Cleanup Action Report
7-Eleven Store No. 25983
3541 Martin Way East, Olympia, WA

Facility/Site No.: 5465157
Cleanup Site ID: 5366
UST ID: 8613
LUST ID: 4716
Historic Release ID: 434495
VCP ID: SW1029 (Former)

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Sign-off Sheet

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Stantec

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Abbreviations

7-Eleven	7-Eleven Inc.
AOC	Area of Concern
bgs	Below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylenes
CAR	Cleanup Action Report
COC	Constituent of Concern
CUL	Cleanup Level
Ecology	Washington State Department of Ecology
EDB	1,2-dibromoethane
EDC	1,2-dichloroethane
Ft	Feet
GW	Groundwater
GTI	Flour Daniel GTI
LUST	Leaking Underground Storage Tank
mg/kg	Milligrams per Kilogram
MRLs	Method Reporting Limits
MTBE	Methyl tertiary butyl ether
MTCA	Model Toxics Control Act
NAPL	Nonaqueous Phase Liquid
NFA	No Further Action
PCS	Petroleum Contaminated Soil
Qt	Vashon Till
Site	MTCA Site definition
Stantec	Stantec Consulting Services Inc.
TEE	Terrestrial Ecological Evaluation
TPH-G	Total petroleum hydrocarbons as gasoline
µg/L	Micrograms per Liter
UST	Underground Storage Tank
VPH	Volatile Petroleum Hydrocarbons
WAC	Washington Administrative Code

1.0 INTRODUCTION

This report summarizes cleanup actions and presents the results of confirmation sampling related to a petroleum release from the former retail gasoline fuel system at 7-Eleven Incorporated (7-Eleven) Store No. 25983 (the Site), located at 3541 Martin Way East, Olympia, Thurston County, Washington (the Property) (***Figures 1 and 2***).

1.1 SITE INFORMATION

Site Name:	7-Eleven Store Number 25983
Site Property Address:	3541 Martin Way E, Olympia, WA
Site Property Parcel Number:	41701900100
Current Property Owner:	Sunshine Plaza, LLC
Project Client:	Mr. Jose Rios – Manager, Environmental Services 7-Eleven Inc. P.O. Box 711 Dallas, TX 75221-0711
Project Consultant:	Mr. Paul Fairbairn - Project Manager Stantec Consulting Services Inc. 11130 NE 33rd Place, Suite 200 Bellevue, WA 98004
Department of Ecology Site Manager:	Ms. Carol Johnston
Voluntary Cleanup Program No.:	SW1029 (Former)
Facility No.:	5465157

1.2 PURPOSE

Stantec Consulting Services Inc. (Stantec) prepared this Cleanup Action Report (CAR) on behalf of 7-Eleven to demonstrate that historically impacted soil and groundwater associated with the first generation fuel system that operated at the Property from 1984 to 2014 no longer poses a threat to human health and the environment as defined in Model Toxics Control Act (MTCA), Chapter 70.105D Revised Code of Washington, and its implementing regulations, Washington Administrative Code (WAC) 173-340 and, therefore, meets the requirements for a No Further Action (NFA) determination.

2.0 PROPERTY DESCRIPTION AND SITE IDENTIFICATION

2.1 RELEASE DISCOVERY AND REGULATORY STATUS

The initial release was discovered in June 1995 during product piping upgrade activities. During the upgrade activities, Fluor Daniel GTI (GTI) personnel collected soil samples from the tank pit, dispenser area, and stockpiled soils. Soil samples collected from beneath the pump dispenser island were reported to contain concentrations of total petroleum hydrocarbons characterized as gasoline (TPH-G), toluene, ethyl benzene, and total xylenes exceeding respective MTCA Method A Cleanup Levels (CULs). The release was reported to Washington State Department of Ecology (Ecology), and the Site was entered into the Ecology Leaking Underground Storage Tank (LUST) database (LUST ID 4716). A detailed Site history is presented in ***Appendix A.***

Stantec reviewed Ecology electronic databases regarding the regulatory status of the Site. As of December 2015, the Site is included in the Ecology LUST list with the status "cleanup started." Ecology identification numbers for the Site are summarized below.

- Facility Number: 5465157
- UST Site ID: 8613
- Cleanup Site ID: 5366
- LUST Release ID: 4716 (December 12, 1997)
- Historic Release ID: 434495
- Voluntary Cleanup Program ID: SW1029 (Former)

2.2 FACILITY DESCRIPTION AND SITE DEFINITION

The Property consists of three Tax Parcels (Thurston County Assessor Parcel: 99000990600, 99002058812, and 99000201000) located on Thurston County Assessor real property Tax Parcel #41701900100 (***Figures 1 and 2***) at the southwest corner of the intersection of Martin Way East and Lily Road in Olympia, Washington. A legal description of the Property is included in ***Appendix B***. The southeast portion of the Property is currently occupied by an active 7-Eleven branded convenience store, with former retail sales of gasoline. The former gasoline distribution system, installed in 1984, consisted of three 12,000-gallon, single-wall fiberglass underground storage tank (UST); two fuel dispensers covered by a canopy; and associated underground piping. The USTs and ancillary equipment were removed in October 2014 in accordance with WAC 173-360-610.

The 7-Eleven Store occupies Tax Parcel #99000990600 on the southeastern-most portion of a multi-unit commercial development (connected structures) that extends east-to-west along the

southern boundary of the Property. The fuel canopy, dispenser islands, and USTs were previously located directly north of the 7-Eleven Store (***Figure 2***).

The Property is located in a predominately commercial area with surrounding residential neighborhoods (***Figures 1 and 2***).

Under MTCA (WAC 173-340-200), a "site" is defined by the nature and extent of contamination associated with one or more releases of hazardous substances, prior to any cleanup of that contamination. In this CAR, the MTCA site (Site) is defined as all affected areas from the petroleum release associated with former 7-Eleven retail fueling operations and any potentially impacted adjacent parcels. Based on data presented in this CAR, the Site does not extend off the Property.

2.3 NEIGHBORHOOD SETTING

The Site is located in the Sunshine Plaza bordered to the north by Martin Way beyond which is Park Manor Strip Mall. Lilly Road borders the Site to the east beyond which are commercial businesses. The Site is bordered to the south by a private residential property. The Site is bordered to the west by an International House of Pancakes® restaurant parking lot.

2.4 PHYSIOGRAPHIC SETTING AND TOPOGRAPHY

The Property is located at approximately 200-feet above mean sea level. Surface cover at the Property is primarily asphalt pavement and is generally flat. The local topography is characterized by gentle hills with a relatively flat plain that increases to the west toward the Olympic Mountains. Woodward Creek, located approximately 1,000 feet to the west, is the closest surface water body to the Property. Regional sediments consist primarily of glacial outwash alluvial deposits. The Property is located on a composite of artificial fill and glacial outwash alluvial deposits. Generally, permeability of these types of sediments is extremely low, except in sand and gravel lenses.

Groundwater seasonally fluctuates between approximately 23- and 30-feet below ground surface (bgs). See ***Section 4.4*** for details.

2.5 ZONING, INFRASTRUCTURE, AND WATER SUPPLY

According to the City of Olympia Zoning Map, the Property is zoned High Density Corridor 4. Subsurface utilities present beneath and adjacent to the Property include sanitary sewer, storm water, water, and communications. Additional subsurface utilities may be present, but were not identified by Stantec.

Several catch basins are located throughout the Property to collect surface water runoff. Two public storm water catch basins are also located on the gutter line to the north of the Property. All of the catch basins are connected and drain into the storm drain system located along Martin Way East.

Potable water is supplied by the City of Olympia and sourced primarily from two aquifers including the Unconfined McAllister Gravel Aquifer and the Deschutes Valley Aquifer system. Several water wells which supply drinking water to the City of Olympia are located throughout the region. Of the City's water supply wells, none are located within a one mile radius of the Property. Based on the cross-gradient locations, distance from the Property, and aquifer depth, these wells are unlikely to be adversely affected by the release at the Site. Based on well logs publicly available in the Ecology database, one additional, private water well is located within 0.5-mile of the Property.

3.0 PROPERTY DEVELOPMENT HISTORY AND POTENTIAL SOURCES OF CONTAMINATION

3.1 PAST SITE USES AND FACILITIES

Based on available aerial photographs dating back to 1941, a single-family residential structure, possibly a farmhouse, was located at the Property until at least 1969. The current 7-Eleven Store and former fuel system, canopy, and dispenser island were built and installed at the Site in 1984. Ecology UST summary data records indicate that USTs were installed at the Site in December 1984 and removed in October 2014.

3.1.1 Former Underground Storage Tanks

Tank ID	Tank Type & Volume	Substance Stored	Date Installed	Date Decommissioned	Tank Operator
#1 REG	12,000-gallon, single-wall fiberglass	Unleaded Premium	12/1/1984	10/8/2014	7-Eleven, Inc.
#2 NOL	12,000-gallon, single-wall fiberglass	Unleaded Regular	12/1/1984	10/8/2014	7-Eleven, Inc.
#3 SNL	12,000-gallon, single-wall fiberglass	Unleaded Regular	12/1/1984	10/8/2014	7-Eleven, Inc.

3.2 CURRENT SITE USE AND FACILITIES AND POTENTIAL FUTURE USES

The Property is currently operating as an active 7-Eleven branded convenience store located in a residential and commercial neighborhood on the southwest corner of the intersection of Martin Way East and Lily Avenue in Olympia, Washington (***Figures 1 and 2)***. Stantec is unaware of any proposed land use changes to the Property.

3.3 POTENTIAL SOURCES OF ON-SITE CONTAMINATION

Potential on-Site sources of the Constituents of Concern (COCs), as defined in ***Section 5.2,*** are likely from the gasoline fuel system that operated between 1984 and 2014.

Potential sources of contamination include:

- Fuel dispensers;
- Product lines;
- UST filling area, including leaks from overfill spill buckets; and,
- USTs.

3.4 POTENTIAL SOURCES OF CONTAMINATION FROM NEIGHBORING PROPERTIES

According to the Ecology database, there are no confirmed and suspected contaminated sites identified within one mile of the Property.

4.0 NATURAL CONDITIONS

4.1 REGIONAL GEOLOGY

The Property lies within the central Puget Lowland Physiographic province, which consists primarily of glacially-deposited sediments. The lowland is part of a regional north-south trending trough that extends from southwestern British Columbia to near Eugene, Oregon. This lowland is glacially carved with a depositional and erosional history, including at least four separate glacial advances/retreats. The Puget Lowland is bounded to the west by the Olympic Mountains and to the east by the Cascade Range. The lowland is filled with glacial and non-glacial sediments consisting of interbedded gravel, sand, silt, till, and peat lenses.

The Property is located in the Deschutes River Basin, which rises to the Cascade Range to the southeast and empties into the Puget Sound to the north. Soils in the vicinity of the Property generally consist of alluvial deposits overlying undifferentiated pre-Vashon glacial deposits.

4.2 SITE GEOLOGICAL CONDITIONS

The Site is located on a composite of artificial fill and glacial outwash alluvial deposits. The glacial deposits are Vashon Till (Qt), a member of the Pleistocene Vashon Drift sediments deposited during the latest episode of glaciation in the Puget Sound region. The Qt varies in thickness from a few feet to 150 feet thick. It is comprised of gravelly, sandy silt to silty sand with varied quantities of clay, cobbles, and boulders. Local lenses of sand and gravel containing pockets of perched groundwater are common. Generally, permeability of these types of sediments is extremely low, except in the sand and gravel lenses.

The soils encountered beneath the Site during drilling operations were identified as silty to gravelly sand with some areas of silt overlying poorly graded gravel to silty gravel between approximately 16- to 30- feet bgs. The gravel layer extended to the total depth of each borehole, approximately 30- to 32- feet bgs. Saturated soils were encountered at 26.85- to 28.90- feet bgs. Boring logs are included in ***Appendix C***. Geologic cross sections are provided as ***Figures A and B***.

4.3 SURFACE WATER

The closest body of water is Woodard Creek, located approximately 1,000 feet west of the Site. Woodard Creek ultimately discharges to Woodard Bay and the Puget Sound waterway, which lies approximately two miles north of the Site. Surface water at the Property flows into a network of catch basins that discharge into the City of Olympia storm drain system.

4.4 GROUNDWATER

Depth to groundwater at the Site has ranged from approximately 23-feet to 30-feet (ft) bgs as presented in ***Table 1***. The average depth to groundwater at the Site is 26.27-ft bgs. Based on 12 years of groundwater flow direction interpretations (presented in ***Graph 1***), the dominate groundwater flow direction is to the west.

4.5 NATURAL RESOURCES AND ECOLOGICAL RECEPTORS

Terrestrial Ecological Evaluation: A Terrestrial Ecological Evaluation (TEE) form has been completed. The evaluation indicates that there is no risk to ecological receptors from the release at the Site. The TEE form for this Site is included in ***Appendix D***, along with an aerial map depicting a 500-foot radius around the Site.

5.0 ENVIRONMENTAL INVESTIGATION SUMMARY

Eighteen soil borings have been advanced at the Site, and a total of 101 soil samples have been collected since petroleum-impacted soil was first discovered during product piping upgrade activities in 1995. The Site has a current network of three groundwater monitoring wells (MW-2, MW-3, and MW-5). One interim remedial action that included excavation associated with a UST system removal was completed at the Site.

The following subsurface investigations have been completed at the Site:

- 1997 *Restore Letter Report*, Fluor Daniel GTI;
- 2000 *Site Assessment Report*, IT Corporation;
- 2001 *Remediation Progress and Well Installation Report Second Quarter 2001*, IT Corporation;
- 2009 *Additional Subsurface Investigation Report*, Stantec; and,
- 2014 *UST System Removal Report*, Stantec.

A detailed summary of work completed at the Site is included as ***Appendix A***. A summary of historical soil analytical data is presented in ***Table 2A and 2B***. All available historical boring logs for the previous investigations are included in ***Appendix C***.

5.1 AREA OF CONCERN

The Area of Concern (AOC) is defined as the extent of soil beneath the Site where COCs have been detected exceeding the MTCA Method A screening levels. For the purpose of this CAR, the AOC and the MTCA Site Boundary are the same (***Figure 3***). Site data indicates that the AOC for soil is located in the area surrounding the former USTs, product piping, and dispensers at a depth of approximately 15- to 20-feet bgs.

5.2 POTENTIAL CONSTITUENTS OF CONCERN

Based on past and present use of the Site and existing analytical data, potential COCs include the compounds listed in *MTCA 173-340-900 Table 830-1 Required Testing for Petroleum Releases* (Ecology 2007). The following table presents the potential sources of contamination and the corresponding potential COCs for the Site:

Potential Source(s)	Potential COCs
Former gasoline USTs and distribution system that operated between 1984 and 2014 dispensing leaded and unleaded gasoline.	• TPH-G • Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX) • Total lead • Methyl Tertiary Butyl Ether (MTBE) • 1,2-dibromoethane (EDB) • 1,2-dichloroethane (EDC) • Total Naphthalenes (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)

Records obtained from 7-Eleven and Ecology do not indicate that diesel has ever been sold at the Site; therefore, diesel range organics are not considered a potential COC. Based on previous environmental activities completed at the Site, the COCs detected at concentrations greater than MTCA Method A screening levels in soil include:

- BTEX; and
- TPH-G.

Benzene was not detected above MTCA Method A screening levels in any soil sample collected during the UST removal activities for soils that remain onsite and has not been detected above laboratory reporting limits in groundwater since at least August 2008. Furthermore, total lead has never been detected above MTCA Method A screening levels in site soils. MTBE, EDB, and EDC have never been observed above practical quantitation limits at the Site, and are not considered COCs at the Site. Additionally, total naphthalene's have never been detected above MTCA Method A cleanup levels at the Site.

5.3 INTERIM ACTIONS

One interim action occurred during the 2014 UST system removal that involved over-excavation of the UST basin and dispenser island area with the removal of a total of 1,393-tons of petroleum contaminated soil (PCS) from the source area. Excavation was limited along the southern and western edges of the excavation due to geotechnical issues (i.e. soil sloughing), and concerns of causing structural damage to the existing 7-Eleven convenience store located in close proximity to the southern portion of excavation.

6.0 CONTAMINANT OCCURRENCE AND MOVEMENT

6.1 SOIL

The initial release was reported in June 1995 during a product piping upgrade. The apparent source of the release appears to be the fuel dispensing system in the area of the dispenser island.

Seven soil investigations were conducted at the Site between 1995 and 2014 (***Appendix A***). A summary of soil sample locations submitted for analyses, including the sample date, depth, consultant, analytical methods, and results, is presented in ***Table 2A and 2B***. The location of soil samples (excluding stockpile samples) collected during previous investigations and select analytical results are presented in ***Figure 3***.

A total of 101 soil samples have been collected at the Site since 1995. Most soil samples have been collected around the vicinity of the former USTs and dispensers. The depth of soil samples range from approximately 5- to 26-feet bgs. Native soil consists predominately of sandy silt and silty gravel with varied quantities of clay, cobles, and boulders. A summary of Site geological conditions is provided in ***Section 4.2***.

The extent of historical petroleum-impacted soil is defined at the Site and limited to a small layer along the western (SB-3@16') and southern (Southwall@18') sidewall boundaries of the 2014 remedial excavation (***Figures A and B***). Following the remedial excavation, the only COC remaining at the Site above MTCA Method A screening levels is TPH-G. Historic analytical data is summarized in ***Table 2A and 2B*** and presented in ***Figure 3***. The vertical extent of petroleum-impacted soil is limited from approximately 15-feet to 18-feet bgs.

6.1.1 Degradation

Stantec estimated TPH-G degradation rates at the Site based based on analytical results of soil samples collected at the Site (1995 through 2014) from comparable locations and depths.

Based on an average Site degradation constant (k = -0.3627), it would take approximately 6 years (2020) for the highest residual TPH-G concentration remaining at the Site (SB-3@16') to reach the MTCA Method A screening level. ***Table 3*** presents degradation calculations.

Example Degradation calculation for TPH-G:

k = [ln(N/No)][1/t] = [ln(756/2,230][1/12] = -0.0901 years -1

t = [ln(N/No)]/k = [ln(100/756)]/-0.0901 = 22 years to reach 100 milligrams per kilogram (mg/kg)

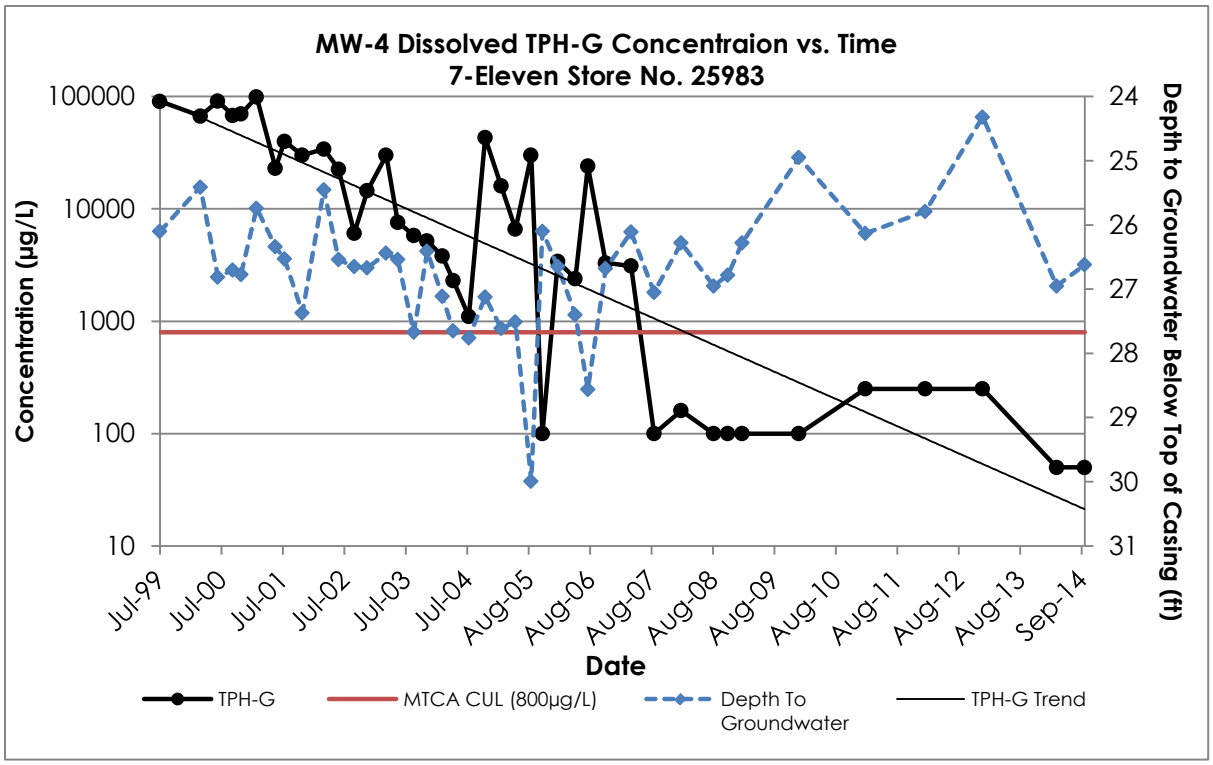
6.2 GROUNDWATER

Based on historic periodic groundwater sampling laboratory analytical data collected from on-Site groundwater monitoring wells, dissolved concentrations of COCs have been below MTCA Method A CULs in all Site groundwater monitoring wells for a minimum of six consecutively sampled quarters and a continuous period from August 2007.

Previous environmental investigations and Ecology records indicate:

- A total of five groundwater wells have been installed at the Property;
- Monitoring wells MW-1 through MW-4 were installed at the Site in 1999. Well MW-5 was installed in 2001;
- Monitoring wells MW-1 and MW-4 were removed in September 2014 prior to UST removal and excavation activities;
- Groundwater analytical results from wells MW-1, MW-2 and MW-3 have been below MTCA Method A CULs for the COCs since at least 2002;
- Groundwater analytical results from wells MW-4 and MW-5 have been below MTCA Method A CULs for the COCs since at least 2007. As depicted in the graphs below of well MW-4, dissolved benzene and TPH-G concentrations have been below respective CULs since 2007. Groundwater analytical results from well MW-5 have been below MTCA Method A CULs for the dissolved COCs for at least six consecutively sampled quarters and continuously since January 2006; and,
- Depth to groundwater at the Site has ranged from approximately 23- to 30-feet bgs. Based on 12 years of groundwater flow direction interpretations, the dominant groundwater flow direction is to the west. Historical groundwater elevation is presented in ***Table 1***. Previously un-submitted analytical data and groundwater elevation contour maps from second and third quarter 2015 are presented in ***Figures 4*** *and* ***5***. Previously un-submitted field notes and analytical results are presented in ***Appendix E***.

As presented in ***Table 1*** and ***Figure 4***, dissolved COCs in groundwater analytical concentrations measured during the second and third quarters of 2015 did not exceed MTCA Method A CULs. The total lead exceedances observed in June and August 2015 (MW-3 and MW-5) are not representative of lead concentrations in groundwater, based on historical groundwater results and dissolved lead analytical results (August 2015).


MW-4 Dissolved TPH-G Concentraion vs. Time
7-Eleven Store No. 25983
Concentration (µg/L)
100000
10000
1000
100
10
Depth to Groundwater Below Top of Casing (ft)
24
25
26
27
28
29
30
31
Jul-99
Jul-00
Jul-01
Jul-02
Jul-03
Jul-04
Aug-05
Aug-06
Aug-07
Aug-08
Aug-09
Aug-10
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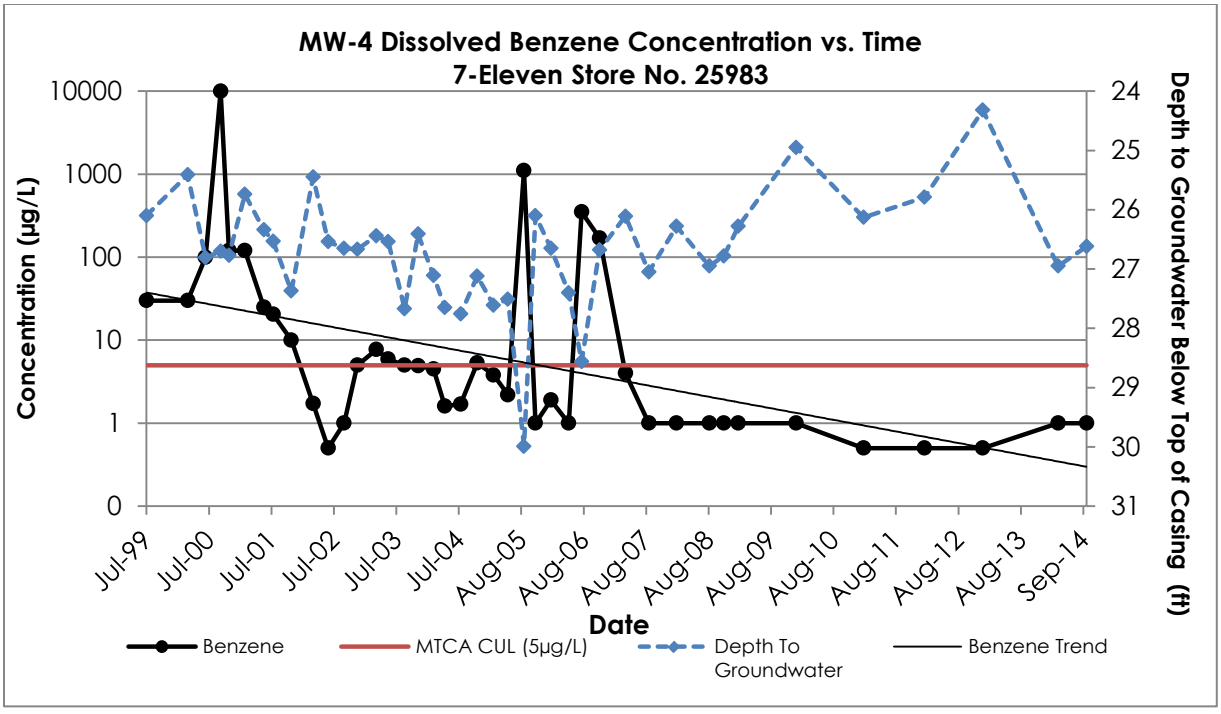
Aug-13
Sep-14
Date
TPH-G
MTCA CUL (800µg/L)
Depth To Groundwater
TPH-G Trend


MW-4 Dissolved Benzene Concentration vs. Time
7-Eleven Store No. 25983
Concentration (µg/L)
10000
1000
100
10
1
0
Depth to Groundwater Below Top of Casing (ft)
24
25
26
27
28
29
30
31
Jul-99
Jul-00
Jul-01
Jul-02
Jul-03
Jul-04
Aug-05
Aug-06
Aug-07
Aug-08
Aug-09
Aug-10
Aug-11
Aug-12
Aug-13
Sep-14
Date
Benzene
MTCA CUL (5µg/L)
Depth To Groundwater
Benzene Trend

6.3 SURFACE WATER AND SEDIMENT

There has been no evidence of impact to surface water or sediment from historical petroleum hydrocarbons beneath the Site. No discussion of the occurrence or movement of contaminants in this medium is necessary.

6.4 SOIL VAPOR

There have been no specific investigations of soil vapor associated with the release of petroleum at the Site. Based on the following rationale, the potential soil vapor pathway is likely incomplete for residential structures:

- The bulk of the source area soils (associated with former USTs and piping) have been removed to a depth of between 23-ft bgs (western extent of 2014 excavation) and 26-ft bgs (eastern extent of 2014 excavation), and backfilled with clean overburden material and/or imported fill material;

- Confirmation samples indicate that the lateral extent of soil impacts has been defined and does not extend beneath the 7-Eleven convenience store. Benzene, the chemical which more accurately captures TPH risk to human health concerns, has not been detected above laboratory reporting limits in site soils since 2009, and has not been detected above laboratory reporting limits in site groundwater since 2007; therefore, it is considered unlikely to pose a risk of vapor intrusion;

- All residual COCs (in soil and groundwater) are below cleanup standards for the Site (***Section 8.0***); and,

- Dissolved concentrations of benzene are below the vapor intrusion screening level of 2.4 micrograms per liter as established in Ecology's 2009 *Draft* in *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, Table B-1.

Work conducted by Robin Davis at Utah Department of Environmental Quality since 2009 indicates that petroleum vapors will be fully attenuated within 8- to 13-feet of the soil source Thus, the presence of clean backfill and lateral separation between excavation boundaries, and the convenience store would provide a sufficient biodegradation zone for attenuation of any unidentified residual petroleum constituents in soil vapor.

6.5 NATURAL RESOURCES AND ECOLOGICAL RECEPTORS

A Terrestrial Ecological Evaluation (TEE) is included in this report (***Appendix D***).

6.6 WASTE MATERIAL

Investigative-derived waste and waste generated from the groundwater sampling and cleanup action was transported from the Site and disposed of at an appropriately permitted waste disposal facility.

7.0 CONCEPTUAL MODEL

Petroleum was likely released into the soil before June 1995 when product piping upgrades were completed at the Site and the release was discovered. In June 1999, four monitoring wells (MW-1 through MW-4) were installed. Soil samples collected from monitoring wells MW-1, MW-2, MW-3, and MW-4 were not reported to have detections of TPH-G or BTEX above method reporting limits (MRLs) in any of the submitted soil samples. In June 2005, monitoring well MW-5 was installed downgradient of the UST basin. Benzene and TPH-G were not reported above respective MRLs or MTCA Method A CULs in the soil samples collected from MW-5. Dissolved concentrations of total xylenes were reported below the MTCA Method A CUL in the groundwater sample collected from monitoring well MW-5 in August 2001.

Based on Site investigations from 1995 to 2014, and quarterly groundwater analytical results, petroleum impacted soil and groundwater appears to be localized in the area immediately to the west of the USTs and dispenser island. Both soil and dissolved phase hydrocarbons have not migrated off-Property. Depth to groundwater at the Site has ranged from approximately 23- to 30-feet bgs. Based on 16 years of groundwater flow direction interpretations, the dominant flow groundwater flow direction is to the west.

In October 2014, the UST system was removed and over-excavation of soils in the vicinity of UST basin and dispenser island occurred. Approximately 1,393-tons of PCS were transported and disposed offsite. The excavation was backfilled with clean overburden/imported fill. Further, soil confirmation and compliance samples were taken from locations that historically had soil impacts, and from the excavation side walls and base. See ***Table 4*** for compliance demonstration. Groundwater has been below Method A CULs in all wells since at least August 2007.

The Site qualifies for TEE exclusion, indicating that there is no risk to ecological receptors based on the historical release.

Based on current soil and groundwater quality at the Site, and current use of the Property, soil vapor concentrations of petroleum hydrocarbon compounds are not likely to be a potential risk to human health. It is anticipated that commercial use of the Property will continue in the future.

8.0 CLEANUP STANDARDS

In accordance with MTCA, development of cleanup levels includes identifying potential exposure pathways for humans and environmental impacts based on planned land use. The Site is currently zoned for commercial use, and future zoning is not anticipated to change. As noted previously, the Property is currently used as a convenience store.

The following potential exposure/risk pathways were considered:

- Human health protection from direct soil contact pathway exposure;
- Human health protection from soil-to-groundwater pathway exposure;
- Human health protection from soil-to-air pathway exposure;
- Human health protection from soil-to-surface water pathway exposure;
- Human health protection from groundwater-to-surface water; and,
- Terrestrial ecological protection.

8.1 GROUNDWATER CLEANUP LEVELS

MTCA Method A CULs are appropriate for groundwater at the Site. Groundwater is classified as potable to protect drinking water beneficial uses; therefore, MTCA Method A CULs (WAC 173-340 Table 720-1) will be used relative to COCs at the Site. The point of compliance for this Site is defined as the point at which the groundwater cleanup level must be attained; thus, the point of compliance is the entire Site. Site specific groundwater cleanup levels and analytical results are presented in ***Table 1***.

8.2 SOIL CLEANUP LEVELS

Cleanup levels for unrestricted land use at the Site are based on protection of the direct contact pathway and protection of groundwater via the leaching pathway. The point of compliance for the direct contact pathway is from ground surface to 15-feet bgs. The point of compliance for the leaching pathway is throughout the Site.

MTCA Method A and B cleanup levels were established for Site soil. MTCA Method A CULs were selected for all COCs, except TPH-G. Modified Method B CULs were established for TPH-G in soil based on the specific composition of petroleum fractions at the Site, and adjusted downward to residual saturation screening levels [per MTCA 173-340-747 (3)(g)] for protection of groundwater. The rational and methods used for selecting soil CULs at the Site is described below.

MTCA Method A CULs were selected for BTEX and lead in Site soil. MTCA Method A CULs were selected for BTEX constituents based on mobility and human health risks of these constituents. However, since petroleum constituents and ratios vary widely among petroleum contaminated sites, a Site-specific Method B CUL was calculated for TPH-G in accordance with MTCA 173-340-

745 and page 108 of *Guidance for Remediation of Petroleum Contaminated Sites* (Ecology 2011). According to the guidance "MTCA cleanup regulation allows the use of site specific petroleum composition to calculate site-specific Method B TPH cleanup levels." The Method B cleanup level considers the ratio of Site-specific petroleum fractions and more accurately evaluates the human health risk at the Site.

MTCA Method B CULs for TPH-G were established by analyzing five representative soil samples for volatile petroleum hydrocarbons (VPH). Analytical VPH results were used to determine the specific composition of petroleum hydrocarbon fractions in Site soil. This data was entered into the *MTCATPH11.1 Workbook for Calculating Cleanup Levels for Petroleum contaminated Sites* (Ecology 2007). The MTCA Method B CUL for TPH-G was selected by calculating the median Method B value from the five workbooks. The median Method B CUL for Site-specific hydrocarbon fractions (TPH-G) was calculated to be 2,540 mg/kg. This modified Method B cleanup level is protective of human health via direct contact for Site soil. MTCATPH workbooks are provided in ***Appendix F***. Since diesel fuel and oil range hydrocarbons are not COCs at the Site, the TPH cleanup level calculated in the workbooks is equivalent to the TPH-G cleanup level.

Per MTCA regulations 173-340-747 (3)(g), the ***TPH-G CUL was lowered to the residual saturation screening level*** for weathered gasoline. The residual saturation screening level for TPH-G is 1,000 mg/kg (MTCA 173-340-900 Table 747-5). Therefore, the modified Method B cleanup level for TPH-G at the Site is 1,000 mg/kg. The rational with the selection of the TPH-G cleanup levels is consistent with Example 10 in *Guidance for Remediation of Petroleum Contaminated Sites* (Ecology 2011). Site-specific cleanup levels are summarized below.

Summary of Site-Specific MTCA Cleanup Levels

(MTCA Cleanup Regulation, Chapter 173-340 WAC, Publication No. 94-06 Revised November 2007)

Media	TPH-G	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total Lead
Soil (mg/kg)	Residual Saturation 1,000	Method A 0.03	Method A 7	Method A 6	Method A 9	Method A 250
Groundwater (µg/L)	Method A 1,000	Method A 5	Method A 1,000	Method A 700	Method A 1,000	Method A 15

Note: µg/L = Micrograms per Liter

MTBE, EDB, and EDC have never been observed above practical quantitation limits at the Site, and are not considered COCs at the Site. Additionally, total naphthalene's have never been detected above MTCA Method A cleanup levels at the Site.

9.0 CONCLUSIONS

9.1 CONSTITUENTS OF CONCERN

COC's historically detected above MTCA Method A screening levels at the Site include:

- BTEX; and,
- TPH-G.

Based on the results of 2014 remedial excavation confirmation sampling, no COCs remain in soil or groundwater at the Site above cleanup standards. Applicable CULs and points of compliance for soil and groundwater are discussed in ***Section 8.1*** and ***8.2***. TPH-G is the only COC that remains above MTCA Method A screening levels; however, concentrations are in compliance with Site-specific Method B CULs.

9.2 SOIL – LATERAL AND VERTICAL

In October 2014, the UST system was removed and over-excavation of soils in the vicinity of UST basin and dispenser island occurred. Approximately 1,393-tons of PC5 were transported and disposed off-Site. Residual petroleum hydrocarbons remain at the Site following the over-excavation; however, all COCs are in compliance with cleanup standards for the direct contact and leaching pathways as described below.

Direct Contact

All COCs are below MTCA Method A CLUs from ground surface to 15-feet bgs. The remedial over-excavation was completed to approximately 23- to 26-feet bgs (based on location), and then backfilled with clean fill material. The surface was finished with asphalt. Based on confirmation sampling results, there is no risk to human health or the environment via the direct contact pathway at the Site.

Leaching Pathway

The leaching pathway is incomplete at the Site based on the following results and rational:

- ***Groundwater analytical results empirically demonstrate that residual COCs are not negatively impacting groundwater quality [MTCA 173-340-373(9)].*** Groundwater analytical results have been below MTCA Method A CULs for over 7 years at the Site. Additionally, the vast majority of petroleum impacted soil was removed from Site during the remedial excavation, which further reduces the risk to groundwater.

- ***If residual TPH-G in soil could impact groundwater quality, it would have been observed within the past 7 years.*** Based on groundwater results, COCs have historically migrated to and impacted groundwater (1999 through 2007). Given the horizontal groundwater seepage velocity at the Site [0.5-feet per day (***Appendix G***)], COCs would have been observed in groundwater analytical samples from monitoring wells within the past 7 years if vertical migration were occurring. Monitoring well MW-5 is located only 10-feet downgradient of residual TPH-G impacts (SB-3@16'). Based on this and the removal of over 1,393-tons of soil during the remedial investigation, there is no likely risk to human health or the environment via the leaching pathway.

- ***BTEX and lead concentrations are below MTCA Method A CULs for soil throughout the Site***. Benzene, the chemical that presents the most risk to human health (in terms of both mobility and carcinogenic risk), was not reported above practical quantitation limits for any soil sample collected during the 2014 remedial over-excavation.

- ***The small quantity of TPH-G in soil that remains is below the Site-specific cleanup standard (residual saturation).*** Based on field observations and analytical results, Stantec estimates approximately 6-pounds of TPH-G mass remain in soil along the western wall of the excavation. Confirmation sample SB-3@16' reported a TPH-G concentration of 756 mg/kg at 16-feet bgs, which attenuated to less than 3.16 mg/kg at 17-feet bgs. The confirmation sample Southwall@18' reported a TPH-G concentration of 280 mg/kg. These are the highest residual TPH-G concentrations observed in soil remaining at Site, and are below the residual saturation screening level for weathered gasoline (1,000 mg/kg). As discussed previously, these concentrations are protective of the leaching pathway based on over 7-years of empirical groundwater analytical results.

- ***Remaining TPH-G is likely held in place due to adsorption and capillary forces within the soil matrix***. When a nonaqueous phase liquid (NAPL) is released to soil, some of the NAPL will be held in the soil pores or void spaces by adsorption and capillary force. The concentration of petroleum hydrocarbons under equilibrium conditions is called residual saturation. The highest TPH-G concentrations remaining in soil are below the residual saturation screening level (1,000 mg/kg) indicating vertical migration is unlikely.

- ***Petroleum impacts were not observed near the soil/water interface during the remedial excavation.*** This field observation provides additional evidence that residual petroleum hydrocarbons do not appear to be migrating to groundwater.

- ***Residual TPH-G concentrations are protective of groundwater, even if the asphalt cap is removed in the future***. Per MTCA 173-340-747(3)(e), Stantec used VLEACH, as a fate and transport model to evaluate potential impacts to groundwater quality in the event the asphalt cap is removed at Site. Infiltration was based on 70% of the average yearly rainfall in Olympia, Washington (50 inches/year) over the last 30 years [173-340-747

(5)(f)(B)(ii)]. A surrogate compound (n-hexane) was selected as a conservative worst case scenario to model TPH-G leaching using chemical property values from MTCA Table 747-4 *Petroleum EC Fraction Physical/Chemical Values* [WAC 173-340-900 MTCA Cleanup Regulation, 2007]. Based on conservative assumptions, model results indicate maximum dissolved concentrations due to TPH-G leaching to groundwater would likely be below MTCA Method A cleanup levels. A description of the model and input/output data is provided in ***Appendix H.***

Degradation

All COCs, except for TPH-G, are below MTCA Method A screening levels. Based on average degradation rates from soil analytical results (***Table 3***), residual COCs in Site soil will likely reach MTCA Method A screening levels in 2020.

9.2.1 Soil Compliance Demonstration

Soil compliance is summarized on the next page.

Conclusions
November 12, 2015

	Sample Location(s)	Media	Depth(s)	Date(s)	Location Excavated 2014[1]		Sample Location(s)	Media	Depth(s)	Date(s)
Dispenser Area	D-1, D-2 & D-2	Soil	3'[2]	6/21/95 & 9/24/97	Y	Confirmation Sample	DI@26'[3]	Soil	26'	10/9/14
							DIW	Soil	5'	10/9/14
							DIE	Soil	5'	10/9/14
						Removal	N/A	Soil	0' - 26'	10/7/14 to 10/16/14
	East Wall	Soil	17'	10/14/14	Y	Confirmation Sample	East Wall	Soil	26'	10/14/14
	MW-2	GW[4]	N/A	11/15/01	N	13 Years of GW Samples Below CULs	MW-2	GW	N/A	3/25/02 to Present
Down Gradient of Former USTs	GP-1	Soil	13' - 15'	5/23/02	Y	Confirmation Sample	CSS-10	Soil	16'	10/16/14
			15' - 18'				SB-3	Soil	25' - 26'	8/20/09
			Both			Removal	N/A	Soil	0' - 26'	10/7/14 to 10/16/14
	SB-3	Soil	16' - 16.5'	8/19/09	N	Confirmation Sample	SB-3@17'	Soil	17'	10/16/14
						Empirical Demontration	N/A	Soil	> 15' bgs	N/A
							N/A	Soil	Above Water Table	N/A
							MW-4	Ground water	N/A	8/27/07 to Present
							MW-5	Ground water	N/A	1/26/06 to Present
	SB-4	Soil	14' -15'	8/20/2009	Y	Confirmation Sample	SB-4	Soil	24' - 25'	8/20/09
						Removal	N/A	Soil	0' - 26'	10/7/14 to 10/16/14
	SB-5	Soil	14' - 15'	8/21/2009	Y	Confirmation Sample	CSS-7	Soil	23'	10/16/14
							CSS-9	Soil	16'	10/16/14
						Removal	N/A	Soil	0' - 26'	10/7/14 to 10/16/14
						Empirical Demontration	MW-5	Ground water	N/A	1/26/06 to Present
	MW-4	GW	N/A	7/15/99 to 4/11/07	Y	7 Years of GW Samples Below CULs	MW-4	GW	N/A	8/27/07 to 9/23/14[5]
	MW-5	GW	N/A	8/1/01 to 10/26/05	N	9 Years of GW Samples Below CULs	MW-5	GW	N/A	1/26/06 to Present

Notes
1 - Excavation backfilled with imported clean fill material. See 2014 UST Removal Report for details.
2 - Assumed depth based upon standard depth of product piping and dispenser equipment.
3 - Location excavated.
4 - Groundwater (GW).
5 - Well abandoned September 23, 2014 prior to UST removal activities.

