

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

For

DIAMOND TANK TRANSPORT, INC. D&M JOB NO. 38229-001-005 May 13, 1998



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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. Schulze:

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

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Laura S. Cooper Senior Environmental Engineer

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EXECUTIVE SUMMARY

This report documents the results of a Subsuface Investigation and subsequent soil remediation at the vacant property currently owned by Diamond Tank Transport, Inc. (DTT). The property is located at 912 Dexter Avenue North in Seattle, Washington and was most recently leased by a taxi cab business collective 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. A report presenting our findings and conclusions of the ESA along with figures and supporting documentation is included with this report as Appendix A. A limited asbestos containing building material survey was also conducted by Dames & Moore of the largest building on site concurrently with conducting the ESA. A report presenting our findings and conclusions of the survey along with supporting documentation are included herein as Appendix B.

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

- characterization and quantification of the nature and extent of surface soil in several areas at the site indicated by previous sampling and analytical data reviewed by Dames & Moore to be impacted by petroleum hydrocarbon contamination
- assessment of the present condition of a concrete storm water catch basin and a concrete sump located on site, which could not be completely assessed during the ESA, for indications of potential subsurface soil impact due to leaks or other malfunctions of this equipment
- further assessment of the potential presence of underground storage tanks suspected to be present at the property based on information obtained during the ESA, and, if found, assessment of the current condition and, likelihood of subsurface soil contamination from past product releases and/or improper closure/removal
- further assessment of the condition of two in-ground, inactive hydraulic automotive lifts observed at the site and the potential of impacts to soils in the areas where the lifts were installed, due to past releases from hydraulic system leaks
- demolition, removal and disposal off site of in-active sub-grade equipment described above, and/or any tanks at the site
- based on analytical data regarding test pit and equipment excavation soil samples collected at the site, remediation of affected soil by excavation and off site disposal of impacted soil

Dames & Moore's scope of work during the site investigation included:

- obtaining the location of underground utilities at the site via a local utility locating service contracted by Dames & Moore
- completion of a survey of the subsurface underlying the site by obtaining the services of a survey company with electromagnetic and ground penetrating radar instruments in order to assist with locating buried tanks or other materials/debris potentially present at the site
- interpretation of the subsurface survey
- determining test pit and equipment excavation soil sample locations and soil classification as well as collection and field screening soil samples from test pits and equipment excavations
- submittal of soil samples to a state-accredited laboratory subcontracted by DTT for analyses of suspected site contaminants including TPH, volatile organic compounds (VOCs), polychlorinated biphenyl compounds (PCBs), semivolatile organic compounds (SVOCs) and several toxic heavy metals
- interpretation of the analytical results and delineation of areas requiring remediation based on established MTCA Method A cleanup levels and MTCA Method B risk-based screening levels for those substances not listed by Method A
- general project oversight with respect to regulatory and technical issues
- collection of post excavation samples for verification that sufficient soils in each area had been remediated
- preparation of this report including the results of our ESA and limited asbestos survey

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

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

- DTT reported that the one known UST on site was removed prior to the adoption of the current UST regulations. The presence of additional underground storage tanks (USTs) or other sub-grade structures at the site was not indicated by exploration of the subsurface.
- The condition of the concrete sump located inside the service bay on the east end of the building and two in-ground hydraulic lifts located in the two former maintenance bays on the east end of the building on site appeared satisfactory and, in conjunction with observations of adjacent and underlying soil in these locations do not appear to have been impacted by substances at levels exceeding Method A cleanup levels for petroleum hydrocarbons and heavy metals or Method B risk-calculation values for detected substances not included by Method A. The sump and hydraulic lifts were removed and disposed off site by Ace Contractors.

- Groundwater was not encountered during excavation of test pits, sub-grade equipment inside the building and remediation of impacted surface soil at the site. TPH fractions including diesel and oil range hydrocarbons were the most common contaminants and were the only substances that exceeded Method A cleanup levels for soil. Other suspected nonhalogenated solvents and toxic metals were not detected in samples of soil collected at the site at levels above Method A and/or B cleanup values.
- Based on subsurface samples collected from test pits and subsequent samples collected from 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 TPH 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.
- Approximately 500 tons of petroleum hydrocarbon impacted soil was excavated from the site and disposed at a permitted off site landfill. Post excavation samples and/or test pit soil samples indicate that remediation of surface soil impacted by petroleum hydrocarbons was complete.

