anthracene-d12	101	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	<0.05
Pyrene	<0.05
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	<0.05
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Date of Report: 06/30/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506265

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506265-07 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	<1	108	109	50-150	1
Toluene	ug/L (ppb)	50	<1	108	109	50-150	1
Ethylbenzene	ug/L (ppb)	50	<1	111	112	50-150	1
Xylenes	ug/L (ppb)	150	<3	108	109	50-150	2
Gasoline	ug/L (ppb)	1,000	<100	98	98	53-117	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	110	65-118
Toluene	ug/L (ppb)	50	110	72-122
Ethylbenzene	ug/L (ppb)	50	112	73-126
Xylenes	ug/L (ppb)	150	107	74-118
Gasoline	ug/L (ppb)	1,000	100	69-134

Date of Report: 06/30/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506265

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	92	98	63-142	6

Date of Report: 06/30/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506265

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 506266-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	97	96	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	97	83-115

Date of Report: 06/30/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506265

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 506285-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	1.81	101	104	79-121	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	106	83-115

Date of Report: 06/30/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506265

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 506266-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	74-127

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	103	104	64-147	1

Date of Report: 06/30/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506265

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	85	85	67-116	0
Acenaphthylene	ug/L (ppb)	1	93	96	65-119	3
Acenaphthene	ug/L (ppb)	1	93	94	66-118	1
Fluorene	ug/L (ppb)	1	95	96	64-125	1
Phenanthrene	ug/L (ppb)	1	85	85	67-120	0
Anthracene	ug/L (ppb)	1	87	87	65-122	0
Fluoranthene	ug/L (ppb)	1	89	90	65-127	1
Pyrene	ug/L (ppb)	1	84	79	62-130	6
Benz(a)anthracene	ug/L (ppb)	1	89	89	60-118	0
Chrysene	ug/L (ppb)	1	87	89	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	1	110	112	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	112	114	62-125	2
Benzo(a)pyrene	ug/L (ppb)	1	108	109	58-127	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	103	96	36-142	7
Dibenz(a,h)anthracene	ug/L (ppb)	1	94	92	37-133	2
Benzo(g,h,i)perylene	ug/L (ppb)	1	98	91	34-135	7

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

TOC + TOC/Farmasons
506265 Property

SAMPLE CHAIN OF CUSTODY

ME 06-12-15 AI3/B05/V4

Page # 1 of 2

Send Report To Rebekah Brooks
Company STANTEC
Address 10101 W 36th Ave, STE 203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax # -

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT/203700102
PO#
REMARKS Dissolved lead bottles are field filtered and labled (diss), total lead are labled (total)

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Pb	Dissolved Pb	MTBE	PAHs			Notes
MW57	01A-C	6-9-15	1330	W	3		X	X										
MW32	02A-E	6-9-15	1357	W	5		X	X				X	X					
MW27	03A-C	6-9-15	1445	W	3		X	X										
MW15	04 T	6-10-15	1035	W	3		X	X										
MW56	05	6-10-15	1040	W	3		X	X										
MW59	06	6-10-15	1145	W	3		X	X										
MW54	07A-I	6-10-15	1200	W	9		X	X										MS/MSD
MW66	08A-E	6-10-15	1340	W	5	X	X	X						X	X			
MW58	09A-C	6-10-15	1345	W	3		X	X										
MW10	10 T	6-10-15	1506	W	3		X	X										

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Dana Hutchins	Dana Hutchins	STANTEC	6-11-15	1300
Received by:		Nhan Phan	FEBI	6/12/15	1115
Relinquished by:					
Received by:			Samples received at 2 °C		

506265

SAMPLE CHAIN OF CUSTODY 06-12-15

AI3 / B05 / V4

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 W 36th Ave STE 203
City, State, ZIP Lynnwood Wa 98036
Phone # 425-477-4994 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TBL MLT / 203700102
PO#
REMARKS

Page # 2 of 2

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	PAHs					Notes
MW20	11 A-E	6-11-15	1000	W	5	X	X	X				X	X					
MLT-02	12	6-11-15	1030	W	5	X	X	X				X	X					

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE		PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Dana Hutchins	Dana Hutchins	STANTEC	6-11-15	1300
Received by:	[illegible]	Nhan Phan	FcBI	6-12-15	11:15
Relinquished by:					
Received by:					

Samples received at 2 °C

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 29, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 12, 2015 from the TOC_01-176, WORFDB8 F&BI 506266 project. There are 27 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0629R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 12, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506266 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506266 -01	MW98
506266 -02	MW70
506266 -03	MW96
506266 -04	MW69
506266 -05	MW95
506266 -06	MW67
506266 -07	MW68
506266 -08	TB-061115-1
506266 -09	TB-061115-2

All quality control requirements were acceptable.

Date of Report: 06/29/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506266
Date Extracted: 06/15/15
Date Analyzed: 06/15/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW98 506266-01	<1	<1	3.1	17	380	112
MW70 506266-02	<1	<1	<1	<3	<100	112
MW96 506266-03	<1	<1	<1	<3	<100	112
MW69 506266-04	<1	1.4	12	200	3,100	107
MW95 506266-05	<1	<1	<1	<3	<100	114
MW67 506266-06	<1	<1	<1	<3	<100	113
MW68 506266-07	<1	<1	<1	<3	<100	107
TB-061115-1 506266-08	<1	<1	<1	<3	<100	110
TB-061115-2 506266-09	<1	<1	<1	<3	<100	111
Method Blank 05-1286 MB	<1	<1	<1	<3	<100	106

Date of Report: 06/29/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506266
Date Extracted: 06/15/15
Date Analyzed: 06/15/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW70 506266-02 1/2	<100	<500	87
MW69 506266-04 1/2	290 x	<500	85
Method Blank 05-1109 MB	<50	<250	95

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW70	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/25/15	Lab ID:	506266-02
Date Analyzed:	06/25/15	Data File:	506266-02.020
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/25/15	Lab ID:	I5-371 mb
Date Analyzed:	06/25/15	Data File:	I5-371 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW70	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/18/15	Lab ID:	506266-02
Date Analyzed:	06/25/15	Data File:	506266-02.009
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/18/15	Lab ID:	I5-357 mb
Date Analyzed:	06/25/15	Data File:	I5-357 mb.007
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW98	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/12/15	Lab ID:	506266-01
Date Analyzed:	06/12/15	Data File:	061220.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW70	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/12/15	Lab ID:	506266-02
Date Analyzed:	06/12/15	Data File:	061221.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW96	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/12/15	Lab ID:	506266-03
Date Analyzed:	06/12/15	Data File:	061222.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	98	63	127
4-Bromofluorobenzene	97	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW69	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/12/15	Lab ID:	506266-04
Date Analyzed:	06/12/15	Data File:	061223.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW95	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/12/15	Lab ID:	506266-05
Date Analyzed:	06/12/15	Data File:	061224.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW67	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/12/15	Lab ID:	506266-06
Date Analyzed:	06/12/15	Data File:	061225.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW68	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/12/15	Lab ID:	506266-07
Date Analyzed:	06/12/15	Data File:	061226.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/12/15	Lab ID:	05-1091 mb
Date Analyzed:	06/12/15	Data File:	061219.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW70	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/15/15	Lab ID:	506266-02 1/2
Date Analyzed:	06/16/15	Data File:	061610.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	93	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW69	Client:	Stantec
Date Received:	06/12/15	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/15/15	Lab ID:	506266-04 1/2
Date Analyzed:	06/16/15	Data File:	061611.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	96	31	160
Benzo(a)anthracene-d12	87	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	11
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506266
Date Extracted:	06/15/15	Lab ID:	05-1107 mb
Date Analyzed:	06/16/15	Data File:	061605.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	31	160
Benzo(a)anthracene-d12	101	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	<0.05
Pyrene	<0.05
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	<0.05
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Date of Report: 06/29/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506266
Date Extracted: 06/23/15
Date Analyzed: 06/23/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW70 506266-02	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Date of Report: 06/29/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506266

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506266-06 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	110	65-118
Toluene	ug/L (ppb)	50	108	72-122
Ethylbenzene	ug/L (ppb)	50	108	73-126
Xylenes	ug/L (ppb)	150	106	74-118
Gasoline	ug/L (ppb)	1,000	102	69-134

Date of Report: 06/29/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506266

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	92	98	63-142	6

Date of Report: 06/29/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506266

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 506266-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	97	96	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	97	83-115

Date of Report: 06/29/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506266

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 506285-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	1.81	101	104	79-121	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	106	83-115

Date of Report: 06/29/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506266

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 506266-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	74-127

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	103	104	64-147	1

Date of Report: 06/29/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506266

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	85	85	67-116	0
Acenaphthylene	ug/L (ppb)	1	93	96	65-119	3
Acenaphthene	ug/L (ppb)	1	93	94	66-118	1
Fluorene	ug/L (ppb)	1	95	96	64-125	1
Phenanthrene	ug/L (ppb)	1	85	85	67-120	0
Anthracene	ug/L (ppb)	1	87	87	65-122	0
Fluoranthene	ug/L (ppb)	1	89	90	65-127	1
Pyrene	ug/L (ppb)	1	84	79	62-130	6
Benz(a)anthracene	ug/L (ppb)	1	89	89	60-118	0
Chrysene	ug/L (ppb)	1	87	89	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	1	110	112	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	112	114	62-125	2
Benzo(a)pyrene	ug/L (ppb)	1	108	109	58-127	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	103	96	36-142	7
Dibenz(a,h)anthracene	ug/L (ppb)	1	94	92	37-133	2
Benzo(g,h,i)perylene	ug/L (ppb)	1	98	91	34-135	7

Date of Report: 06/29/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506266

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	116	122	70-130	5

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Drake Wells

506266

SAMPLE CHAIN OF CUSTODY

ME 06-12-15

AI2 / V3 / B05

Page # _____ of _____

Send Report To Rebekah Brooks

Company STANTEC

Address 19101 W 36th Ave, Suite 203

City, State, ZIP Lynnwood WA 98036

Phone # 425-977-4944 Fax # /

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT / 203700.62

PO#

REMARKS Dissolved lead Bottles are Bild Filtered and Labled (diss) total Bottles are labled (total)

TURNAROUND TIME
- ☒ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	Total Pb	dissolved Pb	PAHs	EDC	EDB	Notes
MW 98	01A-D	6-9-15	1415	W	4		X	X				X						
MW 70	02A-G	6-10-15	0900	W	7	X	X	X				X	X	X	X	X	X	
MW 96	03A-D	6-10-15	0900	W	4		X	X				X						
MW 69	04A-E	6-10-15	0956	W	5	X	X	X				X			X			
MW 95	05A-D	6-11-15	0905	W	4		X	X				X						
MW 67	06	6-11-15	1045	W	4		X	X				X						
MW 68	07	6-11-15	1200	W	4		X	X				X						
TB-061115-1	08	-	-	W	1		X	X										
TB-061115-2	09	-	-	W	1		X	X										

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	6-11-15	1300
Received by: [signature]	Khan Phan	FedEx	6-12-15	11:15
Relinquished by:				
Received by:		Samples received at 2 °C		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 17, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 12, 2015 from the TOC_01-176, WORFDB8 F&BI 506267 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0617R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 12, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506267 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506267 -01	MW49
506267 -02	EB-061015
506267 -03	MW53

All quality control requirements were acceptable.

Date of Report: 06/17/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506267
Date Extracted: 06/12/15
Date Analyzed: 06/12/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW49 506267-01	<1	<1	<1	<3	<100	103
EB-061015 506267-02	<1	<1	<1	<3	<100	105
MW53 506267-03	<1	<1	<1	<3	<100	102
Method Blank 05-1283 MB	<1	<1	<1	<3	<100	96

Date of Report: 06/17/15
Date Received: 06/12/15
Project: TOC_01-176, WORFDB8 F&BI 506267

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506252-06 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	104	65-118
Toluene	ug/L (ppb)	50	104	72-122
Ethylbenzene	ug/L (ppb)	50	106	73-126
Xylenes	ug/L (ppb)	150	100	74-118
Gasoline	ug/L (ppb)	1,000	92	69-134

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

ROW wells

506267

SAMPLE CHAIN OF CUSTODY

ME 06/12/15 V2

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 W 36th Ave, suite 203
City, State, ZIP Lynnwood WA - 98036
Phone #425-977-4944 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT / 203700102
PO#
REMARKS

Page # 1 of 1

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
MW49	01 A-C	6-10-15	1500	W	3		X	X										
EB-061015	02	6-10-15	1530	W	3		X	X										
MW53	03	6-11-15	1200	W	3		X	X										

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Dana Hutchins	Dana Hutchins	STANTEC	6-11-15	1300
Received by:		Khan Phan	FEBI	6-12-15	1045
Relinquished by:					
Received by:			Samples received at 2 °C		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 30, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 15, 2015 from the TOC_01-176, WORFDB8 F&BI 506296 project. There are 10 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0630R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 15, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506296 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506296 -01	MW50
506296 -02	MW60
506296 -03	MW48
506296 -04	MW55
506296 -05	MW63
506296 -06	MW52

All quality control requirements were acceptable.

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506296
Date Extracted: 06/16/15
Date Analyzed: 06/16/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW50 506296-01	<1	<1	<1	<3	<100	108
MW60 506296-02	<1	<1	<1	<3	<100	111
MW48 506296-03	<1	4.5	<1	110	2,200	123
MW55 506296-04	7.6	3.2	1.8	8.4	120	112
MW63 506296-05	2.9	1.2	<1	3.5	<100	112
MW52 506296-06	<1	<1	<1	<3	<100	114
Method Blank 05-1288 MB	<1	<1	<1	<3	<100	104

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW48	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506296
Date Extracted:	06/25/15	Lab ID:	506296-03
Date Analyzed:	06/25/15	Data File:	506296-03.024
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Lead	1.20

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506296
Date Extracted:	06/25/15	Lab ID:	I5-371 mb
Date Analyzed:	06/25/15	Data File:	I5-371 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW48	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506296
Date Extracted:	06/23/15	Lab ID:	506296-03
Date Analyzed:	06/24/15	Data File:	506296-03.020
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

Analyte:	Concentration ug/L (ppb)
Lead	7.06

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506296
Date Extracted:	06/23/15	Lab ID:	I5-367 mb
Date Analyzed:	06/24/15	Data File:	I5-367 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506296

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506118-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	3.9	3.8	3
Ethylbenzene	ug/L (ppb)	35	31	12
Xylenes	ug/L (ppb)	84	76	10
Gasoline	ug/L (ppb)	6,100	5,700	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	114	65-118
Toluene	ug/L (ppb)	50	111	72-122
Ethylbenzene	ug/L (ppb)	50	108	73-126
Xylenes	ug/L (ppb)	150	110	74-118
Gasoline	ug/L (ppb)	1,000	102	69-134

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506296

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 506266-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	97	96	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	97	83-115

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506296

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 506296-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	7.06	102	100	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	98	83-115

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

ROW

506296

SAMPLE CHAIN OF CUSTODY

ME 06/15/15 V3/AI 3

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave STE 203

City, State, ZIP Lynnwood Wa, 98036

Phone # 425-477-4994 Fax # –

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT/203700102

PO#

REMARKS Dissolved lead Bottles are labeled (diss) and Total lead Bottles are labeled (Total)

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- [x] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Pb	Dissolved Pb					Notes
						ANALYSES REQUESTED												
MW50	01 A-C	6-11-15	1415	W	3		X	X										
MW60	02 A-C	6-11-15	1430	W	3		X	X										
MW48	03 A-E	6-11-15	1515	W	5		X	X				X	X					
MW55	04 A-C	6-12-15	1130	W	3		X	X										
MW63	05 A-C	6-12-15	1215	W	3		X	X										
MW52	06 A-C	6-12-15	1410	W	3		X	X										
														Samples received at				4 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Dana Hutchins	Dana Hutchins	Stantec	6-15-15	1500
Received by:		Nhan Phan	FedEx	6-15-15	1520
Relinquished by:					
Received by:					

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 30, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 15, 2015 from the TOC_01-176, WORFDB8 F&BI 506297 project. There are 27 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0630R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 15, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506297 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506297 -01	MW73
506297 -02	MW74
506297 -03	TB-061515-1
506297 -04	TB-061515-2

All quality control requirements were acceptable.

