STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

December 16, 2016

Mr. Brett Hunter
Project Manager
Chevron Environmental Management Co,
6101 Bollinger Canyon Road
San Ramon, CA 94583-5177

Re: Opinion on Proposed Cleanup of the following Site:

- **Site Name:** Emerald Petroleum Services Inc. Transfer
- **Site Address:** 1300 W 12th Street, Vancouver, WA 98640
- **Facility/Site No.:** 605
- **Cleanup Site ID No.:** 47231541
- **VCP Project No.:** SW1227

Dear Mr. Hunter,

The Washington State Department of Ecology (Ecology) received your request for an opinion on your proposed independent cleanup of the Emerald Petroleum Services Inc. facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Is further remedial action necessary to clean up contamination at the Site?

YES. Ecology has determined that further remedial action is necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and it's implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following releases:

- Petroleum hydrocarbons and related constituents of concern in Soil.
- Tetrachloroethene of concern in groundwater

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcels associated with this Site are affected by other sites.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. Soil Investigation, Inman Oil Company Facility, 1300 West 12th Street, Vancouver, WA; dated November 7, 1997; by Pacific Environmental Group Inc. Redmond, WA
2. Site Characterization Activities, Inman Oil Company Facility, 1300 West 12th Street, Vancouver, WA, file no. 4823-0022-00; dated August 17, 1998; by GeoEngineers, Portland OR.
3. Soil Characterization Report, Inman Oil Company Facility, 1300 West 12th Street, Vancouver, WA; dated January 2000; by Parametrix, Inc. Portland OR.
4. Department of Ecology Opinion Letter requesting additional information, dated August 2, 2002; issued by Lisa Pearson, project engineer.
5. Truck Slab Soil Characterization Report, Emerald Recycling Vancouver Facility, 1300 West 12th Street, Vancouver, WA, 98660, dated August 2008; by CH2M/HILL, Bellevue, WA.
6. Tetrachloroethene Source Evaluation, 76 Products Facility No. 351386, 1300 West 12th Street, Vancouver, WA; dated April 28, 2014; by Leidos Engineering LLC, Boise, ID
7. First Quarter 2015 Groundwater Monitoring and Sampling Report 76 Products Facility No. 351386, 1300 West 12th Street, Vancouver, WA, VCP No. SW1227; dated June 29, 2015; by Leidos Engineering LLC, Bothell WA.

These documents are kept in the Central Files of the Headquarters Office of Ecology for review by appointment only. You can make an appointment by calling the Headquarters resource contact, Carol Dorn at (360) 407-7224.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

Characterization of the Site.

The site is a treatment facility for used oil and oily wastewater. Processed and unprocessed waste oil as well as waste water are stored in aboveground storage tanks (ASTs) at the northeastern site quadrant. Three underground storage tanks have been removed from the site. A 10,000 gallon diesel fuel UST was removed from the site in 1998. A 1,000-gallon UST in the northwestern corner of the site that contained a mixture lighter oils and water was removed in the early 2000s. A third UST with unknown size and contents has also been removed from the site. A 385-gallon heating oil UST remain at the southwestern corner of the site.

Between 1997 and 2008 four separate soil investigations identified both shallow (< 15 ft. below ground surface (bgs)) and deep (>30 feet bgs) soil contamination throughout the site. Levels for total petroleum hydrocarbons (TPH) including: TPHgasoline, TPHdiesel, and TPHoil exceed MTCA Method A cleanup levels for groundwater protection in both shallow and deep soils. Both shallow and deep soils exceed MTCA Method A cleanup levels for industrial properties in localized areas. Some of the detections of non-carcinogenic PAHs were evaluated using MTCA Method B (CH2M/Hill, 2008).

As part of the UST decommissioning program and site investigation, six groundwater monitoring wells have been installed on-site. Groundwater monitoring since 2002 have shown contaminants exceeding MTCA Method A groundwater clean-up levels. However, there has been a clear trend of decreasing contaminant concentration and the last groundwater monitoring report from early 2015 shows that tetrachloroethene (PCE) is the main constituent of concern remaining in groundwater.