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. If during site re-development activities, USTs or indications of additional subsurface contamination are uncovered at the site, re-development work should be halted and an investigation implemented in order to determine potential subsurface impacts caused by the uncovered tanks or other structures.

1.0 INTRODUCTION AND BACKGROUND

This report presents the findings and conclusions of a investigation and soil remediation at the property located at 912 Dexter Avenue North in Seattle, Washington (Figure 1) and owned by DTT Transport, Inc.(DTT). The property is currently vacant but has been occupied by various businesses since its development during the early 1940s including a municipal waste disposal and transportation firm, an auto dealership, and a taxi cab company. 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.

According to an agency database search conducted during the ESA, 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 contained in several inspection reports prepared by Metro Industrial Waste division (Metro) and Ecology inspectors detailing their observations during several inspections of the property beginning in 1992 and continuing until 1996 when the tenant of the property, Yellow Cab Company, declared bankruptcy and its lease was terminated by DTT. A more detailed review of the inspections by both organizations and other documents provided to Dames & Moore and reviewed during the ESA is presented in the ESA report (Appendix A).

The investigation and subsequent soil remediation was conducted during the months of January, February and March 1998 based on the findings of ESA and upon the request of DTT. In addition, DTT requested that once the areas of environmental impact at the site had been sufficiently determined, remediation of affected media would begin immediately and the results of investigation and remediation would be submitted to Ecology for their review under the Voluntary Cleanup Program.

2.0 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 proposal dated December 17, 1997. The subsurface investigation was conducted to further characterize the lateral and vertical extent of soil contamination indicated by oil stained surface soil observed by Dames & Moore during the ESA (Appendix A) and further assess other potential sources of sub-grade contamination at the site identified during the ESA.

2.1 SUBSURFACE INVESTIGATION

The investigation of the site's subsurface was performed in order to further assess the potential presence of underground storage tanks (USTs) and other buried debris which were suspected to be present at the site based on information reviewed during the ESA. In addition, if any USTs or other buried items were discovered, assessment of each item's potential to have caused impacts to the site subsurface from product releases was planned. If USTs were discovered, DTT requested that Dames & Moore oversee the closure and removal of each tank in accordance with state regulations. Additional objectives of the investigation included assessment of the current condition of sub-grade equipment at the site including two inactive hydraulic hoists and oil/water separator and a utility floor drain inside the building on site and a storm

water catch basin north of the building, and further characterization of the nature and impact of soil contamination at the site observed during the ESA.

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

- Prepared a site-specific Health and Safety Plan which addressed potential site hazards
- Subcontracted a utility locator to identify subgrade utilities
- Subcontracted 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
- Observed soil conditions and collected samples for laboratory analysis from ten test pits excavated in oil stained areas and near suspected buried debris and a utility drain
- Assessed the condition of two shop hoists, a sump and associated piping exposed during excavation and removal of the equipment, observed the condition of soils exposed in these areas, and collected representative soil samples for laboratory analysis
- Compiled and analyzed the analytical data obtained, relative to applicable MTCA Method A and B soil cleanup levels
- Prepared this report with pertinent conclusions and recommendations

3.0 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.

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 to perform a geophysical survey in the vicinity of the known and suspected USTs. The subsurface investigation included excavation of 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. 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 at test pit locations specified by Dames & Moore. 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 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 photoionizing 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. 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 any reported detection from this method were quantified by appropriate methods including NWTPH-Gx, NWTPH-dx

and NWTPH-dx 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 SITE SETTING

6.1 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 8^{th} 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.

6.2 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 at the property line 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 is occupied by the largest building observed at the site. The building is approximately 5800 square feet and consists of a concrete poured foundation and floor, with concrete masonry unit (CMU) structural walls. The western third of the building has two floors which are finished as office spaces.

