Cleanup Action Report West Block – North Lot Development Property Seattle, Washington

October 19, 2012

Prepared for

North Lot Development, LLC Seattle, Washington



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LIST OF ABBREVIATIONS AND ACRONYMS

μg/kg Micrograms per Kilogram

ARAR Applicable or Relevant and Appropriate Requirement

BGS Below Ground Surface CAP Cleanup Action Plan City City of Seattle

cPAH Carcinogenic Polycyclic Aromatic Hydrocarbon

DCA Disproportionate Cost Analysis

Ecology Washington State Department of Ecology

EDR Engineering Design Report

EPA U.S. Environmental Protection Agency

FS Feasibility Study

ft Feet

MTCA Washington State Model Toxics Control Act

NLD North Lot Development

NPDES National Pollutant Discharge Elimination System

ORC Oxygen Release Compound
PAH Polycyclic Aromatic Hydrocarbon
PCC Partial Certificate of Completion
PCS Petroleum-Contaminated Soil

PPCD Prospective Purchaser Consent Decree

Property North Lot Property PVC Polyvinyl Chloride

RCW Revised Code of Washington RI Remedial Investigation

SWPPP Stormwater Pollution Prevention Plan

TPH-G Gasoline-Range Total Petroleum Hydrocarbons

UST Underground Storage Tank
VOC Volatile Organic Compound
WAC Washington Administrative Code

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1.0 INTRODUCTION

This Cleanup Action Report documents the cleanup action conducted on the West Block of the North Lot Property (Property) located in the south end Central Business District, southeast of the intersection of South King Street and Occidental Avenue South in Seattle, Washington (Figure 1). Prior to implementation of the cleanup action, North Lot Development (NLD) conducted several investigations to characterize soil and groundwater conditions at the Property, and prepared reports to document those conditions including the Remedial Investigation (RI) report (Landau Associates 2011a) and the Feasibility Study (FS) report (Landau Associates 2011b).

The Property cleanup described in this report is being accomplished under the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Cleanup Regulation [Chapter 173-340 Washington Administrative Code (WAC)]. The West Block cleanup action activities documented in this report were conducted between December 2011 and September 2012 in accordance with the Cleanup Action Plan (CAP; Landau Associates 2011c) and the Engineering Design Report (EDR; Landau Associates 2011d), which were approved by Ecology.

NLD conducted the cleanup action pursuant to the Prospective Purchaser Consent Decree (PPCD), North Lot Development Site, Seattle, Washington (September 26, 2011) and the CAP, as part of development of the Property for commercial and residential uses. The West Block consists of the portion of the Property west of the 2nd Avenue right-of-way (Figure 2). As outlined in the CAP and the approved Seattle Master Use Permit, the West Block is being developed first. The four-story podium structure on the West Block has been designed and is being constructed in anticipation of the future high-rise buildings; therefore, all physical underground elements for the high-rise buildings have been built during the initial construction to avoid future disturbance of the podium foundation. The construction elements for the podium include underground and ground-level items such as piles, pile caps, elevator pits, grade beams, slab-on-grade foundations, and underground utilities. As documented throughout this report, future development can proceed without the need to penetrate below ground level on the West Block, and therefore, NLD has requested that Ecology issue a Partial Certificate of Completion (PCC) for the capital portion of the cleanup at the West Block.

This Cleanup Action Report has been prepared to document the cleanup action activities completed on the West Block, and to support Ecology's issuance of the PCC for the capital portion of the cleanup at the West Block. The cleanup action activities completed for the West Block that are documented in this report include: hotspot excavation of contaminated soil from the former gasoline station area, enhanced bioremediation for impacted soil/groundwater in the hotspot excavation area, construction soil excavation, heating oil underground storage tank (UST) removal, installation of a surface cap, and added measures to prevent contact with contaminated soils outside the building

foundations. In addition, two groundwater compliance monitoring wells have been installed on the West Block for future groundwater compliance monitoring.

In addition to the cleanup activities specific to the West Block, and as required by the CAP, the surface material (i.e., asphalt, associated subgrade, and shallow soil/fill) was removed from the 2^{nd} Avenue right-of-way/Center Drive Lane and the area has been capped with new pavement, and the existing asphalt surface on the East Block of the Property has been repaired or replaced, as warranted.

2.0 CLEANUP ACTION SELECTION

The RI findings were used in the FS to develop and evaluate remedial alternatives for cleanup of the Property. The FS defined the cleanup standards and nature and extent of contamination, identified and evaluated six cleanup action alternatives, and identified a preferred cleanup action alternative that is protective of human health and the environment per MTCA requirements.

2.1 CLEANUP LEVELS AND POINT OF COMPLIANCE

Prior to development of the West Block, the conditions at the Property presented limited risk to users of the Property because contaminated soil was capped by the asphalt pavement of the parking lots, and groundwater in the Property area is not used as a potable water source. Property-specific cleanup levels were developed in the FS and summarized in the CAP for both soil and groundwater. Detailed information regarding cleanup level development is provided in Appendix F of the FS report (Landau Associates 2011b). These cleanup levels were used to demonstrate the effectiveness of the cleanup action at the point of compliance.

The points of compliance for soil and groundwater were developed under MTCA in the FS and approved by Ecology. For the Property, the soil point of compliance is throughout the soil column throughout the Property. The groundwater point of compliance is the Property boundary for most of the Property, including the West Block, and as close to the Property boundary as practicable in the northeastern portion of the East Block of the Property where creosote-like material is present along the Property boundary, because it is not feasible to install a compliance monitoring well in the creosote-like material. As discussed in the CAP, the East Block of the Property will be developed later as market conditions allow. The compliance monitoring plan provided in Appendix A of the CAP identifies the approach to document groundwater quality at the conditional point of compliance.

2.2 NATURE AND EXTENT OF CONTAMINATION

The nature and extent of soil contamination on the West Block of the Property are discussed in the RI and FS reports by area and are summarized in the CAP, based on the operational history of the Property and the analytical results for the soil, groundwater, and soil vapor samples collected, as follows:

Northwestern Portion of the Property: The laboratory analytical and field-screening data indicate that shallow soil [less than 15 feet (ft) below ground surface (BGS)] was impacted by releases resulting from former gasoline station operations. The soil contamination appeared to be primarily near the top of the groundwater table, but extended to a depth of at least 17 ft BGS locally. Due to the presence of benzene in shallow soil in the northwestern portion of the Property, the potential for vapor intrusion was evaluated during the soil vapor investigation and this evaluation was taken into consideration when developing cleanup levels.

• Property-wide: Polycyclic aromatic hydrocarbons (PAHs), primarily carcinogenic PAHs (cPAHs), were detected at concentrations greater than the cleanup levels in most of the soil samples collected across the southern portion of the Property, which includes the southern portion of the West Block. Arsenic and motor oil-range total petroleum hydrocarbons were also detected at concentrations greater than the cleanup levels in soil samples collected in the west-central portion of the Property. Dioxins/furans were detected at concentrations greater than the laboratory reporting limit in both of the samples analyzed and one of the detected concentrations was greater than the cleanup level. The presence of these analytes in shallow surface soil suggests a source within the fill material placed over the native marine sediment layer. Off-Property borings to the northwest of the Property were clean and bounded the extent of the constituents of concern in soil.

Groundwater quality was evaluated in the RI and FS reports, also by area, and is summarized in the CAP. Overall, only arsenic was detected in groundwater at concentrations greater than the cleanup level(s), and these elevated concentrations are in the eastern portion of the Property, are upgradient of much of the Property, and are the result of migration from off-Property sources.

2.3 EVALUATED ALTERNATIVE CLEANUP ACTIONS

The development of cleanup alternatives included analysis of technologies and process options potentially applicable to conditions at the Property. Potential general response actions and remedial technologies were identified based on the known site conditions, media impacted, contaminant types, and best professional judgment regarding applicable remedial technologies. The identified remedial technologies were screened in the FS on the basis of effectiveness, implementability, and cost. Screened technologies included institutional controls, containment, removal/excavation, and treatment.

Each of the cleanup action alternatives developed for the Property was developed to be protective of human health and the environment, consistent with the MTCA regulations, and suitable for integration into the proposed development plan for the Property. Each alternative was comprehensive and considered the Property and its future use as a whole, but included the use of separate cleanup action technologies for the different areas of concern. The six alternatives incorporated the most viable cleanup action technologies within the general response action categories of containment, source removal (i.e., excavation), treatment, and institutional controls.

Based on the results of the evaluation of alternatives conducted for the FS, including the disproportionate cost analysis, which compares the overall benefit of the alternative to the estimated cost, Alternative 3 was selected as the preferred cleanup action alternative for the Property, which includes hotspot excavation of contaminated soil from the northwestern portion of the Property (former gasoline station area) to the elevation of the groundwater table, enhanced bioremediation for soil/groundwater impacted by residual gasoline and benzene near the elevation of the water table in the area of hotspot excavation, a surface cap over the entire Property, added measures to prevent contact with shallow

contaminated soil outside the footprints of the building foundations within the Property boundary, institutional controls, groundwater monitoring, and contingent groundwater treatment. The completed portions of this cleanup action are described in Section 3.0.

3.0 WEST BLOCK CLEANUP ACTION

The completed components of the selected alternative (Alternative 3) are discussed in the following sections. The as-built drawings of the completed West Block cleanup action are provided in Appendix A. The remedial action described below and implemented on the West Block is consistent with the cleanup action elements include in the CAP for removal, treatment, or containment of contaminated soil. In addition, as required by the CAP, following the implementation of the cleanup and below- or atgrade construction activities described below, the surface material (i.e., asphalt, associated subgrade, and shallow soil/fill) was removed from the 2nd Avenue right-of-way/Center Drive Lane, and this area has been capped with new pavement. The Release of Liability/Certificate of Disposal from the disposal facility (CEMEX) for all of the soil disposal discussed in the following sections is provided in Appendix B.

The development plan for the East Block has been revised as part of the pending sale of the East Block parcel. The pending changes in the development plan and associated revisions to the cleanup action for the East Block parcel are documented in the FS Addendum (Landau Associates 2012a) and the Revised CAP (Landau Associates 2012b) that have been submitted to Ecology. The revised East Block cleanup action does not affect the cleanup action for the West Block of the Property and, therefore, is not discussed further in this document. As noted above, the work to date by NLD has also included the repair or replacement of existing asphalt surface on the East Block of the Property, as warranted.

3.1 HOTSPOT EXCAVATION OF CONTAMINATED SOIL AND ENHANCED BIOREMEDIATION FOR IMPACTED SOIL/GROUNDWATER IN THE FORMER GASOLINE STATION AREA

The completion of the hotspot excavation of contaminated soil and enhanced bioremediation for impacted soil and groundwater in the former gasoline station area (in the northwestern corner of the West Block) was documented in the January 9, 2012 technical memorandum: *Cleanup Action Plan Implementation, Hotspot Soil Excavation and Enhanced Bioremediation, North Lot Development, Seattle, Washington, Cleanup ID#:1966, Prospective Purchaser Consent Decree No. 11-2-27892-1* that has been submitted to Ecology. The technical memorandum includes figures of the hotspot excavation area and confirmation sample locations, selected photographs from the hotspot excavation, and a table of soil analytical data from the hotspot excavation demonstrating compliance with the Property cleanup levels. The technical memorandum is provided as Appendix C of this report and the completed cleanup activities are summarized below.

The purpose of the hotspot excavation and enhanced bioremediation activities was to remove soil with benzene concentrations greater than the cleanup level identified in the CAP (established to mitigate

the potential for vapor intrusion), and to apply a bioremediation material [Oxygen Release Compound (ORC®) Advanced] to enhance bioremediation of residual gasoline and benzene present at the elevation of the groundwater table. The hotspot soil excavation, enhanced bioremediation, and clean soil backfilling activities began on December 5, 2011 and were completed by December 9, 2011. Soil was excavated to the elevation of the groundwater table (a depth of approximately 9 ft BGS). Approximately 675 cubic yards of soil with benzene concentrations greater than the cleanup level of 780 micrograms per kilogram (µg/kg) was removed from the northwestern portion of the West Block and disposed of off-Property at an approved facility (CEMEX, as discussed above) to mitigate the potential for vapor intrusion. The final extent of the excavation area was adjusted from the area presented in the FS, CAP, and EDR based on the following considerations:

- The excavation extent along the north side was limited by the presence of a City of Seattle (City) electrical vault and associated utilities. The City required a 4-ft clearance on both sides of the electrical vault and utilities, so the excavation boundary was moved south.
- The excavation extent along the west Property boundary was limited by the presence of a utility corridor beneath the sidewalk, so the excavation boundary was moved east. A section of the west excavation boundary was also moved farther east to protect a City fire hydrant.
- The excavation extent along the east side was expanded farther east due to visual field observations during excavation activities and readings on the photoionization detector that indicated the presence of soil with benzene concentrations greater than the cleanup level.

The final extent of the hotspot excavation and the confirmation sample locations are shown on Figure 3.

Twenty confirmation samples were collected to document contaminant concentrations in soil at the limits of the excavation area. Consistent with the procedures identified in the EDR, soil samples were collected at approximately 20-linear-ft intervals along the excavation bottom and sidewalls. The soil samples were analyzed for gasoline-range total petroleum hydrocarbons (TPH-G) by Method NWTPH-G and benzene by U.S. Environmental Protection Agency (EPA) Method 8021B per the EDR. All samples were collected using a laboratory-supplied coring device for collection of soil for volatile organic compound (VOC) analysis (TPH-G and benzene) by EPA Method 5035A. Sample details were documented and samples were submitted to ALS Environmental laboratory in Everett, Washington on an expedited 24-hour turnaround time. The analytical results for the confirmation samples that demonstrate compliance with the Property cleanup levels are provided in Table 1.

Prior to backfilling of the hotspot excavation area, a bioremediation material, ORC Advanced manufactured by Regenesis, was placed in the bottom of the excavation area. The ORC Advanced will accelerate the rate of naturally occurring aerobic contaminant biodegradation to enhance the degradation of residual gasoline and benzene present at the elevation of the groundwater table. Based on model calculations from the vendor, which took into account the anticipated hotspot excavation area and the

contaminant concentrations, approximately 900 pounds of ORC Advanced was placed at the bottom of the hotspot excavation area prior to backfilling. Following placement of the ORC Advanced, the hotspot excavation was backfilled with clean imported fill.

3.2 CONSTRUCTION SOIL EXCAVATION

General construction soil excavation activities on the West Block were conducted per the requirements established in the FS, CAP, and EDR. Site development and construction included removal and off-Property disposal of soil across the West Block to a depth of approximately 1.5 ft BGS (including existing asphalt, associated subgrade, and shallow soil/fill) to prepare the Property for development. Additional below-grade excavation included excavation in the areas of utilities, piles, grade beams, and elevator pits, and was primarily within the footprint of the podium foundation. Approximately 13,890 cubic yards of material was excavated and disposed of off-Property as part of construction. This material, which was excavated and disposed of as part of construction, is in addition to the materials excavated and disposed of as part of the hotspot excavation and the heating oil UST (see next section) removal work. The excavated material, including shallow contaminated soil, removed during construction was disposed of at CEMEX consistent with MTCA and other applicable regulations.

