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FINAL REPORT INVESTIGATION AND SOIL REMEDIATION DIAMOND TANK TRANSPORT PROPERTY SEATTLE, WASHINGTON

For

DIAMOND TANK TRANSPORT, INC.
D&M JOB NO. 38229-001-005
December 10, 1998

DAMES & MOORE
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Final Report
Subsurface Investigation and Soil Remediation
Diamond Tank Transport Property
912 Dexter Avenue North
Seattle, Washington
D&M Job No. 38229-001-005

Dear Mr. Banchero:

Presented in this report are the results of Dames & Moore's subsurface investigation and soil remediation at the property located at 912 Dexter Avenue North in Seattle, Washington. This project was conducted in general accordance with our revised proposal to Diamond Tank Transport, Inc. dated December 17, 1997.

Dames & Moore appreciates this opportunity to be of service to Diamond Tank Transport, Inc. Please contact us if you have any questions regarding this report, or require additional information or assistance.

Very truly yours,

Dames & Moore

Laura S. Cooper
Senior Environmental Engineer

James H. Flynn, R.G.
Senior Hydrogeologist

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EXECUTIVE SUMMARY

This report documents the results of a subsurface investigation and subsequent soil remediation at the Diamond Tank Transport, Inc. (DTT) property located at 912 Dexter Avenue North in Seattle, Washington. The property is owned by DTT and was most recently leased by Yellow Cab Company who vacated the site in 1996. The Seattle-King County Health Department completed the site hazard assessment of the site, as required under the Model Toxics Control Act. The site's hazard ranking, an estimation of the potential threat to human health and/or the environment relative to all other Washington State sites assessed at this time, has been determined to be a 5, where 1 represents the highest relative risk and 5 the lowest.

The subsurface investigation and soil remediation was conducted at the request of DTT and based on the findings and conclusions of a Phase I Environmental Site Assessment (ESA) of the property conducted by Dames & Moore in December 1997.

The objectives of the subsurface investigation and remediation at the site included the following:

- assessment of the nature and extent of impacts to surface soil in several areas where oil stains were observed
- assessment of the condition of a concrete storm water catch basin and a concrete sump located on site
- further assessment of the potential presence of underground storage tanks suspected to be present at the property based on information obtained during the ESA,
- assessment of the condition of two in-ground, inactive hydraulic automotive lifts and an oil-water separator observed at the site and the potential of impacts to soils in the areas surrounding the sub-grade equipment
- assessment of soil conditions near the pump island canopy
- demolition, removal and disposal off site of in-active sub-grade equipment described above
- excavation and off site disposal of soil containing petroleum hydrocarbons at concentrations above the Model Toxics Control Act (MTCA) Method A cleanup level

DTT contracted with a local remediation firm, Ace Contractors, to assist Dames & Moore with the soil investigation and sub-grade equipment assessment and removal. Ace Contractors and WestPac Environmental, Inc., completed the soil remediation, provided transportation of impacted soil to the off site disposal facility, and completed site re-grading after remediation had been completed.

Conclusions based on the results of the subsurface investigation and remediation of petroleum hydrocarbon impacted soil at the site include the following:

- Information from the ESA indicated that underground storage tanks (USTs) might be present near the pump island canopy or the garage building at the site. The presence of

USTs or other sub-grade structures at the site was not indicated by the geophysical survey or extensive excavations in the area of the suspected USTs.

- Petroleum hydrocarbons including gasoline-, diesel-, and oil-range hydrocarbons and benzene, toluene, ethylbenzene and xylenes were the most common contaminants detected in soil and were the only substances that exceeded Method A cleanup levels in soil. Other chemicals of concern including non-halogenated solvents, metals and polychlorinated biphenyls were not detected in soil samples collected at the site at levels above Method A and/or B cleanup values.

- Based on subsurface samples collected from test pits near oil-stained areas and subsequent samples collected from shallow excavated areas, levels of TPH fractions in soils at the site were highest in soils at the surface to approximately one foot below ground surface (bgs) and in most cases decreased to levels below the applicable MTCA Method A soil cleanup level at three feet bgs or less. The lateral extent of the petroleum hydrocarbon impacts was generally defined by the boundary of visually discernable oil-stained soil, which in some areas, was initially obscured due to cobble and gravel cover.

- The condition of the oil-water separator and two in-ground hydraulic lifts located in the former maintenance bays on the east end of the garage building appeared satisfactory; however, a limited amount of soil containing petroleum hydrocarbons above the cleanup level was detected near one of the lifts and the oil-water separator. This soil was removed and confirmation soil samples did not contain petroleum hydrocarbons at concentrations above the MTCA Method A cleanup level. The oil-water separator, hydraulic lifts and affected soil were removed and disposed off site.

- Approximately 1,000 tons of petroleum hydrocarbon impacted surficial soil from the oil-stained areas and the hydraulic lifts was excavated from the site and disposed at a permitted offsite landfill. Post excavation samples and/or test pit soil samples indicate that remediation of surface soil impacted by petroleum hydrocarbons was complete.

- Approximately 2,000 tons of petroleum affected soil originating in the area of the gas island was excavated and transported from the site for disposal at a permitted offsite landfill. Post excavation samples indicate that the remediation of subsurface soil affected by an apparent release from a former underground storage tank system was complete.

- Groundwater was not encountered during excavation of test pits, sub-grade equipment inside the building and remediation of impacted surface soil at the site. A limited zone of perched groundwater was encountered in the pump island canopy excavation. However, the soil within this perched zone containing petroleum hydrocarbons above the cleanup level was removed and soil samples collected below the perched groundwater did not contain petroleum hydrocarbons above the cleanup level. Therefore, Dames & Moore does not believe that a groundwater investigation is warranted.

Based on the results of the subsurface investigation and soil remediation at the site, it is Dames & Moore's opinion that no further investigation or cleanup at the site is warranted. However, the potential does exist that during redevelopment of the site USTs or affected soil could be encountered. If USTs are encountered, the USTs should be decommissioned in accordance with local, state and federal requirements. If indications of subsurface contamination are encountered an investigation should be implemented to determine the nature and extent of subsurface impacts. If additional soil containing hazardous substances above applicable MTCA cleanup levels is detected, the need for additional remedial actions should be considered.

1.0 INTRODUCTION AND BACKGROUND

This report presents the findings and conclusions of an investigation and soil remediation project at the property located at 912 Dexter Avenue North in Seattle, Washington (Figure 1) and owned by Diamond Tank Transport, Inc. (DTT). The objectives of the investigation and remedial actions were to assess the extent of hazardous substances in soil beneath the site and to reduce the concentrations of these substances in soil to below applicable cleanup levels in the Model Toxics Control Act (MTCA) Cleanup Regulation (Chapter 173-340 WAC). Dames & Moore performed this work on behalf of DTT in accordance with the terms and conditions in our proposals dated December 17, 1997, and August 19 and September 22, 1998.

The property is currently vacant but has been occupied by various businesses since its development during the early 1940s. The property is currently listed on the Washington Department of Ecology (Ecology) Toxics Cleanup Program's site register of suspected and confirmed contaminated sites and has been listed since 1993. The property was placed on the list due to information obtained during site inspections conducted by Metro Industrial Waste division (Metro) and Ecology beginning in 1992 and continuing until 1996. In 1997, the Seattle-King County Health Department completed the site hazard assessment of the site, as required under the Model Toxics Control Act. The site's hazard ranking, an estimation of the potential threat to human health and/or the environment relative to all other Washington State sites assessed at this time, has been determined to be a 5, where 1 represents the highest relative risk and 5 the lowest. A further discussion of the historical use of the property is presented in Dames & Moore's Phase I Environmental Site Assessment (ESA) report included in Appendix A of this report.

The investigation and remediation work was completed in two phases. The initial phase of soil investigation and remediation was conducted during January, February and March 1998 based on the findings of ESA. In August 1998, a subsurface investigation completed by Environmental Associates (EA) identified the presence of petroleum-affected soil beneath the former pump islands and canopy located north of the garage building, which had not been accessible during the previous investigation/remediation phase. Analytical results showed gasoline-range hydrocarbons in excess of MTCA cleanup levels at two locations in the vicinity of the former pump islands. Subsequent to these investigations, the second phase of investigation and remediation was completed in August, September and October 1998.

2.0 SITE SETTING

2.1 SITE LOCATION

The subject property is located at 912 Dexter Avenue North, Seattle, King County, Washington (Figure 1). It is bounded on the north by vacant property currently being developed for commercial use, to the east by 8th Avenue North and a refrigeration/air conditioning supply and installation company, to the south by a currently unoccupied commercial-size structure and on the west by Dexter Avenue North. Land use in the site vicinity consists of commercial, manufacturing, retail, and multi-tenant office space.

2.2 SITE DESCRIPTION

The subject property is approximately 48,400 square feet and is variously paved with gravel/cobble, asphalt, and concrete or unpaved ground (Figure 2). A fence surrounds the perimeter of the property on the north, east, and west sides and a portion of the south side. The southern portion of the property extending from the western property line east approximately 150 feet and approximately 36 feet northward from the southern property boundary was occupied by a building at the time the ESA was completed. The building covered approximately 5,800 square feet and consisted of a concrete poured foundation and floor, with concrete masonry unit (CMU) structural walls.

In addition to the main building, several smaller structures including two small wooden enclosures on the southeast and east sides of the property and two areas covered by metal canopies in the northwestern area of the property were observed at the site at the time the ESA was conducted.

Prior to implementing the investigation, the wooden structures on the east side of the property and east end of the main building were demolished. Also removed were the waste oil storage tanks and concrete pad which had been located adjacent to the pump island canopy north of the main building (Figure 2). To facilitate the removal of affected soil in the vicinity of the pump island canopy, the canopy and the main building were also demolished.

2.2.1 Sub-grade Equipment and Potential Underground Storage Tanks

Two inactive, sub-grade dual cylinder lifts and an oil-water separator were observed in two service bays on the eastern end of the main building during the ESA (Figure 2). One cylinder associated with each lift was contained within a concrete vault, while the other was set directly into a concrete footing cast into the soil. The depth to the base of the concrete vault was approximately 8 feet below ground surface (bgs). The base of the buried cylinder was 8 feet bgs and the base of the concrete footing was approximately 10 feet bgs. The oil reservoir of each hydraulic lift was also observed in the concrete vault. The hydraulic controls of each lift were located in a shallow sub-grade concrete structure adjoining the cylinder and reservoir vault. Observation of both cylinders of each lift indicated that no hydraulic oil remained in the equipment. Observation of the vaults associated with each lift indicated the eastern lift was partially filled with a green liquid mixed with water. The lift in the second bay from the east end of the building (Figure 2) contained approximately one to two feet of oily water.

A sub-grade concrete sump, reported to be an oil-water separator, was observed inside the easternmost service bay of the main building on site during the ESA (Figure 2) and was reportedly inactive. The interior of the sump could not be inspected by Dames & Moore during the ESA due to a metal plate covering the opening at the floor surface which had been welded to the lip of the sump. Files obtained from the Department of Ecology and reviewed during the ESA indicated that the most recent occupant of the site, Yellow Cab Company (Appendix A), had reportedly allowed volatile non-halogenated solvents and petroleum hydrocarbon products that were mixed with rinse water used to wash and clean the service bay floors to enter the sump.