9.3 GROUNDWATER LATERAL AND VERTICAL

Depth to groundwater from on-Site wells occurs at an average of approximately 26-feet bgs. All dissolved COCs have been below MTCA Method A CULs since August 2007 in on-Site wells. Groundwater analytical results, including previously un-submitted data from second and third quarter 2015, are presented in ***Table 1 and Figures 4 and 5.*** The total lead exceedances observed in June and August 2015 (MW-3 and MW-5), are not representative of lead concentrations in groundwater based on historical groundwater results and dissolved lead analytical results (August 2015).

9.4 SEDIMENT

No areas of impacted sediment exist at the Site nor require any future management.

9.5 SURFACE WATER

Surface water was unlikely impacted by historical petroleum hydrocarbons beneath the Site.

9.6 SOIL VAPOR

Based on concentrations of petroleum compounds in soil and groundwater and the depth at which residual concentrations occur, future management of soil vapor is not required.

9.7 MTCA PATHWAY EXPOSURE ANALYSIS

Exposure Pathway	Pathway Complete or Incomplete	Supporting Evidence
Human health protection from direct soil contact	Incomplete	Soil concentrations are either below site specific Method A CULs for this pathway or below 15-feet bgs.
Human health protection from soil to groundwater (drinking water)	Incomplete	Groundwater has been below Method A CULs for at least six consecutive quarters on all on-Site wells. In the event the asphalt cap is removed in the future, residual TPH-G concentrations in soil are protective of the groundwater cleanup levels (MTCA Method A) based on VLEACH model results (***Section 9.2***).
Human health protection from soil to groundwater (direct contact)	Incomplete	Groundwater has been below Method A CULs for at least six consecutive quarters on all on-Site wells. Average depth to groundwater is approximately 8-feet below the deepest remaining soil contamination.
Human health protection from soil vapor inhalation	Incomplete	Soil concentrations are either below site specific Method A CULs for this pathway or below 15-feet bgs.

Exposure Pathway	Pathway Complete or Incomplete	Supporting Evidence
Human health protection from soil to surface water	Incomplete	The distance to any surface water bodies is far greater than the potential for contaminant migration.
Human health protection from groundwater to surface water	Incomplete	Groundwater has been below Method A CULs for at least six consecutive quarters on all on-Site wells.
Terrestrial ecological protection	Incomplete	The Site qualifies for an Exclusion from TEE.

10.0 REQUEST FOR NO FURTHER ACTION DETERMINATION

The Site meets the criteria required for exclusion from further TEE, confirming that the Site is protective of the terrestrial environment. Based on the information contained in this CAR, Stantec requests a NFA determination for the Site.

11.0 REFERENCES

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TABLE 1 GROUNDWATER MONITORING AND ANALYTICAL RESULTS

TABLE 1
GROUNDWATER MONITORING AND ANALYTICAL RESULTS
7-Eleven Store No. 25983
3541 Martin Way East, Olympia, Washington
All results in micrograms per liter (µg/L), except where noted.

Well ID (TOC)	Sample Date	MTBE	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-G	EDC	EDB	Total Lead	Dissolved Lead	Depth To Groundwater	Groundwater Elevation (feet)
MW-1	07/08/99	--	--	--	--	--	--	--	--	--	--	26.00	172.33
198.33	07/15/99	--	<0.3	<0.3	<0.5	<0.6	<100	--	--	<5	--	26.02	172.31
	03/14/00	--	<0.3	<0.3	<0.5	<0.6	<100	--	--	--	--	25.38	172.95
	06/27/00	--	<0.5	<0.5	<0.5	<1.0	<100	--	--	--	--	25.97	172.36
	09/25/00	--	<0.5	2.90	0.56	2.8	100	--	--	--	--	26.52	171.81
	11/13/00	--	<0.5	<0.5	<0.5	<1.5	<100	--	--	--	--	26.30	172.03
	02/14/01	--	<0.5	<0.5	0.56 [a]	<1.0	<100	--	--	--	--	26.09	172.24
	06/07/01	--	<0.5	<0.5	<0.5	<1.0	<100	--	--	--	--	26.13	172.20
	08/01/01	--	<0.5	<0.5	<0.5	<1.0	<50	--	--	--	--	26.29	172.04
	11/15/01	--	<0.5	<0.5	<0.5	<1.0	<100	--	--	--	--	26.36	171.97
	03/25/02	--	<0.5	<1.0	<1.0	<3.0	<100	--	--	--	--	25.34	172.99
	06/21/02	--	--	--	--	--	--	--	--	--	--	--	--
	09/23/02	--	<0.5	<1.0	<1.0	1.01	<100	--	--	--	--	26.20	172.13
	12/10/02	--	--	--	--	--	--	--	--	--	--	26.37	171.96
	04/02/03	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	25.41	172.92
	06/11/03	--	--	--	--	--	--	--	--	--	--	26.05	172.28
	09/15/03	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	27.34	170.99
	12/04/03	--	--	--	--	--	--	--	--	--	--	25.51	172.82
	03/04/04	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.64	171.69
	05/10/04	--	--	--	--	--	--	--	--	--	--	27.02	171.31
	08/11/04	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	27.27	171.06
	11/17/04	--	--	--	--	--	--	--	--	--	--	27.16	171.17
	02/21/05	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.94	171.39
	05/16/05	--	--	--	--	--	--	--	--	--	--	28.96	169.37
	08/19/05	--	--	--	--	--	--	--	--	--	--	27.03	171.30
	10/26/05	--	--	--	--	--	--	--	--	--	--	27.16	171.17
	01/26/06	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	25.79	172.54
	05/11/06	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	--	--
	07/26/06	--	--	--	--	--	--	--	--	--	--	--	--
	11/09/06	--	--	--	--	--	--	--	--	--	--	24.18	174.15
	04/11/07	--	--	--	--	--	--	--	--	--	--	25.36	172.97
	08/27/07	--	--	--	--	--	--	--	--	--	--	26.15	172.18
	02/06/08	--	--	--	--	--	--	--	--	--	--	26.35	171.98
	08/18/08	--	--	--	--	--	--	--	--	--	--	25.05	173.28
	11/12/08	--	--	--	--	--	--	--	--	--	--	24.28	174.05
	02/05/09	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	25.56	172.77
	01/12/10	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	25.30	173.03
	02/14/11	--	<0.5	<0.5	<0.5	<0.5	<250	--	--	--	--	25.48	172.85
	02/09/12	--	<0.50	<0.50	<0.50	<0.50	<250	--	--	--	--	25.23	173.10
	01/18/13	--	<0.50	<0.50	<0.50	<0.50	<250	--	--	--	--	24.51	173.82
	04/08/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	<1.00	<0.00922	1.77	--	25.25	173.08
	09/23/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	--	--	--	--	26.14	172.19
	09/23/14	Well Abandoned 9/23/14											
MTCA Method A Cleanup Level		**20**	**5**	**1,000**	**700**	**1,000**	**800/ 1,000[b]**	**5**	**0.01**	**15**			

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Well ID (TOC)	Sample Date	MTBE	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-G	EDC	EDB	Total Lead	Dissolved Lead	Depth To Groundwater	Groundwater Elevation (feet)
MW-2	07/08/99	--	--	--	--	--	--	--	--	--	--	25.89	172.42
198.31	07/15/99	--	<0.3	<0.3	<0.5	44	725	--	--	<5	--	26.00	172.31
	03/14/00	--	<0.3	<0.3	0.78	1.12	104	--	--	--	--	25.34	172.97
	06/27/00	--	<0.5	<0.5	<0.5	<1.0	<100	--	--	--	--	25.94	172.37
	09/25/00	--	<0.5	2.70	0.58	2.3	<100	--	--	--	--	26.33	171.98
	11/13/00	--	<0.5	<0.5	<0.5	2.2	<100	--	--	--	--	26.32	171.99
	02/14/01	--	<0.5	<0.5	0.58 [a]	<1.0	<100	--	--	--	--	26.33	171.98
	06/07/01	--	<0.5	<0.5	<0.5	<1.0	<100	--	--	--	--	26.21	172.10
	08/01/01	--	<0.5	<0.5	<0.5	<1.0	<50	--	--	--	--	26.37	171.94
	11/15/01	--	<0.5	5.7 [a]	12 [a]	43 [a]	**1,900**	--	--	--	--	26.50	171.81
	03/25/02	--	<0.5	<1.0	<1.0	1.66	<100	--	--	--	--	25.29	173.02
	06/21/02	--	--	--	--	--	--	--	--	--	--	--	--
	09/23/02	--	0.317	<1.0	<1.0	1.01	<100	--	--	--	--	26.25	172.06
	12/10/02	--	--	--	--	--	--	--	--	--	--	26.41	171.90
	04/02/03	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	25.40	172.91
	06/11/03	--	--	--	--	--	--	--	--	--	--	26.05	172.26
	09/15/03	--	<1.0	<1.0	<1.0	<1.0	<100	--	--	--	--	27.40	170.91
	12/04/03	--	--	--	--	--	--	--	--	--	--	25.51	172.80
	03/04/04	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.64	171.67
	05/10/04	--	--	--	--	--	--	--	--	--	--	27.05	171.26
	08/11/04	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	27.34	170.97
	11/17/04	--	--	--	--	--	--	--	--	--	--	27.23	171.08
	02/21/05	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.95	171.36
	05/17/05	--	--	--	--	--	--	--	--	--	--	29.21	169.10
	08/19/05	--	--	--	--	--	--	--	--	--	--	28.91	169.40
	10/26/05	--	--	--	--	--	--	--	--	--	--	29.68	168.63
	01/26/06	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	25.72	172.59
	05/11/06	--	--	--	--	--	--	--	--	--	--	25.90	172.41
	07/26/06	--	--	--	--	--	--	--	--	--	--	--	--
	11/09/06	--	--	--	--	--	--	--	--	--	--	22.96	175.35
	04/11/07	--	--	--	--	--	--	--	--	--	--	23.35	174.96
	08/27/07	--	--	--	--	--	--	--	--	--	--	26.22	172.09
	02/06/08	--	--	--	--	--	--	--	--	--	--	26.38	171.93
	08/18/08	--	--	--	--	--	--	--	--	--	--	25.12	173.19
	11/12/08	--	--	--	--	--	--	--	--	--	--	23.06	175.25
	02/05/09	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	24.98	173.33
	01/12/10	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	25.23	173.08
	02/14/11	--	<0.5	<0.5	<0.5	<0.5	<250	--	--	--	--	25.45	172.86
	02/09/12	--	<0.50	<0.50	<0.50	<0.50	<250	--	--	--	--	25.18	173.13
	01/18/13	--	<0.50	<0.50	<0.50	<0.50	<250	--	--	--	--	25.13	173.18
	04/08/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	<1.00	<0.00932	13.2	--	25.25	173.06
	09/23/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	--	--	--	--	26.18	172.13
	12/08/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	<1.00	<0.0600	1.75	--	25.54	172.77
	03/09/15	<1.00	<1.00	<1.00	<1.00	<2.00	<100	<1.00	<0.0200	5.44	--	25.49	172.82
	06/09/14	--	<1.00	<1.00	<1.00	<3.00	<100	--	--	11.1	--	25.90	172.41
	08/19/15	--	<1.00	<1.00	<1.00	<3.00	<100	--	--	5.50	<0.00200	26.23	172.08
MTCA Method A Cleanup Level		**20**	**5**	**1,000**	**700**	**1,000**	**800/ 1,000 [b]**	**5**	**0.01**	**15**			

TABLE 1
GROUNDWATER MONITORING AND ANALYTICAL RESULTS
7-Eleven Store No. 25983
3541 Martin Way East, Olympia, Washington
All results in micrograms per liter (µg/L), except where noted.

Well ID (TOC)	Sample Date	MTBE	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-G	EDC	EDB	Total Lead	Dissolved Lead	Depth To Groundwater	Groundwater Elevation (feet)
MW-3	07/08/99	--	--	--	--	--	--	--	--	--	--	25.60	172.59
198.19	07/15/99	--	<0.3	<0.3	<0.5	<0.6	<100	--	--	<5	--	26.10	172.09
	03/14/00	--	<0.3	<0.3	<0.5	<0.6	<100	--	--	--	--	24.89	173.30
	06/27/00	--	<0.5	<0.5	<0.5	<1.0	<100	--	--	--	--	25.56	172.63
	09/25/00	--	<0.5	2.10	<0.5	1.7	<100	--	--	--	--	25.98	172.21
	11/13/00	--	<0.5	<0.5	<0.5	<1.5	<100	--	--	--	--	25.94	172.25
	02/14/01	--	<0.5	<0.5	<0.57 [a]	<1.0	<100	--	--	--	--	26.15	172.04
	06/07/01	--	<0.5	<0.5	<0.5	<1.0	<100	--	--	--	--	25.87	172.32
	08/01/01	--	<0.5	<0.5	<0.5	<1.0	<50	--	--	--	--	26.01	172.18
	11/15/01	--	<0.5	<0.5	<0.5	<1.0	<100	--	--	--	--	26.20	171.99
	03/25/02	--	<0.5	<1.0	<1.0	<3.0	<100	--	--	--	--	23.89	174.30
	06/21/02	--	<0.5	<1.0	<1.0	<3.0	<100	--	--	--	--	25.59	172.60
	09/23/02	--	0.299	<1.0	<1.0	<1.0	<100	--	--	--	--	25.88	172.31
	12/10/02	--	<0.5	<1.0	<1.0	<3.0	<100	--	--	--	--	26.00	172.19
	04/02/03	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	25.98	172.21
	06/11/03	--	<1.0	<1.0	<1.0	<2.0	<100	--	--		--	25.68	172.51
	09/15/03	--	<1.0	<1.0	<1.0	<2.0	<100	--	--		--	27.05	171.14
	12/04/03	--	--	--	--	--	--	--	--	--	--	25.09	173.10
	03/04/04	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.23	171.96
	05/10/04	--	--	--	--	--	--	--	--	--	--	26.68	171.51
	08/11/04	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.97	171.22
	11/17/04	--	--	--	--	--	--	--	--	--	--	26.84	171.35
	02/21/05	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.61	171.58
	05/17/05	--	--	--	--	--	--	--	--	--	--	28.46	169.73
	08/19/05	--	--	--	--	--	--	--	--	--	--	27.68	170.51
	10/26/05	--	--	--	--	--	--	--	--	--	--	24.68	173.51
	01/26/06	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	25.27	172.92
	05/11/06	--	--	--	--	--	--	--	--	--	--	25.40	172.79
	07/26/06	--	--	--	--	--	--	--	--	--	--	--	--
	11/09/06	--	--	--	--	--	--	--	--	--	--	21.14	177.05
	04/11/07	--	--	--	--	--	--	--	--	--	--	24.92	173.27
	08/27/07	--	--	--	--	--	--	--	--	--	--	25.83	172.36
	02/06/08	--	--	--	--	--	--	--	--	--	--	--	--
	08/18/08	--	--	--	--	--	--	--	--	--	--	24.73	173.46
	02/05/09	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	25.14	173.05
	01/12/10	Unable to access well									--	--	--
	02/14/11	Unable to access well									--	--	--
	02/09/12	Unable to access well									--	--	--
	01/18/13	Unable to access well									--	--	--
	04/08/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	<1.00	<0.00969	6.10	--	--	--
	09/23/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	--	--	--	--	25.81	172.38
	12/08/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	<1.00	<0.0600	2.12	--	25.15	173.04
	03/09/15	<1.00	<1.00	<1.00	<1.00	<2.00	<100	<1.00	<0.0198	10.4	--	25.11	173.08
	06/09/15	--	<1.00	<1.00	<1.00	<3.00	<100	--	--	**26.0**	--	25.54	172.65
	08/19/15	--	<1.00	<1.00	<1.00	<3.00	<100	--	--	**16.5**	<0.00200	25.85	172.34
MTCA Method A Cleanup Level		**20**	**5**	**1,000**	**700**	**1,000**	**800/ 1,000[b]**	**5**	**0.01**	**15**			

TABLE 1
GROUNDWATER MONITORING AND ANALYTICAL RESULTS
7-Eleven Store No. 25983
3541 Martin Way East, Olympia, Washington
All results in micrograms per liter (µg/L), except where noted.

Well ID (TOC)	Sample Date	MTBE	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-G	EDC	EDB	Total Lead	Dissolved Lead	Depth To Groundwater	Groundwater Elevation (feet)
MW-4	07/08/99	--	--	--	--	--	--	--	--	--	--	26.12	172.43
198.55	07/15/99	--	**<30**	**5,150**	<50	**23,900**	**90,800**	--	--	<5	--	26.10	172.45
	03/14/00	--	**<30**	**1,870**	**3,030**	**27,500**	**67,000**	--	--	--	--	25.41	173.14
	06/27/00	--	**100**	**2,500**	**3,400**	**27,000**	**91,000**	--	--	--	--	26.81	171.74
	09/25/00	--	**10,000**	**4,800**	**4,200**	**4,200**	**68,000**	--	--	--	--	26.70	171.85
	11/13/00	--	**<120**	780	**1,800**	**17,000**	**70,000**	--	--	--	--	26.77	171.78
	02/14/01	--	**<120**	660	**1,300** [a]	**21,000**	**99,000**	--	--	--	--	25.74	172.81
	06/07/01	--	**<25**	97	360	**4,800**	**23,000**	--	--	--	--	26.34	172.21
	08/01/01	--	**20.5**	329	300	**12,100**	**39,900**	--	--	--	--	26.53	172.02
	11/15/01	--	**<10**	97 [a]	350 [a]	**4,700** [a]	**30,000**	--	--	--	--	27.37	171.18
	03/25/02	--	1.7	74.8	143	**1,489**	**34,100**	--	--	--	--	25.45	173.10
	06/21/02	--	<0.5	5.28	349	**1,867**	**22,600**	--	--	--	--	26.54	172.01
	09/23/02	--	1.0	7.97	77.3	438	**6,090**	--	--	--	--	26.65	171.90
	12/10/02	--	**<5.0**	7.38	225.0	**1,788**	**14,500**	--	--	--	--	26.67	171.88
	04/02/03	--	**7.7**	7.9	350	**1,950**	**30,000**	--	--	--	--	26.44	172.11
	06/11/03	--	**5.9**	6.5	160	580	**7,600**	--	--	--	--	26.54	172.01
	09/15/03	--	**<5.0**	<5.0	76.0	460	**5,800**	--	--	--	--	27.67	170.88
	12/04/03	--	4.9	2.1	140	332	**5,200**	--	--	--	--	26.41	172.14
	03/04/04	--	4.5	3.2	75	259	**3,800**	--	--	--	--	27.11	171.44
	05/10/04	--	1.6	<1.0	24	100	**2,300**	--	--	--	--	27.65	170.90
	08/11/04	--	1.7	<1.0	10	38	**1,100**	--	--	--	--	27.76	170.79
	11/17/04	--	**5.3**	15	580	**4,500**	**43,000**	--	--	--	--	27.12	171.43
	02/21/05	--	3.8	1.8	93	630	**16,000**	--	--	--	--	27.61	170.94
	05/17/05	--	2.2	<1.0	49	190	**6,600**	--	--	--	--	27.51	171.04
	08/19/05	--	**1,100**	580	**1,600**	**5,330**	**30,000**	--	--	--	--	29.99	168.56
	10/26/05	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.10	172.45
	01/26/06	--	1.9	<1.0	120	139	**3,400**	--	--		--	26.65	171.90
	05/11/06	--	<1.0	<1.0	75	37	**2,400**	--	--	--	--	27.40	171.15
	07/26/06	--	**350**	**2,900**	**750**	**2,740**	**24,000**	--	--	--	--	28.56	169.99
	11/09/06	--	**170**	<4.0	91	55	**3,300**	--	--		--	26.68	171.87
	04/11/07	--	<4.0	<4.0	59	50	**3,100**	--	--	--	--	26.11	172.44
	08/27/07	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	27.05	171.50
	02/06/08	--	<1.0	<1.0	6.9	<2.0	160	--	--	--	--	26.28	172.27
	08/18/08	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.95	171.60
	11/12/08	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.78	171.77
	02/05/09	<0.20	<1.0	<1.0	<1.0	<2.0	<100	<0.20	<0.0095	--	--	26.28	172.27
	01/12/10	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	24.95	173.60
	02/14/11	--	<0.5	<0.5	<0.5	<0.5	<250	--	--	--	--	26.13	172.42
	02/09/12	--	<0.50	<0.50	<0.50	<0.50	<250	--	--	--	--	25.79	172.76
	01/18/13	--	<0.50	<0.50	<0.50	<0.50	<250	--	--	--	--	24.32	174.23
	04/08/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	<1.00	<0.00952	6.48	--	26.95	171.60
	09/23/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	--	--	--	--	26.62	171.93
		Well Abandoned 9/23/14											
MTCA Method A Cleanup Level		**20**	**5**	**1,000**	**700**	**1,000**	**800/ 1,000**[b]	**5**	**0.01**	**15**			

TABLE 1
GROUNDWATER MONITORING AND ANALYTICAL RESULTS
7-Eleven Store No. 25983
3541 Martin Way East, Olympia, Washington
All results in micrograms per liter (µg/L), except where noted.

Well ID (TOC)	Sample Date	MTBE	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-G	EDC	EDB	Total Lead	Dissolved Lead	Depth To Groundwater	Groundwater Elevation (feet)
MW-5	06/07/01	--	<0.5	<0.5	2.1	26	950	--	--	--	--	26.48	171.88
198.36	08/01/01	--	1.4	<0.5	3.0	4.3	**899**	--	--	--	--	26.76	171.60
	11/15/01	--	<0.5	<0.5	6.5 [a]	20 [a]	**1,500**	--	--	--	--	27.08	171.28
	03/25/02	--	<0.5	<1.0	0.6	1.6	188	--	--	--	--	26.10	172.26
	06/21/02	--	<0.5	<1.0	<1.0	<3.0	<100	--	--	--	--	26.59	171.77
	09/23/02	--	0.304	<1.0	<1.0	1.6	<100	--	--	--	--	26.65	171.71
	12/10/02	--	<0.5	<1.0	<1.0	<3.0	<100	--	--	--	--	26.70	171.66
	04/02/03	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.24	172.12
	06/11/03	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.70	171.66
	09/15/03	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	27.67	170.69
	12/04/03	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.32	172.04
	03/04/04	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	27.48	170.88
	05/10/04	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	27.58	170.78
	08/11/04	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	27.71	170.65
	11/17/04	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	27.68	170.68
	02/21/05	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	27.31	171.05
	05/17/05	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	31.26	167.10
	08/19/05	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	28.46	169.90
	10/26/05	--	**7.50**	<1.0	<1.0	1.1	410	--	--	--	--	24.25	174.11
	01/26/06	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.55	171.81
	05/11/06	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.60	171.76
	07/26/06	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	31.68	166.68
	11/09/06	--	--	--	--	--	--	--	--	--	--	22.90	175.46
	04/11/07	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.17	172.19
	08/27/07	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.70	171.66
	02/06/08	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.12	172.24
	08/18/08	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	25.65	172.71
	11/12/08	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.65	171.71
	02/05/09	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	26.37	171.99
	01/12/10	--	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	24.90	173.46
	02/14/11	--	<0.5	<0.5	<0.5	<0.5	<250	--	--	--	--	26.25	172.11
	02/09/12	--	<0.50	<0.50	<0.50	<0.50	<250	--	--	--	--	26.00	172.36
	01/18/13	--	<0.50	0.60	<0.50	<0.50	<250	--	--	--	--	26.00	172.36
	04/08/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	<1.00	<0.00962	2.51	--	26.05	172.31
	09/23/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	--	--	--	--	26.65	171.71
	12/08/14	<1.00	<1.00	<1.00	<1.00	<2.00	<50.0	<1.00	<0.0600	2.52	--	26.39	171.97
	03/09/15	<1.00	<1.00	<1.00	<1.00	<2.00	<100	<1.00	<0.0202	11.3	--	26.34	172.02
	06/09/15	--	<1.00	<1.00	<1.00	<3.00	<100	--	--	**28.5**	--	26.55	171.81
	08/19/15	--	<1.00	<1.00	<1.00	<3.00	<100	--	--	**21.6**	<0.00200	26.64	171.72
MTCA Method A Cleanup Level		**20**	**5**	**1,000**	**700**	**1,000**	**800/ 1,000[b]**	**5**	**0.01**	**15**			

Explanation of Abbreviations:

TOC = top of casing elevation
MtBE = methyl tertiary butyl ether
TPH-G = total petroleum hydrocarbons as gasoline
EDC = 1,2-Dichloroethane
EDB = 1,2-Dibromoethane
-- = not sampled, not measured, or not available
< = less than the reporting limit
MTCA = Model Toxics Control Act

Notes:

[a] Method blank contamination

[b] The TPH-G cleanup level is reduced from 1,000 µg/L to 800 µg/L if benzene is present in the sample

Bold values exceed the MTCA Method A Cleanup Level

TABLE 2A SOIL ANALYTICAL RESULTS – TPH-G, BTEX, MTBE AND TOTAL LEAD

TABLE 2A
Soil Analytical Results - TPH-G, BTEX, MTBE & Total Lead
7-Eleven Store No. 25983
3541 Martin Way East
Olympia, Washington
All concentrations are in milligrams per kilogram (mg/kg).

Sample Type	Sample Name	Depth (feet bgs)	USCS	PID (ppm)	Date Sampled	BTEX Compounds (mg/Kg)				TPH-G (mg/Kg)	MTBE (mg/Kg)	Total Lead (mg/Kg)
						Benzene	Toluene	Ethyl Benzene	Total Xylenes			
1995 Product Piping Upgrade - Fluor Daniel GTI												
Dispenser Area Samples	D-1	--	--	--	06/21/95	**<0.05**	<0.05	<0.05	0.56	**140**	--	<10
	D-2	--	--	--	06/21/95	**<0.40**	**16**	**11**	**120**	**1,400**	--	<10
Tank Area Samples	T-1	--	--	--	06/21/95	**<0.05**	<0.05	<0.05	<0.10	<1.0	--	<10
	T-2	--	--	--	06/21/95	**<0.05**	<0.05	<0.05	<0.10	<1.0	--	<10
1997 Limited Site Assessment - Fluor Daniel GTI												
Dispenser Area Samples	D-1[a]	--	--	--	09/24/97	**<0.05**	0.0934	<0.05	0.289	10.7	--	18.4
	D-2[a]	--	--	--	09/24/97	**<10.0**	**188**	**60.4**	**1,060**	**11,100**	--	<10
Fill Port Sample	FP-1	--	--	--	09/24/97	**<0.05**	0.223	<0.05	0.242	5.63	--	<10
Product Line Sample	PL-1	--	--	--	09/24/97	**<0.05**	0.0527	<0.05	<0.1	<5.0	--	13.7
1999 Well Install - IT Corporation												
Soil Boring Samples	MW-1	12.5-15.5	GM	0.0	06/07/99	**<0.05**	<0.05	<0.05	<0.10	<10	<0.05	31.7
		24.5-27.5	SM	0.0	06/07/99	**<0.05**	<0.05	<0.05	<0.10	<10	<0.05	15.3
	MW-2	11.5-14.5	SP	0.0	06/07/99	**<0.05**	<0.05	<0.05	<0.10	<10	<0.05	16.7
		26.5-29.5	SP-GP	0.0	06/07/99	**<0.05**	<0.05	<0.05	<0.10	<10	<0.05	17.8
	MW-3	11.5-14.5	SM	0.0	06/07/99	**<0.05**	<0.05	<0.05	<0.10	<10	<0.05	28.7
		26.5-29.5	GP	0.0	06/07/99	**<0.05**	<0.05	<0.05	<0.10	<10	<0.05	15.2
	MW-4	6.5-9.5	ML	0.0	06/07/99	**<0.05**	<0.05	<0.05	<0.10	<10	<0.05	43.3
		11.5-14.5	SM	--	06/07/99	**<0.05**	<0.05	<0.05	0.117	<10	<0.05	29
2001 Well Install - IT Corporation												
Soil Boring Samples	MW-5	15	GM	113	04/26/01	<0.005	<0.005	<0.005	<0.015	<1.0	--	--
		25	GP	27	04/26/01	<0.005	<0.005	<0.005	0.0097	<1.0	--	--
2002 Subsurface Assessment - IT Corporation												
Soil Boring Samples	GP-1	13-15	GW	442	05/23/02	**0.55**	1.23	**17.2**	**148**	**2,230**	--	--
		15-18	GW	730	05/23/02	0.192	0.15	0.342	1.789	**236**	--	--
	GP-4	12-16	GW	190	05/23/02	<0.0213	0.01	<0.0425	0.067	<4.25	--	--
		16-20	GP	0.0	05/23/02	<0.0214	0.01	0.0084	0.067	<4.28	--	--
		24-28	SP	10	05/23/02	<0.0209	<0.0419	<0.0419	0.053	<4.19	--	--
		28-32	GP	8.0	05/23/02	<0.0261	<0.0522	<0.0522	0.057	<5.22	--	--
	GP-5	16-20	SP	0.0	05/23/02	<0.0213	0.03	0.0087	0.047	<4.26	--	--
		24-28	SP	0.0	05/23/02	<0.0206	<0.0413	<0.0413	0.1238	<4.13	--	--
		28-32	SP	0.0	05/23/02	<0.0219	<0.0437	<0.0437	0.052	<4.37	--	--
2009 Subsurface Assessment - Stantec												
Soil Boring Samples	SB-1	15-15.5	ML	0.0	08/19/09	<0.020	<0.045	<0.045	<0.090	<4.5	--	--
		24-25	GP	0.0	08/20/09	<0.020	<0.049	<0.049	<0.098	<4.9	--	--
	SB-2	5-5.5	SM	0.0	08/18/09	<0.020	<0.069	<0.069	<0.138	<6.9	--	--
	SB-3	5-5.5	SM	0.0	08/18/09	<0.020	<0.073	<0.073	<0.146	<7.3	--	--
		10-10.5	GP	0.0	08/19/09	<0.020	<0.064	<0.064	<0.128	<6.4	--	--
		16-16.5	GW	760	08/19/09	**1.3**	0.15	5.1	**29.8**	**980**	<0.10	<5.6
		25-26	GP	0.0	08/20/09	<0.020	<0.044	0.048	0.291	6.6	--	--
	SB-4	14-15	GP	0.0	08/20/09	**0.080**	<0.11	0.49	0.79	**140**	--	--
		24-25	GP	0.0	08/20/09	<0.020	<0.054	<0.054	<0.108	<5.4	--	--
	SB-5	9-10	SM	0.0	08/21/09	<0.020	<0.056	<0.056	<0.112	<5.6	--	--
		14-15	SM	40	08/21/09	**0.33**	0.41	3.5	**24.2**	**530**	<0.099	<5.6
		24-25	GP	0.0	08/21/09	<0.020	<0.049	<0.049	<0.098	<4.9	--	--
	SB-6	14-15	ML	0.0	08/21/09	<0.020	<0.047	<0.047	<0.094	<4.7	--	--
		19-20	GP	0.0	08/21/09	<0.020	<0.062	<0.062	<0.124	<6.2	--	--
	SB-7	5-5.5	ML	0.0	08/18/09	<0.020	<0.055	<0.055	<0.110	<5.5	--	--
		14-15	GP	0.0	08/21/09	<0.020	<0.054	<0.054	<0.108	<5.4	--	--
		24-25	GP	0.0	08/21/09	<0.020	<0.062	<0.062	<0.124	<6.2	--	--
	SB-8	5-5.5	ML	0.0	08/18/09	<0.020	<0.067	<0.067	<0.134	<6.7	--	--
		15-16	ML	0.0	08/21/09	<0.020	<0.063	<0.063	<0.126	<6.3	--	--
		24-25	GP	0.0	08/21/09	<0.020	<0.048	<0.048	<0.096	<4.8	--	--
	SB-3 FD	16-16.5	GW	834	08/19/09	**0.039**	<0.050	<0.49	3.01	**92**	--	--
		26	GP	0.0	08/20/09	<0.020	<0.061	<0.061	0.094	<6.1	--	--
	SB-5 FD	15	SM	40	08/21/09	**0.54**	0.49	4.4	**33.6**	**640**	--	--
MTCA Method A Cleanup Levels						**0.03**	**7**	**6**	**9**	**100[b]**	**0.01**	**250**

TABLE 2A
Soil Analytical Results - TPH-G, BTEX, MTBE & Total Lead
7-Eleven Store No. 25983
3541 Martin Way East
Olympia, Washington
All concentrations are in milligrams per kilogram (mg/kg).

Sample Type	Sample Name	Depth (feet bgs)	USCS	PID (ppm)	Date Sampled	BTEX Compounds (mg/Kg)				TPH-G (mg/Kg)	MTBE (mg/Kg)	Total Lead (mg/Kg)
						Benzene	Toluene	Ethyl Benzene	Total Xylenes			
2014 UST Removal - Stantec												
Stockpile Samples	CSP-1	--	--	7	10/07/14	<.0.0135	<0.0135	<0.0203	<0.0270	<3.38	--	9.75
	CSP-2	--	--	0	10/08/14	<0.0139	<0.0139	<0.0208	<0.0278	<3.46	--	9.73
	CSP-3	--	--	0	10/09/14	<0.0137	<0.0137	<0.0205	<0.0274	<3.42	--	6.61
	DSP-1	--	--	1,874	10/09/14	<0.0133	<0.0133	<0.0199	0.0542	20.1	--	2.89
	DSP-2	--	--	1,546	10/09/14	<0.0134	<0.0134	<0.0202	<0.0268	5.36	--	2.22
	DSP-3	--	--	2,426	10/09/14	<0.0160	<0.0160	<0.0240	0.153	24.2	--	2.20
	DSP-4	--	--	2,130	10/15/14	<0.0121	<0.0121	0.160	1.178	46.4	--	2.25
	DSP-5	--	--	1,647	10/16/14	<0.0117	0.0225	1.28	8.59	**330**	--	2.10
	DSP-6	--	--	1,866	10/16/14	<0.0111	0.260	5.31	**40.4**	**934**	--	2.09
UST Basin Bottom Samples	WEST TANK@13'	13'	--	794	10/08/14	<0.0124	<0.0124	0.0799	0.542	98.6	--	3.10
	MID TANK@13'	13'	--	7	10/08/14	<0.0138	<0.0138	<0.0207	<0.0276	<3.45	--	3.35
	EAST TANK@12'	12'	--	0	10/08/14	<0.0150	<0.0150	<0.0226	<0.0300	<3.76	--	2.66
Side Wall Samples	WEST WALL@8'	8'	--	1	10/08/14	<0.0172	<0.0172	<0.0258	<0.0344	<4.30	--	3.27
	EAST WALL@10'	10'	--	3	10/08/14	<0.0124	<0.0124	<0.0186	<0.0248	<3.10	--	1.55
	EAST WALL@17'	17'	--	2,285	10/14/14	<0.0108	4.07	6.38	**40.9**	**517**	--	2.40
	EAST WALL@26'	26'	--	3	10/14/14	<0.0112	0.0152	<0.0169	0.0219	<2.81	--	2.19
	NORTH WALL@9'	9'	--	0	10/09/14	<0.0148	<0.0148	<0.0221	<0.0296	<3.69	--	2.16
	NORTH WALL@16'	16'	--	250	10/15/14	<0.02	<0.05	<0.05	<0.15	63	--	<5.0
	NORTH WALL@18'	18'	--	448	10/15/14	<0.02	<0.05	<0.05	<0.15	24	--	--
	NORTH WALL@24'	24'	--	2	10/15/14	<0.0107	<0.0107	<0.0161	0.0214	<2.68	--	2.21
	SOUTH WALL@10'	10'	--	1	10/15/14	<0.0130	<0.0130	<0.195	<0.026	<3.25	--	7.01
	SOUTH WALL@18'	18'	--	1,389	10/15/14	<0.02	<0.05	0.09	1.8	**280**	<0.05	<5.0
Product Line Sample	PL@3'	3'	--	0	10/09/14	<0.0138	<0.0138	<0.0207	<0.0276	<3.45	--	1.60
Dispenser Island Samples	DIW@5'	5'	--	0	10/09/14	<0.0142	<0.0142	<0.0213	<0.0284	<3.54	--	4.67
	DIE@5'	5'	--	1	10/09/14	<0.0131	<0.0131	<0.0196	<0.0262	<3.27	--	1.88
	DI@20'	20'	--	2,176	10/09/14	<0.0150	0.0467	0.586	5.68	**270**	--	2.53
	DI@26'	26'	--	0	10/09/14	<0.0240	<0.0240	<0.0361	0.0562	<6.01	--	2.88
Excavation Samples	CSS-1@17'	17'	--	5	10/10/14	<0.0130	<0.0130	<0.0195	<0.0260	<3.25	--	2.02
	CSS-2@20'	20'	--	5	10/10/14	<0.0164	<0.0164	<0.0246	<0.0328	<4.10	--	2.29
	CSS-3@17'	17'	--	2	10/13/14	<0.0122	<0.0122	<0.0182	<0.0244	<3.04	--	1.76
	CSS-3@22'	22'	--	2	10/13/14	<0.0105	<0.0105	<0.0158	<0.0210	<2.63	--	1.62
	CSS-4@18'	18'	--	3	10/13/14	<0.0120	<0.0120	<0.0180	<0.0240	<3.00	--	2.44
	CSS-4@25'	25'	--	4	10/13/14	<0.0129	<0.0129	<0.0193	<0.0258	<3.22	--	2.55
	CSS-5@18'	18'	--	0	10/13/14	<0.0140	<0.0140	<0.0210	<0.0280	<3.49	--	2.53
	CSS-5@24'	24'	--	0	10/13/14	<0.0127	<0.0127	<0.0190	<0.0254	<3.17	--	2.82
	CSS-6@18'	18	--	1,752	10/16/14	<0.0104	<0.0104	0.0452	0.3304	84.2	<0.0260	1.80
	CSS-7@23'	23'	--	30	10/16/14	<0.0127	<0.0127	<0.0190	<0.0254	<3.17	<0.0317	2.00
	CSS-8@25'	25'	--	12	10/16/14	<0.0113	<0.0113	<0.0170	<0.0226	<2.83	--	2.00
	CSS-9@16'	16'	--	4	10/16/14	<0.0113	<0.0113	<0.0169	0.0531	<2.81	<0.0281	2.03
	CSS-10@16'	16'	--	0	10/16/14	<0.0128	0.0382	<0.0192	0.0304	<3.20	<0.316	3.03
	SS-1@20'	20'	--	2,440	10/10/14	<0.0147	0.0247	0.0690	0.507	48.7	--	3.22
	SS-1@25'	25'	--	1	10/10/14	<0.0128	<0.0128	<0.0192	<0.0256	<3.20	--	1.95
	SS-2@17'	17'	--	970	10/10/14	<0.0144	<0.0144	<0.0216	<0.0288	8.80	--	2.04
	SS-3@15'	15'	--	1,904	10/10/14	<0.0141	<0.0141	0.146	0.660	86.9	--	2.13
	SS-4@18'	18'	--	2,022	10/10/14	<0.0147	<0.0147	<0.0220	0.1933	85.7	--	2.29
	SS-4@23'	23'	--	4	10/10/14	<0.0129	<0.0129	<0.0194	<0.0258	<3.23	--	2.64
	SB-3@16'	16'	--	1,750	10/16/14	<0.0112	<0.0112	0.451	4.02	**756**	--	2.04
	SB-3@17'	17'	--	141	10/16/14	<0.0127	<0.0127	<0.0190	<0.0254	<3.16	--	2.16
MTCA Method A Cleanup Levels						**0.03**	**7**	**6**	**9**	**100**	**0.01**	**250**

Explanation of Abbreviations:

TPH-G	= total petroleum hydrocarbons in the gasoline range
MTBE	= methyl tertiary butyl ether
feet bgs	= feet below ground surface
USCS	= Unified Soil Classification System
PID	= photoionization detector
ppm	= parts per million
BTEX	= benzene, toluene, ethyl benzene, and total xylenes
mg/Kg	= milligrams per kilogram or approximately ppm
--	= not analyzed
MTCA	= Model Toxics Control Act
<	= result is below practical quantitation limits

Notes:

[a]	= D-1 and D-2 samples were collected during the September 24, 1997 investigation and are separate samples from D-1 and D-2
[b]	= gasoline mixtures without benzene and where the total of the other BTEX constituents are less than 1% of the gasoline mixture have a cleanup level of 100 mg/Kg; all other mixtures are 30 mg/Kg
	= samples removed from Site during 2014 excavation
bold	= analytical result exceeds the specified MTCA Method A Cleanup Level

CLEANUP ACTION REPORT
7-ELEVEN STORE NO. 25983
3541 MARTIN WAY EAST, OLYMPIA, WA

November 12, 2015

TABLE 2B SOIL ANALYTICAL RESULTS – NAPHTHALENE, VPH, EDB, AND EDC

Stantec

TABLE 2B
Soil Analytical Results - Naphthalene, VPH, EDB, and EDC
7-Eleven Store No. 25983
3541 Martin Way East
Olympia, Washington
All concentrations are in milligrams per kilogram (mg/kg).