3.3 HEATING OIL UNDERGROUND STORAGE TANK REMOVAL

A heating oil UST was encountered during construction soil excavation on the West Block. Removal of the heating oil UST was documented in the February 9, 2012 technical memorandum: Cleanup Action Plan Implementation, Heating Oil Underground Storage Tank Removal, North Lot Development, Seattle, Washington, Cleanup ID#:1966, Prospective Purchaser Consent Decree No. 11-2-27892-1 that was submitted to Ecology. The technical memorandum included figures of the heating oil UST excavation area and confirmation sample locations, selected photographs from the heating oil UST removal, and a table of soil analytical data from the heating oil UST excavation demonstrating compliance with the Property cleanup levels. The technical memorandum is provided as Appendix D of this report and the completed cleanup activities are summarized below.

The purpose of the heating oil UST cleanup activity was to remove the heating oil UST and associated soil with contaminant concentrations greater than the cleanup levels established for the Property. The soil excavation, UST and associated piping removal, and excavation and offsite disposal of petroleum-contaminated soil (PCS), and subsequent clean soil backfilling activities began on December 27, 2011 and were completed by January 6, 2012. The heating oil UST was encountered by the construction contractor during exploratory pothole excavation on December 27, 2011. The exploratory pothole excavations were initiated following completion of the hotspot soil excavation and enhanced

bioremediation activities in preparation for construction. The pothole excavations exposed the UST (located adjacent to the north Property boundary, Figure 4), and associated piping that was connected to the tank. Field screening identified PCS adjacent to the UST and around the piping. The PCS appeared to be the result of releases of residual heating oil (product) from the piping, from a small hole that was punctured in the UST by the excavation during potholing activities, and/or historical leakage from the UST and piping. The final excavation extent was established where the field screening no longer indicated evidence of PCS (Figure 4). The final excavation depth was approximately 1 to 2 ft below the depth of groundwater, which was at approximately 7 ft BGS during the pothole excavation activities. The UST was removed along with approximately 1,012 cubic yards of PCS. During excavation of the piping, heavy sheen and some floating product was observed on the groundwater that accumulated in the excavation. Localized areas of floating product were isolated within the piping excavation by creating soil dams to minimize the spread of contamination and to facilitate removal of the floating product. Marine Vacuum Services used a vacuum truck to skim the product from the surface of the water that accumulated in the excavation for appropriate off-Property disposal.

Six confirmation samples were collected to document petroleum hydrocarbon concentrations in soil at the limits of the excavation area along the course of the piping associated with the UST, and the UST excavation limits. The soil samples were analyzed for TPH-G by Method NWTPH-Gx, motor oil-and diesel-range total petroleum hydrocarbons by Method NWTPH-Dx, and benzene by EPA Method 8021B per the EDR. The samples analyzed for gasoline and benzene were collected using a laboratory-supplied coring device for collection of soil for VOC analysis per EPA Method 5035A. Sample details were documented and samples were submitted to ALS Environmental laboratory in Everett, Washington on an expedited 24-hour turnaround time. The analytical results for the confirmation samples that demonstrate compliance with the Property cleanup levels are provided in Table 2.

The heating oil UST was removed in accordance with the MTCA Cleanup Regulations (Chapter 173-340 WAC), Dangerous Waste Regulations (Chapter 173-303 WAC) for the handling and disposal of contaminated media, and the UST regulations (Chapter 173-360 WAC, including WAC 173-360-385). Ecology provided NLD with a waiver to the 30-day notice requirement for UST closure (Ecology 2012).

3.4 SURFACE CAP AND ADDED MEASURES TO PREVENT CONTACT WITH CONTAMINATED SOIL OUTSIDE THE BUILDING FOUNDATIONS

Placement of the surface cap on the West Block, which consists of the concrete building foundation, has been completed. The contaminated soils remaining in place at the West Block are now contained beneath the building foundation.

The areas of shallow contaminated soil on the West Block within the Property boundary outside of the footprint of the building foundation have been addressed by added measures that are considered to be equally effective in containing the contaminated soil and preventing potential human contact with shallow soil. The landscaped areas outside of the building foundation footprint within the Property boundary have been excavated to 5 ft BGS and backfilled with clean soil, and all other areas outside of the building foundation footprint within the Property boundary have been capped with concrete.

As-built conditions of the West Block surface cap and landscaped areas are provided in Appendix A.

3.5 GROUNDWATER MONITORING WELLS

Prior to Property development and construction activities, the eight groundwater monitoring wells installed on the West and East Blocks of the Property during the RI were decommissioned. The eight decommissioned groundwater monitoring wells consist of: MW-2, MW-3, MW-8, MW-10, MW-11, MW-12, MW-13, and MW-14. All of the wells were decommissioned by backfilling and grouting inplace with bentonite chips and concrete by a licensed driller in accordance with WAC 173-160-381. The locations of the decommissioned groundwater monitoring wells are shown on Figure 2.

Per the Groundwater Compliance Monitoring Plan (Appendix A of the CAP), two new groundwater compliance monitoring wells were installed as part of the construction and cleanup activities on the West Block. Groundwater compliance monitoring well MW-19 was installed along the north Property boundary near the eastern extent of the former gasoline station area on September 11, 2012; groundwater compliance monitoring well MW-20 was installed along the north Property boundary on July 25, 2012, near the northwestern corner of the Property adjacent to the former gasoline station area. The approximate locations of MW-19 and MW-20 are shown on Figure 2 (locations are pending official survey information). The new monitoring wells were constructed in accordance with Washington State Minimum Standards for Construction and Maintenance of Wells (WAC 173-160). Landau Associates field personnel were present to oversee the drilling and well installation activities. Detailed records of the well installations were created during the drilling activities; the groundwater monitoring well construction logs are provided in Appendix E. Soil field screening conducted during the well installation drilling activities found no evidence of contamination at either MW-19 or MW-20.

Per the Groundwater Compliance Monitoring Plan, the new wells were constructed with 2-inch-diameter, flush-threaded, Schedule 40 polyvinyl chloride (PVC) pipe and 10-ft screens with 0.020-inch machine-slotted casing, and filter pack material consisting of pre-washed, pre-sized number 10/20 silica sand. The well screens were placed from 5 to 15 ft BGS to intersect the water table. The filter pack was placed from the bottom of the well to approximately 2 ft above the top of the screen. Filter pack material

was placed slowly and carefully to avoid bridging of the material. A bentonite seal was placed above the filter pack to within about 3 ft of the ground surface. Grout was used to backfill the boring to the subgrade for placement of the protective cover. The well installation depths and screen intervals are shown on the groundwater monitoring well construction logs in Appendix E. The groundwater monitoring wells will be developed prior to groundwater compliance monitoring activities (see Section 4.0). The wells will be developed by appropriate combinations of surging, bailing, or pumping.

4.0 REMAINING CLEANUP ACTION ELEMENTS TO BE ADDRESSED

As discussed in Section 1.0, future development can proceed without the need to penetrate below ground level on the West Block. All capital cleanup actions associated with below- and at-grade development of the West Block have been completed per the CAP, as described in Section 3.0. The following elements included in the CAP will be completed for the West Block once Property development is complete:

- Required Institutional Controls. Institutional controls will be implemented for the West Block to assure the continued protection of human health and the environment. Institutional controls include restrictions on disturbance of the surface cap at the Property except as part of the cleanup action, and a restriction on the use of site groundwater as drinking water. A deed restriction documenting these limitations will be used for the West Block.
- Groundwater Compliance Monitoring. As required by the MTCA regulations, monitoring is included in the planned cleanup action to assess contaminant concentrations in groundwater and document groundwater flow direction. A groundwater compliance monitoring plan is provided in the CAP. The groundwater compliance monitoring includes the installation of two additional groundwater monitoring wells on the West Block (which has been completed, as discussed above), groundwater monitoring and sample collection at the new wells and existing wells, and laboratory analysis of groundwater samples. Compliance reports will be submitted to Ecology according to the schedule presented in the CAP.

5.0 APPLICABLE STATE AND FEDERAL LAWS

In accordance with MTCA, all cleanup actions must comply with applicable state and federal laws [WAC 173-340-710(1)]. MTCA defines applicable state and federal laws to include legally applicable requirements and those requirements that are relevant and appropriate. Collectively, these requirements are referred to as applicable or relevant and appropriate requirements (ARARs). This section provides a brief overview of potential ARARs for the Property cleanup. The primary ARAR is the MTCA Cleanup Regulations (Chapter 173-340 WAC), which outline requirements for the development of cleanup standards, and procedures for development and implementation of a cleanup under MTCA. The other ARARs that may be applicable to the cleanup action include the following:

- Washington Hazardous Waste Management Act [Chapter 70.105 Revised Code of Washington (RCW)] and its implementing regulations, Dangerous Waste Regulations (Chapter 173-303 WAC). These regulations establish a comprehensive statewide framework for the planning, regulation, control, and management of dangerous waste. The regulations designate those solid wastes that are dangerous or extremely hazardous to human health and the environment. The management of excavated contaminated soil from the Property would be conducted in accordance with these regulations to the extent that any dangerous wastes are discovered or generated during the cleanup action.
- Washington Solid Waste Management Act (Chapter 70.95 RCW) and its implementing regulation, Criteria for Municipal Solid Waste Landfills (Chapter 173-351 WAC). These regulations establish a comprehensive statewide program for solid waste management including proper handling and disposal. The management of any contaminated soil removed from the Property would be conducted in accordance with these regulations to the extent that this soil could be managed as solid waste instead of dangerous waste.
- Hazardous Waste Operations (Chapter 296-843 WAC). These requirements establish safety
 requirements for workers conducting investigation and cleanup operations at sites containing
 hazardous materials. These requirements would be applicable to onsite cleanup activities and
 would be addressed in a site health and safety plan prepared specifically for these activities.
- Federal Clean Water Act National Pollutant Discharge Elimination System (NPDES) Permit and State Construction Stormwater General Permit. Construction activities that disturb one or more acres of land typically need to obtain an NPDES Construction Stormwater General Permit from Ecology. A substantive requirement would be to prepare a stormwater pollution prevention plan (SWPPP) prior to the earthwork activities. The SWPPP would document planned procedures designed to prevent stormwater pollution by controlling erosion of exposed soil and by containing soil stockpiles and other materials that could contribute pollutants to stormwater.

6.0 WEST BLOCK CLEANUP ACTION SUMMARY

The activities completed to date for the West Block have been implemented consistent with the CAP and PPCD, and are protective of human health and the environment per the MTCA Cleanup Regulations (Chapter 173-340 WAC). The capital cleanup action activities completed for the West Block described in this report include: hotspot excavation of contaminated soil from the former gasoline station area, enhanced bioremediation for impacted soil/groundwater in the hotspot excavation area, construction soil excavation, heating oil UST removal, installation of a surface cap, and added measures to prevent contact with contaminated soils outside the building foundations. In addition, two groundwater compliance monitoring wells have been installed on the West Block for future groundwater compliance monitoring activities. Cleanup elements remaining to be completed for the West Block (institutional controls and groundwater compliance monitoring) will be documented in subsequent reports.

With the construction completed to date, future development can proceed without the need to penetrate below the ground level on the West Block. Therefore, issuance of a Partial Certificate of Completion (PCC) for the capital portion of the cleanup at the West Block is warranted.

7.0 USE OF THIS REPORT

This report was prepared for the exclusive use of North Lot Development, and applicable regulatory agencies, for specific application to the North Lot Development Property, including review by the public. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied. This document was prepared under the supervision and direction of the undersigned.

