



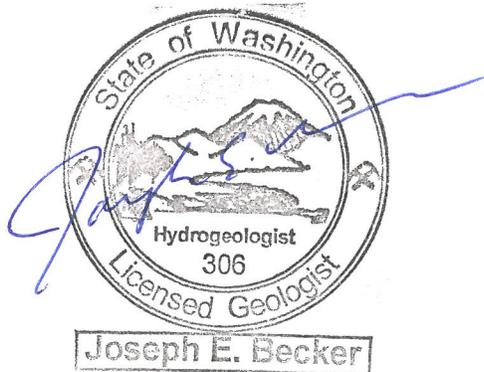
ROBINSON  
NOBLE

FOUNDER'S CHOICE CABINETS  
AND COUNTERTOPS  
1517 S. TACOMA WAY  
TACOMA, WASHINGTON  
GROUNDWATER CHARACTERIZATION AND  
REMEDIAL FEASIBILITY STUDY

JUNE 2013

by

John F. Hildenbrand  
Associate Environmental Scientist  
Environmental Services Manager



Founder's Choice Cabinets and Countertops  
1517 S. Tacoma Way, Tacoma, Washington  
Groundwater Characterization and Remedial Feasibility Study  
June 2013

---

<b>1.0 Introduction</b> .....	<b>1</b>
1.1 PURPOSE AND OBJECTIVES .....	1
<b>2.0 Site Description</b> .....	<b>1</b>
2.1 BACKGROUND .....	1
<b>3.0 Field Activities</b> .....	<b>2</b>
3.1 SAMPLE SUBMITTAL, STORAGE, AND HANDLING .....	3
<b>4.0 Sample Analysis and Results</b> .....	<b>3</b>
4.1 ANALYTICAL RESULTS .....	3
4.2 LABORATORY QA/QC .....	3
<b>5.0 Data Reduction, Validation, and Reporting</b> .....	<b>4</b>
5.1 REDUCTION .....	4
5.2 VALIDATION .....	4
5.3 REPORTING .....	4
<b>6.0 Conceptual Site Model</b> .....	<b>4</b>
6.1 SOIL .....	4
6.2 GROUNDWATER .....	4
<b>7.0 Feasibility Study and Disproportionate Cost Analysis</b> .....	<b>5</b>
7.1 EXISTING STATUS .....	5
7.2 REMEDIAL ACTION OPTIONS .....	5
7.3 SUMMARY .....	7
<b>8.0 Terrestrial Ecological Evaluation</b> .....	<b>8</b>
<b>9.0 Conclusions</b> .....	<b>8</b>
<b>8.0 Recommendations</b> .....	<b>8</b>
<b>9.0 Limitations</b> .....	<b>8</b>
<b>10.0 References</b> .....	<b>9</b>

**FIGURES**

FIGURE 1	SITE VICINITY MAP
FIGURE 2	MONITORING WELL, BORING AND CROSS SECTION LOCATION MAP
FIGURE 3	GROUNDWATER ELEVATION MAP
FIGURE 4	CONCEPTUAL CROSS SECTION A-A'
FIGURE 5	CONCEPTUAL CROSS SECTION B-B'
FIGURE 6	BORING B-20 GEOLOGIC LOG
FIGURES 7A-D	MONITORING WELL LOGS

**APPENDICES**

APPENDIX A	LABORATORY ANALYTICAL RESULTS
APPENDIX B	GROUNDWATER SAMPLING SHEETS
APPENDIX C	TERRESTRIAL ECOLOGICAL EVALUATION FORM
APPENDIX D	PREVIOUS REPORT



Founder's Choice Cabinets and Countertops  
1517 S. Tacoma Way, Tacoma, Washington  
Groundwater Characterization and Remedial Feasibility Study  
June 2013

---

## 1.0 Introduction

### 1.1 Purpose and Objectives

This report documents a series of investigative field efforts at the subject site in Tacoma, Washington designed to assess and characterize the presence of petroleum-hydrocarbon contaminants in soils and possibly groundwater. Four separate field events are discussed herein.

## 2.0 Site Description

The site is located at 1517 South Tacoma Way, Tacoma, Washington. It is comprised of three tax parcels which have been assigned parcel numbers 7105000300, 7105000301, and 7105000340 by the Pierce County Assessor-Treasurer's office. The location and layout of the subject are noted in Figures 1 and 2.

Troost (in review) maps the surface geology of the site as Quaternary Vashon Steilacoom gravel deposits located within the South Tacoma Channel (labeled Qvsst4). These deposits consist of open-work sandy gravels with cobbles. As noted in our previous work and on the monitoring well and boring logs attached as Figures 7a through 7d, we observed brown gravelly sand to depths of at least 40 feet. As discussed herein, groundwater was encountered at between 28 and 34 feet below ground surface (bgs).

### 2.1 Background

A 2012 Phase I Environmental Site Assessment prepared by Associated Environmental Services, Inc. (AESI) described the presence of three possible recognized environmental conditions (RECs). These included a property adjacent to the subject that was historically used as a gas station, a former heavy fuel-oil (bunker) tank that was removed from the site in the early 1990s, and a historical 500-gallon heating-oil tank that was also alleged to have been removed around the same time.

Robinson Noble, Inc. completed four field events from September 2012 to December 2012 in an effort to delineate the extent of heating-oil impacted soil contamination. Nineteen borings completed to evaluate the extent of contamination from the former heating-oil tank identified impacts covering approximately 2,500 square feet. Soils in this area exhibit a zone of contamination generally between 15-18 feet below the ground surface. The results of these investigations are documented in our March 2013 site investigation report, a copy of which is located in Appendix D.

The aforementioned report recommended the following additional efforts:

1. Prepare and submit application materials for entry into the Washington Department of Ecology's Voluntary Cleanup Program.
2. Complete additional characterization consisting of the installation of four groundwater monitoring wells and one additional soil boring. The purpose of the soil boring is to evaluate the maximum vertical extent of the contamination in the area of boring B13. The

purpose of the groundwater monitoring wells is to assess whether or not groundwater has been impacted by the contaminants identified on site along with evaluation of groundwater flow direction and gradient across the impacted area.

3. Assuming groundwater impacts are not found, submit a final remedial investigation and feasibility study report, including disproportional cost analysis and cleanup (closure) action plan, to Ecology. If groundwater is impacted, then additional investigation and/or cleanup actions will be developed and presented to Ecology for review.

Item 1 was completed and the site was accepted into Washington State Department of Ecology's (Ecology) Voluntary Cleanup Program (VCP) on April 9, 2013. It has been assigned VCP Identification Number SW1292.

The remaining items are addressed in this report.

### 3.0 Field Activities

Monitoring well installation and soil boring activities were completed from April 22 through April 24. Monitoring well development and groundwater sampling activities took place from April 29 to May 1.

Holt Services, Inc. provided licensed drilling services to drill and install four groundwater monitoring wells (MW-2, MW-2, MW-3, MW-4). They also provided services to complete a single soil boring (B-20). The monitoring wells were located to assess the presence or absence of groundwater impacts as a result of the existing soil contaminant plume. Boring B-20 was completed to evaluate the maximum vertical extent of soil contamination near the previously completed boring B-13. Figure 2 depicts the locations of the monitoring wells and the borings completed to date at the site.

The subsurface geology observed was approximately ten feet of silty sand and gravel over gravelly sand above a fine sand. These observations are consistent with the sediments encountered in previous borings. The subsurface geology, along with monitoring well construction details, are shown on the boring and monitoring well logs, attached.

Field screening and collection of soil samples for laboratory analysis were limited to boring B-20. Slight fuel-oil odor was noted at depths of between 24 and 32 feet. Soil samples were collected and submitted for laboratory analysis.

After the completion of boring and monitoring well installation, each well was developed using surge-block techniques. After development, the wells were allowed to stabilize for 24 hours and then purged and sampled.

The wells were opened and allowed to stabilize before water levels were sounded. Table 1 displays the depth to water measured in each well, which are also show on Figure 3.

Table 1. May 24, 2013 water levels (in feet)

Well No.	Top of Casing Elevation*	Depth to Groundwater	Groundwater Elevation*
MW1	245.81	29.03	216.78
MW-2	245.58	28.76	216.82
MW-3	246.22	29.39	216.83
MW-4	250.88	34.04	216.84

\* Elevations based on NGVD 1929 Tacoma datum were surveyed by Contour Engineering, LLC

A bladder pump and dedicated tubing were used to sample each well. Samples were collected after water purged from the wells had stabilized field measurements of temperature, conductivity, total dissolved solids, and dissolved oxygen (within measurement error limits). The groundwater monitoring field sampling notes are attached in Appendix B.

Water samples were collected from the four wells and placed into laboratory-supplied, pre-cleaned containers with the proper preservatives for delivery to an accredited laboratory. The samples were placed in a laboratory-supplied, thick-walled cooler containing blue ice. The samples were delivered to Libby Environmental, Inc. of Olympia, Washington. The samples were submitted for analysis using Ecology NWTPH-Dx.

### 3.1 Sample Submittal, Storage, and Handling

Soil samples were collected using methodologies appropriate for diesel-range petroleum hydrocarbons. Stainless-steel spoons were used to place soil into laboratory-supplied four-ounce glass jars except for volatile organic and EPH/VPH extractable and volatile hydrocarbon fraction samples, which were collected using EPA 5035 techniques. The properly labeled samples were submitted directly to the on-site mobile laboratory for analysis. The unused soil samples and EPH/VPH samples were refrigerated by the mobile laboratory for long-term storage after appropriate preservation requirements were applied.

The chain-of-custody form (attached) displays the details of the on-site sample submittal to Libby. Each sample was tracked on the form with the details of the sample's identity, identity of handlers responsible for the samples, and analyses to be performed.

## 4.0 Sample Analysis and Results

Analysis of samples was completed using NWTPH-DX by Libby Environmental, Inc. (Libby).

### 4.1 Analytical Results

The laboratory analytical results are attached in Appendix A. Groundwater samples submitted for analysis did not reveal concentrations of diesel-range petroleum hydrocarbons above laboratory detection levels.

In addition to the groundwater samples, four soil samples were submitted from boring B-20. As noted in Section 3.0, this boring was completed to further characterize the vertical extent of soil contamination in the vicinity of boring B-13. The analytical results are shown in Table 2 below.

Table 2. Boring B-20 diesel-range heating oil soil analytical results (mg/kg)

Sample identification depth, in feet	Diesel-range TPH (NWTPH-DX) in mg/Kg
B20-25.5'	10,720
B20-27'	3,420
B20-30'	570
B20-32'	1,190
MTCA Method A Cleanup Limit	2,000

### 4.2 Laboratory QA/QC

With the exception of matrix interferences caused by high-analyte concentrations, the laboratory analyses were within the guidelines and control limits established by the laboratory and the analytical method. Therefore, the analyses were within acceptable QA/QC boundaries.

## 5.0 Data Reduction, Validation, and Reporting

### 5.1 Reduction

The raw data from the investigation are digitally stored on file. Reviews of the data show no inconsistencies or concerns.

### 5.2 Validation

Quality assurance and quality control results reported by the laboratory confirmed the data is consistent and repeatable. The laboratory indicates that all samples analyzed and recorded fall within acceptable QA/QC limitations.

According to our review, quality control data for the chain-of-custody, sample holding times, laboratory blanks, blind field duplicates, laboratory surrogate recoveries, and field documentation are acceptable.

### 5.3 Reporting

The laboratory results (attached) include a cover letter report from Libby explaining the details regarding the analysis, the chain-of-custody forms, the sample summary results, and the summary of the laboratory QA/QC.

## 6.0 Conceptual Site Model

### 6.1 Soil

Remedial investigations and a limited removal of contaminated soil completed from September 2012 to May 2013 have identified approximately 583 cubic yards (875 tons) of diesel-range heating-oil contaminated soil. Approximately 96 cubic yards (144 tons) were previously excavated and disposed of at a permitted off-site location (LRI-Pierce County Landfill). The contaminant plume consists of an approximately five to eight foot thick zone. This zone of contamination is underneath between 13 and 23 feet of overburden that is not impacted above MTCA Method A Cleanup levels. It appears that the migration of contaminants in the unsaturated environment occurred following preferential pathways created by slight differences in permeability caused by varying amounts of silt and reduction in grain size from medium to somewhat finer sands.

Figures 4 and 5 graphically illustrate the distribution of the contaminants. Much of the remaining soil contamination is located underneath a portion of the existing office structure with the remainder in parking areas, landscaping adjacent to the building, and within the public-right-of-way.

### 6.2 Groundwater

As stated in Section 2.0, the subject is located within the South Tacoma Channel area of the City of Tacoma. Drinking water in the area is supplied by the City of Tacoma. This area has been designated an Aquifer Protection District by City of Tacoma Ordinance. This district is known as the South Tacoma Groundwater Protection District (STGPD). The STGPD was created to provide for the protection of groundwater resources used by the City of Tacoma. Groundwater wells in the area may supply up to 50% of Tacoma's peak summer drinking water demand. Past historical industrial uses in the area have resulted in impacts to this supply. Groundwater in the immediate area of the subject is mapped with respect to wellhead protection by Ecology and the Washington Department of Health as moderately susceptible to impact within the 5-

year time-of-travel. This implies that any impacts to groundwater are not likely to pose immediate risks to municipal drinking water supplies.

The calculated groundwater gradient is 0.0012 feet toward the east. The essentially flat potentiometric surface suggests that any release of contaminants into groundwater would likely remain close to the source. Based on the relatively permeable nature of the observed subsurface geology and the age of the release, it is reasonable to conclude that, if the volume released were sufficient to impact groundwater, it would have already occurred. Based on the absence of detectable concentrations in groundwater, the risk of future impacts to groundwater is likely to be low. The groundwater elevations are depicted on Figure 3.