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506297
Date Extracted: 06/16/15
Date Analyzed: 06/16/15 and 06/17/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW73 506297-01 1/1000	17,000	4,400	2,400	12,000	83,000	118
MW74 506297-02 1/1000	13,000	8,300	850	4,000	60,000	98
TB-061515-1 506297-03	<1	<1	<1	<3	<100	110
TB-061515-2 506297-04	<1	<1	<1	<3	<100	110
Method Blank 05-1288 MB	<1	<1	<1	<3	<100	104

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506297
Date Extracted: 06/16/15
Date Analyzed: 06/17/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
MW73 506297-01 1/2	2,800 x	<500	108
MW74 506297-02 1/2	4,500 x	<500	98
Method Blank 05-1109 MB2	<50	<250	92

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW73	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/25/15	Lab ID:	506297-01
Date Analyzed:	06/25/15	Data File:	506297-01.025
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW74	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/25/15	Lab ID:	506297-02
Date Analyzed:	06/25/15	Data File:	506297-02.026
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	83	60	125

Analyte:	Concentration ug/L (ppb)
Lead	9.72

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/25/15	Lab ID:	I5-371 mb
Date Analyzed:	06/25/15	Data File:	I5-371 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW73	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/18/15	Lab ID:	506297-01
Date Analyzed:	06/25/15	Data File:	506297-01.010
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW74	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/18/15	Lab ID:	506297-02
Date Analyzed:	06/25/15	Data File:	506297-02.011
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	88	60	125

Analyte:	Concentration ug/L (ppb)
Lead	11.0

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/18/15	Lab ID:	I5-357 mb
Date Analyzed:	06/25/15	Data File:	I5-357 mb.007
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW73	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/16/15	Lab ID:	506297-01
Date Analyzed:	06/16/15	Data File:	061611.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	134 ip	57	121
Toluene-d8	107	63	127
4-Bromofluorobenzene	105	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	7.2
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW74	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/16/15	Lab ID:	506297-02
Date Analyzed:	06/16/15	Data File:	061612.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	121	57	121
Toluene-d8	107	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	1,200 ve
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW74	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/16/15	Lab ID:	506297-02 1/100
Date Analyzed:	06/16/15	Data File:	061628.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	1,300
1,2-Dichloroethane (EDC)	<100

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/16/15	Lab ID:	05-1094 mb
Date Analyzed:	06/16/15	Data File:	061610.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506297
Date Extracted: 06/23/15
Date Analyzed: 06/23/15 and 06/24/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW73 506297-01 1/10	1.3
MW74 506297-02 1/2	0.30
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW73	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/16/15	Lab ID:	506297-01 1/2
Date Analyzed:	06/17/15	Data File:	061704.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	31	160
Benzo(a)anthracene-d12	107	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	200 ve
Acenaphthylene	<0.1
Acenaphthene	0.12
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW73	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/16/15	Lab ID:	506297-01 1/200
Date Analyzed:	06/17/15	Data File:	061719.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	191 d	31	160
Benzo(a)anthracene-d12	87 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	280
Acenaphthylene	<10
Acenaphthene	<10
Fluorene	<10
Phenanthrene	<10
Anthracene	<10
Fluoranthene	<10
Pyrene	<10
Benz(a)anthracene	<10
Chrysene	<10
Benzo(a)pyrene	<10
Benzo(b)fluoranthene	<10
Benzo(k)fluoranthene	<10
Indeno(1,2,3-cd)pyrene	<10
Dibenz(a,h)anthracene	<10
Benzo(g,h,i)perylene	<10

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW74	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/16/15	Lab ID:	506297-02 1/2
Date Analyzed:	06/17/15	Data File:	061705.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	106	31	160
Benzo(a)anthracene-d12	107	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	80 ve
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW74	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/16/15	Lab ID:	506297-02 1/20
Date Analyzed:	06/17/15	Data File:	061720.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	131 d	31	160
Benzo(a)anthracene-d12	97 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	97
Acenaphthylene	<1
Acenaphthene	<1
Fluorene	<1
Phenanthrene	<1
Anthracene	<1
Fluoranthene	<1
Pyrene	<1
Benz(a)anthracene	<1
Chrysene	<1
Benzo(a)pyrene	<1
Benzo(b)fluoranthene	<1
Benzo(k)fluoranthene	<1
Indeno(1,2,3-cd)pyrene	<1
Dibenz(a,h)anthracene	<1
Benzo(g,h,i)perylene	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506297
Date Extracted:	06/16/15	Lab ID:	05-1107 mb2
Date Analyzed:	06/16/15	Data File:	061612.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	95	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	<0.05
Pyrene	<0.05
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	<0.05
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506297

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506118-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	3.9	3.8	3
Ethylbenzene	ug/L (ppb)	35	31	12
Xylenes	ug/L (ppb)	84	76	10
Gasoline	ug/L (ppb)	6,100	5,700	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	114	65-118
Toluene	ug/L (ppb)	50	111	72-122
Ethylbenzene	ug/L (ppb)	50	108	73-126
Xylenes	ug/L (ppb)	150	110	74-118
Gasoline	ug/L (ppb)	1,000	102	69-134

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506297

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	92	98	63-142	6

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506297

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 506266-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	97	96	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	97	83-115

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506297

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 506285-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	1.81	101	104	79-121	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	106	83-115

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506297

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 506299-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	104	74-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	103	69-133

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	108	113	64-147	5
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	104	108	73-132	4

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506297

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	116	122	70-130	5

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506297

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	85	85	67-116	0
Acenaphthylene	ug/L (ppb)	1	93	96	65-119	3
Acenaphthene	ug/L (ppb)	1	93	94	66-118	1
Fluorene	ug/L (ppb)	1	95	96	64-125	1
Phenanthrene	ug/L (ppb)	1	85	85	67-120	0
Anthracene	ug/L (ppb)	1	87	87	65-122	0
Fluoranthene	ug/L (ppb)	1	89	90	65-127	1
Pyrene	ug/L (ppb)	1	84	79	62-130	6
Benz(a)anthracene	ug/L (ppb)	1	89	89	60-118	0
Chrysene	ug/L (ppb)	1	87	89	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	1	110	112	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	112	114	62-125	2
Benzo(a)pyrene	ug/L (ppb)	1	108	109	58-127	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	103	96	36-142	7
Dibenz(a,h)anthracene	ug/L (ppb)	1	94	92	37-133	2
Benzo(g,h,i)perylene	ug/L (ppb)	1	98	91	34-135	7

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

shin Choi

506297

SAMPLE CHAIN OF CUSTODY

ME 06/15/15

V3/C05/AD

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave STE 203

City, State, ZIP Lynnwood Wa, 98036

Phone #425-477-4994 Fax #

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT / 203700.02

PO#

REMARKS Dissolved lead BOTTLES are labeled (diss) and Total lead BOTTLES are labeled (TOTAL)

Page # 1 of

TURNAROUND TIME
- ☑ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	PAHs	Total Pb	Dissolved Pb	EDC	EDB	Notes
MW73	01 A-G	6-12-15	0945	W	7	X	X	X				X	X	X	X	X	X	
MW74	02 A-G	6-12-15	1000	W	7	X	X	X				X	X	X	X	X	X	
TB-061515-1	03	—	—	W	1		X	X										
TB-061515-2	04	—	—	W	1		X	X										
																		Samples received at 4 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	6-15-15	1700
Received by:	Khan Phan	FEBT	6-15-15	1500
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

July 7, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 15, 2015 from the TOC_01-176, WORFDB8 F&BI 506298 project. There are 42 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0707R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 15, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506298 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506298 -01	MW104
506298 -02	MLT-04
506298 -03	MW105
506298 -04	MW107
506298 -05	MW106
506298 -06	EB-061315

The 8011 EDB detections could not be confirmed by 8260C analysis. The results may be due to interferences present in the samples.

All quality control requirements were acceptable.

Date of Report: 07/07/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506298
Date Extracted: 06/17/15
Date Analyzed: 06/17/15 and 06/18/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW104 506298-01 1/100	9.5	720	2,000	10,000	40,000	111
MLT-04 506298-02 1/100	11	830	2,100	11,000	41,000	112
MW105 506298-03	<1	<1	<1	<3	<100	112
MW107 506298-04	<1	<1	<1	<3	<100	108
MW106 506298-05	<1	<1	<1	<3	<100	110
EB-061315 506298-06	<1	<1	<1	<3	<100	107
Method Blank 05-1289 MB	<1	<1	<1	<3	<100	102
Method Blank 05-1289 MB2	<1	<1	<1	<3	<100	110

Date of Report: 07/07/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506298
Date Extracted: 06/16/15
Date Analyzed: 06/17/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW104 506298-01 1/2	8,000 x	580 x	106
MLT-04 506298-02 1/2	7,700 x	580 x	106
MW105 506298-03 1/2	<100	<500	102
MW107 506298-04 1/2	<100	<500	120
MW106 506298-05 1/2	480 x	<500	107
EB-061315 506298-06 1/2	<100	<500	105
Method Blank 05-1115 MB	<50	<250	103

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW104	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/26/15	Lab ID:	506298-01
Date Analyzed:	07/02/15	Data File:	506298-01.010
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MLT-04	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/26/15	Lab ID:	506298-02
Date Analyzed:	07/02/15	Data File:	506298-02.038
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	78	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW105	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/26/15	Lab ID:	506298-03
Date Analyzed:	07/02/15	Data File:	506298-03.039
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	81	60	125

Analyte:	Concentration ug/L (ppb)
Lead	4.58

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW107	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/26/15	Lab ID:	506298-04
Date Analyzed:	07/02/15	Data File:	506298-04.040
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	86	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW106	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/26/15	Lab ID:	506298-05
Date Analyzed:	07/02/15	Data File:	506298-05.041
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	86	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-061315	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/26/15	Lab ID:	506298-06
Date Analyzed:	07/02/15	Data File:	506298-06.042
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	85	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/26/15	Lab ID:	I5-372 mb
Date Analyzed:	07/02/15	Data File:	I5-372 mb.008
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW104	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/25/15	Lab ID:	506298-01
Date Analyzed:	06/25/15	Data File:	506298-01.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	82	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MLT-04	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/25/15	Lab ID:	506298-02
Date Analyzed:	06/25/15	Data File:	506298-02.029
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	82	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW105	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/25/15	Lab ID:	506298-03
Date Analyzed:	06/25/15	Data File:	506298-03.030
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	90	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW107	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/25/15	Lab ID:	506298-04
Date Analyzed:	06/25/15	Data File:	506298-04.031
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	90	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW106	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/25/15	Lab ID:	506298-05
Date Analyzed:	06/25/15	Data File:	506298-05.032
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-061315	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/25/15	Lab ID:	506298-06
Date Analyzed:	06/25/15	Data File:	506298-06.033
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	87	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/25/15	Lab ID:	I5-371 mb
Date Analyzed:	06/25/15	Data File:	I5-371 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW104	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-01
Date Analyzed:	06/16/15	Data File:	061614.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	95	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	125	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-04	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-02
Date Analyzed:	06/16/15	Data File:	061615.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	114	63	127
4-Bromofluorobenzene	108	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW105	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-03
Date Analyzed:	06/16/15	Data File:	061616.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	95	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW107	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-04
Date Analyzed:	06/16/15	Data File:	061617.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW106	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-05
Date Analyzed:	06/16/15	Data File:	061618.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-061315	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-06
Date Analyzed:	06/16/15	Data File:	061619.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	05-1094 mb
Date Analyzed:	06/16/15	Data File:	061610.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 07/07/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506298
Date Extracted: 06/23/15
Date Analyzed: 06/23/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW104 506298-01	0.098
MLT-04 506298-02	0.10
MW105 506298-03	<0.01
MW107 506298-04	<0.01
MW106 506298-05	<0.01
EB-061315 506298-06	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Note: The EDB detections could not be confirmed by 8260C analysis. The results may be due to interferences present in the samples.

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW104	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-01 1/2
Date Analyzed:	06/17/15	Data File:	061706.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	31	160
Benzo(a)anthracene-d12	110	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	270 ve
Acenaphthylene	<0.1
Acenaphthene	0.16
Fluorene	0.19
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW104	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-01 1/200
Date Analyzed:	06/17/15	Data File:	061721.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	284 d	31	160
Benzo(a)anthracene-d12	109 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	360
Acenaphthylene	<10
Acenaphthene	<10
Fluorene	<10
Phenanthrene	<10
Anthracene	<10
Fluoranthene	<10
Pyrene	<10
Benz(a)anthracene	<10
Chrysene	<10
Benzo(a)pyrene	<10
Benzo(b)fluoranthene	<10
Benzo(k)fluoranthene	<10
Indeno(1,2,3-cd)pyrene	<10
Dibenz(a,h)anthracene	<10
Benzo(g,h,i)perylene	<10

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-04	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-02 1/2
Date Analyzed:	06/17/15	Data File:	061707.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	31	160
Benzo(a)anthracene-d12	125	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	200 ve
Acenaphthylene	<0.1
Acenaphthene	0.15
Fluorene	0.17
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-04	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-02 1/200
Date Analyzed:	06/17/15	Data File:	061722.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	173 d	31	160
Benzo(a)anthracene-d12	96 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	260
Acenaphthylene	<10
Acenaphthene	<10
Fluorene	<10
Phenanthrene	<10
Anthracene	<10
Fluoranthene	<10
Pyrene	<10
Benz(a)anthracene	<10
Chrysene	<10
Benzo(a)pyrene	<10
Benzo(b)fluoranthene	<10
Benzo(k)fluoranthene	<10
Indeno(1,2,3-cd)pyrene	<10
Dibenz(a,h)anthracene	<10
Benzo(g,h,i)perylene	<10

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW105	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-03 1/2
Date Analyzed:	06/17/15	Data File:	061708.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	31	160
Benzo(a)anthracene-d12	98	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW107	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-04 1/2
Date Analyzed:	06/17/15	Data File:	061709.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	31	160
Benzo(a)anthracene-d12	102	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW106	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-05 1/2
Date Analyzed:	06/17/15	Data File:	061710.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	31	160
Benzo(a)anthracene-d12	105	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	0.18
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-061315	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	506298-06 1/2
Date Analyzed:	06/17/15	Data File:	061711.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	31	160
Benzo(a)anthracene-d12	102	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506298
Date Extracted:	06/16/15	Lab ID:	05-1107 mb2
Date Analyzed:	06/16/15	Data File:	061612.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	95	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	<0.05
Pyrene	<0.05
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	<0.05
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Date of Report: 07/07/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506298

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506322-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	106	65-118
Toluene	ug/L (ppb)	50	106	72-122
Ethylbenzene	ug/L (ppb)	50	109	73-126
Xylenes	ug/L (ppb)	150	105	74-118
Gasoline	ug/L (ppb)	1,000	101	69-134

Date of Report: 07/07/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506298

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	97	101	63-142	4

Date of Report: 07/07/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506298

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 506298-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	97	99	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	105	83-115

Date of Report: 07/07/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506298

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 506266-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	97	96	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	97	83-115

Date of Report: 07/07/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506298

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 506299-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	104	74-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	103	69-133

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	108	113	64-147	5
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	104	108	73-132	4

Date of Report: 07/07/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506298

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	116	122	70-130	5

Date of Report: 07/07/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506298

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	85	85	67-116	0
Acenaphthylene	ug/L (ppb)	1	93	96	65-119	3
Acenaphthene	ug/L (ppb)	1	93	94	66-118	1
Fluorene	ug/L (ppb)	1	95	96	64-125	1
Phenanthrene	ug/L (ppb)	1	85	85	67-120	0
Anthracene	ug/L (ppb)	1	87	87	65-122	0
Fluoranthene	ug/L (ppb)	1	89	90	65-127	1
Pyrene	ug/L (ppb)	1	84	79	62-130	6
Benz(a)anthracene	ug/L (ppb)	1	89	89	60-118	0
Chrysene	ug/L (ppb)	1	87	89	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	1	110	112	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	112	114	62-125	2
Benzo(a)pyrene	ug/L (ppb)	1	108	109	58-127	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	103	96	36-142	7
Dibenz(a,h)anthracene	ug/L (ppb)	1	94	92	37-133	2
Benzo(g,h,i)perylene	ug/L (ppb)	1	98	91	34-135	7

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Herman
506298

SAMPLE CHAIN OF CUSTODY

ME 06/15/15 V4/ATS/KCS

Page # ____ of ____

Send Report To Rebekah Brooks
Company Stantec
Address 19101 W 36th Ave Ste 203
City, State, ZIP Lynnwood Wa, 98036
Phone # 425-477-4994 Fax # ____

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT / 20370002

PO#

REMARKS Dissolved lead Bottles are Field Filtered and labled (diss) Total lead BOTTLES are labled (Total)

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH ____
Rush charges authorized by ____

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Pb	Dissolved Pb	PAHs	MTBE	EDC	EDB	Notes
MW104	01A-G	6-12-15	1133	W	7	X	X	X				X	X	X	X	X	X	
MLT-04	02	6-12-15	1145	W	7	X	X	X				X	X	X	X	X	X	
MW105	03	6-12-15	1230	W	7	X	X	X				X	X	X	X	X	X	
MW107	04	6-13-15	1100	W	7	X	X	X				X	X	X	X	X	X	
MW106	05	6-13-15	1200	W	7	X	X	X				X	X	X	X	X	X	
EB-061315	06	6-13-15	1415	W	7	X	X	X				X	X	X	X	X	X	

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	6-15-15	1500
Received by:	Khan Phan	FEBT	6-15-15	1520
Relinquished by:				
Received by:		Samples received at 4 °C		

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
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(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 30, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 15, 2015 from the TOC_01-176, WORFDB8 F&BI 506299 project. There are 37 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0630R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 15, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506299 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506299 -01	MW85
506299 -02	EB-061115
506299 -03	MW86
506299 -04	MLT-03
506299 -05	EB-061215
506299 -06	WB-061215
506299 -07	MW77

All quality control requirements were acceptable.

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506299
Date Extracted: 06/16/15
Date Analyzed: 06/16/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW85 506299-01	<1	<1	<1	<3	<100	114
EB-061115 506299-02	<1	<1	<1	<3	<100	107
MW86 506299-03	1.1	<1	<1	<3	<100	112
MLT-03 506299-04	1.1	<1	<1	<3	<100	109
EB-061215 506299-05	<1	<1	<1	<3	<100	113
WB-061215 506299-06	<1	<1	<1	<3	<100	113
MW77 506299-07	<1	<1	<1	<3	<100	114
Method Blank 05-1288 MB	<1	<1	<1	<3	<100	104

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506299
Date Extracted: 06/16/15
Date Analyzed: 06/17/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
EB-061115 506299-02 1/2	<100	<500	95
MW86 506299-03 1/2	<100	<500	97
MLT-03 506299-04 1/2	<100	<500	96
EB-061215 506299-05 1/2	<100	<500	92
WB-061215 506299-06 1/2	<100	<500	92
Method Blank 05-1109 MB2	<50	<250	92

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW86	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/25/15	Lab ID:	506299-03
Date Analyzed:	06/25/15	Data File:	506299-03.034
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	90	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MLT-03	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/25/15	Lab ID:	506299-04
Date Analyzed:	06/25/15	Data File:	506299-04.035
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-061215	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/25/15	Lab ID:	506299-05
Date Analyzed:	06/25/15	Data File:	506299-05.036
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	88	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	WB-061215	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/25/15	Lab ID:	506299-06
Date Analyzed:	06/25/15	Data File:	506299-06.037
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/25/15	Lab ID:	I5-371 mb
Date Analyzed:	06/25/15	Data File:	I5-371 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW86	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/18/15	Lab ID:	506299-03
Date Analyzed:	06/25/15	Data File:	506299-03.012
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MLT-03	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/18/15	Lab ID:	506299-04
Date Analyzed:	06/25/15	Data File:	506299-04.013
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-061215	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/18/15	Lab ID:	506299-05
Date Analyzed:	06/25/15	Data File:	506299-05.014
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	WB-061215	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/18/15	Lab ID:	506299-06
Date Analyzed:	06/25/15	Data File:	506299-06.015
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/18/15	Lab ID:	I5-357 mb
Date Analyzed:	06/25/15	Data File:	I5-357 mb.007
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW85	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	506299-01
Date Analyzed:	06/16/15	Data File:	061620.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-061115	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	506299-02
Date Analyzed:	06/16/15	Data File:	061621.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW86	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	506299-03
Date Analyzed:	06/16/15	Data File:	061622.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-03	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	506299-04
Date Analyzed:	06/16/15	Data File:	061623.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-061215	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	506299-05
Date Analyzed:	06/16/15	Data File:	061624.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	WB-061215	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	506299-06
Date Analyzed:	06/16/15	Data File:	061625.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW77	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	506299-07
Date Analyzed:	06/16/15	Data File:	061626.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	05-1094 mb
Date Analyzed:	06/16/15	Data File:	061610.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506299
Date Extracted: 06/23/15
Date Analyzed: 06/23/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW86 506299-03	<0.01
MLT-03 506299-04	<0.01
EB-061215 506299-05	<0.01
WB-061215 506299-06	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-061115	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	506299-02 1/2
Date Analyzed:	06/17/15	Data File:	061712.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	31	160
Benzo(a)anthracene-d12	105	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW86	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	506299-03 1/2
Date Analyzed:	06/17/15	Data File:	061713.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	102	31	160
Benzo(a)anthracene-d12	97	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-03	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	506299-04 1/2
Date Analyzed:	06/17/15	Data File:	061714.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	102	31	160
Benzo(a)anthracene-d12	97	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-061215	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	506299-05 1/2
Date Analyzed:	06/17/15	Data File:	061715.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	31	160
Benzo(a)anthracene-d12	101	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	0.22
Anthracene	<0.1
Fluoranthene	0.12
Pyrene	0.13
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	WB-061215	Client:	Stantec
Date Received:	06/15/15	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	506299-06 1/2
Date Analyzed:	06/17/15	Data File:	061716.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	31	160
Benzo(a)anthracene-d12	98	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506299
Date Extracted:	06/16/15	Lab ID:	05-1107 mb2
Date Analyzed:	06/16/15	Data File:	061612.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	95	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	<0.05
Pyrene	<0.05
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	<0.05
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506299