Sample Location and Depth (feet bgs)	Date Sampled	Total Naphthalenes* (mg/Kg)			Volatile Petroleum Hydrocarbons (mg/Kg)							EDB (mg/Kg)	EDC (mg/Kg)
					Aliphatic				Aromatic				
		Naphthalene	2-Methyl Naphthalene	1-Methyl Naphthalene	C5-C6	C6-C8	C8-C10	C10-C12	C8-C10	C10-C12	C12-C13		
2009 Subsurface Assessment - Stantec													
SB-3@16'	08/19/09	0.11	0.43	0.18	<9.8	25	<9.8	14	31	27	<9.8	<0.10	<0.10
SB-5@15'	08/21/09	--	--	--	--	--	--	--	--	--	--	<0.099	<0.099
2014 UST Removal - Stantec													
South Wall @ 18'	10/15/14	0.02	0.22	0.12	<5.0	6.3	6.0	<5.0	26	64	48	<0.01	<0.05
CSS-6 @ 18'	10/16/14	<0.0533	<0.0533	<0.0533	<1.18	1.88	1.70	9.87	8.28	44.4	24.1	<0.00260	<0.0156
CSS-7 @ 23'	10/16/14	<0.0530	<0.0530	<0.0530	<1.59	<1.59	<1.59	<1.59	<1.59	<1.59	<1.59	<0.0317	<0.0190
CSS-9 @ 16'	10/16/14	<0.0521	<0.0521	<0.0521	<1.12	<1.12	<1.12	<1.12	<1.12	1.67	1.32	<0.00281	<0.0169
CSS-10 @ 16'	10/16/14	<0.0564	<0.0564	<0.0564	<1.26	<1.26	<1.26	<1.26	<1.26	<1.26	<1.26	<0.00320	<0.0192
MTCA Method A Cleanup Levels		**5**			--	--	--	--	--	--	--	**0.005**	--

MTCA METHOD B CLEANUP LEVEL FOR TPH-G					
Sample ID	Sample Depth (ft bgs)	Sample Date	Sample Location Excavated?	Total TPH-G Concentration [1]	Calculated MTCA Method B Cleanup Level Results (TPH-G)
Southwall@18'	18	10/15/14	No	155.3	2,278
CSS-6@18'	18	10/16/14	No	90.9	2,012
CSS-7@23'	23	10/16/14	No	5.7	3,158
CSS-9@16'	16	10/16/14	No	5.9	2,540
CSS-10@16'	16	10/16/14	No	4.6	3,121
MEDIAN MTCA METHOD B CLEANUP LEVEL FOR TPH-G =					**2,540**
RESIDUAL SATURATION SCREENING LEVEL FOR TPH-G =					**1,000**

Explanation of Abbreviations

VPH	= volatile petroleum hydrocarbons
C5-C13	= petroleum equivalent carbon number (fractionization)
EDB	= 1,2-Dibromoethane
EDC	= 1,2-Dichloroethane
bgs	= below ground surface
mg/Kg	= milligrams per kilogram or approximately ppm
MTCA	= Model Toxics Control Act
*	= Naphthalenes by EPA Method 8270
	= Sample has been removed from site
bold	= analytical result exceeds the specified MTCA Method A Cleanup Level
--	= not analyzed
ft bgs	= feet below ground surface
<	= result is below practical quantitation limits
NWVPH	= Northwest Volatile Petroleum Hydrocarbons
NWEPH	= Northwest Extractable Petroleum Hydrocarbons
MTCA	= Model Toxics Control Act
Total Naphthalenes	= total of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene

Notes

[1]	= Calculated using the MTCATPH workbook from VPH/EPH fractionation data, total naphthalenes, and BTEX analytical results

TABLE 3 SOIL DEGRADATION CALCULATION

TABLE 3
SOIL DEGRADATION CALCULATION
7-Eleven Store No. 25983
3541 Martin Way E
Olympia, Washington

Sample ID	TPH-G Concentration (mg/kg)	Depth (feet bgs)	Soil Sample Collection Date	Elapsed Time Between Soil Samples (years)	Degradation Constant (k)	Time To Reach MTCA Method A CUL (years)
SB-3@16'	756	16	2014	12	-0.0901	22
GP-1	2,230	15	2002			
SB-3@16'	756	16	2014	5	-0.0519	39
SB-3	980	16	2009			
CSS-9@16'	3	16	2014	5	-1.0479	-3
SB-5	530	15	2009			
DIE	3	5	2014	19	-0.1977	-17
D-1	140	3	1995			
DIW	4	5	2014	19	-0.3147	-11
D-2	1,400	3	1995			
DIW	4	5	2014	17	-0.4736	-7
D-2	11,100	3	1997			
Average					-0.3627	6
Estimated Year for Site Soil to Reach MTCA Method A CUL						**2020**

Soil degradation equation:

$$N=N_o e^{kt}$$

Where,

N = soil concentration after elapsed time t (mg/kg)
N_o = soil concentration at initial time t_o (mg/kg)
t = elapsed time (years)
e = base of the natural logarithm
k = first order rate constant ($years^{-1}$)

Notes:

CUL = cleanup level
feet bgs = feet below ground surface
MTCA = Model Toxics Control Act
N/A = not applicable (degradation calculation for comparison purposes only)
TPH-G = total petroleum hydrocarbons characterized as gasoline
mg/kg = milligrams per kilogram

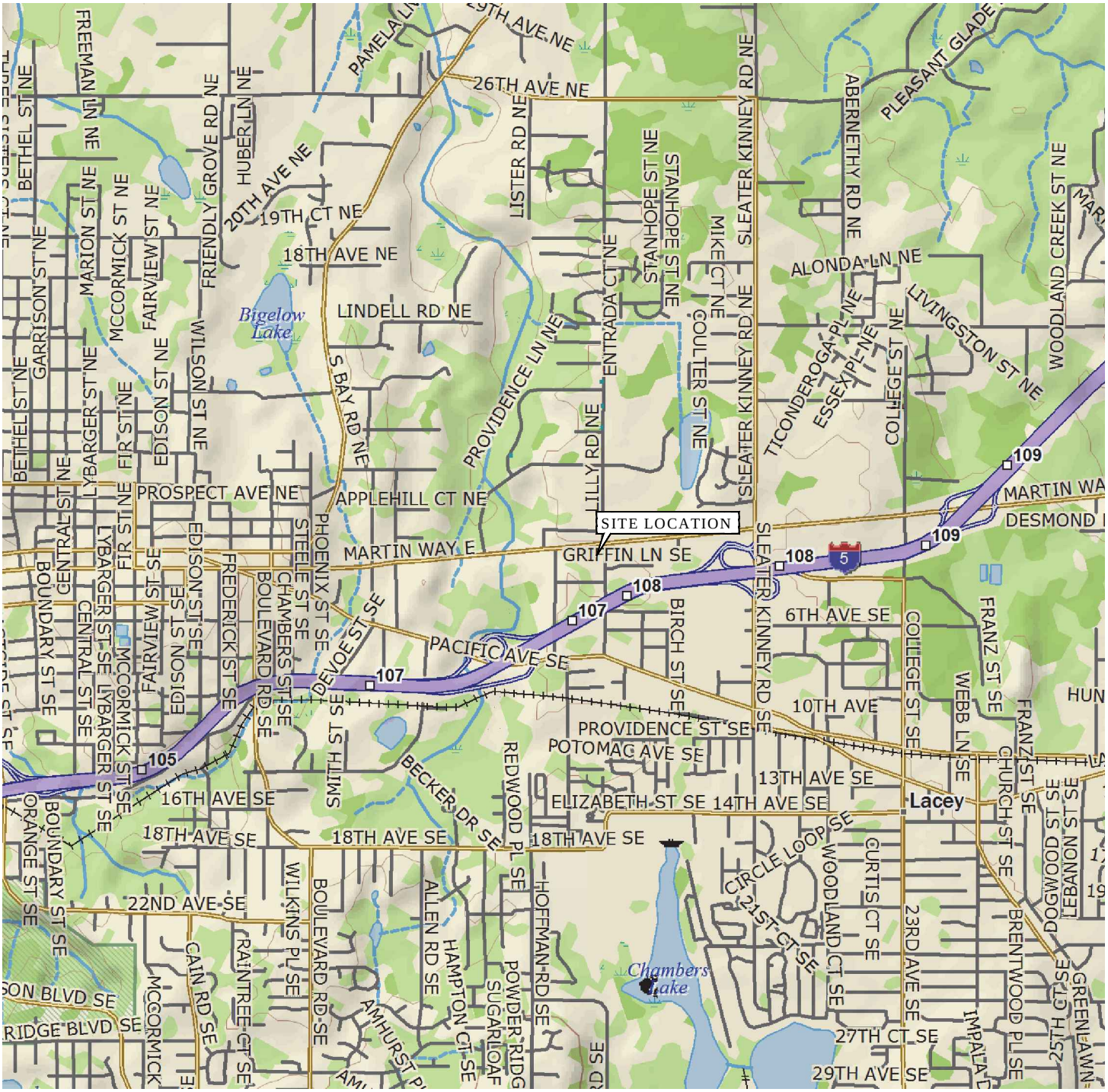
TABLE 4 COMPLIANCE CONFIRMATION SAMPLE SUMMARY

Table 4
Compliance Confirmation Sample Summary
7-Eleven Store No. 25983
3541 Martin Way East
Olympia, Washington

	Sample Location(s)	Media	Depth(s)	Date(s)	Location Excavated 2014[1]		Sample Location(s)	Media	Depth(s)	Date(s)
Dispenser Area	D-1, D-2 & D-2	Soil	3'[2]	6/21/95 & 9/24/97	Y	Confirmation Sample	DI@26'[3]	Soil	26'	10/9/14
							DIW	Soil	5'	10/9/14
							DIE	Soil	5'	10/9/14
						Removal	N/A	Soil	0' - 26'	10/7/14 to 10/16/14
	East Wall	Soil	17'	10/14/14	Y	Confirmation Sample	East Wall	Soil	26'	10/14/14
	MW-2	GW[4]	N/A	11/15/01	N	13 Years of GW Samples Below CULs	MW-2	GW	N/A	3/25/02 to Present
Down Gradient of Former USTs	GP-1	Soil	13' - 15'	5/23/02	Y	Confirmation Sample	CSS-10	Soil	16'	10/16/14
			15' - 18'				SB-3	Soil	25' - 26'	8/20/09
			Both			Removal	N/A	Soil	0' - 26'	10/7/14 to 10/16/14
	SB-3	Soil	16' - 16.5'	8/19/09	N	Confirmation Sample	SB-3@17'	Soil	17'	10/16/14
						Empirical Demontration	N/A	Soil	> 15' bgs	N/A
							N/A	Soil	Above Water Table	N/A
							MW-4	Ground water	N/A	8/27/07 to Present
							MW-5	Ground water	N/A	1/26/06 to Present
	SB-4	Soil	14' -15'	8/20/2009	Y	Confirmation Sample	SB-4	Soil	24' - 25'	8/20/09
						Removal	N/A	Soil	0' - 26'	10/7/14 to 10/16/14
	SB-5	Soil	14' - 15'	8/21/2009	Y	Confirmation Sample	CSS-7	Soil	23'	10/16/14
							CSS-9	Soil	16'	10/16/14
						Removal	N/A	Soil	0' - 26'	10/7/14 to 10/16/14
						Empirical Demontration	MW-5	Ground water	N/A	1/26/06 to Present
	MW-4	GW	N/A	7/15/99 to 4/11/07	Y	7 Years of GW Samples Below CULs	MW-4	GW	N/A	8/27/07 to 9/23/14[5]
	MW-5	GW	N/A	8/1/01 to 10/26/05	N	9 Years of GW Samples Below CULs	MW-5	GW	N/A	1/26/06 to Present

Notes
1 - Excavation backfilled with imported clean fill material. See 2014 UST Removal Report for details.
2 - Assumed depth based upon standard depth of product piping and dispenser equipment.
3 - Location excavated.
4 - Groundwater (GW).
5 - Well abandoned September 23, 2014 prior to UST removal activities.

FIGURE 1 SITE LOCATION MAP



North

WASHINGTON

1 1/2 0 1

SCALE (MILES)

1000 0 1000 2000 3000 4000 5000 6000 7000

SCALE (FEET)

REFERENCE: USGS 7.5 MINUTE QUADRANGLE, LACEY, WASHINGTON

Stantec

11130 NE 33RD PLACE, SUITE 200
BELLEVUE, WASHINGTON
PHONE: (425) 869-9448 FAX: (425) 869-1190

FOR: 7-ELEVEN

STORE NO. 25983
3541 MARTIN WAY EAST
OLYMPIA, WASHINGTON

SITE LOCATION MAP

FIGURE: **1**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185750040	MDR	EWB	PF	JUNE 2013

FILEPATH:M:_00 OTHER OFFICES\01-REDMOND\7-11\25983\FIG-1 SITE LOC.dwg | Layout Tab: Layout1 | Drafter: MiRamirez | Jul 21, 2014 at 14:41

FIGURE 2 SITE VICINITY MAP

LEGEND:

SUBJECT PROPERTY

Stantec
11130 NE 33RD PLACE, SUITE 200
BELLEVUE, WASHINGTON
PHONE: (425) 869-9448 FAX: (425) 869-1190

FOR: 7-ELEVEN

STORE NO. 25983
3541 MARTIN WAY EAST
OLYMPIA, WASHINGTON

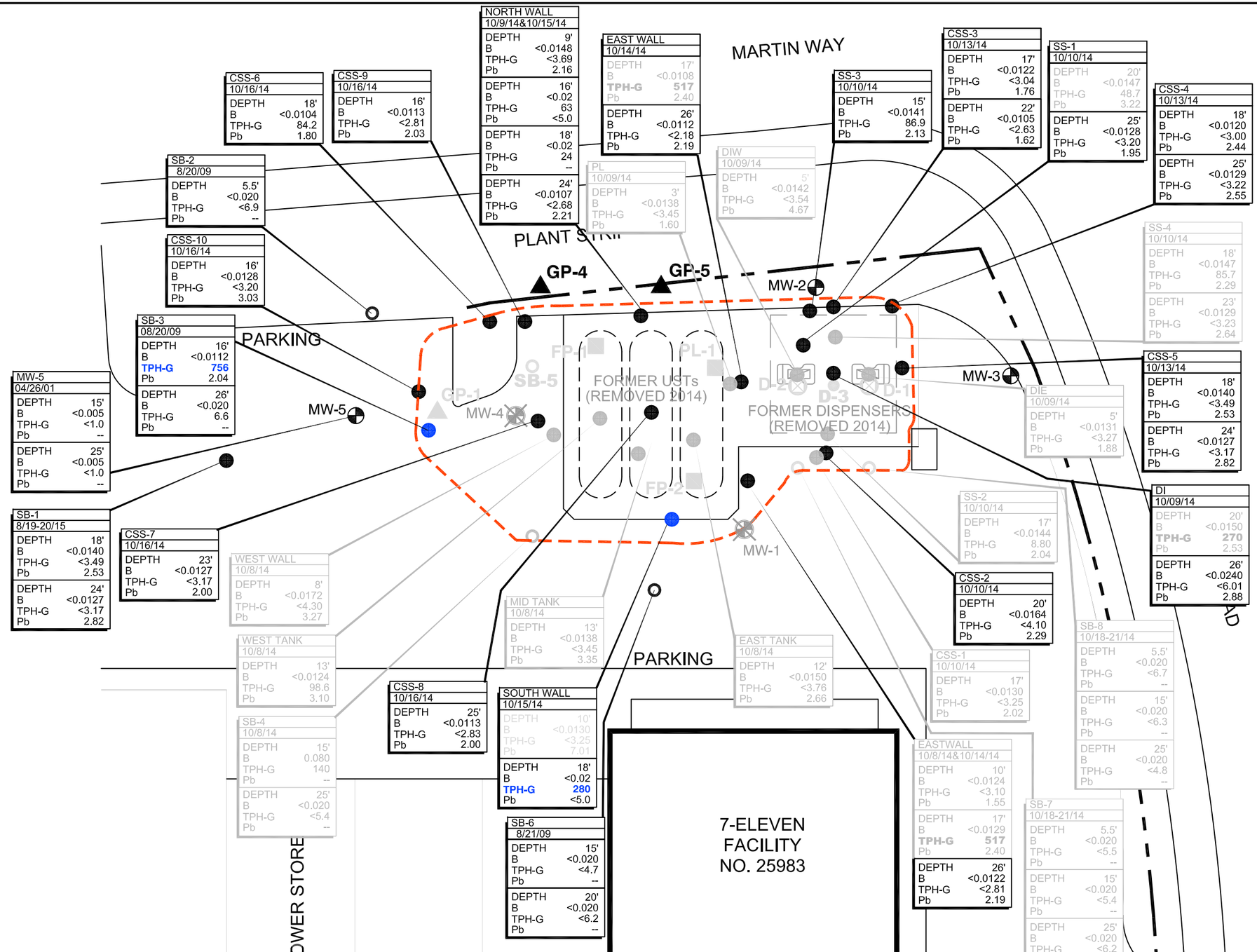
SITE VICINITY MAP

FIGURE: 2

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185750040	MDR	EWB	PF	JUNE 2013

FILEPATH: M:_00 OTHER OFFICES\01-REDMOND\7-11\25983\FIG-3 2014 4TH QTR.DWG MODIFIED BY MIRAMIREZ ON APR 21, 2015 - 12:43

FIGURE 3 SITE PLAN WITH SOIL ANALYTICAL RESULTS, OCTOBER 10-18, 2014



Stantec

11130 NE 33RD PLACE, SUITE 200
BELLEVUE, WASHINGTON
PHONE: (425) 869-9448 FAX: (425) 869-1190

FOR: 7-ELEVEN
STORE NO. 25983
3541 MARTIN WAY EAST
OLYMPIA, WASHINGTON

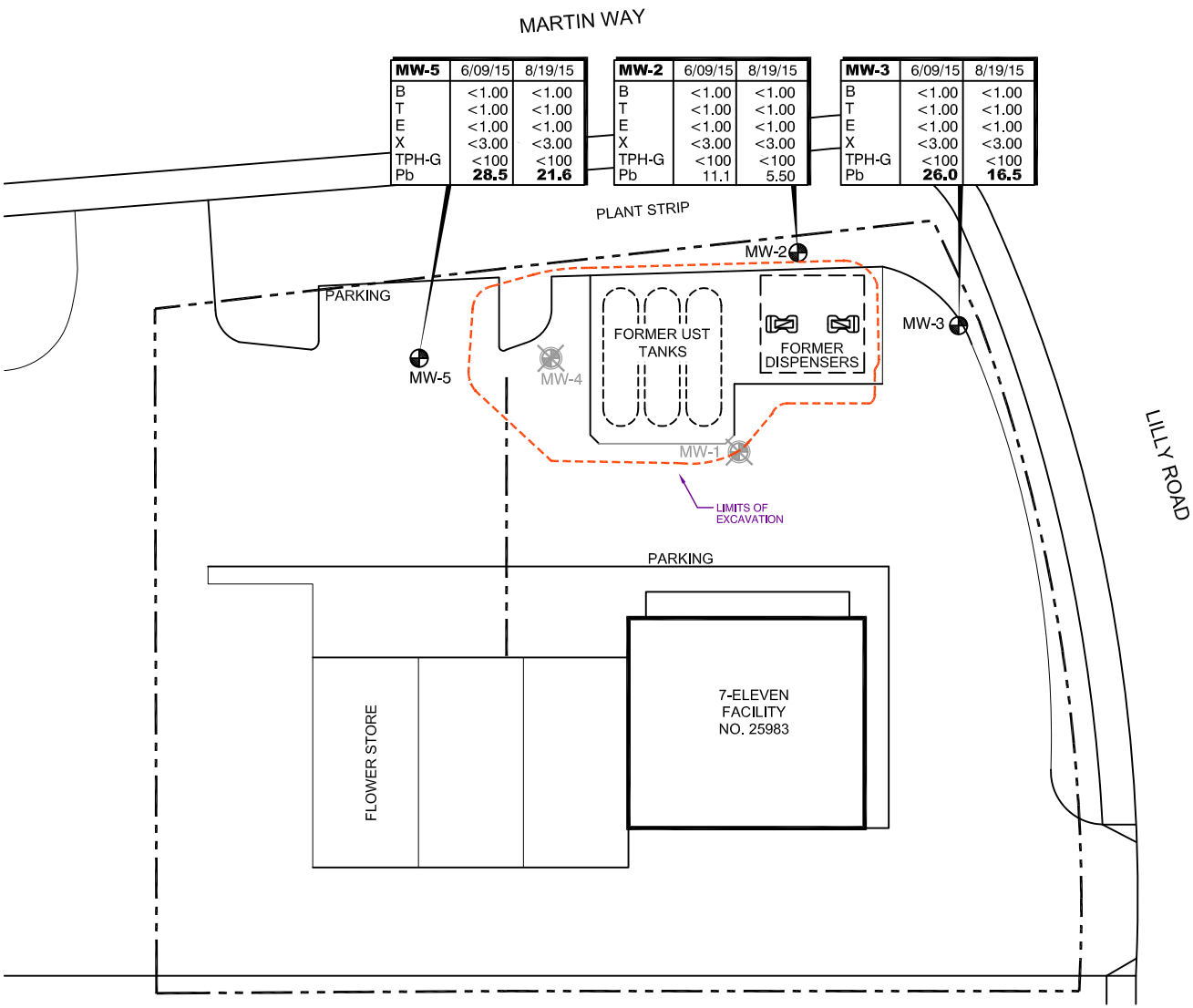
SITE PLAN WITH SOIL ANALYTICAL RESULTS OCTOBER 10-18, 2014

FIGURE: 3

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185750040	BLG/MDR	NM	PF	NOV 2015

FILEPATH:M:_00 OTHER OFFICES\01-REDMOND\7-11\25983\2015\7-11_25983-2014 (2).dwg | Layout Tab: F3-ELS | Drafter: miramirez | Nov 19, 2015 at 13:37

FIGURE 4 GROUNDWATER ANALYTICAL RESULTS JUNE 9TH AND AUGUST 19, 2015



LEGEND:

- SUBJECT PROPERTY LINE BOUNDARY
- MW-1 GROUNDWATER MONITORING WELL LOCATION
- MW-4 MONITORING WELL REMOVED DURING 2014 UST EXCAVATION

WELL ID — DATE SAMPLED

MW-2	6/09/15	8/19/15
B	<1.00	<1.00
T	<1.00	<1.00
E	<1.00	<1.00
X	<3.00	<3.00
TPH-G	<100	<100
Pb	11.1	5.50

ANALYTE — CONCENTRATION (µg/L)

µg/L MICROGRAMS PER LITER

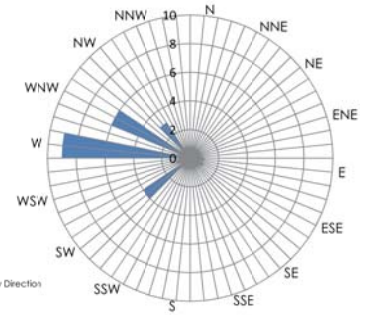
< NOT DETECTED AT OR ABOVE THE LABORATORY REPORTING LIMIT

ANALYTE

B	BENZENE
T	TOLUENE
E	EHTYLBENZENE
X	TOTAL XYLENES
TPH-G	TOTAL PETROLUEM HYDROCARBONS - GASOLINE
Pb	TOTAL LEAD

GROUNDWATER FLOW DIRECTION

7-ELEVEN STORE NO. 25983
3541 MARTIN WAY EAST
OLYMPIA, WASHINGTON



LEGEND:
CONCENTRIC CIRCLES REPRESENT QUARTERLY MONITORING EVENTS SECOND QUARTER 2003 THROUGH FIRST QUARTER 2015
25 DATA POINTS SHOWN

0 40 80

Stantec
11130 NE 33RD PLACE, SUITE 200
BELLEVUE, WASHINGTON
PHONE: (425) 869-9448 FAX: (425) 869-1190

FOR: 7-ELEVEN
STORE NO. 25983
3541 MARTIN WAY EAST
OLYMPIA, WASHINGTON

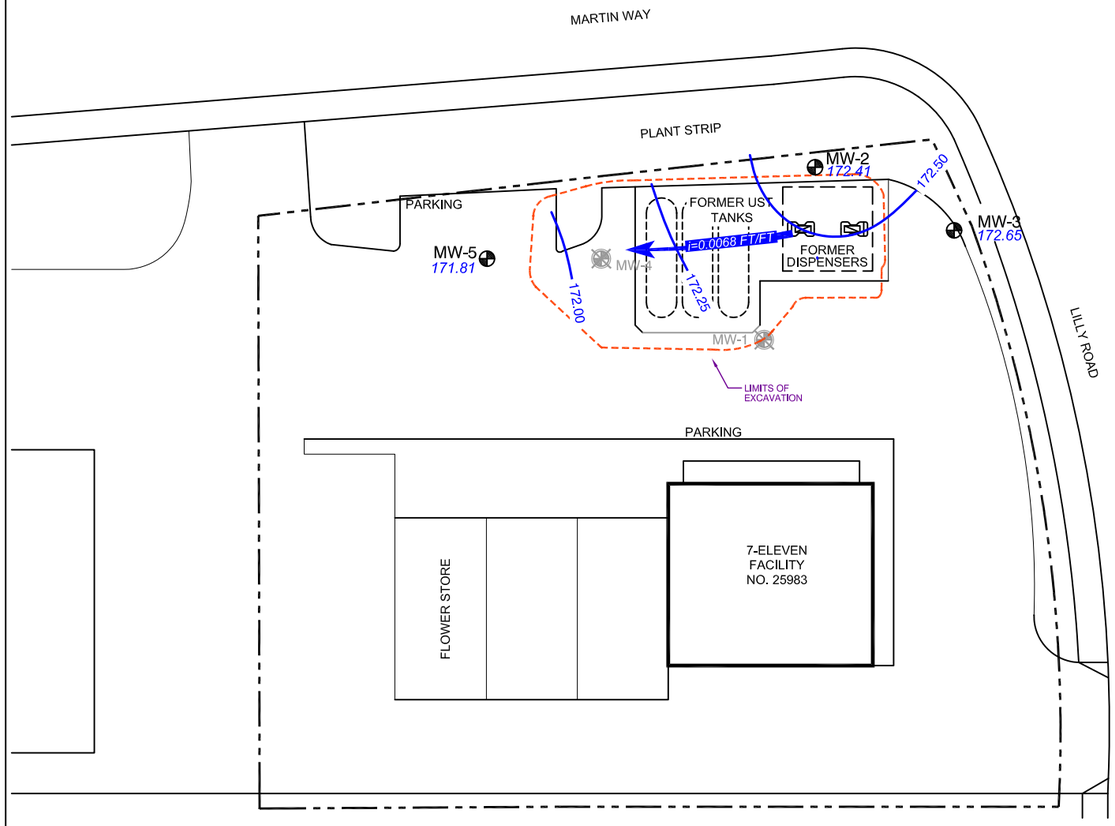
GROUNDWATER ANALYTICAL RESULTS JUNE 9, 2015 AND AUGUST 19, 2015

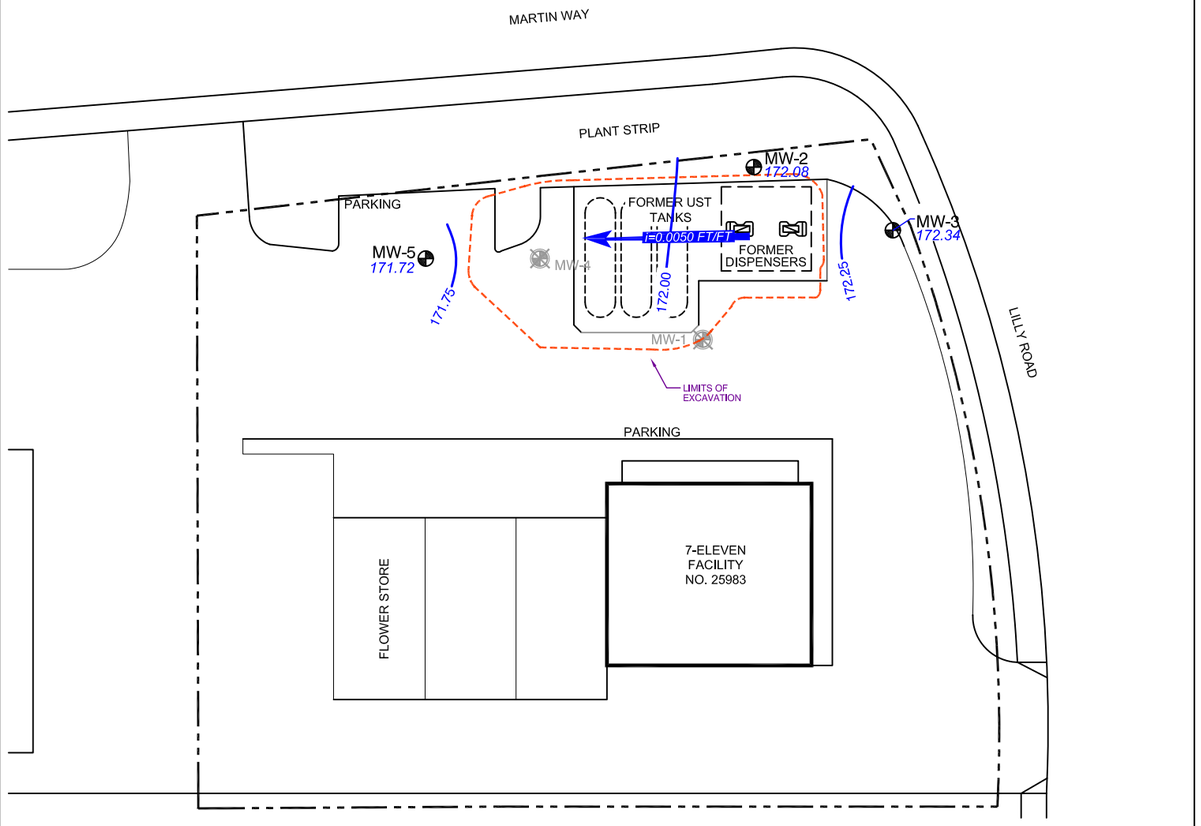
FIGURE: 4

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185750040	MDR	NM	PF	NOV 2014

FILEPATH: M:_00 OTHER OFFICES\01-REDMOND\7-11\25983\FIG-3 AND 4 2014 2ND AND 3TH QTR-2014.DWG MODIFIED BY MIRAMIREZ ON NOV 11, 2015 - 10:43

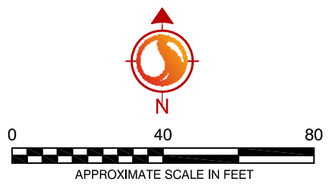
FIGURE 5 GROUNDWATER ELEVATION CONTOUR MAP FOR JUNE 9TH AND AUGUST 19, 2015



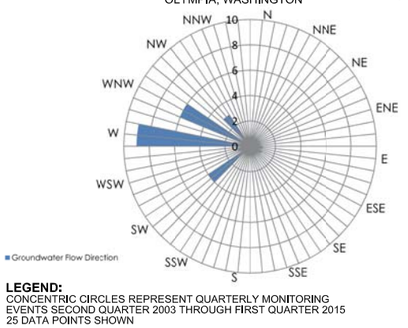


LEGEND:

- SUBJECT PROPERTY LINE BOUNDARY
- MW-2 — GROUNDWATER MONITORING WELL LOCATION
- MW-1 — MONITORING WELL REMOVED DURING 2014 UST EXCAVATION
- INFERRED GROUNDWATER FLOW DIRECTION
- 172.00 — ELEVATION CONTOUR (FEET) INFERRED GROUNDWATER
- CONTOUR INTERVAL = 0.25 FT
- 172.65 — RELATIVE GROUNDWATER ELEVATION (FEET)



GROUNDWATER FLOW DIRECTION
7-ELEVEN STORE NO. 25983
3541 MARTIN WAY EAST
OLYMPIA, WASHINGTON



LEGEND:
CONCENTRIC CIRCLES REPRESENT QUARTERLY MONITORING EVENTS SECOND QUARTER 2003 THROUGH FIRST QUARTER 2015
25 DATA POINTS SHOWN

GROUNDWATER ELEVATION CONTOUR MAP
JUNE 9, 2015

Stantec
11130 NE 33RD PLACE, SUITE 200
BELLEVUE, WASHINGTON
PHONE: (425) 869-9448 FAX: (425) 869-1190

FOR: 7-ELEVEN
STORE NO. 25983
3541 MARTIN WAY EAST
OLYMPIA, WASHINGTON

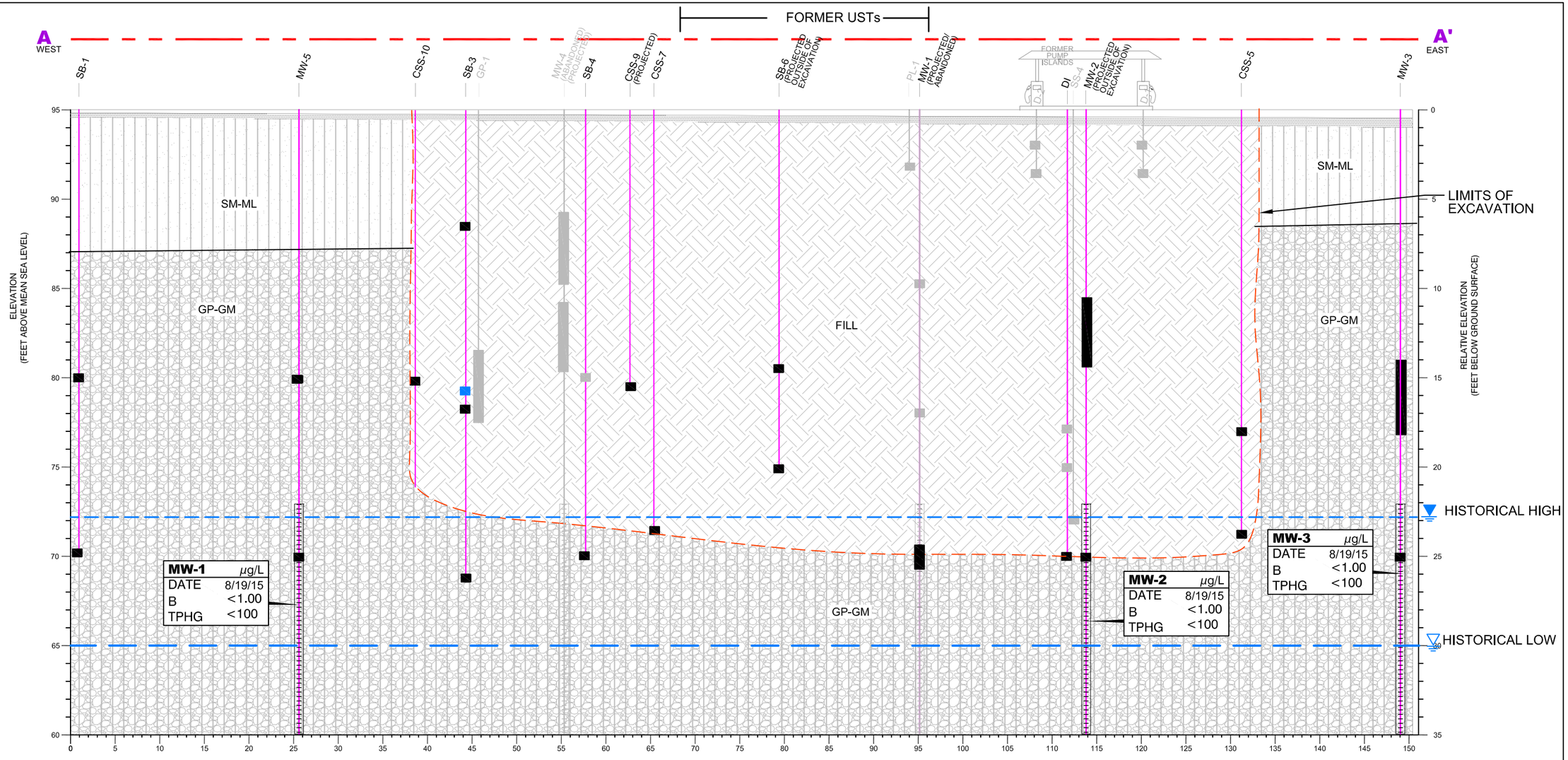
GROUNDWATER ELEVATION CONTOUR MAP FOR AUGUST 19, 2015

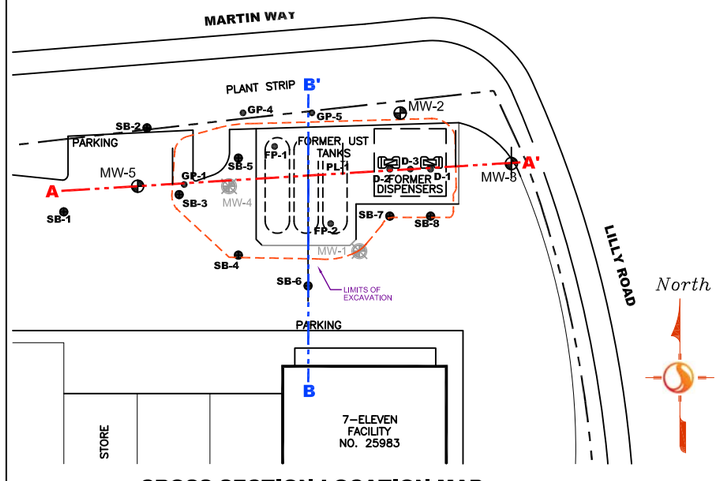
FIGURE: **5**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185750040	MDR	NM	PF	NOV 2015

FILEPATH:M:_00 OTHER OFFICES\01-REDMOND\7-11\25983\2015\FIG-5_2- QTR.dwg | Layout Tab: 2-Qtr GWE | Drafter: miramirez | Nov 11, 2015 at 13:55

FIGURE A GEOLOGICAL CROSS SECTION A-A'





CROSS-SECTION LOCATION MAP
SCALE: 1" = 50'

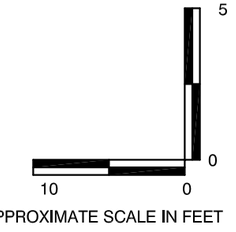
LEGEND

- EXISTING MONITORING WELL LOCATION
- **GP-1 TO GP-5** SOIL PROBEHOLE ADVANCED MAY 23, 2002
- **FP-1, FP-2, PL-1** SOIL SAMPLES COLLECTED SEPTEMBER 24, 1997
- **D-1 AND D-2** SOIL SAMPLES COLLECTED JUNE 21, 1995 AND SEPTEMBER 24, 1997
- **SB-1** PROBEHOLE LOCATION
- GEOLOGIC CROSS SECTION
- GEOLOGIC CROSS SECTION

EXPLANATION:

- INTERPRETED SOIL STRATIGRAPHIC BOUNDARY
- BORING/WELL LOCATION W/ ANALYTICAL SAMPLE
- SCREENED INTERVAL FOR MONITORING WELLS

- ASPHALT/CONCRETE
- FILL
- (SM-ML) SILTY SAND W/ SOME AREAS OF SILTS AND VERY FINE SAND (ML)
- (GP-GM) POORLY GRADED GRAVEL TO SILTY GRAVEL
- SOIL SAMPLE LOCATION BELOW MTCA METHOD A CLEANUP LEVELS
- SOIL SAMPLE LOCATION REMOVED DURING 2014 EXCAVATION
- 2014 SOIL SAMPLE LOCATION BELOW MTCA METHOD B CLEANUP LEVELS AND BELOW RESIDUAL SATURATION SCREENING LEVELS



APPROXIMATE SCALE IN FEET

Stantec
11130 NE 33RD PLACE, SUITE 200
BELLEVUE, WASHINGTON
PHONE: (425) 869-9448 FAX: (425) 869-1190

FOR:
STORE NO. 25983
3541 MARTIN WAY EAST
OLYMPIA, WASHINGTON

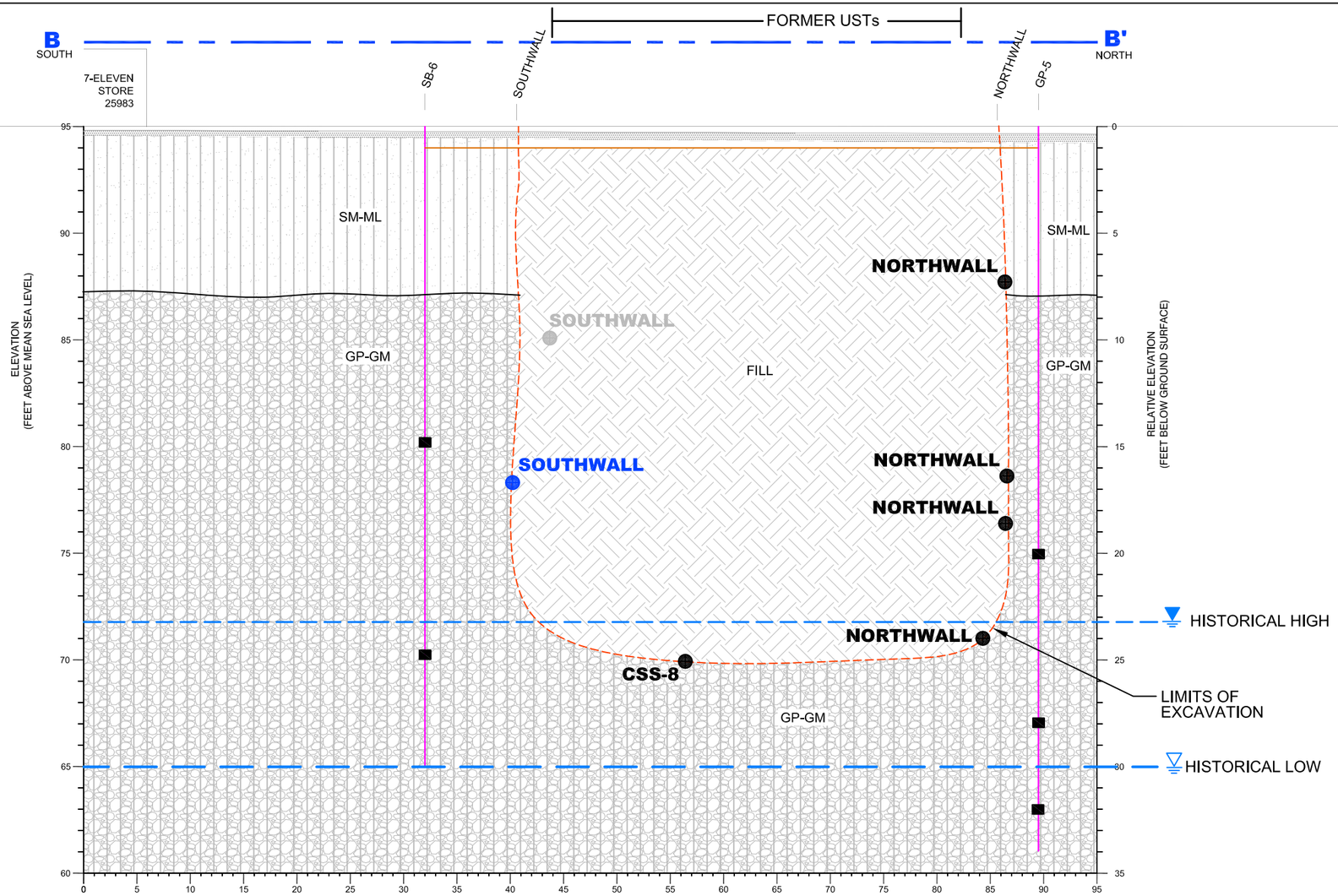
GEOLOGIC CROSS SECTION A-A'

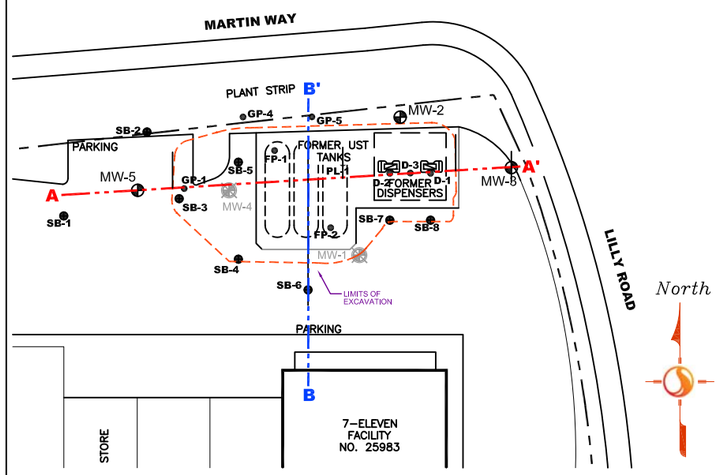
FIGURE: **A**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185750040	MDR	NM	PF	NOV 2015

FILEPATH:M:_00 OTHER OFFICES\01-REDMOND\7-11\25983\2015\FIG-A _X-SEC 25983.dwg | Layout Tab: A-A' | Drafter: miramirez | Nov 19, 2015 at 11:26

FIGURE B GEOLOGICAL CROSS SECTION B-B'





CROSS-SECTION LOCATION MAP
SCALE: 1" = 50'

LEGEND

- EXISTING MONITORING WELL LOCATION
- **GP-1 TO GP-5** SOIL PROBEHOLE ADVANCED MAY 23, 2002
- **FP-1, FP-2, PL-1** SOIL SAMPLES COLLECTED SEPTEMBER 24, 1997
- **D-1 AND D-2** SOIL SAMPLES COLLECTED JUNE 21, 1995 AND SEPTEMBER 24, 1997
- **SB-1** PROBEHOLE LOCATION
- GEOLOGIC CROSS SECTION
- GEOLOGIC CROSS SECTION

EXPLANATION:

- INTERPRETED SOIL STRATIGRAPHIC BOUNDARY
- BORING/WELL LOCATION W/ ANALYTICAL SAMPLE
- SCREENED INTERVAL FOR MONITORING WELLS

- ASPHALT/CONCRETE
- FILL
- (SM-ML) SILTY SAND W/ SOME AREAS OF SILTS AND VERY FINE SAND (ML)
- (GP-GM) POORLY GRADED GRAVEL TO SILTY GRAVEL
- SOIL SAMPLE LOCATION BELOW MTCA METHOD A CLEANUP LEVELS
- SOIL SAMPLE LOCATION REMOVED DURING 2014 EXCAVATION
- 2014 SOIL SAMPLE LOCATION BELOW MTCA METHOD B CLEANUP LEVELS AND BELOW RESIDUAL SATURATION SCREENING LEVELS

5 0
10 0
APPROXIMATE SCALE IN FEET

Stantec
11130 NE 33RD PLACE, SUITE 200
BELLEVUE, WASHINGTON
PHONE: (425) 869-9448 FAX: (425) 869-1190

FOR: 7-ELEVEN
STORE NO. 25983
3541 MARTIN WAY EAST
OLYMPIA, WASHINGTON

GEOLOGIC CROSS SECTION
B-B'

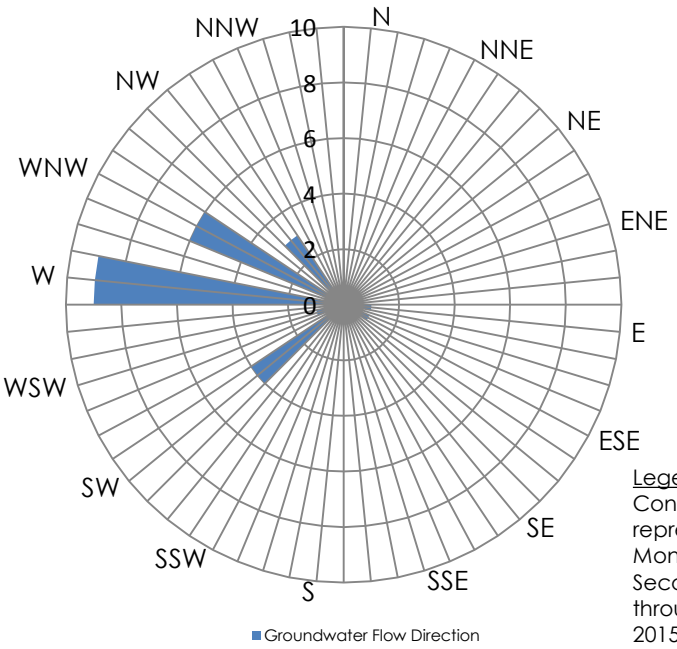
FIGURE: **B**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185750040	MDR	NM	PF	NOV 2015

FILEPATH:M:_00 OTHER OFFICES\01-REDMOND\7-11\25983\2015\FIG-A _X-SEC 25983.dwg | Layout Tab: B-B' | Drafter: miramirez | Nov 19, 2015 at 11:27

GRAPH 1 GROUNDWATER FLOW DIRECTION ROSE DIAGRAM

Graph 1
Groundwater Flow Direction Rose Diagram
7-Eleven Store No. 25983
3541 Martin Way East
Olympia, Washington



Legend
Concentric Circles represent Quarterly Montoring Events - Second Quarter 2003 through First Quarter 2015

4 Data Points Shown

Appendix A DETAILED SITE BACKGROUND

A.1 INITIAL DISCOVERY

In June 1995, McCon Building and Petroleum Services, Inc. of Vancouver, Washington, conducted a product piping upgrade at the Site. During the upgrade activities, Fluor Daniel GTI (GTI) personnel collected soil samples from the tank pit, dispenser area, and stockpiled soils. Concentrations of benzene and lead were not detected above respective project laboratory method reporting limits (MRLs) in the submitted soil samples. However, soil samples D-1 and D-2, which were collected from beneath the pump dispenser island, contained concentrations of TPH-G exceeding the Model Toxics Control Act (MTCA) Method A Cleanup Level (CUL). Furthermore, concentrations of toluene, ethyl benzene, and total xylenes were reported exceeding respective MTCA Method A CULs in soil sample D-2.