## 7.0 Feasibility Study and Disproportionate Cost Analysis

Remedial investigations and a limited removal of contaminated soil completed from September 2012 to May 2013 have identified approximately 583 cubic yards (875 tons) of diesel-range heating oil contaminated soil.

MTCA defines that the evaluation of whether or not a cleanup action uses permanent solutions to the "maximum extent practicable" should be based on a disproportionate cost analysis consistent with the requirements of WAC 173-340-360(e). In that analysis, cleanup alternatives are arranged from most to least permanent based on the criteria contained in WAC 173-340-360(f).

The disproportionate cost analysis then compares the relative environmental benefits of each alternative against those provided by the most permanent alternative evaluated. The assessment of benefits can be qualitative as well as quantitative. Costs are disproportionate to benefits if the incremental costs of the more permanent alternative exceed the incremental degree of benefits achieved by the other lower cost alternative (WAC 173-340-360(e) (i)). Alternatives which exhibit such disproportionate costs are considered "impracticable." Where the quantitative and qualitative benefits of two alternatives are equivalent, MTCA specifies that Department of Ecology shall select the less costly alternative (WAC 173-340-360(e)(ii)(c)).

### 7.1 Existing Status

As previously documented and noted above, an area of impacted soil remains underneath an existing office structure within the public right-of-way and within a parking/drive-way area of the subject. Remedial excavation of the original tank cavity was conducted to the extent allowed by the proximity to the building.

### 7.2 Remedial Action Options

The existing data indicate that the residual soil concentrations are above MCTA Method A cleanup levels. Groundwater is not impacted above MTCA limits. The absence of groundwater impact and the relative amount of contamination likely preclude the practical consideration of in-situ remedial options. Additionally, given the amount of unimpacted overburden, the subsurface geology and the location of the existing office building as well as utilities, excavation and off-site disposal is equally problematic.

However, in an effort to thoroughly evaluate the relative costs and benefits of various closure strategies, we have evaluated the following remedial options.

- Institutional controls consisting of environmental covenants and long-term groundwater monitoring.
- Excavation and off-site disposal of impacted soils.

- In-situ treatment using low-temperature thermal desorption.

The selected options were evaluated according to the criteria specified in WAC 173-340-360 3(e) which are 1) protectiveness, 2) permanence, 3) cost, 4) long-term effectiveness, 5) short-term risk management, 6) implementability (technical and administrative), and 7) consideration of public concerns. The results of our evaluation are as follows.

1. **Protectiveness** – Excavation and off-site disposal would remove the contaminants from the site and dispose of them in a permitted landfill. This removes the contaminant risk from the site and transfers it to a protected or managed location. In-situ thermal desorption removes contaminants. The removed contaminants are either captured by filter media or discharged into the air by permit. It also removes the risk from the site. The implementation of institutional controls manages the risk by monitoring currently unimpacted groundwater as a point of compliance and providing for activity and use limitations that control exposures to the contaminants.

Each of these options provides protection against exposures, and therefore, are qualitatively equally protective.

2. **Permanence** – In-situ thermal desorption is the most permanent option, to the extent that it removes contaminants from the subject and transfers them to filter media or ambient air as governed by permit. In reality, this method reduces the volume of contaminants that have to be removed from the site and properly disposed of or it simply transfers the contaminants into a different matrix. If the bulk of the contaminants are contained in filter media and ultimately destroyed, then this method is permanent. However, our experience is that the bulk of the contaminants are transferred into the air.

Excavation and off-site disposal permanently removes contaminants from the site, however, it simply relocates the contaminants to a controlled facility (landfill). Although it does not really eliminate the contaminants because the relocation is to a managed facility, it is more permanent than transferring contaminants to a different matrix (air).

3. **Costs** – As outlined in the following table, the costs for in-situ thermal desorption and excavation and off-site disposal are equal to or greater than fourteen times the cost of implementation of institutional controls.

Table 3. Cost comparison

Task	Excavation and off-site disposal	Institutional control and long-term groundwater monitoring	In-situ thermal desorption
Contaminated soil excavation and backfill*	\$30,000	N/A	N/A
Contaminated soil transport and* disposal	\$28,000	N/A	N/A
Heating probe installation	N/A	N/A	\$75,000
Extraction well installation	N/A	N/A	\$75,000
Controls, motors and pollution control equipment	N/A	N/A	\$75,000
O&M (three years)	N/A	N/A	\$150,000
Building demolition	\$35,000	N/A	N/A

Task	Excavation and off-site disposal	Institutional control and long-term groundwater monitoring	In-situ thermal desorption
Engineering and permitting for utility relocation and restoration	\$25,000	N/A	\$5,000
Utility relocation and restoration	\$50,000	N/A	\$15,000
Building reconstruction	\$200,000	N/A	N/A
Engineering and permitting for roadway/side walk removal and repair	\$10,000	N/A	N/A
Sidewalk and roadway repair	\$25,000	N/A	N/A
Preparation and filing of environmental covenant	N/A	\$1,000	
Long-term monitoring (five years)	N/A	\$28,000**	\$65,000***
Total cost	\$403,000	\$29,000	\$460,000

\* The excavation estimates are based on 875 tons of contaminated soil requiring removal and disposal

\*\* Assumes one year of quarterly monitoring and five years of monitoring at 18-month intervals

\*\*\* Assumes quarterly monitoring for three years

4. **Effectiveness over the long term** – Given the stable nature of the contaminants and the nature of the selected options, they are equally effective; although the use of institutional controls will require the implementation of activity and use limitations set forth in an environmental covenant.
5. **Management of short-term risks** – The short-term risks posed by excavation and off-site disposal or the use of thermal desorption consist primarily of potential non-cleanup worker exposure to contaminants during excavation activities and from safety risks posed by an operating business and working near arterial roads.

Given the current stable nature of the site, there are no significant short-term risks associated with the implementation of institutional controls and groundwater monitoring.

6. **Implementability** – Each of the options can technically be implemented. However, they all have different timelines and levels of complexity. If timelines are used to compare the effective implementability of each option, the use of institutional controls and groundwater monitoring, which can be implemented immediately, is the preferred option. Excavation and off-site disposal, which would require demolition permits, relocation of utilities, restoration of the site post-removal, and reconstruction of the office building, is the most implementable.
7. **Consideration of public concerns** – Given the scope of the project and the commercial nature of the area, public concern is not expected for any of the options studied.

### 7.3 Summary

Considering the technical challenges, costs, and time frames associated with in-situ thermal treatment and excavation/off-site disposal, the practicality of these options is limited. This limitation leads us to opine that the proposed implementation of institutional controls and long-term groundwater monitoring option is at least equally protective. As shown above, the institutional control option possesses substantially lower implementation costs. Therefore, the costs of in-situ thermal remediation and excavation/off-site disposal are considered to be substantially

disproportionate to the reduction in risk when compared to the preferred option of implementing institutional controls.

## 8.0 Terrestrial Ecological Evaluation

The subject property and surrounding area is zoned industrial by the City of Tacoma, Washington. The residual soil contamination is covered by existing sidewalks and asphalt parking roadway or at least 12 feet of unimpacted soil. As noted on the Terrestrial Ecological Evaluation process Primary Exclusion Documentation Form located in Appendix C, all soil contamination is, or will be, at least six feet below the surface and institutional controls will be used to manage remaining contamination. Additionally, there is less than 0.25 acres of contiguous undeveloped land on or within 500 feet of any area of the site and none of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.

## 9.0 Conclusions

Investigative activities completed to date have determined approximately 875 tons of heating oil contaminated soil are present at the site. Groundwater is not impacted.

The evaluation of remedial options detailed in Section 7.0 show that, given the absence of groundwater contamination above MTCA method A limits and the removal of accessible contaminated soil, the cost of further remedial actions designed to remove or further reduce the remaining residual soil contaminants is substantially disproportionate to the additional reduction in risk when compared to the implementation of institutional controls. Further, the analysis indicates there is little risk to the terrestrial ecosystem proximal to the subject. Thus, closure of this site by implementing institutional controls and long-term groundwater monitoring is appropriate and protective of human and ecological health.

## 8.0 Recommendations

We recommend that quarterly groundwater monitoring be completed for two additional quarters. Assuming that groundwater remains unimpacted, a long-term groundwater monitoring plan should be prepared and submitted to Ecology for review and approval. This long-term monitoring plan should provide for monitoring at 18-month intervals. Subsequent to determination by the Washington State Department of Ecology that a no-further-action determination is likely, an environmental covenant specifying the institutional controls and requisite long-term groundwater monitoring program should be prepared and recorded with the Pierce County Auditor.

## 9.0 Limitations

The services described in this report were performed consistently with generally accepted environmental consulting principles and practices. No other warranty, expressed or implied, is made. These services were consistent with the Robinson Noble, Inc. agreement with the client. This report is solely for the use and information of the client unless otherwise noted. Any reliance on this report by a third party is at the party's sole risk.

Opinions and recommendations contained in this report apply to existing conditions when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. Since site conditions and regulations beyond our control could change at any time after the completion of our site visit, we are not responsible for the impacts of any changes in environmental conditions, standards, practices, or regulations sub-

sequent to performance of services. We do not warrant the accuracy of information supplied by others, nor do we warrant the use of segregated portions of this report.

## 10.0 References

Libby Environmental Services, Inc.

Tacoma-Pierce County Health Department

Troost, in review, Geologic map of the Tacoma-south 7.5-minute quadrangle, scale 1:24,000

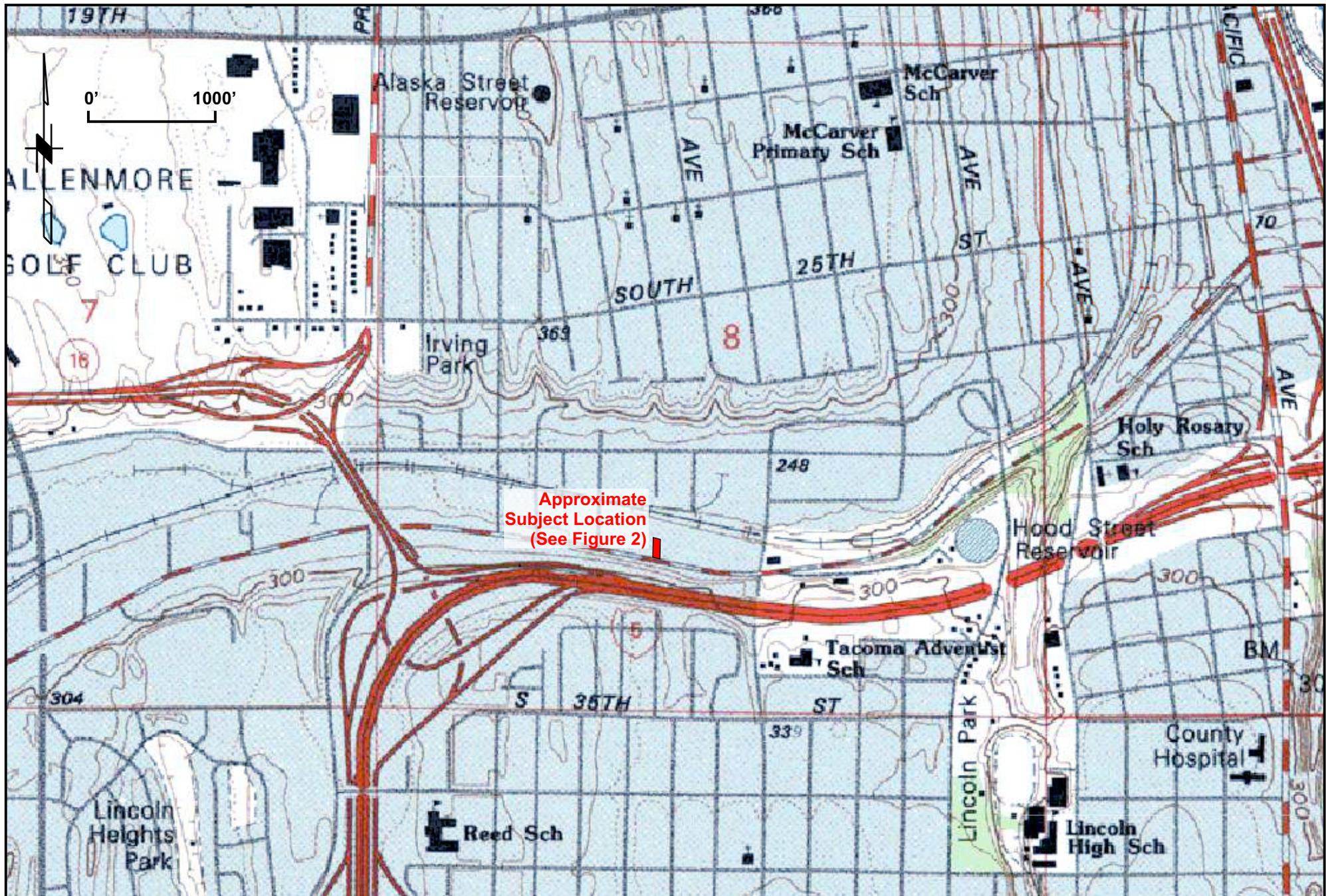
Washington State Department of Ecology, Toxics Cleanup Program, Revised November 2007, The Model Toxics Control Act Statute and Regulation, Chapter 173-340 WAC, publication no. 94-06

Washington State Department of Ecology, Toxics Cleanup Program, February 1996, Cleanup Levels and Risk Calculations (CLARC), Publication No. 94-145

Washington State Department of Ecology, June 1997, Analytical Methods for Petroleum Hydrocarbons, publication no. ECY 97-602

## FIGURES

---



Approximate  
Subject Location  
(See Figure 2)