A storm water catch basin near the eastern property boundary at the site was full of oily water at the time the ESA was conducted and its interior could not be observed by Dames & Moore.

Information obtained from the ESA of the site indicated that one or more USTs might be present at the site and potentially located in the areas shown on Figure 2. In addition, evidence of debris and mounded soil in the northwest corner of the site (Figure 2) indicated the possibility that debris may have been buried in this area by past occupants of the site.

2.2.2 Utility Floor Drain

A small floor drain was observed in a former utility room inside the western portion of the main building (Figure 2). Based on the information reviewed concerning the most recent former occupant of the site, the drain was considered a potential source of subsurface soil contamination from potential improper disposal of hazardous substances and/or petroleum products to this drain.

3.0 PURPOSE AND SCOPE OF WORK

The subsurface investigation and soil remediation was conducted in general accordance with the scope of work outlined in Dames & Moore's proposals dated December 17, 1997, and August 19 and September 22, 1998. The subsurface investigation was conducted to further characterize the lateral and vertical extent of soil contamination indicated by oil stained surface soil and further assess other potential sources of sub-grade contamination at the site identified during the ESA. The purpose of the soil remediation was to remove soil from the site which contains concentrations of petroleum hydrocarbons at concentrations exceeding applicable MTCA Method A cleanup levels.

The subsurface investigation was performed to assess the extent of impact to the shallow soil associated with the surficial oil stains, and further assess the potential presence of USTs and other buried debris which were suspected to be present at the site based on information reviewed during the ESA. Additional objectives of the investigation included assessment of the condition of sub-grade equipment at the site including two inactive hydraulic hoists, an oil-water separator and a utility floor drain inside the building on site and a storm water catch basin northeast of the building. In August, 1998 and subsequent to the demolition of a pump island canopy located in the southwest portion of the site, a subsurface investigation was conducted by Environmental Associates (EA). Based on these finding, the scope of the investigation and remediation was revised to address the affected soil in this area.

In order to fulfill the objectives described above, Dames & Moore performed the following scope of work during the subsurface investigation and remediation:

- Preparing a site-specific Health and Safety Plan which addressed potential site hazards
- Subcontracting a utility locator to identify sub-grade utilities
- Subcontracting a geophysical survey company to perform electromagnetic (EM) and ground penetrating radar (GPR) surveys of the site subsurface to assist with finding suspected USTs and other buried debris on site

- Observing soil conditions and collecting samples for laboratory analysis from ten test pits excavated in oil stained areas and near suspected buried debris and a utility drain
- Assessing the condition of two shop hoists, an oil-water separator and associated piping exposed during excavation and removal of the equipment, observing the condition of soils exposed in these areas, and collecting representative soil samples for laboratory analysis
- Observing the drilling and sampling of soil borings near the pump island canopy
- Directing the excavation of soil containing petroleum hydrocarbons above the applicable cleanup levels beneath the southwest portion of the site.
- Collecting and analyzing soil samples collected from the excavations to guide the removal of petroleum contaminated soil (petroleum-affected soil) and to confirm that soil exceeding the applicable cleanup levels was removed.
- Preparing this report to document the findings of the investigation and soil remediation

4.0 SAMPLING DESIGN AND METHODOLOGY

Prior to initiating the subsurface investigation, Dames & Moore subcontracted Locating, Inc., to perform a subsurface utility survey in the areas to be investigated and Apollo Geophysics Corporation (Apollo) of Seattle, Washington, to perform a geophysical survey in the vicinity of the suspected USTs. The subsurface investigation included excavating test pits, collecting soil samples, field screening soil samples, and logging of the soil physical characteristics and conditions. All field activities were performed and/or monitored by a qualified Dames & Moore engineer or geologist. The techniques and equipment used were performed in accordance with generally accepted environmental science and engineering practices.

A log of the subsurface materials encountered was prepared, samples were collected, and organic vapor readings for soil were recorded by the Dames & Moore engineer. Particular attention was given to noting visible evidence of staining, discoloration, odors, or other relevant factors indicative of petroleum hydrocarbons or other hazardous substances in the soil. Soils were classified in general accordance with the Unified Soil Classification System.

On January 19, 21 and 22, 1998, subsurface soil samples were collected from 10 test pit locations (TP-1 through TP-10) specified by Dames & Moore (Figure 3). Soil samples were also collected from excavations adjacent to sub-grade equipment (e.g., hydraulic lifts, oil-water separator, sumps) located within and immediately north of the main building (Figure 4). Soil samples were collected from test pit excavation sidewalls and from the center of the backhoe bucket as the test pit excavations were advanced. A hand auger, cleaned with a dilute Alconox solution and rinsed with distilled water, was used to collect the soil samples from a boring (HA-1) near the drain within the utility/shower room of the main building (Figure 2). The samples were transferred to laboratory-prepared glassware using a clean, disposable plastic spoon. The sample containers were labeled and placed in a chilled cooler containing ice. A portion of the retrieved soil was screened using a photoionization detector (PID) using head space techniques. The recovered soil was classified and logged. Chain-of-custody protocol was maintained while transferring the soil samples to the analytical laboratories.

As part of the site specific health and safety plan developed for this project, ambient air monitoring in the work zone was also conducted during sampling. Elevated PID readings were not observed during work zone monitoring.

5.0 ANALYTICAL METHODOLOGY

Selected soil samples to be analyzed for petroleum hydrocarbons, VOCs, PCBs, SVOCs, and metals were submitted to North Creek Analytical (NCA) located in Bothell, Washington and Transglobal Environmental Geosciences Northwest, Inc. (TEG) located in Bellevue, Washington. The shallowest soil sample from each test pit location was selected for laboratory analysis. Samples were collected from the base of the hydraulic floor hoists and associated hydraulic control valves, from the base of the oil-water separator, and from areas adjacent to piping associated with the oil/water separator and hydraulic lifts. Samples collected from the floor drain located in the utility/shower room were not submitted for analysis because visual evidence and instrumental field screening did not indicate evidence of contamination.

The selected soil samples were analyzed by methods, which included NWTPH-HCID, and reported detection from this method were generally quantified by appropriate methods including NWTPH-Gx, NWTPH-D and NWTPH-D extended. Soil samples with the highest reported concentration of petroleum hydrocarbon compounds collected from near the two floor hoists and oil/water separator were also analyzed for VOCs by EPA method 8260, SVOCs by EPA method 8270, and eight RCRA metals by EPA method 6010/7000. Soil samples collected in other areas at the site including the former compressor shed on the east end of the building were also analyzed for PCBs.

6.0 APPLICABLE CLEANUP LEVELS

Soil cleanup levels for petroleum hydrocarbons and other hazardous substances have been established by Ecology and are compared to site data to determine whether remediation is necessary or has been sufficient to protect human health and the environment. Method A soil cleanup levels for common soil contaminants including petroleum hydrocarbons, organic solvents, metals and other toxic substances have been tabulated by Ecology for industrial and non-industrial sites and can be used as cleanup levels for site undergoing routine cleanup actions such as soil excavation with offsite disposal. The values for each contaminant were developed using available toxicity and chemical data for each substance listed. A table of these values for soil and groundwater is included in the MTCA cleanup regulation. Ecology has established cleanup values for substances not listed in the Method A tables discussed above using risk-based calculations and available toxicity data. The use of these values in evaluating sites termed Method B. The calculated cleanup values for many organic and inorganic substances have been published by Ecology in the publication "Cleanup Levels and Risk Calculations (CLARCII) Update, February 1996". These levels are considered applicable to all sites and can be used to evaluate multiple contaminants and substances without published Method A cleanup levels.

Based on the site soil analytical data discussed below, petroleum hydrocarbons are the chemicals of concern at the site, and Method A cleanup levels are applicable for use in determining the need for

remediation. Identified contaminants at the site which do not have Method A cleanup values will be compared to Method B formula values as appropriate.

The primary soil contaminant at the site is assumed to be petroleum hydrocarbons including gasoline, diesel and heavy oil range hydrocarbons based on information reviewed and site observations during the ESA and given the current land use in the area, the site is assumed to be classified as non-industrial. Consequently, the site data were compared to the Method A cleanup level for non-industrial soil for gasoline range hydrocarbons (100 mg/kg) and for diesel and heavy oil range hydrocarbons (200 mg/kg).

7.0 RESULTS AND DISCUSSION

Presented in this section are the results of the subsurface investigation and soil remediation at the site. Section 7.1 discusses the results and interpretation of the subsurface geophysical survey. Section 7.2 describes the observations and results of the soil investigation including test pit sample analyses, equipment excavation sample analyses, one hand auger boring completed near a floor drain, and the site results of the investigation completed by EA at the pump island canopy. Section 7.3 discusses the observations and results of inactive sub-grade equipment demolition and removal and assessment of the condition of equipment left in place at the site.

7.1 SUBSURFACE GEOPHYSICAL SURVEY

A geophysical survey was performed by Apollo on January 9, 1998 using electromagnetic and ground penetrating radar (GPR) techniques to assist Dames & Moore with locating suspected USTs and any other debris or equipment that might be buried at the site. The results of the GPR survey were presented by Apollo in a report dated January 13, 1998 (Appendix C).

Electromagnetic instrumentation initially employed to survey the subsurface did not provide useful information regarding the potential presence of USTs or other sub-grade equipment due to interference caused by metal debris scattered across the site. The areas where USTs and/or buried debris were suspected including the area north of the building under the pump island canopy, the northwestern corner of the site, and the areas within the service bays (Figure 2) were subsequently surveyed using GPR. Survey results of the northwestern area did not indicate the presence of buried equipment or tanks, however a large amount of buried debris was identified. The debris was subsequently removed from the site. Survey results in the area under the pump island canopy (Figure 2) indicated that USTs were potentially present in the areas shown on Figure 3. Further exploration of these areas conducted by Ace Contractors and observed by Dames & Moore using a backhoe and a hand auger did not uncover evidence of USTs in the area. Survey of the area adjacent to the small sump at the east end of the building did not provide evidence that a UST was present in this area (Figure 3).

7.2 SOIL INVESTIGATION

7.2.1 Test Pits

Ten test pits (TP-1 through TP-10) were excavated by Ace Contractors on January 19, 1998 in the areas shown on Figure 3. Test pit locations were chosen by Dames & Moore based on information obtained and observations made during the ESA. The test pits were completed to five feet bgs. Soil exposed in the test pits was classified and samples were collected according to the methodology described in Section 4.0. In general, samples were collected from each pit at depths of one to three feet below ground surface. Shallow samples (one foot bgs) were collected in order to identify and quantify suspected petroleum hydrocarbon impacts near the ground surface in selected areas stained with oil. Deeper samples (three feet bgs) were collected to assess the vertical extent of affected soil when observations and field screening indicated no evidence of petroleum hydrocarbons. The observed condition and classification of soil types and field screening observations were recorded on Test Pit Log forms by the Dames & Moore field representative on site and are included in Appendix D.