A.2 INITIAL SOIL AND GROUNDWATER INVESTIGATIONS

In September 1997, during an upgrade of the UST system, GTI conducted a limited site assessment that included soil sampling. Petroleum hydrocarbons were not reported exceeding respective MTCA Method A CULs in soil samples D-1, D-2, FP-1, and PL-1.

In June 1999, IT Corporation advanced four onsite soil borings in the area of the UST system. The soil borings were completed as groundwater monitoring wells MW-1, MW-2, MW-3, and MW-4. Soil analytical results derived from the investigation indicated that the concentrations of BTEX and TPH-G were not detected above MRLs in any of the submitted soil samples. Dissolved concentrations of TPH-G and benzene were reported above MTCA Method A CULs in source area monitoring well MW-4.

In June 2001, IT Corporation personnel installed one offsite monitoring well (MW-5) west of the property in the down-gradient direction. Benzene and TPH-G were not reported above respective MRLs or MTCA Method A CULs in the soil samples collected from MW-5. Dissolved concentrations of total xylenes were reported below the MTCA Method A CUL in the groundwater sample collected from monitoring well MW-5 in August 2001.

In May 2002, IT Corporation conducted an additional subsurface assessment to further define the extent of petroleum-impacted soil and groundwater beneath the Site. The direct-push investigation included advancing three soil boreholes to total depths ranging from approximately 20- to 30-feet below ground surface (bgs). One "grab" groundwater sample was collected from soil borehole GP-4, located northwest of the UST system. Concentrations of BTEX and TPH-G were reported above MTCA Method A CULs in the soil sample collected from borehole GP-1 at a depth of 15-feet bgs. Dissolved petroleum hydrocarbon concentrations were not reported exceeding MTCA method A CULs in the groundwater sample collected from the borehole GP-4, located northwest of the UST System.

In August 2009, Stantec advanced eight boreholes (SB-1 through SB-8) to depths ranging from approximately 16- to 32-feet bgs. Petroleum hydrocarbon constituents were detected exceeding MTCA CULs in the soil samples collected from boreholes SB-3, SB-4, and SB-5. Additionally, TPH-G and total xylenes were detected above MTCA Method A CULs in the groundwater sample collected from borehole SB-3.

A.3 UST REMOVAL 2014

Stantec contracted Saybr Construction, Inc. (Saybr) of Tacoma, Washington to remove the three 12,000-gallon, single-wall fiberglass USTs and ancillary equipment at the Subject Property. On October 7, 2014, the USTs were rendered inert by a certified marine chemist. Approximately 1,200 gallons of rinstate water and 100 gallons of sludge were removed from the USTs and transported to a permitted hazardous waste treatment and disposal facility. On October 8, 2014, the three 12,000-gallon, single-wall fiberglass USTs were removed from the Property. The western UST was removed first and staged beside the excavation for inspection. Upon exposure and visual inspection, the UST appeared to be in overall good condition and no apparent failures were observed. The fiberglass UST was then crushed with the excavator, and the fiberglass fragments were loaded into a waste disposal unit. The middle and eastern USTs could not be removed in one piece. The inside of each tank was visually inspected before each was crushed in-place. Fiberglass fragments were individually removed and placed in the disposal unit.

A.4 CLEANUP ACTION 2014

Following 2014 UST removal activities, soil located below the former dispenser island, UST basin, and adjacent areas were excavated to remove the horizontal and vertical extent of Petroleum Contaminated Soil (PCS). Clean soil overburden was removed and stockpiled to over-excavate PCS which extended from approximately 16- to 24-feet bgs.

In the former UST basin, PCS was removed as far north and south as safety constraints would allow. This area of the excavation extended laterally approximately 40 feet by 40 feet. Upon completion, clean overburden was used to backfill the excavation to approximately 16-feet bgs. This area was then used as a platform for the excavator to continue excavating toward the west. The western excavation extended to depths between approximately 17- to 23-feet bgs until clean confirmation samples were taken at vertical extents. A small layer of PCS was identified along the western wall (SB-3@16') at approximately 16-feet bgs which remained on-Site. This small layer of PCS is delineated by borings MW-5, SB-1, and SB-2. Once excavation was completed, clean fill material was used to backfill the excavation. Backfill was compacted in sections until ground level was reached.

Approximately 1,393- tons of PCS was removed from the Site, of which, approximately 236 tons were transported to Regional Disposal Intermodal in Seattle and disposed of at the

Rabanco/Allied Waste Landfill in Roosevelt, WA. The remaining 1,157- tons of PCS was transported to the Cowlitz County Landfill (formerly Weyerhaeuser) in Castle Rock, WA.

A total of 23 confirmation soil samples were collected during the remedial excavation. Analytical results for the remedial excavation soil samples are summarized in ***Table 2A***. The table indicates which areas were excavated and which samples represent final limit samples of material remaining in place following the remedial excavation. The lateral extent of the excavation is illustrated in ***Figure 3***.

Appendix B LEGAL DESCRIPTION

THURSTON COUNTY

OFFICE OF THE ASSESSOR
STEVEN J. DREW, ASSESSOR

Basic information
Property: 99000201000

Use these buttons to display different information for this property

New Search | Basic Info | Structures | Map Info | Owner History
Values | Sales | Value Report | Taxes | Appraisal Quality Standards | Useful Links | Feedback | Printable

Owner/Taxpayer Information

Role	Pct	Name\Street	City	State	Country	Zip
Owner	100%	IHOP RESTAURANTS LLC 450 N BRAND BLVD 7TH FLOOR	GLENDALE	CA		91203
Taxpayer	100%	IHOP RESTAURANTS LLC 450 N BRAND BLVD 7TH FLOOR	GLENDALE	CA		91203

Personal Property

Abbreviated Legal: Not Listed
Sect/Town/Range: Not Listed
Size: Not Listed
Use Code: Not Listed
TCA Number: Not Listed
Not Listed
Neighborhood: No Record Found
Property Type: No Record Found
Total Living Units: No Record Found
Located on: 41701900100

Clicking this link will open a new browser window, displaying information about the parcel upon which this personal property is located

Searching for Sales

For your convenience, and for greater transparency, the Assessor's office offers three separate sales listings:

- Owner History displays all transfers of ownership for the selected parcel.
- Sales returns a list of all sales within the subject neighborhood that carry a sale price greater than $0. Many of these sales have not been verified and are not considered valid, arms length sales for assessment purposes. They include transfers between banks, sales between relatives and business partners, estate sales, etc. that do not typically represent market prices.
- Value Report includes a list of valid, arms length sales that were used in determining values for assessment purposes. They include bank sales of foreclosed properties that may have been discounted in price and that have a weighted influence on other market transactions.

Office of the Assessor
2000 Lakeridge Drive SW - Olympia, WA 98502
Customer Service (360)867-2200 -- Fax (360)867-2201 -- TDD (360)754-2933

THURSTON COUNTY

OFFICE OF THE ASSESSOR

STEVEN J. DREW, ASSESSOR

Basic information
Property: 99000990600

Use these buttons to display different information for this property

New Search | Basic Info | Structures | Map Info | Owner History

Values | Sales | Value Report | Taxes | Appraisal Quality Standards | Useful Links | Feedback | Printable

Owner/Taxpayer Information

Role	Pct	Name\Street	City	State	Country	Zip
Owner	100%	7-ELEVEN INC #25983 PO BOX 4900 DEPT 711	SCOTTSDALE	AZ		85261
Taxpayer	100%	7-ELEVEN INC #25983 PO BOX 4900 DEPT 711	SCOTTSDALE	AZ		85261

Personal Property

Abbreviated Legal: Not Listed
Sect/Town/Range: Not Listed
Size: Not Listed
Use Code: Not Listed
TCA Number: Not Listed
Not Listed
Neighborhood: No Record Found
Property Type: No Record Found
Total Living Units: No Record Found
Located on: 41701900100 Clicking this link will open a new browser window, displaying information about the parcel upon which this personal property is located

Searching for Sales

For your convenience, and for greater transparency, the Assessor's office offers three separate sales listings:

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- Sales returns a list of all sales within the subject neighborhood that carry a sale price greater than $0. Many of these sales have not been verified and are not considered valid, arms length sales for assessment purposes. They include transfers between banks, sales between relatives and business partners, estate sales, etc. that do not typically represent market prices.
- Value Report includes a list of valid, arms length sales that were used in determining values for assessment purposes. They include bank sales of foreclosed properties that may have been discounted in price and that have a weighted influence on other market transactions.

Office of the Assessor
2000 Lakeridge Drive SW - Olympia, WA 98502
Customer Service (360)867-2200 -- Fax (360)867-2201 -- TDD (360)754-2933

THURSTON COUNTY

OFFICE OF THE ASSESSOR
STEVEN J. DREW, ASSESSOR

Basic information
Property: 99002058812

Use these buttons to display different information for this property

New Search | Basic Info | Structures | Map Info | Owner History
Values | Sales | Value Report | Taxes | Appraisal Quality Standards | Useful Links | Feedback | Printable

Owner/Taxpayer Information

Role	Pct	Name\Street	City	State	Country	Zip
Owner	100%	DERRICK FAMILY CHIROPRACTIC INC 3535 MARTIN WAY E	OLYMPIA	WA		98506
Taxpayer	100%	DERRICK FAMILY CHIROPRACTIC INC 3535 MARTIN WAY E	OLYMPIA	WA		98506

Personal Property

Abbreviated Legal: Not Listed
Sect/Town/Range: Not Listed
Size: Not Listed
Use Code: Not Listed
TCA Number: Not Listed
Not Listed
Neighborhood: No Record Found
Property Type: No Record Found
Total Living Units: No Record Found
Located on: 41701900100 Clicking this link will open a new browser window, displaying information about the parcel upon which this personal property is located

Searching for Sales

For your convenience, and for greater transparency, the Assessor's office offers three separate sales listings:

- Owner History displays all transfers of ownership for the selected parcel.
- Sales returns a list of all sales within the subject neighborhood that carry a sale price greater than $0. Many of these sales have not been verified and are not considered valid, arms length sales for assessment purposes. They include transfers between banks, sales between relatives and business partners, estate sales, etc. that do not typically represent market prices.
- Value Report includes a list of valid, arms length sales that were used in determining values for assessment purposes. They include bank sales of foreclosed properties that may have been discounted in price and that have a weighted influence on other market transactions.

Office of the Assessor
2000 Lakeridge Drive SW - Olympia, WA 98502
Customer Service (360)867-2200 -- Fax (360)867-2201 -- TDD (360)754-2933

THURSTON COUNTY

OFFICE OF THE ASSESSOR

STEVEN J. DREW, ASSESSOR

Basic information
Property: 41701900100

Use these buttons to display different information for this property

New Search | Basic Info | Structures | Land | Photo | Map Info | Owner History
Values | Sales | Value Report | Taxes | Appraisal Quality Standards | Useful Links | Feedback | Printable

Owner/Taxpayer Information

Role	Pct	Name\Street	City	State	Country	Zip
Owner	100%	SUNSHINE PLAZA LLC PO BOX 1066	OLYMPIA	WA		98507
Taxpayer	100%	SUNSHINE PLAZA LLC PO BOX 1066	OLYMPIA	WA	USA	98507

Parcel Information

Situs Address: 3519 MARTIN WAY E, OLYMPIA
Abbreviated Legal: Section 18 Township 18 Range 1W Plat APPRAISAL COMBINATION FOR TAX PURPOSES ONLY; Parcel 1: COLLEGE CITY BERRY TRS N HLF BLK 19 Document 009/07; Parcel 2: COM E4 COR N 54F WLY ON HW 472F E
Sect/Town/Range: 18 18 1W
Size: 1.45
Use Code: 54 Retail - Food
TCA Number: 114
Taxable: Yes
Neighborhood: 66T1
Property Type: RTL
Total Living Units: 0
Located on: 99000201000 — Clicking this link will open a new browser window, displaying information about the parcel upon which this real property is located
School District: NORTH THURSTON S.D. #3
Water Source: PUBLIC
Sewer Type: SEWER
Associations: 99000990600 — 7-ELEVEN INC #25983
99002058812 — DERRICK FAMILY CHIROPRACTIC INC
99000201000 — IHOP RESTAURANTS LLC

Searching for Sales

For your convenience, and for greater transparency, the Assessor's office offers three separate sales listings:

- Owner History displays all transfers of ownership for the selected parcel.
- Sales returns a list of all sales within the subject neighborhood that carry a sale price greater than $0. Many of these sales have not been verified and are not considered valid, arms length sales for assessment purposes. They include transfers between banks, sales between relatives and business partners, estate sales, etc. that do not typically represent market prices.
- Value Report includes a list of valid, arms length sales that were used in determining values for assessment purposes. They include bank sales of foreclosed properties that may have been discounted in price and that have a weighted influence on other market transactions.

Office of the Assessor
2000 Lakeridge Drive SW - Olympia, WA 98502
Customer Service (360)867-2200 -- Fax (360)867-2201 — TDD (360)754-2933

Appendix C BORING LOGS

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. AE29055

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☐ Construction

☒ Decommission

ORIGINAL INSTALLATION Notice of Intent Number: RD44114

Consulting Firm

Unique Ecology Well IDTag No. AER-836

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Peterson, Trevor

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 3008

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner 7Eleven Inc #25983

Site Address 3541 Martin Way E

City Olympia County Thurston

Location NE1/4-1/4 SE1/4 Sec 18 Twn 18 R 01

EWM ☐ or WWM ☒

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

Long Deg ____ Min ____ Sec ____

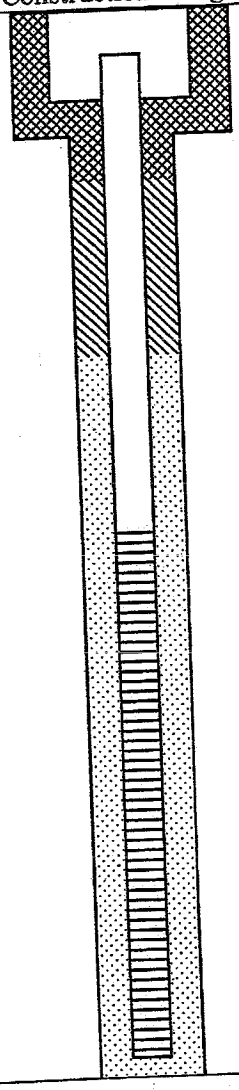
Tax Parcel No. 99000990600

Cased or Uncased Diameter 2" Static Level

Work/Decommission Start Date 10/6/14

Work/Decommission Completed Date 10/6/14

Construction Design



Well Data

MONUMENT TYPE: flush mount

REMOVED MONUMENT: (YES)/NO

PVC BLANK:

SCREEN:

WELL DEPTH: 36'

Formation Description

FORMATION NOT OBSERVED – WELL WAS DECOMMISSIONED

REMOVED MONUMENT: (YES) / NO

☒ WELL WAS CHIPPED/GROUTED IN PLACE

☐ ALL CASING WAS REMOVED AND BACKFILLED BOTTOM UP

SCALE: 1"= ____ PAGE 1 OF 2

Ecology is an Equal Opportunity Employer

ECY 050-12 (Rev. 7/06)

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. AE29055

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☐ Construction

☒ Decommission

ORIGINAL INSTALLATION Notice of Intent Number: RD44114

Consulting Firm

Unique Ecology Well IDTag No. AER-839

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Peterson, Trevor

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 3008

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner 7Eleven Inc #25983

Site Address 3541 Martin Way E

City Olympia County Thurston

Location NE1/4-1/4 SE1/4 Sec 18 Twn 18 R 01

EWM ☐ or WWM ☒

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

Long Deg ____ Min ____ Sec ____

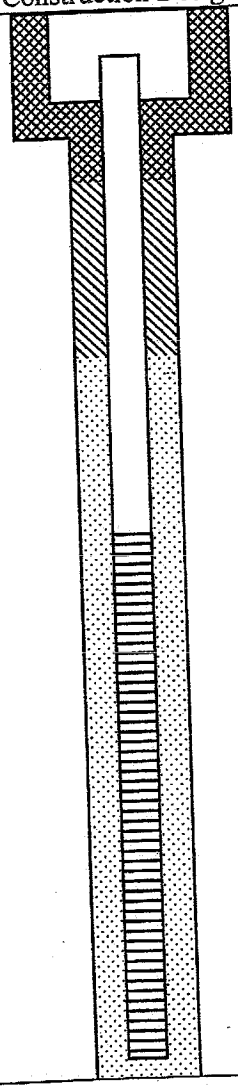
Tax Parcel No. 99000990600

Cased or Uncased Diameter 2" Static Level ____

Work/Decommission Start Date 10/6/14

Work/Decommission Completed Date 10/6/14

Construction Design



Well Data

MONUMENT TYPE: flush mount

REMOVED MONUMENT: (YES)/NO

PVC BLANK:

SCREEN:

WELL DEPTH: 36'

Formation Description

FORMATION NOT OBSERVED – WELL WAS DECOMMISSIONED

REMOVED MONUMENT: (YES) / NO

☒ WELL WAS CHIPPED/GROUTED IN PLACE

☐ ALL CASING WAS REMOVED AND BACKFILLED BOTTOM UP

SCALE: 1"= ____ PAGE 2 OF 2

Ecology is an Equal Opportunity Employer

ECY 050-12 (Rev. 7/06)

Drilling Log

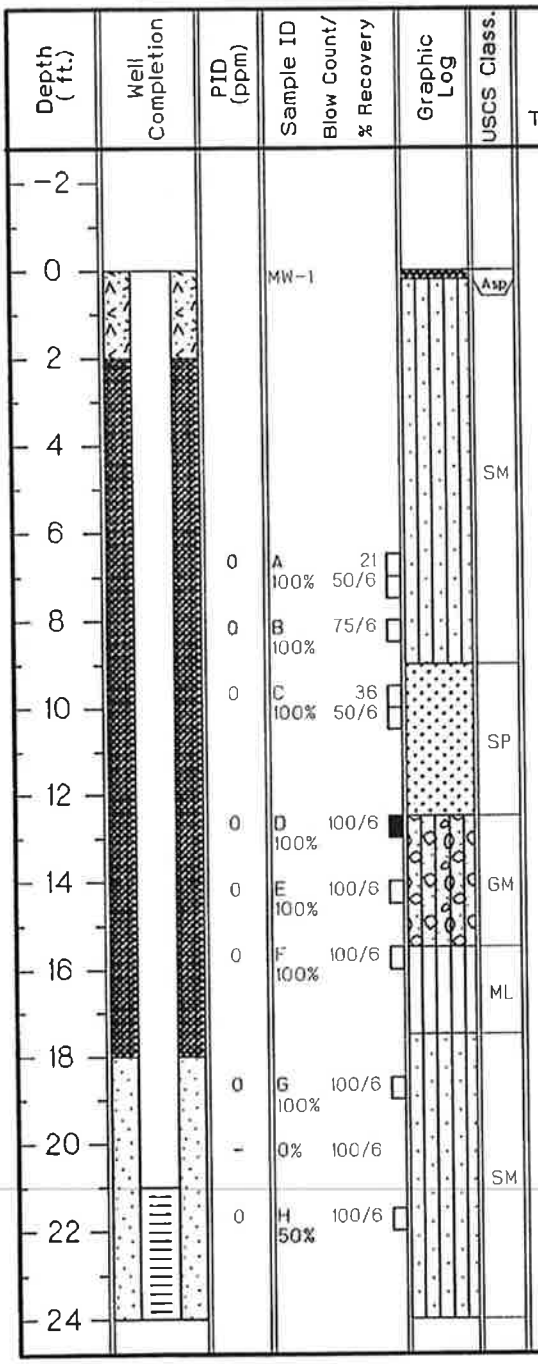
Monitoring Well **MW-1**

Project 7-Eleven Facility #25983 Owner 7-Eleven, Inc.
Location 3541 Martin Way E, Olympia, WA Proj. No. 782254
Surface Elev. _____ Total Hole Depth 36 ft. Diameter 7 in.
Top of Casing _____ Water Level Initial 26 ft. Static _____
Screen: Dia 2 in. Length 15 ft. Type/Size 0.020 in.
Casing: Dia 2 in. Length 21 ft. Type Sched. 40 PVC
Fill Material 10/20 Sand Rig/Core CME-55
Drill Co. CASCADE DRILLING Method HSA
Driller Brian Gose Log By Matt Miller Date 6/7/99 Permit # _____
Checked By _____ License No. _____

See Site Map For Boring Location

COMMENTS:

Analyzed soil samples are indicated by a black box.



Description

(Color, Texture, Structure)
Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%

2" asphalt. Hand dug to five feet.

Brown/gray very fine SAND and silt
(dry, medium dense, no odor)

Gray fine to coarse SAND, trace silt and gravel
(dry, dense, no odor)

Olive brown fine to coarse GRAVEL, some silt, little fine to coarse sand
(dry, dense, no odor)

Gray/brown SILT, some gravel, little very fine sand
(dry, hard, no odor)

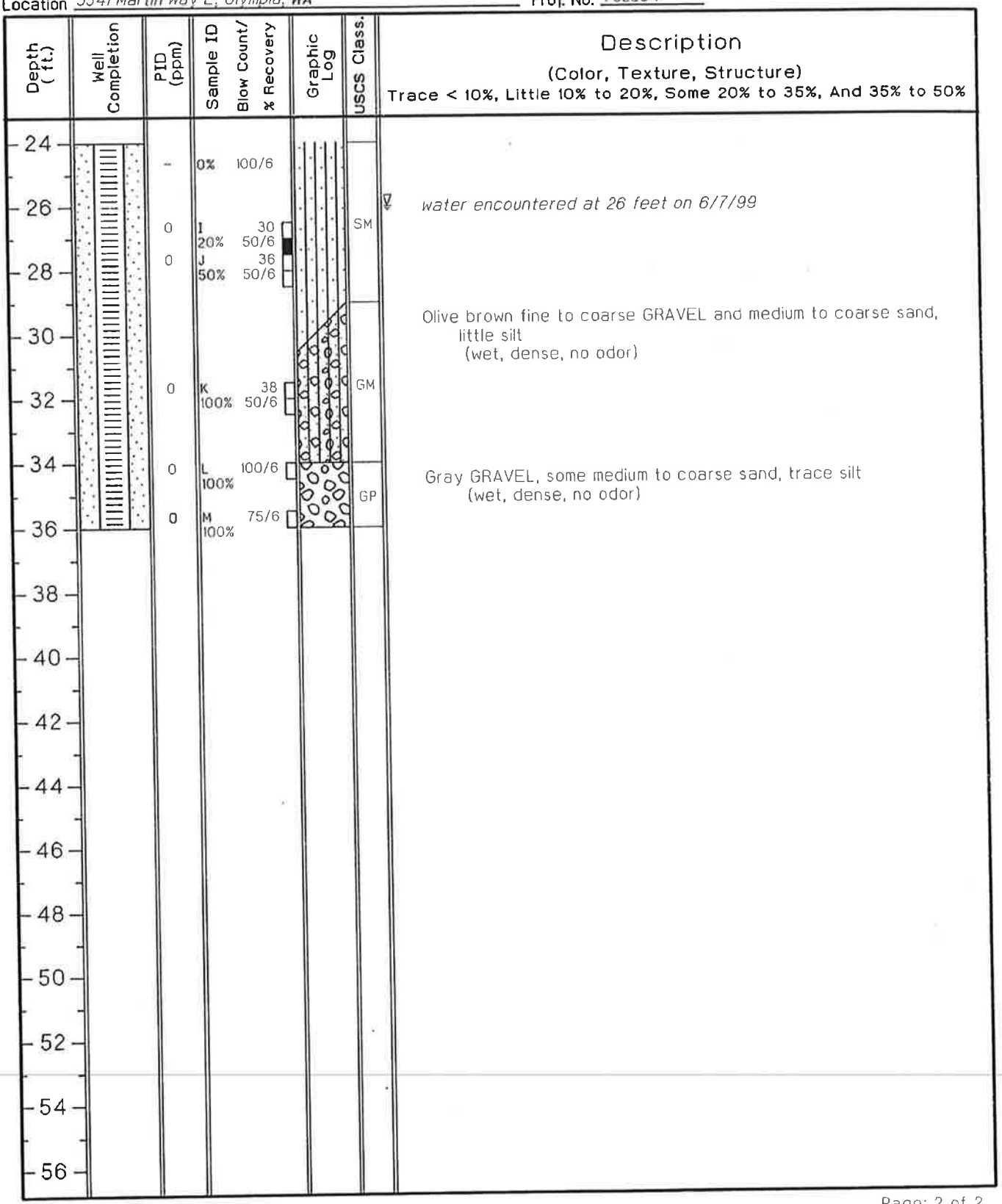
Gray/brown very fine to coarse SAND, some gravel, little silt
(dry, very dense, no odor)

(grades and gravel)

Drilling Log

Monitoring Well **MW-1**

Project 7-Eleven Facility #25983 Owner 7-Eleven, Inc.
Location 3541 Martin Way E, Olympia, WA Proj. No. 782254



MW-1

RESOURCE PROTECTION WELL REPORT

START CARD NO. R44114

25983

PROJECT NAME: Southland (7-Eleven)

WELL IDENTIFICATION NO. AER 836

DRILLING METHOD: HSA

DRILLER: BRIAN G. GOSE

FIRM: Cascade Drilling, Inc.

SIGNATURE: [signature]

CONSULTING FIRM: IT CORPORATION

REPRESENTATIVE: MATT MILLER

COUNTY: THURSTON

LOCATION: NE ¼ SW ¼ Sec 18 Twn 18N R 1W

STREET ADDRESS OF WELL: 3541 MARTIN WAY OLYMPIA

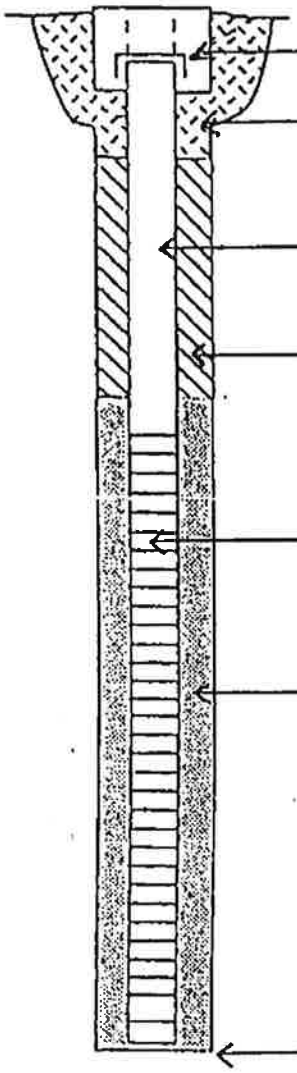
WATER LEVEL ELEVATION: 26'

GROUND SURFACE ELEVATION: N/A

INSTALLED: 6/7-8/99

DEVELOPED: No

9286

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	WELL COVER CONCRETE SURFACE SEAL DEPTH = 1 ft PVC BLANK 2 "x 21 ' BACKFILL 17 ft. TYPE: bent. chips PVC SCREEN 2 "x 15 ' SLOT SIZE: .020 GRAVEL PACK 17 ft. MATERIAL: 2/12 sand WELL DEPTH 36 ' "	0 - 36 ft. Brown silt, sand + gravels - ft. - ft.

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/99)

Drilling Log

Monitoring Well **MW-2**

Project 7-Eleven Facility #25983 Owner 7-Eleven, Inc.
Location 3541 Martin Way E, Olympia, WA Proj. No. 782254
Surface Elev. _____ Total Hole Depth 36.5 ft. Diameter 10 in.
Top of Casing _____ Water Level Initial 27 ft. Static _____
Screen: Dia 4 in. Length 15 ft. Type/Size 0.020 in.
Casing: Dia 4 in. Length 21 ft. Type Sched. 40 PVC
Fill Material 10/20 Sand Rig/Core CME-55
Drill Co. CASCADE DRILLING Method HSA
Driller Brian Gose Log By Matt Miller Date 6/7/99 Permit # _____
Checked By _____ License No. _____

See Site Map For Boring Location

COMMENTS:

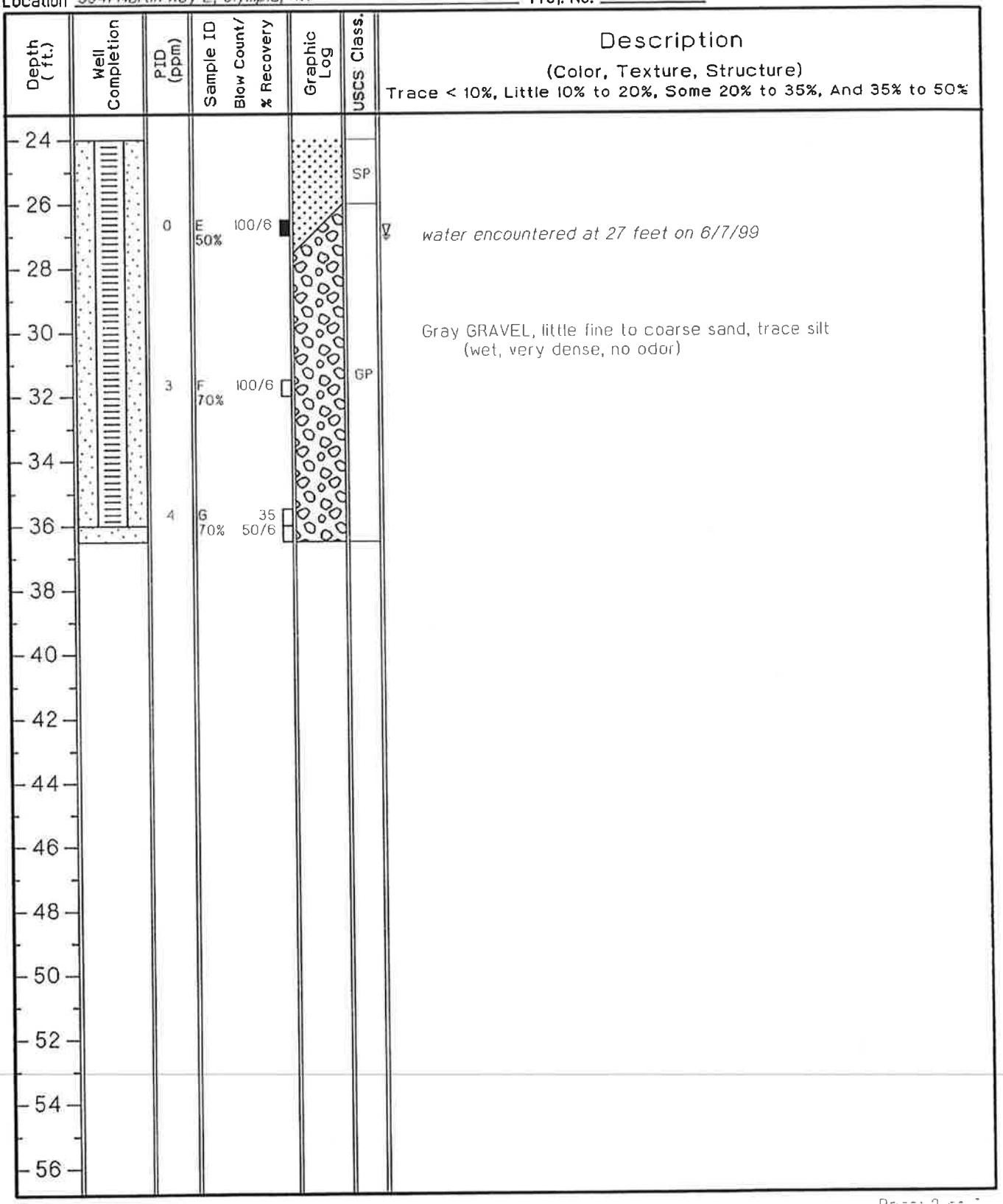
Analyzed soil samples are indicated by a black box.

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2							
0			MW-2			Asp	2" asphalt. Hand dug to five feet.
2						ML	Olive brown SILT, trace very fine to fine sand, iron staining (dry, hard, no odor)
4							
6		0	A 100%	24 50/6			Olive brown very fine to coarse SAND, trace silt and gravel (dry, dense, no odor)
8							
10							
12		0	B 100%	38 50/6			(grades gray) (dry, dense, no odor)
14						SP	
16		0	C 50%	60/6			
18							
20							
22		0	D 20%	100/6			
24							

Drilling Log

Monitoring Well MW-2

Project 7-Eleven Facility #25983 Owner 7-Eleven, Inc.
Location 3541 Martin Way E, Olympia, WA Proj. No. 782254



MW-2

RESOURCE PROTECTION WELL REPORT

START CARD NO. R44114

25983

PROJECT NAME: Southland (7-Eleven)
WELL IDENTIFICATION NO. AER 837
DRILLING METHOD: HSA
DRILLER: BRIAN G. GOSE
FIRM: Cascade Drilling, Inc.
SIGNATURE:
CONSULTING FIRM: IT CORPORATION
REPRESENTATIVE: MATT MILLER

COUNTY: THURSTON
LOCATION: NE ¼ SW ¼ Sec 18 Twn 18N R 1W
STREET ADDRESS OF WELL:
3541 MARTIN WAY, OLYMPIA
WATER LEVEL ELEVATION: 26'
GROUND SURFACE ELEVATION: N/A
INSTALLED: 6/7/99
DEVELOPED: No

9286

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	WELL COVER	0 - 36 ft. Brown silt, sand + gravels
	CONCRETE SURFACE SEAL DEPTH = 2 ft	- ft.
	PVC BLANK 4 "x 21'	
	BACKFILL 17 ft. TYPE: bent. Chips	- ft.
	PVC SCREEN 4 "x 15' SLOT SIZE: .020	
	GRAVEL PACK 17 ft. MATERIAL: 2/12 sand	
	WELL DEPTH 36 ' "	

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/09)

MW-3

RESOURCE PROTECTION WELL REPORT

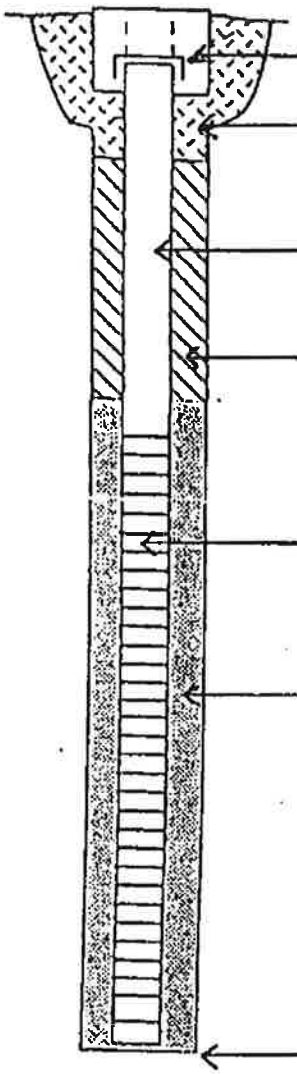
25983

START CARD NO. R44114

PROJECT NAME: Southland (7-Eleven)
WELL IDENTIFICATION NO. AER 838
DRILLING METHOD: HSA
DRILLER: BRIAN G. GOSE
FIRM: Cascade Drilling, Inc.
SIGNATURE: [signature]
CONSULTING FIRM: IT CORPORATION
REPRESENTATIVE: MATT MILLER

COUNTY: THURSTON
LOCATION: NE ¼ SW ¼ Sec 18 Twn 18N R 1W
STREET ADDRESS OF WELL:
3541 MARTIN WAY OLYMPIA
WATER LEVEL ELEVATION: 26'
GROUND SURFACE ELEVATION: N/A
INSTALLED: 6/7-8/99
DEVELOPED: No

9286

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	WELL COVER CONCRETE SURFACE SEAL DEPTH = 1/ft PVC BLANK 2 "x 21 ' BACKFILL 17 ft. TYPE: bent. chips PVC SCREEN 2 "x 15 ' SLOT SIZE: .020 GRAVEL PACK 17 ft. MATERIAL: 2/12 sand WELL DEPTH 36 ' "	0 - 36 ft. Brown silt, sand + gravels - ft. - ft.

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/99)

Drilling Log

Monitoring Well **MW-4**

Project 7-Eleven Facility #25983 Owner 7-Eleven, Inc.
Location 3541 Martin Way E, Olympia, WA Proj. No. 782254
Surface Elev. _____ Total Hole Depth 36.5 ft. Diameter 7 in.
Top of Casing _____ Water Level Initial 26 ft. Static _____
Screen: Dia 2 in. Length 15 ft. Type/Size 0.020 in.
Casing: Dia 2 in. Length 21 ft. Type Sched. 40 PVC
Fill Material 10/20 Sand Rig/Core CME-55
Drill Co. CASCADE DRILLING Method HSA
Driller Brian Gose Log By Matt Miller Date 6/8/99 Permit # _____
Checked By _____ License No. _____

See Site Map For Boring Location

COMMENTS:

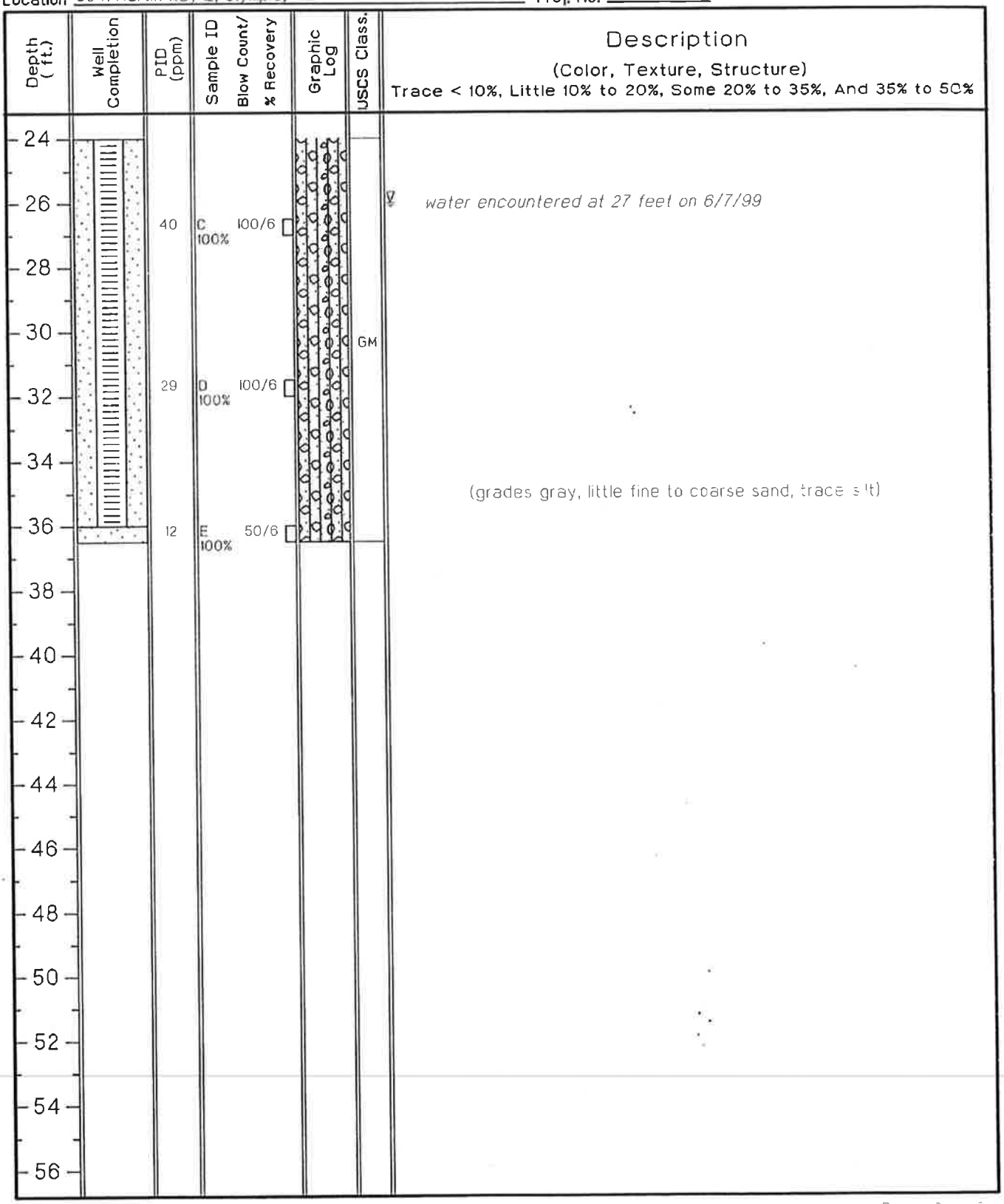
Analyzed soil samples are indicated by a black box.