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CMG/TLS/ccy

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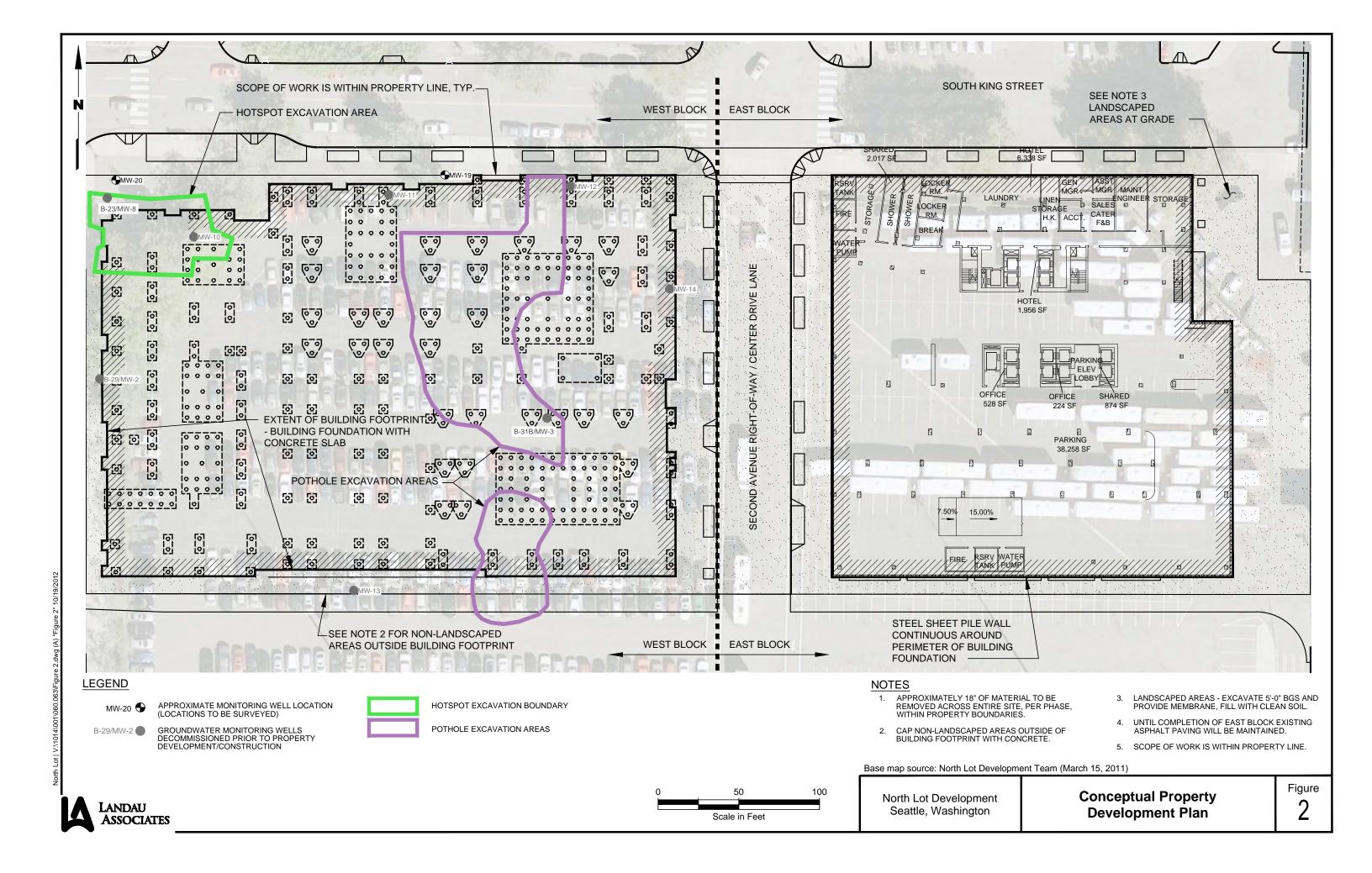
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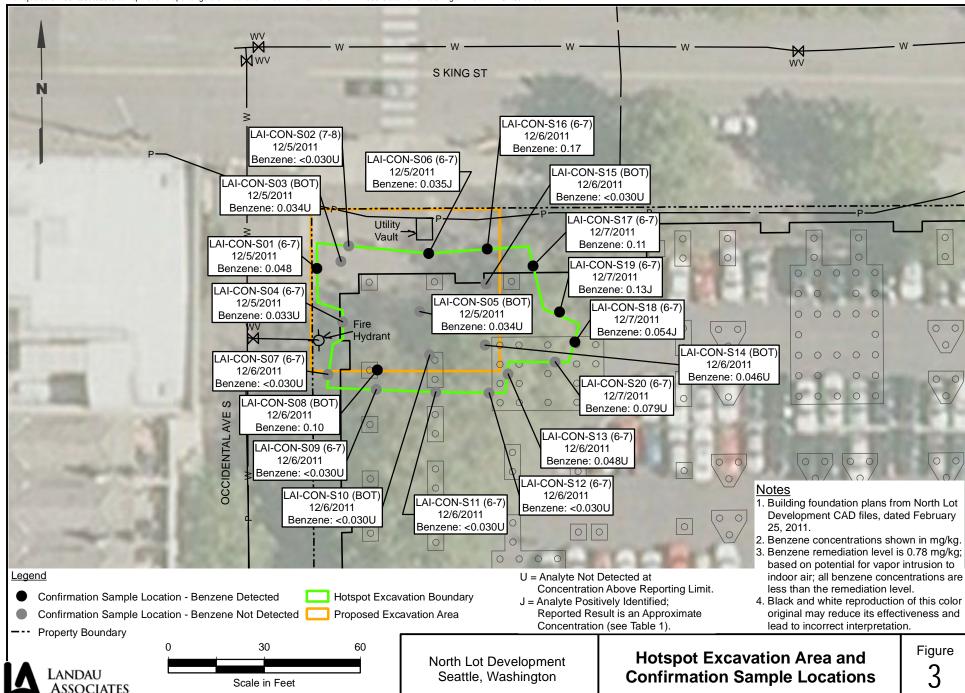
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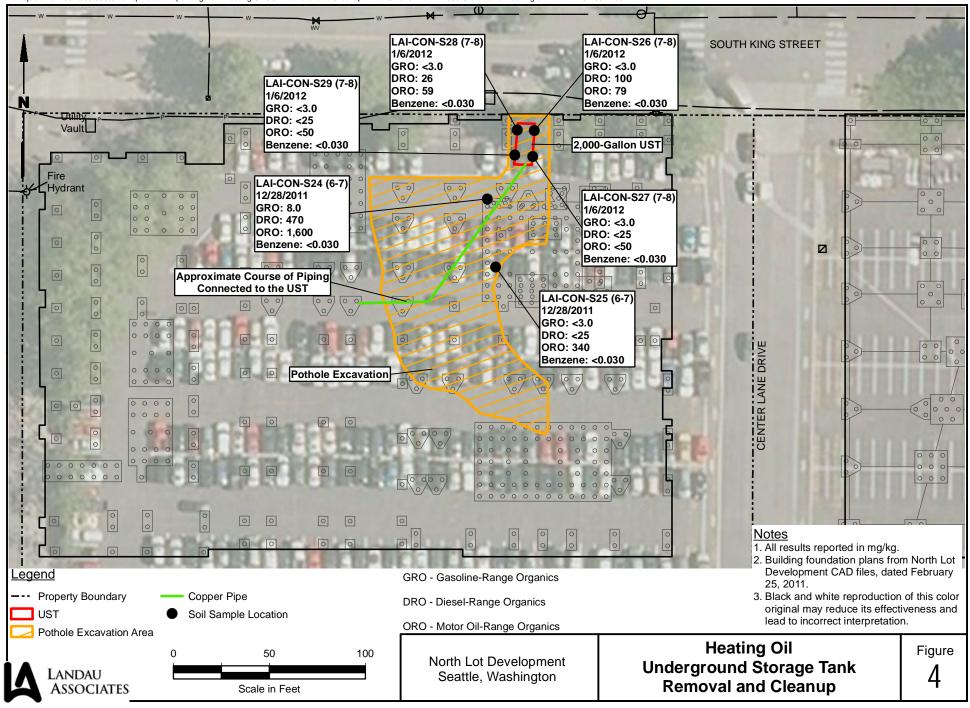


TABLE 1 HOTSPOT EXCAVATION SOIL ANALYTICAL DATA NORTH LOT – SEATTLE, WASHINGTON

Location	Lab ID	Date Collected	Benzene (mg/kg) Method SW8021	Gasoline-Range Organics (mg/kg) Method NWTPH-GX
LAI-CON-S01 (6-7)	1112022-01A	12/05/2011	0.048	110
LAI-CON-S02 (7-8)	1112022-02A	12/05/2011	0.030 U	33
LAI-CON-S03 (BOT)	1112022-03A	12/05/2011	0.034 U	15
LAI-CON-S04 (6-7)	1112022-04A	12/05/2011	0.033 U	68
LAI-CON-S05 (BOT)	1112022-05A	12/05/2011	0.034 U	8.3
LAI-CON-S06 (6-7)	1112022-06A	12/05/2011	0.035 J	11 UJ
LAI-CON-S07 (6-7)	1112029-01A	12/06/2011	0.030 U	3.0 U
LAI-CON-S08 (BOT)	1112029-02A	12/06/2011	0.10	75
LAI-CON-S09 (6-7)	1112029-03A	12/06/2011	0.030 U	1.6 J1
LAI-CON-S10 (BOT)	1112029-04A	12/06/2011	0.030 U	3.0 U
LAI-CON-S11 (6-7)	1112029-05A	12/06/2011	0.030 U	5.5
LAI-CON-S12 (6-7)	1112029-06A	12/06/2011	0.030 U	2.1 J1
LAI-CON-S13 (6-7)	1112029-07A	12/06/2011	0.048 U	79 U
LAI-CON-S14 (BOT)	1112029-08A	12/06/2011	0.046 U	44
LAI-CON-S15 (BOT)	1112034-01A	12/06/2011	0.030 U	10
LAI-CON-S16 (6-7)	1112034-02A	12/06/2011	0.17	810
LAI-CON-S17 (6-7)	1112042-01A	12/07/2011	0.11	410
LAI-CON-S18 (6-7)	1112042-02A	12/07/2011	0.054 J1	220
LAI-CON-S19 (6-7)	1112042-03A	12/07/2011	0.13 J1	130
LAI-CON-S20 (6-7)	1112042-04A	12/07/2011	0.079 U	430
	Remediation	Cleanup Level	0.78 (a)	100/30 (b)

Bold = Detected compound.

Box = Concentration exceeds cleanup level.

- (a) Remediation level based on the potential for vapor intrusion to indoor air as approved by Ecology.
- (b) MTCA Method A cleanup level is 100 mg/kg if benzene is not present and the total of ethylbenzene, toluene, and xylenes is less than 1% of the gasoline mixture; otherwise the cleanup level is 30 mg/kg.

U = Analyte analyzed for but not detected at level above reporting limit.

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J1 = Analyte was positively identified. Reported result is an estimate below the associated reporting limit but above the method detection limit.

TABLE 2 HEATING OIL UNDERGROUND STORAGE TANK SOIL ANALYTICAL DATA NORTH LOT DEVELOPMENT – SEATTLE, WASHINGTON

	Remediation/ Cleanup Level	LAI-CON-S24 (6-7) 1112161-01A 12/28/2011	LAI-CON-S25 (6-7) 1112161-02A 12/28/2011	LAI-CON-S26 (7-8) 1201036-01A 01/06/2012	LAI-CON-S27 (7-8) 1201036-02A 01/06/2012	LAI-CON-S28 (7-8) 1201036-03A 01/06/2012	LAI-CON-S29 (7-8) 1201036-04A 01/06/2012
PETROLEUM HYDROCARBONS (NWTPH-G Gasoline	(mg/kg) 100/30 (a)	8.0	3.0 U				
NWTPH-Dx Diesel	2,000 (b)	470	25 U	100	25 U	26	25 U
Motor Oil BTEX (mg/kg)	2,000 (b)	1,600	340	79	50 U	59	50 U
EPA Method 8021 Benzene	0.78 (c)	0.030 U					

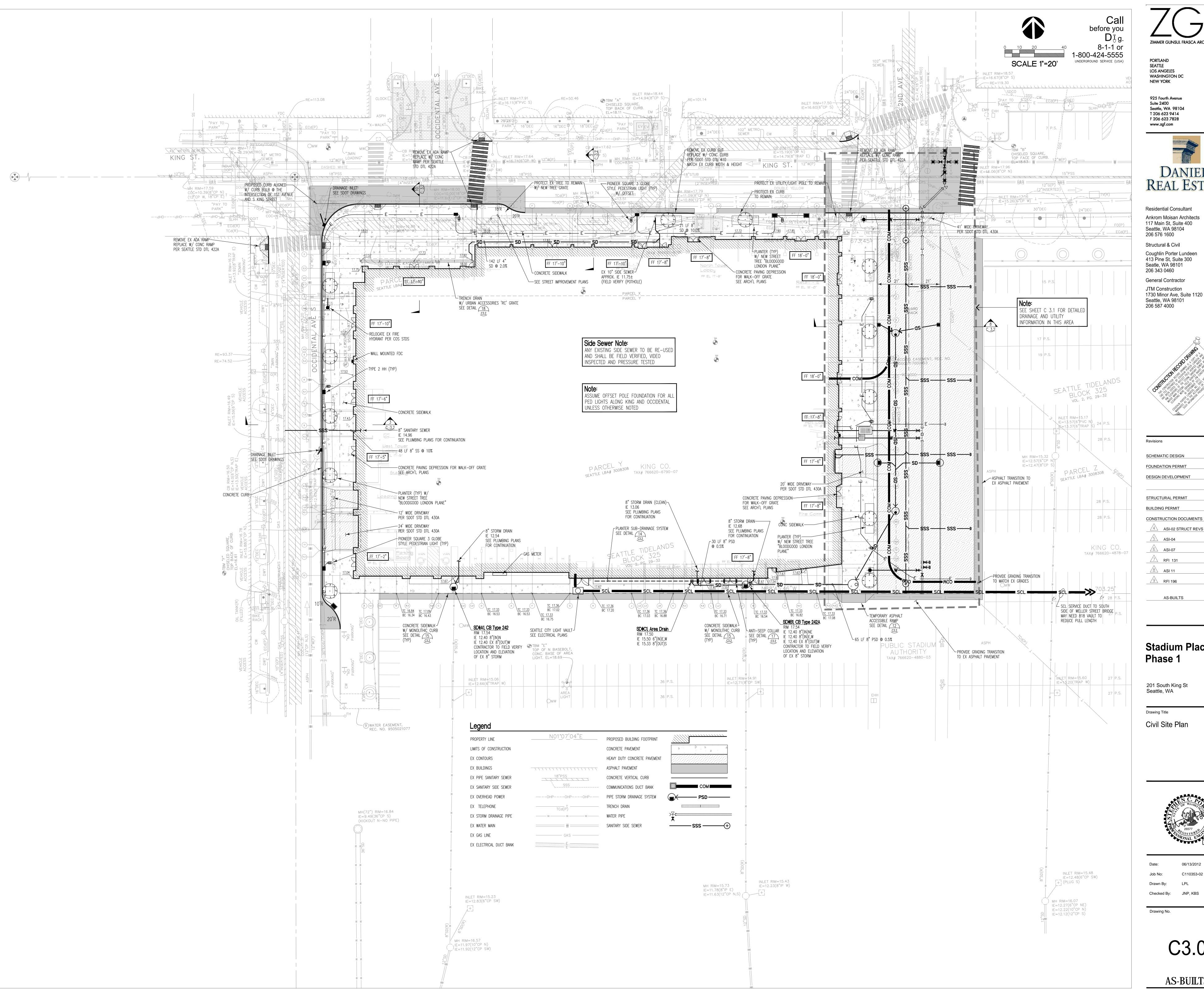
NA = Not analyzed.

 $\ensuremath{\mathsf{U}}$ = Indicates the compound was undetected at the reported concentration.

Bold = Detected concentration.

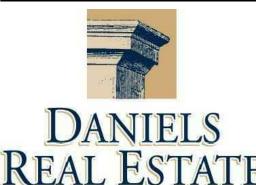
- (a) MTCA Method A cleanup level is 100 mg/kg if benzene is not present and the total of ethylbenzene, toluene, and xylenes is less than 1% of the gasoline mixture; otherwise the cleanup level is 30 mg/kg.
- (b) MTCA Method A cleanup level.
- (c) Remediation level based on the potential for vapor intrusion to indoor air as approved by Ecology.