The eastern portion of the building is divided equally into four maintenance bays with wooden, roll-up entrance doors. The maintenance bays consist of unfinished concrete floors and CMU walls. Evidence of in-ground hydraulic lifts was observed in the two bays on the east end of the building (Figure 2). In addition, an oil/water separator is located in the eastern bay near the entrance door.

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 (Appendix A). 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 large metal canopy north of the main building (Figure 2).

6.2.1 Subgrade Equipment and Potential Underground Storage Tanks

Two inactive, subgrade dual cylinder lifts and an oil/water separator were observed in two service bays on the eastern end of the main building on site during the ESA. One cylinder of 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 depth of the base of the buried cylinder was 8 feet bgs and the depth to the base of the concrete footing was approximately 10 feet. 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 subgrade 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 subgrade concrete sump was observed inside the eastern most 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 which is located in the service bay on the east end of the main building (Figure 2). In addition, information reviewed during the ESA indicated the sump was actually an oil/water separator, however, this could not be confirmed during the ESA for the reason discussed above. Results of the sump investigation can be found in Section 8.2.2.

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. Surface runoff from the northern and southeastern portion of the site with an oil sheen was observed by Dames & Moore flowing into the already filled basin which indicated that the basin might have been partially or completely plugged with debris or sediment.

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.

6.2.2 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 and/or petroleum products to this drain.

7.0 APPLICABLE CLEANUP LEVELS

Soil and groundwater cleanup levels for petroleum hydrocarbons and other hazardous substances have been established by Ecology and used to compare site data for determining if remediation is necessary or has been sufficient to protect human health and the environment. Cleanup levels for common soil and groundwater 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 for evaluating the necessity for remediation of sites with few contaminating substances. Use of the these values is considered one method of approaching site cleanup and is termed Method A. 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 for each substance. The use of these values in evaluating sites is considered by Ecology to be a unique approach 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 can be used to evaluate sites with multiple contaminants and for substances without published Method A cleanup levels. Based on the suspected site contaminants identified by Ecology and limited site soil sample analytical data, the primary site contaminants are assumed to be petroleum hydrocarbons and Method A cleanup levels appear applicable for use in determining the need for remediation at the site. 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 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) were used to compare site data.

8.0 RESULTS AND DISCUSSION

Presented in this section are the results of the subsurface investigation and soil remediation at the site. Section 8.1 discusses the results and interpretation of the subsurface geophysical survey conducted by Apollo, Inc. Section 8.2 describes the observations and results of the soil investigation including test pit sample analyses, equipment excavation sample analyses , and one hand auger boring completed at the site. Section 8.3 discusses the observations and results of inactive subgrade equipment demolition and removal and assessment of the condition of equipment left in place at the site.

8.1 SUBSURFACE GEOPHYSICAL SURVEY

A geophysical survey was performed by Apollo Geophysics (Apollo) on January 9, 1998 using EM and 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, see Appendix C.

Electromagnetic instrumentation initially employed to survey the subsurface did not provide useful information regarding the potential presence of USTs or other subgrade 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 a metal canopy, the northwestern corner of the site, and the areas within the service bays (Figure 2) were subsequently surveyed using ground penetrating radar (GPR). Survey results of the northwestern area did not indicate the presence of buried equipment or tanks in this area, however a large amount of buried debris was reported. The debris was subsequently removed from the site. Survey results in the area under the large metal canopy (Figure 2) indicated that a UST was potentially present in the area shown on Figure 2 and further exploration in the area by excavation was recommended. Further exploration of the area conducted by Ace Contractors and observed by Dames & Moore (Figure 3) using heavy equipment and hand digging did not uncover a UST in the area. Survey of the area adjacent to the small sump at the east end of the building did not provide additional evidence that a UST was present in this area.

8.2 SOIL INVESTIGATION

8.2.1 Test Pits

Ten test pits 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 below ground surface (bgs). Soil exposed in the test pits were 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 when field screening and observation of soil in test pits that indicated decreased concentrations of petroleum hydrocarbon impacts were potentially absent or sufficiently below Method A cleanup levels. The observed condition and classification of soil types and field screening observations were recorded on Test Pit Log forms by the Dames & Moore geologist on site and are included in Appendix D.

