NW-2078 Mi-T Lube #1102
LUST 32403
Lynnwood

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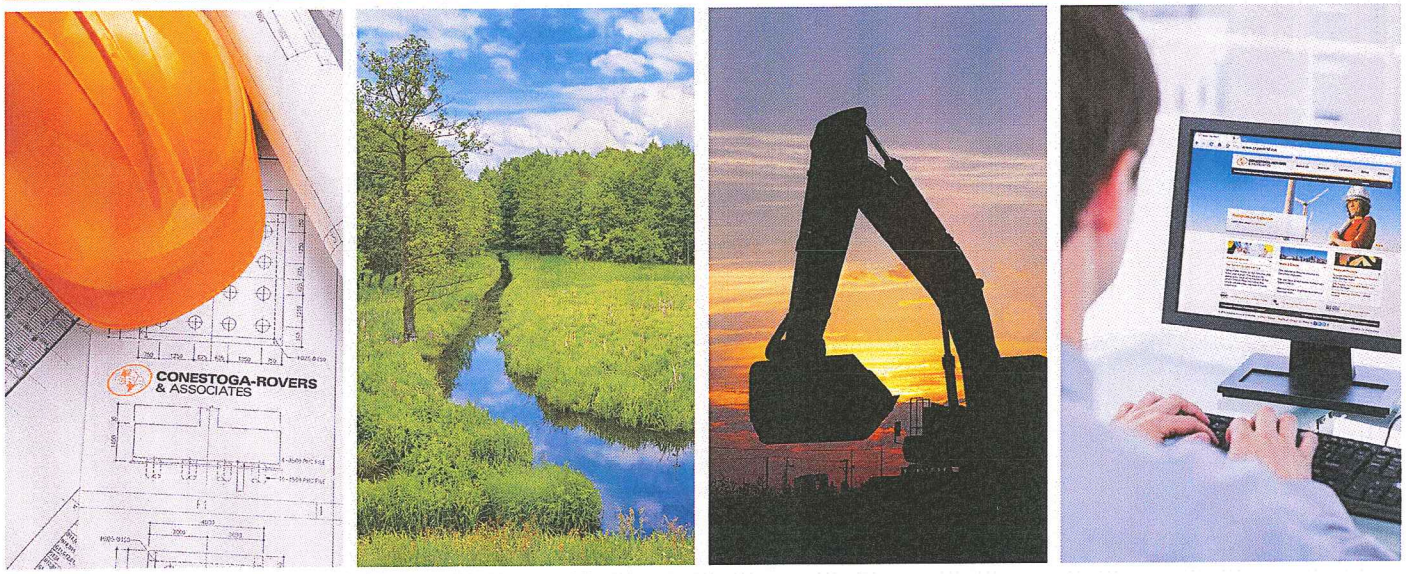

Subsurface Investigation Report

Former Jiffy Lube Facility
6808 196th Street Southwest
Lynnwood, Washington

Prepared for: Shell Oil Products US

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SAP Code	**171152**
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Section 1.0 Introduction

1.1 General

Conestoga-Rovers and Associates (CRA) prepared this *Subsurface Investigation Report* on behalf of Equilon Enterprises LLC dba Shell Oil Products US (SOPUS) for the purpose of documenting the site investigation conducted at 6808 196th Street Southwest, Lynnwood, Snohomish County, Washington (Property; Figure 1). The objectives of this investigation were to evaluate soil conditions to the south, southwest, and northeast of the Aloha Café building and in the vicinity of the former heating oil underground storage tank (UST).

1.2 Site Description and Background

The Property is a former Jiffy Lube Facility located on the southwest corner of 196th Street Southwest and 68th Avenue West in Lynnwood, Snohomish County, Washington (Property; Figure 1). The Property operated as a service station prior to converting to a lube facility in approximately 1977. Currently the Aloha Café (a coffee shop) operates at the Property.

In August 1995, Nowicki and Associates (Nowicki) conducted soil compliance sampling in association with the removal of one 3,000-gallon new oil UST and the closure-in-place of one 500-gallon waste oil UST. Concentrations of total petroleum hydrocarbons (TPH) as diesel (TPHd) and TPH as heavy oil (TPHo) were detected above the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Method A cleanup levels in soil samples collected from the west sidewall. Nowicki over-excavated the locations containing petroleum hydrocarbon impacted soil. Approximately 65 tons of petroleum-hydrocarbon impacted soil was removed from the new oil UST excavation. Soil samples collected from the sidewalls and bottom of the new oil UST excavation following over-excavation were below laboratory reporting limits for TPHd and TPHo.