Soils in the test pits completed typically consisted of a thin layer of gravel or cobbles at the surface followed by alternating layers of moist brown, reddish brown, and gray sand, silty sand, and sandy silt fill. This fill extended to depths ranging from approximately four feet in the western portion of the site to a depth greater than five feet in the eastern portion of the site (Figure 3). Groundwater was not encountered in any of the test pits excavated.

Sixteen test pit soil samples were submitted for analysis. Initially, each sample was analyzed to identify the presence of petroleum hydrocarbons using method NWTPH-HCID. If petroleum hydrocarbons were detected in a sample, the laboratory was generally instructed to quantify the hydrocarbon concentration using an appropriate method including NWTPH-G, NWTPH-D, or NWTPH-D extended depending on the range of hydrocarbons detected. Laboratory analytical reports and chain of custody forms for each type of sample and analysis are included in Appendix E. A summary of test pit sample results are presented in Table 1 and on Figure 3. In general, samples collected from soil within one foot of the ground surface in oil-stained areas had the highest concentrations of petroleum hydrocarbons (up to 7,710 mg/kg in TP-9), which in most cases, was identified as heavy oil range or motor oil hydrocarbons. Concentrations of petroleum hydrocarbons decreased rapidly with depth and with only two exceptions (TP-2 and TP-8) were below detectable levels at depths of three feet bgs or less.

One sample collected from TP-6 at one foot bgs (Figure 3) was selected for metal analysis due to the levels of heavy oil range hydrocarbons (1,470 mg/kg) reported in the sample. Results are summarized in Table 2 and the laboratory analytical report is included in Appendix E. Barium (52.2 mg/kg), cadmium (0.497 mg/kg), chromium (15.0 mg/kg), lead (125.0 mg/kg), and mercury (0.149 mg/kg) were detected in the sample, however, the concentration reported for each metal did not exceed applicable MTCA cleanup levels (Table 2). Due to the concentration of lead reported in the sample, the toxicity characteristic leaching procedure (TCLP) was conducted to determine whether soil in this area exceeded the EPA toxic characteristic for lead (5.0 mg/L). Lead was not detected by the laboratory in the leachate from the extraction test.

A soil sample from TP-9 (TP-9-1@1') collected at the former compressor shed (Figure 3) was also analyzed for PCBs due to information obtained during the ESA which indicated the potential historical use of PCBs as additives to air compressor cooling oils. Based on the results of hydrocarbon analyses conducted on the sample collected at one foot in the area, PCB analysis was requested by Dames & Moore. Aroclor 1260, a PCB isomer, was reported in the sample at 176 ug/kg or 0.176 mg/kg (Table 3) and this level did not exceed the Method A cleanup level for total PCBs (1 mg/kg).

7.2.2 Inactive Sub-grade Equipment Excavations

On January 22, 1998, Ace Contractors demolished concrete and excavated soil surrounding the two in-ground hydraulic lifts located in former service bays on the east end of the main building (Figure 3 and 4), and soil adjacent to the oil-water separator. The soil was transported offsite for disposal at a permitted landfill. A portion of the piping from the oil-water separator to a small sump outside the service bay entrance (Figure 4) was also excavated. Prior to excavation and removal, liquids observed in vaults associated with the lifts were removed and transported off site by Marvac, an industrial cleaning firm subcontracted by Ace Contractors. After the liquids were removed, the lifts and accessory components including piping, reservoir tanks and controls were removed and transported offsite for proper disposal. Dames & Moore observed soil conditions and collected samples from the excavations with assistance from Ace Contractors.

Twelve soil samples were collected from these areas by Dames & Moore in the areas shown on Figure 4 and analyzed by the laboratory NWTPH-HCID. If petroleum hydrocarbons were detected in a sample, the laboratory was generally instructed to quantify the hydrocarbon concentration using an appropriate method including NWTPH-G, NWTPH-D, or NWTPH-D extended depending on the range of hydrocarbons detected. A summary of samples with detected levels of petroleum hydrocarbons are summarized in Table 2 and on Figure 4. Laboratory reports are included in Appendix E.

None of the reported concentrations of petroleum hydrocarbons including diesel and heavy oil range hydrocarbons exceeded the MTCA Method A cleanup level (200 mg/kg) in samples collected from the areas where the sump and lifts had been removed except sample EX-9 @ 4' (Figure 4) (Table 2) which contained 569 mg/kg heavy oil-range hydrocarbons. This sample was selected for volatile and semivolatile organic compound analysis and analysis of selected heavy metals. Volatile organic compounds were not detected above the reporting limit in the sample. One semivolatile target compound, fluorene, was detected in the sample and the reported concentration, 0.153 mg/kg (Table 3), did not exceed the Method B formula value for soil (3,200 mg/kg). Metal analytical results reported by the laboratory included detections of barium (42.8 mg/kg) and chromium (25.5 mg/kg) (Table 3) which did not exceed MTCA Method A cleanup levels.

7.2.3 Floor Drain

One hand auger boring (HA-1) was advanced adjacent to the floor drain (Figure 3) on January 19, 1998 by Dames & Moore after a core through the concrete floor had been made by a subcontractor. The depth

reached was below the bottom of the drain. A log of soil types and condition were recorded on a boring log form (Appendix D). Soil types encountered were similar to the rest of the site and there was no evidence of petroleum hydrocarbons, organic solvent odor or staining. Field screening with the PID did not detect the presence of ionizable compounds. Therefore, because there was no field evidence of contamination and the drain was connected to a shower, soil samples near the drain were not submitted to the laboratory for analysis. Soil near the drain does not appear to have been impacted by the potential discharge of hazardous substances to the drain.

7.2.4 Pump Island Canopy

A subsurface investigation was completed by Environmental Associates (EA) in August 1998. The investigation included five test pits (SB-1 through SB-5) located near the former pump island canopy (Figure 6). The test pits excavated to a maximum depth of 8 feet. The results for NWTPH-HCID analyses indicated the presence of gasoline and heavy-oil range hydrocarbons. Quantitative analyses showed gasoline-range hydrocarbons in excess of MTCA cleanup levels at two locations in the vicinity of the former pump islands. This investigation identified the presence of petroleum affected soil beneath the former pump islands canopy adjacent north of the garage building, which had not been accessible during the previous investigation/remediation phase.

7.3 INACTIVE SUB-GRADE EQUIPMENT ASSESSMENT AND REMOVAL

7.3.1 Hydraulic Lifts

The two lifts were excavated and along with associated piping and oil reservoirs, were removed and disposed off site by Ace Contractors. Prior to removal, observed liquids in the associated vaults were removed and transported off site by an industrial waste water disposal and cleaning firm contracted by Ace Contractors. No evidence that the lifts and other components were potential sources of subsurface soil contamination was obtained from assessment of the equipment.

7.3.2 Oil/Water Separator

The oil/water separator adjacent to the entrance of the east bay inside the main building was assessed after the metal cover had been removed by Ace Contractors during excavation and removal of the hydraulic lift in the bay. The contents of the separator, including sediment and oily water, were removed by the industrial cleaning company contracted by Ace Contractors to pump out the hydraulic lift vaults. After the separator had been emptied, Dames & Moore assessed the condition of the interior. No evidence of cracks or breaches in the walls or floor of the separator were observed. The separator was removed and disposed off site by Ace Contractors during lift removal and soil remediation conducted in this area .

7.3.3 Storm Water Catch Basin

The catch basin was emptied of water and sediment and was cleaned out by the industrial cleaning and waste disposal firm described above on March 3, 1998. Dames & Moore was on site during the clean-out

of the basin and assessed the condition of the basin interior. No obvious or potential leak points in the walls or base of the basin were observed. The basin was left in place and appeared to be functioning satisfactorily.

8.0 SOIL REMEDIATION

Based on the results of the subsurface investigation, contamination at the site appeared to be limited to gasoline-, diesel- and heavy oil-range petroleum hydrocarbons in soil. The areas with concentrations of diesel- and heavy oil-range hydrocarbons which exceeded the Method A cleanup level for soil appeared to be defined by the oil-stained ground. In addition, one sample collected in the eastern service bay of the building contained levels of heavy oil range hydrocarbons that exceeded the Method A cleanup level. The gasoline-range petroleum hydrocarbons exceeding the MTCA cleanup level were limited to the area surrounding the pump island canopy. These areas are shown on Figure 2.

Soil from each of these areas was excavated and transported offsite to the Rabanco Regional Landfill in Klickitat County, Washington. The weigh tickets for the soil transported to the landfill area included in Appendix G. Following the excavation of the soil, post-excavation samples were collected and submitted to NCA or TEG for analysis to confirm that the petroleum hydrocarbon concentrations in the remaining soil did not exceed the MTCA Method A cleanup levels.

8.1 SURFACE SOIL

Excavation of the surficial soil was initiated on February 3, 1998 by Ace Contractors. Dames & Moore provided oversight and collected post excavation samples from the base of excavations when it appeared that impacted soil had been removed. The extent of the surficial soil excavations are shown on Figure 5.

In the northern, central, eastern and southeastern portions of the site, areas of oil staining similar to the staining observed during the ESA were exposed after cobbles and gravel had been scraped away. Based on these observations, several of the planned areas of excavation were expanded laterally to remove the additional oil-stained soils. The depths of the excavations generally ranged from approximately 1 to 3 feet bgs. However, near the former storage shed, storm water catch basin, and the southeastern area of the property, the soil was excavated to greater depths greater than 3 feet based on the presence of oil-stained soil. The maximum depth of excavation was eight feet bgs at the southeastern corner of the property. The depth of the excavation in this area was due to the presence of an abandoned concrete catch basin that was exposed during surface soil excavation in this area. The catch basin was demolished and removed and a soil sample (PE-11@8') was collected from the soil underlying the former bottom of the basin in order to confirm the soils had not been impacted from leaks while the basin was in use.

Post excavation soil sample locations and analytical results are shown on Figure 5. Results of these samples along with composite samples collected from stockpiled contaminated soil are also summarized in Table 4. Laboratory analytical reports for these samples are provided in Appendix E. Results for four post excavation samples exceeded the Method A soil cleanup levels for petroleum hydrocarbons. Soil in each of these locations was excavated until results of a subsequent post excavation soil sample indicated

that the affected soil had been removed. Additional excavation was performed in the vicinity of soil samples PE-4@8", PE-17@1 ½' and PE-18@2 ½'. At the location where sample PE-16@8" was collected, the excavation was extended to a depth of three feet bgs and the soil sample from TP-9 collected at a depth of 3 feet serves as the final post excavation soil sample for the area of the former compressor building. Post excavation samples were also collected near the location of two soil samples (TP-2@3' and TP-8@3') collected during the soil investigation that contained detectable levels of petroleum hydrocarbons, but were not quantified. The concentrations of petroleum hydrocarbons in all of the final post excavation soil samples were below the MTCA Method A cleanup levels for diesel and heavy oil.

Based on the post excavation analytical data and visual observations, surface soils impacted by petroleum hydrocarbon contamination at concentrations exceeding the MTCA Method A soil cleanup level have been removed from the former parking area and the areas along the eastern, northwestern and southeastern property boundary.