Soils in the test pits completed typically consisted of a thin layer of gravel or cobble 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.

A total of sixteen test pit soil samples were collected by Dames & Moore and submitted to North Creek Analytical Laboratory for analysis. Initially, each sample was analyzed to identify the presence of hydrocarbons and/or hydrocarbon ranges using the Department of Ecology Petroleum Hydrocarbon method NWTPH-HCID. This method reports the presence or absence of petroleum hydrocarbons at specific detection limits in the sample analyzed. If a hydrocarbon range or product was detected in a specific sample, the laboratory was instructed to quantify the amount of the specific hydrocarbon using an appropriate method including NWTPH-gx, NWTPH-dx, or NWTPH-dx 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. In general, samples collected from soil within one foot of the ground surface in oil-stained areas had the highest concentrations of petroleum hydrocarbons, which in most cases, was identified as heavy oil range or motor oil hydrocarbons. Detectable petroleum hydrocarbons were not reported by the laboratory in soil samples collected at three feet bgs in any of the test pits indicating the vertical extent in these areas of petroleum hydrocarbon contamination did not exceed three feet.

One sample collected from Test Pit # 6 at one foot bgs (Figure 3) was selected for heavy metal analysis due to the levels of heavy oil range hydrocarbons reported in the sample. Results are summarized in Table 2 and the laboratory analytical report is included in Appendix E. Barium (52.2 J 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 Method A cleanup level for each metal. Due to the concentration of lead reported in the sample, the toxicity characteristic leaching procedure (TCLP) was conducted to determine whether soil remediated at the site 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 test pit sample (TP-9-1@1') collected at the former compressor shed (Figure 3) was analyzed for PCBs in addition to petroleum hydrocarbon identification and quantitation, 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).

8.2.2 Inactive Subgrade Equipment Excavations

On January 22, 1998, Ace Contractors demolished concrete and excavated soil surrounding the two inground hydraulic lifts located in former service bays on the east end of the main building (Figure 3 and 4), and soil adjacent to and underlying the concrete sump and uncovered piping from the sump to a small sump outside the service bay entrance (Figure 4). Prior to excavation and removal, liquids observed in vaults associated with the lifts (Section 6.2.1) were removed and transported off site by Marvac, a 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 properly disposed of. Dames & Moore observed soil conditions and collected samples from the excavations with assistance from the contractor.

Twelve soil samples were collected from these areas by Dames & Moore in the areas shown on Figure 4 and analyzed by the laboratory. A summary of samples with detected levels of petroleum hydrocarbons are summarized in Table 2 and the 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 (a) 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 including several non-halogenated volatile target 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). Heavy metal analytical results reported by the laboratory included detections of barium (42.8 J mg/kg) and chromium (25.5 J mg/kg) (Table 3) which did not exceed Method A cleanup levels established for each metal.

8.2.3 Floor Drain

Dames & Moore recommended that the floor drain observed inside a small room within the western portion of the main building on the first floor (Figure 2) be evaluated as a potential source of hazardous or petroleum based substances disposed on site at the drain by advancing one hand auger boring through the concrete floor and soils adjacent to the drain to a depth sufficiently below the bottom of the drain in order to assess the condition of soils encountered. One hand auger boring was advanced adjacent to the drain 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, see Appendix D of this report. Soil types encountered were similar to the rest of the site and evidence of petroleum hydrocarbon or organic solvent odor or staining as well as field screening with the PID by Dames & Moore was not indicated. Therefore, soil samples near the drain were not submitted to the laboratory for analysis and do not appear to have been impacted by disposal of substances used at the site to the drain.

8.3 INACTIVE SUBGRADE EQUIPMENT ASSESSMENT AND REMOVAL

8.3.1 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 a 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.

8.3.2 Oil/Water Separator

The oil/water separator adjacent to the entrance of the east bay inside the main building and discussed in the ESA report and Section 6.2.1 of this report 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 (Section 9.0).

8.3.3 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 cleanout 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.