A petroleum release was reported to Ecology on November 20, 1995, and the Site was listed with Ecology's leaking underground storage tank (LUST) program (ID #6802). The Site was entered into Ecology's Voluntary Cleanup Program (VCP) in 2009 and issued site number NW2070. In February 2007, the listing was amended to include petroleum hydrocarbon impacted groundwater as a "media affected." The current status of the release with Ecology is "Cleanup Started" for soil and groundwater as of February 2007. It should be noted that in February 2007, Cambria Environmental Technologies reported a secondary release at the site relating to gasoline range hydrocarbons found during a 2006 site investigation. The release of gasoline range hydrocarbons were erroneously added to the existing release of oil range hydrocarbons associated with the former lube facility operation. The two releases occurred at different times and by different responsible parties. SOPUS is responsible for the former lube facility release, and the work documented herein pertains solely to the lube facility constituents of concern (COCs).

The MTCA site (Site) is defined as all affected areas from the petroleum release associated with the lube facility operation at the Property and any potentially impacted adjacent parcels. The affected areas associated with the gasoline range hydrocarbon release are not considered part of the Site described in this report. A chronological summary of the environmental work completed at the Site is included as Appendix A.

Section 2.0 Site Investigation Activities

On August 6, 2014 Cascade Drilling, Inc. (Cascade), under the direction of CRA, advanced three soil borings using a combination of air knife assisted vacuum and hand auger techniques; boring SB-5 was advanced to 9 feet below ground surface (bgs) and borings SB-6 and SB-7 were advanced to 5.5 feet bgs. The boring logs are presented in Appendix B.

Soil samples were collected from the soil borings at 2 and 5 feet bgs in borings SB-6 and SB-7 and at 2, 5, and 8.5 feet bgs in boring SB-5, via a hand auger for the purpose of field screening and soil classification. Soil samples were submitted for laboratory analyses. Laboratory analytical data is presented in Table 1 and the laboratory report is included as Appendix C.

Investigation derived waste (IDW) generated during the investigation included soil cuttings and decontamination water. Waste was stored on the Property in United States Department of Transportation compliant 55-gallon drums. IDW was removed from the Property on August 21, 2014 in accordance with SOPUS waste disposal requirements. Waste disposal documentation will be provided under separate cover.

Section 3.0 Investigation Results

3.1 Site Geology and Hydrogeology

According to historical boring logs and observations during drilling, the Site is underlain by imported fill and native material. Fill comprises the subsurface to approximately 7.5 feet bgs, and is underlain by unconsolidated sediments (silts and sands with gravels and clay) characteristic of weathered till to approximately 18 feet bgs. The unconsolidated sediments are underlain by consolidated, dense silts and sands with gravel and clay, characteristic of unweathered till. The till extends to the maximum depth explored of 32.5 feet bgs. All available historical boring logs are included as Appendix B.

Shallow groundwater beneath the Site is present at average depths varying between approximately 6.1 to 14.9 feet bgs in Site monitoring wells. Groundwater encountered in the Site wells is likely perched water present on top of native material consisting of relatively lower permeable silts and interbedded

sands, with trace amounts of gravel and clay. Groundwater flows to the southwest. Historical groundwater elevations for Site wells are presented on Table 2.

3.2 Analytical Results - Soil

A total of seven soil samples collected from SB-5, SB-6, and SB-7 were submitted to TestAmerica for laboratory chemical analyses. The soil samples were analyzed for the following:

- Total Petroleum Hydrocarbons (TPH) in the diesel range (TPHd) and TPH in the oil range (TPHo) by Method NWTPH-Dx

Soil collected from SB-5 at 8.5 feet bgs was also analyzed for:

- TPH in the gasoline range (TPHg) by Method NWTPH-Gx
- Benzene, toluene, ethylbenzene and xylenes (BTEX), 1,2-Dichloroethane (EDC), 1,2-Dibromoethane (EDB), and Methyl tert-butyl ether (MTBE) per EPA Method 8260B
- naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene, and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270D SIM

Petroleum hydrocarbon concentrations were below MTCA Method A cleanup levels in each sample analyzed. Soil sample analytical results for the current investigation as well as historical soil analytical data are presented in Table 1. A soil investigation data map is included as Figure 3. Laboratory analytical reports for the current investigation are included in Appendix C.

Section 4.0 Response to Ecology's Further Action Letter

The purpose of this section is to address items presented in Ecology's further action opinion letter dated April 16, 2012. Ecology concluded that further remedial action is necessary based on insufficiencies in Site characterization and inappropriate establishment of cleanup standards. The following are Ecology's comments and CRA's response.