Note: Basemap taken from USGS Tacoma South Quadrangle

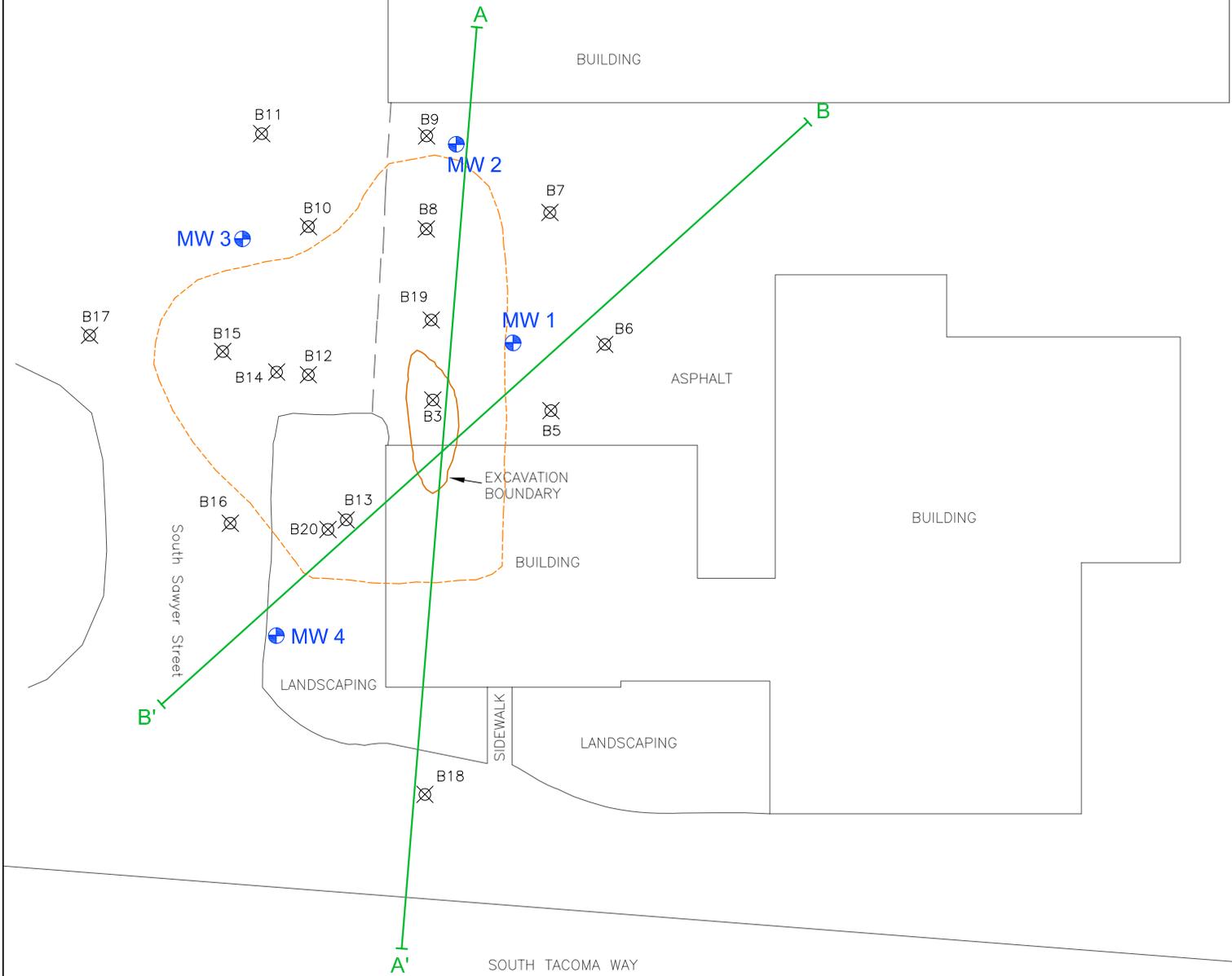
PM: JFH  
June 2013  
2754-001C

Pierce County  
T 20 N/R 03 E - 08  
Scale 1" = 1000'

Figure 1  
Vicinity Map  
Founder's Choice: Groundwater Characterization & Remedial Feasibility Study

**Legend:**

-  Monitoring Well Location
-  Boring Location
-  Plume Boundary
-  Excavation Boundary
-  Cross Section (See figures 4 & 5)



**Legend:**

- 216.82' Groundwater Elevation
- Monitoring Well Location
- Boring Location
- Plume Boundary
- Excavation Boundary



BUILDING

B11

B9

MW 2  
216.82'

B7

MW 3  
216.83'

B10

B8

B17

B15

B14

B12

B19

MW 1  
216.78'

B6

ASPHALT

B3

B5

EXCAVATION  
BOUNDARY

BUILDING

B16

B13

B20

BUILDING

South Sawyer Street

MW 4  
216.84'

LANDSCAPING

SIDEWALK

LANDSCAPING

B18

SOUTH TACOMA WAY



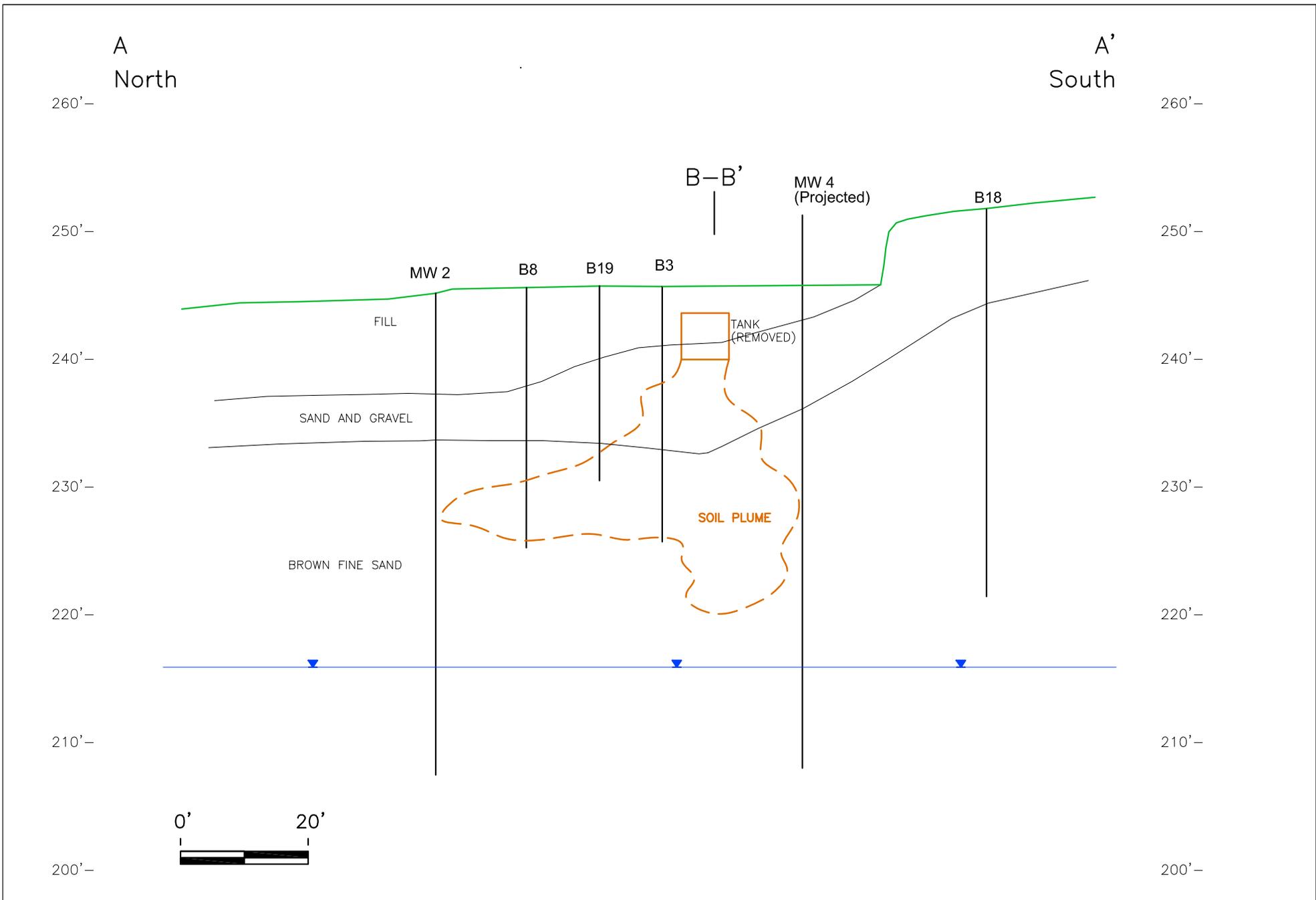
PM: JFH  
June 2013  
2754-001C

Pierce County  
T 20 N/R 03 E - 08  
Scale 1" = 20'