Based on the Tetrachloroethene Source Evaluation report[1] and the other aforementioned documents, the following characterization issues require additional clarification:

1. The current lateral and vertical extents of soil and groundwater contamination at the Site are not clearly presented in the report. Lateral and vertical extents of contamination are typically provided as delineated geologic cross sections and plan view maps with isocontours. Delineated geologic cross sections and plan view maps were not included in the report.
2. Whether the vapor pathway is currently complete throughout the Site, including onsite buildings, based on current Site data.

Comments:

1. Please upload all Site data to EIM. In accordance with WAC 173-340-840(5), and Ecology Toxics Cleanup Program Policy 840 (Data Submittal Requirements), data generated for Independent Remedial Actions shall be submitted simultaneously in written and electronic format. No data is currently uploaded from any Site investigation or remedial activities. Additional review of Site submittals for this project will require all required site EIM data loaded.

2. Please provide the following additional supporting evidence:

    a. Please provide detailed and delineated plan view maps and geologic cross sections, as appropriate:

        i. Delineate remaining contamination in soil and groundwater at the Site in plan view and cross section with isocontours. Clearly indicate all areas exceeding MTCA Method A Cleanup levels for unrestricted land use. Include all sample results above cleanup levels to evaluate clean extents reported.

3. Please evaluate past analytical data for non-carcinogenic PAH (except naphthalenes) in soil and groundwater in accordance with MTCA Method B to determine cleanup levels for these PAHs in soil and groundwater.

---

[1] *Tetrachloroethene Source Evaluation*, 76 Products Facility No. 351386, 1300 West 12th Street, Vancouver, WA; dated April 28, 2014; by Leidos Engineering LLC, Boise, ID.

4. To address potential vapor intrusion to existing or planned on-site buildings used for regular occupancy, please evaluate the vapor intrusion pathway at the site and identify whether cleanup levels need to be determined.

5. Please include a determination whether a terrestrial ecological evaluation (TEE) is required for the site in accordance with MTCA.

6. Install one additional groundwater monitoring well at the southeastern quadrant of the site between groundwater monitoring wells MW-1 and MW-2.

7. Carry out groundwater monitoring for six quarterly and consecutive events to confirm the declining trends of contaminants in groundwater in the five existing groundwater monitoring wells and the new groundwater monitoring well. Because of the importance of the underlying aquifers to the City of Vancouver, Ecology is of the opinion that six quarterly and consecutive groundwater monitoring events would be prudent for a potential NFA determination. Analyze the groundwater for all MTCA Method A constituents of concern and US EPA non-carcinogenic priority PAHs, excluding DDT, Lindane and radiological parameters. Ensure that method detection limits are sufficiently low to be able to detect Method A constituents of concern cleanup levels. If non-carcinogenic PAHs (except naphthalenes) exceed MTCA Method B cleanup levels, please include these constituents as well in the groundwater monitoring program. Please do not use silica gel cleanup when preparing groundwater samples for TPH analyses.

8. It is unclear whether the concrete pad at the tanker truck loading/unloading area has been replaced and the recommendations set forth in the report prepared by CH2M/Hill (2008) have been implemented. If the pad has not been replaced but is planned to be replaced, please ensure that the soil cleanup recommendations set forth in CH2M/Hill's (2008) report are implemented in accordance with Dept. of Ecology's Guidance for Remediation of Petroleum Contaminated Sites, Toxics Cleanup Program, Publication No. 10-09-057.

9. Please remove soils exceeding MTCA Method A for groundwater protection, if there is an opportunity during the removal of old structures, construction of new structures or other on-site construction, where a soil removal action could be integrated into a planned demolition- or construction plan.

2. Establishment of cleanup standards.

During review of the aforementioned documents discussing subsurface environmental conditions at the Site, Ecology determined the cleanup levels and points of compliance established for the Site meet the substantive requirements of MTCA. The cleanup standards used for the Site included:

a. Cleanup levels.

MTCA Method A Soil Cleanup Levels unrestricted land use (primarily for groundwater protection) were used to characterize the Site. Exception is for non-carcinogenic PAHs where MTCA Method B Cleanup Levels were proposed earlier, because no Method A levels exist for non-carcinogenic PAHs.

b. Points of compliance.