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506118-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	3.9	3.8	3
Ethylbenzene	ug/L (ppb)	35	31	12
Xylenes	ug/L (ppb)	84	76	10
Gasoline	ug/L (ppb)	6,100	5,700	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	114	65-118
Toluene	ug/L (ppb)	50	111	72-122
Ethylbenzene	ug/L (ppb)	50	108	73-126
Xylenes	ug/L (ppb)	150	110	74-118
Gasoline	ug/L (ppb)	1,000	102	69-134

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506299

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	92	98	63-142	6

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506299

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 506266-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	97	96	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	97	83-115

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506299

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 506285-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	1.81	101	104	79-121	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	106	83-115

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506299

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 506299-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	104	74-127

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	108	113	64-147	5

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506299

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 506299-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	104	74-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	103	69-133

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	108	113	64-147	5
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	104	108	73-132	4

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506299

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	116	122	70-130	5

Date of Report: 06/30/15
Date Received: 06/15/15
Project: TOC_01-176, WORFDB8 F&BI 506299

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	85	85	67-116	0
Acenaphthylene	ug/L (ppb)	1	93	96	65-119	3
Acenaphthene	ug/L (ppb)	1	93	94	66-118	1
Fluorene	ug/L (ppb)	1	95	96	64-125	1
Phenanthrene	ug/L (ppb)	1	85	85	67-120	0
Anthracene	ug/L (ppb)	1	87	87	65-122	0
Fluoranthene	ug/L (ppb)	1	89	90	65-127	1
Pyrene	ug/L (ppb)	1	84	79	62-130	6
Benz(a)anthracene	ug/L (ppb)	1	89	89	60-118	0
Chrysene	ug/L (ppb)	1	87	89	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	1	110	112	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	112	114	62-125	2
Benzo(a)pyrene	ug/L (ppb)	1	108	109	58-127	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	103	96	36-142	7
Dibenz(a,h)anthracene	ug/L (ppb)	1	94	92	37-133	2
Benzo(g,h,i)perylene	ug/L (ppb)	1	98	91	34-135	7

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Urake

5060299

SAMPLE CHAIN OF CUSTODY

ME 06/15/15

Page # 1 of 1

V4/AI6/COS

Send Report To Rebekah Brooks

Company StanTec

Address 19101 W 36th Ave Ste 203

City, State, ZIP Lynnwood Wa, 98036

Phone # 425-477-4994 Fax # —

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT/203700102

PO#

REMARKS Dissolved lead bottles are labeled (diss) and total lead bottles are labeled (total).

TURNAROUND TIME
- ☒ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	PAHs	Total Pb	Dissolved Pb	EDC	EDB	Notes
MW85	01 A-D	6-11-15	1600	W	4		X	X				X						
EB-061115	02 A-E	6-11-15	1615	W	5	X	X	X				X	X					
MW86	03 A-G	6-12-15	1420	W	7	X	X	X				X	X	X	X	X	X	
MLT-03	04	6-12-15	1440	W	7	X	X	X				X	X	X	X	X	X	
EB-061215	05	6-12-15	1515	W	7	X	X	X				X	X	X	X	X	X	
WB-061215	06	6-12-15	1530	W	7	X	X	X				X	X	X	X	X	X	
MW77	07 A-D	6-13-15	1345	W	4		X	X				X						

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Dana Hutchins	Dana Hutchins	StanTec	6-15-15	1500
Received by:		Nhan Phan	FEBI	6-15-15	1500
Relinquished by:					
Received by:			Samples received at 4 °C		

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 30, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 18, 2015 from the TOC_01-176, WORFDB8 F&BI 506373 project. There are 18 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0630R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 18, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506373 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506373 -01	MW108
506373 -02	EB-061815
506373 -03	TB-061815

All quality control requirements were acceptable.

Date of Report: 06/30/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506373
Date Extracted: 06/19/15
Date Analyzed: 06/19/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW108 506373-01	<1	<1	<1	<3	110	111
EB-061815 506373-02	<1	<1	<1	<3	<100	110
TB-061815 506373-03	<1	<1	<1	<3	<100	112
Method Blank 05-1295 MB	<1	<1	<1	<3	<100	107

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW108	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506373
Date Extracted:	06/19/15	Lab ID:	506373-01
Date Analyzed:	06/23/15	Data File:	506373-01.021
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Lead	6.24

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-061815	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506373
Date Extracted:	06/19/15	Lab ID:	506373-02
Date Analyzed:	06/23/15	Data File:	506373-02.022
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506373
Date Extracted:	06/19/15	Lab ID:	I5-357 mb2
Date Analyzed:	06/23/15	Data File:	I5-357 mb2.023
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW108	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506373
Date Extracted:	06/19/15	Lab ID:	506373-01
Date Analyzed:	06/23/15	Data File:	506373-01.009
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	85	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-061815	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506373
Date Extracted:	06/19/15	Lab ID:	506373-02
Date Analyzed:	06/23/15	Data File:	506373-02.012
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	83	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506373
Date Extracted:	06/19/15	Lab ID:	I5-366 mb
Date Analyzed:	06/23/15	Data File:	I5-366 mb.007
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW108	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506373
Date Extracted:	06/19/15	Lab ID:	506373-01
Date Analyzed:	06/19/15	Data File:	061908.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-061815	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506373
Date Extracted:	06/19/15	Lab ID:	506373-02
Date Analyzed:	06/19/15	Data File:	061909.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	105	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506373
Date Extracted:	06/19/15	Lab ID:	05-1100 mb
Date Analyzed:	06/19/15	Data File:	061907.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	105	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 06/30/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506373
Date Extracted: 06/23/15
Date Analyzed: 06/23/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW108 506373-01	<0.01
EB-061815 506373-02	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Date of Report: 06/30/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506373

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506369-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	108	65-118
Toluene	ug/L (ppb)	50	107	72-122
Ethylbenzene	ug/L (ppb)	50	107	73-126
Xylenes	ug/L (ppb)	150	107	74-118
Gasoline	ug/L (ppb)	1,000	101	69-134

Date of Report: 06/30/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506373

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 506285-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	1.81	101	104	79-121	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	106	83-115

Date of Report: 06/30/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506373

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 506373-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	97	96	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	98	83-115

Date of Report: 06/30/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506373

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 506376-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	68-125
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	93	70-119

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	98	100	70-122	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	92	92	79-109	0

Date of Report: 06/30/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506373

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	116	122	70-130	5

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

new Norman Wells

506373

SAMPLE CHAIN OF CUSTODY

ME 06/18/15 V2/AB

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave STE 203

City, State, ZIP Lynnwood Wa, 98036

Phone # 425-477-4994 Fax #

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT/203700102

PO#

REMARKS Total lead Bottles are Field Filtered and Labeled (dss). * Rush 24 hr TAT

TURNAROUND TIME
- ☐ Standard (2 Weeks)
- ☒ RUSH 24 hr TAT

Rush charges authorized by

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	EDC	EDB	Total Pb	Dissolved Pb	Notes
MW108	01 A-F	6-18-15	0945	W	6		X	X				X	X	X	X	X	
[redacted]																	
EB-061815	02 A-F	6-18-15	1100	W	6		X	X				X	X	X	X	X	
TB-061815-1	03	6	—	W	1		X	X									

Samples received at 2 °C

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Dana Hutchins	Dana Hutchins	Stantec	6-18-15	1600
Received by:	[signature]	Nhan Phan	FEBI	6-18-15	1600
Relinquished by:					
Received by:					

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

* Please let Turbid samples settle prior to analizing.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 25, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 18, 2015 from the TOC_01-176, WORFDB8 F&BI 506374 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0625R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 18, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506374 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506374 -01	MW51

All quality control requirements were acceptable.

Date of Report: 06/25/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506374
Date Extracted: 06/19/15
Date Analyzed: 06/19/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW51 506374-01	<1	<1	<1	<3	<100	116
Method Blank 05-1295 MB	<1	<1	<1	<3	<100	107

Date of Report: 06/25/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506374

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506369-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	108	65-118
Toluene	ug/L (ppb)	50	107	72-122
Ethylbenzene	ug/L (ppb)	50	107	73-126
Xylenes	ug/L (ppb)	150	107	74-118
Gasoline	ug/L (ppb)	1,000	101	69-134

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

ROW

506374

SAMPLE CHAIN OF CUSTODY

ME 06/18/15 VZ

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave STE 203

City, State, ZIP Lynnwood Wa, 98036

Phone # 425-477-4994 Fax # -

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT / 203700102

PO#

REMARKS

TURNAROUND TIME
- ☒ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
MW 51	01 A-C	6-16-15	1030	W	3		X	X										

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	6-16-15	1600
Received by: [illegible]	Afshan Khan	FEBI	6/18/15	1600
Relinquished by:				
Received by:		Samples received at 2 °C		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
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fbi@isomedia.com
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June 29, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 18, 2015 from the TOC_01-176, WORFDB8 F&BI 506375 project. There are 21 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0629R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 18, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506375 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506375 -01	MW103

All quality control requirements were acceptable.

Date of Report: 06/29/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506375
Date Extracted: 06/19/15
Date Analyzed: 06/19/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW103 506375-01	<1	<1	<1	<3	<100	113
Method Blank 05-1295 MB	<1	<1	<1	<3	<100	107

Date of Report: 06/29/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506375
Date Extracted: 06/19/15
Date Analyzed: 06/19/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
MW103 506375-01	350	<250	108
Method Blank 05-1134 MB	<50	<250	89

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW103	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506375
Date Extracted:	06/25/15	Lab ID:	506375-01
Date Analyzed:	06/25/15	Data File:	506375-01.038
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	82	60	125

Analyte:	Concentration ug/L (ppb)
Lead	14.8

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506375
Date Extracted:	06/25/15	Lab ID:	I5-371 mb
Date Analyzed:	06/25/15	Data File:	I5-371 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW103	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506375
Date Extracted:	06/23/15	Lab ID:	506375-01 x5
Date Analyzed:	06/24/15	Data File:	506375-01 x5.024
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

Analyte:	Concentration ug/L (ppb)
Lead	17.9

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 506375
Date Extracted:	06/23/15	Lab ID:	I5-367 mb
Date Analyzed:	06/24/15	Data File:	I5-367 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW103	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506375
Date Extracted:	06/19/15	Lab ID:	506375-01
Date Analyzed:	06/19/15	Data File:	061910.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	104	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	410 ve
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1
Benzene	0.37
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW103	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506375
Date Extracted:	06/19/15	Lab ID:	506375-01 1/10
Date Analyzed:	06/22/15	Data File:	062215.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	105	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	380
1,2-Dichloroethane (EDC)	<10
1,2-Dibromoethane (EDB)	<10
Benzene	<3.5
Toluene	<10
Ethylbenzene	<10
m,p-Xylene	<20
o-Xylene	<10

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506375
Date Extracted:	06/19/15	Lab ID:	05-1100 mb
Date Analyzed:	06/19/15	Data File:	061907.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	105	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Date of Report: 06/29/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506375
Date Extracted: 06/23/15
Date Analyzed: 06/23/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW103 506375-01	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW103	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506375
Date Extracted:	06/22/15	Lab ID:	506375-01 1/2
Date Analyzed:	06/23/15	Data File:	062314.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	101	31	160
Benzo(a)anthracene-d12	73	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506375
Date Extracted:	06/22/15	Lab ID:	05-1144 mb2
Date Analyzed:	06/23/15	Data File:	062306.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	31	160
Benzo(a)anthracene-d12	97	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	<0.05
Pyrene	<0.05
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	<0.05
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Date of Report: 06/29/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506375

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506369-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	108	65-118
Toluene	ug/L (ppb)	50	107	72-122
Ethylbenzene	ug/L (ppb)	50	107	73-126
Xylenes	ug/L (ppb)	150	107	74-118
Gasoline	ug/L (ppb)	1,000	101	69-134

Date of Report: 06/29/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506375

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	96	107	61-133	11

Date of Report: 06/29/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506375

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 506266-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	97	96	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	97	83-115

Date of Report: 06/29/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506375

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 506296-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	7.06	102	100	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	98	83-115

Date of Report: 06/29/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506375

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 506376-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	68-125
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	93	70-119
Benzene	ug/L (ppb)	50	<0.35	93	78-108
Toluene	ug/L (ppb)	50	<1	94	73-117
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	94	79-120
Ethylbenzene	ug/L (ppb)	50	<1	101	71-120
m,p-Xylene	ug/L (ppb)	100	<2	106	63-128
o-Xylene	ug/L (ppb)	50	<1	111	64-129

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	98	100	70-122	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	92	92	79-109	0
Benzene	ug/L (ppb)	50	92	94	81-108	2
Toluene	ug/L (ppb)	50	94	95	83-108	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	96	97	82-118	1
Ethylbenzene	ug/L (ppb)	50	100	102	83-111	2
m,p-Xylene	ug/L (ppb)	100	105	106	84-112	1
o-Xylene	ug/L (ppb)	50	111	112	81-117	1

Date of Report: 06/29/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506375

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	116	122	70-130	5

Date of Report: 06/29/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506375

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	0.25	86	88	67-116	2
Acenaphthylene	ug/L (ppb)	0.25	100	103	65-119	3
Acenaphthene	ug/L (ppb)	0.25	98	102	66-118	4
Fluorene	ug/L (ppb)	0.25	100	103	64-125	3
Phenanthrene	ug/L (ppb)	0.25	99	94	67-120	5
Anthracene	ug/L (ppb)	0.25	94	91	65-122	3
Fluoranthene	ug/L (ppb)	0.25	92	95	65-127	3
Pyrene	ug/L (ppb)	0.25	88	101	62-130	14
Benz(a)anthracene	ug/L (ppb)	0.25	95	92	60-118	3
Chrysene	ug/L (ppb)	0.25	87	97	66-125	11
Benzo(b)fluoranthene	ug/L (ppb)	0.25	107	116	55-135	8
Benzo(k)fluoranthene	ug/L (ppb)	0.25	105	111	62-125	6
Benzo(a)pyrene	ug/L (ppb)	0.25	103	110	58-127	7
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	0.25	92	99	36-142	7
Dibenz(a,h)anthracene	ug/L (ppb)	0.25	80	91	37-133	13
Benzo(g,h,i)perylene	ug/L (ppb)	0.25	92	99	34-135	7

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Herman

506375

SAMPLE CHAIN OF CUSTODY

ME 06/18/15 AI2/V2

Page # 1 of 1

Send Report To Rebekah Brooks

Company STantec

Address 19101 W 36th Ave STE203

City, State, ZIP Lynnwood Wa, 98036

Phone # 425-477-4994 Fax #

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT/2037002

PO#

REMARKS Dissolved Pb samples are Field Filtered and labeled (diss)

TURNAROUND TIME
- ☒ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	PAHs	Total Pb	Dissolved Pb	EDC	EDB	Notes
MW103	01 AG	6-1615	0920	W	7	X	X	X				X	X	X	X	X	X	
																		Samples received at 2 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STanTec	6-18-15	1600
Received by: Nhan Phan	Nhan Phan	FEBI	6/18/15	1600
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
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3012 16th Avenue West
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June 25, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 18, 2015 from the TOC_01-176, WORFDB8 F&BI 506376 project. There are 7 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0625R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 18, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506376 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506376 -01	MW09
506376 -02	MLT-01
506376 -03	EB-061615

All quality control requirements were acceptable.

Date of Report: 06/25/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506376
Date Extracted: 06/19/15
Date Analyzed: 06/19/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW09 506376-01	<1	<1	<1	<3	<100	115
MLT-01 506376-02	<1	<1	<1	<3	<100	116
EB-061615 506376-03	<1	<1	<1	<3	<100	116
Method Blank 05-1295 MB	<1	<1	<1	<3	<100	107

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-061615	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506376
Date Extracted:	06/19/15	Lab ID:	506376-03
Date Analyzed:	06/19/15	Data File:	061912.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506376
Date Extracted:	06/19/15	Lab ID:	05-1100 mb
Date Analyzed:	06/19/15	Data File:	061907.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	105	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Date of Report: 06/25/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506376

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506369-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	108	65-118
Toluene	ug/L (ppb)	50	107	72-122
Ethylbenzene	ug/L (ppb)	50	107	73-126
Xylenes	ug/L (ppb)	150	107	74-118
Gasoline	ug/L (ppb)	1,000	101	69-134

Date of Report: 06/25/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506376

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 506376-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	68-125

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	98	100	70-122	2

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

TOC

5063776

SAMPLE CHAIN OF CUSTODY

ME 06/18/15

V2

Page # 1 of 1

Send Report To Rebekah Brooks

Company StanTec

Address 19101 W 36th Ave STE203

City, State, ZIP Lynnwood Wa, 98036

Phone #425-477-4994 Fax #

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT/203700102

PO#

REMARKS

TURNAROUND TIME
- ☒ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE						Notes
MW09	01 A-C	6-16-15	1330	W	3		X	X										
MLT-01	02 A-C	6-16-15	1345	W	3		X	X										
EB-061615	03 A-D	6-16-15	1415	W	4		X	X				X						
													Samples received at 2 °C					

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	StanTec	6-18-15	1600
Received by:	Nhan Phan	FedEx	6/18/15	1600
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 30, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 18, 2015 from the TOC_01-176, WORFDB8 F&BI 506377 project. There are 10 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0630R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 18, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506377 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506377 -01	MW84
506377 -02	MW89
506377 -03	EB-061515
506377 -04	MW65

All quality control requirements were acceptable.