West Block Surface Cap and Landscaping As-Built Drawings



PORTLAND SEATTLE LOS ANGELES WASHINGTON DC **NEW YORK**

925 Fourth Avenue Suite 2400 Seattle, WA 98104 T 206 623 9414 F 206 623 7828



Residential Consultant **Ankrom Moisan Architects** 117 Main St, Suite 400 Seattle, WA 98104 206 576 1600 Structural & Civil Coughlin Porter Lundeen 413 Pine St, Suite 300 Seatle, WA 98101 206 343 0460 **General Contractor**



Revision	S	
SCHEM	ATIC DESIGN	04/01/2011
FOUND	ATION PERMIT	04/21/2011
DESIGN	DEVELOPMENT	06/24/2011
STRUC	ΓURAL PERMIT	08/18/2011
BUILDIN	IG PERMIT	09/14/2011
CONSTI	RUCTION DOCUMENTS	10/31/2011
	ASI-02 STRUCT REVS	01/09/2012
	ASI-04	02/17/2012
6	ASI-07	05/01/2012
	RFI 131	05/10/2012
8	ASI 11	06/13/2012
^		

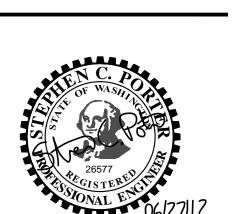
Stadium Place Phase 1

AS-BUILTS

10/12/2012

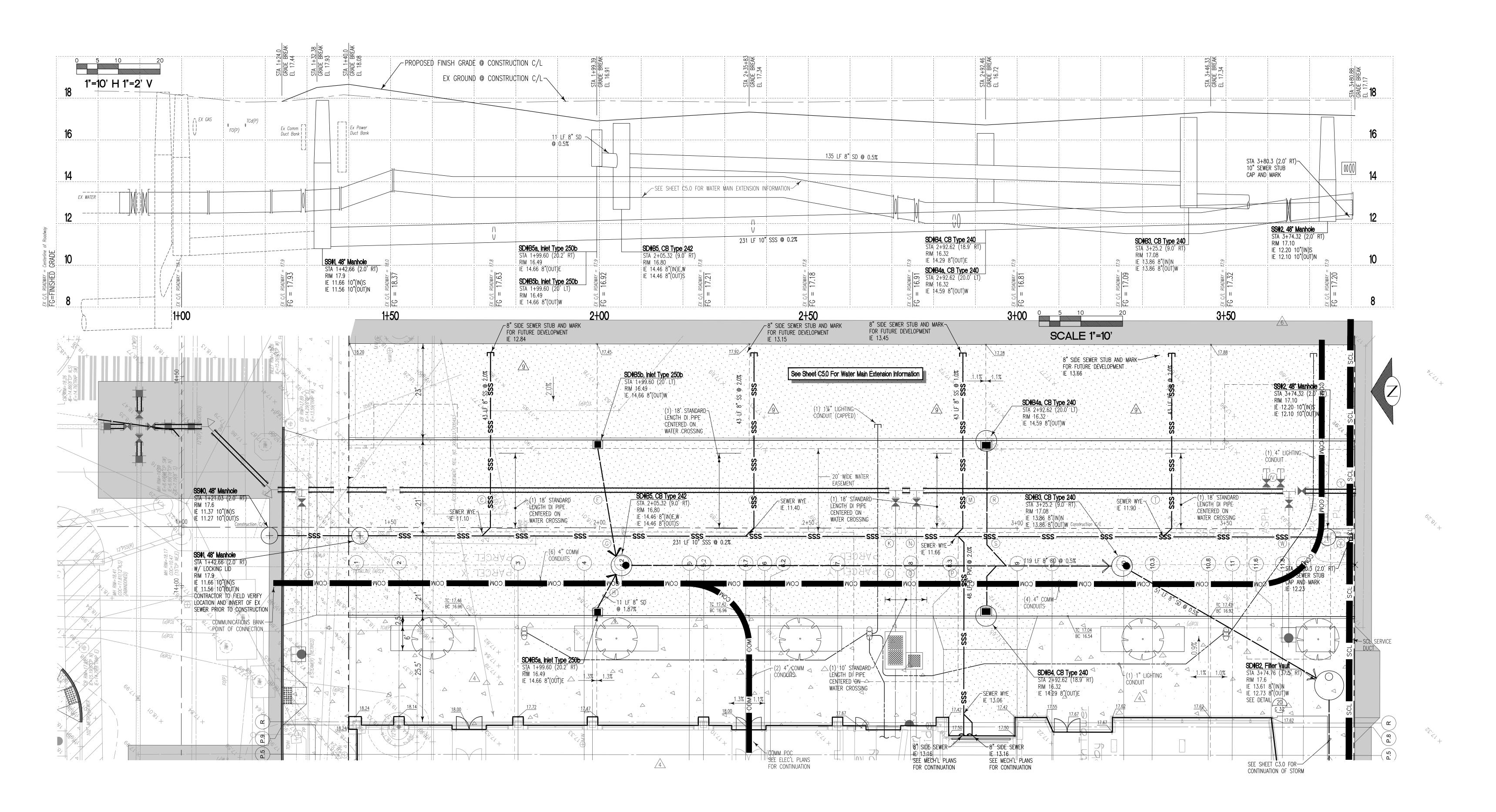
201 South King St

Civil Site Plan



Checked By: JNP, KBS

AS-BUILTS



CONCRETE SCORING PATTERN
PER ARCHITECTURAL PLANS

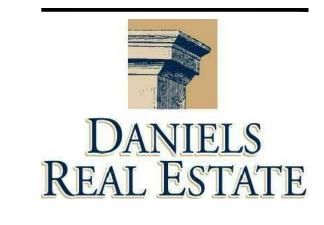
		UTILI	TY CRO	DSSIN	IG TAB	LE	
$\overline{(X)}$	SIZE	PIPE	INVERT	SIZE	PIPE	INVERT	CLEARANCE
Ă		COMM	15.32	6"	WATER	13.57	
В		COMM	15.25	6"	WATER	13.50	
С	12"	WATER	13.25	8"	SEWER	12.20	
D	6(4")	COMM	14.00	8"	SEWER	12.28	
Е	8"	STORM	14.61	6(4")	COMM	13.77	
F	8"	STORM	14.59	12"	WATER	13.09	
G	8"	STORM	14.51	10"	SEWER	11.25	
Н	8"	STORM	14.53		COMM	13.69	
	12"	WATER	13.25	8"	SEWER	12.40	
J	6(4")	COMM	13.77	8"	SEWER	12.63	
K	6"	WATER	12.92	10"	SEWER	11.59	
L	8"	STORM	14.14	6"	WATER	12.92	
М	12"	WATER	12.00	8"	SEWER	13.21	
N	6"	WATER	12.92	10"	SEWER	11.61	
0	8"	STORM	14.11	6"	WATER	12.92	
Р	8"	STORM	14.06	8"	SEWER	12.36	
Q	6(4")	COMM	14.03	8"	SEWER	13.26	
R	8"	STORM	14.50	12"	WATER	12.00	
S	8"	STORM	14.41	10"	SEWER	11.70	
T	12"	WATER	11.52	8"	SEWER	13.02	
U		COMM	14.25	6"	WATER	13.50	
٧		COMM	14.25	6"	WATER	13.50	
W	6"	WATER	13.06	10"	SEWER	12.06	
Χ		SCL	14.10	10"	SEWER	12.23	
Υ		SCL	14.10	12"	WATER	12.60	
Z		COMM	14.25	6"	WATER	13.25	

egend	
ROPOSED BUILDING FOOTPRINT	
NCRETE PAVEMENT	δ · · · · · Δ · · · Δ
CAVY DUTY CONCRETE PAVEMENT	
PHALT PAVEMENT	
NCRETE VERTICAL CURB	
OMMUNICATIONS DUCK BANK	COM
PE STORM DRAINAGE SYSTEM	PSD
ENCH DRAIN	
ATER PIPE) \
NITARY SIDE SEWER	



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206 343 0460

General Contractor

JTM Construction
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Seattle, WA 98101

206 587 4000

Residential Consultant



Revision	S	
SCHEMA	ATIC DESIGN	04/01/2011
FOUNDA	ATION PERMIT	04/21/2011
DESIGN	DEVELOPMENT	06/24/2011
STRUCT	URAL PERMIT	08/18/2011
BUILDIN	G PERMIT	09/14/2011
CONSTR	RUCTION DOCUMENTS	10/31/2011
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	ASI-04	02/17/2012
	ASI-07	05/01/2012
	RFI 131	05/10/2012
	ASI 11	06/13/2012
	RFI 196	06/27/2012
	AC DI III TO	40/40/0040
	AS-BUILTS	10/12/2012

Stadium Place Phase 1

201 South King St Seattle, WA

Drawing Title

Detailed Drainage and Utility Plan



 Date:
 06/13/2012

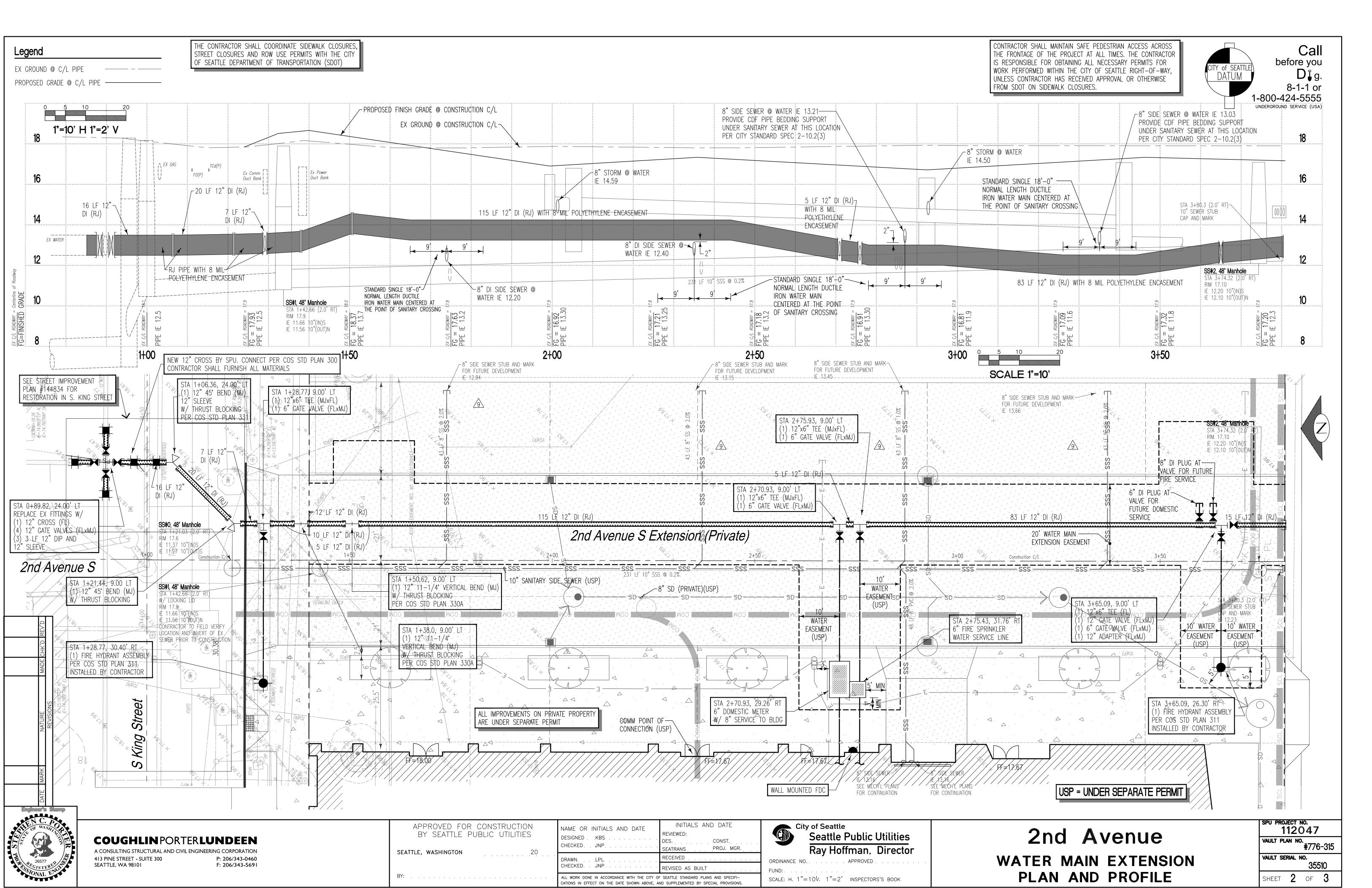
 Job No:
 C110353-02

 Drawn By:
 LPL

 Checked By:
 JNP, KBS

Drawing

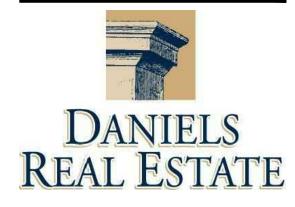
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Ankrom Moisan Architects 117 Main St, Suite 400 Seattle, WA 98104 206 576 1600 Structural & Civil Coughlin Porter Lundeen

Residential Consultant

Coughlin Porter Lundeer 413 Pine St, Suite 300 Seatle, WA 98101 206 343 0460 General Contractor JTM Construction

> Seattle, WA 98101 206 587 4000

1730 Minor Ave, Suite 1120



SCHEM	ATIC DESIGN	04/01/201
FOUND	ATION PERMIT	04/21/201
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<u> </u>	ASI-04	02/17/201
		05/04/004
	ASI-07	05/01/201
6	ASI-07 RFI 131	05/01/2012
<u>6</u> <u>7</u> <u>8</u>		

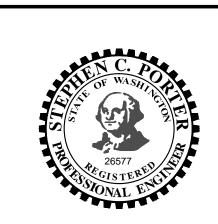
Stadium Place Phase 1

AS-BUILTS

201 South King St Seattle, WA

Drawing Title

2nd Avenue Water Main Extension Plan/Profile



Date: 06/13/2012

Job No: C110353-02

Drawn By: LPL

Checked By: JNP, KBS

Drawing No.

C5.1

AS-BUILTS

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Release of Liability/Certificate of Disposal



September 20, 2012

Release of Liability/Certificate of Disposal

STADIUM PLACE LLC: is released from liability for all petroleum contaminated waste originating from:

201 S. King Street Seattle, WA 98104

and transported to:

CEMEX USA-Everett Soil Remediation 6300 Glenwood Avenue Everett, WA 98203

From 12/05/2011 through 08/28/2012

A total of 21648.73 tons of petroleum contaminated soil and 2011.47 of clean soil (see totals below) was transported to the above facility. The material was disposed of in the following manner:

Thermal Remediation: Class 3 Soil = 2826.09

Landfill for Reclamation: Class 2 Soil = 18822.64 & Clean Soil = 2011.47

Disposal of the contaminated soil was performed in accordance with all applicable federal, state, and local laws and regulations.

Signed:

Larry W. Baker

Soil Remediation Operations Manager

Farry W. Baken

CEMEX

Northwest Region U.S. Operations

Hotspot Soil Excavation and Enhanced Bioremediation Technical Memorandum

TECHNICAL MEMORANDUM



TO:

Alan Cornell, North Lot Development Team

FROM:

Timothy Syverson, L.G. and Colette Griffith, E.I.T.