9.0 SOIL REMEDIATION

Based on the results of the subsurface investigation, contamination at the site appeared to be limited to diesel and heavy oil range petroleum hydrocarbons in surface soil from past releases of these substances to the ground surface during operations conducted at the site. 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 observed during the ESA conducted at the site. These areas are shown on Figure 2. In additon, one sample collected in the eastern service bay of the building had levels of heavy oil range hydrocarbons that exceeded the Method A cleanup level which was assumed to be from minor leaks that had occurred from the hydraulic lift or oil/water separator formerly located in the bay.

9.1 SURFACE SOIL

Remediation of the areas indicated on Figure 2 was initiated on February 3, 1998 by Ace Contractors. Surface soil was excavated and transported off site to a waste landfill permitted to receive petroleum hydrocarbon contaminated soil. Dames & Moore provided oversight and collected post excavation samples from the base of excavations when it appeared that impacted soil had been adequately removed.

In the northern, central, eastern and southeastern portions of the site, areas of oil staining similar to the staining described during the ESA were exposed after cobble and gravel had been scraped away. Based on these observations, several of the planned areas of excavation were expanded laterally to remove the newly exposed oil stained areas and in some cases, the depth in excavations specifically near the former storage shed and storm water catch basin (Figure 2) and the southeastern area of the property required removal of soils at greater depths than initially planned by Dames & Moore.

Post excavation samples were collected from excavated areas as shown on Figure 5. Results of these samples along with composite samples collected from stockpiled contaminated soil on the site are summarized in Table 4. Laboratory analytical reports for these samples are provided in Appendix E. Results for post excavation samples that continued to exceed Method A soil cleanup levels for petroleum hydrocarbons indicated the need for additional remediation in the specific area, which was subsequently completed by the contractor. Post excavation samples depicted on Figure 5, consequently, represent the samples confirming soil petroleum hydrocarbon levels below the Method A cleanup level.

Based on the post excavation analytical data and visual observations, it appears that surface soils impacted by petroleum hydrocarbon contamination have been sufficiently remediated in the former parking area and the areas along the eastern, northwestern and southeastern property boundary. The maximum depth of excavation in these areas 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 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. Results of the sample (PE-11@8'), Table 4 and Figure 5) confirmed that soils had not been impacted from the former catch basin.

9.2 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 had reported concentrations of heavy oil range hydrocarbons (569 mg/kg) (Table 2 and Figure 4) that exceeded the MTCA Method A cleanup level. During excavation, the concrete sump 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.

9.3 FILL MATERIALS USED ON SITE

On March 2, 1998, approximately 60 cubic yards of imported top soil was brought to the site by the contractor for use in filling depressions and leveling the site property after 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 small stockpile and submitted to the laboratory for identification of detectable petroleum hydrocarbons. The composite (Fill Comp #1) (Table 4) 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 with abundant plant matter and was brown and moist.

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 did raise questions concerning the fill's suitability for use at the site. DTT was notified of the result and after consulting with the contractor, requested that Dames & Moore collect additional samples of the fill to confirm the initial result. 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.

10.0 CONCLUSIONS

This report documents the results of an investigation and soil remediation at the property located at 912 Dexter Avenue North in Seattle, Washington. Ten test pits, one hand auger, and samples collected from excavations adjacent to two inground hydraulic lifts, an oil/water separator, and a sump were completed at the site to assess the soil conditions in each area and collect soil samples for laboratory analysis. Specific analyses performed on samples were selected based on information provided in the site listing information prepared by Ecology when the site was placed on the list of suspected contaminated sites in Washington. Ecology approved laboratory analyses were performed on the samples by North Creek Analytical Laboratory, an Ecology-accredited laboratory. The following are Dames & Moore's conclusions based on the results of investigation and subsequent remediation of impacted soils at the site.

10.1 SUBSURFACE INVESTIGATION

Ten test pits and one hand auger boring were completed in the former parking area and storage shed areas and inside a utility room within the main building at the site, respectively. Soil samples from the test pits indicated that the primary site contaminant was oil range petroleum hydrocarbons and was limited to surface soils. The soils exposed in the hand auger boring inside the utility room did not appear to have been impacted from petroleum hydrocarbon contamination, samples from this area were therefore not submitted to the laboratory for analysis.