Date of Report: 06/30/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506377
Date Extracted: 06/23/15
Date Analyzed: 06/23/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
MW84 506377-01	<1	<1	<1	<3	<100	89
MW89 506377-02	<1	<1	<1	<3	<100	100
EB-061515 506377-03	<1	<1	<1	<3	<100	99
MW65 506377-04	<1	<1	<1	<3	<100	100
Method Blank 05-1145 MB	<1	<1	<1	<3	<100	98

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW84	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506377
Date Extracted:	06/19/15	Lab ID:	506377-01
Date Analyzed:	06/19/15	Data File:	061915.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW89	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506377
Date Extracted:	06/19/15	Lab ID:	506377-02
Date Analyzed:	06/19/15	Data File:	061916.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	105	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-061515	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506377
Date Extracted:	06/19/15	Lab ID:	506377-03
Date Analyzed:	06/19/15	Data File:	061917.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	104	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW65	Client:	Stantec
Date Received:	06/18/15	Project:	TOC_01-176, WORFDB8 F&BI 506377
Date Extracted:	06/19/15	Lab ID:	506377-04
Date Analyzed:	06/19/15	Data File:	061918.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	99	91	108
4-Bromofluorobenzene	104	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506377
Date Extracted:	06/19/15	Lab ID:	05-1100 mb
Date Analyzed:	06/19/15	Data File:	061907.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	105	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Date of Report: 06/30/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506372-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	102	72-119
Toluene	ug/L (ppb)	50	106	71-113
Ethylbenzene	ug/L (ppb)	50	105	72-114
Xylenes	ug/L (ppb)	150	91	72-113
Gasoline	ug/L (ppb)	1,000	104	70-119

Date of Report: 06/30/15
Date Received: 06/18/15
Project: TOC_01-176, WORFDB8 F&BI 506377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 506376-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	68-125

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	98	100	70-122	2

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

506377 Drake

SAMPLE CHAIN OF CUSTODY

ME 06/18/15 v2

Page # 1 of 1

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 W 36th Ave STE 203
City, State, ZIP Lynnwood WA, 98036
Phone # 425-477-4994 Fax # -

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT/203700102
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE						Notes
MW84	01 A-D	6-15-15	1430	W	4		X	X				X						
MW89	02	6-15-15	1600	W	4		X	X				X						
EB-061515	03	6-15-15	1630	W	4		X	X				X						
MW65	04	6-16-15	1145	W	4		X	X				X						
													Samples received at 2 °C					

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Dana Hutchins	Dana Hutchins	STANTEC	6-18-15	1600
Received by:	[signature]	Nhan Phan	FEBI	6/18/15	1600
Relinquished by:					
Received by:					

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 29, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 19, 2015 from the TOC_01-176, WORFDB8 F&BI 506392 project. There are 7 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0629R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 19, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 506392 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
506392 -01	MW109

All quality control requirements were acceptable.

Date of Report: 06/29/15
Date Received: 06/19/15
Project: TOC_01-176, WORFDB8 F&BI 506392
Date Extracted: 06/19/15
Date Analyzed: 06/19/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW109 cf 506392-01	130	102
Method Blank 05-1295 MB	<100	101

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW109	Client:	Stantec
Date Received:	06/19/15	Project:	TOC_01-176, WORFDB8 F&BI 506392
Date Extracted:	06/19/15	Lab ID:	506392-01
Date Analyzed:	06/19/15	Data File:	061911.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	99	91	108
4-Bromofluorobenzene	104	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506392
Date Extracted:	06/19/15	Lab ID:	05-1100 mb
Date Analyzed:	06/19/15	Data File:	061907.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	105	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Date of Report: 06/29/15
Date Received: 06/19/15
Project: TOC_01-176, WORFDB8 F&BI 506392

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 506369-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	101	69-134

Date of Report: 06/29/15
Date Received: 06/19/15
Project: TOC_01-176, WORFDB8 F&BI 506392

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 506376-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	68-125
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	93	70-119
Benzene	ug/L (ppb)	50	<0.35	93	78-108
Toluene	ug/L (ppb)	50	<1	94	73-117
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	94	79-120
Ethylbenzene	ug/L (ppb)	50	<1	101	71-120
m,p-Xylene	ug/L (ppb)	100	<2	106	63-128
o-Xylene	ug/L (ppb)	50	<1	111	64-129

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	98	100	70-122	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	92	92	79-109	0
Benzene	ug/L (ppb)	50	92	94	81-108	2
Toluene	ug/L (ppb)	50	94	95	83-108	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	96	97	82-118	1
Ethylbenzene	ug/L (ppb)	50	100	102	83-111	2
m,p-Xylene	ug/L (ppb)	100	105	106	84-112	1
o-Xylene	ug/L (ppb)	50	111	112	81-117	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

506392

SAMPLE CHAIN OF CUSTODY

HE 06-19-15

VI

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave Ste 203

City, State, ZIP Lynnwood Wa, 98036

Phone # 425-477-4000 Fax # -

SAMPLERS (signature)

PROJECT NAME/NO. TOC MCT/2037002 PO#

REMARKS LET samples settle Before Testing.

TURNAROUND TIME
- ☐ Standard (2 Weeks)
- ☒ RUSH 24 hr TAT

Rush charges authorized by

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	EDC	EDB	Notes
MW 109	01ABG-19-15	6-19-15	1100	W	2		X	X	X			X	X	X	
															samples received at 5 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Robert A. Hudson	Hydrocon	6-19-15	1200
Received by:	James Bruya	F&B	6/19	1300
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

Appendix C

Laboratory Analytical Reports – Groundwater Samples, Third Quarter 2015

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 6, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 24, 2015 from the TOC_01-176, WORFDB8 F&BI 509439 project. There are 10 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1006R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 24, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 509439 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
509439 -01	MW51
509439 -02	MW49
509439 -03	EB-092315
509439 -04	MW48
509439 -05	MW55

All quality control requirements were acceptable.

Date of Report: 10/06/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509439
Date Extracted: 09/25/15
Date Analyzed: 09/25/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW51 509439-01	<1	<1	<1	<3	<100	91
MW49 509439-02	<1	<1	<1	<3	<100	92
EB-092315 509439-03	<1	<1	<1	<3	<100	89
MW48 509439-04	5.9	14	20	83	5,400	120
MW55 509439-05	<1	<1	<1	<3	<100	88
Method Blank 05-1931 MB	<1	<1	<1	<3	<100	88

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW48	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509439
Date Extracted:	09/28/15	Lab ID:	509439-04
Date Analyzed:	09/28/15	Data File:	509439-04.033
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	86	60	125

Analyte:	Concentration ug/L (ppb)
Lead	16.8

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509439
Date Extracted:	09/28/15	Lab ID:	I5-554 mb
Date Analyzed:	09/28/15	Data File:	I5-554 mb.019
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW48	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509439
Date Extracted:	09/25/15	Lab ID:	509439-04
Date Analyzed:	09/25/15	Data File:	509439-04.029
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	90	60	125

Analyte:	Concentration ug/L (ppb)
Lead	4.85

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509439
Date Extracted:	09/25/15	Lab ID:	I5-549 mb
Date Analyzed:	09/25/15	Data File:	I5-549 mb.025
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Date of Report: 10/06/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509439

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 509440-06 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	<1	95	95	50-150	0
Toluene	ug/L (ppb)	50	<1	95	95	50-150	0
Ethylbenzene	ug/L (ppb)	50	<1	95	94	50-150	1
Xylenes	ug/L (ppb)	150	<3	93	94	50-150	1
Gasoline	ug/L (ppb)	1,000	<100	98	95	53-117	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	93	65-118
Toluene	ug/L (ppb)	50	93	72-122
Ethylbenzene	ug/L (ppb)	50	93	73-126
Xylenes	ug/L (ppb)	150	92	74-118
Gasoline	ug/L (ppb)	1,000	100	69-134

Date of Report: 10/06/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509439

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 509473-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	98	99	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	99	83-115

Date of Report: 10/06/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509439

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 509439-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	4.85	98	98	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	100	83-115

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

ROW 509439

SAMPLE CHAIN OF CUSTODY

ME 09-24-15

AI2 / V2

Page # 1 of 1

Send Report To Rebekah Brooks
Company StanTec
Address 19101 W 36th Ave STE 203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax #

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT 203700102

PO#

REMARKS dissolved lead Bottles are labled (diss) and are field filtered.

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- [x] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Lead	Dissolved Lead					Notes
MW51	01A-C	9-23-15	1400	W	3		X	X										
MW49	02 T	9-23-15	1515	W	3		X	X										
EB-092315	03	9-23-15	1600	W	3		X	X										
MW48	04A-E	9-23-15	1140	W	5		X	X				X	X					
MW55	05A-C	9-24-15	1230	W	3		X	X										
																		Samples received at 4

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	StanTec	9-24-15	1500
Received by:	Elizabeth Wagner-Bruya	F?B	9/24/15	15:00
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

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Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 6, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 24, 2015 from the TOC_01-176, WORFDB8 F&BI 509440 project. There are 15 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1006R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 24, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 509440 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
509440 -01	MW32
509440 -02	MW27
509440 -03	MW56
509440 -04	MW59
509440 -05	MW58
509440 -06	MW54
509440 -07	MW66

All quality control requirements were acceptable.

Date of Report: 10/06/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509440
Date Extracted: 09/25/15
Date Analyzed: 09/25/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW32 509440-01	<1	<1	<1	4.4	140	95
MW27 509440-02	<1	1.6	<1	22	910	94
MW56 509440-03	<1	<1	<1	<3	<100	96
MW59 509440-04	<1	<1	<1	<3	<100	95
MW58 509440-05	<1	<1	<1	<3	<100	95
MW54 509440-06	<1	<1	<1	<3	<100	93
MW66 509440-07	<1	<1	<1	<3	<100	95
Method Blank 05-1931 MB	<1	<1	<1	<3	<100	88

Date of Report: 10/06/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509440
Date Extracted: 09/28/15
Date Analyzed: 09/28/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW66 509440-07	<50	<250	108
Method Blank 05-1994 MB	<50	<250	100

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW32	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509440
Date Extracted:	09/28/15	Lab ID:	509440-01
Date Analyzed:	09/28/15	Data File:	509440-01.034
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	87	60	125

Analyte:	Concentration ug/L (ppb)
Lead	120

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509440
Date Extracted:	09/28/15	Lab ID:	I5-554 mb
Date Analyzed:	09/28/15	Data File:	I5-554 mb.019
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW32	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509440
Date Extracted:	09/25/15	Lab ID:	509440-01
Date Analyzed:	09/25/15	Data File:	509440-01.032
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509440
Date Extracted:	09/25/15	Lab ID:	I5-549 mb
Date Analyzed:	09/25/15	Data File:	I5-549 mb.025
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW66	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509440
Date Extracted:	09/29/15	Lab ID:	509440-07 1/2
Date Analyzed:	09/30/15	Data File:	093014.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	31	160
Benzo(a)anthracene-d12	85	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 509440
Date Extracted:	09/29/15	Lab ID:	05-1997 mb
Date Analyzed:	09/30/15	Data File:	093008.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	88	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Date of Report: 10/06/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509440

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 509440-06 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	<1	95	95	50-150	0
Toluene	ug/L (ppb)	50	<1	95	95	50-150	0
Ethylbenzene	ug/L (ppb)	50	<1	95	94	50-150	1
Xylenes	ug/L (ppb)	150	<3	93	94	50-150	1
Gasoline	ug/L (ppb)	1,000	<100	98	95	53-117	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	93	65-118
Toluene	ug/L (ppb)	50	93	72-122
Ethylbenzene	ug/L (ppb)	50	93	73-126
Xylenes	ug/L (ppb)	150	92	74-118
Gasoline	ug/L (ppb)	1,000	100	69-134

Date of Report: 10/06/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509440

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	95	96	63-142	1

Date of Report: 10/06/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509440

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 509473-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	98	99	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	99	83-115

Date of Report: 10/06/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509440

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 509439-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	4.85	98	98	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	100	83-115

Date of Report: 10/06/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509440

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	87	91	67-116	4
Acenaphthylene	ug/L (ppb)	1	89	92	65-119	3
Acenaphthene	ug/L (ppb)	1	89	91	66-118	2
Fluorene	ug/L (ppb)	1	88	91	64-125	3
Phenanthrene	ug/L (ppb)	1	91	95	67-120	4
Anthracene	ug/L (ppb)	1	87	91	65-122	4
Fluoranthene	ug/L (ppb)	1	86	90	65-127	5
Pyrene	ug/L (ppb)	1	83	85	62-130	2
Benz(a)anthracene	ug/L (ppb)	1	91	93	60-118	2
Chrysene	ug/L (ppb)	1	96	98	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	1	79	81	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	83	86	62-125	4
Benzo(a)pyrene	ug/L (ppb)	1	75	78	58-127	4
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	78	83	36-142	6
Dibenz(a,h)anthracene	ug/L (ppb)	1	75	82	37-133	9
Benzo(g,h,i)perylene	ug/L (ppb)	1	78	84	34-135	7

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

TOC + Farmasonis

509440

SAMPLE CHAIN OF CUSTODY

ME 09-24-15

D03 / AT2 / V2

Page # 1 of 1

Send Report To ~~Rebekah~~ Brooks

Company STanTec

Address 19101 W 36th Ave, STE203

City, State, ZIP Lynnwood WA 98036

Phone # 425-977-4944 Fax #

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT 20370010 2

PO#

REMARKS dissolved lead Bottles are LaBled (Diss) and are Field Filtered

TURNAROUND TIME
- ☒ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Lead	Dissolved Lead	PAHs				Notes
																		* - per DH
MW32	01A-B	9-22-15	1130	W	5		X	X				X	X					9/28/15
MW27	02A-C	9-22-15	1300	W	3		X	X										mc
MW56	03	9-23-15	1145	W	3		X	X										
MW59	04	9-23-15	1300	W	3		X	X										
MW58	05	9-23-15	1410	W	3		X	X										
MW54	06A-I	9-23-15	1620	W	9		X	X										MS/MSD
MW66	07A-F	9-24-15	1150	W	6	X	X	X						*				
																		Samples received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STanTec	9-24-15	1500
Received by: Elizabeth D. Webster-Berg	Elizabeth Webster-Berg	FSBI	9/24/15	1500
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 13, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 24, 2015 from the TOC_01-176, WORFDB8 F&BI 509441 project. There are 27 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1013R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 24, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 509441 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
509441 -01	MW96
509441 -02	MW69
509441 -03	MW98
509441 -04	MW95
509441 -05	MW70
509441 -06	MW84
509441 -07	MW89
509441 -08	MW68
509441 -09	TB-092415-1
509441 -10	TB-092415-2

All quality control requirements were acceptable.

Date of Report: 10/13/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509441
Date Extracted: 09/25/15
Date Analyzed: 09/25/15, 09/26/15 and 09/28/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW96 509441-01	<1	<1	<1	<3	<100	95
MW69 509441-02	<1	1.3	<1	230	4,100	103
MW98 509441-03	<1	<1	<1	<3	<100	94
MW95 509441-04	<1	<1	<1	<3	<100	94
MW70 509441-05	<1	<1	<1	<3	<100	94
MW84 509441-06	<1	<1	<1	<3	<100	93
MW89 509441-07	<1	<1	<1	<3	<100	92
MW68 509441-08	<1	<1	<1	<3	<100	94
TB-092415-1 509441-09	<1	<1	<1	<3	<100	93
TB-092415-2 509441-10	<1	<1	<1	<3	<100	94
Method Blank 05-1975 MB	<1	<1	<1	<3	<100	93

Date of Report: 10/13/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509441
Date Extracted: 09/28/15
Date Analyzed: 09/28/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW69 509441-02	510 x	<250	108
MW70 509441-05	<50	<250	107
Method Blank 05-1994 MB	<50	<250	100

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW70	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/28/15	Lab ID:	509441-05
Date Analyzed:	09/28/15	Data File:	509441-05.035
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	88	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/28/15	Lab ID:	I5-554 mb
Date Analyzed:	09/28/15	Data File:	I5-554 mb.019
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW70	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/25/15	Lab ID:	509441-05
Date Analyzed:	09/25/15	Data File:	509441-05.033
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/25/15	Lab ID:	I5-549 mb
Date Analyzed:	09/25/15	Data File:	I5-549 mb.025
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Date of Report: 10/13/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509441
Date Extracted: 10/05/15
Date Analyzed: 10/05/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW70 509441-05	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW96	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/25/15	Lab ID:	509441-01
Date Analyzed:	09/25/15	Data File:	092511.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	85	117
Toluene-d8	102	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW69	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/25/15	Lab ID:	509441-02
Date Analyzed:	09/25/15	Data File:	092512.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	105	91	108
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW98	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/25/15	Lab ID:	509441-03
Date Analyzed:	09/25/15	Data File:	092513.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW95	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/25/15	Lab ID:	509441-04
Date Analyzed:	09/25/15	Data File:	092514.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW70	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/25/15	Lab ID:	509441-05
Date Analyzed:	09/25/15	Data File:	092515.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW84	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/25/15	Lab ID:	509441-06
Date Analyzed:	09/25/15	Data File:	092516.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	103	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW89	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/25/15	Lab ID:	509441-07
Date Analyzed:	09/25/15	Data File:	092517.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW68	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/25/15	Lab ID:	509441-08
Date Analyzed:	09/25/15	Data File:	092518.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/25/15	Lab ID:	05-1954 mb
Date Analyzed:	09/25/15	Data File:	092508.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	102	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW69	Client:	Stantec
Date Received:	09/24/15	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/29/15	Lab ID:	509441-02 1/2
Date Analyzed:	09/30/15	Data File:	093015.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	102	31	160
Benzo(a)anthracene-d12	84	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.79
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 509441
Date Extracted:	09/29/15	Lab ID:	05-1997 mb
Date Analyzed:	09/30/15	Data File:	093008.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	88	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Date of Report: 10/13/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509441

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING METHOD 8021B AND NWTPH-Gx

Laboratory Code: 509441-07 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	91	65-118
Toluene	ug/L (ppb)	50	91	72-122
Ethylbenzene	ug/L (ppb)	50	91	73-126
Xylenes	ug/L (ppb)	150	90	74-118
Gasoline	ug/L (ppb)	1,000	96	69-134

Date of Report: 10/13/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509441

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	95	96	63-142	1

Date of Report: 10/13/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509441

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 509473-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	98	99	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	99	83-115

Date of Report: 10/13/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509441

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 509439-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	4.85	98	98	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	100	83-115

Date of Report: 10/13/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509441

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	86	81	70-130	6

Date of Report: 10/13/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509441

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 509441-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	108	68-125
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	95	70-119

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	107	109	70-122	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	98	98	79-109	0

Date of Report: 10/13/15
Date Received: 09/24/15
Project: TOC_01-176, WORFDB8 F&BI 509441

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	87	91	67-116	4
Acenaphthylene	ug/L (ppb)	1	89	92	65-119	3
Acenaphthene	ug/L (ppb)	1	89	91	66-118	2
Fluorene	ug/L (ppb)	1	88	91	64-125	3
Phenanthrene	ug/L (ppb)	1	91	95	67-120	4
Anthracene	ug/L (ppb)	1	87	91	65-122	4
Fluoranthene	ug/L (ppb)	1	86	90	65-127	5
Pyrene	ug/L (ppb)	1	83	85	62-130	2
Benz(a)anthracene	ug/L (ppb)	1	91	93	60-118	2
Chrysene	ug/L (ppb)	1	96	98	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	1	79	81	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	83	86	62-125	4
Benzo(a)pyrene	ug/L (ppb)	1	75	78	58-127	4
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	78	83	36-142	6
Dibenz(a,h)anthracene	ug/L (ppb)	1	75	82	37-133	9
Benzo(g,h,i)perylene	ug/L (ppb)	1	78	84	34-135	7

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Drake
509441

SAMPLE CHAIN OF CUSTODY

ME 09-24-15

D03/A12/03

Page # 1 of 1

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 W36Th Ave, STE203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4944 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT 203700102
PO#
REMARKS dissolved lead Bottles are labled (diss) and are Field Filtered.