Founder's Choice: GW Characterization & Remedial Feas. Study

Figure 3

**Groundwater Elevation Map**

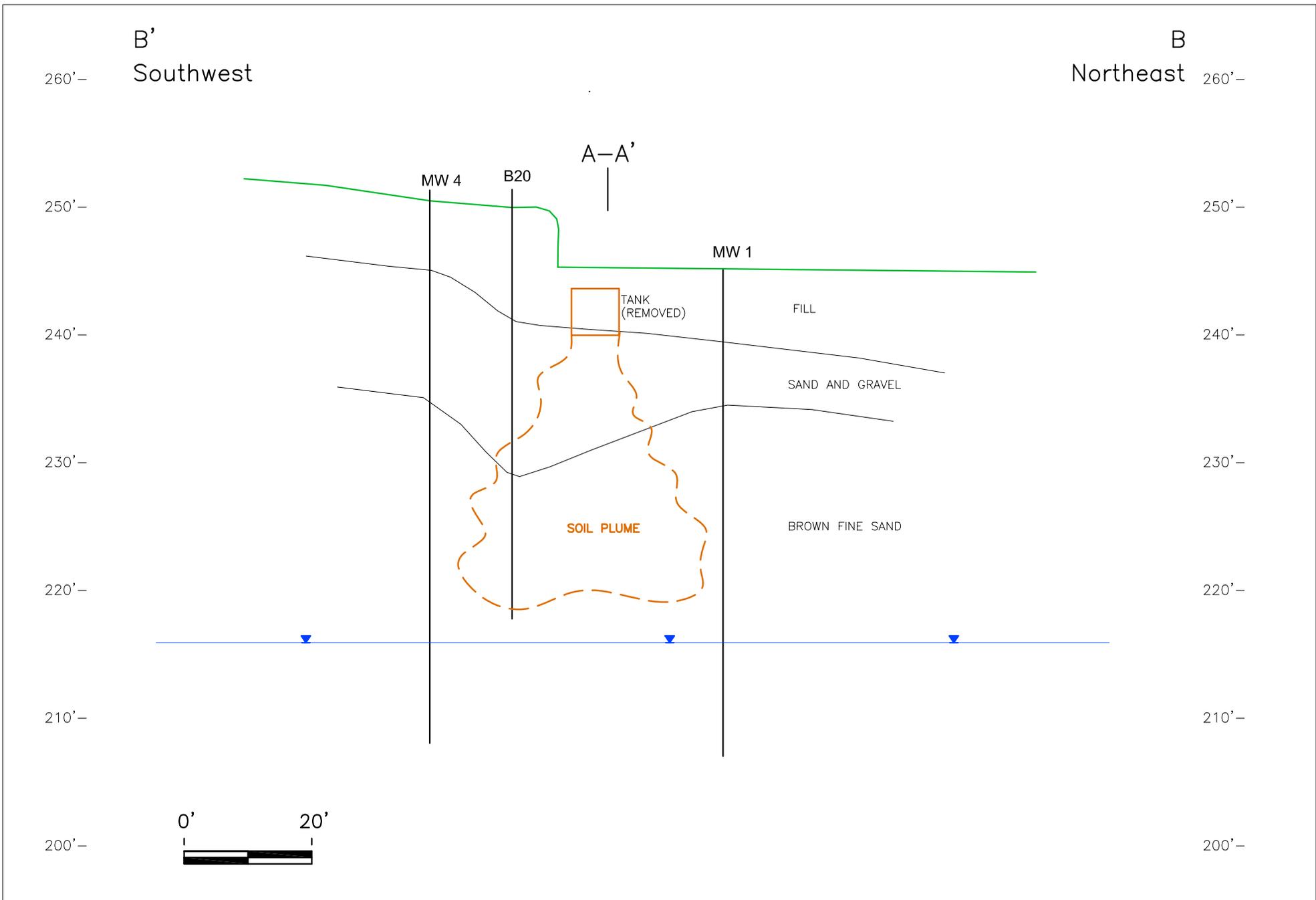


PM: JFH  
 June 2013  
 2754-001C

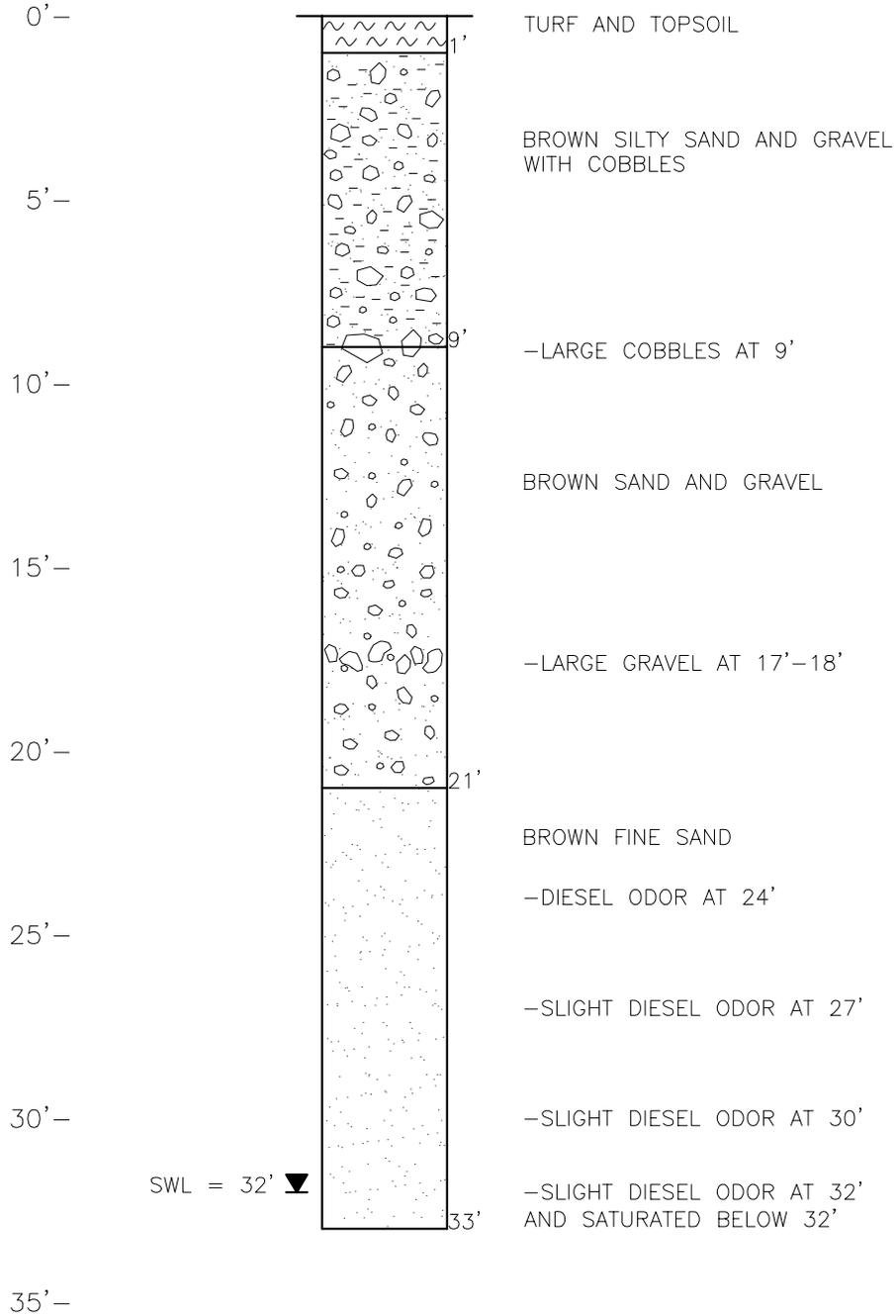
Pierce County  
 T 20 N/R 03 E - 08

Horizontal Scale 1" = 20'  
 Vertical Scale 1" = 10'  
 2:1 Vertical Exaggeration

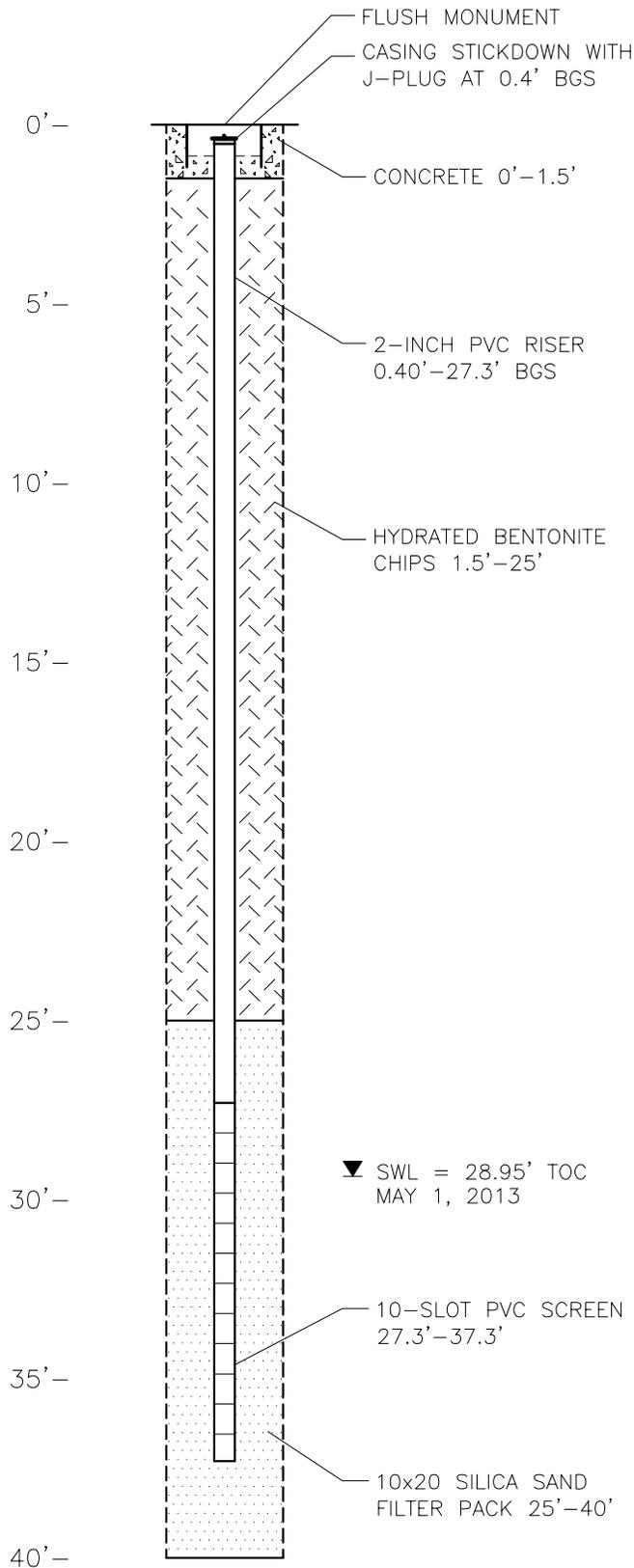
Figure 4  
**Conceptual Cross Section A-A'**  
 Founder's Choice: GW Characterization & Remedial Feasibility Study