Standard points of compliance were used for the Site. The point of compliance for protection of groundwater was established in the soils throughout the Site. For soil cleanup levels based on human exposure via direct contact or other exposure pathways where contact with the soil is required to complete the pathway, the point of compliance was established in the soils throughout the Site from the ground surface to 15 feet bgs. In addition, the point of compliance for the groundwater was established throughout the Site from the uppermost level of the saturated zone extending vertically to the lowest most depth that could potentially be affected by the Site.

3. Selection of cleanup action.

Ecology has determined that no cleanup action has been currently selected for the site. However, groundwater monitoring at the site show a decrease in contaminant concentrations.

At this time, the latest groundwater monitoring data show that contamination above MTCA Method A cleanup levels for unrestricted land use (primarily for groundwater protection) remains at the Site. Although contaminant concentrations have decreased in groundwater over time, these concentrations are not yet fully confirmed to be below MTCA Method A cleanup levels.

4. Cleanup.

If constituents of concern at the site exceed their respective cleanup levels after the completion of the year-long groundwater monitoring program, Ecology would recommend that a feasibility study and clean-up action plan be prepared.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

3. State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at (360) 407-6991 or e-mail at chsrister.loftenius@ecy.wa.gov.

Sincerely,

Christer Loftenius
Headquarters, Toxics Cleanup Program

CL:AF

Enclosure: A– Description of the Site
B– Site Layout

By certified mail: 9171999991703646815389

cc: Mr. Ronald Santos, Leidos Engineering LLC
Mr. Matt Alexander, Ecology

Enclosure A

Description of the Site

Site Description

The site comprises of the property located at 1300 West 12th Street, Vancouver, WA 98660. Tax parcel no. 59890000. According to Leidos (2014) the site is used as a transfer facility for liquid wastes including waste oil and oily waste water. The property is approximately 0.75 acres in side, forming an approximately, N-S oriented, 200 x 160 ft. rectangle, which southwest corner is truncated by an industrial access road. Onsite structures comprise of four 20,000-gallon aboveground storage tanks (ASTs) in the northeast corner of the site. Additionally, nine fuel ASTs, three wastewater ASTs, an underground oil/water separator and waste oil processing units are located at the north part of the site. A truck liquid loading/unloading area (concrete pad) is located at the northwestern corner of the site. An office building, a warehouse with attached loading dock and storage areas are found at the southwestern corner of the site. The Southeastern portion of the site is used as a vehicle parking area.

The site is bounded by multi-unit and single-unit residential buildings to the east, across Lincoln Street. To the west and south the site is bounded by railroads. Industrial facilities are found to the southeast and north of the site.

Union Oil Co. operated a bulk fuel facility at the site between 1928 and 1956 (Leidos, 2014). Between 1956 and 1995 the site was used as a waste oil reprocessing facility under the name of Inman Oil. In 1995 Emerald Services acquired the site and accepted various industrial liquid wastes and reprocessed these into petroleum fuel and cleaning products (CH2M/Hill, 2007). Since 2007 until present time Emerald Services used the site as a transfer station for waste products to be processed elsewhere (Leidos, 2014).

Underground Storage Tanks

The site had three confirmed underground storage tanks at the site originally. Of these three USTs, a 285-gallon heating oil UST (UST3) is still remaining on-site:

UST 1: This is a 285-gallon UST used to supply heating oil to the office furnace. This UST is still reportedly in use and is found at the southwest corner of the site just to the south of the office building. Emerald considered this UST to be exempt from WAC 173-360 in accordance with WAC 173-360-110(2)(h) because the UST is used for heating oil only and is less than 1,000 gallons in size.

UST 2: This UST was a 5,000 gallon tar-coated steel tank used for temporary storage of oily water as part of the site's waste water system. The tank was removed in the year 2000. Emerald considered this UST to be exempt from WAC 173-360 in accordance with WAC 173-360-110(2)(l) because the UST was used as part of a waste water treatment system (ATC, 2000).