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	Total Lead	Dissolved Lead	PAHs	EDB, EDC		Notes
MW96	01A-D	9-22-15	1345	W	4		X	X				X						*-per DH
MW69	02A-F	9-22-15	1415	W	6	X	X	X				X			*			9/28/15
MW98	03A-D	9-22-15	1500	W	4		X	X				X						MG
MW95	04 T	9-23-15	0930	W	4		X	X				X						
MW70	05A-H	9-23-15	1000	W	8	X	X	X				X	X	X		*		
MW84	06A-D	9-24-15	1015	W	4		X	X				X						
MW89	07 T	9-24-15	1120	W	4		X	X				X						
MW68	08	9-24-15	1300	W	4		X	X				X						
TB-092415-1	09	—	—	W	1		X	X										
TB-092415-2	10	—	—	W	1		X	X										

Samples received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	9-24-15	1600
Received by: E.D. Webster-Bay	Elizabeth Webster-Bay	FSBI	9/24/15	1500
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 13, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 28, 2015 from the TOC_01-176, WORFDB8 F&BI 509496 project. There are 21 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1013R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 28, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 509496 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
509496 -01	MW73

The 8011 EDB detection could not be confirmed by method 8260C. The result may be due to a false positive.

All quality control requirements were acceptable.

Date of Report: 10/13/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509496
Date Extracted: 09/29/15
Date Analyzed: 09/29/15 and 10/01/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW73 509496-01 1/100	12,000	1,500	1,700	8,300	68,000	93
Method Blank 05-1978 MB	<1	<1	<1	<3	<100	88

Date of Report: 10/13/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509496
Date Extracted: 09/29/15
Date Analyzed: 09/30/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
MW73 509496-01	3,500 x	<250	83
Method Blank 05-1994 MB2	<50	<250	78

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW73	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509496
Date Extracted:	09/30/15	Lab ID:	509496-01
Date Analyzed:	10/05/15	Data File:	509496-01.026
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	82	60	125

Analyte:	Concentration ug/L (ppb)
Lead	2.89

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509496
Date Extracted:	09/30/15	Lab ID:	I5-561 mb
Date Analyzed:	10/05/15	Data File:	I5-561 mb.024
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	88	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW73	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509496
Date Extracted:	09/30/15	Lab ID:	509496-01
Date Analyzed:	09/30/15	Data File:	509496-01.060
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	81	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509496
Date Extracted:	09/30/15	Lab ID:	I5-560 mb
Date Analyzed:	09/30/15	Data File:	I5-560 mb.077
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Date of Report: 10/13/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509496
Date Extracted: 10/05/15
Date Analyzed: 10/05/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW73 509496-01	0.10
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW73	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509496
Date Extracted:	09/29/15	Lab ID:	509496-01
Date Analyzed:	09/29/15	Data File:	092909.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	91	57	121
Toluene-d8	107	63	127
4-Bromofluorobenzene	109	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	21
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 509496
Date Extracted:	09/29/15	Lab ID:	05-1958 mb
Date Analyzed:	09/29/15	Data File:	092908.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW73	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509496
Date Extracted:	09/29/15	Lab ID:	509496-01 1/2
Date Analyzed:	09/30/15	Data File:	093022.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	31	160
Benzo(a)anthracene-d12	86	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	190 ve
Acenaphthylene	<0.06
Acenaphthene	0.16
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW73	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509496
Date Extracted:	09/29/15	Lab ID:	509496-01 1/200
Date Analyzed:	10/01/15	Data File:	100104.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	102 d	31	160
Benzo(a)anthracene-d12	107 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	320
Acenaphthylene	<6
Acenaphthene	<6
Fluorene	<6
Phenanthrene	<6
Anthracene	<6
Fluoranthene	<6
Pyrene	<6
Benz(a)anthracene	<6
Chrysene	<6
Benzo(a)pyrene	<6
Benzo(b)fluoranthene	<6
Benzo(k)fluoranthene	<6
Indeno(1,2,3-cd)pyrene	<6
Dibenz(a,h)anthracene	<6
Benzo(g,h,i)perylene	<6

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 509496
Date Extracted:	09/29/15	Lab ID:	05-1997 mb
Date Analyzed:	09/30/15	Data File:	093008.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	88	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Date of Report: 10/13/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509496

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING METHOD 8021B AND NWTPH-Gx

Laboratory Code: 509484-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	90	93	65-118	3
Toluene	ug/L (ppb)	50	90	93	72-122	3
Ethylbenzene	ug/L (ppb)	50	90	93	73-126	3
Xylenes	ug/L (ppb)	150	90	92	74-118	2
Gasoline	ug/L (ppb)	1,000	97	93	69-134	4

Date of Report: 10/13/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509496

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	95	96	63-142	1

Date of Report: 10/13/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509496

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 509497-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	103	103	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	83-115

Date of Report: 10/13/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509496

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 509497-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	101	100	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	108	83-115

Date of Report: 10/13/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509496

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	86	81	70-130	6

Date of Report: 10/13/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509496

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 509497-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	99	74-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	101	69-133

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	105	102	64-147	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	101	99	73-132	2

Date of Report: 10/13/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509496

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	87	91	67-116	4
Acenaphthylene	ug/L (ppb)	1	89	92	65-119	3
Acenaphthene	ug/L (ppb)	1	89	91	66-118	2
Fluorene	ug/L (ppb)	1	88	91	64-125	3
Phenanthrene	ug/L (ppb)	1	91	95	67-120	4
Anthracene	ug/L (ppb)	1	87	91	65-122	4
Fluoranthene	ug/L (ppb)	1	86	90	65-127	5
Pyrene	ug/L (ppb)	1	83	85	62-130	2
Benz(a)anthracene	ug/L (ppb)	1	91	93	60-118	2
Chrysene	ug/L (ppb)	1	96	98	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	1	79	81	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	83	86	62-125	4
Benzo(a)pyrene	ug/L (ppb)	1	75	78	58-127	4
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	78	83	36-142	6
Dibenz(a,h)anthracene	ug/L (ppb)	1	75	82	37-133	9
Benzo(g,h,i)perylene	ug/L (ppb)	1	78	84	34-135	7

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

509496

SAMPLE CHAIN OF CUSTODY

ME 09/28/15 D03/U1/1AE2

Page # 1 of 1

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 W 36th AVE STE 203
City, State, ZIP Lynnwood WA, 98036
Phone # 425-977-4994 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. 203700b2
PO#
REMARKS Dissolved Pb Bottles are Labled (diss) and are Field Filtered.

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☑ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	Total Pb	Dissolved Pb	PAHs	EDC	EDB	Notes
MW23	01 A-H	9-25-15	1030	W	8	X	X	X				X	X	X	X	X	X	
										Samples received at 4 °C								

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	9-28-15	1600
Received by: Elizabeth Webber-Bruya	Elizabeth Webber-Bruya	FRIEDMAN & BRUYA	9/28/15	1600
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
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October 12, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 28, 2015 from the TOC_01-176, WORFDB8 F&BI 509497 project. There are 44 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1012R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 28, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 509497 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
509497 -01	MW103
509497 -02	EB-092515
509497 -03	MW108
509497 -04	WB-092515
509497 -05	MW107
509497 -06	MW106
509497 -07	MLT-06

All quality control requirements were acceptable.

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509497
Date Extracted: 09/29/15
Date Analyzed: 09/29/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW103 509497-01	<1	<1	<1	<3	<100	90
EB-092515 509497-02	<1	<1	<1	<3	<100	92
MW108 509497-03	<1	1.5	<1	<3	500	93
WB-092515 509497-04	<1	<1	<1	<3	<100	88
MW107 509497-05	<1	<1	<1	<3	<100	89
MW106 509497-06	<1	<1	<1	<3	<100	89
MLT-06 509497-07	<1	<1	<1	<3	<100	90
Method Blank 05-1978 MB	<1	<1	<1	<3	<100	88

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509497
Date Extracted: 09/29/15
Date Analyzed: 09/30/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
MW103 509497-01	<50	<250	90
EB-092515 509497-02	<50	<250	87
MW108 509497-03	740 x	<250	80
WB-092515 509497-04	<50	<250	93
MW107 509497-05 1/1.2	77 x	<300	88
MW106 509497-06	490 x	<250	86
MLT-06 509497-07 1/1.2	500 x	<300	85
Method Blank 05-1994 MB2	<50	<250	78

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW103	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-01
Date Analyzed:	10/05/15	Data File:	509497-01.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Lead	3.47

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-092515	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-02
Date Analyzed:	10/05/15	Data File:	509497-02.028
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW108	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-03
Date Analyzed:	10/05/15	Data File:	509497-03.033
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Lead	1.14

Analysis For Total Metals By EPA Method 200.8

Client ID:	WB-092515	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-04
Date Analyzed:	10/05/15	Data File:	509497-04.034
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW107	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-05
Date Analyzed:	10/05/15	Data File:	509497-05.035
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Lead	1.13

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW106	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-06
Date Analyzed:	10/05/15	Data File:	509497-06.036
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	88	60	125

Analyte:	Concentration ug/L (ppb)
Lead	20.1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MLT-06	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-07
Date Analyzed:	10/05/15	Data File:	509497-07.037
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	I5-561 mb
Date Analyzed:	10/05/15	Data File:	I5-561 mb.024
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	88	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW103	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-01
Date Analyzed:	09/30/15	Data File:	509497-01.080
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	83	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-092515	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-02
Date Analyzed:	09/30/15	Data File:	509497-02.066
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW108	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-03
Date Analyzed:	09/30/15	Data File:	509497-03.067
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	86	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	WB-092515	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-04
Date Analyzed:	09/30/15	Data File:	509497-04.068
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW107	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-05
Date Analyzed:	09/30/15	Data File:	509497-05.069
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	86	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW106	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-06
Date Analyzed:	09/30/15	Data File:	509497-06.070
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MLT-06	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	509497-07
Date Analyzed:	09/30/15	Data File:	509497-07.071
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	87	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/30/15	Lab ID:	I5-560 mb
Date Analyzed:	09/30/15	Data File:	I5-560 mb.077
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW103	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/28/15	Lab ID:	509497-01 1/2
Date Analyzed:	09/30/15	Data File:	093021.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	96	25	160
Benzo(a)anthracene-d12	88	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-092515	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/28/15	Lab ID:	509497-02 1/2
Date Analyzed:	09/30/15	Data File:	093022.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	25	160
Benzo(a)anthracene-d12	96	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW108	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/28/15	Lab ID:	509497-03 1/2
Date Analyzed:	09/30/15	Data File:	093023.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	96	25	160
Benzo(a)anthracene-d12	93	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.22
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	WB-092515	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/28/15	Lab ID:	509497-04 1/2
Date Analyzed:	09/30/15	Data File:	093024.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	25	160
Benzo(a)anthracene-d12	96	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW107	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/28/15	Lab ID:	509497-05 1/2
Date Analyzed:	09/30/15	Data File:	093025.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	25	160
Benzo(a)anthracene-d12	93	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW106	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/28/15	Lab ID:	509497-06 1/2
Date Analyzed:	09/30/15	Data File:	093026.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	101	25	160
Benzo(a)anthracene-d12	98	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	0.13
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-06	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/28/15	Lab ID:	509497-07 1/2
Date Analyzed:	09/30/15	Data File:	093027.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	101	25	160
Benzo(a)anthracene-d12	97	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	0.11
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/28/15	Lab ID:	05-1997 mb
Date Analyzed:	09/30/15	Data File:	093020.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	25	160
Benzo(a)anthracene-d12	97	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW103	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/29/15	Lab ID:	509497-01
Date Analyzed:	09/29/15	Data File:	092912.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-092515	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/29/15	Lab ID:	509497-02
Date Analyzed:	09/29/15	Data File:	092913.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	98	63	127
4-Bromofluorobenzene	97	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW108	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/29/15	Lab ID:	509497-03
Date Analyzed:	09/29/15	Data File:	092914.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	WB-092515	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/29/15	Lab ID:	509497-04
Date Analyzed:	09/29/15	Data File:	092915.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	104	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW107	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/29/15	Lab ID:	509497-05
Date Analyzed:	09/29/15	Data File:	092916.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW106	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/29/15	Lab ID:	509497-06
Date Analyzed:	09/29/15	Data File:	092917.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-06	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/29/15	Lab ID:	509497-07
Date Analyzed:	09/29/15	Data File:	092918.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 509497
Date Extracted:	09/29/15	Lab ID:	05-1958 mb
Date Analyzed:	09/29/15	Data File:	092908.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509497
Date Extracted: 10/05/15
Date Analyzed: 10/05/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW103 509497-01	<0.01
EB-092515 509497-02	<0.01
MW108 509497-03	<0.01
WB-092515 509497-04	<0.01
MW107 509497-05	<0.01
MW106 509497-06	<0.01
MLT-06 509497-07	<0.01
Method Blank	<0.01

EDB **1,2-Dibromoethane**

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509497

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 509484-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	90	93	65-118	3
Toluene	ug/L (ppb)	50	90	93	72-122	3
Ethylbenzene	ug/L (ppb)	50	90	93	73-126	3
Xylenes	ug/L (ppb)	150	90	92	74-118	2
Gasoline	ug/L (ppb)	1,000	97	93	69-134	4

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509497

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	95	96	63-142	1

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509497

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 509497-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	103	103	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	83-115

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509497

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 509497-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	101	100	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	108	83-115

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509497

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	89	91	70-130	2
Acenaphthylene	ug/L (ppb)	1	92	94	70-130	2
Acenaphthene	ug/L (ppb)	1	89	92	70-130	3
Fluorene	ug/L (ppb)	1	95	96	70-130	1
Phenanthrene	ug/L (ppb)	1	93	96	70-130	3
Anthracene	ug/L (ppb)	1	91	94	70-130	3
Fluoranthene	ug/L (ppb)	1	96	94	70-130	2
Pyrene	ug/L (ppb)	1	87	97	70-130	11
Benz(a)anthracene	ug/L (ppb)	1	92	93	70-130	1
Chrysene	ug/L (ppb)	1	98	99	70-130	1
Benzo(b)fluoranthene	ug/L (ppb)	1	82	86	59-130	5
Benzo(k)fluoranthene	ug/L (ppb)	1	87	92	65-120	6
Benzo(a)pyrene	ug/L (ppb)	1	85	85	60-125	0
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	85	79	42-135	7
Dibenz(a,h)anthracene	ug/L (ppb)	1	83	83	37-125	0
Benzo(g,h,i)perylene	ug/L (ppb)	1	88	87	45-123	1

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509497

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 509497-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	99	74-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	101	69-133

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	105	102	64-147	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	101	99	73-132	2

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509497

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	86	81	70-130	6

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Herman 509497

SAMPLE CHAIN OF CUSTODY

ME 09/28/15 VI/AIS/D03

Page 1 of 1

Send Report To Rebekah Brooks
Company StanTec
Address 19101 W 36th Ave, STE 203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4944 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. 20370102
PO#
REMARKS Dissolved Pb bottles are labled (diss) and field filtered

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	Total Pb	Dissolved Pb	PAHs	EDC	EDB	Notes
MW103	01 A-H	9-25-15	1250	W	8	X	X	X				X	X	X	X	X	X	
EB-092515	02 A-H	9-25-15	1500	W	8	X	X	X				X	X	X	X	X	X	
MW108	03 A-H	9-25-15	1525	W	8	X	X	X				X	X	X	X	X	X	
WB-092515	04 A-H	9-25-15	1600	W	8	X	X	X				X	X	X	X	X	X	
MW107	05 A-H	9-26-15	1100	W	8	X	X	X				X	X	X	X	X	X	
MW106	06 A-H	9-26-15	1200	W	8	X	X	X				X	X	X	X	X	X	
MLT-06	07 A-H	9-26-15	1230	W	8	X	X	X				X	X	X	X	X	X	

Samples received at 4 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	StanTec	9-28-15	1600
Received by:	Elizabeth Webber Bruya	F&B	9/28/15	1600
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 12, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 28, 2015 from the TOC_01-176, WORFDB8 F&BI 509498 project. There are 20 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1012R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 28, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 509498 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
509498 -01	MW53
509498 -02	MW63
509498 -03	MLT-05
509498 -04	MW60
509498 -05	EB-092615
509498 -06	TB-092815-1
509498 -07	TB-092815-2

All quality control requirements were acceptable.