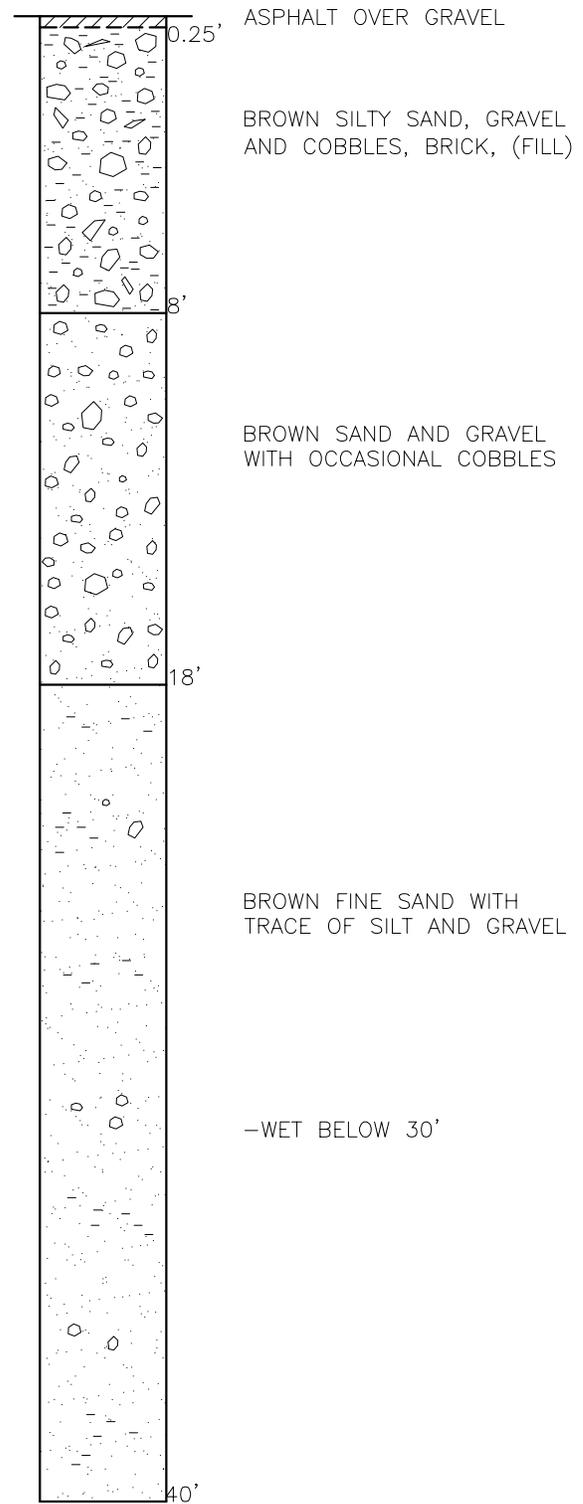
# Geologic Log



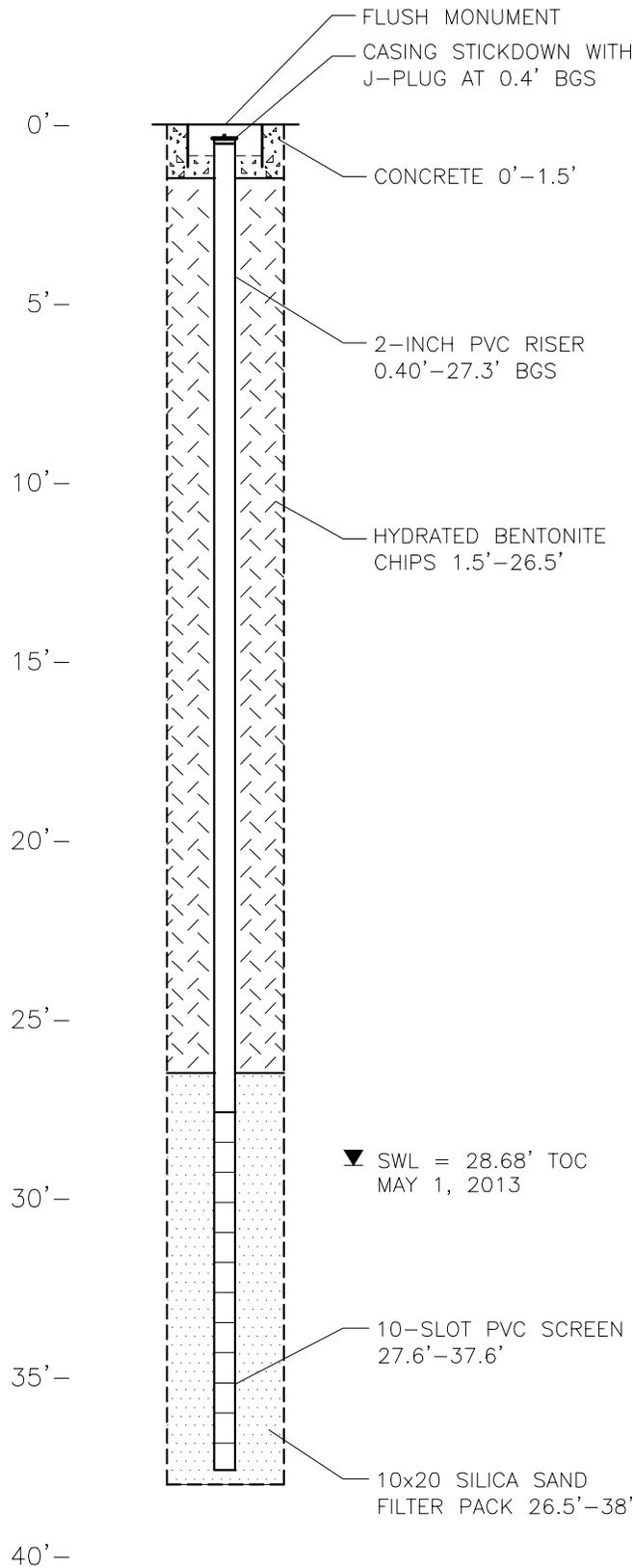
### Construction Detail



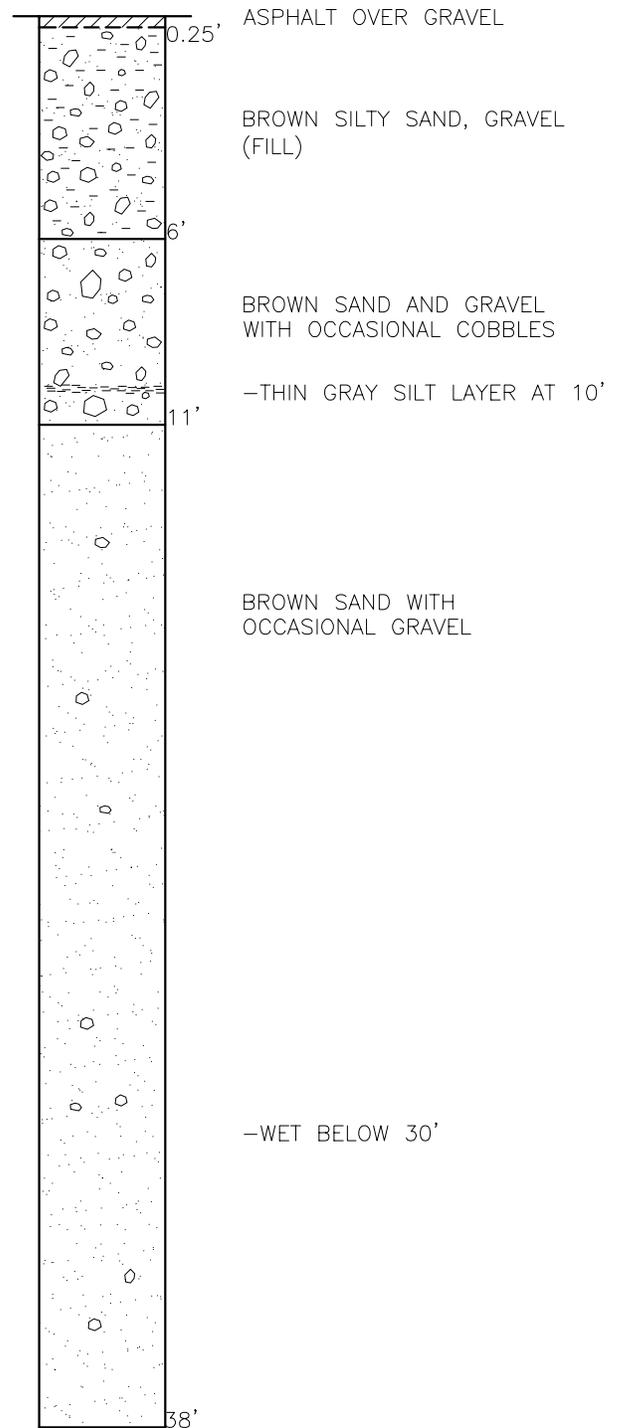
### Geologic Log



### Construction Detail

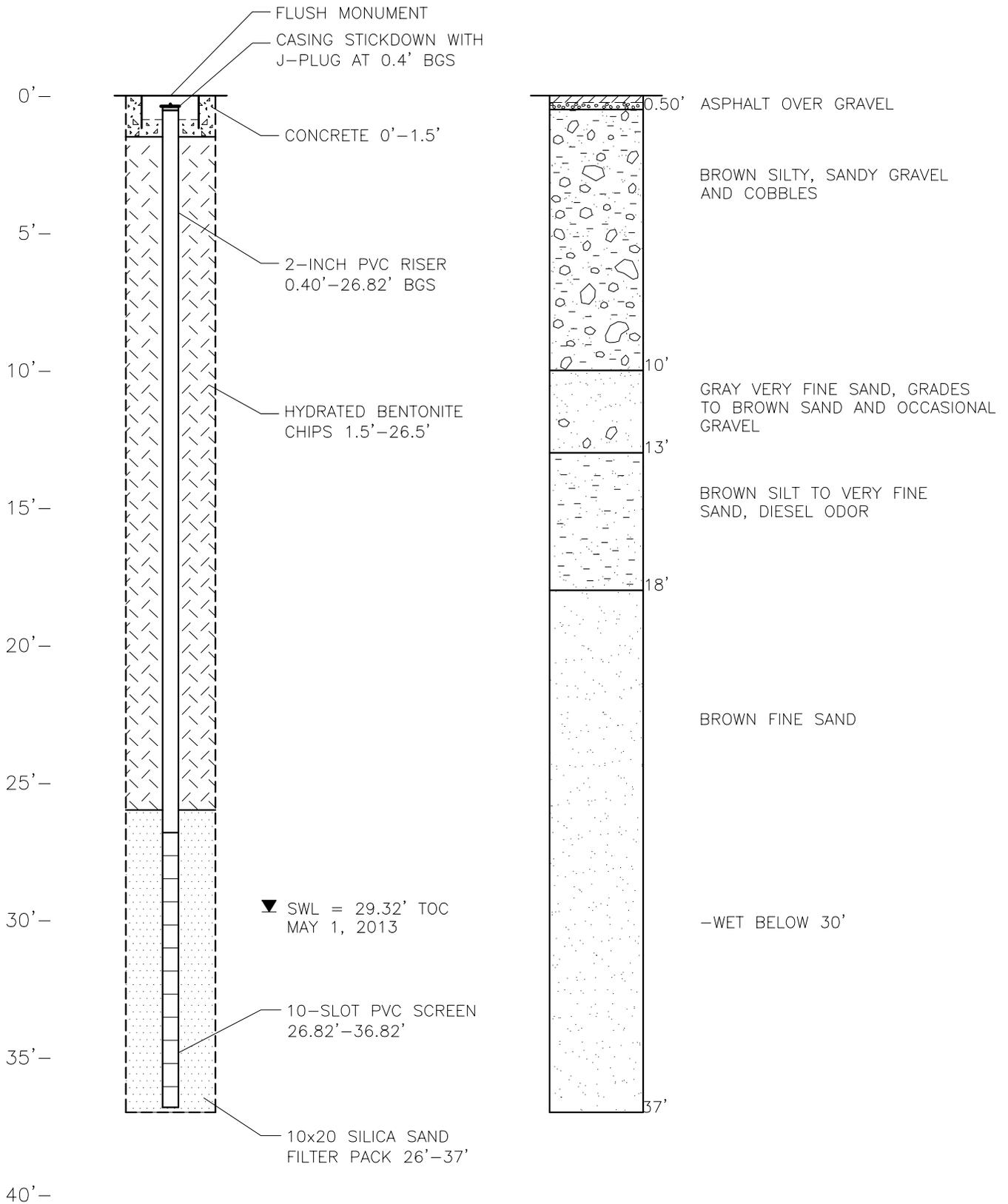


### Geologic Log

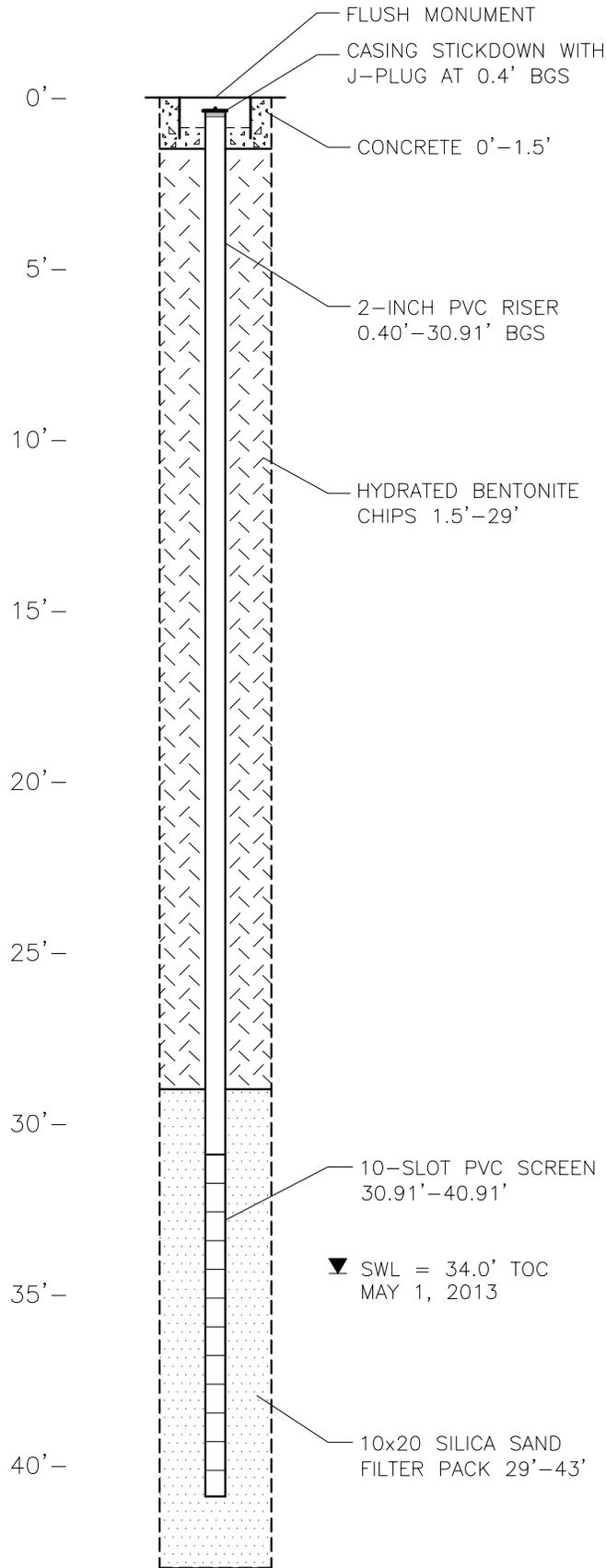


### Construction Detail

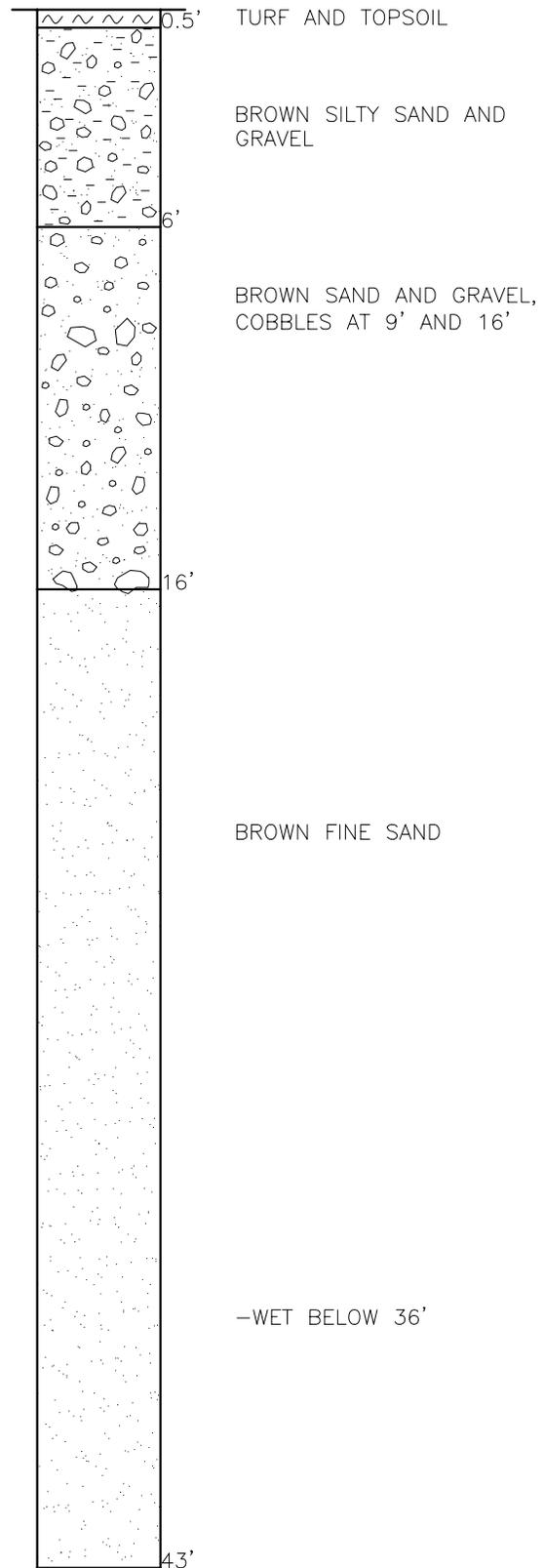
### Geologic Log



### Construction Detail



### Geologic Log



## APPENDIX A

---



# Libby Environmental, Inc.

4139 Libby Road NE • Olympia, WA 98506-2518

May 10, 2013

John Hildenbrand  
Robinson Noble  
3011 Huson Street South  
Suite A  
Tacoma, WA 98409

Dear Mr. Hildenbrand:

Please find enclosed the analytical data report for the Founders Choice Cabinets Project located in Tacoma, Washington. Soil samples were analyzed for Diesel & Oil by NWTPH-Dx/Dx Extended on May 3, 2013.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. All soil samples are reported on a dry weight basis. An invoice for this analytical work is enclosed.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Jamie L. Deyman  
*President*  
*Libby Environmental, Inc.*

Phone (360) 352-2110 • Fax (360) 352-4154 • [libbyenv@aol.com](mailto:libbyenv@aol.com)

[www.LibbyEnvironmental.com](http://www.LibbyEnvironmental.com)

# Libby Environmental, Inc.

4139 Libby Road NE

Olympia, WA 98506

Phone: (360) 352-2110

FAX: (360) 352-4154

Email: libbyenv@aol.com

## FOUNDERS CHOICE CABINETS PROJECT

Robinson Noble

Tacoma, Washington

Libby Project # L130502-4

Client Project # 2754-001C

### Analyses of Diesel & Oil (NWTPH-Dx/Dx Extended) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel ( $\mu\text{g/l}$ )	Oil ( $\mu\text{g/l}$ )
Method Blank	5/3/13	105	nd	nd
MW-4	5/3/13	112	nd	nd
MW-4 Dup	5/3/13	96	nd	nd
MW-2	5/3/13	102	nd	nd
MW-1	5/3/13	80	nd	nd
MW-3	5/3/13	98	nd	nd
Practical Quantitation Limit			200	400

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Paul Burke





# Libby Environmental, Inc.

4139 Libby Road NE • Olympia, WA 98506-2518

May 10, 2013

John Hildenbrand  
Robinson Noble  
3011 Huson Street South  
Suite A  
Tacoma, WA 98409

Dear Mr. Hildenbrand:

Please find enclosed the analytical data report for the 1517 South Tacoma Way Project located in Tacoma, Washington. Soil samples were analyzed for Diesel by NWTPH-Dx on April 30, 2013.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. All soil samples are reported on a dry weight basis. An invoice for this analytical work has been sent to Founders Choice Cabinets.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Jamie L. Deyman  
*President*  
*Libby Environmental, Inc.*

Phone (360) 352-2110 • Fax (360) 352-4154 • [libbyenv@aol.com](mailto:libbyenv@aol.com)

[www.LibbyEnvironmental.com](http://www.LibbyEnvironmental.com)