Investigation of the site subsurface conducted by ground penetrating radar and excavation did not provide evidence of on site USTs. Soil sampling and analysis within oil stained areas indicated oil range petroleum hydrocarbons were the only contaminant that exceeded Method A cleanup levels and the vertical extent of contamination appeared well-defined and less than three feet below the surface. Areas underlying and adjacent to the two in-ground hydraulic lifts and oil/water separator did not appear to have been impacted from releases of hydraulic oil or other substances, the only exception was a small area near the oil/water separator and lift in the service bay at the eastern end of the building.

10.2 SOIL REMEDIATION

Approximately 500 tons of petroleum hydrocarbon impacted soil was excavated and properly disposed off site during a voluntary cleanup of surface soil within the impacted areas of the site. The maximum depth of excavation was eight feet bgs in the area where an abandoned concrete catch basin was uncovered during surface soil excavation. Post excavation sampling indicated that soils remaining after excavation had concentrations of petroleum hydrocarbons sufficiently below the MTCA Method A cleanup level of 200 mg/kg.

A small area inside the eastern service bay underlying the former in-ground hydraulic lift and a portion of a demolished concrete sump was excavated to approximately six feet bgs based on initial analytical data from a sample collected at four feet bgs. Another sample collected at six feet bgs after excavation indicated that remaining soil did not have detectable levels of petroleum hydrocarbons.

10.3 FILL MATERIALS

Approximately 60 cubic yards of imported top soil was brought to the site for use as fill in the excavated areas within the former parking area. Samples of the fill collected on March 3 and March 25, 1998 indicate that detectable levels of petroleum hydrocarbons are not present in the majority of fill brought on site and therefore was considered suitable.

11.0 RECOMMENDATIONS

Based on the results of the soil investigation and soil remediation conducted at the site, it appears that further investigation or remediation is not warranted.

12.0 **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.



based on USGS topographic map, Seattle North, Washington



Job No. 38229-001-005

Diamond Tank Property, Seattle, Washington

8229_07.CDR

Vacant Land

Parking Area









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Wall

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Figure 2 SITE PLAN AND OIL STAINED AREAS

Environmental Site Assessment Diamond Tank Property, Seattle, Washington



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LEGEND	
ومعت و اورونی	Property boundary
· •	Oil-stained area
¢	Test pit location
•	Hand auger boring

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Figure 3 TEST PIT AND HAND AUGER LOCATIONS

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





Job No. 38229-001-005

LEGEND

С	Hydraulic lift control
R	Hydraulic oil reservoir
L	Hydraulic lift cylinder
	Subgrade hydraulic line
	Subgrade oil/water separator line
EX-1(2')⊗	Soil sample location and depth
\bigcirc	Excavation area



Figure 4 SOIL SAMPLE LOCATIONS **IN-GROUND HYDRAULIC LIFTS**

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

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GROUP





8th Avenue

Figure 5 **EXCAVATION LOCATIONS**

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

Summary of Quantitative Analytical Results for Test Pit Soil Samples Quantification of Detected Hydrocarbons and Hydrocarbon Ranges Diamond Tank Transport Property Phase II Soil Investigation and Voluntary Cleanup



All results are reported with units of mg/kg dry weight.

Samples were selected for further characterization based on the results of Hydrocarbon Identification analyses. Bold- Concentrations reported are above the Model Toxics Control Act Method A Soil Cleanup Level of 200 mg/kg.

Summary of Quantitative Analytical Results for Hydraulic Lift Excavation Soil Samples Quantification of Detected Hydrocarbons and Hydrocarbon Ranges Diamond Tank Transport Property Phase II Soil Investigation and Voluntary Cleanup

Sample	Diesel Range (C12-C24)	Gasoline Range (Toluene to Dodecane)	Heavy Oil Range (C24-C40)	Motor Oil	Hydraulic Oil	Xylenes (total)
EX-2@8'	59.3		161			
EX-7@2'	56.6		181			
EX-9@4'		43.3	569			
EX-11@10'	137		93.2			

All results are reported with units of mg/kg dry weight.

Samples were selected for further characterization based on the results of Hydrocarbon Identification analyses. Bold- Concentrations reported are above the Model Toxics Control Act Method A Soil Cleanup Level of 200 mg/kg.