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509498
Date Extracted: 09/29/15
Date Analyzed: 09/29/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW53 509498-01	<1	<1	<1	<3	<100	88
MW63 509498-02	<1	<1	<1	<3	<100	88
MLT-05 509498-03	<1	<1	<1	<3	<100	89
MW60 509498-04	<1	<1	<1	<3	<100	89
EB-092615 509498-05	<1	<1	<1	<3	<100	89
TB-092815-1 509498-06	<1	<1	<1	<3	<100	91
TB-092815-2 509498-07	<1	<1	<1	<3	<100	88
Method Blank 05-1978 MB	<1	<1	<1	<3	<100	88

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509498
Date Extracted: 09/29/15
Date Analyzed: 09/30/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
EB-092615 509498-05 1/1.2	<60	<300	91
Method Blank 05-1998 MB	<50	<250	91

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-092615	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509498
Date Extracted:	09/30/15	Lab ID:	509498-05
Date Analyzed:	10/05/15	Data File:	509498-05.038
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509498
Date Extracted:	09/30/15	Lab ID:	I5-561 mb
Date Analyzed:	10/05/15	Data File:	I5-561 mb.024
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	88	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-092615	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509498
Date Extracted:	09/30/15	Lab ID:	509498-05
Date Analyzed:	09/30/15	Data File:	509498-05.072
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509498
Date Extracted:	09/30/15	Lab ID:	I5-560 mb
Date Analyzed:	09/30/15	Data File:	I5-560 mb.077
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-092615	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509498
Date Extracted:	09/29/15	Lab ID:	509498-05 1/2
Date Analyzed:	09/30/15	Data File:	093030.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	115	25	160
Benzo(a)anthracene-d12	97	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 509498
Date Extracted:	09/28/15	Lab ID:	05-1997 mb
Date Analyzed:	09/30/15	Data File:	093020.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	25	160
Benzo(a)anthracene-d12	97	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-092615	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509498
Date Extracted:	09/29/15	Lab ID:	509498-05
Date Analyzed:	09/29/15	Data File:	092919.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 509498
Date Extracted:	09/29/15	Lab ID:	05-1958 mb
Date Analyzed:	09/29/15	Data File:	092908.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509498
Date Extracted: 10/05/15
Date Analyzed: 10/05/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
EB-092615 509498-05	<0.01
Method Blank	<0.01

EDB **1,2-Dibromoethane**

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509498

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 509484-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	90	93	65-118	3
Toluene	ug/L (ppb)	50	90	93	72-122	3
Ethylbenzene	ug/L (ppb)	50	90	93	73-126	3
Xylenes	ug/L (ppb)	150	90	92	74-118	2
Gasoline	ug/L (ppb)	1,000	97	93	69-134	4

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509498

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	104	94	63-142	10

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509498

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 509497-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	103	103	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	83-115

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509498

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 509497-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	101	100	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	108	83-115

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509498

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	89	91	70-130	2
Acenaphthylene	ug/L (ppb)	1	92	94	70-130	2
Acenaphthene	ug/L (ppb)	1	89	92	70-130	3
Fluorene	ug/L (ppb)	1	95	96	70-130	1
Phenanthrene	ug/L (ppb)	1	93	96	70-130	3
Anthracene	ug/L (ppb)	1	91	94	70-130	3
Fluoranthene	ug/L (ppb)	1	96	94	70-130	2
Pyrene	ug/L (ppb)	1	87	97	70-130	11
Benz(a)anthracene	ug/L (ppb)	1	92	93	70-130	1
Chrysene	ug/L (ppb)	1	98	99	70-130	1
Benzo(b)fluoranthene	ug/L (ppb)	1	82	86	59-130	5
Benzo(k)fluoranthene	ug/L (ppb)	1	87	92	65-120	6
Benzo(a)pyrene	ug/L (ppb)	1	85	85	60-125	0
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	85	79	42-135	7
Dibenz(a,h)anthracene	ug/L (ppb)	1	83	83	37-125	0
Benzo(g,h,i)perylene	ug/L (ppb)	1	88	87	45-123	1

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509498

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 509497-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	99	74-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	101	69-133

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	105	102	64-147	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	101	99	73-132	2

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509498

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	86	81	70-130	6

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

ROW
509498

SAMPLE CHAIN OF CUSTODY

MG 09/28/15 V1/AI2/003

Page 1 of 1

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 W 36TH AVE, STE 203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. 203700102
PO#
REMARKS Dissolved Pb BOTTLES are LABled (diss) and Field Filtered

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	Total Pb	Dissolved Pb	PAHs	EDC	EDB	Notes
MW53	01A-C	9-25-15	1015	W	3		X	X				X						
MW63	02	9-25-15	1115	W	3		X	X										
MLT-05	03	9-25-15	1130	W	3		X	X										
MW60	04	9-25-15	1400	W	3		X	X										
EB-092615	05A-H	9-26-15	1430	W	8	X	X	X				X	X	X	X	X	X	
TB-092815-1	06	—	—	W	1		X	X										
TB-092815-2	07	—	—	W	1		X	X										

Samples received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	9-28-15	1600
Received by:	Elizabeth Weston-Bruya	FBI	9/28/15	600
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 12, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 28, 2015 from the TOC_01-176, WORFDB8 F&BI 509499 project. There are 31 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1012R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 28, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 509499 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
509499 -01	MW67
509499 -02	MW85
509499 -03	EB-092415
509499 -04	MW65
509499 -05	MW86
509499 -06	MLT-03
509499 -07	MW77
509499 -08	EB-092815

All quality control requirements were acceptable.

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509499
Date Extracted: 09/30/15
Date Analyzed: 09/30/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW67 509499-01	<1	<1	<1	<3	<100	91
MW85 509499-02	<1	<1	<1	<3	<100	90
EB-092415 509499-03	<1	<1	<1	<3	<100	90
MW65 509499-04	<1	<1	<1	<3	<100	90
MW86 509499-05	<1	<1	<1	<3	<100	90
MLT-03 509499-06	<1	<1	<1	<3	<100	87
MW77 509499-07	<1	<1	<1	<3	<100	90
EB-092815 509499-08	<1	<1	<1	<3	<100	92
Method Blank 05-1980 MB	<1	<1	<1	<3	<100	89

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509499
Date Extracted: 09/29/15
Date Analyzed: 09/30/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
MW86 509499-05 1/1.2	<60	<300	90
MLT-03 509499-06	<50	<250	86
Method Blank 05-1994 MB2	<50	<250	78

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW86	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/30/15	Lab ID:	509499-05
Date Analyzed:	10/05/15	Data File:	509499-05.039
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	90	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MLT-03	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/30/15	Lab ID:	509499-06
Date Analyzed:	10/05/15	Data File:	509499-06.040
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/30/15	Lab ID:	I5-561 mb
Date Analyzed:	10/05/15	Data File:	I5-561 mb.024
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	88	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW86	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/30/15	Lab ID:	509499-05
Date Analyzed:	09/30/15	Data File:	509499-05.073
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	81	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MLT-03	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/30/15	Lab ID:	509499-06
Date Analyzed:	09/30/15	Data File:	509499-06.074
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	78	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/30/15	Lab ID:	I5-560 mb
Date Analyzed:	09/30/15	Data File:	I5-560 mb.077
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW86	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/29/15	Lab ID:	509499-05 1/2
Date Analyzed:	09/30/15	Data File:	093028.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	110	25	160
Benzo(a)anthracene-d12	91	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-03	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/29/15	Lab ID:	509499-06 1/2
Date Analyzed:	09/30/15	Data File:	093029.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	25	160
Benzo(a)anthracene-d12	95	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/28/15	Lab ID:	05-1997 mb
Date Analyzed:	09/30/15	Data File:	093020.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	25	160
Benzo(a)anthracene-d12	97	36	162

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW67	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/29/15	Lab ID:	509499-01
Date Analyzed:	09/29/15	Data File:	092920.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW85	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/29/15	Lab ID:	509499-02
Date Analyzed:	09/29/15	Data File:	092921.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-092415	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/29/15	Lab ID:	509499-03
Date Analyzed:	09/29/15	Data File:	092922.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW65	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/29/15	Lab ID:	509499-04
Date Analyzed:	09/29/15	Data File:	092923.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW86	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/29/15	Lab ID:	509499-05
Date Analyzed:	09/29/15	Data File:	092924.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-03	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/29/15	Lab ID:	509499-06
Date Analyzed:	09/29/15	Data File:	092925.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	96	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW77	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/29/15	Lab ID:	509499-07
Date Analyzed:	09/29/15	Data File:	092926.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-092815	Client:	Stantec
Date Received:	09/28/15	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/29/15	Lab ID:	509499-08
Date Analyzed:	09/29/15	Data File:	092927.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 509499
Date Extracted:	09/29/15	Lab ID:	05-1958 mb
Date Analyzed:	09/29/15	Data File:	092908.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509499
Date Extracted: 10/05/15
Date Analyzed: 10/05/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW86 509499-05	<0.01
MLT-03 509499-06	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509499

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 509499-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	89	65-118
Toluene	ug/L (ppb)	50	88	72-122
Ethylbenzene	ug/L (ppb)	50	88	73-126
Xylenes	ug/L (ppb)	150	87	74-118
Gasoline	ug/L (ppb)	1,000	94	69-134

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509499

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	95	96	63-142	1

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509499

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 509497-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	103	103	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	83-115

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509499

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 509497-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	101	100	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	108	83-115

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509499

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	89	91	70-130	2
Acenaphthylene	ug/L (ppb)	1	92	94	70-130	2
Acenaphthene	ug/L (ppb)	1	89	92	70-130	3
Fluorene	ug/L (ppb)	1	95	96	70-130	1
Phenanthrene	ug/L (ppb)	1	93	96	70-130	3
Anthracene	ug/L (ppb)	1	91	94	70-130	3
Fluoranthene	ug/L (ppb)	1	96	94	70-130	2
Pyrene	ug/L (ppb)	1	87	97	70-130	11
Benz(a)anthracene	ug/L (ppb)	1	92	93	70-130	1
Chrysene	ug/L (ppb)	1	98	99	70-130	1
Benzo(b)fluoranthene	ug/L (ppb)	1	82	86	59-130	5
Benzo(k)fluoranthene	ug/L (ppb)	1	87	92	65-120	6
Benzo(a)pyrene	ug/L (ppb)	1	85	85	60-125	0
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	85	79	42-135	7
Dibenz(a,h)anthracene	ug/L (ppb)	1	83	83	37-125	0
Benzo(g,h,i)perylene	ug/L (ppb)	1	88	87	45-123	1

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509499

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 509497-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	99	74-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	101	69-133

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	105	102	64-147	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	101	99	73-132	2

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509499

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 509497-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	99	74-127

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	105	102	64-147	3

Date of Report: 10/12/15
Date Received: 09/28/15
Project: TOC_01-176, WORFDB8 F&BI 509499

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	86	81	70-130	6

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Drake
509499

SAMPLE CHAIN OF CUSTODY

ME 09/28/15 [redacted] #1 of 1 DO3

Send Report To Rebekah Brooks
Company STANTEC
Address 1601 W36th Ave, STE203
City, State, ZIP Lynnwood WA 98036
Phone #425-977-4904 Fax #

SAMPLERS (signature): Dana Hutchins
PROJECT NAME/NO.: 203700102
PO#:
REMARKS: Dissolved Pb BOTTLES are Labled (diss) and Field Filtered

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	Total Pb	Dissolved Pb	PAHs	EDC	EDB	Notes
MW67	01 A-D	9-24-15	1500	W	4		X	X				X						
MW85	02 A-D	9-24-15	1515	W	4		X	X				X						
EB-092415	03 A-D	9-24-15	1600	W	4		X	X				X						
MW65	04 A-D	9-25-15	1220	W	4		X	X				X						
MW86	05 A-H	9-25-15	1330	W	8	X	X	X				X	X	X	X	X	X	
MLT-03	06 A-H	9-25-15	1400	W	8	X	X	X				X	X	X	X	X	X	
MW77	07 A-D	9-28-15	1415	W	4		X	X				X						
EB-092815	08 A-D	9-28-15	1430	W	4		X	X				X						
										Samples received at		4	°C					

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	9-28-15	1600
Received by: [signature]	Elizabeth Webber-Bruya	FBI	9/28/15	1600
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

Appendix D

Laboratory Analytical Reports – Groundwater Samples, Fourth Quarter 2015

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

December 18, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 11, 2015 from the TOC_01-176, WORFDB8 F&BI 512217 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1218R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 11, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 512217 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
512217 -01	MW49
512217 -02	EB-120915
512217 -03	MW55
512217 -04	MW60
512217 -05	MW63
512217 -06	MW51

All quality control requirements were acceptable.

Date of Report: 12/18/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512217
Date Extracted: 12/14/15
Date Analyzed: 12/14/15 and 12/15/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW49 512217-01	<1	<1	<1	<3	<100	87
EB-120915 512217-02	<1	<1	<1	<3	<100	91
MW55 512217-03	<1	<1	<1	<3	<100	92
MW60 512217-04	<1	<1	<1	<3	<100	90
MW63 512217-05	<1	<1	<1	<3	<100	81
MW51 512217-06	<1	<1	<1	<3	<100	87
Method Blank 05-2493 MB	<1	<1	<1	<3	<100	87

Date of Report: 12/18/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512217

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING METHOD 8021B AND NWTPH-Gx

Laboratory Code: 512217-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	1.2 c	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	96	65-118
Toluene	ug/L (ppb)	50	93	72-122
Ethylbenzene	ug/L (ppb)	50	91	73-126
Xylenes	ug/L (ppb)	150	91	74-118
Gasoline	ug/L (ppb)	1,000	91	69-134

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

512217 ROW

SAMPLE CHAIN OF CUSTODY

ME 12/11/15 V5

Page # 1 of 1

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 N 36th Ave STE 203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. 203700102
PO# ✓
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
MW49	01MC	12-9-15	1410	W	3		X	X										
EB-120915	02	12-9-15	1500	W	3		X	X										
MW55	03	12-10-15	1400	W	3		X	X										
MW60	04	12-10-15	1500	W	3		X	X										
MW63	05	12-11-15	1015	W	3		X	X										
MW51	06	12-11-15	1026	W	3		X	X										
[redacted]																		
																		Samples received at 2 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	12-11-15	1400
Received by:	Nham Pham	FCBT	12-11-15	1400
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

December 22, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 11, 2015 from the TOC_01-176, WORFDB8 F&BI 512218 project. There are 35 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1222R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 11, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 512218 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
512218 -01	MW101
512218 -02	MW84
512218 -03	MW89
512218 -04	MW70
512218 -05	MW98
512218 -06	MW69
512218 -07	MW96
512218 -08	MW95
512218 -09	MW65
512218 -10	MW85

All quality control requirements were acceptable.

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512218
Date Extracted: 12/14/15
Date Analyzed: 12/14/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW101 512218-01	<1	<1	<1	<3	<100	89
MW84 512218-02	<1	<1	<1	<3	<100	89
MW89 512218-03	<1	<1	<1	<3	<100	86
MW70 512218-04	<1	<1	<1	<3	<100	88
MW98 512218-05	<1	<1	1.1	4.4	110	88
MW69 512218-06	<1	1.4	<1	120	2,700	96
MW96 512218-07	<1	1.1	3.5	26	130	87
MW95 512218-08	<1	<1	<1	<3	<100	88
MW65 512218-09	<1	<1	<1	<3	<100	88

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512218
Date Extracted: 12/14/15
Date Analyzed: 12/14/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW85 512218-10	<1	<1	<1	<3	<100	88
Method Blank 05-2493 MB	<1	<1	<1	<3	<100	87

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512218
Date Extracted: 12/14/15
Date Analyzed: 12/14/15 and 12/15/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
MW101 512218-01	610 x	<250	79
MW84 512218-02 1/1.4	<70	<350	79
MW89 512218-03 1/1.2	<60	<300	79
MW70 512218-04 1/1.2	250 x	<300	81
MW69 512218-06	530 x	<250	89
MW85 512218-10 1/2	<100	<500	84
Method Blank 05-2541 MB	<50	<250	80

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW70	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/15/15	Lab ID:	512218-04
Date Analyzed:	12/15/15	Data File:	512218-04.040
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/15/15	Lab ID:	I5-719 mb
Date Analyzed:	12/15/15	Data File:	I5-719 mb.038
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW70	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/15/15	Lab ID:	512218-04
Date Analyzed:	12/15/15	Data File:	512218-04.029
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/15/15	Lab ID:	I5-720 mb
Date Analyzed:	12/15/15	Data File:	I5-720 mb.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW101	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/11/15	Lab ID:	512218-01
Date Analyzed:	12/11/15	Data File:	121030.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	103	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW84	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/11/15	Lab ID:	512218-02
Date Analyzed:	12/11/15	Data File:	121031.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW89	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/11/15	Lab ID:	512218-03
Date Analyzed:	12/11/15	Data File:	121032.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	102	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW70	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/11/15	Lab ID:	512218-04
Date Analyzed:	12/11/15	Data File:	121033.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dibromoethane (EDB)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW98	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/11/15	Lab ID:	512218-05
Date Analyzed:	12/11/15	Data File:	121034.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW69	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/11/15	Lab ID:	512218-06
Date Analyzed:	12/11/15	Data File:	121035.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	103	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW96	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/11/15	Lab ID:	512218-07
Date Analyzed:	12/11/15	Data File:	121036.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	102	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW95	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/11/15	Lab ID:	512218-08
Date Analyzed:	12/11/15	Data File:	121037.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW65	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/11/15	Lab ID:	512218-09
Date Analyzed:	12/11/15	Data File:	121038.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW85	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/11/15	Lab ID:	512218-10
Date Analyzed:	12/11/15	Data File:	121039.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/11/15	Lab ID:	05-2509 mb
Date Analyzed:	12/11/15	Data File:	121007.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dibromoethane (EDB)	<1

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512218
Date Extracted: 12/17/15
Date Analyzed: 12/17/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW70 512218-04	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW101	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/14/15	Lab ID:	512218-01 1/2
Date Analyzed:	12/15/15	Data File:	121517.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	94	31	160
Benzo(a)anthracene-d12	111	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW84	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/14/15	Lab ID:	512218-02 1/2
Date Analyzed:	12/15/15	Data File:	121518.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	31	160
Benzo(a)anthracene-d12	97	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW89	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/14/15	Lab ID:	512218-03 1/2
Date Analyzed:	12/15/15	Data File:	121519.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	101	31	160
Benzo(a)anthracene-d12	100	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW70	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/14/15	Lab ID:	512218-04 1/2
Date Analyzed:	12/15/15	Data File:	121520.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	31	160
Benzo(a)anthracene-d12	97	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW69	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/14/15	Lab ID:	512218-06 1/2
Date Analyzed:	12/15/15	Data File:	121521.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	31	160
Benzo(a)anthracene-d12	97	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	11
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW85	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/14/15	Lab ID:	512218-10 1/2
Date Analyzed:	12/16/15	Data File:	121606.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	31	160
Benzo(a)anthracene-d12	96	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 512218
Date Extracted:	12/14/15	Lab ID:	05-2540 mb
Date Analyzed:	12/15/15	Data File:	121507.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	31	160
Benzo(a)anthracene-d12	103	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512218

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 512217-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	1.2	1.2	2
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	96	65-118
Toluene	ug/L (ppb)	50	93	72-122
Ethylbenzene	ug/L (ppb)	50	91	73-126
Xylenes	ug/L (ppb)	150	91	74-118
Gasoline	ug/L (ppb)	1,000	91	69-134

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512218

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	88	88	61-133	0

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512218

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 512218-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	88	94	70-130	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	101	85-115

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512218

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 512218-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	93	93	70-130	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	108	85-115

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512218

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 512194-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	101	68-125
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	110	79-120

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	105	104	70-122	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	113	108	82-118	5

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512218

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	104	107	70-130	3

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512218

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	89	91	67-116	2
Acenaphthylene	ug/L (ppb)	1	90	92	65-119	2
Acenaphthene	ug/L (ppb)	1	90	93	66-118	3
Fluorene	ug/L (ppb)	1	92	94	64-125	2
Phenanthrene	ug/L (ppb)	1	90	92	67-120	2
Anthracene	ug/L (ppb)	1	93	94	65-122	1
Fluoranthene	ug/L (ppb)	1	95	96	65-127	1
Pyrene	ug/L (ppb)	1	85	94	62-130	10
Benz(a)anthracene	ug/L (ppb)	1	93	94	60-118	1
Chrysene	ug/L (ppb)	1	93	96	66-125	3
Benzo(b)fluoranthene	ug/L (ppb)	1	108	112	55-135	4
Benzo(k)fluoranthene	ug/L (ppb)	1	104	107	62-125	3
Benzo(a)pyrene	ug/L (ppb)	1	107	109	58-127	2
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	109	105	36-142	4
Dibenz(a,h)anthracene	ug/L (ppb)	1	100	96	37-133	4
Benzo(g,h,i)perylene	ug/L (ppb)	1	98	99	34-135	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Drake
512218

SAMPLE CHAIN OF CUSTODY

ME 12/11/15 VS/DD3/AE3

Page # 1 of 1

Send Report To Rebekah Brooks
Company StanTec
Address 19101 NW 36th Ave, STE 203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax # —

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. 203700102
PO#
REMARKS diss Pb samples are labled and field filtered.