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2							
0			MW-4			Asp	2" asphalt. Hand dug to five feet.
2							Olive SILT, trace very fine to coarse SAND (dry, very stiff, no odor)
4						ML	
6		0	A 100%	25 30/6			
8							
10							Olive brown fine to coarse SAND, some silt and gravel
12		-	0%	100/3			
14						SM	
16		-	0%	100/6			(grades increasing gravel)
18							
20							
22		203	B 100%	100/6		GM	Brown GRAVEL and fine to coarse sand, little silt (dry, very dense, petroleum odor)
24							

Drilling Log

Monitoring Well **MW-4**

Project *7-Eleven Facility #25983* Owner *7-Eleven, Inc.*
Location *3541 Martin Way E, Olympia, WA* Proj. No. *782254*



MW-4

RESOURCE PROTECTION WELL REPORT

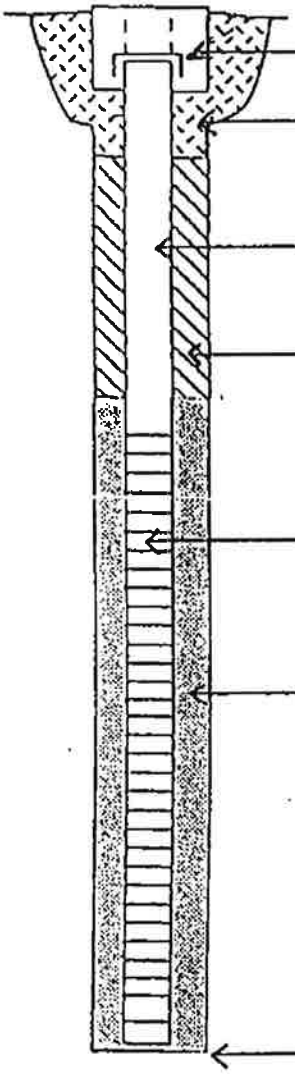
START CARD NO. R44114

25983

PROJECT NAME: Southland (7-Eleven)
WELL IDENTIFICATION NO. AER 839
DRILLING METHOD: HSA
DRILLER: BRIAN G. GOSE
FIRM: Cascade Drilling, Inc.
SIGNATURE: Brian
CONSULTING FIRM: IT CORPORATION
REPRESENTATIVE: MATT MILLER

COUNTY: THURSTON
LOCATION: NE ¼ SW ¼ Sec 18 Twn 18N R 1W
STREET ADDRESS OF WELL:
3541 MARTIN WAY OLYMPIA
WATER LEVEL ELEVATION: 26'
GROUND SURFACE ELEVATION: N/A
INSTALLED: 6/7-8/99
DEVELOPED: No

9286

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	WELL COVER CONCRETE SURFACE SEAL DEPTH = 1 ft PVC BLANK 2 "x 21 ' BACKFILL 17 ft. TYPE: bent. chips PVC SCREEN 2 "x 15 ' SLOT SIZE: .020 GRAVEL PACK 17 ft. MATERIAL: 2/12 sand WELL DEPTH 36 ' "	0 - 36 ft. Brown silt, sand + gravels - ft. - ft.

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/09)

Drilling Log

IT CORPORATION

Site Id: 25983-MW-5

See Site Map For Boring Location
Date(s): 04/26/01 - 04/26/01
Total Depth: 35.00'
Completed Depth: 35.00'
Static Water Level: 23.00'

Project Name: Southland
Location:
Permit No.:
Contractor: Cascade Drilling
Drilling Method: Hollow-Stem Auger
Borehole Dia.: 6.25in
Logged By: Erin McQuillan

Remarks:

Blank Casing:
type: PVC dia: 2.00in fm: 0.0' to: 19.50'

Screens:
type: Slotted size: 0.020in dia: 2.00in fm: 19.50' to: 34.50'

Annular Fill:
type: Cement fm: 0.50' to: 1.00'
type: Bentonite fm: 1.00' to: 17.50'
type: Monterey 2/12 Sand fm: 17.50' to: 35.00'

Depth (ft)	FID	Sample ID	Recovery	Blow Count	Graphic Log	USCS Code	Water Level	Description
1						SP		Asphalt to 2 in.
2								Post Hole Digging to 5 ft.bgs.
3						SM		Silty sand (SM), brown, fine samd, few fines (10%), damp, no odor or sheen.
4								
5	0 ppm	MW-5-5		5				Silty sand (SM), brown, fine sand, some fines (20%), damp, no noticeable odor.
6				6				
7				11				
8						GW		
9								
10	107.8 ppm	MW-5-10		12				Sand and gravel (GW), medium/coarse sand (60%), fine/coarse gravel (40%), hydrocarbon odor.
11				12				
12				12				
13								Very strong hydrocarbon odor from auger cuttings and boring.
14						GM		
15	113.2 ppm	MW-5-15		12				Sand, silt, and gravel (GM), brown, fine/medium sand, fine gravel, nonplastic silts (20%),
16				30				hydrocarbon odor, damp.
17				50				
18						GP		
19								Sand and gravel (GP), medium/coarse sand (40%), fine/coarse gravel (60%), trace fines, moist.
20	15.6 ppm	MW-5-20		20				Same as above.
21				30				
22				30				
23							▼	ADT, saturated at 23 ft. bgs.
24								
25	27.4 ppm	MW-5-25		28				Same as above, wet.
26				30				
27				25				
28								
29								
30	0 ppm	MW-5-30'		28				Same as above, wet.
31				30				
32				50				
33								
34	0 ppm	MW-5-33.5		37				
35				40				Total depth to 35 ft.bgs. Well completed to 35 ft.bgs.

EL. 0

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 2 **SB-1**

Stantec

DRILLING: STARTED **8/18/09** COMPLETED: **8/20/09**
INSTALLATION: STARTED **-** COMPLETED: **-**
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **Geoprobe 6600, CME75**
DRILLING METHOD: **Geoprobe, Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; Geoprob 5-16'; HollowStem 16-30'**

NORTHING (ft):
EASTING (ft):
LATITUDE:
LONGITUDE:
GROUND ELEV (ft):
TOC ELEV (ft):
INITIAL DTW (ft): **26.00**
BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): **26.85**
WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in):
LOGGED BY: **DH**
CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cascade Drilling, Inc. cleared hole to 8 feet bgs using airknife and vacuum							Quickrete
5		ML	**SILT** ; ML; brown; medium dense; moist; no odor; no staining		8/18/09 1530 SB-1 @5'-5.5'	--	--	0.0 ppm	5	
		GW	**GRAVELLY SAND**; GW; gray; medium-grained; medium dense; no odor; coarse gravel; difficult to geoprobe							
10					8/19/09 0830 SB-1 @10'-10.5'	--	--	0.0 ppm	10	Hydrated Bentonite chips
		ML	**SILT WITH COARSE GRAVEL**; ML; gray; very dense; no odor							
15			Refusal at 16' bgs by geoprobe encountered gp layer. Only able to penetrate with hollow-stem		8/19/09 0845 SB-1 @15'-15.5'	--	--	0.0 ppm	15	
		GP	**GRAVEL** ; GP; gray; coarse-grained; damp; no odor; no staining; strong cementation; poorly graded; rounded cobbles; great difficulty penetrating layer with geoprobe		8/20/09 1205 SB-1 @19'-20'	1.5	26 50 for	0.0 ppm		

GEO FORM 304 7-11_25983-SA_AUG09.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 12/2/09

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-1**
PAGE 2 OF 2

DRILLING: STARTED **8/18/09** COMPLETED: **8/20/09**
INSTALLATION: STARTED **-** COMPLETED: **-**
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **Geoprobe 6600, CME75**
DRILLING METHOD: **Geoprobe, Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; Geoprob 5-16'; HollowStem 16-30'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **26.00** BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): **26.85** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
		GP	**GRAVEL**; GP; gray; coarse-grained; damp; no odor; no staining; strong cementation; poorly graded; rounded cobbles; sample obtained via hollow-stem auger				6			
25		GP	**GRAVEL**; GP; gray; coarse-grained; damp; no odor; no staining; strong cementation; poorly graded; rounded cobbles; sample obtained via hollow-stem auger		8/20/09 1215 SB-1 @24'-25'	1.5	24 50 for 5	0.0 ppm	25	Hydrated Bentonite chips
						1.5	50 for 6			
30			Borehole terminated at 30 feet.						30	
35									35	

GEO FORM 304 7-11_25983-SA_AUG09.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 12/2/09

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-2** PAGE 1 OF 1

Stantec

DRILLING: STARTED **8/18/09** COMPLETED:
INSTALLATION: STARTED **-** COMPLETED: **-**
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **Geoprobe 6600, CME75**
DRILLING METHOD: **Geoprobe, Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; Geoprob 5-16'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **0** BOREHOLE DEPTH (ft): **16**
STATIC DTW (ft): **0** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cascade Drilling, Inc. cleared hole to 8 feet bgs using airknife and vacuum							Quickrete
5		SM	**SILTY SAND WITH COARSE GRAVEL**; SM; brown; fine to medium-grained; medium dense; no odor; difficulty air knifint to 7', hand-augered sample at 5' bgs; soil had roots in it		8/18/09 1800 SB-2 @5'-5.5'	--	--	0.0 ppm	5	
		SM	**SILTY SAND WITH COARSE GRAVEL**; SM; gray; fine to medium-grained; dense; no odor; subangular							Hydrated Bentonite chips
10					8/19/09 1015 SB-2 @10'-10.5'	--	--	0.0 ppm	10	
		ML	**SILT WITH COARSE GRAVEL**; ML; gray; very dense; very difficult to geoprobe							
15					8/19/09 1025 SB-2 @15'-15.5'	--	--	0.0 ppm	15	
			Refusal at 16' bgs by geoprobe. Could not use hollow-stem auger because of 2 electric overhead lines - one directly overhead and second not 10' away Borehole terminated at 16 feet.							

GEO FORM 304 7-11_25983-SA_AUG09.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 8/27/09

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-3**
PAGE 1 OF 2

DRILLING: STARTED **8/18/09** COMPLETED: **8/20/09**
INSTALLATION: STARTED COMPLETED:
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **Geoprobe 6600, CME75**
DRILLING METHOD: **Geoprobe, Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; Geoprob 5-16'; HollowStem 16-30'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **26.00** BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): **27.20** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cascade Drilling, Inc. cleared hole to 5 feet bgs using airknife and vacuum							Quickrete
5		SM	**SILTY SAND WITH COARSE GRAVEL**; SM; brown; medium-grained; medium dense; no odor; hand-augered at 5' bgs		8/18/09 1655 SB-3 @5'-5.5'	--	--	0.0 ppm	5	
		ML	**SILT** ; ML; gray; medium dense; no odor							
		SM	**SILTY SAND**; SM; gray; medium-grained; medium dense; no odor							
		GP	**GRAVEL WITH SAND**; GP; gray; damp; no odor; poorly graded; 50/50 sand to gravel							
10					8/19/09 1050 SB-3 @10'-10.5'	--	--	0.0 ppm	10	Hydrated Bentonite chips
15			Refusal at 16' bgs using geoprobe		8/19/09 1100 SB-3 @15.5'-16'	--	--	760 ppm	15	
		GW	**GRAVEL AND SAND**; GW; gray; medium to coarse-grained; very dense; moist; strong petroleum odor; well graded		8/19/09 1110 SB-3 @16'FD	--	834 ppm	834 ppm		

GEO FORM 304 7-11_25983-SA_AUG09.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 12/2/09

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-3**
PAGE 2 OF 2

DRILLING: STARTED **8/18/09** COMPLETED: **8/20/09**
INSTALLATION: STARTED COMPLETED:
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **Geoprobe 6600, CME75**
DRILLING METHOD: **Geoprobe, Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; Geoprob 5-16'; HollowStem 16-30'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **26.00** BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): **27.20** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
		GW			8/20/09 1525 SB-3 @20'-21'	1.5	24 50 for 5	0.0 ppm		
		GP	**GRAVEL WITH SILT**; GP; gray; coarse-grained; very dense; no odor; no staining; poorly graded							
25					8/20/09 1530 SB-3 @25'-26'	1.5	50 for 6	0.0 ppm	25	Hydrated Bentonite chips
		GP	**GRAVEL WITH SILT**; GP; gray; coarse-grained; very dense; no odor; no staining; poorly graded		8/20/09 1540 SB-3 @26'FD	1.5	28 50 for 6			
30			Borehole terminated at 30 feet.						30	
35									35	

GEO FORM 304 7-11_25983-SA_AUG09.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 12/2/09

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-4** PAGE 1 OF 2

Stantec

DRILLING: STARTED **8/18/09** COMPLETED: **8/20/09**
INSTALLATION: STARTED COMPLETED:
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; HollowStem 5'-30'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **26.00** BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): **27.40** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cascade Drilling, Inc. cleared hole to 8 feet bgs using airknife and vacuum							Quickrete
5		SM	**SILTY SAND**; SM; brown; loose; damp; no odor; no staining; no structure; hand-augered sample at 5' bgs		18/18/09 1320 SB-4 @5'-5.5'	--	--	0.0 ppm	5	
					8/20/09 1715 SB-4 @9-'10'	1.5	12 18 20	0.0 ppm		
10		SM	**SILTY SAND WITH COARSE GRAVEL**; SM; gray; medium-grained; medium dense; damp; no odor; no staining; no structure						10	Hydrated Bentonite chips
					8/20/09 1725 SB-4 @14'-15'	1.5	50 for 4	0.0 ppm		
15		GP	**GRAVEL WITH SILT AND MEDIUM SAND**; GP; gray; coarse-grained; very dense; no odor; poorly graded; fine silt						15	
					8/20/09 1730 SB-4 @19'-20'	1.5	21 50	0.0 ppm		

GEO FORM 304 7-11_25983-SA_AUG09.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 8/27/09

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-4** PAGE 2 OF 2

DRILLING: STARTED **8/18/09** COMPLETED: **8/20/09**
INSTALLATION: STARTED COMPLETED:
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; HollowStem 5'-30'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **26.00** BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): **27.40** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
		SM	**SILTY SAND WITH COARSE GRAVEL**; SM; gray; medium-grained; very dense; no odor							
					8/20/09 1740 SB-4 @24'-25'	1.5	50 for 6	0.0 ppm		
25		GP	**GRAVEL WITH SILT**; GP; gray; coarse-grained; very dense; damp; no odor; poorly graded						25	Hydrated Bentonite chips
		GP	**GRAVEL WITH SILT**; GP; gray; coarse-grained; very dense; wet; no odor; poorly graded		-		50 for 5	0.0 ppm		
30			Borehole terminated at 30 feet.						30	
35									35	

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-5**
PAGE 1 OF 2

DRILLING: STARTED **8/18/09** COMPLETED: **8/21/09**
INSTALLATION: STARTED COMPLETED:
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; HollowStem 5'-32'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **26.00** BOREHOLE DEPTH (ft): **32**
STATIC DTW (ft): **27.40** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cascade Drilling, Inc. cleared hole to 8 feet bgs using airknife and vacuum							Quickrete
5		ML	**CLAYEY SILT WITH COARSE GRAVEL**; ML; brown; fine-grained; medium dense; moist; no odor; no staining; subrounded; hand-augered sample at 5' bgs		8/18/09 1440 SB-5 @5'-5.5'	--	--	0.0 ppm	5	
10		SM	**SILTY SAND WITH COARSE GRAVEL**; SM; gray; medium-grained; medium dense; damp; no odor; no staining		8/21/09 1350 SB-5 @9'-10'	1.5	12 15 17	0.0 ppm	10	Hydrated Bentonite chips
15		SM	**SILTY SAND WITH COAL**; SM; gray; medium-grained; very dense; moderate petroleum odor		8/21/09 1355 SB-5 @14'-15' 1400 SB-5 @15'FD	1.5	50 for 5	39.7 ppm 40.0 ppm	15	
					8/21/09 1410 SB-5 @19'-20'	1.5	50 for 6	0.0		

GEO FORM 304 7-11_25983-SA_AUG09.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 12/2/09

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-5**
PAGE 2 OF 2

DRILLING: STARTED **8/18/09** COMPLETED: **8/21/09**
INSTALLATION: STARTED COMPLETED:
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; HollowStem 5'-32'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **26.00** BOREHOLE DEPTH (ft): **32**
STATIC DTW (ft): **27.40** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
		GP	**GRAVEL WITH SILT AND SAND**, GP; gray; very dense; damp; slight petroleum odor; poorly graded; coarse gravel		1415 SB-5 @19'-20'FD			ppm		
25		GP	**GRAVEL WITH SILT AND SAND**, GP; gray; very dense; moist; no odor; poorly graded; coarse gravel		8/21/09 1420 SB-5 @24'-25'	1.5	50 for 6	0.0 ppm	25	Hydrated Bentonite chips
30		GP	**GRAVEL WITH SILT AND SAND**, GP; gray; very dense; wet; poorly graded; coarse gravel; rounded stones		-	1.5	50 for 4		30	
			Borehole terminated at 32 feet.							
35									35	

GEO FORM 304 7-11_25983-SA_AUG09.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 12/2/09

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-6** PAGE 1 OF 2

Stantec

DRILLING: STARTED **8/18/09** COMPLETED: **8/21/09**
INSTALLATION: STARTED COMPLETED:
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; HollowStem 5'-30'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **28.00** BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): **28.90** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cascade Drilling, Inc. cleared hole to 8 feet bgs using airknife and vacuum							Quickrete
5		ML	**CLAYEY SILT WITH FINE TO COARSE GRAVEL**; ML; brown; dense; moist; no odor; no staining; subangular; no structure; hand-augered sample at 5' bgs		8/18/09 1205 SB-6 @5'-5.5'	--	--	0.0 ppm	5	
10		SP	**SAND WITH COARSE GRAVEL**; SP; brownish gray; medium-grained; loose to medium dense; moist; no odor; poorly graded; subrounded and rounded gravel		8/21/09 1215 SB-6 @9'-10'	1.5	17 50 for 6	0.0 ppm	10	Hydrated Bentonite chips
15		ML	**SILT WITH COARSE GRAVEL**; ML; gray; very dense; damp; no odor		8/21/09 1220 SB-6 @14'-15'	1.5	29 50 for 6	0.0 ppm	15	
					8/21/09 1225 SB-6	1.5	50 for 6	0.0		

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-6** PAGE 2 OF 2

DRILLING: STARTED **8/18/09** COMPLETED: **8/21/09**
INSTALLATION: STARTED COMPLETED:
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; HollowStem 5'-30'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **28.00** BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): **28.90** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
		GP	**GRAVEL**; GP; gray; coarse-grained; very dense; damp; no odor; poorly graded; little to no fines		@19'-20'			ppm		
25			No recovery - empty split spoon		-	0	50 for 5	--	25	Hydrated Bentonite chips
			No recovery - pushed a rock all of the way down to 30' bgs		-	0	50 for 4	--		
30			Borehole terminated at 30 feet.						30	
35									35	

GEO FORM 304 7-11_25983-SA_AUG09.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 8/27/09

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 2 **SB-7**

DRILLING: STARTED **8/18/09** COMPLETED: **8/21/09**
INSTALLATION: STARTED COMPLETED:
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; HollowStem 5'-32'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **27.00** BOREHOLE DEPTH (ft): **32**
STATIC DTW (ft): **27.80** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cascade Drilling, Inc. cleared hole to 8 feet bgs using airknife and vacuum							Quickrete
5		ML	**SILT WITH FINE TO COARSE GRAVEL**; ML; brown; medium dense; damp; no odor; no staining; no structure; hand-augered sample at 5' bgs		8/18/09 1030 SB-7 @5'-5.5'	--	--	0.0 ppm	5	
10		GP	**GRAVEL AND MEDIUM SAND**; GP; gray; coarse-grained; very dense; dry; no odor; poorly graded		8/21/09 0945 SB-7 @9'-10'	1.5	22 50 for 6	0.0 ppm	10	Hydrated Bentonite chips
15		GP	**GRAVEL AND MEDIUM SAND**; GP; gray; coarse-grained; very dense; dry; no odor; poorly graded		8/21/09 0950 SB-7 @14'-15'	1.5	17 50 for 6	0.0 ppm	15	
					8/21/09 0955 SB-7 @19'-20'	0.5	50 for 6	0.0 ppm		

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-7**
PAGE 2 OF 2

DRILLING: STARTED **8/18/09** COMPLETED: **8/21/09**
INSTALLATION: STARTED COMPLETED:
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; HollowStem 5'-32'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **27.00** BOREHOLE DEPTH (ft): **32**
STATIC DTW (ft): **27.80** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
		GP	**GRAVEL WITH MEDIUM SAND AND SILT** ; GP; gray; very dense; moist; no odor; poorly graded							
25		GP	**GRAVEL WITH MEDIUM SAND AND SILT** ; GP; gray; very dense; moist; no odor; poorly graded; white quartz crushed rock in spoon		8/21/09 1005 SB-7 @24'-25'	1.5	50 for 6	0.0 ppm	25	Hydrated Bentonite chips
30		GP	**GRAVEL WITH MEDIUM SAND AND SILT** ; GP; gray; very dense; wet; no odor; poorly graded			1.5	50 for 6		30	
			Borehole terminated at 32 feet.							
35									35	

GEO FORM 304 7-11_25983-SA_AUG09.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 12/2/09

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-8** PAGE 1 OF 2

Stantec

DRILLING: STARTED **8/18/09** COMPLETED: **8/21/09**
INSTALLATION: STARTED COMPLETED:
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; HollowStem 5'-30'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **27.00** BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): **27.40** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cascade Drilling, Inc. cleared hole to 8 feet bgs using airknife and vacuum							Quickrete
5		ML	**SILT SOME FINE TO COARSE GRAVEL**; ML; orange brown; fine-grained; loose; dry; no odor; no staining; not stratified; hand-augered sample to 5' bgs		8/18/09 0950 SB-8 @5'-5.5'	--	--	0.0 ppm	5	
10		GP	**GRAVEL WITH SAND AND SILT**; GP; gray; coarse-grained; medium dense; dry; no odor; poorly graded		8/21/09 0815 SB-8 @9'-10'	--	12 16 28	0.0 ppm	10	Hydrated Bentonite chips
15		ML	**SILT WITH SAND AND GRAVEL**; ML; gray; medium-grained; very dense; dry; no odor		8/21/09 0820 SB-8 @15'-16'	--	50 for 6	0.0 ppm	15	
					8/21/09 0830 SB-8	1.5	50 for 6	0.0		

PROJECT: **7-11 25983 Olympia - Subsurface Assessment**
LOCATION: **3541 Martin Way E, Olympia WA 98506**
PROJECT NUMBER: **211501077**

WELL / PROBEHOLE / BOREHOLE NO: **SB-8** PAGE 2 OF 2

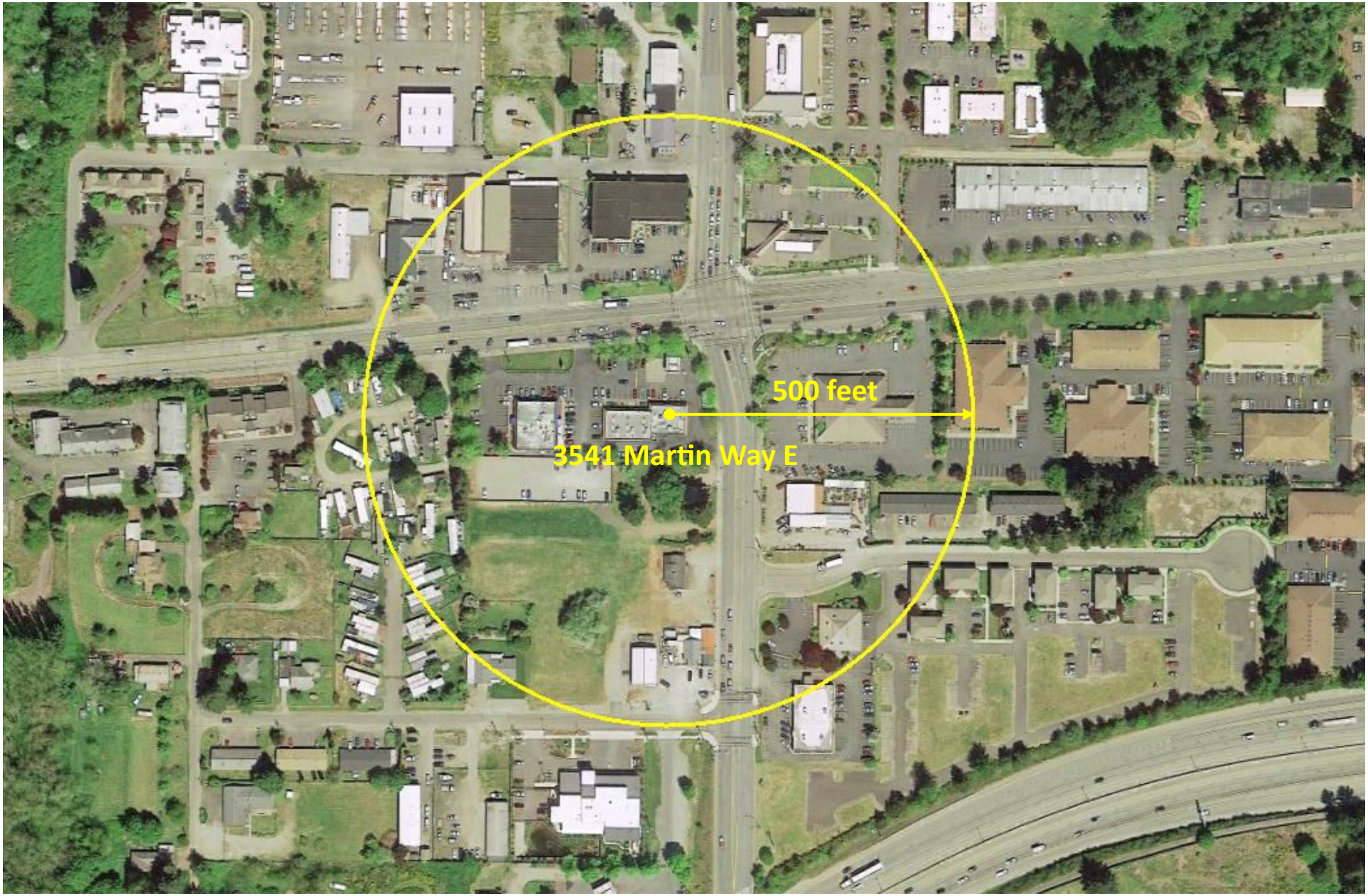
DRILLING: STARTED **8/18/09** COMPLETED: **8/21/09**
INSTALLATION: STARTED COMPLETED:
DRILLING COMPANY: **Cascade Drilling, Inc.**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **Hollow-Stem Auger**
SAMPLING EQUIPMENT: **HandAuger 5'; HollowStem 5'-30'**

NORTHING (ft): EASTING (ft):
LATITUDE: LONGITUDE:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **27.00** BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): **27.40** WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **DH** CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
		ML	**SILT WITH MEDIUM SAND AND GRAVEL** ; ML; gray; very dense; dry; no odor		@19'-20'			ppm		
25		GP	**GRAVEL WITH SILT AND MEDIUM SAND** ; GP; gray; coarse-grained; very dense; moist; no odor; poorly graded		8/21/09 0835 SB-8 @24'-25'	1.5	50 for 6	0.0 ppm	25	Hydrated Bentonite chips
		GP	**GRAVEL SOME SILT AND MEDIUM SAND** ; GP; gray; coarse-grained; very dense; wet; no odor; poorly graded				50 for 6			
30			Borehole terminated at 30 feet.						30	
35									35	

GEO FORM 304 7-11_25983-SA_AUG09.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 8/27/09

Appendix D TERRESTRIAL ECOLOGICAL EVALUATION



Stantec Consulting Services, Inc. 7-Eleven Store # 25983, 3541 Martin Way E, Olympia, WA 500’ Radius Site Map

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation. You still need to submit your evaluation as part of your cleanup plan or report.

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to www.ecy.wa.gov/programs/tcp/policies/terrestrial/TEEHome.htm.

Step 1: IDENTIFY HAZARDOUS WASTE SITE	
Please identify below the hazardous waste site for which you are documenting an evaluation.	
Facility/Site Name: 7-Eleven Store No. 25983	
Facility/Site Address: 3541 Martin Way E, Olympia, Washington	
Facility/Site No: 5465157	VCP Project No.: TBD

Step 2: IDENTIFY EVALUATOR			
Please identify below the person who conducted the evaluation and their contact information.			
Name: Paul Fairbairn			Title: Project Manager
Organization: Stantec Consulting Services, Inc.			
Mailing address: 11130 NE 33rd Place, Suite 200			
City: Bellevue		State: WA	Zip code: 98004
Phone: (425) 289-7343	Fax: (425) 869-1190	E-mail:	paul.fairbairn@stantec.com

Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

A. Exclusion from further evaluation.

1. Does the Site qualify for an exclusion from further evaluation?

☒ Yes *If you answered **"YES,"** then answer **Question 2**.*

☐ No or Unknown *If you answered **"NO" or "UKNOWN,"** then skip to **Step 3B** of this form.*

2. What is the basis for the exclusion? *Check all that apply. Then skip to **Step 4** of this form.*

Point of Compliance: WAC 173-340-7491(1)(a)

☒ All soil contamination is, or will be,* at least 15 feet below the surface.

☐ All soil contamination is, or will be,* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

☒ All contaminated soil, is or will be,* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

☐ There is less than 0.25 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.

☐ For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

☐ Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

[±] "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

[#] "Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

B. Simplified evaluation.

1. Does the Site qualify for a simplified evaluation?

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No or Unknown *If you answered **"NO"** or **"UNKNOWN,"** then skip to **Step 3C** of this form.*

2. Did you conduct a simplified evaluation?

☐ Yes *If you answered **"YES,"** then answer **Question 3** below.*

☐ No *If you answered **"NO,"** then skip to **Step 3C** of this form.*

3. Was further evaluation necessary?

☐ Yes *If you answered **"YES,"** then answer **Question 4** below.*

☐ No *If you answered **"NO,"** then answer **Question 5** below.*

4. If further evaluation was necessary, what did you do?

☐ Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*

☐ Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

5. If no further evaluation was necessary, what was the reason? *Check all that apply. Then skip to **Step 4** of this form.*

Exposure Analysis: WAC 173-340-7492(2)(a)

☐ Area of soil contamination at the Site is not more than 350 square feet.

☐ Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

Pathway Analysis: WAC 173-340-7492(2)(b)

☐ No potential exposure pathways from soil contamination to ecological receptors.

Contaminant Analysis: WAC 173-340-7492(2)(c)

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

C. Site-specific evaluation. A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. *See* WAC 173-340-7493(1)(c).

1. Was there a problem? *See* WAC 173-340-7493(2).

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No *If you answered **"NO,"** then identify the reason here and then skip to **Question 5** below:*

- ☐ No issues were identified during the problem formulation step.
- ☐ While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

2. What did you do to resolve the problem? *See* WAC 173-340-7493(3).

☐ Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*

☐ Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

3. If you conducted further site-specific evaluations, what methods did you use?
Check all that apply. See WAC 173-340-7493(3).

- ☐ Literature surveys.
- ☐ Soil bioassays.
- ☐ Wildlife exposure model.
- ☐ Biomarkers.
- ☐ Site-specific field studies.
- ☐ Weight of evidence.
- ☐ Other methods approved by Ecology. If so, please specify:

4. What was the result of those evaluations?

- ☐ Confirmed there was no problem.
- ☐ Confirmed there was a problem and established site-specific cleanup levels.

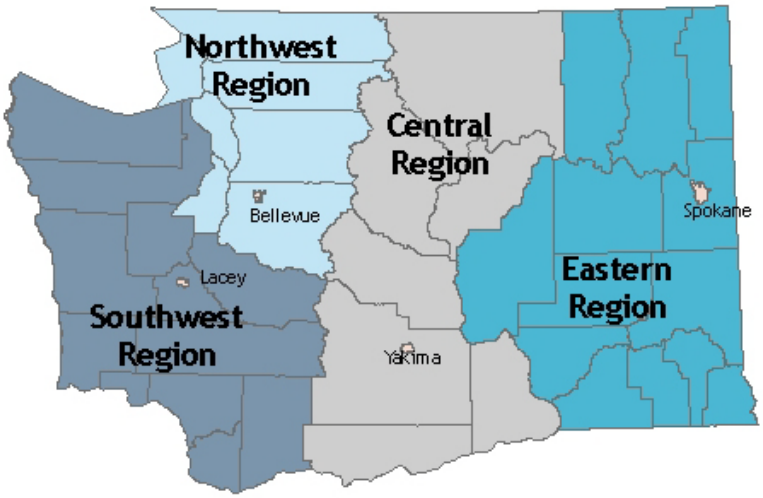
5. Have you already obtained Ecology's approval of both your problem formulation and problem resolution steps?

☐ Yes If so, please identify the Ecology staff who approved those steps:

☐ No

Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



Northwest Region: Attn: Sara Nied 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: Mark Dunbar 15 W. Yakima Ave., Suite 200 Yakima, WA 98902
Southwest Region: Attn: Scott Rose P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Attn: Patti Carter N. 4601 Monroe Spokane WA 99205-1295

Appendix E UNREPORTED FIELD NOTES AND ANALYTICAL RESULTS

WORK REQUEST FORM

Stantec

JOB NAME:	7-Eleven 25983	JOB NUMBER:	185750040
SITE ADDRESS:	3541 Martin Way Olympia, Wa	START DATE:	Tuesday, June 09, 2015
PREPARED FOR:	Emily Harper	PREPARED BY:	Emily Harper
	NOTE:	REVIEWED BY:	Paul Fairbairn

WORK DESCRIPTION:

1. Review H&S Plan.
2. Arrive onsite and check in with Station Manager and contact Paul Fairbairn. .
3. Review HASP, conduct Health and Safety briefing and perform Site Walk to determine any traffic flow.
4. Gauge all site wells following gauging order on Sampling Request Form.
5. Low-flow purge and sample wells following the sampling order provided.
6. Take a drum for purge water. Store purge water in drums onsite, make sure they are labeled properly and secured.
7. Take an inventory of all waste drums generated by Stantec at the site, and mark locations on site plan.
8. Call Paul Fairbairn in the office prior to leaving the site.

Job Numbers:

All Groundwater Sampling

185750040.400.0700

Contacts Information:

Paul Fairbairn in Stantec Office: (425) 298-1016 or (206) 369-8383

7-Eleven Environmental Manager: Jose Rios

ANALYTICAL REQUIREMENTS:	EQUIPMENT NEEDED:
NWTPH-Gx	H&S plan
BTEX 8260	Safety Equipment
Total Lead	Delineators
	Mini cooler for product sample
	Low-Flow Purging/Sampling Equipment
	Oil/Water Interface Probe
	Disposable bailers/ Rope
	Peristaltic Pump & Tubing
	Drum and labels

AUTHORIZATION : _____ COMPLETED: _____

Stantec

2nd QUARTER 2015 SAMPLING REQUEST

7-Eleven Service Station No. 25983 located at 3541 Martin Way; Olympia, WA

Project No.	Task		Project Manager	Date		Lab:		Client Contact:
185750040	400.0700		Paul Fairbairn	06/09/15		TA		Jose Rios

Well Number	Gaug. Freq.	Gaug. Order	Samp. Freq.	Samp. Order	Analyses	Well Depth	Top of Screen	Casing Dia.	Depth of Pump intake (ft bTOC)	Comments
MW-1	Annual	5	Annual	5	NWTPHG, BTEX 8260, Total Lead					
MW-2	Annual	4	Annual	4	NWTPHG, BTEX 8260, Total Lead					
MW-3	Annual	1	Annual	1	NWTPHG, BTEX 8260, Total Lead					
MW-4	Annual	2	Annual	2	NWTPHG, BTEX 8260, Total Lead					
MW-5	Annual	3	Annual	3	NWTPHG, BTEX 8260, Total Lead					

Notes:

*Review and sign HASP prior to arriving on site. Check in with station manager and Stantec Project Manager Paul Fairbairn: Cell: 206 369 8383; Office: 425 298 1016

* Implement Stantec low flow purging and sampling procedures.

*All wells will be sampled for NWTPH-Gx, BTEX 8260

*The wells are now historically clean, if product or sheen is found, use Stop Work Authority and contact the 7-Eleven Project Manager Paul Fairbairn immediately.

*Please gauge all selected wells first and proceed to sample all wells unless otherwise noted.

*Store water in drum on-site. Label drum with contents with a Non Hazardous Waste Drum label and note in the field log

No. wells gauged without sampling: _____ Total wells sampled: _____

Gallons Purged:

SITE VISITATION REPORT
2Q15 - 7-Eleven Service Station No. 25983 - Olympia, WA

Name(s) Emily Harper Date: 06/09/15 Time of Arrival Call-In: —

Arrival Time: 10:00 Departure Time: 1330 Time of Departure Call-In: 1330

Who did you call? Paul Fairbairn

DRUM INVENTORY

1	WATER	0	CARBON	TOTAL OPEN TOP	0
0	SOIL	0	EMPTY	TOTAL BUNG TOP	1

(1) 20 gal bung top

HEALTH AND SAFETY ASSESSMENT

Traffic and delineation	HASP/hospital directions
PPE	first aid kit
Visibility	fire extinguisher
cold stress	pinch points
proper lifting heavy objects	slips, trips, falls/slick surfaces

DESCRIPTION OF ACTIVITIES ONSITE AND NOTES

10:00 ARRIVE ONSITE, set up decon area - H+S Review (phone dead - no call in)
CHG Phone
10:25 Gauge wells
10:50 sample wells
13:15 finished sampling, clean ~~wells~~ site
13:30 call Paul, depart site

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HYDROLOGIC DATA SHEET

Gauge Date: June 9, 2015 **Project Name:** 7-Eleven #25983

Field Technician: Emily Harper **Project Number:** 185750040

DTP = Depth to Free Product (FP or NAPH) Below TOC
DTW = Depth to Groundwater Below TOC
DTB = Depth to Bottom of Well Casing Below TOC

Flow through cell calibrated Y ~~N~~ N/A

Wells checked for product and gauged prior to commencement of bailing or purging the wells Y ~~N~~ N/A

WELL OR LOCATION	WELL SCREEN DEPTH	PROPOSED INTAKE RANGE (feet below TOC)	MEASUREMENTS				PURGE? (Y/N)	SHEEN? (Y/N)	SAMPLE? (Y/N)	COMMENTS / PROBE CALIBRATION
			TIME	DTP (feet)	DTW (feet)	DTB (feet)				
MW-1			–	–	–	–	–	–	–	Abandoned
MW-2			10:35		25.90	35.67	Y	N	Y	
MW-3			10:30		25.54	35.55	Y	N	Y	
MW-4			–	–	–	–	–	–	–	Abandoned
MW-5			10:45		26.55	34.34	Y	N	Y	

Stantec

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WATER SAMPLE FIELD DATA SHEET

PROJECT #: 185750040 **PURGED & SAMPLED BY:** **WELL & SAMPLE ID:**

CLIENT NAME: 7-Eleven Emily Harper MW-5

LOCATION: 3541 Martin Way; Olympia, WA

DATE PURGED & SAMPLED START (2400hr) 11:00 END (2400hr)

Tuesday, June 09, 2015 SAMPLE TIME (2400hr) 11:30 LOW-FLOW USED NO

SAMPLE TYPE: Groundwater x Surface Water Treatment Effluent Other

CASING DIAMETER: 2" X (0.64) 3" (1.44) 4" (2.45)
Casing Volume: (liters per foot)

DEPTH TO BOTTOM (feet) = 34.34 (7.79)(0.64)(4) = 19.9

DEPTH TO WATER (feet) = 26.55

WATER COLUMN HEIGHT (feet) = 7.79 ACTUAL PURGE (L) = 17 L

FIELD MEASUREMENTS

DATE 6/9/2015	TIME (2400hr)	VOLUME (L)	TEMP. (degrees C)	CONDUCTIVITY (µS/cm)	pH (units)	COLOR (visual)	O.R.P.
				BAILED DRY			
Calculated Variance of Final Three Samples:							
Acceptable Variance Limits:			≤ 10%	≤ 3%	≤ 0.1		≤ 10%

DEPTH TO PURGE INTAKE DURING PURGE: — SAMPLE DTW: —

QTY OF SAMPLE VESSELS & PRESERVATIVE:
6 HCL VOA's per well
1 250 mL poly HNO3

ANALYSES:
NWTPH-g
BTEX 8260
Total Lead

PURGING EQUIPMENT:	SAMPLING EQUIPMENT:
Cole-Palmer Peristaltic Pump/Bailer	YSI

Flow Through Cell Disconnected Prior to Sample Collection?: YES NO N/A

WELL PAD CONDITION: Good WELL CASING CONDITION: Good

WELL VAULT CONDITION: Good SEAL PRESENT?: Yes BOLTS PRESENT?: 1/3

WELL INTEGRITY: Good WELL TAG: N/A LOCK#: N/A

REMARKS:

SIGNATURE:

Stantec

Stantec

WATER SAMPLE FIELD DATA SHEET

PROJECT #: 185750040 **PURGED & SAMPLED BY:** **WELL & SAMPLE ID:**

CLIENT NAME: 7-Eleven Emily Harper MW-2

LOCATION: 3541 Martin Way; Olympia, WA

DATE PURGED & SAMPLED START (2400hr) 11:40 END (2400hr)

Tuesday, June 09, 2015 SAMPLE TIME (2400hr) 12:15 LOW-FLOW USED NO

SAMPLE TYPE: Groundwater x Surface Water Treatment Effluent Other

CASING DIAMETER: 2" 3" 4" 4

Casing Volume: (liters per foot) (0.64) (1.44) (2.45)

DEPTH TO BOTTOM (feet) = 25.67 (9.77)(2.45)(4) = 95 L

DEPTH TO WATER (feet) = 25.90

WATER COLUMN HEIGHT (feet) = 9.77 ACTUAL PURGE (L) = 20 L

FIELD MEASUREMENTS

DATE 6/9/2015	TIME (2400hr)	VOLUME (L)	TEMP. (degrees C)	CONDUCTIVITY (µS/cm)	pH (units)	COLOR (visual)	O.R.P.
				BAILED DRY			
Calculated Variance of Final Three Samples:							
Acceptable Variance Limits:			≤ 10%	≤ 3%	≤ 0.1		≤ 10%

DEPTH TO PURGE INTAKE DURING PURGE: ~ SAMPLE DTW: ~

QTY OF SAMPLE VESSELS & PRESERVATIVE:	ANALYSES:
6 HCL VOA's per well	NWTPH-g
1 250 mL poly HNO3	BTEX 8260
	Total Lead

PURGING EQUIPMENT:	SAMPLING EQUIPMENT:
Cole-Palmer Peristaltic Pump/Bailer	YSI

Flow Through Cell Disconnected Prior to Sample Collection?: YES ~~X~~ NO N/A

WELL PAD CONDITION: Good WELL CASING CONDITION: Good

WELL VAULT CONDITION: Good SEAL PRESENT?: Yes BOLTS PRESENT?: 3/3

WELL INTEGRITY: Good WELL TAG: N/A LOCK#: N/A

REMARKS:

SIGNATURE:

Stantec

Stantec

WATER SAMPLE FIELD DATA SHEET

PROJECT #: 185750040 **PURGED & SAMPLED BY:** **WELL & SAMPLE ID:**

CLIENT NAME: 7-Eleven Emily Harper MW-3

LOCATION: 3541 Martin Way; Olympia, WA

DATE PURGED & SAMPLED START (2400hr) 12:20 END (2400hr)

Tuesday, June 09, 2015 SAMPLE TIME (2400hr) 1300 LOW-FLOW USED NO

SAMPLE TYPE: Groundwater x Surface Water Treatment Effluent Other

CASING DIAMETER: 2" X (0.64) 3" (1.44) 4" (2.45)
Casing Volume: (liters per foot)

DEPTH TO BOTTOM (feet) = 35.55 (10.01)(0.64)(4) = 25.6

DEPTH TO WATER (feet) = 25.54

WATER COLUMN HEIGHT (feet) = 10.01 ACTUAL PURGE (L) = 23 L

FIELD MEASUREMENTS

DATE 6/9/2015	TIME (2400hr)	VOLUME (L)	TEMP. (degrees C)	CONDUCTIVITY (µS/cm)	pH (units)	COLOR (visual)	O.R.P.
				BAILED	well		
Calculated Variance of Final Three Samples:							
Acceptable Variance Limits:			≤ 10%	≤ 3%	≤ 0.1		≤ 10%

DEPTH TO PURGE INTAKE DURING PURGE: — SAMPLE DTW: —

QTY OF SAMPLE VESSELS & PRESERVATIVE:	ANALYSES:
6 HCL VOA's per well	NWTPH-g
1 250 mL poly HNO3	BTEX 8260
	Total Lead

PURGING EQUIPMENT:	SAMPLING EQUIPMENT:
Cole-Palmer Peristaltic Pump/Bailer	YSI

Flow Through Cell Disconnected Prior to Sample Collection?: YES NO N/A

WELL PAD CONDITION: Good WELL CASING CONDITION: Good

WELL VAULT CONDITION: Good SEAL PRESENT?: Yes BOLTS PRESENT?: 3/3

WELL INTEGRITY: Good WELL TAG: LOCK#: N/A

REMARKS:

SIGNATURE:

WORK REQUEST FORM

Stantec

JOB NAME:	7-Eleven 25983	JOB NUMBER:	185750040
SITE ADDRESS:	3541 Martin Way Olympia, Wa	START DATE:	8/19/15
PREPARED FOR:	Emily Harper	PREPARED BY:	Emily Harper
NOTE:		REVIEWED BY:	Paul Fairbairn

WORK DESCRIPTION:

1. Review H&S Plan.
2. Arrive onsite and check in with Station Manager and contact Paul Fairbairn. .
3. Review HASP, conduct Health and Safety briefing and perform Site Walk to determine any traffic flow.
4. Gauge all site wells following gauging order on Sampling Request Form.
5. Low-flow purge and sample wells following the sampling order provided.
6. Take a drum for purge water. Store purge water in drums onsite, make sure they are labeled properly and secured.
7. Take an inventory of all waste drums generated by Stantec at the site, and mark locations on site plan.
8. Call Paul Fairbairn in the office prior to leaving the site.