On March 2, 1998, approximately 60 cubic yards of imported top soil were brought to the site by the Ace Contractor for use in filling depressions and leveling the site property after the surficial soil remediation was completed. Information concerning the source of the fill was not available from the contractor so a composite sample of the fill was collected from the stockpile and submitted to the laboratory for identification of detectable petroleum hydrocarbons. The composite sample (Fill Comp #1) was prepared by combining aliquots of soil obtained from the surface of the pile in three locations and another three aliquots were collected from soils further inside the stockpile. The soil appeared to be organic rich, medium sand to silty sand.

The laboratory reported that lube oil range hydrocarbons had been detected in the composite sample and the detection was subsequently quantified by the laboratory as 53.2 mg/kg lube oil range hydrocarbons. This concentration did not exceed the Method A soil cleanup level, but raised concerns regarding the use of this fill at the site. Therefore, on March 25, 1998, Dames & Moore collected three additional samples of the fill in three randomly chosen areas where the fill had previously been spread over excavations. Petroleum hydrocarbons were not identified above the laboratory reporting limit in any of the samples collected. The analytical reports including these sample results are included in Appendix E and summarized in Table 4. Based on the additional data obtained, the initial sample result appeared to be an anomaly and thus, not representative of the actual fill condition.

8.2 EASTERN SERVICE BAY

Limited excavation of an area inside the service bay on the east end of the building at the site was conducted due to the results of sample EX-9@4' which contained concentrations of heavy oil range hydrocarbons (569 mg/kg) (Table 3 and Figure 4) that exceeded the MTCA Method A cleanup level. During excavation, the oil-water separator adjacent to the area was demolished and removed and the area was further excavated to approximately six feet bgs. Sample PE-13@6' was collected after excavation and analyzed for petroleum hydrocarbons and none were reported above the laboratory reporting limit. Based on this information, it was assumed the area had been sufficiently remediated.

8.3 PUMP ISLAND CANOPY

The remediation of the soil in the vicinity of the pump island canopy included three phases of excavation and an investigation during which four soil borings were drilled to assess the extent of the petroleum hydrocarbons in soil. The limits of the three areas excavated during each phase are shown on Figure 6 and are referred to as Areas A, B and C. The soil investigation was conducted after Area A was excavated. Prior to the excavation of Area C, the main building at the site was demolished to allow the removal of affected soil beneath the building. WestPac performed the soil excavation, transportation and backfilling in these areas.

The analytical results for the soil samples collected from this excavation and the soil borings are summarized in Table 5. The laboratory reports are included in Appendix E. Results of the excavation in each of these areas and the results of the soil investigation are described below.

8.3.1 Area A

Excavation of soil in the vicinity of the former pump islands (Area A) began in the vicinity of EA test pits SB-5 and SB-6 on August 28, 1998. The excavation extended westward to within approximately 10 feet from the fence line, where the excavation was stopped due to concerns with undermining the sidewalk (Figure 6). The excavation was bounded on the south by the concrete driveway, and extended eastward and northward to apparent clean soils (Figure 6). The excavation was extended to a depth of approximately 14 to 20 feet bgs until observations and field screening results indicated that the petroleum-affected soil was no longer present. The excavation was extended laterally until laboratory analyses did not indicate petroleum hydrocarbon concentrations above MTCA cleanup levels in the sidewall samples, except on the southwest corner (PEX-3-10) and southeast corner (PEX-9-10) where concentrations in excess of MTCA cleanup limits remained. The sidewall samples were collected at depths between 8 and 12 bgs which corresponded to the approximate depth of the soil within the excavated area that appeared the most affected.

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Sixteen confirmation soil samples were collected from the base and sidewalls of the excavation in Area A (Figure 6). The samples were analyzed using method WTPH-G/BETX, although PEX-4-15 was also analyzed for diesel and heavy oil hydrocarbons by WTPH-D extended based on field observations. Petroleum hydrocarbons were not detected above the MTCA Method A cleanup levels in any of the base samples (Table 6). With the exception of the two sidewall samples discussed above, no sidewall samples exceeded MTCA Method A cleanup levels (Table 6).

Soil within the excavation consisted primarily of interbedded fine silty sand with gravel (till) to a depth of approximately 20 feet bgs. Minor seeps of perched groundwater were noted at a depth of approximately 15 feet bgs, at the interface of a 1 to 2 foot-thick silty clay layer which appeared to be continuous throughout the excavated area.

Approximately 200 gallons of water, which had a hydrocarbon sheen, accumulated in the deepest portion of the excavation. The water accumulated within the excavation primarily due to some seepage of perched

water above the silty clay layer. The water within the excavation was removed by mixing with a volume of contaminated soil to facilitate the final clean-out of the deepest portion of the excavation and the placement and compaction of the backfill. The Area A excavation was backfilled with imported clean granular fill following receipt of the confirmation soil sample analytical results to allow access to the other areas (Areas A and B) which required excavation.

8.3.2 Pump Island Canopy Soil Investigation

On September 9, 1998, four soil borings (B-1 through B-4) were installed at the facility (Figure 6). Two of the borings were completed west of the excavation in the sidewalk adjacent to Dexter Avenue North to assess the western extent of petroleum hydrocarbons in soils adjacent to the northwest corner of the excavation, where the highest concentrations of gasoline-range hydrocarbons remained in the excavation sidewall. The other two soil borings were completed south of the excavation to assess the southern extent of petroleum hydrocarbons in soil.

The soil borings were completed by Cascade Drilling, Inc. of Woodinville, Washington utilizing a limited-access hollow-stem auger drilling rig. During drilling of the borings, relatively undisturbed soil samples were be obtained using a SPT split barrel sampler. The sampler was driven 18 inches using a 140-pound hammer or until refusal (>50 blows for 6 inches or less). Soil samples were collected on 5-foot intervals to the total depth. The samples were screened using an organic vapor monitor (OVM). Retrieved soil samples were visually inspected for evidence of staining, field screened for organic vapors, and characterized in accordance with the Unified Soil Classification System by the Dames & Moore field representative. Boring logs are included in Appendix F.

The four soil borings were completed to depths of 20 feet, bgs. Soils encountered typically consisted of a thin layer of sandy fill overlying brown to gray dense silty sand. Slightly oxidized layers were noted in borings B-1 and B-3. A silt and clay layer was encountered at 18 to 20 feet, bgs. Perched groundwater was encountered between 13 and 14 feet bgs. Hydrocarbon odors were noted between 10 and 15 feet bgs and decreased with depth. Soil samples were submitted to TEG for analysis by method NWTPH-G/BTEX on the basis of field observations. Analytical results are summarized in Table 5 and the laboratory reports are included in Appendix E. Petroleum hydrocarbon concentrations exceeding MTCA cleanup levels were detected south of the excavation in boring B-3 at 10 feet bgs, and boring B-4 at 10 feet bgs. However, the samples from borings B-1 and B-2 located offsite to the west of the excavation did not contain petroleum hydrocarbons at concentrations above the MTCA Method A cleanup levels.

8.3.3 Area B

Based on the results of the subsurface investigation, the excavation was extended to the south to include Area B (Figure 6) on September 11, 14, and 15, 1998. Apparently clean surficial soils were segregated, and the excavation was extended to the south (Figure 6) to the edge of the building. Perched groundwater was encountered at approximately 18 feet bgs. Eleven soil confirmation samples were collected from the base and sidewalls of the excavation. At the time of sampling, a two- to three-foot thick layer of petroleum-affected soil was noted in the western sidewall of Area B. Results of the sample analysis

indicated gasoline-range hydrocarbon concentrations in excess of the MTCA cleanup levels in two samples at the southeast corner of the excavation (PEX-26-13 and PEX-27-10), and in one sample at the south edge of the excavation (PEX-29-10). The results for other samples did not exceed cleanup levels for gasoline-range hydrocarbons (Table 5). Additionally, seven samples of segregated surficial soils (FILL-1 to FILL-7) were collected to confirm that petroleum hydrocarbons were not present. Gasoline-range hydrocarbons were not detected in any of the surficial soil samples (Table 5) and this soil was used to backfill the excavation.

8.3.4 Area C

Because of the elevated hydrocarbon concentrations remaining in the south excavation sidewall, WestPac subcontracted the demolition and removal of the garage building. After the building was removed, excavation was continued to remove remnant volumes of petroleum-affected soil to the south (Areas C). On October 28, the excavation was extended approximately 20 feet south to remove a layer of petroleum-affected soil observed at a depth of approximately 10 feet bgs. The excavation was extended to a depth of 12 feet, bgs, where decreased hydrocarbon impact was noted. Three sidewall samples and one base sample (PEX-30 to PEX-34) were collected to confirm that cleanup levels were achieved. Elevated hydrocarbon concentrations were not detected in any of these samples (Table 5). A limited excavation was also extended southeast (Figure 6) to remove a small volume of affected soil in the sidewall and base of the excavation in this area. Two confirmation samples (PEX-35-10 and PEX-36-14) were collected in the excavation. Neither sample indicated elevated hydrocarbon concentrations.

The excavation was also extended to the west property line. Prior to this excavation work, a Dames & Moore geotechnical engineer observed site soil conditions and boring log information to make a determination that the excavation could be extended to the sidewalk with limited risk of sloughing or undermining the sidewalk. On October 30, WestPac excavated soils between sample PEX-1-20 and south to the former north side of the garage building. A layer of sand with hydrocarbon odors was noted at approximately 10-12 feet bgs. This layer decreased in thickness and hydrocarbon odors diminished as the excavation progressed west toward the sidewalk. Five side-wall and base samples (PEX-37 to PEX-41) were collected (Figure 6) from this are. Elevated hydrocarbon concentrations were not detected in any of the samples. Following receipt of the final confirmation samples, the excavation was backfilled with clean imported fill.

9.0 CONCLUSIONS

This report documents the results of an investigation and soil remediation at the property located at 912 Dexter Avenue North in Seattle, Washington. The following are Dames & Moore's conclusions based on the results of investigation and subsequent remediation of impacted soils at the site.

- Information from the ESA indicated that USTs might be present near the pump island canopy or the garage building at the site. The presence of additional USTs or other sub-grade structures at the site was not indicated by the geophysical survey or extensive excavations in the area of the suspected USTs.

- Petroleum hydrocarbons including gasoline-, diesel-, and oil-range hydrocarbons and benzene, toluene, ethylbenzene and xylenes were the most common contaminants detected in soil and were the only substances that exceeded Method A cleanup levels in soil. Other chemicals of concern including non-halogenated solvents, metals and polychlorinated biphenyls were not detected in soil samples collected at the site at levels above Method A and/or B cleanup values.

- Based on subsurface samples collected from test pits, near oil-stained areas and subsequent samples collected from shallow excavated areas, levels of TPH fractions in soils at the site were highest in soils at the surface to approximately one foot bgs and in most cases decreased to levels below the applicable MTCA Method A soil cleanup level at three feet bgs or less. The lateral extent of the petroleum hydrocarbon impacts was generally defined by the boundary of visually discernable oil-stained soil, which in some areas, was initially obscured due to cobble and gravel cover.