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☑ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	PAHs	Total Pb	Diss Pb	EDC	EDB	Notes
MW101	01	12-10-15	1145	W	6	X	X	X				X	X					
MW84	02	12-10-15	1145	W	6	X	X	X				X	X					
MW89	03	12-10-15	1300	W	6	X	X	X				X	X					
MW70	04	12-10-15	1320	W	8	X	X	X				X	X	X	X	X	X	
MW98	05	12-10-15	1416	W	4		X	X				X						
MW69	06	12-10-15	1420	W	6	X	X	X				X	X					
MW96	07	12-10-15	1440	W	4		X	X				X						
MW95	08	12-10-15	1454	W	4		X	X				X						
MW65	09	12-11-15	1120	W	4		X	X				X						
MW85	10	12-11-15	1230	W	6	X	X	X				X	X					

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Dana Hutchins	Dana Hutchins	STANTEC	12-11-15	1400
Received by:	Nhan Pham	Nhan Pham	FEBI	12/11/15	1400
Relinquished by:					
Received by:			Samples received at 2 °C		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

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Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

December 22, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 11, 2015 from the TOC_01-176, WORFDB8 F&BI 512219 project. There are 14 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1222R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 11, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 512219 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
512219 -01	MW59
512219 -02	MW56
512219 -03	MW58
512219 -04	MW09
512219 -05	MLT-01
512219 -06	EB-121015
512219 -07	MW66
512219 -08	TB-121115-1
512219 -09	TB-121115-2

All quality control requirements were acceptable.

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512219
Date Extracted: 12/15/15
Date Analyzed: 12/15/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW59 512219-01	<1	<1	<1	<3	<100	80
MW56 512219-02	<1	<1	<1	<3	<100	90
MW58 512219-03	<1	<1	<1	<3	<100	88
MW09 512219-04	<1	<1	<1	<3	<100	81
MLT-01 512219-05	<1	<1	<1	<3	<100	85
EB-121015 512219-06	<1	<1	<1	<3	<100	88
MW66 512219-07	<1	<1	<1	<3	<100	88
TB-121115-1 512219-08	<1	<1	<1	<3	<100	90
TB-121115-2 512219-09	<1	<1	<1	<3	<100	90
Method Blank 05-2529 MB	<1	<1	<1	<3	<100	87

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512219
Date Extracted: 12/14/15
Date Analyzed: 12/14/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
EB-121015 512219-06	<50	<250	84
MW66 512219-07	<50	<250	83
Method Blank 05-2541 MB	<50	<250	80

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-121015	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512219
Date Extracted:	12/15/15	Lab ID:	512219-06
Date Analyzed:	12/15/15	Data File:	121508.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW66	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512219
Date Extracted:	12/15/15	Lab ID:	512219-07
Date Analyzed:	12/15/15	Data File:	121509.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	104	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 512219
Date Extracted:	12/15/15	Lab ID:	05-2512 mb
Date Analyzed:	12/15/15	Data File:	121507.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-121015	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512219
Date Extracted:	12/14/15	Lab ID:	512219-06 1/2
Date Analyzed:	12/16/15	Data File:	121607.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	98	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW66	Client:	Stantec
Date Received:	12/11/15	Project:	TOC_01-176, WORFDB8 F&BI 512219
Date Extracted:	12/14/15	Lab ID:	512219-07 1/2
Date Analyzed:	12/16/15	Data File:	121608.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	95	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 512219
Date Extracted:	12/14/15	Lab ID:	05-2540 mb
Date Analyzed:	12/15/15	Data File:	121507.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	31	160
Benzo(a)anthracene-d12	103	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512219

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 512219-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	95	65-118
Toluene	ug/L (ppb)	50	93	72-122
Ethylbenzene	ug/L (ppb)	50	91	73-126
Xylenes	ug/L (ppb)	150	91	74-118
Gasoline	ug/L (ppb)	1,000	91	69-134

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512219

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	88	88	61-133	0

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512219

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 512247-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	68-125

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	101	99	70-122	2

Date of Report: 12/22/15
Date Received: 12/11/15
Project: TOC_01-176, WORFDB8 F&BI 512219

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	89	91	67-116	2
Acenaphthylene	ug/L (ppb)	1	90	92	65-119	2
Acenaphthene	ug/L (ppb)	1	90	93	66-118	3
Fluorene	ug/L (ppb)	1	92	94	64-125	2
Phenanthrene	ug/L (ppb)	1	90	92	67-120	2
Anthracene	ug/L (ppb)	1	93	94	65-122	1
Fluoranthene	ug/L (ppb)	1	95	96	65-127	1
Pyrene	ug/L (ppb)	1	85	94	62-130	10
Benz(a)anthracene	ug/L (ppb)	1	93	94	60-118	1
Chrysene	ug/L (ppb)	1	93	96	66-125	3
Benzo(b)fluoranthene	ug/L (ppb)	1	108	112	55-135	4
Benzo(k)fluoranthene	ug/L (ppb)	1	104	107	62-125	3
Benzo(a)pyrene	ug/L (ppb)	1	107	109	58-127	2
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	109	105	36-142	4
Dibenz(a,h)anthracene	ug/L (ppb)	1	100	96	37-133	4
Benzo(g,h,i)perylene	ug/L (ppb)	1	98	99	34-135	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

TOC
512219

SAMPLE CHAIN OF CUSTODY

ME 12/11/15 DO2/15

Page # 1 of 1

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 W 36th Ave, STE 203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax # -

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. 203700102
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	PAHs					Notes
MW59	01	12-9-15	1025	W	3		X	X										
MW56	02	12-9-15	1140	W	3		X	X										
MW58	03	12-9-15	1240	W	3		X	X										
MW09	04	12-10-15	1020	W	3		X	X										
MLT-01	05	12-10-15	1040	W	3		X	X										
EB-121015	06 A-F	12-10-15	1530	W	6	X	X	X				X	X					
MW66	07 A-F	12-11-15	1115	W	6	X	X	X				X	X					
TB-121115-1	08	—	—	W	1		X	X										
TB-121115-2	09	—	—	W	1		X	X										

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	Stantec	12-11-15	1400
Received by:	Nhan Pham	FEBT	12/11/15	1400
Relinquished by:				
Received by:				

Samples received at 2 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

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December 22, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 15, 2015 from the TOC_01-176, WORFDB8 F&BI 512255 project. There are 21 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1222R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 15, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 512255 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
512255 -01	MW73

All quality control requirements were acceptable.

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512255
Date Extracted: 12/16/15
Date Analyzed: 12/16/15 and 12/17/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW73 512255-01 1/100	11,000	590	1,500	6,100	55,000	88
Method Blank 05-2533 MB2	<1	<1	<1	<3	<100	87

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512255
Date Extracted: 12/16/15
Date Analyzed: 12/16/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW73 512255-01	2,300 x	280 x	78
Method Blank 05-2553 MB	<50	<250	78

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW73	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512255
Date Extracted:	12/17/15	Lab ID:	512255-01
Date Analyzed:	12/18/15	Data File:	512255-01.042
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Lead	5.30

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 512255
Date Extracted:	12/17/15	Lab ID:	I5-726 mb
Date Analyzed:	12/17/15	Data File:	I5-726 mb.069
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW73	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512255
Date Extracted:	12/17/15	Lab ID:	512255-01
Date Analyzed:	12/17/15	Data File:	512255-01.020
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	80	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 512255
Date Extracted:	12/17/15	Lab ID:	I5-725 mb
Date Analyzed:	12/17/15	Data File:	I5-725 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW73	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512255
Date Extracted:	12/16/15	Lab ID:	512255-01
Date Analyzed:	12/16/15	Data File:	121613.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	105	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	150
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 512255
Date Extracted:	12/16/15	Lab ID:	05-2514 mb
Date Analyzed:	12/16/15	Data File:	121608.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512255
Date Extracted: 12/17/15
Date Analyzed: 12/17/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW73 512255-01	0.11
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW73	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512255
Date Extracted:	12/16/15	Lab ID:	512255-01 1/2
Date Analyzed:	12/17/15	Data File:	121724.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	31	160
Benzo(a)anthracene-d12	113	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	180 ve
Acenaphthylene	<0.06
Acenaphthene	0.12
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW73	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512255
Date Extracted:	12/16/15	Lab ID:	512255-01 1/200
Date Analyzed:	12/18/15	Data File:	121818.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	36 d	31	160
Benzo(a)anthracene-d12	126 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	320
Acenaphthylene	<6
Acenaphthene	<6
Fluorene	<6
Phenanthrene	<6
Anthracene	<6
Fluoranthene	<6
Pyrene	<6
Benz(a)anthracene	<6
Chrysene	<6
Benzo(a)pyrene	<6
Benzo(b)fluoranthene	<6
Benzo(k)fluoranthene	<6
Indeno(1,2,3-cd)pyrene	<6
Dibenz(a,h)anthracene	<6
Benzo(g,h,i)perylene	<6

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 512255
Date Extracted:	12/16/15	Lab ID:	05-2552 mb
Date Analyzed:	12/17/15	Data File:	121707.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	31	160
Benzo(a)anthracene-d12	94	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512255

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING METHOD 8021B AND NWTPH-Gx

Laboratory Code: 512246-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	48	48	1
Toluene	ug/L (ppb)	1.4	1.4	1
Ethylbenzene	ug/L (ppb)	360	360	0
Xylenes	ug/L (ppb)	3.2	3.2	0
Gasoline	ug/L (ppb)	1,800	1,800	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	99	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	96	73-126
Xylenes	ug/L (ppb)	150	95	74-118
Gasoline	ug/L (ppb)	1,000	92	69-134

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512255

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	72	80	63-142	11

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512255

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 512252-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	1.19	100	95	70-130	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	99	85-115

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512255

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 512255-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	84	83	70-130	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	85-115

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512255

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 512265-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	101	68-125
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	92	70-119

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	98	98	70-122	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	89	87	79-109	2

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512255

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	104	107	70-130	3

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512255

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	93	92	67-116	1
Acenaphthylene	ug/L (ppb)	1	92	92	65-119	0
Acenaphthene	ug/L (ppb)	1	94	93	66-118	1
Fluorene	ug/L (ppb)	1	93	96	64-125	3
Phenanthrene	ug/L (ppb)	1	94	94	67-120	0
Anthracene	ug/L (ppb)	1	94	97	65-122	3
Fluoranthene	ug/L (ppb)	1	89	96	65-127	8
Pyrene	ug/L (ppb)	1	102	94	62-130	8
Benz(a)anthracene	ug/L (ppb)	1	95	97	60-118	2
Chrysene	ug/L (ppb)	1	95	99	66-125	4
Benzo(b)fluoranthene	ug/L (ppb)	1	109	111	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	107	105	62-125	2
Benzo(a)pyrene	ug/L (ppb)	1	107	109	58-127	2
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	114	118	36-142	3
Dibenz(a,h)anthracene	ug/L (ppb)	1	106	115	37-133	8
Benzo(g,h,i)perylene	ug/L (ppb)	1	107	113	34-135	5

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

shin/choi

512255

ME 12-15-15

AI2 / D03 / VE

SAMPLE CHAIN OF CUSTODY

Send Report To Rebekah Brooks
Company Stantec
Address 19101 W 36th Ave, STE203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4944 Fax # -

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. 203700102
PO#
REMARKS Diss Pb samples are field filtered and labeled (diss)

Page # ____ of ____

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH ____
Rush charges authorized by ____

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	PAHs	Total Pb	Diss Pb	EDC	EDB	Notes
MW73	01A-H	12-11-15	1414	W	8	X	X	X				X	X	X	X	X	X	
																		Samples received at 3 °C
																		Samples received at ____ °C

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	Stantec	12-15-15	1300
Received by: Dana	DO VO	F&BI	12-15-15	13.00
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
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fbi@isomedia.com
www.friedmanandbruya.com

December 18, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 15, 2015 from the TOC_01-176, WORFDB8 F&BI 512256 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1218R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 15, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 512256 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
512256 -01	MW54
512256 -02	TB-121515-1
512256 -03	TB-121515-2

All quality control requirements were acceptable.

Date of Report: 12/18/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512256
Date Extracted: 12/16/15
Date Analyzed: 12/16/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW54 512256-01	<1	<1	<1	<3	<100	89
TB-121515-1 512256-02	<1	<1	<1	<3	<100	83
TB-121515-2 512256-03	<1	<1	<1	<3	<100	88
Method Blank 05-2534 MB	<1	<1	<1	<3	<100	87

Date of Report: 12/18/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512256

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 512256-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	<1	98	99	50-150	1
Toluene	ug/L (ppb)	50	<1	96	98	50-150	2
Ethylbenzene	ug/L (ppb)	50	<1	95	98	50-150	3
Xylenes	ug/L (ppb)	150	<3	95	97	50-150	2
Gasoline	ug/L (ppb)	1,000	<100	94	98	53-117	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	95	65-118
Toluene	ug/L (ppb)	50	93	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	92	74-118
Gasoline	ug/L (ppb)	1,000	95	69-134

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

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fc - The compound is a common laboratory and field contaminant.

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j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

TOC

512256

SAMPLE CHAIN OF CUSTODY

ME 12/15/15

VS

Page # 1 of 1

Send Report To Rebekah Brooks
Company STantec
Address 19101 W 36Th Ave, STE203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. 203700102
PO#
REMARKS MW54 is a MS/MSD sample

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS						Notes
						ANALYSES REQUESTED											
MW54	01 A-I	12-15-15	1115	W	9		X	X									MS/MSD
TB-121515-1	02	〃	—	W	1		X	X									
TB-121515-2	03	—	—	W	1		X	X									
												Samples received at 3 °C					

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Dana Hutchins	Dana Hutchins	STANTEC	12-15-15	1500
Received by:		Khan Phan	FCB I	12/15/15	1500
Relinquished by:					
Received by:					

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

December 22, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 15, 2015 from the TOC_01-176, WORFDB8 F&BI 512257 project. There are 10 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1222R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 15, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 512257 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
512257 -01	MW48
512257 -02	MW53
512257 -03	EB-121515

All quality control requirements were acceptable.

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512257
Date Extracted: 12/16/15
Date Analyzed: 12/16/15 and 12/17/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW48 512257-01 1/20	32	30	61	480	11,000	88
MW53 512257-02	<1	<1	<1	<3	<100	75
EB-121515 512257-03	<1	<1	<1	<3	<100	87
Method Blank 05-2534 MB	<1	<1	<1	<3	<100	87

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW48	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512257
Date Extracted:	12/17/15	Lab ID:	512257-01
Date Analyzed:	12/18/15	Data File:	512257-01.043
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	103	60	125

Analyte:	Concentration ug/L (ppb)
Lead	25.6

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 512257
Date Extracted:	12/17/15	Lab ID:	I5-726 mb
Date Analyzed:	12/17/15	Data File:	I5-726 mb.069
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW48	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512257
Date Extracted:	12/17/15	Lab ID:	512257-01
Date Analyzed:	12/17/15	Data File:	512257-01.023
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	76	60	125

Analyte:	Concentration ug/L (ppb)
Lead	13.4

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 512257
Date Extracted:	12/17/15	Lab ID:	I5-725 mb
Date Analyzed:	12/17/15	Data File:	I5-725 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512257

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING METHOD 8021B AND NWTPH-Gx

Laboratory Code: 512256-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	<1	98	99	50-150	1
Toluene	ug/L (ppb)	50	<1	96	98	50-150	2
Ethylbenzene	ug/L (ppb)	50	<1	95	98	50-150	3
Xylenes	ug/L (ppb)	150	<3	95	97	50-150	2
Gasoline	ug/L (ppb)	1,000	<100	94	98	53-117	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	95	65-118
Toluene	ug/L (ppb)	50	93	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	92	74-118
Gasoline	ug/L (ppb)	1,000	95	69-134

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512257

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 512252-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	1.19	100	95	70-130	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	99	85-115

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512257

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 512255-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	84	83	70-130	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	85-115

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

ROW 512257

SAMPLE CHAIN OF CUSTODY

ME 12/15/15 VS/AT3

Page # _____ of _____

Send Report To Rebekah Brooks
Company Stantec
Address 19101 W 36th Ave, Ste 203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax # _____

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. 20370102
PO#
REMARKS Diss Pb samples are field filtered and labled Diss

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH _____
Rush charges authorized by _____

SAMPLE DISPOSAL
☑ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Pb	Diss Pb					Notes
MW48	01 A-E	12-14-15	1305	W	5		X	X				X	X					
MW53	02 A-C	12-15-15	1015	W	3		X	X										
EB-121515	03	12-15-15	1030	W	3		X	X										

Samples received at 3 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	12-15-15	1800
Received by: [signature]	Nhan Phan	FEBJ	12/15/15	1500
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

December 22, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 15, 2015 from the TOC_01-176, WORFDB8 F&BI 512258 project. There are 50 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1222R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 15, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 512258 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
512258 -01	MW107
512258 -02	MW106
512258 -03	EB-121215
512258 -04	WB-121215
512258 -05	MW103
512258 -06	MW104
512258 -07	MLT-04
512258 -08	MW108

All quality control requirements were acceptable.