DATE:

January 9, 2012

RE:

CLEANUP ACTION PLAN IMPLEMENTATION

HOTSPOT SOIL EXCAVATION AND ENHANCED BIOREMEDIATION

NORTH LOT DEVELOPMENT, SEATTLE, WASHINGTON

CLEANUP ID#: 1966

PROSPECTIVE PURCHASER CONSENT DECREE No. 11-2-27892-1

This technical memorandum has been prepared to document for the Washington State Department of Ecology (Ecology) the completion of the hotspot soil excavation and enhanced bioremediation activities as part of the Cleanup Action Plan (CAP) implementation at the North Lot Property (Property; Table B-1 of the CAP). The Property is located in the south end Central Business District, southeast of the intersection of South King Street and Occidental Avenue South in Seattle, Washington (Figure 1). North Lot Development (NLD) conducted the excavation activities pursuant to the Prospective Purchaser Consent Decree (PPCD), North Lot Development Site, Seattle, Washington effective on September 26, 2011 and the CAP (Landau Associate 2011a) as part of the cleanup action associated with development of the Property for commercial and residential uses. The hotspot soil excavation and enhanced bioremediation area was identified based on the results of the investigations conducted to characterize soil and groundwater conditions at the Property, as documented in the Remedial Investigation (RI) report (Landau Associates 2011b) and the Feasibility Study (FS) report (Landau Associates 2011c). The hotspot soil excavation and enhanced bioremediation activities were conducted per the procedures identified in the CAP and the Engineering Design Report (EDR; Landau Associates 2011d), and in accordance with the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Cleanup Regulation (Chapter 173-340 WAC).

The purpose of the hotspot excavation and enhanced bioremediation activities was to remove soil with benzene concentrations greater than the remediation level identified in the CAP, which, as discussed below, was established to mitigate the potential for vapor intrusion, and to apply a bioremediation material [Oxygen Release Compound (ORC®) Advanced] to enhance bioremediation of residual gasoline and benzene present at the elevation of the groundwater table. This technical memorandum is provided to document completion of the hotspot soil excavation and the enhanced bioremediation element of the approved cleanup action for the Property. This technical memorandum assumes that the reader is generally familiar with the Property history and background, the details of the previous investigations and

remedial actions, and current conditions at the Property, which are documented in the Ecology-approved RI, FS, CAP, and EDR.

HOTSPOT SOIL EXCAVATION

The soil excavation, enhanced bioremediation, and clean soil backfilling (see below) activities began on December 5, 2011 and were completed by December 9, 2011. As discussed above, the hotspot excavation was conducted to remove soil with benzene concentrations greater than the remediation level that was established to mitigate the potential for vapor intrusion. The benzene remediation level of 0.78 milligrams per kilogram (mg/kg) was developed based on the results of the evaluation of potential vapor intrusion discussed in Sections 3.0 and 4.2.1 of the FS report. The hotspot excavation was conducted in the northwest portion of the Property within the area of the former gasoline stations. Soil in this area with benzene concentrations greater than the remediation level was excavated to the elevation of the groundwater table [a depth of approximately 9 feet (ft) below ground surface (BGS)]. Approximately 675 cubic yards of soil and debris were removed from the excavation area (Figure 1). The final extent of the excavation area was adjusted from the area presented in the FS, CAP, and EDR based on the following considerations:

- The excavation extent along the north side was limited by the presence of a City of Seattle electrical vault and associated utilities. The City of Seattle required a 4-ft clearance on both sides of the electrical vault and utilities, so the excavation boundary was moved south.
- The excavation extent along the west Property boundary was limited by the presence of a utility corridor beneath the sidewalk, so the excavation boundary was moved east. A section of the west excavation boundary was also moved farther east to protect a City of Seattle fire hydrant.
- The excavation extent along the east side was expanded farther east due to visual field observations during excavation activities and readings on the photoionization detector (PID) that indicated the presence of soil with benzene concentrations greater than the remediation level.

An environmental professional from Landau Associates was present to observe and document the hotspot excavation activities, evaluate the extent of the excavation based on field screening, and collect confirmation samples. Field-screening results (e.g., obvious signs of contamination, PID headspace analysis) were recorded on the excavation and sampling log. Headspace analysis was conducted by placing a representative portion of the soil in a sealable plastic bag, allowing the soil to vaporize inside the sealed container for 5 minutes, then inserting the PID tip into the bag to measure total volatile organic compounds (VOCs). All soil samples collected were visually described in the field in general accordance with ASTM International standard D 2488-09, *Standard Recommended Practice for Description of Soils* (*Visual-Manual Procedure*). Pictures documenting the progress and completion of the hotspot excavation and enhanced bioremediation (see below) activities are shown on Figures 2 through 9.

Twenty confirmation samples were collected to document contaminant concentrations in soil at the limits of the excavation area. As outlined in the EDR, soil samples were collected from the excavation bottom and sidewalls, at approximately 20-linear-ft intervals along the excavation bottom and sidewalls. Sidewall sample depths are indicated in the sample names; the sidewall samples were generally collected between 6 and 8 ft BGS and the excavation bottom samples collected from the bottom of the excavation were generally collected from approximately 9 ft BGS. The soil confirmation samples were placed in laboratory-supplied containers and submitted for laboratory analysis under appropriate chain-of-custody procedures. The soil samples were analyzed for gasoline-range total petroleum hydrocarbons (TPH-G) by Method NWTPH-G and benzene by U.S. Environmental Protection Agency (EPA) Method 8021B as outlined in the EDR. All samples were collected using a laboratory-supplied coring device for collection of soil for VOC analysis (TPH-G and benzene) per EPA Method 5035A. Each VOC sampling device was preset to collect approximately 5 grams of soil. The sample was collected directly from the soil of interest (i.e., an undisturbed portion of the soil sample volume) using the coring device. The soil was then transferred from the coring device to pre-weighed, laboratorysupplied vials. After collection, the sample was placed in a cooler on ice, and sample information was recorded on the chain-of-custody form. Sample details were recorded on a sample collection form. Samples were submitted to ALS Environmental laboratory in Everett, Washington on an expedited 24-hour turnaround time. The laboratory analytical results for the soil samples are provided in Table 1. The benzene results are also shown on Figure 1.

As shown on Figure 1, although benzene was detected at a concentration greater than the laboratory reporting limit in 7 of the 20 soil confirmation samples, all of the detected benzene concentrations were below the remediation level of 0.78 mg/kg, and the objective of the hotspot excavation was accomplished.

In accordance with the CAP, the soil confirmation samples were also analyzed for TPH-G, but the analytical results were not used to identify the extent of the hotspot excavation. The analytical results indicate that TPH-G was detected at concentrations greater than the laboratory reporting limit in 16 of the 20 soil confirmation samples, and the TPH-G concentrations detected in 8 of the samples are greater than the MTCA Method A soil cleanup level. The TPH-G concentrations detected in the soil confirmation samples are consistent with the concentrations detected during previous investigations and discussed in the RI and FS reports.

ENHANCED BIOREMEDIATION

A bioremediation material, ORC Advanced manufactured by Regenesis, was placed in the bottom of the hotspot excavation prior to backfilling. The ORC Advanced will accelerate the rate of naturally

occurring aerobic contaminant biodegradation to enhance the degradation of residual gasoline and benzene present at the elevation of the groundwater table. As shown in Table 1 and discussed in the RI and FS reports, residual TPH-G is present at concentrations greater than the MTCA Method A soil cleanup level in soil near the elevation of the groundwater table in the northwest portion of the Property in the former locations of the gasoline stations. Based on model calculations from the vendor, which took into account the anticipated hotspot excavation area and the contaminant concentrations, approximately 900 pounds of ORC Advanced was placed at the bottom of the hotspot excavation area prior to backfilling. Following placement of the ORC Advanced, the hotspot excavation was backfilled with clean imported fill.

SITE CONSTRUCTION AND DEVELOPMENT

The NLD construction team is continuing with the next phase of the CAP, which includes excavation of approximately 18 inches of soil in the West Block building footprint, and additional excavation for obstructions, utilities, piles, pile caps, and elevator pits as outlined in the FS, CAP, and EDR. Excavated soil is being transported off site for appropriate disposal. The remaining cleanup action elements will be implemented as appropriate, as development construction progresses. As discussed above, a Cleanup Action Report will be prepared to document the completed cleanup action. Groundwater compliance monitoring as described in Appendix A of the CAP will begin following completion of construction in the west portion of the Property.

USE OF THIS TECHNICAL MEMORANDUM

This technical memorandum has been prepared for the exclusive use of North Lot Development and applicable regulatory agencies for specific application to the North Lot Property. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

REFERENCES

Landau Associates. 2011a. *Cleanup Action Plan, North Lot Development, Seattle, Washington*. Prepared for North Lot Development, LLC. May 31.

Landau Associates. 2011b. *Remedial Investigation Report, North Lot Development, Seattle, Washington.* Prepared for North Lot Development, LLC. May 23.

Landau Associates. 2011c. Report: Feasibility Study, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. May 23.

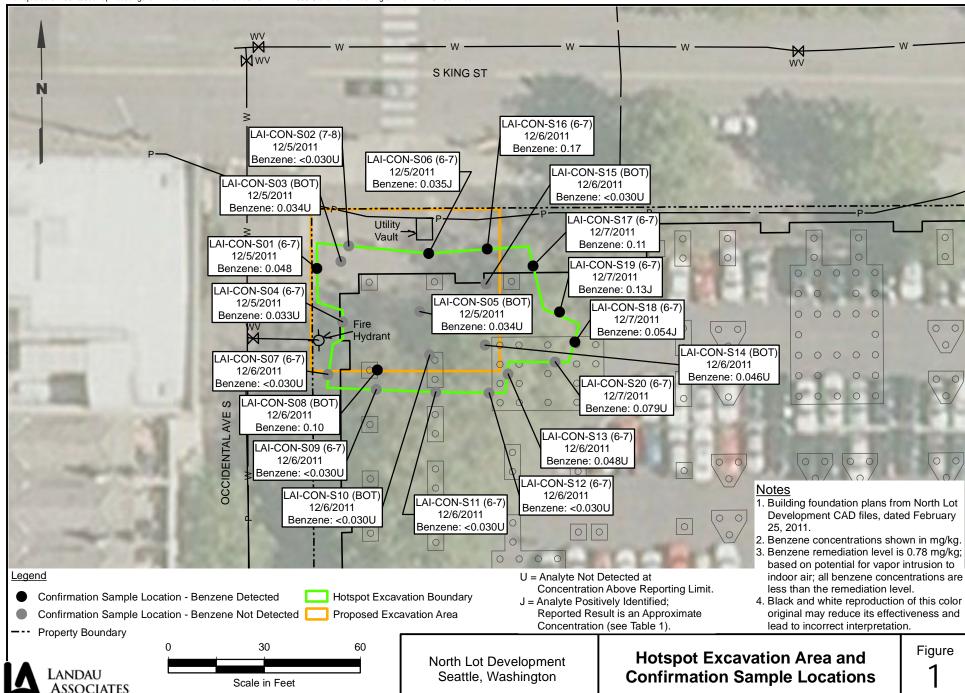
Landau Associates. 2011d. *Engineering Design Report, North Lot Development, Seattle, Washington.* Prepared for North Lot Development, LLC. July 5.

ATTACHMENTS

Figure 1 Hotspot Excavation Area and Confirmation Sample Locations

Figures 2 through 9 Selected Photographs from Hotspot Excavation

Table 1 Soil Analytical Data Hotpot Excavation



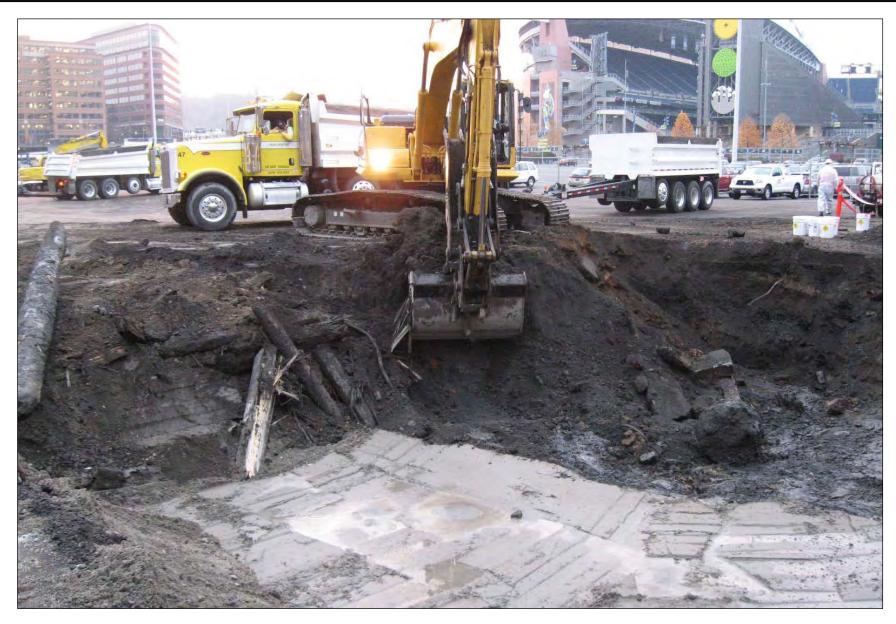




Selected Photographs from Hotspot Excavation









Selected Photographs from Hotspot Excavation





Selected Photographs from Hotspot Excavation





Selected Photographs from Hotspot Excavation





Selected Photographs from Hotspot Excavation





Selected Photographs from Hotspot Excavation





Selected Photographs from Hotspot Excavation

TABLE 1 SOIL ANALYTICAL DATA HOT SPOT EXCAVATION NORTH LOT – SEATTLE, WASHINGTON

Location	Lab ID	Date Collected	Benzene (mg/kg) Method SW8021	Gasoline-Range Organics (mg/kg) Method NWTPH-GX
LAI-CON-S01 (6-7)	1112022-01A	12/05/2011	0.048	110
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LAI-CON-S03 (BOT)	1112022-03A	12/05/2011	0.034 U	15
LAI-CON-S04 (6-7)	1112022-04A	12/05/2011	0.033 U	68
LAI-CON-S05 (BOT)	1112022-05A	12/05/2011	0.034 U	8.3
LAI-CON-S06 (6-7)	1112022-06A	12/05/2011	0.035 J	11 UJ
LAI-CON-S07 (6-7)	1112029-01A	12/06/2011	0.030 U	3.0 U
LAI-CON-S08 (BOT)	1112029-02A	12/06/2011	0.10	75
LAI-CON-S09 (6-7)	1112029-03A	12/06/2011	0.030 U	1.6 J1
LAI-CON-S10 (BOT)	1112029-04A	12/06/2011	0.030 U	3.0 U
LAI-CON-S11 (6-7)	1112029-05A	12/06/2011	0.030 U	5.5
LAI-CON-S12 (6-7)	1112029-06A	12/06/2011	0.030 U	2.1 J1
LAI-CON-S13 (6-7)	1112029-07A	12/06/2011	0.048 U	79 U
LAI-CON-S14 (BOT)	1112029-08A	12/06/2011	0.046 U	44
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LAI-CON-S20 (6-7)	1112042-04A	12/07/2011	0.079 U	430
	Remediation	/Cleanup Level	0.78 (a)	100/30 (b)

Bold = Detected compound.