Job Numbers:

All Groundwater Sampling

185750040.400.0700

Contacts Information:

Paul Fairbairn in Stantec Office: (425) 298-1016 or (206) 369-8383

7-Eleven Environmental Manager: Jose Rios

ANALYTICAL REQUIREMENTS:	EQUIPMENT NEEDED:
NWTPH-Gx	H&S plan
BTEX 8260	Safety Equipment
Total Lead	Delineators
	Mini cooler for product sample
	Low-Flow Purging/Sampling Equipment
	Oil/Water Interface Probe
	Disposable bailers/ Rope
	Peristaltic Pump & Tubing
	Drum and labels

AUTHORIZATION : _____ COMPLETED: _____

Stantec

2nd QUARTER 2015 SAMPLING REQUEST

7-Eleven Service Station No. 25983 located at 3541 Martin Way; Olympia, WA

Project No.	Task		Project Manager	Date		Lab:		Client Contact:
185750040	400.0700		Paul Fairbairn	06/09/15		TA		Jose Rios

Well Number	Gaug. Freq.	Gaug. Order	Samp. Freq.	Samp. Order	Analyses	Well Depth	Top of Screen	Casing Dia.	Depth of Pump intake (ft bTOC)	Comments
MW-1	Annual	5	Annual	5	NWTPHG, BTEX 8260, Total Lead					
MW-2	Annual	4	Annual	4	NWTPHG, BTEX 8260, Total Lead					
MW-3	Annual	1	Annual	1	NWTPHG, BTEX 8260, Total Lead					
MW-4	Annual	2	Annual	2						
MW-5	Annual	3	Annual	3	NWTPHG, BTEX 8260, Total Lead					

Notes:

*Review and sign HASP prior to arriving on site. Check in with station manager and Stantec Project Manager Paul Fairbairn: Cell: 206 369 8383; Office: 425 298 1016

* Implement Stantec low flow purging and sampling procedures.

*All wells will be sampled for NWTPH-Gx, BTEX 8260

*The wells are now historically clean, if product or sheen is found, use Stop Work Authority and contact the 7-Eleven Project Manager Paul Fairbairn immediately.

*Please gauge all selected wells first and proceed to sample all wells unless otherwise noted.

*Store water in drum on-site. Label drum with contents with a Non Hazardous Waste Drum label and note in the field log

No. wells gauged without sampling: _____ Total wells sampled: _____

Gallons Purged:

SITE VISITATION REPORT
3Q15 - 7-Eleven Service Station No. 25983 - Olympia, WA

Name(s): Emily Harper | Date: 8/19/15 | Time of Arrival Call-In: 6:50

Arrival Time: 6:45 | Departure Time: 10:00 | Time of Departure Call-In: 10:00

Who did you call? Paul Fairbairn

DRUM INVENTORY

1	WATER	0	CARBON	TOTAL OPEN TOP	0
0	SOIL	0	EMPTY	TOTAL BUNG TOP	1

(1) 20 gal bung top ready for pickup.

HEALTH AND SAFETY ASSESSMENT

Traffic and delineation	HASP/hospital directions
PPE	first aid kit
Visibility	fire extinguisher
cold stress	pinch points
proper lifting heavy objects	slips, trips, falls/slick surfaces

DESCRIPTION OF ACTIVITIES ONSITE AND NOTES

6:45 ARRIVE ONSITE
6:50 Test Dan F. set up eqp + decon
7:00 gauge wells
7:20 Sample wells
9:15 finished sampling, clean up site
10:00 depart site

Stantec

Stantec
HYDROLOGIC DATA SHEET

Gauge Date: ~~June 9, 2015~~ 8/19/15

Project Name: 7-Eleven #25983

Field Technician: Emily Harper

Project Number: 185750040

DTP = Depth to Free Product (FP or NAPH) Below TOC
DTW = Depth to Groundwater Below TOC
DTB = Depth to Bottom of Well Casing Below TOC

Flow through cell calibrated Y____ N____

Wells checked for product and gauged prior to commencement of bailing or purging the wells Y____ N____

WELL OR LOCATION	WELL SCREEN DEPTH	PROPOSED INTAKE RANGE (feet below TOC)	MEASUREMENTS				PURGE? (Y/N)	SHEEN? (Y/N)	SAMPLE? (Y/N)	COMMENTS / PROBE CALIBRATION
			TIME	DTP (feet)	DTW (feet)	DTB (feet)				
MW-1			—	—	—	—	—	—	—	well destroyed
MW-2			7:10	—	26.23	35.48	Y	N	Y	
MW-3			7:00	—	25.85	35.35	Y	N	Y	
MW-4S			7:15	—	26.04	34.32	Y	N	Y	
MW-5I			—	—	—	—	—	—	—	well destroyed

Stantec

Stantec

WATER SAMPLE FIELD DATA SHEET

PROJECT #: 185750040 **PURGED & SAMPLED BY:** **WELL & SAMPLE ID:**

CLIENT NAME: 7-Eleven Emily Harper MW-5

LOCATION: 3541 Martin Way; Olympia, WA

DATE PURGED & SAMPLED 8/19/15 START (2400hr) 7:20 END (2400hr) –

SAMPLE TIME (2400hr) 7:40 LOW-FLOW USED NO

SAMPLE TYPE: Groundwater x Surface Water ____ Treatment Effluent ____ Other ____

CASING DIAMETER: 2" X (0.64) 3" ____ (1.44) 4" ____ (2.45)

Casing Volume: (liters per foot)

DEPTH TO BOTTOM (feet) = 34.32 (7.68)(0.64)(4) = 19.66

DEPTH TO WATER (feet) = 26.64

WATER COLUMN HEIGHT (feet) = 7.68 ACTUAL PURGE (L) = 14.0 L

FIELD MEASUREMENTS

DATE	TIME (2400hr)	VOLUME (L)	TEMP. (degrees C)	CONDUCTIVITY mS/cm	pH (units)	COLOR (visual)	O.R.P.
				BAILED WELL			
Calculated Variance of Final Three Samples:							
Acceptable Variance Limits:			≤ 10%	≤ 3%	≤ 0.1		≤ 10%

DEPTH TO PURGE INTAKE DURING PURGE: – SAMPLE DTW: –

QTY OF SAMPLE VESSELS & PRESERVATIVE:	ANALYSES:
6 HCL VOA's per well	NWTPH-g
1 250 mL poly HNO3	BTEX 8260
	Total Lead

PURGING EQUIPMENT:	SAMPLING EQUIPMENT:
Cole-Palmer Peristaltic Pump/Bailer	YSI

Flow Through Cell Disconnected Prior to Sample Collection?: N/A YES ____ NO ____

WELL PAD CONDITION: Good WELL CASING CONDITION: Good

WELL VAULT CONDITION: Good SEAL PRESENT?: Yes BOLTS PRESENT?: 1/3

WELL INTEGRITY: Good WELL TAG: NO LOCK#: N/A

REMARKS:

SIGNATURE:

Stantec

Stantec

WATER SAMPLE FIELD DATA SHEET

PROJECT #: 185750040 **PURGED & SAMPLED BY:** **WELL & SAMPLE ID:**

CLIENT NAME: 7-Eleven Emily Harper MW-2

LOCATION: 3541 Martin Way; Olympia, WA

DATE PURGED & SAMPLED 8/19/13 START (2400hr) 7:50 END (2400hr) –

SAMPLE TIME (2400hr) 8:20 LOW-FLOW USED NO

SAMPLE TYPE: Groundwater x Surface Water ____ Treatment Effluent ____ Other ____

CASING DIAMETER: 2" ____ (0.64) 3" ____ (1.44) 4" X (2.45)

Casing Volume: (liters per foot)

DEPTH TO BOTTOM (feet) = 35.48 (9.25)(2.45)(4) = 90.65

DEPTH TO WATER (feet) = 26.23

WATER COLUMN HEIGHT (feet) = 9.25 ACTUAL PURGE (L) = 24.5 L

FIELD MEASUREMENTS

DATE	TIME (2400hr)	VOLUME (L)	TEMP. (degrees C)	CONDUCTIVITY mS/cm	pH (units)	COLOR (visual)	O.R.P.
				BAILED WELL			
Calculated Variance of Final Three Samples:							
Acceptable Variance Limits:			≤ 10%	≤ 3%	≤ 0.1		≤ 10%

DEPTH TO PURGE INTAKE DURING PURGE: – SAMPLE DTW: –

QTY OF SAMPLE VESSELS & PRESERVATIVE:	ANALYSES:
6 HCL VOA's per well	NWTPH-g
1 250 mL poly HNO3	BTEX 8260
	Total Lead

PURGING EQUIPMENT:	SAMPLING EQUIPMENT:
Cole-Palmer Peristaltic Pump/Bailer	YSI

Flow Through Cell Disconnected Prior to Sample Collection?: N/A YES ____ NO ____

WELL PAD CONDITION: Good WELL CASING CONDITION: Good

WELL VAULT CONDITION: Good SEAL PRESENT?: Yes BOLTS PRESENT?: 2/3

WELL INTEGRITY: Good WELL TAG: N/A LOCK#: N/A

REMARKS:

SIGNATURE:

Stantec

Stantec

WATER SAMPLE FIELD DATA SHEET

PROJECT #: 185750040 **PURGED & SAMPLED BY:** **WELL & SAMPLE ID:**

CLIENT NAME: 7-Eleven Emily Harper MW-3

LOCATION: 3541 Martin Way; Olympia, WA

DATE PURGED & SAMPLED 8/19/15 START (2400hr) 8:30 END (2400hr)

SAMPLE TIME (2400hr) 9:00 LOW-FLOW USED NO

SAMPLE TYPE: Groundwater x Surface Water Treatment Effluent Other

CASING DIAMETER: 2" X (0.64) 3" (1.44) 4" (2.45)

Casing Volume: (liters per foot)

DEPTH TO BOTTOM (feet) = 35.35

DEPTH TO WATER (feet) = 25.85

WATER COLUMN HEIGHT (feet) = 9.50

(9.50)(0.64)(4) = 24.32 L

ACTUAL PURGE (L) = 160.0 L

FIELD MEASUREMENTS

DATE	TIME (2400hr)	VOLUME (L)	TEMP. (degrees C)	CONDUCTIVITY mS/cm	pH (units)	COLOR (visual)	O.R.P.
				FAILED	WELL		
Calculated Variance of Final Three Samples:							
Acceptable Variance Limits:			≤ 10%	≤ 3%	≤ 0.1		≤ 10%

DEPTH TO PURGE INTAKE DURING PURGE: – SAMPLE DTW: –

QTY OF SAMPLE VESSELS & PRESERVATIVE:

6 HCL VOA's per well

1 250 mL poly HNO3

ANALYSES:

NWTPH-g

BTEX 8260

Total Lead

PURGING EQUIPMENT:	SAMPLING EQUIPMENT:
Cole-Palmer Peristaltic Pump/Bailer	YSI

Flow Through Cell Disconnected Prior to Sample Collection?: N/A YES NO

WELL PAD CONDITION: GOOD WELL CASING CONDITION: GOOD

WELL VAULT CONDITION: GOOD SEAL PRESENT?: YES BOLTS PRESENT?: 2/2

WELL INTEGRITY: GOOD WELL TAG: N/A LOCK#: N/A

REMARKS:

SIGNATURE:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-80290-1
Client Project/Site: 2Q15 GWM 25983

For:
Stantec Consulting Corp.
11130 NE 33rd Place
Suite 200
Bellevue, Washington 98004-1465

Attn: Paul Fairbairn

Authorized for release by:
6/19/2015 3:29:15 PM

Heather Wagner, Project Manager I
(615)301-5763
heather.wagner@testamericainc.com

Table of Contents

Sample Summary

Client: Stantec Consulting Corp.
Project/Site: 2Q15 GWM 25983

TestAmerica Job ID: 490-80290-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-80290-1	MW-2	Water	06/09/15 12:15	06/11/15 08:30
490-80290-2	MW-3	Water	06/09/15 13:00	06/11/15 08:30
490-80290-3	MW-5	Water	06/09/15 11:30	06/11/15 08:30

Job ID: 490-80290-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-80290-1

Comments
No additional comments.

Receipt
The samples were received on 6/11/2015 8:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.1º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
Method(s) 200.8: The following sample was diluted due to the abundance of non-target analytes: MW-3 (490-80290-2). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client: Stantec Consulting Corp.
Project/Site: 2Q15 GWM 25983

TestAmerica Job ID: 490-80290-1

Client Sample ID: MW-2
Date Collected: 06/09/15 12:15
Date Received: 06/11/15 08:30

Lab Sample ID: 490-80290-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.00		ug/L			06/17/15 07:08	1
Ethylbenzene	ND		1.00		ug/L			06/17/15 07:08	1
Xylenes, Total	ND		3.00		ug/L			06/17/15 07:08	1
Toluene	ND		1.00		ug/L			06/17/15 07:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*		*06/17/15 07:08*	*1*
1,2-Dichloroethane-d4 (Surr)	*75*		*70 - 130*		*06/17/15 07:08*	*1*
Toluene-d8 (Surr)	*99*		*70 - 130*		*06/17/15 07:08*	*1*
Dibromofluoromethane (Surr)	*71*		*70 - 130*		*06/17/15 07:08*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	ND		100		ug/L			06/16/15 17:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene	*76*		*50 - 150*		*06/16/15 17:08*	*1*

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**11.1**		2.00		ug/L		06/12/15 13:33	06/15/15 14:49	1

Client: Stantec Consulting Corp.
Project/Site: 2Q15 GWM 25983

TestAmerica Job ID: 490-80290-1

Client Sample ID: MW-3
Date Collected: 06/09/15 13:00
Date Received: 06/11/15 08:30

Lab Sample ID: 490-80290-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.00		ug/L			06/17/15 07:34	1
Ethylbenzene	ND		1.00		ug/L			06/17/15 07:34	1
Xylenes, Total	ND		3.00		ug/L			06/17/15 07:34	1
Toluene	ND		1.00		ug/L			06/17/15 07:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*70 - 130*		*06/17/15 07:34*	*1*
1,2-Dichloroethane-d4 (Surr)	*76*		*70 - 130*		*06/17/15 07:34*	*1*
Toluene-d8 (Surr)	*100*		*70 - 130*		*06/17/15 07:34*	*1*
Dibromofluoromethane (Surr)	*81*		*70 - 130*		*06/17/15 07:34*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	ND		100		ug/L			06/16/15 16:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene	*80*		*50 - 150*		*06/16/15 16:03*	*1*

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**26.0**		10.0		ug/L		06/12/15 13:33	06/15/15 14:55	5

Client: Stantec Consulting Corp.
Project/Site: 2Q15 GWM 25983

TestAmerica Job ID: 490-80290-1

Client Sample ID: MW-5
Date Collected: 06/09/15 11:30
Date Received: 06/11/15 08:30

Lab Sample ID: 490-80290-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.00		ug/L			06/17/15 07:59	1
Ethylbenzene	ND		1.00		ug/L			06/17/15 07:59	1
Xylenes, Total	ND		3.00		ug/L			06/17/15 07:59	1
Toluene	ND		1.00		ug/L			06/17/15 07:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*		*06/17/15 07:59*	*1*
1,2-Dichloroethane-d4 (Surr)	*74*		*70 - 130*		*06/17/15 07:59*	*1*
Toluene-d8 (Surr)	*100*		*70 - 130*		*06/17/15 07:59*	*1*
Dibromofluoromethane (Surr)	*78*		*70 - 130*		*06/17/15 07:59*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	ND		100		ug/L			06/16/15 17:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene	*85*		*50 - 150*		*06/16/15 17:41*	*1*

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**28.5**		2.00		ug/L		06/12/15 13:33	06/15/15 15:00	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 490-256669/7
Matrix: Water
Analysis Batch: 256669

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.00		ug/L			06/17/15 01:34	1
Ethylbenzene	ND		1.00		ug/L			06/17/15 01:34	1
Xylenes, Total	ND		3.00		ug/L			06/17/15 01:34	1
Toluene	ND		1.00		ug/L			06/17/15 01:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*		*06/17/15 01:34*	*1*
1,2-Dichloroethane-d4 (Surr)	*72*		*70 - 130*		*06/17/15 01:34*	*1*
Toluene-d8 (Surr)	*99*		*70 - 130*		*06/17/15 01:34*	*1*
Dibromofluoromethane (Surr)	*78*		*70 - 130*		*06/17/15 01:34*	*1*

Lab Sample ID: LCS 490-256669/3
Matrix: Water
Analysis Batch: 256669

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			50.0	52.50		ug/L		105	80 - 121		
Ethylbenzene			50.0	49.27		ug/L		99	80 - 130		
Xylenes, Total			150	143.2		ug/L		95	80 - 132		
Toluene			50.0	54.26		ug/L		109	80 - 126		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 130*
Toluene-d8 (Surr)	*98*		*70 - 130*
Dibromofluoromethane (Surr)	*79*		*70 - 130*

Lab Sample ID: LCSD 490-256669/4
Matrix: Water
Analysis Batch: 256669

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			50.0	52.85		ug/L		106	80 - 121	1	17
Ethylbenzene			50.0	50.01		ug/L		100	80 - 130	2	15
Xylenes, Total			150	145.3		ug/L		97	80 - 132	1	15
Toluene			50.0	54.54		ug/L		109	80 - 126	1	15

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 130*
Toluene-d8 (Surr)	*100*		*70 - 130*
Dibromofluoromethane (Surr)	*77*		*70 - 130*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 490-256450/5
Matrix: Water
Analysis Batch: 256450

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	ND		100		ug/L			06/16/15 15:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene	*78*		*50 - 150*		*06/16/15 15:31*	*1*

Lab Sample ID: LCS 490-256450/3
Matrix: Water
Analysis Batch: 256450

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
C6-C12			1000	970.8		ug/L		97	39 - 143		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene	*111*		*50 - 150*

Lab Sample ID: LCSD 490-256450/4
Matrix: Water
Analysis Batch: 256450

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
C6-C12			1000	968.2		ug/L		97	39 - 143	0	18

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene	*105*		*50 - 150*

Lab Sample ID: 490-80290-2 DU
Matrix: Water
Analysis Batch: 256450

Client Sample ID: MW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
C6-C12	ND			ND		ug/L				NC	18

Surrogate	*DU %Recovery*	*DU Qualifier*	*Limits*
a,a,a-Trifluorotoluene	*81*		*50 - 150*

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 490-255837/1-A
Matrix: Water
Analysis Batch: 256454

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 255837

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		2.00		ug/L		06/12/15 13:33	06/15/15 12:47	1

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 490-255837/2-A
Matrix: Water
Analysis Batch: 256454

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 255837

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	100	107.1		ug/L		107	85 - 115

QC Association Summary

Client: Stantec Consulting Corp.
Project/Site: 2Q15 GWM 25983

TestAmerica Job ID: 490-80290-1

GC/MS VOA

Analysis Batch: 256669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-80290-1	MW-2	Total/NA	Water	8260B	
490-80290-2	MW-3	Total/NA	Water	8260B	
490-80290-3	MW-5	Total/NA	Water	8260B	
LCS 490-256669/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 490-256669/4	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 490-256669/7	Method Blank	Total/NA	Water	8260B	

GC VOA

Analysis Batch: 256450

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-80290-1	MW-2	Total/NA	Water	NWTPH-Gx	
490-80290-2	MW-3	Total/NA	Water	NWTPH-Gx	
490-80290-2 DU	MW-3	Total/NA	Water	NWTPH-Gx	
490-80290-3	MW-5	Total/NA	Water	NWTPH-Gx	
LCS 490-256450/3	Lab Control Sample	Total/NA	Water	NWTPH-Gx	
LCSD 490-256450/4	Lab Control Sample Dup	Total/NA	Water	NWTPH-Gx	
MB 490-256450/5	Method Blank	Total/NA	Water	NWTPH-Gx	

Metals

Prep Batch: 255837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-80290-1	MW-2	Total/NA	Water	200.8	
490-80290-2	MW-3	Total/NA	Water	200.8	
490-80290-3	MW-5	Total/NA	Water	200.8	
LCS 490-255837/2-A	Lab Control Sample	Total/NA	Water	200.8	
MB 490-255837/1-A	Method Blank	Total/NA	Water	200.8	

Analysis Batch: 256454

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-80290-1	MW-2	Total/NA	Water	200.8	255837
490-80290-2	MW-3	Total/NA	Water	200.8	255837
490-80290-3	MW-5	Total/NA	Water	200.8	255837
LCS 490-255837/2-A	Lab Control Sample	Total/NA	Water	200.8	255837
MB 490-255837/1-A	Method Blank	Total/NA	Water	200.8	255837

Lab Chronicle

Client: Stantec Consulting Corp.
Project/Site: 2Q15 GWM 25983

TestAmerica Job ID: 490-80290-1

Client Sample ID: MW-2

Date Collected: 06/09/15 12:15
Date Received: 06/11/15 08:30

Lab Sample ID: 490-80290-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	256669	06/17/15 07:08	NC	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	5 mL	5 mL	256450	06/16/15 17:08	GWM	TAL NSH
Total/NA	Prep	200.8			50 mL	50 mL	255837	06/12/15 13:33	TSC	TAL NSH
Total/NA	Analysis	200.8		1	50 mL	50 mL	256454	06/15/15 14:49	JBD	TAL NSH

Client Sample ID: MW-3

Date Collected: 06/09/15 13:00
Date Received: 06/11/15 08:30

Lab Sample ID: 490-80290-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	256669	06/17/15 07:34	NC	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	5 mL	5 mL	256450	06/16/15 16:03	GWM	TAL NSH
Total/NA	Prep	200.8			50 mL	50 mL	255837	06/12/15 13:33	TSC	TAL NSH
Total/NA	Analysis	200.8		5	50 mL	50 mL	256454	06/15/15 14:55	JBD	TAL NSH

Client Sample ID: MW-5

Date Collected: 06/09/15 11:30
Date Received: 06/11/15 08:30

Lab Sample ID: 490-80290-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	256669	06/17/15 07:59	NC	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	5 mL	5 mL	256450	06/16/15 17:41	GWM	TAL NSH
Total/NA	Prep	200.8			50 mL	50 mL	255837	06/12/15 13:33	TSC	TAL NSH
Total/NA	Analysis	200.8		1	50 mL	50 mL	256454	06/15/15 15:00	JBD	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Stantec Consulting Corp.
Project/Site: 2Q15 GWM 25983

TestAmerica Job ID: 490-80290-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL NSH
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC)	NWTPH	TAL NSH
200.8	Metals (ICP/MS)	EPA	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Certification Summary

Client: Stantec Consulting Corp.
Project/Site: 2Q15 GWM 25983

TestAmerica Job ID: 490-80290-1

Laboratory: TestAmerica Nashville

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C789	07-19-15

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-80290 Chain of Custod

Cooler Received/Opened On 6/11/2015 @ 0830

1. Tracking # 7065 (last 4 digits, FedEx)

Courier: FedEx IR Gun ID 12080142

2. Temperature of rep. sample or temp blank when opened: 5.1 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES NO NA

If yes, how many and where: Two front

5. Were the seals intact, signed, and dated correctly? YES NO NA

6. Were custody papers inside cooler? YES NO NA

I certify that I opened the cooler and answered questions 1-6 (intial) DA

7. Were custody seals on containers: YES NO and Intact YES NO NA

Were these signed and dated correctly? YES NO NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES NO NA

12. Did all container labels and tags agree with custody papers? YES NO NA

13a. Were VOA vials received? YES NO NA

b. Was there any observable headspace present in any VOA vial? YES NO NA

14. Was there a Trip Blank in this cooler? YES NO NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) AJT

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES NO NA

b. Did the bottle labels indicate that the correct preservatives were used YES NO NA

16. Was residual chlorine present? YES NO NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) AJT

17. Were custody papers properly filled out (ink, signed, etc)? YES NO NA

18. Did you sign the custody papers in the appropriate place? YES NO NA

19. Were correct containers used for the analysis requested? YES NO NA

20. Was sufficient amount of sample sent in each container? YES NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) AJT

I certify that I attached a label with the unique LIMS number to each container (intial) AJT

21. Were there Non-Conformance issues at login? YES NO Was a NCM generated? YES NO #_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 11/28/12

TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: EMILY HARPER	Lab PM: Wagner, Heather	Carrier Tracking No(s):	COC No:
Client Contact: Paul Fairbairn	Phone: 425-869-9496	E-Mail: heather.wagner@testamericainc.com		Page:
Company: Stantec Consulting Corp.				Job #: 185750040
Address: 11130 NE 33rd Place Suite 200	Due Date Requested:			
City: Bellevue	TAT Requested (days): STANDARD			
State, Zip: WA, 98004-1465				
Phone: 425-298-1000(Tel)	PO #: Purchase Order Requested			
Email: paul.fairbairn@stantec.com	WO #:			
Project Name: 2015 GWM 25983	Project #:			
Site: 25983 OLYMPIA	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1. BTEX 8260	2. NWTPH-Gx	3. Total Lead 200.8										Total Number of containers	Special Instructions/Note:
			Preservation Code:				F	N	N	N	N	F								
MW-2	6/9/15	12:15		H_2O			X	X	X											
MW-3	↓	1300		↓			X	X	X											
MW-5	↓	11:30		↓			X	X	X											

Loc: 490
80290

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		6/10/15 1300	STANTEC		6/11/15 8:50	TAL
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: 5.1

Page 17 of 18

6/19/2015

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 490-80290-1

Login Number: 80290
List Number: 1
Creator: Huskey, Adam

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	False	Headspace larger than 1/4".
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-86101-1
Client Project/Site: 3Q15 GWM 25983

For:
Stantec Consulting Corp.
11130 NE 33rd Place
Suite 200
Bellevue, Washington 98004-1465

Attn: Paul Fairbairn

Authorized for release by:
9/1/2015 1:29:46 PM

Heather Wagner, Project Manager I
(615)301-5763
heather.wagner@testamericainc.com

Table of Contents

Sample Summary

Client: Stantec Consulting Corp.
Project/Site: 3Q15 GWM 25983

TestAmerica Job ID: 490-86101-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-86101-1	MW-2	Water	08/19/15 08:20	08/27/15 10:00
490-86101-2	MW-3	Water	08/19/15 09:00	08/27/15 10:00
490-86101-3	MW-5	Water	08/19/15 07:40	08/27/15 10:00

Case Narrative

Client: Stantec Consulting Corp.
Project/Site: 3Q15 GWM 25983

TestAmerica Job ID: 490-86101-1

Job ID: 490-86101-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-86101-1

Comments
No additional comments.

Receipt
The samples were received on 8/27/2015 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.3º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client: Stantec Consulting Corp.
Project/Site: 3Q15 GWM 25983

TestAmerica Job ID: 490-86101-1

Client Sample ID: MW-2
Date Collected: 08/19/15 08:20
Date Received: 08/27/15 10:00

Lab Sample ID: 490-86101-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.00		ug/L			08/31/15 16:53	1
Ethylbenzene	ND		1.00		ug/L			08/31/15 16:53	1
Xylenes, Total	ND		3.00		ug/L			08/31/15 16:53	1
Toluene	ND		1.00		ug/L			08/31/15 16:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*		*08/31/15 16:53*	*1*
1,2-Dichloroethane-d4 (Surr)	*112*		*70 - 130*		*08/31/15 16:53*	*1*
Toluene-d8 (Surr)	*107*		*70 - 130*		*08/31/15 16:53*	*1*
Dibromofluoromethane (Surr)	*108*		*70 - 130*		*08/31/15 16:53*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	ND		100		ug/L			08/30/15 03:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene	*78*		*50 - 150*		*08/30/15 03:44*	*1*

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**5.50**		2.00		ug/L		08/28/15 12:08	08/28/15 19:23	1

Method: 200.8 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.00200		mg/L		08/28/15 14:55	08/31/15 22:10	1

Client: Stantec Consulting Corp.
Project/Site: 3Q15 GWM 25983

TestAmerica Job ID: 490-86101-1

Client Sample ID: MW-3
Date Collected: 08/19/15 09:00
Date Received: 08/27/15 10:00

Lab Sample ID: 490-86101-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.00		ug/L			08/31/15 17:19	1
Ethylbenzene	ND		1.00		ug/L			08/31/15 17:19	1
Xylenes, Total	ND		3.00		ug/L			08/31/15 17:19	1
Toluene	ND		1.00		ug/L			08/31/15 17:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*		*08/31/15 17:19*	*1*
1,2-Dichloroethane-d4 (Surr)	*108*		*70 - 130*		*08/31/15 17:19*	*1*
Toluene-d8 (Surr)	*110*		*70 - 130*		*08/31/15 17:19*	*1*
Dibromofluoromethane (Surr)	*105*		*70 - 130*		*08/31/15 17:19*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	ND		100		ug/L			08/30/15 04:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene	*82*		*50 - 150*		*08/30/15 04:15*	*1*

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**16.5**		2.00		ug/L		08/28/15 12:08	08/28/15 19:29	1

Method: 200.8 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.00200		mg/L		08/28/15 14:55	08/31/15 22:15	1

Client: Stantec Consulting Corp.
Project/Site: 3Q15 GWM 25983

TestAmerica Job ID: 490-86101-1

Client Sample ID: MW-5
Date Collected: 08/19/15 07:40
Date Received: 08/27/15 10:00

Lab Sample ID: 490-86101-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.00		ug/L			08/31/15 17:45	1
Ethylbenzene	ND		1.00		ug/L			08/31/15 17:45	1
Xylenes, Total	ND		3.00		ug/L			08/31/15 17:45	1
Toluene	ND		1.00		ug/L			08/31/15 17:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*		*08/31/15 17:45*	*1*
1,2-Dichloroethane-d4 (Surr)	*109*		*70 - 130*		*08/31/15 17:45*	*1*
Toluene-d8 (Surr)	*109*		*70 - 130*		*08/31/15 17:45*	*1*
Dibromofluoromethane (Surr)	*105*		*70 - 130*		*08/31/15 17:45*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	ND		100		ug/L			08/30/15 04:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene	*82*		*50 - 150*		*08/30/15 04:45*	*1*

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**21.6**		2.00		ug/L		08/28/15 12:08	08/28/15 19:34	1

Method: 200.8 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.00200		mg/L		08/28/15 14:55	08/31/15 22:20	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 490-277741/6
Matrix: Water
Analysis Batch: 277741

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.00		ug/L			08/31/15 12:34	1
Ethylbenzene	ND		1.00		ug/L			08/31/15 12:34	1
Xylenes, Total	ND		3.00		ug/L			08/31/15 12:34	1
Toluene	ND		1.00		ug/L			08/31/15 12:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*08/31/15 12:34*	*1*
1,2-Dichloroethane-d4 (Surr)	*111*		*70 - 130*		*08/31/15 12:34*	*1*
Toluene-d8 (Surr)	*107*		*70 - 130*		*08/31/15 12:34*	*1*
Dibromofluoromethane (Surr)	*105*		*70 - 130*		*08/31/15 12:34*	*1*

Lab Sample ID: LCS 490-277741/3
Matrix: Water
Analysis Batch: 277741

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			50.0	52.98		ug/L		106	80 - 121		
Ethylbenzene			50.0	52.04		ug/L		104	80 - 130		
Xylenes, Total			150	158.3		ug/L		106	80 - 132		
Toluene			50.0	54.42		ug/L		109	80 - 126		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 130*
Toluene-d8 (Surr)	*108*		*70 - 130*
Dibromofluoromethane (Surr)	*104*		*70 - 130*

Lab Sample ID: LCSD 490-277741/4
Matrix: Water
Analysis Batch: 277741

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			50.0	53.94		ug/L		108	80 - 121	2	17
Ethylbenzene			50.0	51.78		ug/L		104	80 - 130	0	15
Xylenes, Total			150	157.5		ug/L		105	80 - 132	1	15
Toluene			50.0	52.79		ug/L		106	80 - 126	3	15

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 130*
Toluene-d8 (Surr)	*107*		*70 - 130*
Dibromofluoromethane (Surr)	*106*		*70 - 130*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 490-277377/3
Matrix: Water
Analysis Batch: 277377

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	ND		100		ug/L			08/29/15 17:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene	*66*		*50 - 150*		*08/29/15 17:57*	*1*

Lab Sample ID: LCS 490-277377/29
Matrix: Water
Analysis Batch: 277377

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
C6-C12	1000	1149		ug/L		115	39 - 143

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene	*127*		*50 - 150*

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 490-277130/1-A
Matrix: Water
Analysis Batch: 277352

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 277130

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		2.00		ug/L		08/28/15 12:08	08/28/15 17:45	1

Lab Sample ID: LCS 490-277130/2-A
Matrix: Water
Analysis Batch: 277352

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 277130

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	100	94.55		ug/L		95	85 - 115

Lab Sample ID: MB 490-277205/1-B
Matrix: Water
Analysis Batch: 277984

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 277207

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.00200		mg/L		08/28/15 14:55	08/31/15 21:08	1

Lab Sample ID: LCS 490-277205/2-B
Matrix: Water
Analysis Batch: 277984

Client Sample ID: Lab Control Sample
Prep Type: Dissolved
Prep Batch: 277207

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	0.100	0.1022		mg/L		102	85 - 115

QC Association Summary

Client: Stantec Consulting Corp.
Project/Site: 3Q15 GWM 25983

TestAmerica Job ID: 490-86101-1

GC/MS VOA

Analysis Batch: 277741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-86101-1	MW-2	Total/NA	Water	8260B	
490-86101-2	MW-3	Total/NA	Water	8260B	
490-86101-3	MW-5	Total/NA	Water	8260B	
LCS 490-277741/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 490-277741/4	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 490-277741/6	Method Blank	Total/NA	Water	8260B	

GC VOA

Analysis Batch: 277377

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-86101-1	MW-2	Total/NA	Water	NWTPH-Gx	
490-86101-2	MW-3	Total/NA	Water	NWTPH-Gx	
490-86101-3	MW-5	Total/NA	Water	NWTPH-Gx	
LCS 490-277377/29	Lab Control Sample	Total/NA	Water	NWTPH-Gx	
MB 490-277377/3	Method Blank	Total/NA	Water	NWTPH-Gx	

Metals

Prep Batch: 277130

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-86101-1	MW-2	Total/NA	Water	200.8	
490-86101-2	MW-3	Total/NA	Water	200.8	
490-86101-3	MW-5	Total/NA	Water	200.8	
LCS 490-277130/2-A	Lab Control Sample	Total/NA	Water	200.8	
MB 490-277130/1-A	Method Blank	Total/NA	Water	200.8	

Filtration Batch: 277205

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-86101-1	MW-2	Dissolved	Water	Filtration	
490-86101-2	MW-3	Dissolved	Water	Filtration	
490-86101-3	MW-5	Dissolved	Water	Filtration	
LCS 490-277205/2-B	Lab Control Sample	Dissolved	Water	Filtration	
MB 490-277205/1-B	Method Blank	Dissolved	Water	Filtration	

Prep Batch: 277207

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-86101-1	MW-2	Dissolved	Water	200.8	277205
490-86101-2	MW-3	Dissolved	Water	200.8	277205
490-86101-3	MW-5	Dissolved	Water	200.8	277205
LCS 490-277205/2-B	Lab Control Sample	Dissolved	Water	200.8	277205
MB 490-277205/1-B	Method Blank	Dissolved	Water	200.8	277205

Analysis Batch: 277352

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-86101-1	MW-2	Total/NA	Water	200.8	277130
490-86101-2	MW-3	Total/NA	Water	200.8	277130
490-86101-3	MW-5	Total/NA	Water	200.8	277130
LCS 490-277130/2-A	Lab Control Sample	Total/NA	Water	200.8	277130
MB 490-277130/1-A	Method Blank	Total/NA	Water	200.8	277130

Metals (Continued)

Analysis Batch: 277984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-86101-1	MW-2	Dissolved	Water	200.8	277207
490-86101-2	MW-3	Dissolved	Water	200.8	277207
490-86101-3	MW-5	Dissolved	Water	200.8	277207
LCS 490-277205/2-B	Lab Control Sample	Dissolved	Water	200.8	277207
MB 490-277205/1-B	Method Blank	Dissolved	Water	200.8	277207

Lab Chronicle

Client: Stantec Consulting Corp.
Project/Site: 3Q15 GWM 25983

TestAmerica Job ID: 490-86101-1

Client Sample ID: MW-2

Date Collected: 08/19/15 08:20
Date Received: 08/27/15 10:00

Lab Sample ID: 490-86101-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	277741	08/31/15 16:53	SLM	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	5 mL	5 mL	277377	08/30/15 03:44	AMC	TAL NSH
Dissolved	Prep	200.8			50 mL	50 mL	277207	08/28/15 14:55	ZLN	TAL NSH
Dissolved	Filtration	Filtration			50 mL	50 mL	277205	08/28/15 14:55	ZLN	TAL NSH
Dissolved	Analysis	200.8		1	50 mL	50 mL	277984	08/31/15 22:10	KKK	TAL NSH
Total/NA	Prep	200.8			50 mL	50 mL	277130	08/28/15 12:08	ZLN	TAL NSH
Total/NA	Analysis	200.8		1	50 mL	50 mL	277352	08/28/15 19:23	LEG	TAL NSH

Client Sample ID: MW-3

Date Collected: 08/19/15 09:00
Date Received: 08/27/15 10:00

Lab Sample ID: 490-86101-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	277741	08/31/15 17:19	SLM	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	5 mL	5 mL	277377	08/30/15 04:15	AMC	TAL NSH
Dissolved	Prep	200.8			50 mL	50 mL	277207	08/28/15 14:55	ZLN	TAL NSH
Dissolved	Filtration	Filtration			50 mL	50 mL	277205	08/28/15 14:55	ZLN	TAL NSH
Dissolved	Analysis	200.8		1	50 mL	50 mL	277984	08/31/15 22:15	KKK	TAL NSH
Total/NA	Prep	200.8			50 mL	50 mL	277130	08/28/15 12:08	ZLN	TAL NSH
Total/NA	Analysis	200.8		1	50 mL	50 mL	277352	08/28/15 19:29	LEG	TAL NSH

Client Sample ID: MW-5

Date Collected: 08/19/15 07:40
Date Received: 08/27/15 10:00

Lab Sample ID: 490-86101-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	277741	08/31/15 17:45	SLM	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	5 mL	5 mL	277377	08/30/15 04:45	AMC	TAL NSH
Dissolved	Prep	200.8			50 mL	50 mL	277207	08/28/15 14:55	ZLN	TAL NSH
Dissolved	Filtration	Filtration			50 mL	50 mL	277205	08/28/15 14:55	ZLN	TAL NSH
Dissolved	Analysis	200.8		1	50 mL	50 mL	277984	08/31/15 22:20	KKK	TAL NSH
Total/NA	Prep	200.8			50 mL	50 mL	277130	08/28/15 12:08	ZLN	TAL NSH
Total/NA	Analysis	200.8		1	50 mL	50 mL	277352	08/28/15 19:34	LEG	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Stantec Consulting Corp.
Project/Site: 3Q15 GWM 25983

TestAmerica Job ID: 490-86101-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL NSH
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC)	NWTPH	TAL NSH
200.8	Metals (ICP/MS)	EPA	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Certification Summary

Client: Stantec Consulting Corp.
Project/Site: 3Q15 GWM 25983

TestAmerica Job ID: 490-86101-1

Laboratory: TestAmerica Nashville

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C789	07-19-16

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT

490-86101 Chain of Custody

Cooler Received/Opened On 8/27/2015 @ 1000

1. Tracking # 9872 (last 4 digits, FedEx)

Courier: FedEx IR Gun ID 94660220

2. Temperature of rep. sample or temp blank when opened: 2.3 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO..NA

4. Were custody seals on outside of cooler? YES..NO...NA

If yes, how many and where: (1)Front

5. Were the seals intact, signed, and dated correctly? YES..NO...NA

6. Were custody papers inside cooler? YES..NO..NA

I certify that I opened the cooler and answered questions 1-6 (intial) MDM

7. Were custody seals on containers: YES ~~NO~~ and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? ~~Bubblewrap~~ Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: ~~Ice~~ Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES..NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES..NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO..NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # NA

I certify that I unloaded the cooler and answered questions 7-14 (intial)

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES..NO..NA

b. Did the bottle labels indicate that the correct preservatives were used YES..NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial)

17. Were custody papers properly filled out (ink, signed, etc)? YES..NO...NA

18. Did you sign the custody papers in the appropriate place? YES..NO...NA

19. Were correct containers used for the analysis requested? YES..NO...NA

20. Was sufficient amount of sample sent in each container? YES..NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial)

I certify that I attached a label with the unique LIMS number to each container (intial)

21. Were there Non-Conformance issues at login? YES..NO Was a NCM generated? YES..NO..#

BIS = Broken in shipment

TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

9/1/2015

Client Information

Client Contact: Paul Fairbairn
Company: Stantec Consulting Corp.
Address: 11130 NE 33rd Place Suite 200
City: Bellevue
State, Zip: WA, 98004-1465
Phone: 425-298-1000(Tel)
Email: paul.fairbairn@stantec.com
Project Name: 3Q15 GWM 25983
Site: 7-ELEVEN 25983 OLYMPIA

Sampler: EMILY HARPER
Phone: 425-869-9448 x162
Lab PM: Wagner, Heather
E-Mail: heather.wagner@testamericainc.com
Carrier Tracking No(s):
COC No:
Page:
Job #: 185750040

Due Date Requested:
TAT Requested (days): STANDARD
PO #: Purchase Order Requested
WO #:
Project #:
SSOW#:

Analysis Requested

Field Filtered Sample (Yes or No)
Perform MS/MSD (Yes or No)
1 BTEX 8260
8 NWTPH-G
Total lead 200.8
DISSOLVED LEAD
Total Number of containers

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	F	N	N	N	N	F	Special Instructions/Note:
			Preservation Code:								
MW-2	8/19/15	8:20		W		X	X	X	X		
MW-3		9:00				X	X	X	X		
MW-5		7:40				X	X	X	X		
											Loc: 490 86101

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by: Dmitrie Okanson	Date/Time: 8/25/2015 1310	Company: STANTEC	Received by:		Date/Time: 8/25/15 1310	Company: TA-SEA	
Relinquished by: Nicole Daugherty	Date/Time: 8/26/15 1500	Company:	Received by:	2.3	Date/Time: 8-27-15 1000	Company: TA	
Relinquished by:	Date/Time:	Company:	Received by:		Date/Time:	Company:	

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 490-86101-1
SDG Number:

Login Number: 86101
List Number: 1
Creator: Ford, Easton

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix F MTCA WORKBOOKS

Appendix F MTCA WORKBOOKS

A1 Soil Cleanup Levels: Worksheet for Soil Data Entry: Refer to WAC 173-340-720, 740,745, 747, 750

1. Enter Site Information

Date: 08/19/09
Site Name: 7-Eleven Store No. 25983
Sample Name: SB-3@16'

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6	4.9	4.19%
AL_EC >6-8	25	21.36%
AL_EC >8-10	4.9	4.19%
AL_EC >10-12	14	11.96%
AL_EC >12-16	0	0.00%
AL_EC >16-21	0	0.00%
AL_EC >21-34	0	0.00%
AR_EC >8-10	0	0.00%
AR_EC >10-12	26.89	22.97%
AR_EC >12-16	4.29	3.67%
AR_EC >16-21	0	0.00%
AR_EC >21-34	0	0.00%
Benzene	1.3	1.11%
Toluene	0.15	0.13%
Ethylbenzene	5.1	4.36%
Total Xylenes	29.8	25.46%
Naphthalene	0.11	0.09%
1-Methyl Naphthalene	0.43	0.37%
2-Methyl Naphthalene	0.18	0.15%
n-Hexane	0	0.00%
MTBE	0	0.00%
Ethylene Dibromide (EDB)	0	0.00%
1,2 Dichloroethane (EDC)	0	0.00%
Benzo(a)anthracene	0	0.00%
Benzo(b)fluoranthene	0	0.00%
Benzo(k)fluoranthene	0	0.00%
Benzo(a)pyrene	0	0.00%
Chrysene	0	0.00%
Dibenz(a,h)anthracene	0	0.00%
Indeno(1,2,3-cd)pyrene	0	0.00%
Sum	117.05	100.00%

3. Enter Site-Specific Hydrogeological Data

Total soil porosity:	0.43	Unitless
Volumetric water content:	0.3	Unitless
Volumetric air content:	0.13	Unitless
Soil bulk density measured:	1.5	kg/L
Fraction Organic Carbon:	0.001	Unitless
Dilution Factor:	20	Unitless

4. Target TPH Ground Water Concentation (if adjusted)

If you adjusted the target TPH ground water concentration, enter adjusted value here: 800 ug/L

Notes for Data Entry | **Set Default Hydrogeology**

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared

REMARK:

Soil collected from this location has been excavated and properly diposed; it was added to simulate a worst-case scenario.