Description of the Site

Ecology comment: *The extent of the contamination of the two known releases on the Property, as currently understood, appear to be comingled. The boundaries of the two releases overlap.*

CRA response to comment: While it is true that the boundaries of the two releases overlap, the two releases are not comingled. The Jiffy Lube release (referred to as Release 2 by Ecology) affected soil shallower than 2 feet bgs below the current Aloha Café building. Soil sample SB-16" contained TPHo exceeding MTCA Method A cleanup levels; however, the sample collected at 2 feet bgs (SB-24") did not

contain any concentrations exceeding MTCA Method A cleanup levels. CRA's soil borings SB-5 through SB-7, described in the sections above, confirmed that TPHo impacts do not extend beyond the footprint of the building. Therefore, the vertical and lateral extents of TPHo impacted soil are well defined. TPHo has not been detected above MTCA Method A cleanup levels in any other soil samples at the Site, with the exception of sample WW, related to the new oil UST, which was subsequently overexcavated. Any TPHo concentrations in groundwater that exceed MTCA Method A cleanup levels have been flagged by the laboratory as not being representative of motor oil. These TPHo concentrations in groundwater tend to occur in wells with significant TPHd concentrations. Therefore, TPHo in groundwater is likely the result of TPHd eluting in the motor oil carbon range. Groundwater is present beneath the Site at a depth of approximately 7 to 12 feet bgs. Since the only TPHo impacted soil was detected at approximately 16 inches bgs, there is approximately 5.5 feet of soil between the TPHo impacts and groundwater. Based on all of the aforementioned information, it is evident that the two releases are not comingled.

Characterization of the Site

Ecology comment: *Release 2 – The lateral and vertical extent of soil and ground water contamination associated with the former Jiffy Lube station has not been defined. The lateral and vertical extent of ground water and soil contamination near the former new oil UST and Used Oil UST has not been characterized. Soil and ground water near the former heating oil UST has not been adequately characterized. No soil samples were collected from this area when the UST was closed in place.*

Soil vapors at the Site have not been evaluated. Specifically impacts at the coffee shop that operates on-site as well as the apartment residences that are adjacent to the Property.

CRA response to comment: As stated previously in this report, and in CRA's *Remedial Investigation Report* dated August 17, 2011, the extent of TPHo impacted soil is fully defined vertically and laterally, and is contained within shallow soil in a very small area under the existing Aloha Café building. Groundwater has not been impacted by the oil release.

Soil samples were collected from the sidewalls and base of the former new oil UST excavation during removal in 1995. Soil exceeding MTCA Method A cleanup levels was overexcavated. Groundwater samples from monitoring wells in the vicinity of the former new oil UST (MW-1 and MW-9) have been analyzed for TPHo and no concentrations have exceeded MTCA Method A cleanup levels, except a few instances in MW-1 where the concentration was flagged by the laboratory as not representative of motor oil (as discussed above).

As discussed in Section 3.2, soil samples from boring SB-5 at 8.5 feet bgs were analyzed for the required constituents in Table 830-1 related to heating oil USTs. No concentrations exceeded MTCA Method A cleanup levels. Groundwater samples from wells downgradient of the former heating oil UST (MW-1

and MW-10) have not contained any impacts indicative of a heating oil release. Therefore, the former heating oil UST has been appropriately investigated.

CRA agrees that soil vapor impact to on-Property and potentially off-Property facilities needs to be evaluated. Soil vapor impacts would be the result of the volatile organic compounds associated with the former gasoline station release (Release 1), specifically the presence of separate phase hydrocarbons (SPH) and significant dissolved phase groundwater concentrations, and not from the limited non-volatile heavy end hydrocarbons associated with the oil release. Soil vapor risk should be evaluated and addressed as part of the cleanup action for Release 1.

Ecology comment: *Ecology has determined the cleanup you performed does not meet any cleanup standards at the Site.*

Soil vapors at the Site have not been evaluated for the coffee shop that operates on-site as well as for the apartment residences that are adjacent to the Property.

TPHo contaminated soil remains at the former used oil UST. The extent of TPHo contaminated soil resulting from releases from the heating oil UST is not known.

TPHg, TPHd, TPHo, and BTEX contaminated soil and ground water along with SPH in the ground water has not been cleaned up. Contaminated soil and groundwater may extend beyond the Property boundaries.