Box = Concentration exceeds cleanup level.

- (a) Remediation level based on the potential for vapor intrusion to indoor air as approved by Ecology.
- (b) MTCA Method A cleanup level is 100 mg/kg if benzene is not present and the total of ethylbenzene, toluene, and xylenes is less than 1% of the gasoline mixture; otherwise the cleanup level is 30 mg/kg.

U = Analyte analyzed for but not detected at level above reporting limit.

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J1 = Analyte was positively identified. Reported result is an estimate below the associated reporting limit but above the method detection limit.

Heating Oil Underground Storage Tank Removal Technical Memorandum

TECHNICAL MEMORANDUM



TO:

Alan Cornell, North Cevelopment Team

FROM:

Timothy Syverson, L.G., and Dylan Frazer, G.I.T.

DATE:

February 9, 2012

RE:

CLEANUP ACTION PLAN IMPLEMENTATION

HEATING OIL UNDERGROUND STORAGE TANK REMOVAL NORTH LOT DEVELOPMENT, SEATTLE, WASHINGTON

CLEANUP ID#: 1966

PROSPECTIVE PURCHASER CONSENT DECREE No. 11-2-27892-1

This technical memorandum has been prepared to document for the Washington State Department of Ecology (Ecology) the removal of a heating oil underground storage tank (UST) from the North Lot Property (Property). The Property is located in the south end Central Business District, southeast of the intersection of South King Street and Occidental Avenue South in Seattle, Washington (Figure 1). North Lot Development (NLD) conducted the heating oil UST removal pursuant to the Prospective Purchaser Consent Decree (PPCD), North Lot Development Site, Seattle, Washington effective on September 26, 2011 and the Cleanup Action Plan (CAP; Landau Associates 2011a) as part of the cleanup action associated with development of the Property for commercial and residential uses. The heating oil UST was encountered during the exploratory pothole excavations conducted by the contractor in preparation for upcoming construction activities at the Property. The heating oil UST removal was conducted in accordance with the Ecology Model Toxics Control Act (MTCA) Cleanup Regulation (Chapter 173-340 WAC), Dangerous Waste Regulations (Chapter 173-303 WAC) for the handling and disposal of contaminated media, and the UST regulations (Chapter 173-360 WAC, including WAC 173-360-385). Ecology provided NLD with a waiver of the 30-day Notice requirement for UST closure (Ecology 2012).

The purpose of the work was to remove the heating oil UST and associated soil with contaminant concentrations greater than the cleanup levels established for the Property (Landau Associate 2011a). This technical memorandum is provided to document completion of the heating oil UST removal. This technical memorandum assumes that the reader is generally familiar with the Property history and background, the details of the previous investigations and remedial actions, and current conditions at the Property, which are documented in the Ecology-approved Remedial Investigation (RI) report (Landau Associates 2011b), Feasibility Study (FS) report (Landau Associates 2011c), CAP (Landau Associates 2011a), and Engineering Design Report (EDR; Landau Associates 2011d).

HEATING OIL UNDERGROUND STORAGE TANK REMOVAL

The soil excavation, UST and associated piping removal, and excavation and offsite disposal of petroleum-contaminated soil (PCS), and subsequent clean soil backfilling activities began on December 27, 2011 and were completed by January 6, 2012. An environmental professional from Landau Associates was present to observe and document the heating oil UST removal and associated PCS and water removal activities described below and to establish the limits of the excavation, based on field screening, and to collect confirmation samples to document petroleum hydrocarbon concentrations at the extent of the excavation. Field-screening results (e.g., visual and olfactory signs of contamination, photoionization detector headspace analysis) were recorded on the excavation and sampling log and communicated to the contractor. All soil samples collected were visually described in the field in general accordance with ASTM International standard D 2488-09, *Standard Recommended Practice for Description of Soils (Visual-Manual Procedure)*.

As discussed above, the heating oil UST was encountered by the contractor during exploratory pothole excavations on December 27, 2011. The exploratory pothole excavations were initiated following completion of the hotspot soil excavation and enhanced bioremediation (Landau Associates 2012) activities in preparation for construction. The initial excavation that encountered the UST was located adjacent to the north property boundary (Figure 1). The excavation also exposed piping that was connected to the tank. Field screening identified PCS adjacent to the UST and around the piping. The PCS appeared to be the result of releases of residual heating oil (product) from the piping, from a small hole that was punctured in the UST by the excavator during potholing activities, and/or historical leakage from the UST and piping. From December 27 through December 29, the excavation was expanded approximately 75 feet (ft) to the south of the original excavation where the UST was located to expose and remove the UST piping and associated PCS. The final excavation extent was established where the field screening no longer indicated evidence of PCS (Figure 1). The final excavation depth was approximately 1 to 2 ft below the depth of the groundwater, which was at approximately 7 ft below ground surface (BGS), during the pothole excavation activities. During excavation of the piping, heavy sheen and some floating product was observed on the groundwater that accumulated in the excavation. Localized areas of floating product were isolated within the piping excavation by creating soil dams to minimize the spread of contamination and to facilitate removal of the floating product. Marine Vacuum Services used a vacuum truck to skim the product from the surface of the water that accumulated in the excavation for appropriate off-Property disposal. The PCS was loaded into trucks and transported for appropriate off-Property disposal.

Two confirmation samples, numbered S24 and S25, were collected on December 28, 2011 to document petroleum hydrocarbon concentrations in soil at the limits of the excavation area along the

course of the piping associated with the UST. Samples were not collected from the bottom of the excavation due to the presence of accumulated water in the bottom of the excavation. Sidewall sample depths are indicated in the sample names; the sidewall samples were collected between 6 and 7 ft BGS, which was just above the accumulated water. The soil confirmation samples from the piping excavation were analyzed for gasoline-range total petroleum hydrocarbons by Method NWTPH-Gx, oil- and diesel-range total petroleum hydrocarbons by Method NWTPH-Dx, and benzene by U.S. Environmental Protection Agency (EPA) Method 8021B. The samples analyzed for gasoline and benzene were collected using a laboratory-supplied coring device for collection of soil per EPA Method 5035A. The laboratory analytical results for the soil samples associated with the piping and UST removal are provided in Table 1. The laboratory analytical results from the piping excavation sidewall samples indicate that the analyte concentrations in the soil samples collected are below the laboratory reporting limits and/or less than the Property cleanup levels.

The UST was removed and confirmation samples were collected from the UST excavation on January 6, 2012. After removal of the UST, PCS was not observed around the former location of the tank, so only minimal additional excavation was conducted around the former UST location. Prior to removal of the UST, a marine chemist was on site to evaluate the tank and indicate that the tank was safe for cutting, removal, and transport off-Property for appropriate disposal. A representative of the Seattle Fire Department also inspected the tank prior to removal. The UST was approximately 17 ft long and 5 ft in diameter and appeared to be corroded, but no corrosion holes were observed. Water accumulated in the base of the UST excavation at approximately 8 ft BGS during the tank removal, which was approximately 0.5 ft above the bottom of the former location of the UST. No sheen or floating product was observed on the accumulated water in the UST excavation. Photographs documenting the progress and completion of the heating oil UST excavation activities are presented on Figures 2 through 6.

Four confirmation samples, numbered S26, S27, S28, and S29, were collected on January 6, 2012 following removal of the UST. As described above, confirmation samples were not collected from the bottom of the UST excavation due to the presence of accumulated water. Sidewall sample depths are indicated in the sample names; the sidewall samples were collected between 7 and 8 ft BGS, which was just above the accumulated water in the excavation.

The soil confirmation samples from the UST excavation were also analyzed for gasoline-range total petroleum hydrocarbons by Method NWTPH-Gx, oil- and diesel-range total petroleum hydrocarbons by Method NWTPH-Dx, and benzene by EPA Method 8021B. The samples analyzed for gasoline and benzene were collected using a laboratory-supplied coring device for collection of soil per EPA Method 5035A. As noted above, the laboratory analytical results for the soil samples associated with the UST removal are provided in Table 1. The laboratory analytical results indicate that the petroleum

hydrocarbon concentrations in the soil samples collected from the UST sidewalls are all below the laboratory reporting limits and/or less than the applicable Property cleanup levels.

Based on the analytical results for the soil samples, no additional soil removal or remediation work is warranted regarding the heating oil UST and associated piping encountered during preparation for construction at the Property.

SITE CONSTRUCTION AND DEVELOPMENT

The NLD construction team is continuing with the next phase of the CAP, which includes excavation of approximately 18 inches of soil in the West Block building footprint, and additional excavation for obstructions, utilities, piles, pile caps, and elevator pits as outlined in the FS, CAP, and EDR. Excavated soil is being transported off site for appropriate disposal. The remaining cleanup action elements will be implemented, as appropriate, as development construction progresses. A Cleanup Action Report will be prepared to document the completed cleanup action. Groundwater compliance monitoring as described in Appendix A of the CAP will begin following completion of construction in the western portion of the Property.

USE OF THIS TECHNICAL MEMORANDUM

This technical memorandum has been prepared for the exclusive use of North Lot Development and applicable regulatory agencies for specific application to the North Lot Property. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

REFERENCES

Ecology. 2012. Form: *Underground Storage Tank 30 Day Notice (Intent to Close)*. Waiver of 30-day notice required approved by Russ Olsen. Washington State Department of Ecology. January 4.

Landau Associates. 2012. Technical Memorandum: Cleanup Action Plan Implementation, Hotspot Soil Excavation and Enhanced Bioremediation, North Lot Development, Seattle, Washington, Cleanup ID#: 1966, Prospective Purchaser Consent Decree No. 11-2-27892-1. From Timothy Syverson, L.G., and Colette Griffith, E.I.T., to Alan Cornell, North Lot Development Team. January 9.

Landau Associates. 2011a. Cleanup Action Plan, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. July 20.

Landau Associates. 2011b. *Remedial Investigation Report, North Lot Development, Seattle, Washington.* Prepared for North Lot Development, LLC. May 23.

Landau Associates. 2011c. Report: *Feasibility Study, North Lot Development, Seattle, Washington.* Prepared for North Lot Development, LLC. May 23.

Landau Associates. 2011d. *Engineering Design Report, North Lot Development, Seattle, Washington.* Prepared for North Lot Development, LLC. July 5.

ATTACHMENTS

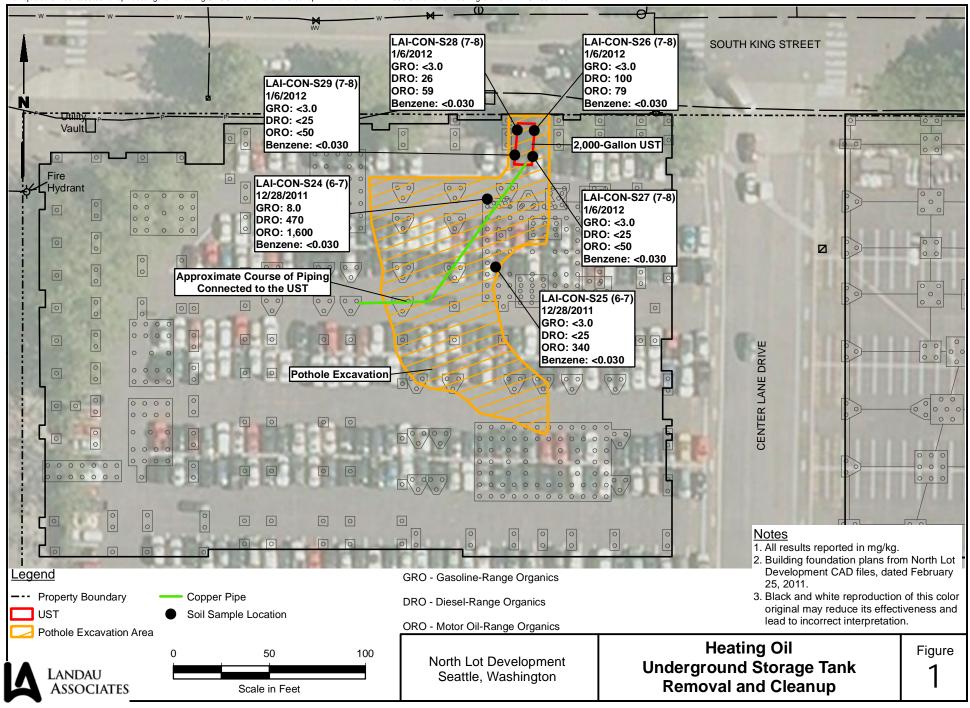
Figure 1: Heating Oil Underground Storage Tank Excavation and Confirmation Sample

Locations

Figures 2 through 6: Selected Photographs from Underground Storage Tank Removal and Cleanup

Table 1: Soil Analytical Data

Attachment 1: Laboratory Analytical Data





1. View of the exposed UST from the south.



2. View of the exposed UST.



3. Inside of UST after being opened.



4. UST after cleaning.





5. Removal of UST.



North Lot Development Seattle, Washington

Selected Photographs from Underground Storage Tank Removal and Cleanup Figure

4



6. UST excavation after removal.



North Lot Development Seattle, Washington

Selected Photographs from Underground Storage Tank Removal and Cleanup



7. UST excavation after removal and backfilling.



North Lot Development Seattle, Washington

Selected Photographs from Underground Storage Tank Removal and Cleanup

TABLE 1 SOIL ANALYTICAL DATA UNDERGROUND STORAGE TANK REMOVAL AND CLEANUP CONFIRMATION SAMPLES NORTH LOT DEVELOPMENT – SEATTLE, WASHINGTON

	Remediation/ Cleanup Level	LAI-CON-S24 (6-7) 1112161-01A 12/28/2011	LAI-CON-S25 (6-7) 1112161-02A 12/28/2011	LAI-CON-S26 (7-8) 1201036-01A 01/06/2012	LAI-CON-S27 (7-8) 1201036-02A 01/06/2012	LAI-CON-S28 (7-8) 1201036-03A 01/06/2012	LAI-CON-S29 (7-8) 1201036-04A 01/06/2012
PETROLEUM HYDROCARBONS NWTPH-G	(mg/kg)						
Gasoline	100/30 (a)	8.0	3.0 U				
NWTPH-Dx Diesel	2,000 (b)	470	25 U	100	25 U	26	25 U
Motor Oil	2,000 (b)	1,600	340	79	50 U	59	50 U
BTEX (mg/kg) EPA Method 8021 Benzene	0.78 (c)	0.030 U					

NA = Not analyzed.

 $\ensuremath{\mathsf{U}}$ = Indicates the compound was undetected at the reported concentration.

Bold = Detected concentration.