UST 3: This former 1,000-gallon UST was used to store diesel fuel for a former hot oil heater that was used as part of the on-site waste oil reprocessing. The UST was located on the west side of the property. The UST was removed on November 11, 1998. Documentation was submitted to the Dept. of Ecology for review.

Site Geology and Hydrogeology

The site is located within the Portland Basin Washington Geologic Province (*http://www.dnr.wa.gov/programs-and-services/geology/explore-popular-geology/geologic-provinces-washington/portland-basin*). The regional geology consists of Holocene and late Pleistocene alluvial sediments overlying Pleistocene flood sediments from the large Missoula flood that affected the area it the end of the last ice age (Parametrix, 2000). The flood sediments comprise of fine to coarse grained sediments, in which are found the two topmost aquifers in the Portland Basin: the Upper and Lower Orchard Aquifers (*http://www.cityofvancouver.us/publicworks/page/aquifers-our-source-drinking-water*).

The flood sediments are underlain by the Troutdale Formation, which consists of Miocene and Pliocene alluvial sediments deposited by an ancestral Columbia River (Parametrix, 2000). Two out of the four aquifers beneath Vancouver are found in this formation, of which the so-called Sand-and-Gravel Aquifer that is the most import aquifer for the City of Vancouver. The Troutdale Formation is underlain by Miocene Columbia River Basalts. Vertical groundwater flow is downward where the deepest aquifer: the Sand-and-Gravel Aquifer is replenished by the three overlying aquifers (*http://www.cityofvancouver.us/publicworks/page/aquifers-our-source-drinking-water*). This downward interconnectivity of all the four aquifers makes groundwater especially vulnerable to contamination.

According to Parametrix (2000) the site geology, which was explored to a maximum depth of 50 feet below ground surface (bgs), comprises of a well graded sand that transitions to a poorly graded sand with depth. Discontinuous lenses of a silty sand were

also encountered in some borings. Parametrix (2000) assigned the sands to the Missoula flood deposits. Groundwater occurs between approximately 27 feet bgs in well MW-4 and 60 feet bgs in well MW-6 (Leidos, 2015). The groundwater gradient is generally to the east and south-east (Leidos, (formerly SAIC), quarterly groundwater monitoring reports 2012-2015). Four municipal groundwater extraction wells are located approximately 2.5 miles northwest of the site and in the opposite direction of the general on-site groundwater flow direction. The nearest wells to the site are three active groundwater wells owned by Columbia River Paper Mills. The extracted groundwater is used in the manufacturing process. These wells are located approximately 0.5 miles southeast and downgradient of the site. No other wells were identified within 0.5 miles from the site (Leidos, 2014).

Past Environmental Investigations

Following documented site investigations and other environmental site work has been carried out at the site:

1. Pacific Environmental Group, Inc. November 7, 1997*: Soil Investigation, Inman Oil Company*, Redmond WA, project no. 512-005.1A: Site Investigation, Soils

2. GeoEngineers Inc. August 17, 1998: *Site Characterization Activities, Inman Oil Company Facility*, Portland OR, File No. 4823-022-00: Site Investigation, Soil and Groundwater

3. Parametrix Inc. January 2000: *Site Characterization Report, Inman Oil Company*, Portland OR, proj no. 275-3454-003: Site Investigation, Soil and Groundwater

4. ATC Associates Inc. April 19, 2000: *Report of Waste Water/ Former Waste Oil UST Decommissioning, 1300 West 12th Street, Vancouver, WA 98660*, Tigard OR, proj. no. 25355.0001: UST Removal Report

5. GeoEngineers Inc. October 1, 2002: *Workplan for Supplemental Site Characterization, Former Inman Oil Company Facility, Vancouver, WA*, Portland OR, file no. 4823-022-04: The workplan appears not to have been implemented.