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Summary of Analytical Results for Test Pit and Hydraulic Lift Excavation Soil Samples VOCs, SVOCs, Metals and PCBs

Diamond Tank Transport Property Phase II Soil Investigation and Voluntary Cleanup

×	Detected Metals, mg/kg						SVOCs	PCBs
Sample	Barium	Cadmium	Chromium	Lead	Mercury	VOCs (mg/kg)	(mg/kg)	(ug/kg)
							0.153	
EX-9@4'	42.8 J	<0.250	25.5 J	<10.0 UJ	<0.0500	ND	(Fluorene)	
EX-12@3'						ND		
				125 J			-	
TP-6-1@1'	52.2 J	0.497 J	15.0 J	(<0.500)	0.149			
TP-9-1@1'								176

Eight heavy metals were analyzed for in the samples shown, only the metals detected above the laboratory reporting limit in one or more samples are reported here.

VOC - Volatile Organic Compounds (Total)

SVOC - Semivolatile Organic Compounds (the only target analyte detected in the sample shown was fluorene).

PCBs - Polychlorinated Biphenyl Compounds (in the sample shown, the congener Aroclor 1260 was detected). J - The reported concentration should be considered as an estimate of the true concentration due to laboratory quality control deficiencies during analysis.

UJ - The reporting limit shown represents an estimate of the actual laboratory reporting limit due to laboratory quality control deficiencies during analysis.

Summary of Analytical Results for Post Excavation Soil, Stockpiled Soil, and Imported Fill Samples Petroleum Hydrocarbons and Hydrocarbon Ranges

Diamond Tank Transport Property Phase II Soil Investigation and Voluntary Cleanup

Sample	Collection Date	Diesel Range (C12-C24)	Gasoline Range (Toluene to Dodecane)	Heavy Oil Range (C24-C40)	Motor Oil	Hydraulic Oil	Xylenes (total)
PE-1 @ 1/1/2'	2/3/98	<10.0		<25.0			
PE-2 @ 2	2/3/98	23.8		48.7			
PE-3@11/2'	2/3/98	<10.0		<25.0			
PE-4@1/2'	2/3/98	61.8		226			
PE-5@1'	2/3/98	<10.0		<25.0			
PE-6@21/2'	2/4/98	<10.0		<25.0			
PE-7@1'	2/4/98	57.7		184			
PE-8@1'	2/4/98	41.2		119			
SS-1	2/4/98	721		1440			
SS-2	2/4/98	52.3		99.6			
SS-3	2/4/98	46.3		140			
Composite ¹	2/4/98	183		394			
PE-9@4'	2/9/98	<10.0		48.8			
PE-10@3'	2/9/98	<10.0		132			
PE-11@8'	2/9/98	13.4		<25.0			
PE-12@8"	2/11/98	16.1		39.3			
PE-13@6'	2/11/98	<10.0		<25.0			

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Dames & Moore 1998

Summary of Analytical Results for Post Excavation Soil, Stockpiled Soil, and Imported Fill Samples Petroleum Hydrocarbons and Hydrocarbon Ranges

Diamond Tank Transport Property Phase II Soil Investigation and Voluntary Cleanup

Xylenes (total)								
Hydraulic Oil								
Motor Oil						29.4		
Heavy Oil Range (C24-C40)	305	60.9	1550	1150	824	< <25.0	27.9	53.2
Gasoline Range (Toluene to Dodecane)								
Diesel Range (C12-C24)	47.0	18.4	480	164				
Collection Date	2/11/98	2/11/98	2/11/98	2/11/98	2/26/98	2/26/98	3/2/98	3/2/98
Sample	PE-14@1'	PE-15@21/2'	PE-16@8"	PE-17@11/2	PE-18@21/2'	PE-19@31/2'	PE-21@31/2'	Fill Comp#1

All results are reported with units of mg/kg dry weight.

Bold- Concentrations reported are above the Model Toxics Control Act Method A Soil Cleanup Level of 200 mg/kg. Samples were selected for further characterization based on the results of Hydrocarbon Identification analyses.

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