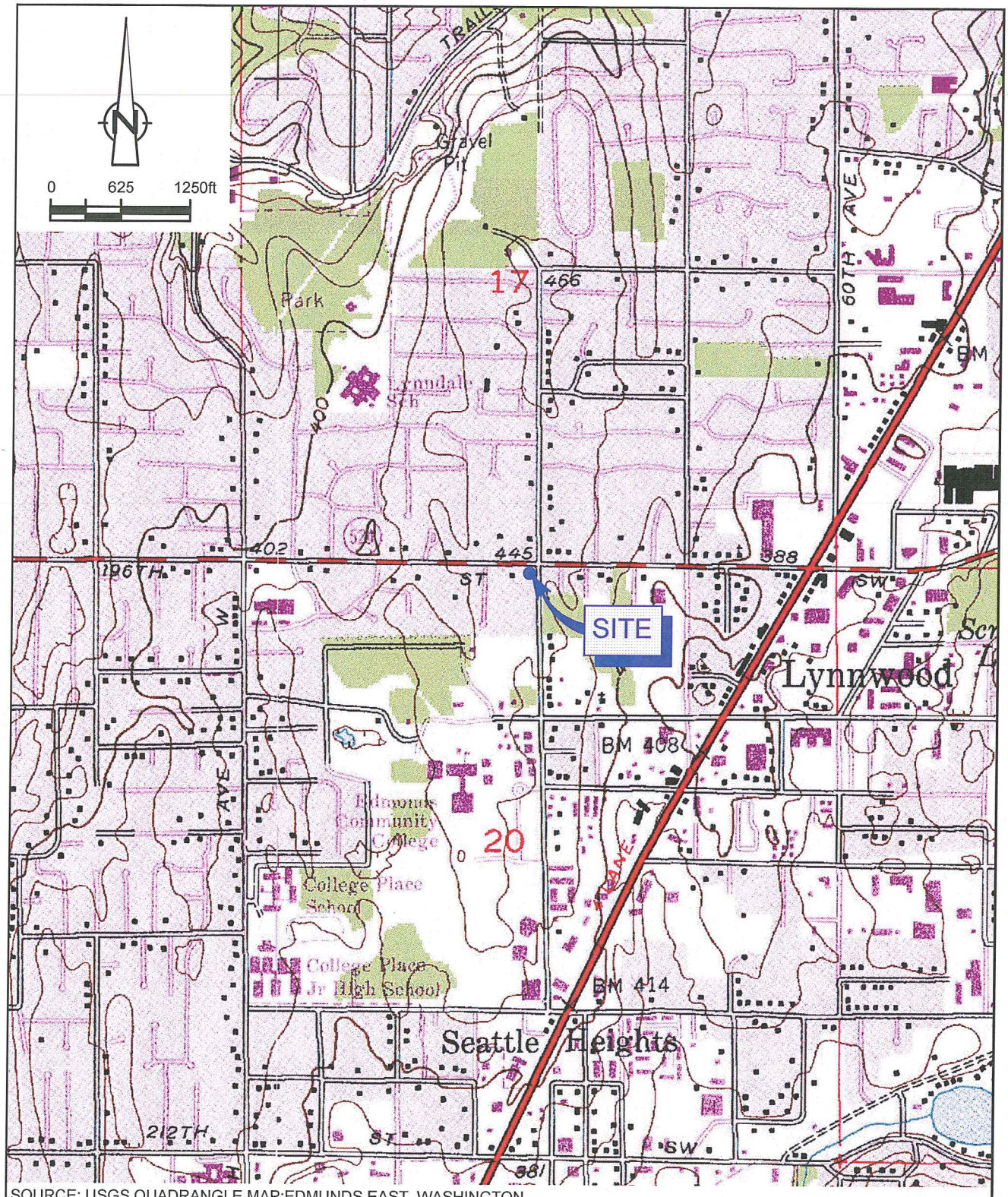
CRA response to comment: As stated above, the TPHo release is fully defined vertically and laterally and has only impacted soil at 16 inches bgs in a very small area beneath the existing Aloha Café. Groundwater has not been impacted by the oil release (Release 2). Soil and groundwater impacted with TPHg, TPHd, and BTEX, and the SPH plume are the result of Release 1 and should be investigated and cleaned up by the appropriate responsible party.

Section 5.0 Conclusions and Recommendations

The current investigation has confirmed that all affected areas from the petroleum release associated with the lube facility operation at the Property do not extend beyond the existing Aloha Café building. The two releases are not comingled. Soil samples to the south, southwest, and northeast of the Aloha Café building were documented below MTCA Method A cleanup levels. In addition, there does not appear to be any soil impacts related to the former heating oil UST. Groundwater has not been adversely impacted by the oil release (Release 2). No additional action with respect to Release 2 is warranted at this time. CRA requests that Ecology separate the releases into two distinct LUST cases

with the appropriate responsible parties identified. CRA also requests a formal opinion from Ecology regarding the contents of this report.

Figures



SOURCE: USGS QUADRANGLE MAP:EDMUNDS EAST, WASHINGTON.

figure 1

VICINITY MAP
FORMER JIFFY LUBE FACILITY
6808 196TH STREET SOUTHWEST
Lynwood, Washington

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