# Libby Environmental, Inc.

1517 SOUTH TACOMA WAY PROJECT  
Robinson Noble  
Tacoma, Washington  
Libby Project # L130429-1  
Client Project # 2754-001C

4139 Libby Road NE  
Olympia, WA 98506  
Phone: (360) 352-2110  
FAX: (360) 352-4154  
Email: libbyenv@aol.com

## Analyses of Diesel (NWTPH-Dx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)
Method Blank	4/30/13	107	nd
B20-25.5	4/30/13	int	10720
B20-27	4/30/13	int	3420
Practical Quantitation Limit			25

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Kyle Williams

# Libby Environmental, Inc.

# Chain of Custody Record

4139 Libby Road NE  
 Olympia, WA 98506  
 Ph: 360-352-2110  
 Fax: 360-352-4154

Date: April 29 Page: 1 of 1

Client: Robinson Noble

Project Manager: Hildenbrand

Address: 3011 S Huson #A

Project Name: 1517 South Tacoma Way

Phone: 475 7711 Fax: 472 5846

Location: \_\_\_\_\_ City: Tacoma

Client Project # Q754-001C

Collector: Rehowski Date of Collection: 4-27-2013



Sample Number	Depth	Time	Sample Type	Container Type	Analytes											Field Notes											
					VOA 8021B	VOA 8021B BTEX Only	VOA 8260	SEMI VOL 8270	NWTPH-HCID	NWTPH-Gx	NWTPH-Dx	PAH 8270	PCB's 8082	MTCA 5 Metals													
1	25.5	10:00	Soil	402																							
2	27'	10:14	Soil	402																							
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											
13																											
14																											
15																											
16																											
17																											
18																											

Relinquished by: <u>[Signature]</u>	Date / Time	Received by: <u>[Signature]</u>	Date / Time: <u>4/29 9:50</u>	Sample Receipt:	Remarks: <u>Bill to Owner</u> <u>David Sizemore</u> <u>STD</u>
Relinquished by:	Date / Time	Received by:	Date / Time	Good Condition?	
Relinquished by:	Date / Time	Received by:	Date / Time	Cold?	
Relinquished by:	Date / Time	Received by:	Date / Time	Seals Intact?	
				Total Number of Containers	



# Libby Environmental, Inc.

4139 Libby Road NE • Olympia, WA 98506-2518

May 15, 2013

John Hildenbrand  
Robinson Noble  
3011 Huson Street South  
Suite A  
Tacoma, WA 98409

Dear Mr. Hildenbrand:

Please find enclosed the analytical data report for the Founders Choice Project located in Tacoma, Washington. Soil samples were analyzed for Diesel by NWTPH-Dx on May 8, 2013.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. All soil samples are reported on a dry weight basis. An invoice for this analytical work is enclosed.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Jamie L. Deyman  
*President*  
*Libby Environmental, Inc.*

Phone (360) 352-2110 • Fax (360) 352-4154 • [libbyenv@aol.com](mailto:libbyenv@aol.com)

[www.LibbyEnvironmental.com](http://www.LibbyEnvironmental.com)

# Libby Environmental, Inc.

4139 Libby Road NE

Olympia, WA 98506

Phone: (360) 352-2110

FAX: (360) 352-4154

Email: libbyenv@aol.com

## FOUNDER'S CHOICE PROJECT

Robinson Noble

Tacoma, Washington

Libby Project # L130508-2

Client Project # 2754-001C

### Analyses of Diesel (NWTPH-Dx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)
Method Blank	5/8/13	96	nd
Boring-30'	5/8/13	int	570
Boring-32'	5/8/13	int	1190
Practical Quantitation Limit			25

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Paul Burke

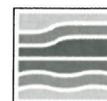


## APPENDIX B

---

# Groundwater Sampling Record

Robinson Noble, Inc.  
3011 S. Huson Street, Suite A  
Tacoma, Washington 98409  
(253) 475-7711



**ROBINSON**  
**NOBLE**

Project Name: Founder's choice cabinets  
Project Number: 2754-001C Project field book no.: \_\_\_\_\_  
Well Name: mw-1 Date: 5-1-13

## Physical Setting

Depth to water (ft)	28.95	Time collected:	12:26
Total well depth (ft)	37.30	Collected by:	Aaron Young
Screened interval (ft)	27.3 - 37.3	Weather:	Sunny
Pumping method:	Bladder pump	Notes/Comments:	
Pump setting:			

## Water Quality Results

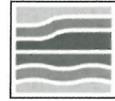
Time	t (min)	Volume (gal)	Temp (°C)	Specific Conductivity (µs/cm/°C)	Total Dissolved Solids (g/L)	Dissolved Oxygen (mg/L)	pH	Oxidation-Reduction Potential (mV)	Notes
12:31	5	0.25	12.77	0.166	0.108	6.88	5.92	148.3	
12:36	10	0.75	12.67	0.167	0.109	6.49	5.88	148.1	
12:41	15	1.25	12.66	0.168	0.109	6.35	5.94	142.5	
12:46	20	2.0	12.67	0.167	0.109	6.30	5.98	140.6	

## Sampling

Time sampled:	12:50	Containers filled:	1 amber
t (min) sampled:	24 min	Sampled by:	Aaron Young
Analysis performed:	NWTPH-DX/DX EXT	Laboratory name:	Libby
Date of delivery:	5-2-13	Date of analysis:	5-3-13

# Groundwater Sampling Record

Robinson Noble, Inc.  
3011 S. Huson Street, Suite A  
Tacoma, Washington 98409  
(253) 475-7711



**ROBINSON**  
**NOBLE**

Project Name: Founders Choice Cabinet 5  
Project Number: 2754-001C Project field book no.: \_\_\_\_\_  
Well Name: MW-2 Date: 5-1-13

## Physical Setting

Depth to water (ft)	<u>28.68</u>	Time collected:	<u>11:30</u>
Total well depth (ft)	<u>37.60</u>	Collected by:	<u>Aaron Young</u>
Screened interval (ft)	<u>27.6 - 37.6</u>	Weather:	<u>Sunny</u>
Pumping method:	<u>Bladder pump</u>	Notes/Comments:	
Pump setting:	<u>30</u>		

## Water Quality Results

Time	t (min)	Volume (gal)	Temp (°C)	Specific Conductivity (µs/cm/°C)	Total Dissolved Solids (g/L)	Dissolved Oxygen (mg/L)	pH	Oxidation-Reduction Potential (mV)	Notes
<u>11:35</u>	<u>5</u>	<u>0.2</u>	<u>13.53</u>	<u>0.235</u>	<u>0.153</u>	<u>6.04</u>	<u>6.44</u>	<u>123.3</u>	
<u>11:40</u>	<u>10</u>	<u>0.5</u>	<u>13.42</u>	<u>0.227</u>	<u>0.148</u>	<u>5.78</u>	<u>6.31</u>	<u>126.8</u>	
<u>11:45</u>	<u>15</u>	<u>0.75</u>	<u>13.43</u>	<u>0.222</u>	<u>0.144</u>	<u>5.76</u>	<u>6.29</u>	<u>126.0</u>	
<u>11:50</u>	<u>20</u>	<u>1.0</u>	<u>13.64</u>	<u>0.218</u>	<u>0.142</u>	<u>5.75</u>	<u>6.29</u>	<u>124.7</u>	
<u>11:55</u>	<u>25</u>	<u>1.5</u>	<u>13.49</u>	<u>0.214</u>	<u>0.139</u>	<u>5.76</u>	<u>6.26</u>	<u>127.0</u>	
<u>12:00</u>	<u>30</u>	<u>2.0</u>	<u>13.49</u>	<u>0.211</u>	<u>0.137</u>	<u>5.74</u>	<u>6.25</u>	<u>127.3</u>	

## Sampling

Time sampled:	<u>1205</u>	Containers filled:	<u>1 amber</u>
t (min) sampled:	<u>35 min</u>	Sampled by:	<u>Aaron Young</u>
Analysis performed:	<u>NWTPH-DX/DX Ex</u>	Laboratory name:	<u>Libby</u>
Date of delivery:	<u>5-2-13</u>	Date of analysis:	<u>5-3-13</u>

# Groundwater Sampling Record

Robinson Noble, Inc.  
3011 S. Huson Street, Suite A  
Tacoma, Washington 98409  
(253) 475-7711



**ROBINSON**  
**NOBLE**

Project Name: Founders choice cabinets  
Project Number: 2754-0014 Project field book no.: \_\_\_\_\_  
Well Name: mw-3 Date: 5-1-13

## Physical Setting

Depth to water (ft)	29.32	Time collected:	13:11
Total well depth (ft)	36.82	Collected by:	Aaron Young
Screened interval (ft)	26.82 - 36.82	Weather:	sunny
Pumping method:	Bladder pump	Notes/Comments:	slight petroleum odor
Pump setting:	30.5		

## Water Quality Results

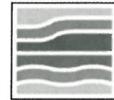
Time	t (min)	Volume (gal)	Temp (°C)	Specific Conductivity (µs/cm/°C)	Total Dissolved Solids (g/L)	Dissolved Oxygen (mg/L)	pH	Oxidation-Reduction Potential (mV)	Notes
13:16	5	0.25	13.21	0.184	0.119	4.36	6.33	136.8	
13:21	10	1.0	13.14	0.181	0.118	4.02	6.28	135.6	
13:26	15	1.75	13.10	0.179	0.116	3.96	6.30	133.9	
13:31	20	2.25	13.09	0.177	0.115	3.90	6.30	132.9	
13:36	25	2.75	13.07	0.175	0.114	3.89	6.28	132.3	
13:41	30	3.25	13.10	0.173	0.113	3.94	6.27	132.0	

## Sampling

Time sampled:	13:45	Containers filled:	1 amber
t (min) sampled:	34 min	Sampled by:	Aaron Young
Analysis performed:	NWTPH-DX/DX EXT	Laboratory name:	Libby
Date of delivery:	5-2-13	Date of analysis:	5-3-13

# Groundwater Sampling Record

Robinson Noble, Inc.  
3011 S. Huson Street, Suite A  
Tacoma, Washington 98409  
(253) 475-7711



**ROBINSON**  
**NOBLE**

Project Name: Founders Choice Cabinets  
Project Number: 2754-001C Project field book no.: \_\_\_\_\_  
Well Name: MW-4 Date: 5-2-13

## Physical Setting

Depth to water (ft)	34.0	Time collected:	10:35
Total well depth (ft)	40.91	Collected by:	Aaron Young
Screened interval (ft)	30.91 - 40.91	Weather:	sunny
Pumping method:	Bladder pump	Notes/Comments:	
Pump setting:	35'		

## Water Quality Results

Time	t (min)	Volume (gal)	Temp (°C)	Specific Conductivity (µs/cm/°C)	Total Dissolved Solids (g/L)	Dissolved Oxygen (mg/L)	pH	Oxidation-Reduction Potential (mV)	Notes
10:40	5	0.2	12.69	0.299	0.194	3.58	6.50	130.2	
10:45	10	1.0	12.62	0.286	0.186	2.82	6.21	132.6	
10:50	15	1.9	12.57	0.274	0.178	2.29	6.14	130.4	
10:55	20	2.5	12.61	0.268	0.174	2.15	6.14	128.6	
11:00	25	3.0	12.62	0.262	0.170	2.04	6.16	126.8	
11:05	30	3.5	12.64	0.258	0.168	1.97	6.16	125.7	

## Sampling

Time sampled:	11:10	Containers filled:	1 amber
t (min) sampled:	35 min	Sampled by:	Aaron Young
Analysis performed:	NWTPH-DK/DK Ext	Laboratory name:	Libby
Date of delivery:	5-2-13	Date of analysis:	5-3-13

## APPENDIX C

---



# Voluntary Cleanup Program

## Washington State Department of Ecology Toxics Cleanup Program

### TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation.

**Completion of this form is not sufficient to document your evaluation. You still need to document your analysis and the basis for your conclusion in your cleanup plan or report.**

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to [www.ecy.wa.gov/programs/tcp/policies/terrestrial/TEEHome.htm](http://www.ecy.wa.gov/programs/tcp/policies/terrestrial/TEEHome.htm).

#### Step 1: IDENTIFY HAZARDOUS WASTE SITE

Please identify below the hazardous waste site for which you are documenting an evaluation.

Facility/Site Name: Founders Choice Cabinets

Facility/Site Address: 1517 South Tacoma Way

Facility/Site No:

VCP Project No.: SW1292

#### Step 2: IDENTIFY EVALUATOR

Please identify below the person who conducted the evaluation and their contact information.

Name: John F. Hildenbrand

Title: Env. Services Manager

Organization: Robinson Noble, Inc.

Mailing address: 3011 South Huson, Ste A

City: Tacoma

State: WA

Zip code: 98409

Phone: 253-475-7711

Fax: 253-472-5846

E-mail: [jhildenbrand@robinson-noble.com](mailto:jhildenbrand@robinson-noble.com)

### Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

#### A. Exclusion from further evaluation.

##### 1. Does the Site qualify for an exclusion from further evaluation?

- Yes    *If you answered "YES," then answer **Question 2**.*
- No or Unknown    *If you answered "NO" or "UNKNOWN," then skip to **Step 3B** of this form.*

##### 2. What is the basis for the exclusion? Check all that apply. Then skip to **Step 4** of this form.

Point of Compliance: WAC 173-340-7491(1)(a)

- All soil contamination is, or will be,\* at least 15 feet below the surface.
- All soil contamination is, or will be,\* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

- All contaminated soil, is or will be,\* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

- There is less than 0.25 acres of contiguous<sup>#</sup> undeveloped<sup>±</sup> land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.
- For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous<sup>#</sup> undeveloped<sup>±</sup> land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

- Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

\* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

<sup>±</sup> "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

<sup>#</sup> "Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

## B. Simplified evaluation.

### 1. Does the Site qualify for a simplified evaluation?

- Yes *If you answered "YES," then answer **Question 2** below.*
- No or Unknown *If you answered "NO" or "UNKNOWN," then skip to **Step 3C** of this form.*

### 2. Did you conduct a simplified evaluation?

- Yes *If you answered "YES," then answer **Question 3** below.*
- No *If you answered "NO," then skip to **Step 3C** of this form.*

### 3. Was further evaluation necessary?

- Yes *If you answered "YES," then answer **Question 4** below.*
- No *If you answered "NO," then answer **Question 5** below.*

### 4. If further evaluation was necessary, what did you do?

- Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*
- Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

### 5. If no further evaluation was necessary, what was the reason? Check all that apply. Then skip to **Step 4** of this form.