- The condition of the oil-water separator and two in-ground hydraulic lifts located in the former maintenance bays on the east end of the garage building appeared satisfactory; however, a limited amount of soil containing petroleum hydrocarbons above the cleanup level was detected near one of the lifts and the oil-water separator. This soil was removed and confirmation soil samples did not contain petroleum hydrocarbons at concentrations above the MTCA Method A cleanup level. The oil-water separator, hydraulic lifts and affected soil were removed and disposed off site.

- Approximately 1,000 tons of petroleum hydrocarbon impacted surficial soil from the oil-stained areas and the hydraulic lifts was excavated from the site and disposed at a permitted offsite landfill. Post excavation samples and/or test pit soil samples indicate that remediation of surface soil impacted by petroleum hydrocarbons was complete.

- Approximately 2,000 tons of petroleum affected soil originating in the area of the gas island was excavated and transported from the site for disposal at a permitted offsite landfill. Post excavation samples indicate that the remediation of subsurface soil affected by an apparent release from a former underground storage tank system was complete.

- Groundwater was not encountered during excavation of test pits, sub-grade equipment inside the building and remediation of impacted surface soil at the site. A limited zone of perched groundwater was encountered in the pump island canopy excavation. However, the soil within this perched zone containing petroleum hydrocarbons above the cleanup level was removed and soil samples collected below the perched groundwater did not contain petroleum hydrocarbons above the cleanup level. Therefore, Dames & Moore does not believe that a groundwater investigation is warranted.

Based on the results of the subsurface investigation and soil remediation at the site, it is Dames & Moore's opinion that no further investigation or cleanup at the site is warranted. However, the potential does exist that during redevelopment of the site USTs or affected soil could be encountered. If USTs are encountered, the USTs should be decommissioned in accordance with local, state and federal requirements. If indications of subsurface contamination are encountered an investigation should be implemented to determine the nature and extent of subsurface impacts. If additional soil containing hazardous substances above applicable MTCA cleanup levels is detected, the need for additional remedial actions should be considered.

10.0 LIMITATIONS

The conclusions presented in this report are professional opinions based upon our visual observations of the site and vicinity, our interpretation of the available historical information and documents reviewed (i.e., Phase I ESA), and the results of the subsurface investigation and soil remediation as described in this report. This report is intended exclusively for the purposes outlined herein and is intended for the sole use of DTT. Opinions and conclusions presented herein apply to site conditions existing at the time of our investigation and remediation at the site and do not necessarily apply to future conditions or other prior conditions which Dames & Moore was not aware, and did not have the opportunity to evaluate. The scope of services performed in execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or re-use of this document or the findings, conclusions, or recommendations presented, is at the sole risk of the user.

Dames & Moore's objective is to perform our work with care, exercising the customary thoroughness and competence of environmental and engineering consulting professionals in the relevant disciplines, in accordance with the standard for professional services by a national consulting firm at the time those services are rendered. It is important to recognize that even the most comprehensive scope of services may fail to detect environmental liability on a particular site. Therefore, Dames & Moore cannot act as insurers and cannot "certify or underwrite" that a site is free of environmental contamination, and no expressed or implied representation or warranty is included or intended in our reports except that our work was performed, within the limits prescribed by our client, with the customary thoroughness and competence of our profession.

11.0 REFERENCES

United States Geological Survey 7.5 Minute Series Topographic Map dated 1995, Seattle North, Washington.

Washington Department of Ecology Toxics Cleanup Program. Amended 1996. The Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC. Publication No. 94-06.

Washington Department of Ecology. February 1996. Model Toxics Control Act Cleanup Levels and Risk Calculations (CLARC II) Update. Publication #94-145.

Table 1
Summary of Test Pit Soil Sample Analytical Results for TPH and VOCs (mg/kg)
Diamond Tank Transport Property
Seattle, Washington

Sample ID*	NWTPH-HCID			NWTPH-Gx	NWTPH-Dx				VOCs EPA 8021 A
	Gasoline-Range	Diesel-Range	Oil-Range	Gasoline-Range (Toluene to Dodecane)	Diesel-Range (C12-C24)	Heavy Oil-Range (C24-C40)	Motor Oil	Hydraulic Oil	Xylenes (total)
TP-1-1@1'	20.0 U	50.0 U	100.0 U	NA	NA	NA	NA	NA	NA
TP-2-1@1'	20.0 U	DET	DET	20.0 U	**627**	**1,350**	25.0 U	25.0 U	NA
TP-2-2@3'	20.0 U	50.0 U	DET	NA	NA	NA	NA	NA	NA
TP-3-1@1'	20.0 U	50.0 U	100.0 U	NA	NA	NA	NA	NA	NA
TP-4-1@1/2'	20.0 U	DET	DET	20.0 U	50.0 U	NR	**3,870**	125 U	NA
TP-4-2@3'	20.0 U	50.0 U	100.0 U	NA	NA	NA	NA	NA	NA
TP-5-1@1'	20.0 U	50.0 U	100.0 U	NA	NA	NA	NA	NA	NA
TP-6-1@1'	20.0 U	50.0 U	DET	NA	50.0 U	NR	125 U	**1,470**	NA
TP-6-2@3'	20.0 U	50.0 U	100.0 U	NA	NA	NA	NA	NA	NA
TP-7-1@1'	20.0 U	DET	DET	NA	108	**215**	25.0 U	25.0 U	NA
TP-7-2@3'	20.0 U	50.0 U	100.0 U	NA	NA	NA	NA	NA	NA
TP-8-1@1'	20.0 U	DET	DET	NA	**373**	**1,080**	25.0 U	25.0 U	NA
TP-8-2@3'	20.0 U	50.0 U	DET	NA	NA	NA	NA	NA	NA
TP-9-1@1'	DET	DET	DET	36.2	50.0 U	NR	**7,710**	100 U	0.120
TP-9-2@3'	20.0 U	50.0 U	100.0 U	NA	NA	NA	NA	NA	NA
TP-10-1@1'	20.0 U	50.0 U	100.0 U	NA	NA	NA	NA	NA	NA
MTCA Method A Soil Cleanup Level	100	200	200	100	200	200	200	200	20.0

Notes:
HCID - Hydrocarbon Identification using Washington DOE NWTPH Method.
MTCA - Model Toxics Control Act. Method A values shown are reported with the same concentration units as the sample results.
DET - Analyte was detected above the reporting limit.
NA - Not Analyzed
NR - Not Reported
U - Sample was analyzed for, but not detected above the reporting limit shown.
* Samples collected on 1/19/98.
Numbers in **bold** font indicate that the result reported exceeds a MTCA cleanup level.

Table 2
Summary of Soil Sample Analytical Results for Metals and PCBs
Diamond Tank Transport Property
Seattle, Washington

Sample ID	Sample Date	Total Metals (mg/kg)								VOCs (mg/kg)	PCBs (ug/kg)
		Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver		Aroclor 1260
TP-6-1@1' *	01/19/98	10.0 U	52.2	0.497	15.0	125	0.149	7.50 U	2.50 U	NA	NA
TP-9-1@1'	01/19/98	NA	NA	NA	NA	NA	NA	NA	NA	NA	176
EX-9@4'	01/22/98	10.0 U	42.8	0.250 U	25.5	10.0 U	0.500	7.50 U	2.50 U	ND	NA
EX-12@3'	01/22/98	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA
MTCA Method A or B Soil Cleanup Level		20.0 (A)	2.0 (A)	80.0 (B)	100 (A)	250 (A)	1.0 (A)	400 (B)	400 (B)	-	1,000 (A)

Notes:
(A) - MTCA Method A soil cleanup level
(B) - MTCA Method B soil cleanup level
MTCA - Model Toxics Control Act. Method A and B values shown are reported with the same concentration units as the sample results.
NA - Not Analyzed
ND - Not Detected. EX-9@4' and EX-12@3' were analyzed for VOCs, using EPA Method 8260A, but was not detected above the reporting limit.
* TP-6-1@1' was analyzed for lead using EPA TCLP method, but was not detected above the reporting limit of 0.500 (mg/L).
U - Sample was analyzed for, but not detected above the reporting limit shown.

Table 3
Summary of Hydraulic-Lift Excavation Soil Sample Analytical Results for TPH and SVOCs (mg/kg)
Diamond Tank Transport Property
Seattle, Washington

Sample ID*	NWTPH-HCID			NWTPH-Gx	NWTPH-Dx				VOCs EPA 8260 A	SVOCs EPA 8021 B
	Gasoline-Range	Diesel-Range	Oil-Range	Gasoline-Range (Toluene to Dodecane)	Diesel-Range (C12-C24)	Heavy Oil-Range (C24-C40)	Motor Oil	Hydraulic Oil		Fluorene
EX-1@2'	20.0 U	50.0 U	100 U	NA	NA	NA	NA	NA	NA	NA
EX-2@8'	20.0 U	DET	DET	NA	59.3	161	25.0 U	25.0 U	NA	NA
EX-3@8'	20.0 U	50.0 U	100 U	NA	NA	NA	NA	NA	NA	NA
EX-4@10'	20.0 U	50.0 U	100 U	NA	NA	NA	NA	NA	NA	NA
EX-5@8'	20.0 U	50.0 U	100 U	NA	NA	NA	NA	NA	NA	NA
EX-6@4'	20.0 U	50.0 U	100 U	NA	NA	NA	NA	NA	NA	NA
EX-7@2'	20.0 U	DET	DET	NA	56.6	181	25.0 U	25.0 U	NA	NA
EX-8@8'	20.0 U	50.0 U	100 U	NA	NA	NA	NA	NA	NA	NA
EX-9@4'	DET	DET	DET	43.3	NA	**569**	25.0 U	25.0 U	ND	0.153
EX-10@4'	20.0 U	50.0 U	100 U	NA	NA	NA	NA	NA	NA	NA
EX-11@10'	20.0 U	DET	DET	NA	137	93.2	25.0 U	25.0 U	NA	NA
EX-12@3'	20.0 U	50.0 U	100 U	NA	NA	NA	NA	NA	ND	NA
MTCA Method A Soil Cleanup Level	100	200	200	100	200	200	200	200	-	NE

Notes:
HCID - Hydrocarbon Identification using Washington DOE NWTPH Method.
MTCA - Model Toxics Control Act. Method A values shown are reported with the same concentration units as the sample results.
DET - Analyte was detected above the reporting limit.
NA - Not Analyzed
NE - Not Established. Cleanup level is not established by Washington DOE for this compound.
U - Sample was analyzed for, but not detected above the reporting limit shown.
* Samples collected on 1/22/98.
Numbers in **bold** font indicate that the result reported exceeds a MTCA cleanup level.