6. CH2M/HILL, August 2008: *Truck Slab Soil Characterization Report, Emerald Recycling Vancouver Facility, 1300 West 12th Street, Vancouver, WA, 98660*, Bellevue, WA, ref. no. 200808211: Site Investigation, Soils

7. Leidos Engineering LLC, April 28, 2014: *Tetrachloroethene Source Evaluation, 76 Products Facility No. 351386, 1300 West 12th Street, Vancouver, WA*, Boise

ID, ref. no. 150324-LB2: Risk Evaluation for PCE in Groundwater

8. Intermittent quarterly groundwater monitoring from April 2000 until March 2015. The following consultants have performed this monitoring:

    a. 2000 to 2003: GeoEngineers Inc. in Portland OR performed the groundwater monitoring.
    2004 to 2007: Delta Environmental Inc. in Portland OR performed the groundwater monitoring.
    2008 to mid-2011: Secor/Stantec in Tulatin OR performed the groundwater monitoring.
    Mid-2011 until the last monitoring event during the first quarter in 2015, SAIC, later Leidos in Boise ID performed the groundwater monitoring. In 2015 Leidos transferred the project to their Bothell, WA office. he last of several Groundwater Monitoring Reports is as follows:

    Leidos Engineering LLC, June 29, 2015: *First Quarter 2015 Groundwater Monitoring and Sampling Report 76 Products Facility No. 351386, 1300 West 12th Street, Vancouver, WA, VCP No. SW1227*, Bothell WA, proj. no. 150324-LB2

Identified Site Soil- and Groundwater Contamination

Soil contamination exceeding the MTCA Method A clean-up levels for unrestricted land use have been identified in the following areas:

1. **Former UST 2 at the northwest corner of the site:** Parametrix (2000) identified soil contamination exceeding the clean-up levels for TPH gasoline, diesel and oil as well as for PCE adjacent to, and to the southeast and southwest of the former underground waste water processing tank (UST 2).
   The contamination was found at an approximate depth of six feet bgs in boreholes PMX-16 and PMX-17. It is unclear when ATC Associates (2000) removed the UST, whether the contaminated soil was removed as well. ATC considered the UST in good condition and observed no holes in the tank. It appears that leaking piping associated with the tank is the main suspect for the release of TPH and PCE exceeding MTCA Method A soil cleanup levels.