#### Exposure Analysis: WAC 173-340-7492(2)(a)

- Area of soil contamination at the Site is not more than 350 square feet.
- Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

#### Pathway Analysis: WAC 173-340-7492(2)(b)

- No potential exposure pathways from soil contamination to ecological receptors.

#### Contaminant Analysis: WAC 173-340-7492(2)(c)

- No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.
- No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.
- No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.
- No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

**C. Site-specific evaluation.** A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. See WAC 173-340-7493(1)(c).

**1. Was there a problem?** See WAC 173-340-7493(2).

- Yes    *If you answered "YES," then answer **Question 2** below.*
- No    *If you answered "NO," then identify the reason here and then skip to **Question 5** below:*
- No issues were identified during the problem formulation step.
  - While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

**2. What did you do to resolve the problem?** See WAC 173-340-7493(3).

- Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*
- Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

**3. If you conducted further site-specific evaluations, what methods did you use?**

*Check all that apply. See WAC 173-340-7493(3).*

- Literature surveys.
- Soil bioassays.
- Wildlife exposure model.
- Biomarkers.
- Site-specific field studies.
- Weight of evidence.
- Other methods approved by Ecology. If so, please specify:

**4. What was the result of those evaluations?**

- Confirmed there was no problem.
- Confirmed there was a problem and established site-specific cleanup levels.

**5. Have you already obtained Ecology's approval of both your problem formulation and problem resolution steps?**

- Yes    If so, please identify the Ecology staff who approved those steps:
- No

## Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



<b>Northwest Region:</b> Attn: VCP Coordinator 3190 160 <sup>th</sup> Ave. SE Bellevue, WA 98008-5452	<b>Central Region:</b> Attn: VCP Coordinator 15 W. Yakima Ave., Suite 200 Yakima, WA 98902
<b>Southwest Region:</b> Attn: VCP Coordinator P.O. Box 47775 Olympia, WA 98504-7775	<b>Eastern Region:</b> Attn: VCP Coordinator N. 4601 Monroe Spokane WA 99205-1295

If you need this publication in an alternate format, please call the Toxics Cleanup Program at 360-407-7170. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

## APPENDIX D

---



ROBINSON  
NOBLE

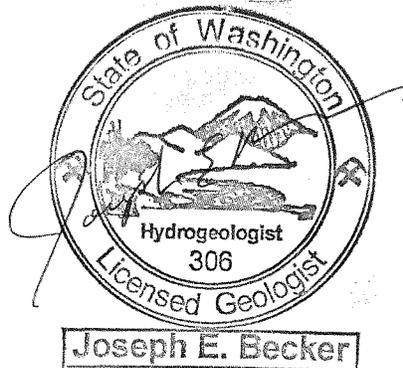
FOUNDER'S CHOICE CABINETS  
AND COUNTERTOPS  
1517 SOUTH TACOMA WAY  
TACOMA WASHINGTON  
SITE INVESTIGATION

MARCH 2013

by

Aaron C. Young  
Project Geologist

John F. Hildenbrand  
Associate Environmental Scientist  
Environmental Services Manager



Founder's Choice Cabinets and Countertops  
1517 South Tacoma Way, Tacoma, Washington  
Site Investigation  
March 2013

---

<b>1.0 Introduction</b> .....	<b>1</b>
1.1 PURPOSE AND OBJECTIVES .....	1
<b>2.0 Site Description</b> .....	<b>1</b>
2.1 BACKGROUND .....	1
<b>3.0 Field Activities</b> .....	<b>2</b>
3.1 SUMMARY .....	2
3.2 FIELD OBSERVATIONS .....	2
3.2.1 Event 1 .....	2
3.2.2 Event 2 .....	3
3.2.3 Event 3 .....	3
3.2.4 Event 4 .....	3
3.3 SAMPLE SUBMITTAL, STORAGE, AND HANDLING .....	4
<b>4.0 Sample Analysis</b> .....	<b>4</b>
4.1 ANALYTICAL RESULTS .....	4
4.2 LABORATORY QA/QC .....	5
<b>5.0 Data Reduction, Validation, and Reporting</b> .....	<b>5</b>
5.1 REDUCTION .....	5
5.2 VALIDATION .....	5
5.3 REPORTING .....	6
<b>6.0 Conclusions, Limitations, &amp; Recommendations</b> .....	<b>6</b>
6.1 CONCLUSIONS .....	6
6.2 RECOMMENDATIONS .....	6
<b>7.0 References</b> .....	<b>7</b>

**FIGURES**

- FIGURE 1 SITE VICINITY MAP
- FIGURE 2 SITE DETAIL MAP
- FIGURE 3 BOREHOLE LOCATION MAP
- FIGURE 4 BORING LOCATION MAP
- FIGURE 5 BORING AND CONTAMINATION BOUNDARY MAP
- FIGURE 6 PROPOSED MONITORING WELL AND BORING LOCATION MAP

**APPENDICES**

- APPENDIX A LABORATORY RESULTS
- APPENDIX B BORING LOGS



Founder's Choice Cabinets and Countertops  
1517 South Tacoma Way, Tacoma, Washington  
Site Investigation  
March 2013

---

## 1.0 Introduction

### 1.1 Purpose and Objectives

This report documents a series of investigative field efforts designed to assess and characterize the presence of petroleum hydrocarbon contaminants in soils and possibly groundwater. Four separate field events are discussed herein.

## 2.0 Site Description

The site is located at 1517 South Tacoma Way, Tacoma, Washington. It is comprised of three tax parcels which have been assigned parcel numbers 7105000300, 7105000301, and 7105000340 by the Pierce County Assessor-Treasurer's Office. The location and layout of the subject are noted in Figures 1 and 2.

Troost (in review) maps the surface geology of the site as Quaternary Vashon Steilacoom gravel deposits located within the South Tacoma Channel (Qvsst4). These deposits consist of open-work sandy gravels with cobbles. As noted in Section 3.0 and the boring logs located in Appendix B, we observed brown gravelly sand to depths of at least 30 feet. This is inconsistent with the noted geologic map; however, it is similar to our findings on other nearby sites. Based on these site-specific observations and a review of well logs in the immediate area of the subject, we expect the depth to groundwater will be between 40 and 50 feet below ground surface (bgs).

### 2.1 Background

A 2012 Phase I Environmental Site Assessment prepared by Associated Environmental Services, Inc. (AESI) described the presence of three possible recognized environmental conditions (RECs). These included a property adjacent to the subject that was historically used as a gas station, a former heavy fuel-oil (bunker) tank that was removed from the site in the early 1990s, and a historical 500-gallon heating-oil tank that was also alleged to have been removed around the same time.

Robinson Noble, Inc. was contracted to complete assessment activities to evaluate these RECs. Our evaluation included a review of existing tank closure documents maintained by the Tacoma-Pierce County Health Department (TPCHD) in addition to our on-site investigation activities.

TPCHD records show that a 1,700-gallon bunker-oil tank was removed in October 1992. Post-removal confirmation sampling showed residual levels of soil contamination to be below the cleanup limit in effect at the time (200 mg/kg) except for one side wall sample adjacent to the building foundation. Laboratory analytical reports for the sample show 812 mg/kg of heavy oil. The TPCHD issued a conditional closure in June 1993 with the proviso that, in the event the building is demolished, additional investigation would be needed. Considering the residual concentration is below the current Model Toxics Control Act (MTCA) Method A cleanup limit for

unrestricted land use of 2,000 mg/kg. We concluded that this REC is effectively resolved. The two remaining RECs are the subject of this report.

## 3.0 Field Activities

### 3.1 Summary

Field events were completed on September 12, 2012 (Event 1), October 30, 2012 (Event 2), November 14, 2012 (Event 3), and December 18, 2012 (Event 4). Event 1 consisted on four soil borings completed to evaluate the potential for the subject to be impacted by the southeastern adjacent former-gas-station property and to assess the presence or absence of impact from the former 500-gallon heating-oil tank. This event demonstrated that soils along the boundary with the former gas station are not impacted to depths of approximately 30 feet. It also identified heating-oil (diesel-range) petroleum hydrocarbon impacted soils in an area near the suspected former location of the 500-gallon heating-oil tank.

Event 2 consisted of excavating the area formerly occupied by the 500-gallon heating-oil tank in an attempt to identify the boundaries of the impacted soil, and if possible, remove it. Although some impacted soil was removed and disposed of at a permitted off-site disposal facility, the boundaries were not defined and excavation was limited to subsurface soil conditions and the proximity of building structural features.

Event 3 was completed by drilling a series of soil borings using direct-push drilling equipment to better define the contamination from the former heating-oil tank. Ten borings were completed. This event provided substantial definition of the areal and vertical extent of the heating-oil soil contaminant plume.

Event 4 involved completing five additional soil borings to complete the areal definition of the contaminant plume.

### 3.2 Field Observations

#### 3.2.1 Event 1

Three of the borings were located along the southeastern boundary of the subject adjacent to the former gas station discussed in Section 2.2. Borings B1, B2, and B4 were completed to depths of 25 feet, 30 feet, and 19 feet, respectively. We were unable to accomplish our original scope of drilling to groundwater as drilling refusal was encountered in each of these borings. The locations of these borings are depicted on Figure 3.

The observed texture of the materials encountered consisted of gravelly sand throughout each boring with some silt noted in boring B4. We did not encounter visual or olfactory indications of impact, and photoionization meter (PID) readings were not above background levels.

The soil samples were collected from the terminal depth of each boring and submitted to the on-site mobile laboratory for gasoline-range petroleum hydrocarbons and gasoline-related volatile organic compound analysis using the methods summarized in Section 4.0. These samples were assigned sample numbers B1-25, B2-30, and B4-19, respectively.

The fourth boring in this event was located in the vicinity of the suspected former location of the 500-gallon heating-oil tank. This boring, B3, was completed to a depth of 19 feet in depth. Field observations identified similar subsurface textures noted in the other borings except for a noticeably siltier layer between 13-15 feet in depth. A pronounced petroleum odor consistent

with diesel-range (heating oil) was noted. From a depth of 15 feet to a final depth of 19 feet, we observed brown medium sand with gravel. Little to no hydrocarbon odor was detected at final depth.

Two soil samples from this boring were collected and submitted to the on-site laboratory for analysis for diesel-range petroleum hydrocarbons. The sample identifications are B3-13.5 and B3-19. They were collected from depths of 13.5 feet 19 feet, respectively. Contamination was detected in sample B3-13.5 (see Section 4.0).

After the samples were collected, the borings were decommissioned by backfilling with hydrated bentonite chips.

### *3.2.2 Event 2*

On October 30, 2012, a contractor procured by the property owner attempted to excavate impacted soils in the suspected location of the former heating-oil tank using a rubber-tired backhoe. Robinson Noble staff was on site to provide guidance, document site activities, and collect soil samples.

An area approximately 20 feet by 10 feet was excavated to an average depth of 13 feet bgs. Soils were observed to be unimpacted until about 10 feet in depth, where a moderate petroleum odor was noticed. Beginning at a depth of 12 feet bgs, soil staining and heavy petroleum odor was encountered. Contamination appeared to attenuate beginning at 15 feet in depth. However, due so soil stability and structural concerns, the extents of contamination could not be determined.

A total of sixteen soil samples were collected from the excavation floor and sidewalls and submitted to an on-site mobile laboratory for analysis. Additionally, four stockpile soil characterization samples were also collected and submitted. Figure 4 documents the area excavated and the sample locations. Contamination was detected in ten samples (see Section 4.0).

### *3.2.3 Event 3*

Based on the observations and analytical data obtained from the preceding events, a series of ten soil borings were completed using direct-push drilling techniques on November 14, 2012. Field observations of these borings, as well as subsequent laboratory results, yielded additional delineation of the areal extent of the contamination. Observations of the subsurface geology were consistent with previous investigative events.

### *3.2.4 Event 4*

On December 18, 2012, four additional borings were completed to finalize the definition of the areal extent of the contamination, collect additional data on the vertical extent of contamination, and obtain samples for extractable and volatile petroleum hydrocarbon fractions (EPH/VPH). The EPH/VPH data was collected for future use in evaluating site closure options. The borings completed during this round showed the previously observed geology to be consistent across the site. Groundwater was not encountered.

The four sampling events discussed above have identified the approximate areal boundaries of the impacted soil. Vertically, the contamination extends to at least 24 feet below ground surface in the vicinity of boring B13. The approximate areal extent of the contamination is 2,500 square feet. Figure 5 depicts the horizontal boundaries of the plume.

### 3.3 Sample Submittal, Storage, and Handling

Samples were collected using methodologies appropriate for diesel-range petroleum hydrocarbons. Stainless-steel spoons were used to place soil into laboratory-supplied four-ounce glass jars except for volatile organic and EPH/VPH extractable and volatile hydrocarbon fraction samples, which were collected using EPA 5035 techniques. The properly labeled samples were submitted directly to the on-site mobile laboratory for analysis. The unused soil samples and EPH/VPH samples were refrigerated by the mobile laboratory for long-term storage after appropriate preservation requirements were applied.