Table 4
Summary of Shallow Excavation Soil Sample Analytical Results for TPH (mg/kg)
Diamond Tank Transport Property
Seattle, Washington

Sample Type	Sample ID	Sample Date	NWTPH-Dx				
			Diesel-Range (C12-C24)	Heavy Oil-Range (C24-C40)	Lube Oil-Range	Motor Oil	Hydraulic Oil
Final Confirmation Soil Samples	PE-1@1½'	02/03/98	10.0 U	25.0 U	NA	25.0 U	25.0 U
	PE-2@2'	02/03/98	23.8	48.7	NA	25.0 U	25.0 U
	PE-3@1½'	02/03/98	10.0 U	25.0 U	NA	25.0 U	25.0 U
	PE-5@1'	02/03/98	10.0 U	25.0 U	NA	25.0 U	25.0 U
	PE-6@2½'	02/04/98	10.0 U	25.0 U	NA	25.0 U	25.0 U
	PE-7@1'	02/04/98	57.7	184	NA	25.0 U	25.0 U
	PE-8@1'	02/04/98	41.2	119	NA	25.0 U	25.0 U
	PE-9@4'	02/09/98	10.0 U	48.8	NA	25.0 U	25.0 U
	PE-10@3'	02/09/98	10.0 U	132	NA	25.0 U	25.0 U
	PE-11@8'	02/09/98	13.4	25.0 U	NA	25.0 U	25.0 U
	PE-12@8"	02/11/98	16.1	39.3	NA	25.0 U	25.0 U
	PE-13@6'	02/11/98	10.0 U	25.0 U	NA	25.0 U	25.0 U
	PE-15@2½'	02/11/98	18.4	60.9	NA	25.0 U	25.0 U
	PE-19@3½'	02/26/98	10.0 U	25.0 U	NA	29.4	25.0 U
	PE-21@3½'	03/02/98	10.0 U	25.0 U	27.9	NA	NA
	PEX-NW@3'	11/19/98	20.0 U	50.0 U	NA	NA	NA
	PEX-SE@3'	11/24/98	20.0 U	50.0 U	NA	NA	NA
Excavated Soil Samples	PE-4@½'	02/03/98	61.8	**226**	NA	25.0 U	25.0 U
	PE-14@1'	02/11/98	47.0	**305**	NA	25.0 U	25.0 U
	PE-16@8"	02/11/98	**480**	**1,550**	NA	275 U	275 U
	PE-17@1½'	02/11/98	164	**1,150**	NA	25.0 U	25.0 U
	PE-18@2½'	02/26/98	10.0 U	**824**	NA	25.0 U	25.0 U
Stockpile	SS-1	02/04/98	**721**	**1,440**	NA	50.0 U	50.0 U
	SS-2	02/04/98	52.3	99.6	NA	25.0 U	25.0 U
	SS-3	02/04/98	46.3	140	NA	25.0 U	25.0 U
Fill Samples	Fill Comp#1	03/02/98	10.0 U	25.0 U	53.2	NA	NA
	Fill-North-6"	03/25/98	50.0 U	100 U	100 U	NA	NA
	Fill-Mid-6"	03/25/98	50.0 U	100 U	100 U	NA	NA
	Fill-South-6"	03/25/98	50.0 U	100 U	100 U	NA	NA
MTCA Method A Soil Cleanup Level			200	200	200	200	200

Notes:
MTCA - Model Toxics Control Act. Method A values shown are reported with the same concentration units as the sample results.
NA - Not Analyzed
NE - Not Established
U - Sample was analyzed for, but not detected above the reporting limit shown.
Numbers in **bold** font indicate that the result reported exceeds a MTCA cleanup level.

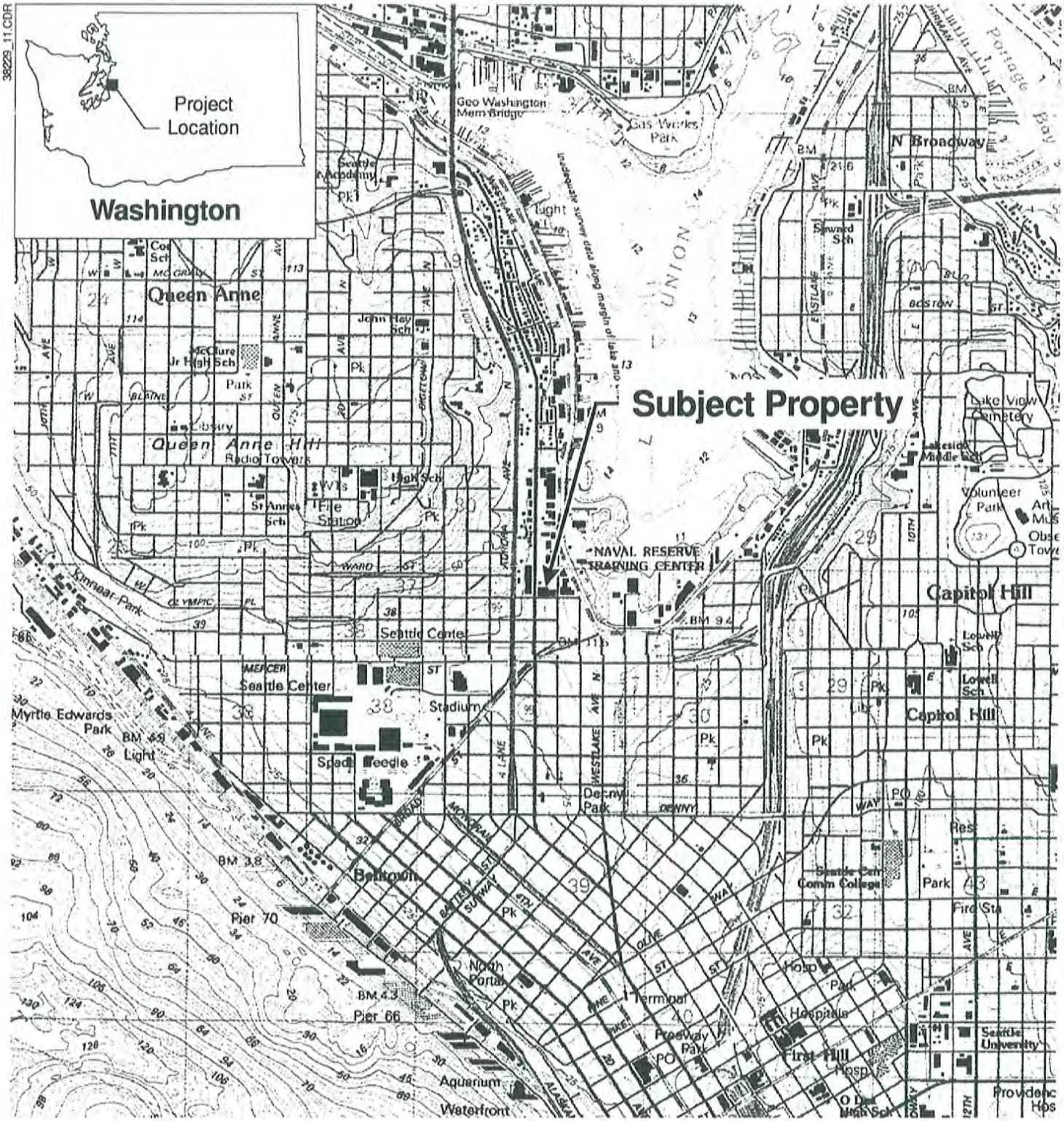
Table 5
Pump Island Canopy Excavation Soil Analytical Results for TPH and BTEX
Diamond Tank Transport Property
Seattle, Washington

Sample Type	Sample ID	Sample Depth (ft, bgs)	Sample Date	NWTPH-Gx (mg/kg)		Volatile Organic Compounds[1] (mg/kg)			
				Mineral Spirits/Stoddard Solvent	Gasoline-Range Hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylene
Soil Boring Samples	B-1-15	15	09/09/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	B-1-20	20	09/09/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	B-2-10	10	09/09/98	72	5.0 U	0.05 U	0.05 U	0.05 U	0.21
	B-2-15	15	09/09/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	B-3-10*	10	09/09/98	**1,500**	5.0 U	**1.2**	0.05 U	10	**50**
	B-3-20	20	09/09/98	13	5.0 U	0.05 U	0.05 U	0.05 U	0.11
	B-4-10*	10	09/09/98	**3,100**	5.0 U	**22**	0.05 U	**39**	**140**
	B-4-15	15	09/09/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	B-4-15 (DUP)	15	09/09/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
Final Confirmation Soil Samples	PEX-1-20	20	08/26/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-2-17	17	08/26/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-4-15	15	08/26/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.12
	PEX-4-15 (DUP)	15	08/26/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-5-16	16	08/28/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-6-12	12	08/28/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-7-10	10	08/28/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-8-14	14	08/28/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-11-14	14	09/01/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-12-10	10	09/01/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-14-8	8	09/01/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-14-8 (DUP)	8	09/01/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-15-8	8	09/02/98	5.0 U	5.0 U	0.05 U	0.11	0.085	0.51
	PEX-16-14	14	09/02/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-17-8	8	09/02/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-17-8 (DUP)	8	09/02/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-18-14	14	09/02/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
Excavated Soil Samples	PEX-3-10	10	08/27/98	**5,000**	5.0 U	0.2	10	**24**	**120**
	PEX-9-10	10	08/28/98	5.0 U	**610**	0.06	0.05 U	15	110
	PEX-9-10 (DUP)	10	08/28/98	5.0 U	**500**	0.072	0.05 U	15	110
	PEX-19-19	19	09/11/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-20-15	15	09/11/98	5.0 U	99	0.05 U	0.05 U	0.05 U	0.35
	PEX-21-22	22	09/11/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-22-10	10	09/11/98	5.0 U	69	0.05 U	0.05 U	0.29	1.1
	PEX-23-15	15	09/11/98	5.0 U	13	0.26	0.05 U	0.05 U	0.26
	PEX-24-20	20	09/11/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-24-20 (DUP)	20	09/11/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
MTCA Method A Soil Cleanup Level				100	100	0.5	40.0	20.0	20.0

Table 5
Pump Island Canopy Excavation Soil Analytical Results for TPH and BTEX
Diamond Tank Transport Property
Seattle, Washington

Sample Type	Sample ID	Sample Depth (ft, bgs)	Sample Date	NWTPH-Gx (mg/kg)		Volatile Organic Compounds[1] (mg/kg)			
				Mineral Spirits/Stoddard Solvent	Gasoline-Range Hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylene
Excavated Soil Samples	PEX-25-20	20	09/14/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-26-14	14	09/14/98	5.0 U	**540**	0.32	0.09	12	**60**
	PEX-27-10	10	09/14/98	5.0 U	**1,400**	0.68	1.4	0.48	3.5
	PEX-28-14	14	09/14/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-30-10	10	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-31-10	10	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-32-12	12	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-33-10	10	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-34-10	10	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-35-10	10	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-36-14	14	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-37-15	15	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-38-12	12	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-39-10	10	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-40-10	10	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	PEX-41-15	15	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
Stockpile Soil Samples	Stockpile-1	NA	08/26/98	5.0 U	**230**	0.05 U	1.2	2.2	15
	Stockpile-2	NA	08/26/98	**340**	5.0 U	0.05 U	0.19	0.66	3.6
	Stockpile-3	NA	08/26/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.075
	Stockpile-A	NA	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	Stockpile-B	NA	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	Stockpile-C	NA	10/30/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
Backfill Soil Samples	Fill-1	NA	09/14/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	Fill-2	NA	09/14/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	Fill-3	NA	09/15/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	Fill-4	NA	09/15/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	Fill-5	NA	09/15/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	Fill-6	NA	09/15/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
	Fill-7	NA	09/15/98	5.0 U	5.0 U	0.05 U	0.05 U	0.05 U	0.05 U
MTCA Method A Soil Cleanup Level				100	100	0.5	40.0	20.0	20.0

Notes:
[1] VOCs analyzed by using EPA method 8020.
(DUP) = Duplicate field sample
MTCA - Model Toxics Control Act. Method A values shown are reported with the same concentration units as the sample results.
mg/kg = milligrams per kilogram (ppm)
NA = Not Applicable
ND = Not Detected
U - Sample was analyzed for, but not detected above the reporting limit shown.
* Sample subsequently excavated.
Numbers in **bold** font indicate that the result reported exceeds a MTCA cleanup level.