- (a) MTCA Method A cleanup level is 100 mg/kg if benzene is not present and the total of ethylbenzene, toluene, and xylenes is less than 1% of the gasoline mixture; otherwise the cleanup level is 30 mg/kg.
- (b) MTCA Method A cleanup level.
- (c) Remediation level based on the potential for vapor intrusion to indoor air as approved by Ecology.

Laboratory Analytical Data



December 30, 2011

Mr. Tim Syverson Landau Associates, Inc. 130 - 2nd Ave. S. Edmonds, WA 98020

Dear Mr. Syverson,

On December 29th, 2 samples were received by our laboratory and assigned our laboratory project number 1112161. The project was identified as your North Lot Development / #1014001.060.061. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan

Laboratory Director



CLIENT: Landau Associates, Inc. DATE: 12/30/2011

130 - 2nd Ave. S. ALS JOB#: 1112161

Edmonds, WA 98020 ALS SAMPLE#: -01

CLIENT CONTACT: Tim Syverson DATE RECEIVED: 12/29/2011

CLIENT SAMPLE ID	LAI-CON-S24 (6-7)	CON-S24 (6-7) WDOE ACCREDITATION: C601									
	DATA RESULTS										
ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS A	ANALYSIS BY				
TPH-Volatile Range	NWTPH-GX	8.0	3.0	1	MG/KG	12/29/2011	LAP				
Benzene	EPA-8021	U	0.030	1	MG/KG	12/29/2011	LAP				
TPH-Diesel Range	NWTPH-DX w/ SGA	470	50	2	MG/KG	12/29/2011	EBS				
TPH-Oil Range	NWTPH-DX w/ SGA	1600	100	2	MG/KG	12/29/2011	EBS				
						ANALYSIS A					
SURROGATE	METHOD	%REC				DATE	BY				
TFT	NWTPH-GX	58.7				12/29/2011	LAP				
TFT	EPA-8021	74.8				12/29/2011	LAP				

12/29/2011

EBS

C25 2X Dilution

132

NWTPH-DX w/ SGA

U - Analyte analyzed for but not detected at level above reporting limit.

Chromatogram indicates that it is likely that sample contains highly weathered gasoline, weathered diesel and lube oil.



CLIENT: Landau Associates, Inc. DATE: 12/30/2011

130 - 2nd Ave. S. ALS JOB#: 1112161

Edmonds, WA 98020 ALS SAMPLE#: -02

CLIENT CONTACT: Tim Syverson DATE RECEIVED: 12/29/2011
CLIENT PROJECT: North Lot Development / #1014001.060.061 COLLECTION DATE: 12/28/2011 15:45

CLIENT SAMPLE ID LAI-CON-S25 (6-7) WDOE ACCREDITATION: C601

	DATA RESULTS										
ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS A	ANALYSIS BY				
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	12/29/2011	LAP				
Benzene	EPA-8021	U	0.030	1	MG/KG	12/29/2011	LAP				
TPH-Diesel Range	NWTPH-DX w/ SGA	U	25	1	MG/KG	12/29/2011	EBS				
TPH-Oil Range	NWTPH-DX w/ SGA	340	50	1	MG/KG	12/29/2011	EBS				
						ANALYSIS A	ANALYSIS BY				
SURROGATE	METHOD	%REC				DATE	БТ				
TFT	NWTPH-GX	56.6				12/29/2011	LAP				
TFT	EPA-8021	71.4				12/29/2011	LAP				
C25	NWTPH-DX w/ SGA	133				12/29/2011	EBS				

U - Analyte analyzed for but not detected at level above reporting limit. Chromatogram indicates that it is likely that sample contains lube oil.



CLIENT: Landau Associates, Inc.

DATE:

12/30/2011

130 - 2nd Ave. S.

ALS SDG#:

1112161

Edmonds, WA 98020

WDOE ACCREDITATION:

C601

CLIENT CONTACT:

Tim Syverson

CLIENT PROJECT:

North Lot Development /

#1014001.060.061

LABORATORY BLANK RESULTS

MBG-122911S - Batch 2405 - Soil by NWTPH-GX

			REPORTING	DILUTION		ANALYSIS A	NALYSIS
ANALYTE	METHOD	RESULTS	LIMITS	FACTOR	UNITS	DATE	BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	12/29/2011	LAP

MB-122911S - Batch 2405 - Soil by EPA-8021

			REPORTING	DILUTION		ANALYSIS A	ANALYSIS	
ANALYTE	METHOD	RESULTS	LIMITS	FACTOR	UNITS	DATE	BY	
Benzene	EPA-8021	U	0.030	1	MG/KG	12/29/2011	LAP	

MB-122911S - Batch 2403 - Soil by NWTPH-DX

			REPORTING	DILUTION		ANALYSIS A	NALYSIS	
ANALYTE	METHOD	RESULTS	LIMITS	FACTOR	UNITS	DATE	BY	
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	12/29/2011	EBS	
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	12/29/2011	EBS	



CLIENT: Landau Associates, Inc.

DATE:

12/30/2011

130 - 2nd Ave. S.

ALS SDG#:

1112161

Edmonds, WA 98020

Tim Syverson

WDOE ACCREDITATION:

C601

CLIENT CONTACT:

CLIENT PROJECT:

North Lot Development /

#1014001.060.061

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 2405 - Soil by NWTPH-GX

					ANALYSIS	ANALYSIS	
SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	DATE	BY	
TPH-Volatile Range - BS	NWTPH-GX	79.2			12/29/2011	LAP	
TPH-Volatile Range - BSD	NWTPH-GX	89.0	12		12/29/2011	LAP	

ALS Test Batch ID: 2405 - Soil by EPA-8021

					ANALYSIS	ANALYSIS
SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	DATE	BY
Benzene - BS	EPA-8021	115			12/29/2011	LAP
Benzene - BSD	EPA-8021	112	3		12/29/2011	LAP

ALS Test Batch ID: 2403 - Soil by NWTPH-DX

					ANALYSIS	ANALYSIS	
SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	DATE	BY	
TPH-Diesel Range - BS	NWTPH-DX	88.9			12/29/2011	EBS	
TPH-Diesel Range - BSD	NWTPH-DX	88.9	0		12/29/2011	EBS	

APPROVED BY

Laboratory Director

ALS ENVIRONMENTAL Sample Receiving Checklist

Client: Landau Associates	ALS Job #:	///2/	6/
Project: North Lot Development	#/0/400/.c	060.06/	
Received Date: 12/29/// Received Time: _/s	2:/O B	y: _ Si_	
Type of shipping container: Cooler Box	Other		<i>D</i> .,
Shipped via: UPS/FedEx US Postal Service	Courier	_ Hand Deliv	ered X Carl
Were custody seals on outside of sample? If yes, how many? Where? _OUTSIDE_Concerts Custody seal date: Seal name:		es <u>No</u>	<u>N/A</u>
Did all bottles have labels?	<u>></u>		·
Did all bottle labels and tags agree with Chain of Custody?	_×	<u> </u>	
Were samples received within hold time?	\rightarrow		
Did all bottles arrive in good condition (unbroken, etc.)?	\ <u>\</u>	<u> </u>	
Was sufficient amount of sample sent for the tests indicated?	\rightarrow	<u> </u>	
Was correct preservation added to samples?	_>		
If no, Sample Control added preservative to the following: Sample Number Reagent Analyte	Received	per 503	s High Kits.
Were VOA vials checked for absence of air bubbles? Bubbles present in sample #:	_ –		X
Temperature of cooler upon receipt: 2.42 (Ice	Ambient N/A	
Was client contacted? Who was called? Outcome of call:	By whom?	Date	:

Seattle/Edmonds (425) 778-0907 ☐ **Tacoma** (253) 926-2493 ☐ **Spokane** (509) 327-9737 LANDAU Spokane (509) 327-9737

ASSOCIATES Portland (503) 542-1080

///2/6/ Date 12/28/2011

Chain-of-Custody Record

Project Name North Lt Develop	Project No. 10	14601.060.061		Testing Parameter	S Turnaround Time
Project Location/Event Seattle, U	A /Fx	<u> </u>		/	Standard
		0.40	////)/ / / / / /	☐ Accelerated □ Accelerated
	mer	·/	/ /.*/\u/?/		/ / /
Project Contact IM Syvers		/ 	John John		
Send Results To	He Griff H	Anneltalunser		/	
Sample I.D. Date		No. of Containers	A A A		Observations/Comments
LAI-CON-524 (6-7), 126	1 1530 Soil	a X	XX		X Allow water samples to settle, collect
LAI-LON-525(6-7) 12/2	8 1545 50	12 ×	××		aliquot from clear portion
					_X_NWTPH-Dx - run acid wash/silica gel cleanup
					run samples standardized to product
					Analyze for EPH if no specific
					product identified
					VOC/BTEX/VPH (soll):
					non-preserved preserved w/methanol
					preserved w/sodium bisulfate
					Freeze upon receipt
					Dissolved metal water samples field filtered
					Other
Special Shipment/Handling or Storage Requirements	ooler on	\ <u>\\\</u>	<u> </u>	Metho Shipm	ent AS pick up
Relinquished by	Received by	Jana	Relinquished		Received by
Signature	Signature R	OKOLIXION I	Signature		Signature
Mark Brance Printed Name	Shawn Ko	obinson	Printed Name		Printed Name
Landau Associates	Company				
Company			Company		Company
Date 12/28/2011 Time 1740	Date 12/29/1/		Date	Time	Date Time



January 9, 2012

Mr. Tim Syverson Landau Associates, Inc. 130 - 2nd Ave. S. Edmonds, WA 98020

Dear Mr. Syverson,

On January 6th, 4 samples were received by our laboratory and assigned our laboratory project number 1201036. The project was identified as your North Lot / #1014001.060.061. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Carl Nott

Operations Manager



CLIENT: Landau Associates, Inc. DATE: 1/9/2012

130 - 2nd Ave. S. ALS JOB#: 1201036

Edmonds, WA 98020 ALS SAMPLE#: -01

CLIENT CONTACT: Tim Syverson DATE RECEIVED: 1/6/2012

122

CLIENT PROJECT: North Lot / #1014001.060.061 COLLECTION DATE: 1/6/2012 12:50

CLIENT SAMPLE ID	LAI-CON-S26 (7-8)	WDOE ACCREDITATION: C601					
		DA ⁻	TA RESULTS				
ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS A	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/09/2012	DLC
Benzene	EPA-8021	U	0.030	1	MG/KG	01/09/2012	DLC
TPH-Diesel Range	NWTPH-DX w/ SGA	100	25	1	MG/KG	01/09/2012	DLC
TPH-Oil Range	NWTPH-DX w/ SGA	79	50	1	MG/KG	01/09/2012	DLC
SURROGATE	METHOD	%REC				ANALYSIS A	ANALYSIS BY
TFT	NWTPH-GX	65.2				01/09/2012	DLC
TFT	EPA-8021	84.7				01/09/2012	DLC

01/09/2012

DLC

C25

Chromatogram indicates that it is likely that sample contains weathered diesel and lube oil.

NWTPH-DX w/ SGA

U - Analyte analyzed for but not detected at level above reporting limit.



CLIENT: Landau Associates, Inc. DATE:

130 - 2nd Ave. S. ALS JOB#: 1201036

1/9/2012

Edmonds, WA 98020 ALS SAMPLE#: -02

CLIENT CONTACT: Tim Syverson DATE RECEIVED: 1/6/2012

CLIENT PROJECT: North Lot / #1014001.060.061 COLLECTION DATE: 1/6/2012 12:55

CLIENT SAMPLE ID LAI-CON-S27 (7-8) WDOE ACCREDITATION: C601

		DA	TA RESULTS				
ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS A	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/09/2012	DLC
Benzene	EPA-8021	U	0.030	1	MG/KG	01/09/2012	DLC
TPH-Diesel Range	NWTPH-DX w/ SGA	U	25	1	MG/KG	01/09/2012	DLC
TPH-Oil Range	NWTPH-DX w/ SGA	U	50	1	MG/KG	01/09/2012	DLC
						ANALYSIS A	
SURROGATE	METHOD	%REC				DATE	BY
TFT	NWTPH-GX	64.6				01/09/2012	DLC
TFT	EPA-8021	85.3				01/09/2012	DLC
C25	NWTPH-DX w/ SGA	125				01/09/2012	DLC

U - Analyte analyzed for but not detected at level above reporting limit.



CLIENT SAMPLE ID

CERTIFICATE OF ANALYSIS

CLIENT: Landau Associates, Inc. DATE: 1/9/2012

130 - 2nd Ave. S. ALS JOB#: 1201036

WDOE ACCREDITATION:

C601

Edmonds, WA 98020 ALS SAMPLE#: -03

CLIENT CONTACT: Tim Syverson DATE RECEIVED: 1/6/2012

CLIENT PROJECT: North Lot / #1014001.060.061 COLLECTION DATE: 1/6/2012 13:00

DATA RESULTS ANALYSIS ANALYSIS **REPORTING DILUTION LIMITS FACTOR** DATE BY **RESULTS** UNITS **ANALYTE METHOD** 3.0 DLC TPH-Volatile Range **NWTPH-GX** U 1 MG/KG 01/09/2012

EPA-8021 U 0.030 1 MG/KG 01/09/2012 DLC Benzene **TPH-Diesel Range** NWTPH-DX w/ SGA 26 25 1 MG/KG 01/09/2012 DLC TPH-Oil Range NWTPH-DX w/ SGA 59 50 MG/KG 01/09/2012 DLC 1

ANALYSIS ANALYSIS DATE BY **SURROGATE METHOD** %REC TFT **NWTPH-GX** 01/09/2012 DLC 66.8 **TFT** DLC EPA-8021 78.8 01/09/2012 C25 NWTPH-DX w/ SGA 97.5 01/09/2012 DLC

LAI-CON-S28 (7-8)

U - Analyte analyzed for but not detected at level above reporting limit. Chromatogram indicates that it is likely that sample contains weathered diesel.



CLIENT: Landau Associates, Inc. DATE:

130 - 2nd Ave. S. ALS JOB#: 1201036 Edmonds, WA 98020

1/9/2012

ALS SAMPLE#: -04

CLIENT CONTACT: Tim Syverson DATE RECEIVED: 1/6/2012 **CLIENT PROJECT:** North Lot / #1014001.060.061 **COLLECTION DATE:** 1/6/2012 13:05

CLIENT SAMPLE ID LAI-CON-S29 (7-8) WDOE ACCREDITATION: C601

		DA	TA RESULTS				
ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS A	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/09/2012	DLC
Benzene	EPA-8021	U	0.030	1	MG/KG	01/09/2012	DLC
TPH-Diesel Range	NWTPH-DX w/ SGA	U	25	1	MG/KG	01/09/2012	DLC
TPH-Oil Range	NWTPH-DX w/ SGA	U	50	1	MG/KG	01/09/2012	DLC
SURROGATE	METHOD	%REC				ANALYSIS A	ANALYSIS BY
TFT	NWTPH-GX	65.8				01/09/2012	DLC
TFT	EPA-8021	78.0				01/09/2012	DLC
C25	NWTPH-DX w/ SGA	107				01/09/2012	DLC

U - Analyte analyzed for but not detected at level above reporting limit.