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512258
Date Extracted: 12/16/15
Date Analyzed: 12/16/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW107 512258-01	<1	<1	<1	<3	<100	88
MW106 512258-02	<1	<1	<1	<3	<100	88
EB-121215 512258-03	<1	<1	<1	<3	<100	90
WB-121215 512258-04	<1	<1	<1	<3	<100	90
MW103 512258-05	<1	<1	<1	<3	<100	76
MW104 512258-06 1/100	78	6,300	2,100	11,000	60,000	92
MLT-04 512258-07 1/100	81	6,900	2,000	10,000	59,000	91
MW108 512258-08	<1	<1	<1	<3	<100	87
Method Blank 05-2533 MB2	<1	<1	<1	<3	<100	87

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512258
Date Extracted: 12/16/15
Date Analyzed: 12/16/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW107 512258-01	<50	<250	77
MW106 512258-02	<50	<250	77
EB-121215 512258-03	<50	<250	73
WB-121215 512258-04 1/1.2	<60	<300	80
MW103 512258-05	<50	<250	69
MW104 512258-06	8,400 x	400 x	93
MLT-04 512258-07 1/1.3	6,200 x	410 x	93
MW108 512258-08	140 x	<250	67
Method Blank 05-2548 MB2	<50	<250	79

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW107	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-01
Date Analyzed:	12/18/15	Data File:	512258-01.044
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	105	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW106	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-02
Date Analyzed:	12/18/15	Data File:	512258-02.045
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	108	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-121215	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-03
Date Analyzed:	12/18/15	Data File:	512258-03.046
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	108	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	WB-121215	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-04
Date Analyzed:	12/18/15	Data File:	512258-04.047
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	108	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW103	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-05
Date Analyzed:	12/18/15	Data File:	512258-05.048
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	106	60	125

Analyte:	Concentration ug/L (ppb)
Lead	5.39

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW104	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-06
Date Analyzed:	12/18/15	Data File:	512258-06.049
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MLT-04	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-07
Date Analyzed:	12/18/15	Data File:	512258-07.051
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW108	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-08
Date Analyzed:	12/18/15	Data File:	512258-08.052
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	103	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	I5-726 mb
Date Analyzed:	12/17/15	Data File:	I5-726 mb.069
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW107	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-01
Date Analyzed:	12/17/15	Data File:	512258-01.024
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW106	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-02
Date Analyzed:	12/17/15	Data File:	512258-02.025
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-121215	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-03
Date Analyzed:	12/17/15	Data File:	512258-03.026
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	77	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	WB-121215	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-04
Date Analyzed:	12/17/15	Data File:	512258-04.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	104	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW103	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-05
Date Analyzed:	12/17/15	Data File:	512258-05.029
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW104	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-06
Date Analyzed:	12/17/15	Data File:	512258-06.037
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MLT-04	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-07
Date Analyzed:	12/17/15	Data File:	512258-07.036
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW108	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	512258-08
Date Analyzed:	12/17/15	Data File:	512258-08.030
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/17/15	Lab ID:	I5-725 mb
Date Analyzed:	12/17/15	Data File:	I5-725 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW107	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-01
Date Analyzed:	12/16/15	Data File:	121615.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	102	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW106	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-02
Date Analyzed:	12/16/15	Data File:	121616.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	103	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-121215	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-03
Date Analyzed:	12/16/15	Data File:	121617.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	85	117
Toluene-d8	102	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	WB-121215	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-04
Date Analyzed:	12/16/15	Data File:	121618.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW103	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-05
Date Analyzed:	12/16/15	Data File:	121632.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	3.1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW104	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-06
Date Analyzed:	12/16/15	Data File:	121640.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	105	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-04	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-07
Date Analyzed:	12/17/15	Data File:	121641.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	107	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW108	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-08
Date Analyzed:	12/16/15	Data File:	121633.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	05-2514 mb
Date Analyzed:	12/16/15	Data File:	121608.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512258
Date Extracted: 12/17/15
Date Analyzed: 12/17/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW107 512258-01	<0.01
MW106 512258-02	<0.01
EB-121215 512258-03	<0.01
WB-121215 512258-04	<0.01
MW103 512258-05	<0.01
MW104 512258-06	0.050
MLT-04 512258-07	0.052
MW108 512258-08	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW107	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-01 1/2
Date Analyzed:	12/17/15	Data File:	121709.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	107	31	160
Benzo(a)anthracene-d12	112	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW106	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-02 1/2
Date Analyzed:	12/17/15	Data File:	121710.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	105	31	160
Benzo(a)anthracene-d12	112	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-121215	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-03 1/2
Date Analyzed:	12/17/15	Data File:	121711.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	31	160
Benzo(a)anthracene-d12	105	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	WB-121215	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-04 1/2
Date Analyzed:	12/17/15	Data File:	121712.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	31	160
Benzo(a)anthracene-d12	99	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW103	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-05 1/2
Date Analyzed:	12/17/15	Data File:	121713.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	31	160
Benzo(a)anthracene-d12	99	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW104	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-06 1/20
Date Analyzed:	12/17/15	Data File:	121714.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91 d	31	160
Benzo(a)anthracene-d12	100 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	380 ve
Acenaphthylene	<0.6
Acenaphthene	<0.6
Fluorene	<0.6
Phenanthrene	<0.6
Anthracene	<0.6
Fluoranthene	<0.6
Pyrene	<0.6
Benz(a)anthracene	<0.6
Chrysene	<0.6
Benzo(a)pyrene	<0.6
Benzo(b)fluoranthene	<0.6
Benzo(k)fluoranthene	<0.6
Indeno(1,2,3-cd)pyrene	<0.6
Dibenz(a,h)anthracene	<0.6
Benzo(g,h,i)perylene	<0.6

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW104	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-06 1/200
Date Analyzed:	12/18/15	Data File:	121817.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	59 d	31	160
Benzo(a)anthracene-d12	128 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	520
Acenaphthylene	<6
Acenaphthene	<6
Fluorene	<6
Phenanthrene	<6
Anthracene	<6
Fluoranthene	<6
Pyrene	<6
Benz(a)anthracene	<6
Chrysene	<6
Benzo(a)pyrene	<6
Benzo(b)fluoranthene	<6
Benzo(k)fluoranthene	<6
Indeno(1,2,3-cd)pyrene	<6
Dibenz(a,h)anthracene	<6
Benzo(g,h,i)perylene	<6

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-04	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-07 1/20
Date Analyzed:	12/17/15	Data File:	121715.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91 d	31	160
Benzo(a)anthracene-d12	94 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	370 ve
Acenaphthylene	<0.6
Acenaphthene	<0.6
Fluorene	<0.6
Phenanthrene	<0.6
Anthracene	<0.6
Fluoranthene	<0.6
Pyrene	<0.6
Benz(a)anthracene	<0.6
Chrysene	<0.6
Benzo(a)pyrene	<0.6
Benzo(b)fluoranthene	<0.6
Benzo(k)fluoranthene	<0.6
Indeno(1,2,3-cd)pyrene	<0.6
Dibenz(a,h)anthracene	<0.6
Benzo(g,h,i)perylene	<0.6

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-04	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-07 1/200
Date Analyzed:	12/18/15	Data File:	121819.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	64 d	31	160
Benzo(a)anthracene-d12	115 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	500
Acenaphthylene	<6
Acenaphthene	<6
Fluorene	<6
Phenanthrene	<6
Anthracene	<6
Fluoranthene	<6
Pyrene	<6
Benz(a)anthracene	<6
Chrysene	<6
Benzo(a)pyrene	<6
Benzo(b)fluoranthene	<6
Benzo(k)fluoranthene	<6
Indeno(1,2,3-cd)pyrene	<6
Dibenz(a,h)anthracene	<6
Benzo(g,h,i)perylene	<6

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW108	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	512258-08 1/2
Date Analyzed:	12/17/15	Data File:	121716.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	31	160
Benzo(a)anthracene-d12	104	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.076
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 512258
Date Extracted:	12/16/15	Lab ID:	05-2552 mb
Date Analyzed:	12/17/15	Data File:	121707.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	31	160
Benzo(a)anthracene-d12	94	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512258

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 512246-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	48	48	1
Toluene	ug/L (ppb)	1.4	1.4	1
Ethylbenzene	ug/L (ppb)	360	360	0
Xylenes	ug/L (ppb)	3.2	3.2	0
Gasoline	ug/L (ppb)	1,800	1,800	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	99	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	96	73-126
Xylenes	ug/L (ppb)	150	95	74-118
Gasoline	ug/L (ppb)	1,000	92	69-134

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512258

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	96	83	58-134	15

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512258

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 512252-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	1.19	100	95	70-130	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	99	85-115

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512258

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 512255-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	84	83	70-130	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	85-115

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512258

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 512265-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	101	68-125
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	92	70-119

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	98	98	70-122	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	89	87	79-109	2

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512258

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	104	107	70-130	3

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512258

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	93	92	67-116	1
Acenaphthylene	ug/L (ppb)	1	92	92	65-119	0
Acenaphthene	ug/L (ppb)	1	94	93	66-118	1
Fluorene	ug/L (ppb)	1	93	96	64-125	3
Phenanthrene	ug/L (ppb)	1	94	94	67-120	0
Anthracene	ug/L (ppb)	1	94	97	65-122	3
Fluoranthene	ug/L (ppb)	1	89	96	65-127	8
Pyrene	ug/L (ppb)	1	102	94	62-130	8
Benz(a)anthracene	ug/L (ppb)	1	95	97	60-118	2
Chrysene	ug/L (ppb)	1	95	99	66-125	4
Benzo(b)fluoranthene	ug/L (ppb)	1	109	111	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	107	105	62-125	2
Benzo(a)pyrene	ug/L (ppb)	1	107	109	58-127	2
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	114	118	36-142	3
Dibenz(a,h)anthracene	ug/L (ppb)	1	106	115	37-133	8
Benzo(g,h,i)perylene	ug/L (ppb)	1	107	113	34-135	5

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Herman
512258

SAMPLE CHAIN OF CUSTODY

ME 12/15/15 DIY/DOY/VS

Page # _____ of _____

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 W 36th Ave, STE203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4944 Fax # —

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. 203700102
PO#
REMARKS Diss Pb samples are field filtered and labled (diss)

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	PAHs	Total Pb	Diss Pb	EDC	EDB	Notes
MW107	01A-H	12-12-15	1020	W	8	X	X	X				X	X	X	X	X	X	
MW106	02	12-12-15	1115	W	8	X	X	X				X	X	X	X	X	X	
EB-121215	03	12-12-15	1300	W	8	X	X	X				X	X	X	X	X	X	
WB-121215	04	12-12-15	1330	W	8	X	X	X				X	X	X	X	X	X	
MW103	05	12-11-15	1232	W	8	X	X	X				X	X	X	X	X	X	
MW104	06	12-13-15	1010	W	8	X	X	X				X	X	X	X	X	X	
MLT-04	07A-G	12-15-15	1030	W	7	X	X	X				X	X	X	X	X	X	only one sample for DX and PAHs
MW108	08A-H	12-15-15	1300	W	8	X	X	X				X	X	X	X	X	X	

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	12-15-15	1500
Received by: Nhan Phan	Nhan Phan	FEBI	12/15/15	1500
Relinquished by:				
Received by:		Samples received at 3 °C		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

December 22, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 15, 2015 from the TOC_01-176, WORFDB8 F&BI 512259 project. There are 32 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1222R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 15, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 512259 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
512259 -01	MW77
512259 -02	MW86
512259 -03	MLT-03
512259 -04	EB-121115
512259 -05	MW67
512259 -06	MW68

All quality control requirements were acceptable.

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512259
Date Extracted: 12/16/15
Date Analyzed: 12/16/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW77 512259-01	<1	<1	<1	<3	<100	89
MW86 512259-02	<1	<1	<1	<3	<100	92
MLT-03 512259-03	<1	<1	<1	<3	<100	90
EB-121115 512259-04	<1	<1	<1	<3	<100	89
MW67 512259-05	<1	<1	<1	<3	<100	91
MW68 512259-06	<1	<1	<1	<3	<100	90
Method Blank 05-2533 MB2	<1	<1	<1	<3	<100	87

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512259
Date Extracted: 12/16/15
Date Analyzed: 12/16/15 and 12/17/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW77 512259-01 1/1.3	<65	<330	68
MW86 512259-02 1/1.3	<65	<330	75
MLT-03 512259-03 1/1.3	<65	<330	74
EB-121115 512259-04 1/1.3	<65	<330	71
Method Blank 05-2548 MB2	<50	<250	79

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW86	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/17/15	Lab ID:	512259-02
Date Analyzed:	12/18/15	Data File:	512259-02.053
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MLT-03	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/17/15	Lab ID:	512259-03
Date Analyzed:	12/18/15	Data File:	512259-03.054
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-121115	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/17/15	Lab ID:	512259-04
Date Analyzed:	12/18/15	Data File:	512259-04.055
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	105	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/17/15	Lab ID:	I5-726 mb
Date Analyzed:	12/17/15	Data File:	I5-726 mb.069
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW86	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/17/15	Lab ID:	512259-02
Date Analyzed:	12/17/15	Data File:	512259-02.031
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	104	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MLT-03	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/17/15	Lab ID:	512259-03
Date Analyzed:	12/17/15	Data File:	512259-03.032
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	104	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-121115	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/17/15	Lab ID:	512259-04
Date Analyzed:	12/17/15	Data File:	512259-04.033
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	102	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/17/15	Lab ID:	I5-725 mb
Date Analyzed:	12/17/15	Data File:	I5-725 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW77	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/16/15	Lab ID:	512259-01
Date Analyzed:	12/16/15	Data File:	121634.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW86	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/16/15	Lab ID:	512259-02
Date Analyzed:	12/16/15	Data File:	121635.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	102	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-03	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/16/15	Lab ID:	512259-03
Date Analyzed:	12/16/15	Data File:	121636.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-121115	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/16/15	Lab ID:	512259-04
Date Analyzed:	12/16/15	Data File:	121637.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW67	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/16/15	Lab ID:	512259-05
Date Analyzed:	12/16/15	Data File:	121638.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	103	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW68	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/16/15	Lab ID:	512259-06
Date Analyzed:	12/16/15	Data File:	121639.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	102	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/16/15	Lab ID:	05-2514 mb
Date Analyzed:	12/16/15	Data File:	121608.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512259
Date Extracted: 12/17/15
Date Analyzed: 12/17/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED
Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW86 512259-02	<0.01
MLT-03 512259-03	<0.01
EB-121115 512259-04	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW77	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/16/15	Lab ID:	512259-01 1/2
Date Analyzed:	12/17/15	Data File:	121723.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	31	160
Benzo(a)anthracene-d12	107	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW86	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/16/15	Lab ID:	512259-02 1/2
Date Analyzed:	12/17/15	Data File:	121718.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	31	160
Benzo(a)anthracene-d12	101	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-03	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/16/15	Lab ID:	512259-03 1/2
Date Analyzed:	12/17/15	Data File:	121719.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	31	160
Benzo(a)anthracene-d12	111	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-121115	Client:	Stantec
Date Received:	12/15/15	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/16/15	Lab ID:	512259-04 1/2
Date Analyzed:	12/17/15	Data File:	121720.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	101	31	160
Benzo(a)anthracene-d12	109	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 512259
Date Extracted:	12/16/15	Lab ID:	05-2552 mb
Date Analyzed:	12/17/15	Data File:	121707.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	31	160
Benzo(a)anthracene-d12	94	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512259

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 512246-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	48	48	1
Toluene	ug/L (ppb)	1.4	1.4	1
Ethylbenzene	ug/L (ppb)	360	360	0
Xylenes	ug/L (ppb)	3.2	3.2	0
Gasoline	ug/L (ppb)	1,800	1,800	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	99	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	96	73-126
Xylenes	ug/L (ppb)	150	95	74-118
Gasoline	ug/L (ppb)	1,000	92	69-134

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512259

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	96	83	58-134	15

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512259

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 512252-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	1.19	100	95	70-130	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	99	85-115

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512259

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 512255-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	84	83	70-130	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	85-115

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512259

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 512265-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	101	68-125
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	92	70-119

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	98	98	70-122	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	89	87	79-109	2

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512259

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	0.10	104	107	70-130	3

Date of Report: 12/22/15
Date Received: 12/15/15
Project: TOC_01-176, WORFDB8 F&BI 512259

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	93	92	67-116	1
Acenaphthylene	ug/L (ppb)	1	92	92	65-119	0
Acenaphthene	ug/L (ppb)	1	94	93	66-118	1
Fluorene	ug/L (ppb)	1	93	96	64-125	3
Phenanthrene	ug/L (ppb)	1	94	94	67-120	0
Anthracene	ug/L (ppb)	1	94	97	65-122	3
Fluoranthene	ug/L (ppb)	1	89	96	65-127	8
Pyrene	ug/L (ppb)	1	102	94	62-130	8
Benz(a)anthracene	ug/L (ppb)	1	95	97	60-118	2
Chrysene	ug/L (ppb)	1	95	99	66-125	4
Benzo(b)fluoranthene	ug/L (ppb)	1	109	111	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	107	105	62-125	2
Benzo(a)pyrene	ug/L (ppb)	1	107	109	58-127	2
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	114	118	36-142	3
Dibenz(a,h)anthracene	ug/L (ppb)	1	106	115	37-133	8
Benzo(g,h,i)perylene	ug/L (ppb)	1	107	113	34-135	5

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

DRAKE 512259

SAMPLE CHAIN OF CUSTODY

ME 12-15-15

AI3/DOY/VS

Page # 1 of 1

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 W 36th AVE STE 203
City, State, ZIP Lynnwood WA 98036
Phone # 425-477-4994 Fax # -

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. 203700/02
PO#
REMARKS diss Pb samples are field filtered and labled (diss).

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☑ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	PAHs	Total Pb	Diss Pb	EDC	EDB	Notes
MW77	01A-F	12-12-15	1230	W	6	X	X	X				X	X					
MW86	02A-H	12-11-15	1500	W	8	X	X	X				X	X	X	X	X	X	
MLT-03	03 T	12-11-15	1515	W	8	X	X	X				X	X	X	X	X	X	
EB-121115	04 T	12-11-15	1600	W	8	X	X	X				X	X	X	X	X	X	
MW67	05A-D	12-15-15	1215	W	4		X	X				X						
MW68	06A-D	12-15-15	1245	W	4		X	X				X						

Samples received at 3 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	Stantec	12-15-15	1500
Received by: DOV	DOV	F&BI	12-15-15	15:00
Relinquished by:				
Received by:				