Map created with TOPO!™ © 1997 Wildflower Productions, www.topo.com, based on USGS topographic map, Seattle North, Washington

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Figure 1
SITE LOCATION MAP

Job No. 38229-001-005

Subsurface Investigation and Soil Remediation
Diamond Tank Property, Seattle, Washington

38229_07.CDR

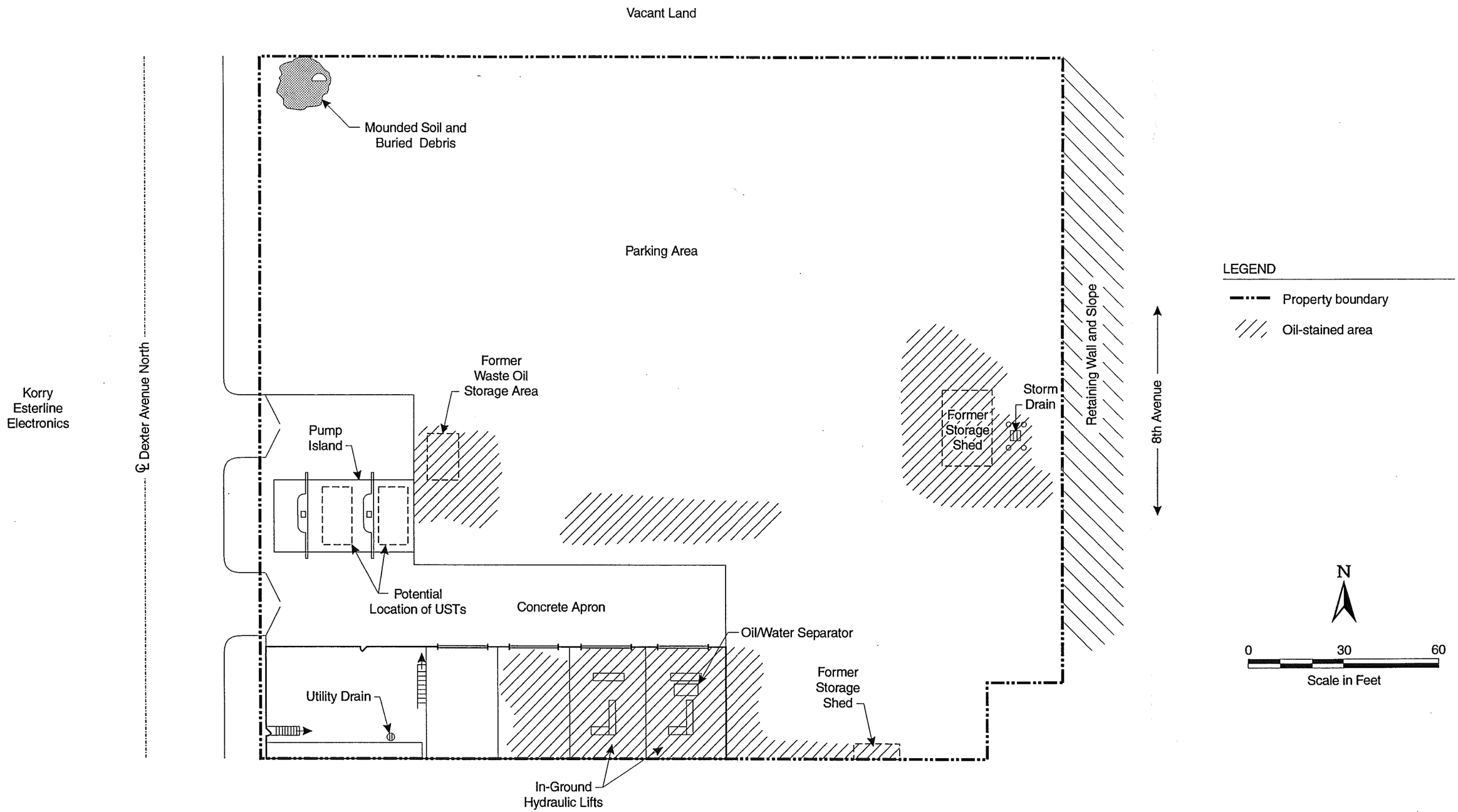

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Figure 2
SITE PLAN AND OIL STAINED AREAS

Environmental Site Assessment
Diamond Tank Property, Seattle, Washington

38229_08.CDR

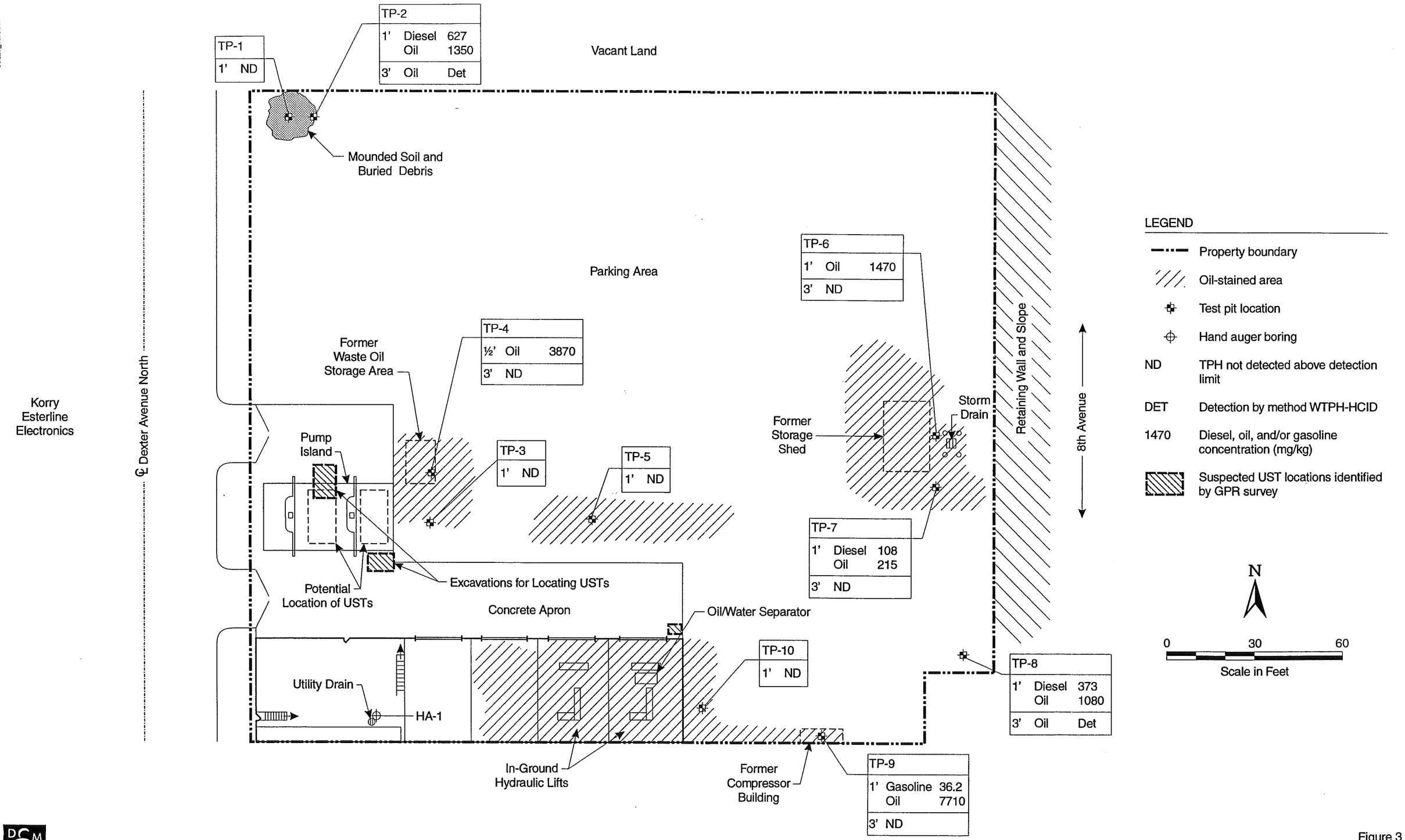

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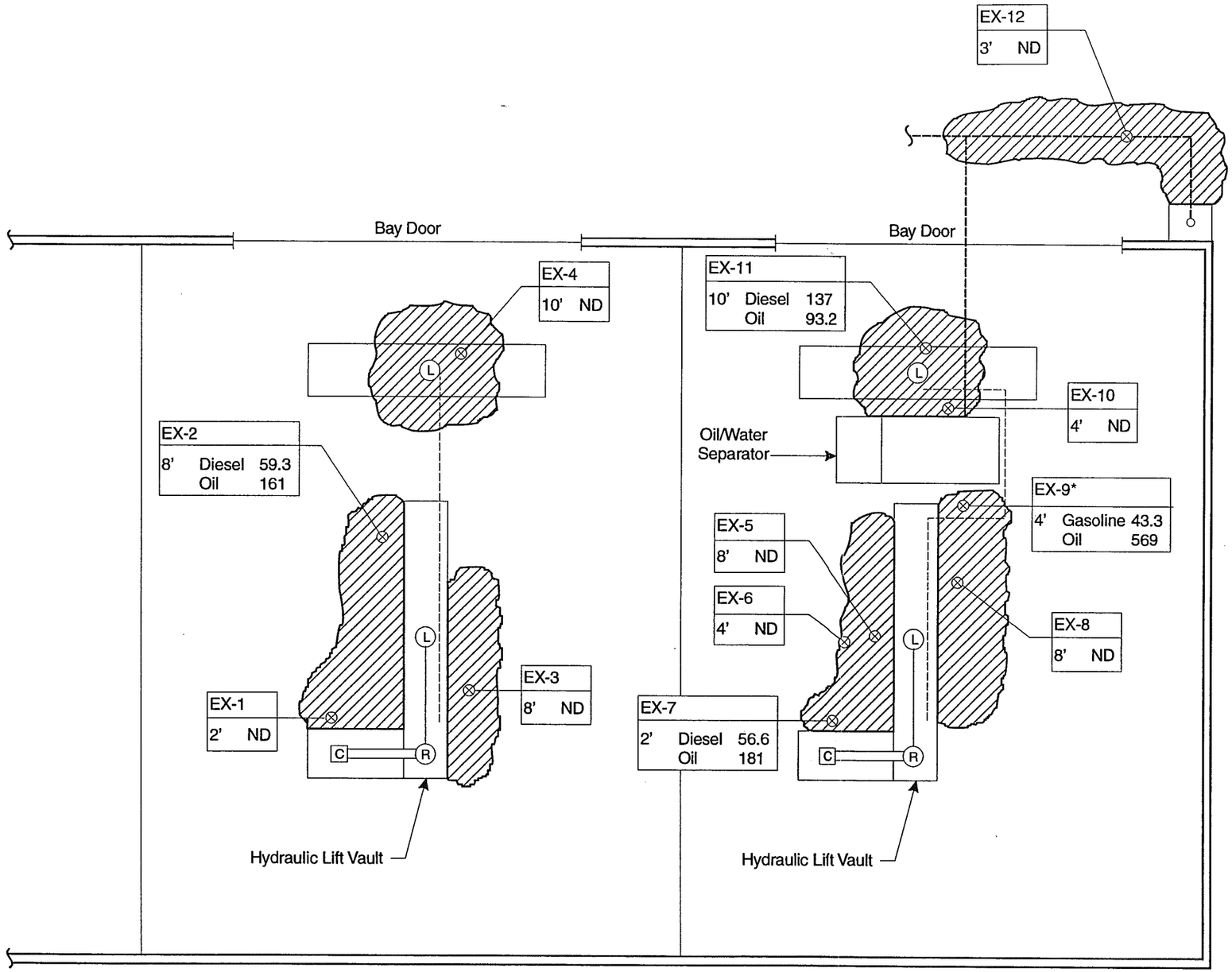
Figure 3
TEST PIT AND HAND AUGER LOCATIONS