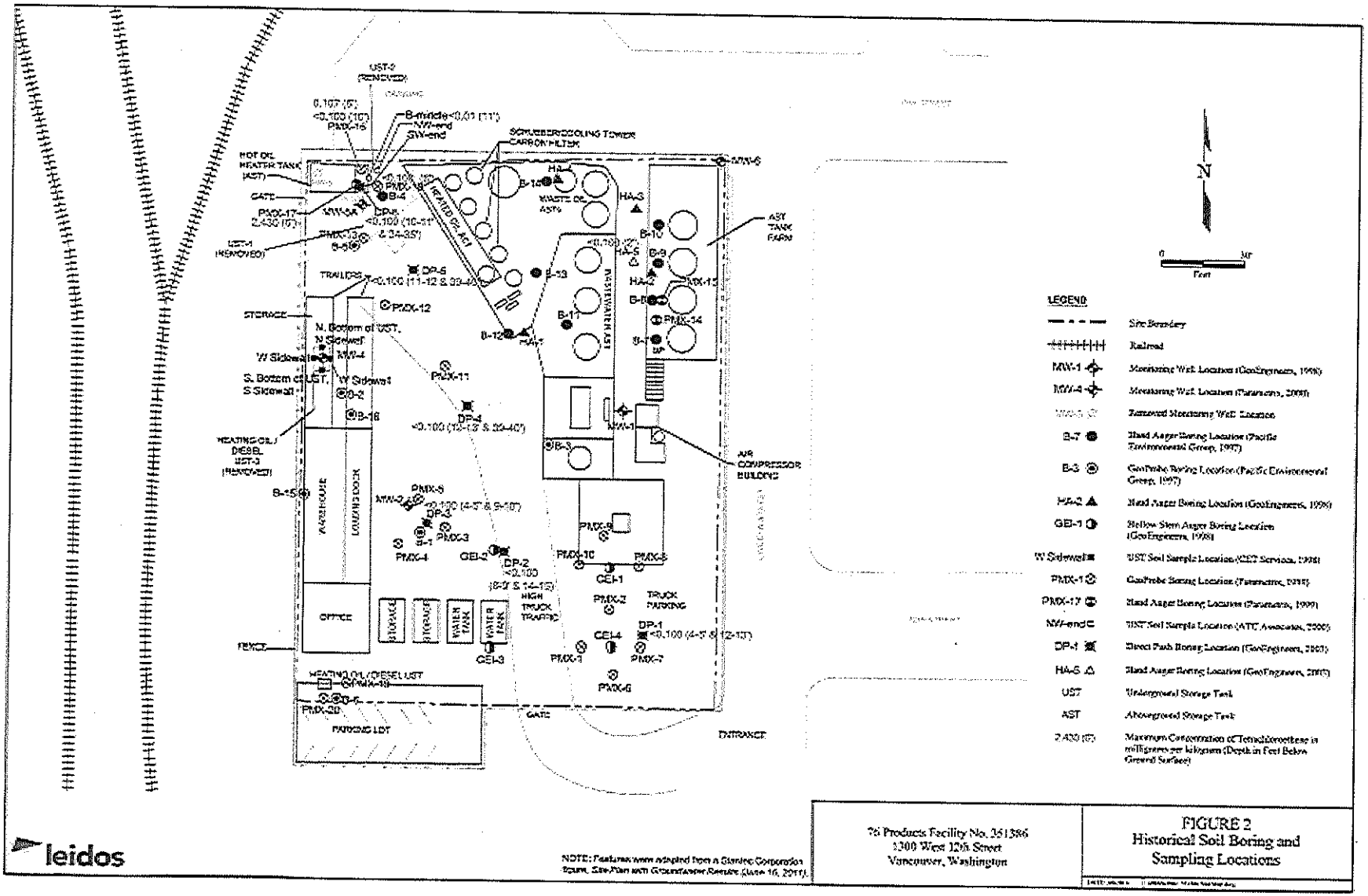
2. **Tanker Truck Loading/Unloading Area:** CH2M/Hill (2008) performed a site investigation beneath the concrete slab in this area at the north-central portion of the site in preparation for a planned construction project. CH2M/Hill discovered shallow (<5ft bgs) soil contamination above the MTCA Method A soil cleanup levels consisting of TPH in the gasoline, diesel, and oil range. This shallow contamination was found in the central portion of the slab around the catch basin, which drains into an oil/water separator the northwest of the slab. Additionally, CH2M/Hill found deep soil contamination (approximately 25-30 feet bgs) on top groundwater at the western end of the slab. The cause for the contamination is unknown but the shallow soil contamination could have been caused by leaks in the catch basin and the pipes leading from the basin to the oil/water separator. Another cause be spills from loading and unloading trucks leaking through potential cracks in the concrete slab. The cause for the deep contamination is also unknown; but two potential sources could be leaks from the oil/water separator and associated piping just north of the detected contamination, or contamination from spills around UST-2 located upgradient from the observed deep contamination.

3. **Concrete Pad/ Truck Parking Area in the Southeastern Quadrant of the Site:** Shallow (< 11 ft. bgs) soil contamination consisting of total lead and TPHoil above MTCA Method A soil cleanup levels were found beneath the paved area at the southeastern quadrant of the site (GeoEngineers, 1998 and Parametrix, 2000). The cause for the contamination is unknown but could have originated from spills and leaks from vehicles and then penetrating though potential cracks in the paving.

4. **Groundwater Contamination:** Leidos (2015) has been monitoring groundwater at the site since 2011. Leidos observed MTBE, TCE and primarily PCE concentrations exceeding MTCA Method A groundwater cleanup levels in all wells but the levels have been declining steadily and at the last monitoring event of the parameters analyzed only PCE was detected in Well MW-5R (6 µg/l), exceeding the MTCA Method A cleanup level for PCE. The source for the observed groundwater contamination seems to be releases from the area around former UST-2. The detection of PCE-contaminated soil (Parametrix 2000) adjacent to former UST-2 point in this direction. The steady decline in contaminant concentrations since UST-2 was removed also support this notion.

Enclosure B

Site Layout
(from Leidos, 2014)



leidos

NOTE: Features were adapted from a Stantec Corporation figure, Site Plan with Groundwater Results (June 16, 2011).

76 Products Facility No. 251386
1300 West 12th Street
Vancouver, Washington

FIGURE 2
Historical Soil Boring and Sampling Locations