CLIENT: Landau Associates, Inc.

DATE: 1/9/2012 ALS SDG#:

130 - 2nd Ave. S.

1201036

Edmonds, WA 98020

WDOE ACCREDITATION: C601

CLIENT CONTACT: Tim Syverson

CLIENT PROJECT: North Lot / #1014001.060.061

LABORATORY BLANK RESULTS

MB-010612S - Batch 2422 - Soil by EPA-8021

			REPORTING	DILUTION	ANALYSIS AF	VALYSIS	
ANALYTE	METHOD	RESULTS	LIMITS	FACTOR	UNITS DATE	BY	
Benzene	EPA-8021	U	0.030	1	MG/KG 01/06/2012	DLC	

MB-010612S - Batch 2421 - Soil by NWTPH-DX

			REPORTING	DILUTION		ANAL I SIS F	MALISIS	
ANALYTE	METHOD	RESULTS	LIMITS	FACTOR	UNITS	DATE	BY	
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	01/06/2012	DLC	
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	01/06/2012	DLC	



CLIENT: Landau Associates, Inc.

DATE: 1/9/2012

130 - 2nd Ave. S.

ALS SDG#: 1201036 REDITATION: C601

Edmonds, WA 98020

WDOE ACCREDITATION:

CLIENT CONTACT: Tim Syverson CLIENT PROJECT: North Lot / #10

North Lot / #1014001.060.061

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 2422 - Soil by NWTPH-GX

					ANALISIS	ANALISIS	
SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	DATE	BY	
TPH-Volatile Range - BS	NWTPH-GX	84.9			01/06/2012	DLC	
TPH-Volatile Range - BSD	NWTPH-GX	96.9	13		01/06/2012	DLC	

ALS Test Batch ID: 2422 - Soil by EPA-8021

					ANALYSIS	ANALYSIS	
SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	DATE	BY	
Benzene - BS	EPA-8021	99.9			01/06/2012	DLC	
Benzene - BSD	EPA-8021	100	0		01/06/2012	DLC	

ALS Test Batch ID: 2421 - Soil by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	95.9			01/06/2012	DLC
TPH-Diesel Range - BSD	NWTPH-DX	99.1	3		01/06/2012	DLC

APPROVED BY

Operations Manager

ALS ENVIRONMENTAL Sample Receiving Checklist

Client: Ladun	ALS Job #: _	120	1036	<u> </u>
Project: North 10t				······
Received Date: Received Time:	7:00	Ву: _	RS	
Type of shipping container: Cooler Box	Other			
Shipped via: UPS/FedEx US Postal Service	_ Courier		Hand Deliv	ered
Were custody seals on outside of sample? If yes, how many? Where? Where? Custody seal date: Seal name: La		Yes X	<u>No</u>	<u>N/A</u>
Was Chain of Custody properly filled out (ink, signed, dated,	etc.)?	7		
Did all bottles have labels?		7		
Did all bottle labels and tags agree with Chain of Custody?		4		
Were samples received within hold time?		<u>}</u>		
Did all bottles arrive in good condition (unbroken, etc.)?		$\frac{\lambda}{}$		
Was sufficient amount of sample sent for the tests indicated?		<u>+</u>		
Was correct preservation added to samples?		<u>×</u>		***************************************
If no, Sample Control added preservative to the following: Sample Number Reagent Analyte ———————————————————————————————————		Per	5035	
Were VOA vials checked for absence of air bubbles? Bubbles present in sample #:	_			Δ
Temperature of cooler upon receipt: 5.6°	Cold Cool	Am	bient N/	A
Explain any discrepancies:				
Was client contacted? Who was called?	By whom?)	Date	e:
Outcome of call:	•			

1201036 Seattle/Edmonds (425) 778-0907 □ Spokane (509) 327-9737 Page. ☐ **Portland** (503) 542-1080 **Chain-of-Custody Record Testing Parameters** Turnaround Time Project No. 1014001.060.061 ☐ Standard Project Location/Event □ Accelerated Sampler's Name Project Contact _ Send Results To_ Observations/Comments Containers Sample I.D. X Allow water samples to settle, collect aliquot from clear portion X NWTPH-Dx - run acid wash/silica gel cleanup ___ run samples standardized to product __ Analyze for EPH if no specific product identified VOC/BTEX/VPH (soll): non-preserved preserved w/methanol preserved w/sodium bisulfate Freeze upon receipt Dissolved metal water samples field filtered Other Method of Special Shipment/Handling cooler on Ic Shipment or Storage Requirements Received by Relinquished by Relinquished by Signature Signature Printed Name **Printed Name**

Date / 6-/2

Time / 700

Company

Date

Time

Company

Date

Groundwater Monitoring Well Logs

Soil Classification System

MAJOR

USCS GRAPHIC LETTER SYMBOL SYMBOL(1)

TYPICAL DESCRIPTIONS (2)(3)

	DIVISIONS		 SYMBOL ⁽¹⁾	DESCRIPTIONS (2)(3)
	GRAVEL AND	CLEAN GRAVEL	GW	Well-graded gravel; gravel/sand mixture(s); little or no fines
SOIL rial is size)	GRAVELLY SOIL	(Little or no fines)	GP	Poorly graded gravel; gravel/sand mixture(s); little or no fines
□ \$ \$	(More than 50% of coarse fraction retained	GRAVEL WITH FINES	GM	Silty gravel; gravel/sand/silt mixture(s)
RAINE)% of ma . 200 sie	on No. 4 sieve)	(Appreciable amount of fines)	GC	Clayey gravel; gravel/sand/clay mixture(s)
0 23 5	SAND AND	CLEAN SAND	SW	Well-graded sand; gravelly sand; little or no fines
COARSE- (More than larger than N	SANDY SOIL	(Little or no fines)	SP	Poorly graded sand; gravelly sand; little or no fines
OAF More rger	(More than 50% of coarse fraction passed	SAND WITH FINES (Appreciable amount of	SM	Silty sand; sand/silt mixture(s)
Q € <u>B</u>	through No. 4 sieve)	fines)	SC	Clayey sand; sand/clay mixture(s)
an an	SII T AI	ND CLAY	ML	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
SOIL % of er than size)	_		CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
NINED SOIL ian 50% of smaller than sieve size)	(Liquid limit	less than 50)	OL	Organic silt; organic, silty clay of low plasticity
RAINI e than al is sm 200 sie	SII Τ ΔΙ	ND CLAY	МН	Inorganic silt; micaceous or diatomaceous fine sand
INE-GRAI (More tha material is s No. 200 s	_		СН	Inorganic clay of high plasticity; fat clay
FINE (N mate	(Liquid limit g	greater than 50)	ОН	Organic clay of medium to high plasticity; organic silt
	HIGHLY OF	RGANIC SOIL		Peat; humus; swamp soil with high organic content

OTHER MATERIALS

GRAPHIC LETTER SYMBOL SYMBOL

TYPICAL DESCRIPTIONS

PAVEMENT	AC or PC	Asphalt concrete pavement or Portland cement pavement
ROCK	RK	Rock (See Rock Classification)
WOOD	WD	Wood, lumber, wood chips
DEBRIS	6/6/6/ DB	Construction debris, garbage

- Notes: 1. USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
 - 2. Soil descriptions are based on the general approach presented in the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the Standard Test Method for Classification of Soils for Engineering Purposes, as outlined in ASTM D 2487.
 - 3. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

 $\label{eq:primary constituent:} Secondary Constituents: $ > 50\% - "GRAVEL," "SAND," "SILT," "CLAY," etc. $ > 30\% and $ \leq 50\% - "very gravelly," "very sandy," "very silty," etc. $ > 15\% and $ \leq 30\% - "gravelly," "sandy," "silty," etc. $ < 5\% and $ \leq 15\% - "with gravel," "with sand," "with silt," etc. $ < 5\% - "with trace gravel," "with trace sand," "with trace silt," etc., or not noted. $ < 5\% - "with trace gravel," "with trace sand," "with trace silt," etc., or not noted. $ < 5\% - "with trace gravel," "with trace sand," "with trace silt," etc., or not noted. $ < 5\% - "with trace gravel," "with trace sand," "with trace silt," etc., or not noted. $ < 5\% - "with trace gravel," "with trace sand," "with trace silt," etc., or not noted. $ < 5\% - "with trace gravel," "with trace sand," "with trace silt," etc., or not noted. $ < 5\% - "with trace gravel," "with trace sand," "with trace silt," etc., or not noted. $ < 5\% - "with trace gravel," "with trace sand," "with trace silt," etc., or not noted. $ < 5\% - "with gravel," "with trace gravel," "with trace gravel," "with trace gravel," "with trace gravel," "with gravel," "$

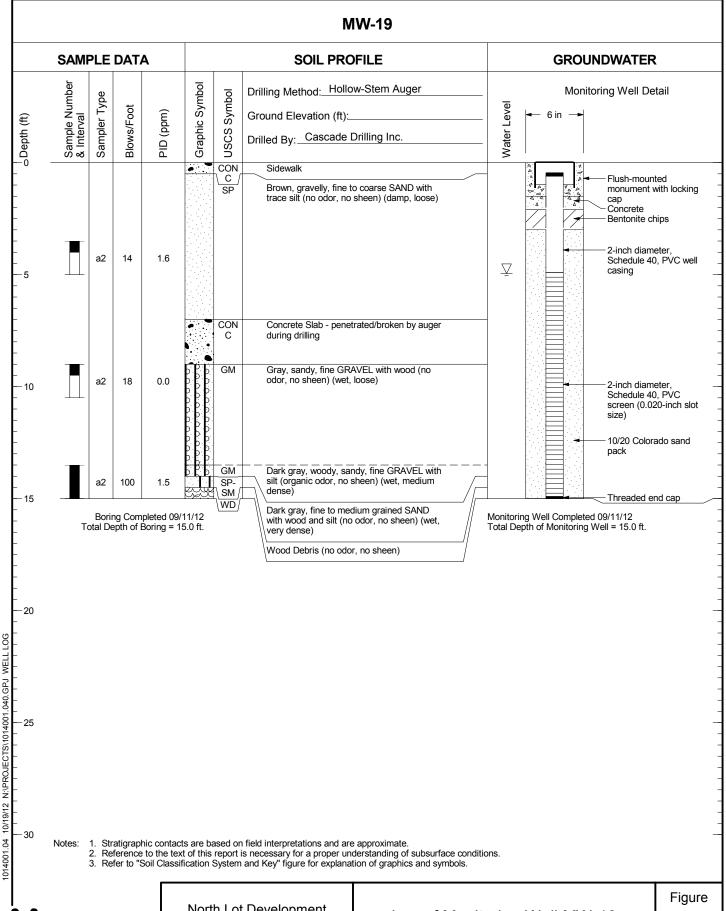
4. Soil density or consistency descriptions are based on judgement using a combination of sampler penetration blow counts, drilling or excavating conditions, field tests, and laboratory tests, as appropriate.

Drilling and Sampling Key Field and Lab Test Data SAMPLER TYPE SAMPLE NUMBER & INTERVAL Code Description Code Description 3.25-inch O.D., 2.42-inch I.D. Split Spoon PP = 1.0Pocket Penetrometer, tsf TV = 0.5 b 2.00-inch O.D., 1.50-inch I.D. Split Spoon Sample Identification Number Torvane, tsf Shelby Tube PID = 100 Photoionization Detector VOC screening, ppm С Recovery Depth Interval Moisture Content, % d Grab Sample W = 10Single-Tube Core Barrel D = 120 Dry Density, pcf Sample Depth Interval Double-Tube Core Barrel -200 = 60 Material smaller than No. 200 sieve, % 2.50-inch O.D., 2.00-inch I.D. WSDOT GS Grain Size - See separate figure for data Portion of Sample Retained 3.00-inch O.D., 2.375-inch I.D. Mod. California ALAtterberg Limits - See separate figure for data for Archive or Analysis Other - See text if applicable GT Other Geotechnical Testing 300-lb Hammer, 30-inch Drop Chemical Analysis 1 CA 2 140-lb Hammer, 30-inch Drop Groundwater Pushed Approximate water level at time of drilling (ATD) Vibrocore (Rotosonic/Geoprobe) Approximate water level at time other than ATD Other - See text if applicable



North Lot Development Seattle, Washington

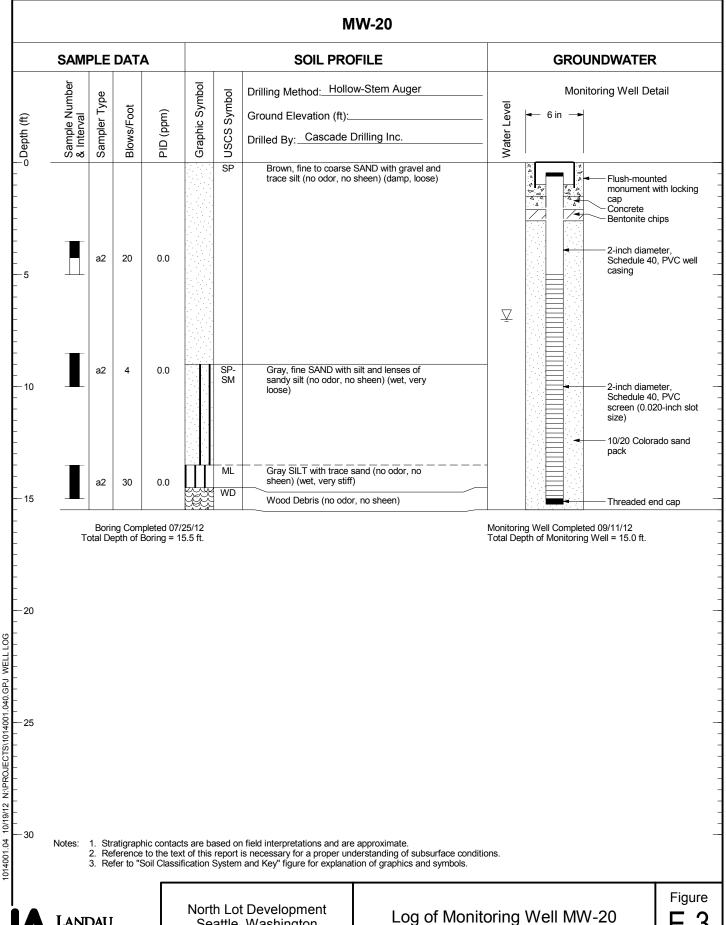
Soil Classification System and Key





Log of Monitoring Well MW-19

Figure F_2





Seattle, Washington