Subsurface Investigation and Soil Remediation
Diamond Tank Property, Seattle, Washington

38229_09.CDR



LEGEND

C	Hydraulic lift control
R	Hydraulic oil reservoir
L	Hydraulic lift cylinder
------	Subgrade hydraulic line
------	Subgrade oil/water separator line
⊗	Soil sample location and depth
	Excavation area
569	Diesel, oil and/or gasoline concentration (mg/kg)
ND	TPH not detected above detection limits
*	Soil sample subsequently excavated

N

0 5 10

Scale in Feet

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Figure 4

SOIL SAMPLE LOCATIONS
IN-GROUND HYDRAULIC LIFTS

Subsurface Investigation and Soil Remediation
Diamond Tank Property, Seattle, Washington

38229_10.CDR

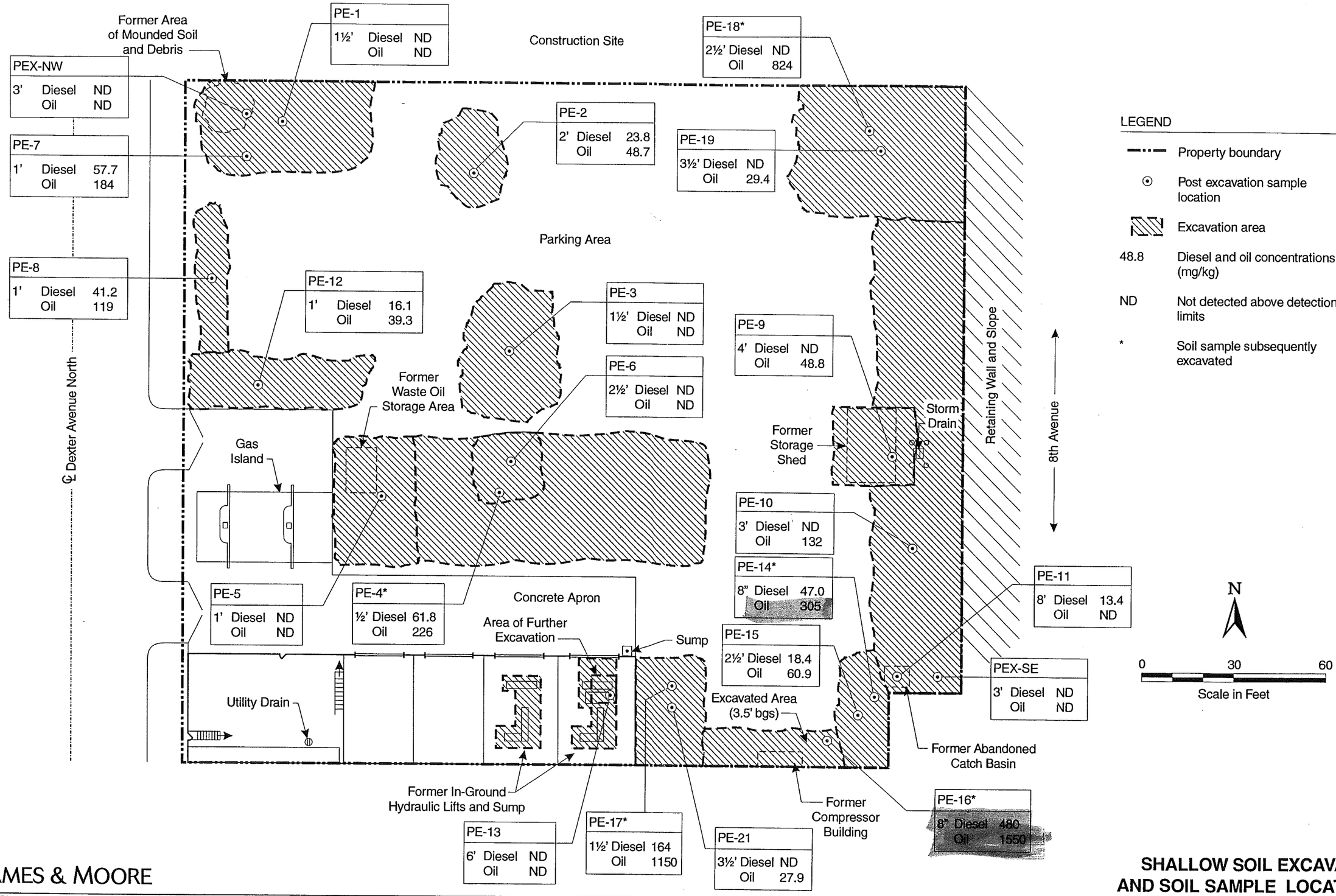

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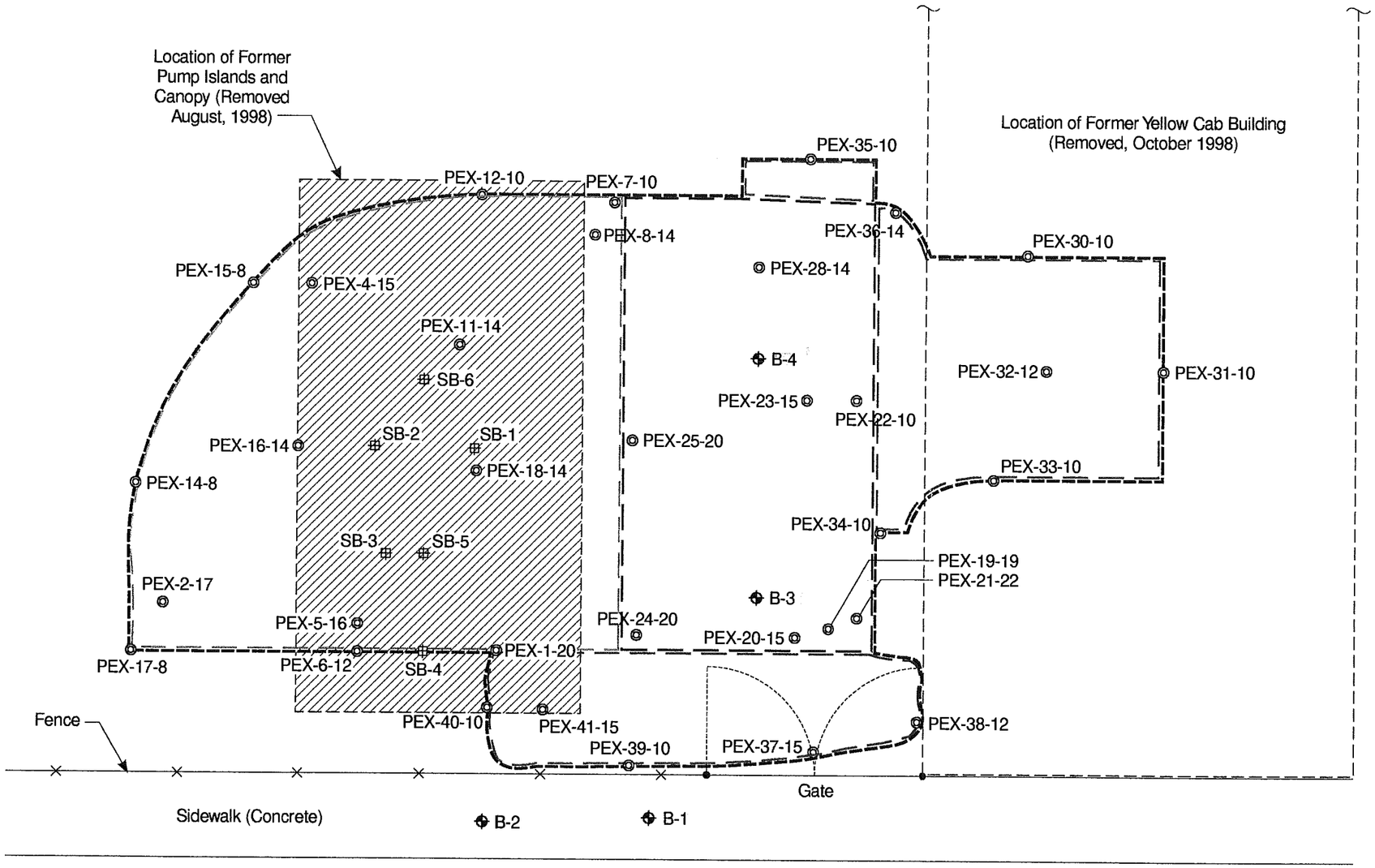
Figure 5
SHALLOW SOIL EXCAVATION AND SOIL SAMPLE LOCATIONS

Subsurface Investigation and Soil Remediation
Diamond Tank Property, Seattle, Washington

38229_12.CDR



LEGEND

- Excavation limits
- Earth Associates test pit location (8/5/95)
- Dames & Moore post-excavation sample location
- Dames & Moore boring location (9/9/98)
- Limit of excavation 8/25-9/2/98 (Area A)
- Limit of excavation 9/11-9/15/98 (Area B)
- Limit of excavation 10/30/98 (Area C)

N

0 10 20

Scale in Feet

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Figure 6

PUMP ISLAND CANOPY EXCAVATION AND SOIL SAMPLE LOCATIONS

Subsurface Investigation and Soil Remediation
Diamond Tank Property, Seattle, Washington