MTBE, EDB, and EDC have been analyzed for and have never been detected at the site in any media and are not suspected of being present at the site based on the site history. Therefore, a value of zero will be assigned. A value of 1/2 of the laboratory reporting limit will be assigned to all other constituents not detected above laboratory detection limits.
There is no history of diesel at the site, so EPH Method was not used and corresponding fractions are therefore zero.

The analytical concentrations of the following hazardous substances will be subtracted from the associated EC-Fractions to avoid double counting as per Table 3.3 of the Washington State Department of Ecology's Workbook Tools for Calculating Soil and Groundwater Cleanup Levels under Model Toxics Control Act Cleanup Regulations User's Guide for MTCATPH11.1 & MTCASGL11.0

Hazardous Substance	Associated EC-Fraction
Ethylbenzene and Xylenes (C8H10)	AR_EC>8-10
Naphthalene (C10H8)	AR_EC>10-12
1-Methyl + 2-Methyl Naphthalene (C11H10)	AR_EC>12-16

If one or more analytes are not detected above the laboratory reporting limits then double counting will not be applied.

AR_EC>8-10 corrected total = (31) - (5.1+ 29.8) = -3.6

AR_EC>10-12 corrected total = (27) - (0.11) = 26.89

AR_EC>12-16 corrected total = (4.9) - (0.43 + 0.18) = 4.29

A2 Soil Cleanup Levels: Calculation and Summary of Results. Refer to WAC 173-340-720, 740, 745, 747, 750

Site Information

Date: 8/19/2009
Site Name: 7-Eleven Store No. 25983
Sample Name: SB-3@16'
Measured Soil TPH Concentration, mg/kg: **117.050**

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B	1,635	7.16E-08	3.61E-02	Pass
	Method C	63,861	9.58E-09	1.83E-03	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protectior	3	2.68E-04	9.92E+00	Fail
	Target TPH GW Conc. @ 800 ug/L	21	NA	NA	Fail

2. Results for Protection of Soil Direct Contact Pathway: Human Health

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	**1,635.17**	**63,860.55**
Most Stringent Criterion	**Risk of Benzene= 1E-6**	**HI =1**

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	*NO*	3.25E+03	1.99E-06	1.00E+00	YES	6.39E+04	5.23E-06	1.00E+00
Total Risk=1E-5	*NO*	1.64E+04	1.00E-05	5.04E+00	*NO*	1.22E+05	1.00E-05	1.91E+00
Risk of Benzene= 1E-6	YES	1.64E+03	1.00E-06	5.04E-01	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	**Benzene MCL = 5 ug/L**
Protective Ground Water Concentration, ug/L	**105.59**
Protective Soil Concentration, mg/kg	**2.54**

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1	*NO*	2.77E+02	2.76E-05	1.00E+00	1.22E+01
Total Risk = 1E-5	*NO*	1.67E+02	1.00E-05	4.59E-01	4.04E+00
Total Risk = 1E-6	YES	1.61E+01	1.00E-06	4.49E-02	4.06E-01
Risk of cPAHs mixture= 1E-5	NA	NA	NA	NA	NA
Benzene MCL = 5 ug/L	YES	1.06E+02	6.29E-06	2.89E-01	2.54E+00
MTBE = 20 ug/L	NA	NA	NA	NA	NA

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
Target TPH GW Conc = 800 ug/L	8.00E+02	5.12E-05	2.26E+00	**2.09E+01**

A2. 2 Worksheet for Calculating Soil Cleanup Level for the Protection of Ground Water Quality: (Leaching Pathway)

Washington State Department of Ecology, Model Toxics Control Act Cleanup Regulation Method B Ground Water

WAC 173-340-740 and 747

Date: 8/19/2009

Site Name: 7-Eleven Store No. 25983

Sample Name: SB-3@16'

Chemical of Concern or EC Group	Measured Soil Conc @dry basis	GW Cleanup Level	Adjusted Condition				
			Soil Conc being tested	Predicted Conc @Well	HQ @ Well	RISK @ Well	Pass or Fail?
	mg/kg	ug/L	mg/kg	ug/L	unitless	unitless	
Petroleum EC Fraction							
AL_EC >5-6	4.9		5.12E-01	4.86E+00	3.58E-04		
AL_EC >6-8	25		2.61E+00	6.56E+00	4.83E-04		
AL_EC >8-10	4.9		5.12E-01	1.13E-01	4.71E-04		
AL_EC >10-12	14		1.46E+00	2.30E-02	9.57E-05		
AL_EC >12-16	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >8-10	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >10-12	26.89		2.81E+00	2.35E+01	1.47E-01		
AR_EC >12-16	4.29		4.49E-01	1.05E+00	1.31E-03		
AR_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
Benzene	1.3	5	1.36E-01	2.19E+01	6.86E-01	2.76E-05	***Fail***
Toluene	0.15	1000	1.57E-02	1.66E+00	2.59E-03		
Ethylbenzene	5.1	700	5.33E-01	3.23E+01	4.04E-02		
Total Xylenes	29.8	1000	3.12E+00	1.84E+02	1.15E-01		
Naphthalene	0.11	160	1.15E-02	1.45E-01	9.04E-04		
1-Methyl Naphthalene	0.43		4.50E-02	3.31E-01	8.27E-04		
2-Methyl Naphthalene	0.18		1.88E-02	1.39E-01	4.33E-03		
n-Hexane	0		0.00E+00	0.00E+00	0.00E+00		
MTBE	0	20	0.00E+00	0.00E+00	0.00E+00		
Ethylene Dibromide (EDB)	0	0.01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0	5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0	for	0.00E+00	0.00E+00		0.00E+00	for
Benzo(b)fluoranthene	0	all	0.00E+00	0.00E+00		0.00E+00	all
Benzo(k)fluoranthene	0	cPAHs	0.00E+00	0.00E+00		0.00E+00	cPAHs
Benzo(a)pyrene	0	Risk=	0.00E+00	0.00E+00		0.00E+00	
Chrysene	0	1E-05	0.00E+00	0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	117.05		1.22E+01	2.77E+02	1.00E+00	2.76E-05	***Fail***

Site-Specific Hydrogeological Properties previously entered:

Item	Symbol	Value	Units
Total soil porosity:	n	0.43	unitless
Volumetric water content:	Θ_w	0.3	unitless
Volumetric air content:	Θ_a	0.13	unitless
Soil bulk density measured:	ρ_b	1.5	kg/L
Fraction Organic Carbon:	f_{oc}	0.001	unitless
Dilution Factor:	DF	20	unitless

Target Ground Water TPH conc adjusted previously if any:

Target Ground Water TPH Conc, ug/L ⇒ 800

CALCULATE PROTECTIVE CONDITION OR TEST ADJUSTED CONDITION Calculate

Selected Criterion: @ HI=1

Most Stringent? *NO*

Protective TPH Soil Conc, mg/kg = **12.24**

Protective TPH GW Conc, ug/L = 2.77E+02

RISK @ Well = 2.76E-05

HI @Well = 1.00E+00

DEDAILED MODEL RESULTS

Type of model used for computation:	3-Phase Model
Computation completed?	Yes!
Initial Weighted Average MW of NAPL, g/mol:	114.3
Equilibrated Weighted Average MW of NAPL, g/mol:	11.3
Initial Weighted Average Density of NAPL, kg/L:	0.808
Volumetric NAPL Content, Θ_{NAPL} :	1.3E-05
NAPL Saturation (%), Θ_{NAPL}/n :	0.00%
100% NAPL, mg/kg	70028.1
Mass Distribution Pattern @ 4-phase in soil pore system:	
Total Mass distributed in Water Phase: 9.06%	in Solid: 25.28%
Total Mass distributed in Air Phase: 8.09%	in NAPL: 57.58%

A2. 2 Worksheet for Calculating Soil Cleanup Level for the Protection of Ground Water Quality (Leaching Pathway)

Washington State Department of Ecology | Toxics Cleanup Program | Soil Cleanup Level Calculation | Method B Ground Water

WAC 173-340-740 and 747

Date: 8/19/2009

Site Name: 7-Eleven Store No. 25983

Sample Name: SB-3@16'

Chemical of Concern or EC Group	Measured Soil Conc @dry basis	GW Cleanup Level	Adjusted Condition				
			Soil Conc being tested	Predicted Conc @Well	HQ @ Well	RISK @ Well	Pass or Fail?
	mg/kg	ug/L	mg/kg	ug/L	unitless	unitless	
Petroleum EC Fraction							
AL_EC >5-6	4.9		1.69E-01	2.19E+00	1.61E-04		
AL_EC >6-8	25		8.62E-01	5.14E+00	3.78E-04		
AL_EC >8-10	4.9		1.69E-01	2.21E-01	9.22E-04		
AL_EC >10-12	14		4.83E-01	9.36E-02	3.90E-04		
AL_EC >12-16	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >8-10	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >10-12	26.89		9.28E-01	1.69E+01	1.06E-01		
AR_EC >12-16	4.29		1.48E-01	1.40E+00	1.75E-03		
AR_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
Benzene	1.3	5	4.48E-02	7.95E+00	2.49E-01	1.00E-05	***Fail***
Toluene	0.15	1000	5.17E-03	7.11E-01	1.11E-03		
Ethylbenzene	5.1	700	1.76E-01	2.03E+01	2.53E-02		
Total Xylenes	29.8	1000	1.03E+00	1.12E+02	7.00E-02		
Naphthalene	0.11	160	3.79E-03	1.35E-01	8.44E-04		
1-Methyl Naphthalene	0.43		1.48E-02	2.28E-01	5.69E-04		
2-Methyl Naphthalene	0.18		6.21E-03	9.72E-02	3.04E-03		
n-Hexane	0		0.00E+00	0.00E+00	0.00E+00		
MTBE	0	20	0.00E+00	0.00E+00	0.00E+00		
Ethylene Dibromide (EDB)	0	0.01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0	5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0	for	0.00E+00	0.00E+00		0.00E+00	for
Benzo(b)fluoranthene	0	all	0.00E+00	0.00E+00		0.00E+00	all
Benzo(k)fluoranthene	0	cPAHs	0.00E+00	0.00E+00		0.00E+00	cPAHs
Benzo(a)pyrene	0	Risk=	0.00E+00	0.00E+00		0.00E+00	
Chrysene	0	1E-05	0.00E+00	0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	117.05		4.04E+00	1.67E+02	4.59E-01	1.00E-05	***Fail***

Site-Specific Hydrogeological Properties previously entered:

Item	Symbol	Value	Units
Total soil porosity:	n	0.43	unitless
Volumetric water content:	Θ_w	0.3	unitless
Volumetric air content:	Θ_a	0.13	unitless
Soil bulk density measured:	ρ_b	1.5	kg/L
Fraction Organic Carbon:	f_{oc}	0.001	unitless
Dilution Factor:	DF	20	unitless

Target Ground Water TPH conc adjusted previously if any:

Target Ground Water TPH Conc, ug/L ⇒ 800

CALCULATE PROTECTIVE CONDITION OR TEST ADJUSTED CONDITION Calculate

Selected Criterion: @ Total Risk=1E-5

Most Stringent? *NO*

Protective TPH Soil Conc, mg/kg = **4.04**

Protective TPH GW Conc, ug/L = 1.67E+02

RISK @ Well = 1.00E-05

HI @Well = 4.59E-01

DEDAILED MODEL RESULTS

Type of model used for computation:	3-Phase Model
Computation completed?	Yes!
Initial Weighted Average MW of NAPL, g/mol:	114.3
Equilibrated Weighted Average MW of NAPL, g/mol:	16.3
Initial Weighted Average Density of NAPL, kg/L:	0.808
Volumetric NAPL Content, Θ_{NAPL} :	8.9E-08
NAPL Saturation (%), Θ_{NAPL}/n :	0.00%
100% NAPL, mg/kg	70028.1

Mass Distribution Pattern @ 4-phase in soil pore system:

Total Mass distributed in Water Phase: 16.58% in Solid: 65.08%

Total Mass distributed in Air Phase: 17.19% in NAPL: 1.15%

A2. 2 Worksheet for Calculating Soil Cleanup Level for the Protection of Ground Water Quality: (Leaching Pathway)

Calculating Soil Cleanup Level for the Protection of Ground Water Quality: (Leaching Pathway) Ground Water

WAC 173-340-740 and 747

Date: 8/19/2009

Site Name: 7-Eleven Store No. 25983

Sample Name: SB-3@16'

Chemical of Concern or EC Group	Measured Soil Conc @dry basis	GW Cleanup Level	Adjusted Condition				
			Soil Conc being tested	Predicted Conc @Well	HQ @ Well	RISK @ Well	Pass or Fail?
	mg/kg	ug/L	mg/kg	ug/L	unitless	unitless	
Petroleum EC Fraction							
AL_EC >5-6	4.9		1.70E-02	2.16E-01	1.59E-05		
AL_EC >6-8	25		8.67E-02	4.83E-01	3.55E-05		
AL_EC >8-10	4.9		1.70E-02	1.78E-02	7.40E-05		
AL_EC >10-12	14		4.85E-02	5.95E-03	2.48E-05		
AL_EC >12-16	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >8-10	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >10-12	26.89		9.32E-02	1.61E+00	1.00E-02		
AR_EC >12-16	4.29		1.49E-02	1.22E-01	1.52E-04		
AR_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
Benzene	1.3	5	4.51E-03	7.95E-01	2.49E-02	1.00E-06	
Toluene	0.15	1000	5.20E-04	7.03E-02	1.10E-04		
Ethylbenzene	5.1	700	1.77E-02	1.95E+00	2.44E-03		
Total Xylenes	29.8	1000	1.03E-01	1.08E+01	6.74E-03		
Naphthalene	0.11	160	3.81E-04	1.24E-02	7.76E-05		
1-Methyl Naphthalene	0.43		1.49E-03	2.17E-02	5.42E-05		
2-Methyl Naphthalene	0.18		6.24E-04	9.24E-03	2.89E-04		
n-Hexane	0		0.00E+00	0.00E+00	0.00E+00		
MTBE	0	20	0.00E+00	0.00E+00	0.00E+00		
Ethylene Dibromide (EDB)	0	0.01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0	5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0	for	0.00E+00	0.00E+00		0.00E+00	for
Benzo(b)fluoranthene	0	all	0.00E+00	0.00E+00		0.00E+00	all
Benzo(k)fluoranthene	0	cPAHs	0.00E+00	0.00E+00		0.00E+00	cPAHs
Benzo(a)pyrene	0	Risk=	0.00E+00	0.00E+00		0.00E+00	
Chrysene	0	1E-05	0.00E+00	0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	117.05		4.06E-01	1.61E+01	4.49E-02	1.00E-06	Pass

Site-Specific Hydrogeological Properties previously entered:

Item	Symbol	Value	Units
Total soil porosity:	n	0.43	unitless
Volumetric water content:	Θ_w	0.3	unitless
Volumetric air content:	Θ_a	0.13	unitless
Soil bulk density measured:	ρ_b	1.5	kg/L
Fraction Organic Carbon:	f_{oc}	0.001	unitless
Dilution Factor:	DF	20	unitless

Target Ground Water TPH conc adjusted previously if any:

Target Ground Water TPH Conc, ug/L ⇒ 800

CALCULATE PROTECTIVE CONDITION OR TEST ADJUSTED CONDITION Calculate

Selected Criterion: @ Total Risk=1E-6

Most Stringent? YES

Protective TPH Soil Conc, mg/kg = **0.41**

Protective TPH GW Conc, ug/L = 1.61E+01

RISK @ Well = 1.00E-06

HI @Well = 4.49E-02

DEDAILED MODEL RESULTS

Type of model used for computation:	3-Phase Model
Computation completed?	Yes!
Initial Weighted Average MW of NAPL, g/mol:	114.3
Equilibrated Weighted Average MW of NAPL, g/mol:	1.2
Initial Weighted Average Density of NAPL, kg/L:	0.808
Volumetric NAPL Content, Θ_{NAPL} :	8.3E-08
NAPL Saturation (%), Θ_{NAPL}/n :	0.00%
100% NAPL, mg/kg	70028.1

Mass Distribution Pattern @ 4-phase in soil pore system:

Total Mass distributed in Water Phase: 15.87% in Solid: 57.43%

Total Mass distributed in Air Phase: 16.00% in NAPL: 10.70%

A2. 2 Worksheet for Calculating Soil Cleanup Level for the Protection of Ground Water Quality: (Leaching Pathway)
Cleanup Level Ecology, Toxics Cleanup Program Soil Cleanup Level for Protection of Ground Water
WAC 173-340-740 and 747

Date: 8/19/2009

Site Name: 7-Eleven Store No. 25983

Sample Name: SB-3@16'

Chemical of Concern or EC Group	Measured Soil Conc @dry basis	GW Cleanup Level	Adjusted Condition				
			Soil Conc being tested	Predicted Conc @Well	HQ @ Well	RISK @ Well	Pass or Fail?
	mg/kg	ug/L	mg/kg	ug/L	unitless	unitless	
Petroleum EC Fraction							
AL_EC >5-6	4.9		1.06E-01	1.38E+00	1.01E-04		
AL_EC >6-8	25		5.42E-01	3.25E+00	2.39E-04		
AL_EC >8-10	4.9		1.06E-01	1.42E-01	5.93E-04		
AL_EC >10-12	14		3.03E-01	6.20E-02	2.58E-04		
AL_EC >12-16	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >8-10	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >10-12	26.89		5.83E-01	1.07E+01	6.69E-02		
AR_EC >12-16	4.29		9.30E-02	8.91E-01	1.11E-03		
AR_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
Benzene	1.3	5	2.82E-02	5.00E+00	1.56E-01	6.29E-06	
Toluene	0.15	1000	3.25E-03	4.47E-01	6.99E-04		
Ethylbenzene	5.1	700	1.11E-01	1.28E+01	1.60E-02		
Total Xylenes	29.8	1000	6.46E-01	7.06E+01	4.41E-02		
Naphthalene	0.11	160	2.38E-03	8.56E-02	5.35E-04		
1-Methyl Naphthalene	0.43		9.32E-03	1.44E-01	3.60E-04		
2-Methyl Naphthalene	0.18		3.90E-03	6.14E-02	1.92E-03		
n-Hexane	0		0.00E+00	0.00E+00	0.00E+00		
MTBE	0	20	0.00E+00	0.00E+00	0.00E+00		
Ethylene Dibromide (EDB)	0	0.01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0	5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0	for	0.00E+00	0.00E+00		0.00E+00	for
Benzo(b)fluoranthene	0	all	0.00E+00	0.00E+00		0.00E+00	all
Benzo(k)fluoranthene	0	cPAHs	0.00E+00	0.00E+00		0.00E+00	cPAHs
Benzo(a)pyrene	0	Risk=	0.00E+00	0.00E+00		0.00E+00	
Chrysene	0	1E-05	0.00E+00	0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	117.05		2.54E+00	1.06E+02	2.89E-01	6.29E-06	Pass

Site-Specific Hydrogeological Properties previously entered:

Item	Symbol	Value	Units
Total soil porosity:	n	0.43	unitless
Volumetric water content:	Θ_w	0.3	unitless
Volumetric air content:	Θ_a	0.13	unitless
Soil bulk density measured:	ρ_b	1.5	kg/L
Fraction Organic Carbon:	f_{oc}	0.001	unitless
Dilution Factor:	DF	20	unitless

Target Ground Water TPH conc adjusted previously if any:

Target Ground Water TPH Conc, ug/L ⇒ 800

CALCULATE PROTECTIVE CONDITION OR TEST ADJUSTED CONDITION Calculate

Selected Criterion: @ Benzene MCL

Most Stringent? YES

Protective TPH Soil Conc, mg/kg = **2.54**

Protective TPH GW Conc, ug/L = 1.06E+02

RISK @ Well = 6.29E-06

HI @Well = 2.89E-01

DEDAILED MODEL RESULTS

Type of model used for computation:	3-Phase Model
Computation completed?	Yes!
Initial Weighted Average MW of NAPL, g/mol:	114.3
Equilibrated Weighted Average MW of NAPL, g/mol:	10.6
Initial Weighted Average Density of NAPL, kg/L:	0.808
Volumetric NAPL Content, Θ_{NAPL} :	4.2E-10
NAPL Saturation (%), Θ_{NAPL}/n :	0.00%
100% NAPL, mg/kg	70028.1

Mass Distribution Pattern @ 4-phase in soil pore system:

Total Mass distributed in Water Phase: 16.65% in Solid: 66.03%

Total Mass distributed in Air Phase: 17.31% in NAPL: 0.01%

A1 Soil Cleanup Levels: Worksheet for Soil Data Entry: Refer to WAC 173-340-720, 740,745, 747, 750

1. Enter Site Information

Date: 10/15/14
Site Name: 7-Eleven Store No. 25983
Sample Name: South Wall @ 18'

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6	2.5	1.61%
AL_EC >6-8	6.3	4.06%
AL_EC >8-10	6	3.86%
AL_EC >10-12	2.5	1.61%
AL_EC >12-16	0	0.00%
AL_EC >16-21	0	0.00%
AL_EC >21-34	0	0.00%
AR_EC >8-10	24.11	15.52%
AR_EC >10-12	63.98	41.19%
AR_EC >12-16	47.66	30.68%
AR_EC >16-21	0	0.00%
AR_EC >21-34	0	0.00%
Benzene	0.01	0.01%
Toluene	0.025	0.02%
Ethylbenzene	0.09	0.06%
Total Xylenes	1.8	1.16%
Naphthalene	0.02	0.01%
1-Methyl Naphthalene	0.22	0.14%
2-Methyl Naphthalene	0.12	0.08%
n-Hexane	0	0.00%
MTBE	0	0.00%
Ethylene Dibromide (EDB)	0	0.00%
1,2 Dichloroethane (EDC)	0	0.00%
Benzo(a)anthracene	0	0.00%
Benzo(b)fluoranthene	0	0.00%
Benzo(k)fluoranthene	0	0.00%
Benzo(a)pyrene	0	0.00%
Chrysene	0	0.00%
Dibenz(a,h)anthracene	0	0.00%
Indeno(1,2,3-cd)pyrene	0	0.00%
Sum	155.335	100.00%

3. Enter Site-Specific Hydrogeological Data

Total soil porosity:	0.43	Unitless
Volumetric water content:	0.3	Unitless
Volumetric air content:	0.13	Unitless
Soil bulk density measured:	1.5	kg/L
Fraction Organic Carbon:	0.001	Unitless
Dilution Factor:	20	Unitless

4. Target TPH Ground Water Concentation (if adjusted)

If you adjusted the target TPH ground water concentration, enter adjusted value here: 800 ug/L

Notes for Data Entry | **Set Default Hydrogeology**

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared

REMARK:

MTBE, EDB, and EDC have been analyzed for and have never been detected at the site in any media and are not suspected of being present at the site based on the site history. Therefore, a value of zero will be assigned. A value of 1/2 of the laboratory reporting limit will be assigned to all other constituents not detected above laboratory detection limits.
There is no history of diesel at the site, so EPH Method was not used and corresponding fractions are therefore zero.

The analytical concentrations of the following hazardous substances will be subtracted from the associated EC-Fractions to avoid double counting as per Table 3.3 of the Washington State Department of Ecology's Workbook Tools for Calculating Soil and Groundwater Cleanup Levels under Model Toxics Control Act Cleanup Regulations User's Guide for MTCATPH11.1 & MTCASGL11.0

Hazardous Substance	Associated EC-Fraction
Ethylbenzene and Xylenes (C8H10)	AR_EC>8-10
Naphthalene (C10H8)	AR_EC>10-12
1-Methyl + 2-Methyl Naphthalene (C11H10)	AR_EC>12-16

If one or more analytes are not detected above the laboratory reporting limits then double counting will not be applied.

AR_EC>8-10 corrected total = (26) - (0.09 + 1.8) = 24.11

AR_EC>10-12 corrected total = (64) - (0.02) = 63.98

AR_EC>12-16 corrected total = (48) - (0.22 + 0.12) = 47.66

A2 Soil Cleanup Levels: Calculation and Summary of Results. Refer to WAC 173-340-720, 740, 745, 747, 750

Site Information

Date: 10/15/2014
Site Name: 7-Eleven Store No. 25983
Sample Name: South Wall @ 18'
Measured Soil TPH Concentration, mg/kg: **155.335**

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B	2,278	5.51E-10	6.82E-02	Pass
	Method C	38,623	7.37E-11	4.02E-03	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protection	Use A2.2	2.00E-06	3.81E+00	Fail
	Target TPH GW Conc. @ 800 ug/L	54	NA	NA	Fail

2. Results for Protection of Soil Direct Contact Pathway: Human Health

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	**2,277.77**	**38,622.72**
Most Stringent Criterion	**HI =1**	**HI =1**

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	2.28E+03	8.07E-09	1.00E+00	YES	3.86E+04	1.83E-08	1.00E+00
Total Risk=1E-5	*NO*	2.82E+06	1.00E-05	1.24E+03	*NO*	2.11E+07	1.00E-05	5.46E+02
Risk of Benzene= 1E-6	*NO*	2.82E+05	1.00E-06	1.24E+02	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	**HI=1**
Protective Ground Water Concentration, ug/L	**291.17**
Protective Soil Concentration, mg/kg	**37.32**

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1	YES	2.91E+02	4.88E-07	1.00E+00	3.73E+01
Total Risk = 1E-5	*NO*	1.34E+03	1.00E-05	4.39E+00	4.03E+03
Total Risk = 1E-6	*NO*	9.09E+02	1.00E-06	3.19E+00	7.13E+01
Risk of cPAHs mixture= 1E-5	NA	NA	NA	NA	NA
Benzene MCL = 5 ug/L	*NO*	1.30E+03	6.29E-06	4.26E+00	8.54E+02
MTBE = 20 ug/L	NA	NA	NA	NA	NA

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
Target TPH GW Conc = 800 ug/L	8.00E+02	7.69E-07	2.81E+00	**5.40E+01**

A2. 2 Worksheet for Calculating Soil Cleanup Level for the Protection of Ground Water Quality: Leaching Pathway

Calculating Soil Cleanup Level for the Protection of Ground Water Quality: Leaching Pathway

WAC 173-340-740 and 747

Date: 10/15/2014

Site Name: 7-Eleven Store No. 25983

Sample Name: South Wall @ 18'

Chemical of Concern or EC Group	Measured Soil Conc @dry basis	GW Cleanup Level	Adjusted Condition				
			Soil Conc being tested	Predicted Conc @Well	HQ @ Well	RISK @ Well	Pass or Fail?
	mg/kg	ug/L	mg/kg	ug/L	unitless	unitless	
Petroleum EC Fraction							
AL_EC >5-6	2.5		6.01E-01	5.70E+00	4.19E-04		
AL_EC >6-8	6.3		1.51E+00	3.80E+00	2.79E-04		
AL_EC >8-10	6		1.44E+00	3.18E-01	1.33E-03		
AL_EC >10-12	2.5		6.01E-01	9.42E-03	3.93E-05		
AL_EC >12-16	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >8-10	24.11		5.79E+00	9.73E+01	1.22E-01		
AR_EC >10-12	63.98		1.54E+01	1.29E+02	8.04E-01		
AR_EC >12-16	47.66		1.15E+01	2.68E+01	3.35E-02		
AR_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
Benzene	0.01	5	2.40E-03	3.88E-01	1.21E-02	4.88E-07	
Toluene	0.025	1000	6.01E-03	6.35E-01	9.92E-04		
Ethylbenzene	0.09	700	2.16E-02	1.31E+00	1.64E-03		
Total Xylenes	1.8	1000	4.32E-01	2.56E+01	1.60E-02		
Naphthalene	0.02	160	4.81E-03	6.04E-02	3.78E-04		
1-Methyl Naphthalene	0.22		5.29E-02	3.89E-01	9.72E-04		
2-Methyl Naphthalene	0.12		2.88E-02	2.12E-01	6.63E-03		
n-Hexane	0		0.00E+00	0.00E+00	0.00E+00		
MTBE	0	20	0.00E+00	0.00E+00	0.00E+00		
Ethylene Dibromide (EDB)	0	0.01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0	5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0	for	0.00E+00	0.00E+00		0.00E+00	for
Benzo(b)fluoranthene	0	all	0.00E+00	0.00E+00		0.00E+00	all
Benzo(k)fluoranthene	0	cPAHs	0.00E+00	0.00E+00		0.00E+00	cPAHs
Benzo(a)pyrene	0	Risk=	0.00E+00	0.00E+00		0.00E+00	
Chrysene	0	1E-05	0.00E+00	0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	155.335		3.73E+01	2.91E+02	1.00E+00	4.88E-07	Pass

Site-Specific Hydrogeological Properties previously entered:

Item	Symbol	Value	Units
Total soil porosity:	n	0.43	unitless
Volumetric water content:	Θ_w	0.3	unitless
Volumetric air content:	Θ_a	0.13	unitless
Soil bulk density measured:	ρ_b	1.5	kg/L
Fraction Organic Carbon:	f_{oc}	0.001	unitless
Dilution Factor:	DF	20	unitless

Target Ground Water TPH conc adjusted previously if any:

Target Ground Water TPH Conc, ug/L ⇒ 800

CALCULATE PROTECTIVE CONDITION OR TEST ADJUSTED CONDITION Calculate

Selected Criterion: @ HI=1

Most Stringent? YES

Protective TPH Soil Conc, mg/kg = **37.32**

Protective TPH GW Conc, ug/L = 2.91E+02

RISK @ Well = 4.88E-07

HI @Well = 1.00E+00

DEDAILED MODEL RESULTS

Type of model used for computation:	3-Phase Model
Computation completed?	Yes!
Initial Weighted Average MW of NAPL, g/mol:	130.8
Equilibrated Weighted Average MW of NAPL, g/mol:	35.7
Initial Weighted Average Density of NAPL, kg/L:	0.896
Volumetric NAPL Content, Θ_{NAPL} :	3.7E-05
NAPL Saturation (%), Θ_{NAPL}/n :	0.01%
100% NAPL, mg/kg	77682.7

Mass Distribution Pattern @ 4-phase in soil pore system:

Total Mass distributed in Water Phase: 3.12% in Solid: 34.82%

Total Mass distributed in Air Phase: 2.22% in NAPL: 59.83%

A2. 2 Worksheet for Calculating Soil Cleanup Level for the Protection of Ground Water Quality: (Leaching Pathway)
Washington State Department of Ecology, Toxics Cleanup Program Soil Cleanup Level for Protection of Ground Water
WAC 173-340-740 and 747

Date: 10/15/2014

Site Name: 7-Eleven Store No. 25983

Sample Name: South Wall @ 18'

Chemical of Concern or EC Group	Measured Soil Conc @dry basis	GW Cleanup Level	Adjusted Condition				
			Soil Conc being tested	Predicted Conc @Well	HQ @ Well	RISK @ Well	Pass or Fail?
	mg/kg	ug/L	mg/kg	ug/L	unitless	unitless	
Petroleum EC Fraction							
AL_EC >5-6	2.5		6.48E+01	4.51E+01	3.32E-03		
AL_EC >6-8	6.3		1.63E+02	1.44E+01	1.06E-03		
AL_EC >8-10	6		1.56E+02	8.47E-01	3.53E-03		
AL_EC >10-12	2.5		6.48E+01	2.27E-02	9.47E-05		
AL_EC >12-16	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >8-10	24.11		6.25E+02	5.42E+02	6.77E-01		
AR_EC >10-12	63.98		1.66E+03	5.18E+02	3.24E+00		
AR_EC >12-16	47.66		1.24E+03	7.84E+01	9.80E-02		
AR_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
Benzene	0.01	5	2.59E-01	7.95E+00	2.49E-01	1.00E-05	***Fail***
Toluene	0.025	1000	6.48E-01	5.73E+00	8.95E-03		
Ethylbenzene	0.09	700	2.33E+00	6.01E+00	7.51E-03		
Total Xylenes	1.8	1000	4.67E+01	1.21E+02	7.59E-02		
Naphthalene	0.02	160	5.19E-01	2.05E-01	1.28E-03		
1-Methyl Naphthalene	0.22		5.70E+00	1.63E+00	4.07E-03		
2-Methyl Naphthalene	0.12		3.11E+00	8.73E-01	2.73E-02		
n-Hexane	0		0.00E+00	0.00E+00	0.00E+00		
MTBE	0	20	0.00E+00	0.00E+00	0.00E+00		
Ethylene Dibromide (EDB)	0	0.01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0	5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0	for	0.00E+00	0.00E+00		0.00E+00	for
Benzo(b)fluoranthene	0	all	0.00E+00	0.00E+00		0.00E+00	all
Benzo(k)fluoranthene	0	cPAHs	0.00E+00	0.00E+00		0.00E+00	cPAHs
Benzo(a)pyrene	0	Risk=	0.00E+00	0.00E+00		0.00E+00	
Chrysene	0	1E-05	0.00E+00	0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	155.335		4.03E+03	1.34E+03	4.39E+00	1.00E-05	***Fail***

Site-Specific Hydrogeological Properties previously entered:

Item	Symbol	Value	Units
Total soil porosity:	n	0.43	unitless
Volumetric water content:	Θ_w	0.3	unitless
Volumetric air content:	Θ_a	0.13	unitless
Soil bulk density measured:	ρ_b	1.5	kg/L
Fraction Organic Carbon:	f_{oc}	0.001	unitless
Dilution Factor:	DF	20	unitless

Target Ground Water TPH conc adjusted previously if any:

Target Ground Water TPH Conc, ug/L ⇒ 800

CALCULATE PROTECTIVE CONDITION OR TEST ADJUSTED CONDITION Calculate

Selected Criterion: @ Total Risk=1E-5

Most Stringent? *NO*

Protective TPH Soil Conc, mg/kg = **4027.33**

Protective TPH GW Conc, ug/L = 1.34E+03

RISK @ Well = 1.00E-05

HI @Well = 4.39E+00

DEDAILED MODEL RESULTS

Type of model used for computation:	4-Phase Model
Computation completed?	Yes!
Initial Weighted Average MW of NAPL, g/mol:	130.8
Equilibrated Weighted Average MW of NAPL, g/mol:	131.0
Initial Weighted Average Density of NAPL, kg/L:	0.896
Volumetric NAPL Content, Θ_{NAPL} :	6.6E-03
NAPL Saturation (%), Θ_{NAPL}/n :	1.54%
100% NAPL, mg/kg	77682.7

Mass Distribution Pattern @ 4-phase in soil pore system:

Total Mass distributed in Water Phase: 0.13% in Solid: 1.35%

Total Mass distributed in Air Phase: 0.11% in NAPL: 98.41%

Please Check Soil Residual Saturation TPH Levels: Refer to Table 747-5!

A1 Soil Cleanup Levels: Worksheet for Soil Data Entry: Refer to WAC 173-340-720, 740,745, 747, 750

1. Enter Site Information

Date: 10/16/14
Site Name: 7-Eleven Store No. 25983
Sample Name: CSS-6 @ 18'

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6	0.59	0.65%
AL_EC >6-8	1.88	2.07%
AL_EC >8-10	1.7	1.87%
AL_EC >10-12	9.87	10.86%
AL_EC >12-16	0	0.00%
AL_EC >16-21	0	0.00%
AL_EC >21-34	0	0.00%
AR_EC >8-10	7.9044	8.69%
AR_EC >10-12	44.4	48.84%
AR_EC >12-16	24.1	26.51%
AR_EC >16-21	0	0.00%
AR_EC >21-34	0	0.00%
Benzene	0.0052	0.01%
Toluene	0.0052	0.01%
Ethylbenzene	0.0452	0.05%
Total Xylenes	0.3304	0.36%
Naphthalene	0.02665	0.03%
1-Methyl Naphthalene	0.02665	0.03%
2-Methyl Naphthalene	0.02665	0.03%
n-Hexane	0	0.00%
MTBE	0	0.00%
Ethylene Dibromide (EDB)	0	0.00%
1,2 Dichloroethane (EDC)	0	0.00%
Benzo(a)anthracene	0	0.00%
Benzo(b)fluoranthene	0	0.00%
Benzo(k)fluoranthene	0	0.00%
Benzo(a)pyrene	0	0.00%
Chrysene	0	0.00%
Dibenz(a,h)anthracene	0	0.00%
Indeno(1,2,3-cd)pyrene	0	0.00%
Sum	90.91035	100.00%

3. Enter Site-Specific Hydrogeological Data

Total soil porosity:	0.43	Unitless
Volumetric water content:	0.3	Unitless
Volumetric air content:	0.13	Unitless
Soil bulk density measured:	1.5	kg/L
Fraction Organic Carbon:	0.001	Unitless
Dilution Factor:	20	Unitless

4. Target TPH Ground Water Concentation (if adjusted)

If you adjusted the target TPH ground water concentration, enter adjusted value here: 800 ug/L

Notes for Data Entry | **Set Default Hydrogeology**

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared

REMARK:

MTBE, EDB, and EDC have been analyzed for and have never been detected at the site in any media and are not suspected of being present at the site based on the site history. Therefore, a value of zero will be assigned. A value of 1/2 of the laboratory reporting limit will be assigned to all other constituents not detected above laboratory detection limits.

There is no history of diesel at the site, so EPH Method was not used and corresponding fractions are therefore zero.

The analytical concentrations of the following hazardous substances will be subtracted from the associated EC-Fractions to avoid double counting as per Table 3.3 of the Washington State Department of Ecology's Workbook Tools for Calculating Soil and Groundwater Cleanup Levels under Model Toxics Control Act Cleanup Regulations User's Guide for MTCATPH11.1 & MTCASGL11.0

Hazardous Substance	Associated EC-Fraction
Ethylbenzene and Xylenes (C8H10)	AR_EC>8-10
Naphthalene (C10H8)	AR_EC>10-12
1-Methyl + 2-Methyl Naphthalene (C11H10)	AR_EC>12-16

If one or more analytes are not detected above the laboratory reporting limits then double counting will not be applied.

AR_EC>8-10 corrected total = (8.28) - (0.0452 + 0.3304) = 7.9044

AR_EC>10-12 corrected total = NA

AR_EC>12-16 corrected total = NA

A2 Soil Cleanup Levels: Calculation and Summary of Results. Refer to WAC 173-340-720, 740, 745, 747, 750

Site Information

Date: 10/16/2014
Site Name: 7-Eleven Store No. 25983
Sample Name: CSS-6 @ 18'
Measured Soil TPH Concentration, mg/kg: **90.910**

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B	2,012	2.86E-10	4.52E-02	Pass
	Method C	35,270	3.83E-11	2.58E-03	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protectior	Use A2.2	1.11E-06	3.57E+00	Fail
	Target TPH GW Conc. @ 800 ug/L	87	NA	NA	Fail

2. Results for Protection of Soil Direct Contact Pathway: Human Health

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	**2,012.05**	**35,270.46**
Most Stringent Criterion	**HI =1**	**HI =1**

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	2.01E+03	6.34E-09	1.00E+00	YES	3.53E+04	1.49E-08	1.00E+00
Total Risk=1E-5	*NO*	3.18E+06	1.00E-05	1.58E+03	*NO*	2.37E+07	1.00E-05	6.72E+02
Risk of Benzene= 1E-6	*NO*	3.18E+05	1.00E-06	1.58E+02	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	**HI=1**
Protective Ground Water Concentration, ug/L	**228.06**
Protective Soil Concentration, mg/kg	**34.79**

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1	YES	2.28E+02	4.04E-07	1.00E+00	3.48E+01
Total Risk = 1E-5	*NO*	1.10E+03	1.00E-05	4.74E+00	8.80E+03
Total Risk = 1E-6	*NO*	7.82E+02	1.00E-06	3.45E+00	8.15E+01
Risk of cPAHs mixture= 1E-5	NA	NA	NA	NA	NA
Benzene MCL = 5 ug/L	*NO*	1.07E+03	6.29E-06	4.59E+00	1.08E+03
MTBE = 20 ug/L	NA	NA	NA	NA	NA

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
Target TPH GW Conc = 800 ug/L	8.00E+02	1.07E-06	3.53E+00	**8.74E+01**

A2. 2 Worksheet for Calculating Soil Cleanup Level for the Protection of Ground Water Quality: (Leaching Pathway)

Washington State Department of Ecology Model Toxics Control Act Cleanup Program Cleanup Level and Risk Calculation (CLARC) Ground Water

WAC 173-340-740 and 747

Date: 10/16/2014

Site Name: 7-Eleven Store No. 25983

Sample Name: CSS-6 @ 18'

Chemical of Concern or EC Group	Measured Soil Conc @dry basis	GW Cleanup Level	Adjusted Condition				
			Soil Conc being tested	Predicted Conc @Well	HQ @ Well	RISK @ Well	Pass or Fail?
	mg/kg	ug/L	mg/kg	ug/L	unitless	unitless	
Petroleum EC Fraction							
AL_EC >5-6	0.59		2.26E-01	2.14E+00	1.58E-04		
AL_EC >6-8	1.88		7.19E-01	1.81E+00	1.33E-04		
AL_EC >8-10	1.7		6.51E-01	1.44E-01	5.99E-04		
AL_EC >10-12	9.87		3.78E+00	5.92E-02	2.47E-04		
AL_EC >12-16	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >8-10	7.9044		3.02E+00	5.08E+01	6.35E-02		
AR_EC >10-12	44.4		1.70E+01	1.42E+02	8.89E-01		
AR_EC >12-16	24.1		9.22E+00	2.16E+01	2.69E-02		
AR_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
Benzene	0.0052	5	1.99E-03	3.21E-01	1.00E-02	4.04E-07	
Toluene	0.0052	1000	1.99E-03	2.10E-01	3.29E-04		
Ethylbenzene	0.0452	700	1.73E-02	1.05E+00	1.31E-03		
Total Xylenes	0.3304	1000	1.26E-01	7.48E+00	4.68E-03		
Naphthalene	0.02665	160	1.02E-02	1.28E-01	8.02E-04		
1-Methyl Naphthalene	0.02665		1.02E-02	7.50E-02	1.88E-04		
2-Methyl Naphthalene	0.02665		1.02E-02	7.51E-02	2.35E-03		
n-Hexane	0		0.00E+00	0.00E+00	0.00E+00		
MTBE	0	20	0.00E+00	0.00E+00	0.00E+00		
Ethylene Dibromide (EDB)	0	0.01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0	5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0	for	0.00E+00	0.00E+00		0.00E+00	for
Benzo(b)fluoranthene	0	all	0.00E+00	0.00E+00		0.00E+00	all
Benzo(k)fluoranthene	0	cPAHs	0.00E+00	0.00E+00		0.00E+00	cPAHs
Benzo(a)pyrene	0	Risk=	0.00E+00	0.00E+00		0.00E+00	
Chrysene	0	1E-05	0.00E+00	0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	90.91035		3.48E+01	2.28E+02	1.00E+00	4.04E-07	Pass

Site-Specific Hydrogeological Properties previously entered:

Item	Symbol	Value	Units
Total soil porosity:	n	0.43	unitless
Volumetric water content:	Θ_w	0.3	unitless
Volumetric air content:	Θ_a	0.13	unitless
Soil bulk density measured:	ρ_b	1.5	kg/L
Fraction Organic Carbon:	f_{oc}	0.001	unitless
Dilution Factor:	DF	20	unitless

Target Ground Water TPH conc adjusted previously if any:

Target Ground Water TPH Conc, ug/L ⇒ 800

CALCULATE PROTECTIVE CONDITION OR TEST ADJUSTED CONDITION Calculate

Selected Criterion: @ HI=1

Most Stringent? YES

Protective TPH Soil Conc, mg/kg = **34.79**

Protective TPH GW Conc, ug/L = 2.28E+02

RISK @ Well = 4.04E-07

HI @Well = 1.00E+00

DEDAILED MODEL RESULTS

Type of model used for computation:	3-Phase Model
Computation completed?	Check again with 'Backup Calc'
Initial Weighted Average MW of NAPL, g/mol:	135.0
Equilibrated Weighted Average MW of NAPL, g/mol:	35.2
Initial Weighted Average Density of NAPL, kg/L:	0.890
Volumetric NAPL Content, Θ_{NAPL} :	3.7E-05
NAPL Saturation (%), Θ_{NAPL}/n :	0.01%
100% NAPL, mg/kg	77174.7

Mass Distribution Pattern @ 4-phase in soil pore system:

Total Mass distributed in Water Phase: 2.62% in Solid: 33.03%

Total Mass distributed in Air Phase: 1.13% in NAPL: 63.21%

A2. 2 Worksheet for Calculating Soil Cleanup Level for the Protection of Ground Water Quality: (Leaching Pathway)
Washington State Department of Ecology, Toxics Cleanup Program Soil Cleanup Level Quality: Leaching Pathway to Ground Water
WAC 173-340-740 and 747

Date: 10/16/2014

Site Name: 7-Eleven Store No. 25983

Sample Name: CSS-6 @ 18'

Chemical of Concern or EC Group	Measured Soil Conc @dry basis	GW Cleanup Level	Adjusted Condition				
			Soil Conc being tested	Predicted Conc @Well	HQ @ Well	RISK @ Well	Pass or Fail?
	mg/kg	ug/L	mg/kg	ug/L	unitless	unitless	
Petroleum EC Fraction							
AL_EC >5-6	0.59		5.71E+01	1.91E+01	1.41E-03		
AL_EC >6-8	1.88		1.82E+02	7.54E+00	5.55E-04		
AL_EC >8-10	1.7		1.64E+02	4.20E-01	1.75E-03		
AL_EC >10-12	9.87		9.55E+02	1.57E-01	6.53E-04		
AL_EC >12-16	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AL_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >8-10	7.9044		7.65E+02	3.15E+02	3.94E-01		
AR_EC >10-12	44.4		4.30E+03	6.33E+02	3.96E+00		
AR_EC >12-16	24.1		2.33E+03	6.95E+01	8.68E-02		
AR_EC >16-21	0		0.00E+00	0.00E+00	0.00E+00		
AR_EC >21-34	0		0.00E+00	0.00E+00	0.00E+00		
Benzene	0.0052	5	5.03E-01	7.95E+00	2.49E-01	1.00E-05	***Fail***
Toluene	0.0052	1000	5.03E-01	2.15E+00	3.37E-03		
Ethylbenzene	0.0452	700	4.37E+00	5.33E+00	6.67E-03		
Total Xylenes	0.3304	1000	3.20E+01	3.94E+01	2.46E-02		
Naphthalene	0.02665	160	2.58E+00	4.80E-01	3.00E-03		
1-Methyl Naphthalene	0.02665		2.58E+00	3.47E-01	8.68E-04		
2-Methyl Naphthalene	0.02665		2.58E+00	3.42E-01	1.07E-02		
n-Hexane	0		0.00E+00	0.00E+00	0.00E+00		
MTBE	0	20	0.00E+00	0.00E+00	0.00E+00		
Ethylene Dibromide (EDB)	0	0.01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0	5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0	for	0.00E+00	0.00E+00		0.00E+00	for
Benzo(b)fluoranthene	0	all	0.00E+00	0.00E+00		0.00E+00	all
Benzo(k)fluoranthene	0	cPAHs	0.00E+00	0.00E+00		0.00E+00	cPAHs
Benzo(a)pyrene	0	Risk=	0.00E+00	0.00E+00		0.00E+00	
Chrysene	0	1E-05	0.00E+00	0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	90.91035		8.80E+03	1.10E+03	4.74E+00	1.00E-05	***Fail***

Site-Specific Hydrogeological Properties previously entered:

Item	Symbol	Value	Units
Total soil porosity:	n	0.43	unitless
Volumetric water content:	Θ_w	0.3	unitless
Volumetric air content:	Θ_a	0.13	unitless
Soil bulk density measured:	ρ_b	1.5	kg/L
Fraction Organic Carbon:	f_{oc}	0.001	unitless
Dilution Factor:	DF	20	unitless

Target Ground Water TPH conc adjusted previously if any:

Target Ground Water TPH Conc, ug/L ⇒ 800

CALCULATE PROTECTIVE CONDITION OR TEST ADJUSTED CONDITION Calculate

Selected Criterion: @ Total Risk=1E-5

Most Stringent? *NO*

Protective TPH Soil Conc, mg/kg = **8795.27**

Protective TPH GW Conc, ug/L = 1.10E+03

RISK @ Well = 1.00E-05

HI @Well = 4.74E+00

DEDAILED MODEL RESULTS

Type of model used for computation:	4-Phase Model
Computation completed?	Yes!
Initial Weighted Average MW of NAPL, g/mol:	135.0
Equilibrated Weighted Average MW of NAPL, g/mol:	135.1
Initial Weighted Average Density of NAPL, kg/L:	0.890
Volumetric NAPL Content, Θ_{NAPL} :	1.5E-02
NAPL Saturation (%), Θ_{NAPL}/n :	3.42%
100% NAPL, mg/kg	77174.7

Mass Distribution Pattern @ 4-phase in soil pore system:

Total Mass distributed in Water Phase: 0.05% in Solid: 0.58%

Total Mass distributed in Air Phase: 0.02% in NAPL: 99.35%

Please Check Soil Residual Saturation TPH Levels: Refer to Table 747-5!

A1 Soil Cleanup Levels: Worksheet for Soil Data Entry: Refer to WAC 173-340-720, 740,745, 747, 750

1. Enter Site Information

Date: 10/16/14
Site Name: 7-Eleven Store No. 25983
Sample Name: CSS-7 @ 23'

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6	0.795	14.00%
AL_EC >6-8	0.795	14.00%
AL_EC >8-10	0.795	14.00%
AL_EC >10-12	0.795	14.00%
AL_EC >12-16	0	0.00%
AL_EC >16-21	0	0.00%
AL_EC >21-34	0	0.00%
AR_EC >8-10	0.795	14.00%
AR_EC >10-12	0.795	14.00%
AR_EC >12-16	0.795	14.00%
AR_EC >16-21	0	0.00%
AR_EC >21-34	0	0.00%
Benzene	0.00635	0.11%
Toluene	0.00635	0.11%
Ethylbenzene	0.0095	0.17%
Total Xylenes	0.0127	0.22%
Naphthalene	0.0265	0.47%
1-Methyl Naphthalene	0.0265	0.47%
2-Methyl Naphthalene	0.0265	0.47%
n-Hexane	0	0.00%
MTBE	0	0.00%
Ethylene Dibromide (EDB)	0	0.00%
1,2 Dichloroethane (EDC)	0	0.00%
Benzo(a)anthracene	0	0.00%
Benzo(b)fluoranthene	0	0.00%
Benzo(k)fluoranthene	0	0.00%
Benzo(a)pyrene	0	0.00%
Chrysene	0	0.00%
Dibenz(a,h)anthracene	0	0.00%
Indeno(1,2,3-cd)pyrene	0	0.00%
Sum	5.6794	100.00%

3. Enter Site-Specific Hydrogeological Data

Total soil porosity:	0.43	Unitless
Volumetric water content:	0.3	Unitless
Volumetric air content:	0.13	Unitless
Soil bulk density measured:	1.5	kg/L
Fraction Organic Carbon:	0.001	Unitless
Dilution Factor:	20	Unitless

4. Target TPH Ground Water Concentation (if adjusted)

If you adjusted the target TPH ground water concentration, enter adjusted value here: 800 ug/L

Notes for Data Entry | **Set Default Hydrogeology**

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared

REMARK:

MTBE, EDB, and EDC have been analyzed for and have never been detected at the site in any media and are not suspected of being present at the site based on the site history. Therefore, a value of zero will be assigned. A value of 1/2 of the laboratory reporting limit will be assigned to all other constituents not detected above laboratory detection limits.
There is no history of diesel at the site, so EPH Method was not used and corresponding fractions are therefore zero.

The analytical concentrations of the following hazardous substances will be subtracted from the associated EC-Fractions to avoid double counting as per Table 3.3 of the Washington State Department of Ecology's Workbook Tools for Calculating Soil and Groundwater Cleanup Levels under Model Toxics Control Act Cleanup Regulations User's Guide for MTCATPH11.1 & MTCASGL11.0

Hazardous Substance	Associated EC-Fraction
Ethylbenzene and Xylenes (C8H10)	AR_EC>8-10
Naphthalene (C10H8)	AR_EC>10-12
1-Methyl + 2-Methyl Naphthalene (C11H10)	AR_EC>12-16

If one or more analytes are not detected above the laboratory reporting limits then double counting will not be applied.

AR_EC>8-10 corrected total = NA

AR_EC>10-12 corrected total = NA

AR_EC>12-16 corrected total = NA

A2 Soil Cleanup Levels: Calculation and Summary of Results. Refer to WAC 173-340-720, 740, 745, 747, 750

Site Information

Date: 10/16/2014
Site Name: 7-Eleven Store No. 25983
Sample Name: CSS-7 @ 23'
Measured Soil TPH Concentration, mg/kg: **5.679**

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B	3,158	3.50E-10	1.80E-03	Pass
	Method C	56,605	4.68E-11	1.00E-04	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protectior	25	1.42E-06	1.93E-01	Pass
	Target TPH GW Conc. @ 800 ug/L	126	NA	NA	Pass

2. Results for Protection of Soil Direct Contact Pathway: Human Health

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	**3,158.23**	**56,604.94**
Most Stringent Criterion	**HI =1**	**HI =1**

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	3.16E+03	1.94E-07	1.00E+00	YES	5.66E+04	4.67E-07	1.00E+00
Total Risk=1E-5	*NO*	1.62E+05	1.00E-05	5.14E+01	*NO*	1.21E+06	1.00E-05	2.14E+01
Risk of Benzene= 1E-6	*NO*	1.62E+04	1.00E-06	5.14E+00	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	**Benzene MCL = 5 ug/L**
Protective Ground Water Concentration, ug/L	**295.51**
Protective Soil Concentration, mg/kg	**25.20**

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1	*NO*	3.37E+02	1.23E-05	1.00E+00	5.41E+01
Total Risk = 1E-5	*NO*	4.32E+02	1.00E-05	1.26E+00	4.04E+01
Total Risk = 1E-6	YES	4.68E+01	1.00E-06	1.36E-01	4.01E+00
Risk of cPAHs mixture= 1E-5	NA	NA	NA	NA	NA
Benzene MCL = 5 ug/L	YES	2.96E+02	6.29E-06	8.57E-01	2.52E+01
MTBE = 20 ug/L	NA	NA	NA	NA	NA

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
Target TPH GW Conc = 800 ug/L	8.00E+02	2.87E-05	2.37E+00	**1.26E+02**

A1 Soil Cleanup Levels: Worksheet for Soil Data Entry: Refer to WAC 173-340-720, 740,745, 747, 750

1. Enter Site Information

Date: 10/16/14
Site Name: 7-Eleven Store No. 25983
Sample Name: CSS-9 @ 16'

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6	0.56	9.47%
AL_EC >6-8	0.56	9.47%
AL_EC >8-10	0.56	9.47%
AL_EC >10-12	0.56	9.47%
AL_EC >12-16	0	0.00%
AL_EC >16-21	0	0.00%
AL_EC >21-34	0	0.00%
AR_EC >8-10	0.56	9.47%
AR_EC >10-12	1.67	28.24%
AR_EC >12-16	1.32	22.32%
AR_EC >16-21	0	0.00%
AR_EC >21-34	0	0.00%
Benzene	0.00565	0.10%
Toluene	0.00565	0.10%
Ethylbenzene	0.00845	0.14%
Total Xylenes	0.02655	0.45%
Naphthalene	0.02605	0.44%
1-Methyl Naphthalene	0.02605	0.44%
2-Methyl Naphthalene	0.02605	0.44%
n-Hexane	0	0.00%
MTBE	0	0.00%
Ethylene Dibromide (EDB)	0	0.00%
1,2 Dichloroethane (EDC)	0	0.00%
Benzo(a)anthracene	0	0.00%
Benzo(b)fluoranthene	0	0.00%
Benzo(k)fluoranthene	0	0.00%
Benzo(a)pyrene	0	0.00%
Chrysene	0	0.00%
Dibenz(a,h)anthracene	0	0.00%
Indeno(1,2,3-cd)pyrene	0	0.00%
Sum	5.91445	100.00%

3. Enter Site-Specific Hydrogeological Data

Total soil porosity:	0.43	Unitless
Volumetric water content:	0.3	Unitless
Volumetric air content:	0.13	Unitless
Soil bulk density measured:	1.5	kg/L
Fraction Organic Carbon:	0.001	Unitless
Dilution Factor:	20	Unitless

4. Target TPH Ground Water Concentation (if adjusted)

If you adjusted the target TPH ground water concentration, enter adjusted value here: 800 ug/L

Notes for Data Entry | **Set Default Hydrogeology**

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared

REMARK:

MTBE, EDB, and EDC have been analyzed for and have never been detected at the site in any media and are not suspected of being present at the site based on the site history. Therefore, a value of zero will be assigned. A value of 1/2 of the laboratory reporting limit will be assigned to all other constituents not detected above laboratory detection limits.
There is no history of diesel at the site, so EPH Method was not used and corresponding fractions are therefore zero.

The analytical concentrations of the following hazardous substances will be subtracted from the associated EC-Fractions to avoid double counting as per Table 3.3 of the Washington State Department of Ecology's Workbook Tools for Calculating Soil and Groundwater Cleanup Levels under Model Toxics Control Act Cleanup Regulations User's Guide for MTCATPH11.1 & MTCASGL11.0

Hazardous Substance	Associated EC-Fraction
Ethylbenzene and Xylenes (C8H10)	AR_EC>8-10
Naphthalene (C10H8)	AR_EC>10-12
1-Methyl + 2-Methyl Naphthalene (C11H10)	AR_EC>12-16

If one or more analytes are not detected above the laboratory reporting limits then double counting will not be applied.

AR_EC>8-10 corrected total = NA

AR_EC>10-12 corrected total = NA

AR_EC>12-16 corrected total = NA

A2 Soil Cleanup Levels: Calculation and Summary of Results. Refer to WAC 173-340-720, 740, 745, 747, 750

Site Information

Date: 10/16/2014
Site Name: 7-Eleven Store No. 25983
Sample Name: CSS-9 @ 16'
Measured Soil TPH Concentration, mg/kg: **5.914**

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B	2,540	3.11E-10	2.33E-03	Pass
	Method C	44,325	4.17E-11	1.33E-04	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protectior	5	1.26E-06	2.86E-01	Pass
	Target TPH GW Conc. @ 800 ug/L	111	NA	NA	Pass

2. Results for Protection of Soil Direct Contact Pathway: Human Health

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	**2,540.25**	**44,324.54**
Most Stringent Criterion	**HI =1**	**HI =1**

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	2.54E+03	1.34E-07	1.00E+00	YES	4.43E+04	3.12E-07	1.00E+00
Total Risk=1E-5	*NO*	1.90E+05	1.00E-05	7.48E+01	*NO*	1.42E+06	1.00E-05	3.20E+01
Risk of Benzene= 1E-6	*NO*	1.90E+04	1.00E-06	7.48E+00	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	**Total Risk = 1E-6**
Protective Ground Water Concentration, ug/L	**61.35**
Protective Soil Concentration, mg/kg	**4.69**

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1	*NO*	2.62E+02	7.99E-06	1.00E+00	**4.12E+01**
Total Risk = 1E-5	*NO*	5.44E+02	1.00E-05	2.03E+00	4.75E+01
Total Risk = 1E-6	YES	6.13E+01	1.00E-06	2.27E-01	4.69E+00
Risk of cPAHs mixture= 1E-5	NA	NA	NA	NA	NA
Benzene MCL = 5 ug/L	*NO*	3.87E+02	6.29E-06	1.43E+00	2.95E+01
MTBE = 20 ug/L	NA	NA	NA	NA	NA

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
Target TPH GW Conc = 800 ug/L	8.00E+02	2.21E-05	3.04E+00	**1.11E+02**

A1 Soil Cleanup Levels: Worksheet for Soil Data Entry: Refer to WAC 173-340-720, 740,745, 747, 750

1. Enter Site Information

Date: 10/16/14
Site Name: 7-Eleven Store No. 25983
Sample Name: CSS-10 @ 16'

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6	0.63	13.76%
AL_EC >6-8	0.63	13.76%
AL_EC >8-10	0.63	13.76%
AL_EC >10-12	0.63	13.76%
AL_EC >12-16	0	0.00%
AL_EC >16-21	0	0.00%
AL_EC >21-34	0	0.00%
AR_EC >8-10	0.63	13.76%
AR_EC >10-12	0.63	13.76%
AR_EC >12-16	0.63	13.76%
AR_EC >16-21	0	0.00%
AR_EC >21-34	0	0.00%
Benzene	0.0064	0.14%
Toluene	0.0382	0.83%
Ethylbenzene	0.0096	0.21%
Total Xylenes	0.0304	0.66%
Naphthalene	0.0282	0.62%
1-Methyl Naphthalene	0.0282	0.62%
2-Methyl Naphthalene	0.0282	0.62%
n-Hexane	0	0.00%
MTBE	0	0.00%
Ethylene Dibromide (EDB)	0	0.00%
1,2 Dichloroethane (EDC)	0	0.00%
Benzo(a)anthracene	0	0.00%
Benzo(b)fluoranthene	0	0.00%
Benzo(k)fluoranthene	0	0.00%
Benzo(a)pyrene	0	0.00%
Chrysene	0	0.00%
Dibenz(a,h)anthracene	0	0.00%
Indeno(1,2,3-cd)pyrene	0	0.00%
Sum	4.5792	100.00%

3. Enter Site-Specific Hydrogeological Data

Total soil porosity:	0.43	Unitless
Volumetric water content:	0.3	Unitless
Volumetric air content:	0.13	Unitless
Soil bulk density measured:	1.5	kg/L
Fraction Organic Carbon:	0.001	Unitless
Dilution Factor:	20	Unitless

4. Target TPH Ground Water Concentation (if adjusted)

If you adjusted the target TPH ground water concentration, enter adjusted value here: 800 ug/L

Notes for Data Entry | **Set Default Hydrogeology**

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared

REMARK:

MTBE, EDB, and EDC have been analyzed for and have never been detected at the site in any media and are not suspected of being present at the site based on the site history. Therefore, a value of zero will be assigned. A value of 1/2 of the laboratory reporting limit will be assigned to all other constituents not detected above laboratory detection limits.
There is no history of diesel at the site, so EPH Method was not used and corresponding fractions are therefore zero.

The analytical concentrations of the following hazardous substances will be subtracted from the associated EC-Fractions to avoid double counting as per Table 3.3 of the Washington State Department of Ecology's Workbook Tools for Calculating Soil and Groundwater Cleanup Levels under Model Toxics Control Act Cleanup Regulations User's Guide for MTCATPH11.1 & MTCASGL11.0

Hazardous Substance	Associated EC-Fraction
Ethylbenzene and Xylenes (C8H10)	AR_EC>8-10
Naphthalene (C10H8)	AR_EC>10-12
1-Methyl + 2-Methyl Naphthalene (C11H10)	AR_EC>12-16

If one or more analytes are not detected above the laboratory reporting limits then double counting will not be applied.

AR_EC>8-10 corrected total = NA

AR_EC>10-12 corrected total = NA

AR_EC>12-16 corrected total = NA

A2 Soil Cleanup Levels: Calculation and Summary of Results. Refer to WAC 173-340-720, 740, 745, 747, 750

Site Information

Date: 10/16/2014
Site Name: 7-Eleven Store No. 25983
Sample Name: CSS-10 @ 16'
Measured Soil TPH Concentration, mg/kg: **4.579**

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B	3,121	3.52E-10	1.47E-03	Pass
	Method C	56,139	4.72E-11	8.16E-05	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protectior	20	1.43E-06	1.75E-01	Pass
	Target TPH GW Conc. @ 800 ug/L	89	NA	NA	Pass

2. Results for Protection of Soil Direct Contact Pathway: Human Health

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	**3,120.59**	**56,138.78**
Most Stringent Criterion	**HI =1**	**HI =1**

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	3.12E+03	2.40E-07	1.00E+00	YES	5.61E+04	5.78E-07	1.00E+00
Total Risk=1E-5	*NO*	1.30E+05	1.00E-05	4.16E+01	*NO*	9.71E+05	1.00E-05	1.73E+01
Risk of Benzene= 1E-6	*NO*	1.30E+04	1.00E-06	4.16E+00	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	**Benzene MCL = 5 ug/L**
Protective Ground Water Concentration, ug/L	**266.45**
Protective Soil Concentration, mg/kg	**20.16**

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1	*NO*	3.36E+02	1.31E-05	1.00E+00	4.63E+01
Total Risk = 1E-5	*NO*	4.12E+02	1.00E-05	1.19E+00	3.22E+01
Total Risk = 1E-6	YES	4.22E+01	1.00E-06	1.22E-01	3.21E+00
Risk of cPAHs mixture= 1E-5	NA	NA	NA	NA	NA
Benzene MCL = 5 ug/L	YES	2.66E+02	6.29E-06	7.70E-01	2.02E+01
MTBE = 20 ug/L	NA	NA	NA	NA	NA

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
Target TPH GW Conc = 800 ug/L	8.00E+02	2.63E-05	2.34E+00	**8.87E+01**

Appendix G SEEPAGE VELOCITY

Groundwater Velocity Calculation

The lateral groundwater velocity was calculated using the formula below (provided in Ecology guidance) for silty gravel soil.

Vgw =(K*i)/n = [5.75* 0.027]/0.31 = **0.5 ft/day**

Where:

K= 5.75 ft/day (based on aquifer slug test performed at the Site by IT Corp in 2000)

i = 0.027 ft/ft (average groundwater gradient)

n = 0.31

Appendix H VLEACH FATE AND TRANSPORT MODEL

VLEACH MODELING

Introduction

VLEACH, a one-dimensional finite Difference Vadose Zone Leaching Model, is a computer code for estimating the impact due to the mobilization and migration of adsorbed volatile organic compounds (VOCs) located in the vadose zone on the underlying groundwater resource. The model was utilized for the ARCO 5585 site to evaluate the potential of petroleum constituents, located in the vadose zone, to impact groundwater beneath the site.

Initially, VLEACH calculates the equilibrium distribution of the impacted mass between the liquid, gas, and adsorbed phases. Transport processes are then simulated. Liquid advective transport is calculated based on values defined by the user for infiltration and soil water content. The impact in the vapor phase migrates into or out of adjacent cells. After the mass is exchanged between the cells, the total mass in each cell is recalculated and re-equilibrated between the different phases. These steps are conducted for each time step. At the end of the model simulation, the results are compiled to determine an overall area-weighted groundwater impact for the entire modeled area. Details of VLEACH are presented in *VLEACH A One-Dimensional Finite Vadose Zone Leaching Model, Version* 2.2.

Within the VLEACH computer code, the following assumptions are made:

1. Linear isotherms describe the partitioning of the pollutant between the liquid, vapor, and soil phases. Local or instantaneous equilibrium between these phases is assumed within each cell.
2. The vadose zone is in a steady state condition with respect to water movement. More specifically, the moisture content profile within the vadose zone is constant.
3. Liquid phase dispersion is neglected. The migration of the impact will be simulated as a plug. This assumption causes higher dissolved concentrations and lower travel time predictions than would occur in reality.
4. The impact is not subjected to in-situ production or degradation. Since organic compounds, especially hydrocarbons, generally undergo some degree of degradation in the vadose zone, this assumption results in conservative concentration values.
5. Homogeneous soil conditions are assumed to occur within a particular polygon. (Based on this, for this modeling study Stantec elected a soil profile that would be conservative yet representative of actual subsurface conditions.
6. Volatilization from the soil boundaries is either completely unimpeded or completely restricted.
7. The model does not account for non-aqueous phase liquids or any flow conditions derived from variable density.

Model Input Data

BTEX concentrations are below MTCA method A soil and groundwater screening levels at the Site. Therefore these constituents were not modeled. Concentrations of total petroleum hydrocarbons as gasoline (TPH-G) remain at the Site. The highest concentration of TPH-G was detected in the sample SB-3 collected 16-feet bgs along the western sidewall of the excavation. A soil sample (SB-3@17') located one foot below this location reported TPH-G less than 3.16 ppm.

Based on site investigation results, petroleum constituents in soil are defined and limited to a very small area along the sidewalls of the excavation. Based on this, Stantec selected to utilize one polygon to represent the area of impacts. The polygon was assumed to cover a surface area of approximately 100 square feet (ft^2). Stantec also assumed the following based on site investigation results:

- a conservative water level of approximately 23 feet bgs (historic high),
- maximum reported concentrations of petroleum compounds (TPH-G) in soil were assumed to extend to extend from 16-feet to 17-feet bgs (756 mg/kg),
- a homogenous subsurface consisting of sand. Since VLEACH only allows for one soil profile per polygon, sand was selected as being a conservative representation of subsurface conditions at the site and also would result in conservative estimates regarding impact to groundwater; and
- petroluem concentrations in recharge water (precipitation), in the atmosphere, and in groundwater were assumed to be zero.

Yearly recharge was estimated at 2.94 feet per year. This was based on an average annual precipitation measured in Olympia, Washington of 50 inches/year (average over last 30 years). Approximately 70% of the average annual rainfall was assumed to infiltrate per MTCA regulations [173-340-747 (5)(f)(B)(ii)].

To evaluate the potential for long-term impacts due to the presence of petroleum constituents in the vadose zone, Stantec selected a modeling simulation period of 50 years with timesteps every 0.5 years.

For this project, n-hexane was chosen as a surrogate compound to model TPH-G leaching. This is a reasonable worst case scenario for leaching of TPH-G to groundwater. Input chemical and soil characteristic parameters including organic carbon distribution coefficient (K_{OC}), Henry's Constant (K_H), water solubility, were based on n-hexane values in MTCA Table 747-4 (*Petroleum EC Fraction Physical/Chemical Values*). Additional properties such as dry bulk density, effective porosity, volumetric water content, and soil organic carbon content are based on default values for sand provided in the VLEACH model.

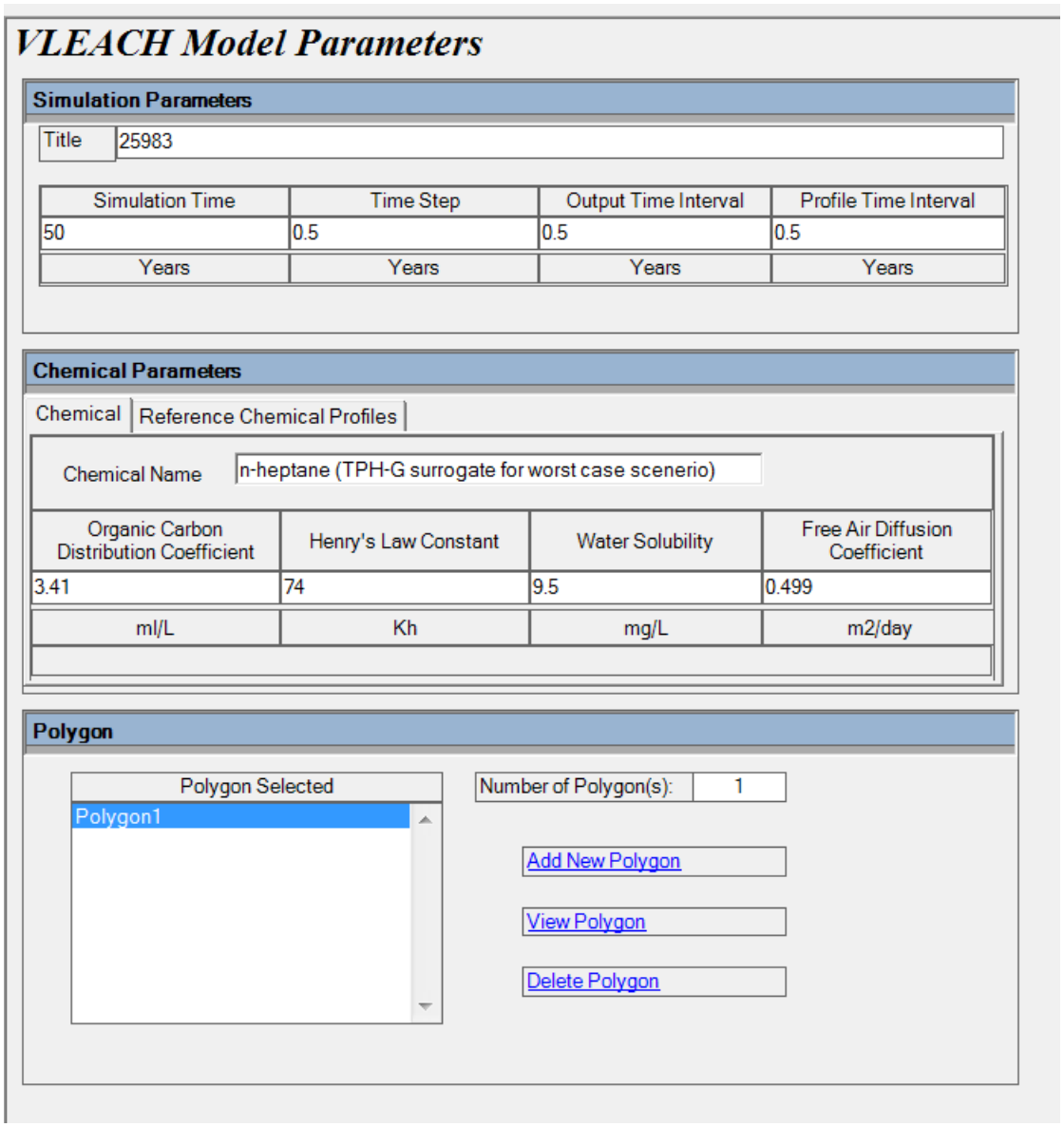
Results

Based on results of this modeling study using the U.S. E.P.A. computer code VLEACH, the maximum loading to groundwater would be approximately 120 grams per year (gm/yr) for TPH-G. Assuming an average gradient at the site of 0.027 and a hydraulic conductivity of 5.75 ft/day (based on Site-specific aquifer slug test), the Darcy velocity of groundwater would be 0.5 ft/day, 182.5 ft/year. Assuming a 1 foot thickness of groundwater, the maximum loading of constituents would result in an averages concentration in groundwater of approximately 748 micrograms per liter. Results of VLEACH modeling are presented graphically below.

Conclusions

Results of VLEACH modeling indicate, under ***conservative assumptions*** that if the asphalt cap was removed at the Site, TPH-G mass would leach to groundwater; however, concentrations would not exceed MTCA Method A cleanup levels. Groundwater monitoring at the site has been conducted from 1999 through 2015. Groundwater results for the last 7 years empirically demonstrate leaching is not currently occurring. VLEACH model results indicate future leaching is unlikely to exceed MTCA Method A CULs if the asphalt cap is removed at the Site. Model Input parameters and output results are provided below.

TPH-G Analysis using average fraction values for Chemical Parameters



VLEACH Model Parameters

Simulation Parameters

Title	25983

Simulation Time	Time Step	Output Time Interval	Profile Time Interval
50	0.5	0.5	0.5
Years	Years	Years	Years

Chemical Parameters

Chemical | Reference Chemical Profiles

Chemical Name: n-heptane (TPH-G surrogate for worst case scenerio)

Organic Carbon Distribution Coefficient	Henry's Law Constant	Water Solubility	Free Air Diffusion Coefficient
3.41	74	9.5	0.499
ml/L	Kh	mg/L	m2/day

Polygon

Polygon Selected
Polygon1

Number of Polygon(s): 1

Add New Polygon

View Polygon

Delete Polygon

Polygon Parameters

Polygon Title: Polygon1

Area of Polygon	Vertical Cell Dimension	Number Of Cells	Height of Polygon
100	1	23	23
Square ft	ft	Cells	ft

Soil Parameters

Soil Type | Reference Soil Type Profiles

Soil Type Name: Sand

Dry Bulk Density	Effective Porosity	Volumetric Water Content	Soil Organic Carbon Content
1.6	0.4	0.3	0.005
g/cm3	(n)	(Vc)	(foc)

Boundary Conditions

Recharge Rate	Concentration of Recharge Water	Upper Boundary Vapor Condition	Lower Boundary Vapor Condition
2.94	0	0	0
ft/year	mg/L	mg/L	mg/L

Output Options

Create Groundwater and Soil Contaminant Profile

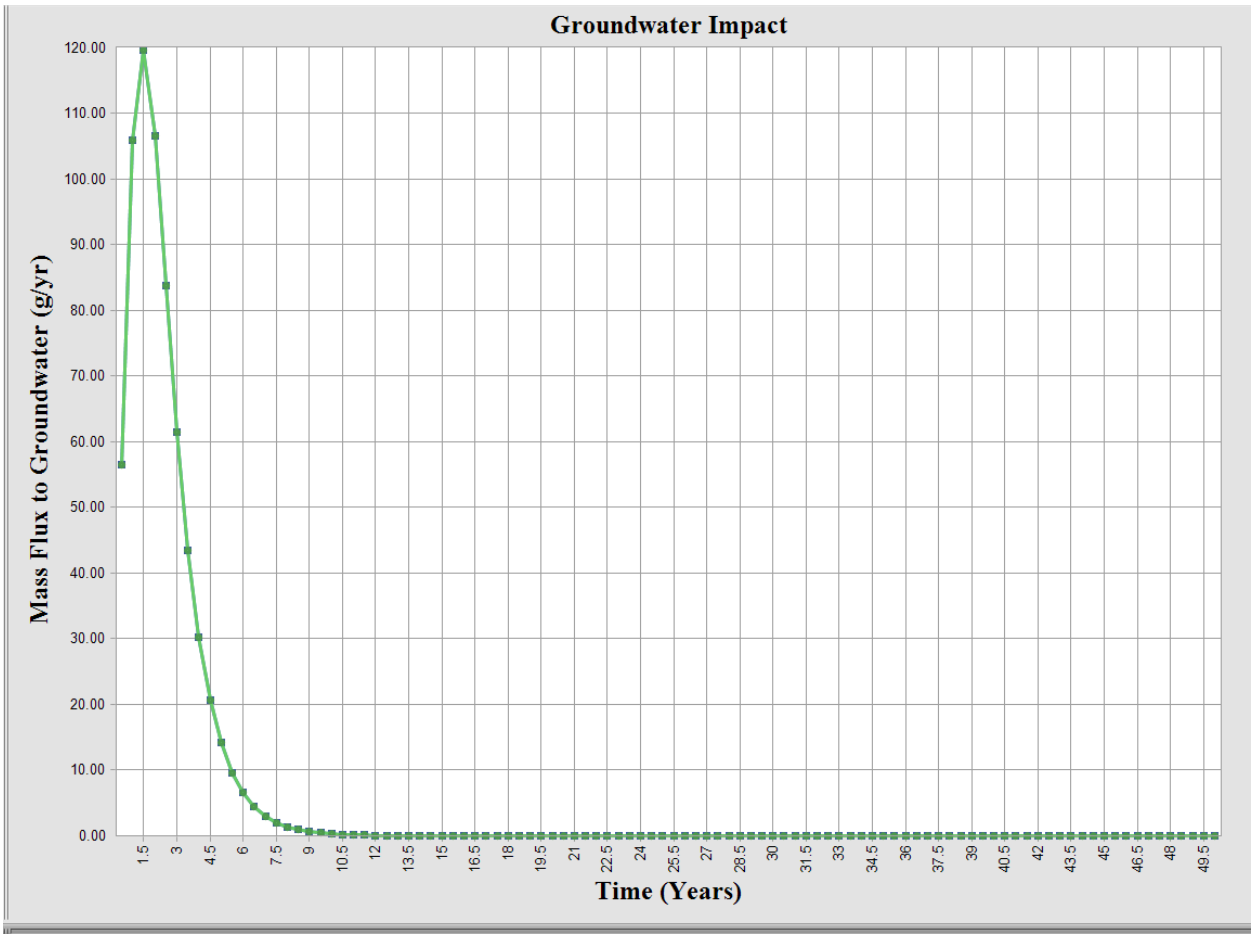
(•) Yes ( ) No

Soil Contaminant Profile Time (Years)

100

Initial Contaminant Concentrations

	Upper C	Lower Cell	Initial Concentration (ug/kg
	1	15	0
	2	16	756000
	3	18	0
▶	4	23	0
*			


Groundwater Impact
Mass Flux to Groundwater (g/yr)
120.00
110.00
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
1.5
3
4.5
6
7.5
9
10.5
12
13.5
15
16.5
18
19.5
21
22.5
24
25.5
27
28.5
30
31.5
33
34.5
36
37.5
39
40.5
42
43.5
45
46.5
48
49.5
Time (Years)