The chain-of-custody form (attached) displays the details of the on-site sample submittal to Libby. Each sample was tracked on the form with the details of the sample's identity, identity of handler's responsible for the samples, and analyses to be performed.

### 4.0 Sample Analysis

Analysis of samples was completed using NWTPH-GX, NWTPH-DX/DX Extended NWTPH-EPH, NWTPH-VPH, and EPA 8260C by Libby Environmental, Inc. (Libby).

#### 4.1 Analytical Results

The laboratory analytical results are located in Appendix A. The following table identifies sample results exceeding MTCA Method A Unrestricted Land-Use cleanup limits (Method A CULS, or CULa). Samples collected during Event 1 used to evaluate the potential impact of the neighboring historical gas station did not show the presence of any target analytes above laboratory reporting limits.

Analytical data confirms the presence of diesel-range petroleum hydrocarbons in the former area of the removed heating-oil tank. The following tables present the data collected from the heating-oil tank area.

Table 3. Excavation results of target analytes (mg/kg)

Sample Identification	Location	Depth (feet)	Diesel (mg/kg)
N6E3D10	Western side wall	10'	<25
N6E3D13	Western side wall	13'	<b>2,900</b>
N12E4D10	Northern side wall	10'	<25
N12E4D13	Northern side wall	13'	150
N6E9D10	Eastern side wall	10'	42.4
N6E9D13	Eastern side wall	13'	<b>5,600</b>
N2E5.5D10	Southern side wall	10'	150
N2E5.5D13	Southern side wall	13'	<b>16,000</b>
E6N6D11	Bottom (Removed)	11'	<b>4,110</b>
N3E7D8.5	Bottom (Removed)	8.5'	<25
N6.5E5.5D12.5	Bottom (Removed)	12.5'	<b>31,400</b>
N7E6.5D13.5	Bottom (Removed)	13.5'	<b>2,370</b>
N7E6.5D15	Bottom	15'	307
E4S3D4.5	Eastern side wall (shallow excavation near former tank location)	4.5'	<25
E6S6D5	Southern side wall (shallow excavation near former tank location)	4.5'	<25
E8S2D4.5	Western side wall (shallow excavation near former tank location)	5'	<25

**Bold** above MTCA Method A cleanup level of 2,000 mg/kg

Table 4. Boring results of target analytes (mg/kg)

Sample Depth	Date of work	Depth (feet)	Diesel (mg/kg)
B3-13.5'	9/12/2012	13.5'	<b>4,090</b>
B3-19'	9/12/2012	19'	<25
B5-15.5'	11/14/2012	15.5'	<25
B5-18'	11/14/2012	18'	<25
B6-16'	11/14/2012	16'	<25
B6-19'	11/14/2012	19'	<25
B7-16'	11/14/2012	16'	<25
B7-20'	11/14/2012	20'	<25
B8-14'	11/14/2012	14'	<b>28,000</b>
B8-18.5'	11/14/2012	18.5'	<25
B9-14.5'	11/14/2012	14.5'	<25
B9-17'	11/14/2012	17'	<25
B10-14.5'	11/14/2012	14.5'	231
B10-18'	11/14/2012	18'	<25
B11-15'	11/14/2012	15'	323
B11-18.5'	11/14/2012	18.5'	<25
B12-14'	11/14/2012	14'	<b>6,810</b>
B12-18'	11/14/2012	18'	<25
B13-24'	11/14/2012	24'	<b>7,370</b>
B14-14.5'	11/14/2012	14.5'	<b>6,780</b>
B15-15.5'	12/18/2012	15.5'	<b>6,350*</b>
B15-18'	12/18/2012	18'	<25
B16-25'	12/18/2012	25'	47
B17-20'	12/18/2012	20'	<25
B18-29'	12/18/2012	29'	52
B19-14.5'	12/18/2012	14.5'	<b>18,700*</b>
MTCA Method A Cleanup level			2,000

**Bold** above MTCA Method A cleanup level of 2,000 mg/kg

\*denotes sample also analyzed for EPH/VPH petroleum fraction analysis.

## 4.2 Laboratory QA/QC

With the exception of matrix interferences caused by high analyte concentrations, the laboratory analyses were within the guidelines and control limits established by the laboratory and the analytical method. Therefore, the analyses were within acceptable QA/QC boundaries.

## 5.0 Data Reduction, Validation, and Reporting

### 5.1 Reduction

The raw data from the investigation are digitally stored on file. Reviews of the data show no inconsistencies or concerns.

### 5.2 Validation

Quality assurance and quality control results reported the laboratory confirm the data is consistent and repeatable. The laboratory indicates that all samples analyzed and recorded fall within acceptable QA/QC limitations.

According to our review, quality control data for the chain-of-custody, sample holding times, laboratory blanks, blind field duplicates, laboratory surrogate recoveries, and field documentation are acceptable.

### **5.3 Reporting**

The laboratory results (attached) include a cover letter report from Libby explaining the details regarding the analysis, the chain-of-custody forms, the sample summary results, and the summary of the laboratory QA/QC.

## **6.0 Conclusions, Limitations, & Recommendations**

### **6.1 Conclusions**

The three borings completed to evaluate the potential impact to the subject from an adjacent former gas station did not reveal evidence of contaminants migrating through soil. The 19 borings completed to evaluate the extent of contamination from a former heating-oil tank have identified impacts covering approximately 2,500 square feet. Soils in this area exhibit a zone of contamination generally between 15-18 feet below the ground surface, except for the area around boring B13 where the maximum vertical extent has not been defined.

Although groundwater was not encountered in the borings, the risk to groundwater has not been established. As noted in Section 2.0, the expected depth to groundwater is approximately 50 feet below ground surface.

Soil excavation activities indicate that excavation of the identified contamination is likely impractical based on the large volume of unimpacted overburden, proximity to building footings, and public right-of-way.

At this time, it appears that the most practical method of achieving site closure is the use of institutional controls and long-term groundwater monitoring.

### **6.2 Recommendations**

In order to move forward with site closure, we recommend completion of the following:

1. Prepare and submit application materials for entry into the Washington Department of Ecology's Voluntary Cleanup Program. This will be accomplished as part of the completion of this report, a copy of which will be submitted to Ecology.
2. Complete additional characterization consisting of the installation of four groundwater monitoring wells and one additional soil boring. The purpose of the soil boring is to evaluate the maximum vertical extent of the contamination in the area of boring B13.

The purpose of the groundwater monitoring wells is to assess whether or not groundwater has been impacted by the contaminants identified on site along with evaluation of groundwater flow direction and gradient across the impacted area. The proposed boring and monitoring well locations are shown in Figure 6.

3. Assuming groundwater impacts are not found, submit a final remedial investigation and feasibility study report, including disproportional cost analysis and cleanup (closure) action plan, to Ecology. If groundwater is impacted, then additional investigation and/or cleanup actions will be developed and presented to Ecology for review.

This additional information will determine whether or not site closure by implementation of an environmental covenant and groundwater monitoring is feasible.

Upon implementation of these recommendations, assuming groundwater impacts are not found, we recommend a final remedial investigation and feasibility study report, including disproportional cost analysis and cleanup (closure) action plan be submitted to Ecology. If groundwater is impacted, then additional investigation and/or cleanup actions will be developed and presented to Ecology for review.

## 7.0 References

Libby Environmental Services, Inc.

Tacoma-Pierce County Health Department

Troost, in review, Geologic map of the Tacoma-south 7.5-minute quadrangle, scale 1:24,000

Washington State Department of Ecology, Toxics Cleanup Program, Revised November 2007, The Model Toxics Control Act Statute and Regulation, Chapter 173-340 WAC, publication no. 94-06

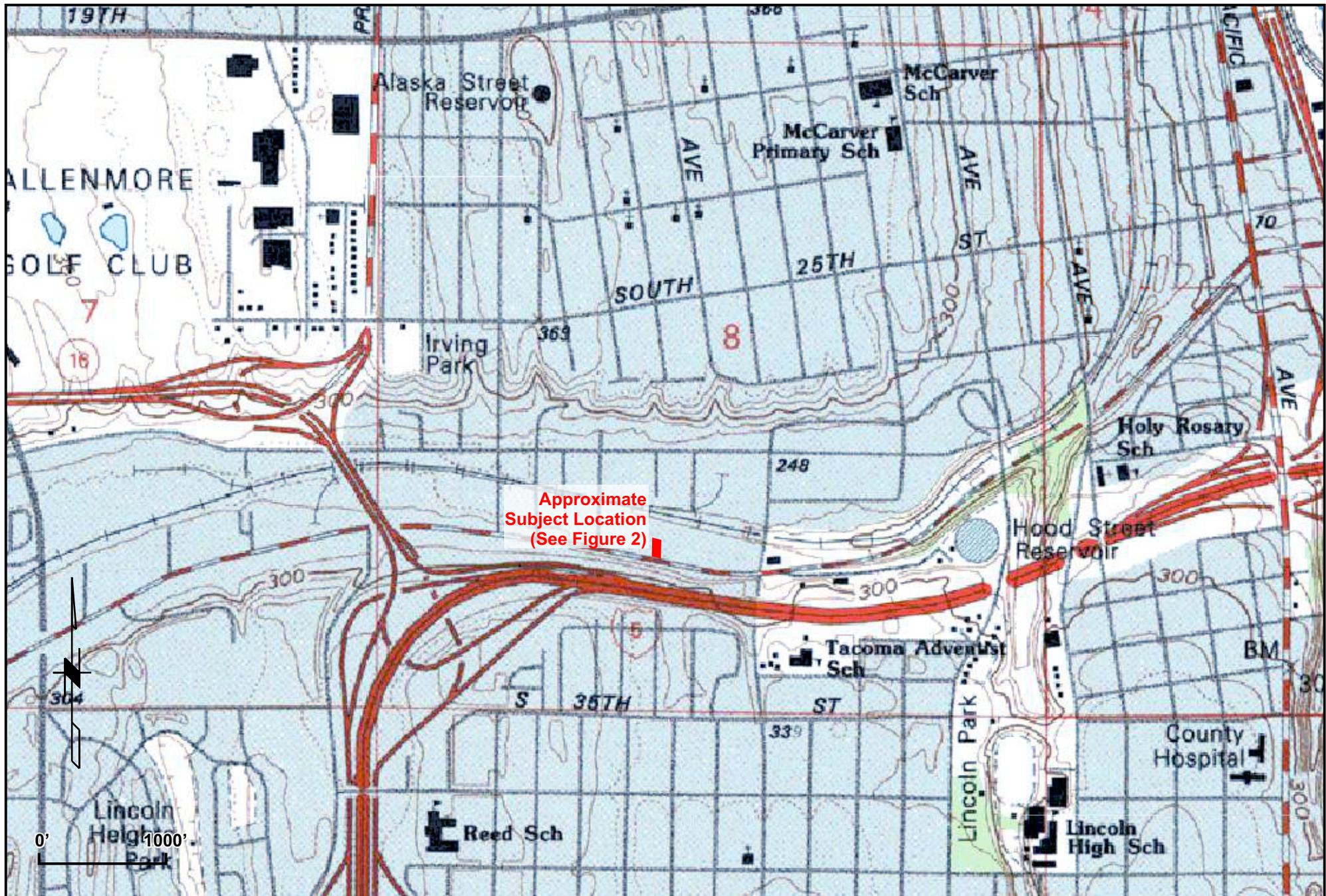
Washington State Department of Ecology, Toxics Cleanup Program, February 1996, Cleanup Levels and Risk Calculations (CLARC), Publication No. 94-145

Washington State Department of Ecology, June 1997, Analytical Methods for Petroleum Hydrocarbons, publication no. ECY 97-602

*The statements, conclusions, and recommendations provided in this report are to be exclusively used within the context of this document. They are based upon generally accepted hydrogeologic and environmental practices and are the result of analysis by Robinson Noble, Inc. staff. This report, and any attachments to it, is for the exclusive use of Founders Choice Cabinets and Countertops and Commencement Bank. Unless specifically stated in the document, no warranty, expressed or implied, is made.*

## FIGURES

---



Approximate  
Subject Location  
(See Figure 2)



Note: Basemap taken from USGS Tacoma South Quadrangle

PM: JFH  
March 2013  
2754-001A/B

Pierce County  
T 20 N/R 03 E - 08  
Scale 1" = 1000'

Figure 1  
Vicinity Map



**Heating-oil Tank Investigation Area**

**Adjacent Former Gas Station Investigation Area**



Note: Image from ESRI ArcGIS

PM: JFH  
March 2013  
2754-001A/B

Pierce County  
T 20 N/R 03 E - 08  
Scale 1" = 50'

Figure 2

Site Detail Map

Founder's Choice Cabinets: 1517 South Tacoma Way Site Investigation



Note: Image from  
ESRI ArcGIS

PM: JFH  
March 2013  
2754-001A/B

Pierce County  
T 20 N/R 03 E - 08  
Scale 1" = 50'

Figure 3

Event 1 Boring Location Map

Founder's Choice Cabinets: 1517 South Tacoma Way Site Investigation



**Legend:**

- B12 - 14' Sample Identification and Depth
- Excavation Boundary
- - - Approximate Contamination Boundary
- ⊗ Boring Location Concentration above MTCA Method A Cleanup Level
- ⊗ Boring Location Concentration below MTCA Method A Cleanup Level

Standard MTCA A Cleanup Levels  
Diesel Range Organics | 2,000 mg/kg

Note:  
**Red** indicate concentrations above Standard MTCA Method A cleanup levels.  
**ND** No Detection (< 25 mg/kg)

**B12 - 14' = 6,810 mg/kg**  
**B12 - 18' = ND**

**B8 - 14' = 28,000 mg/kg**  
**B8 - 18.5' = ND**

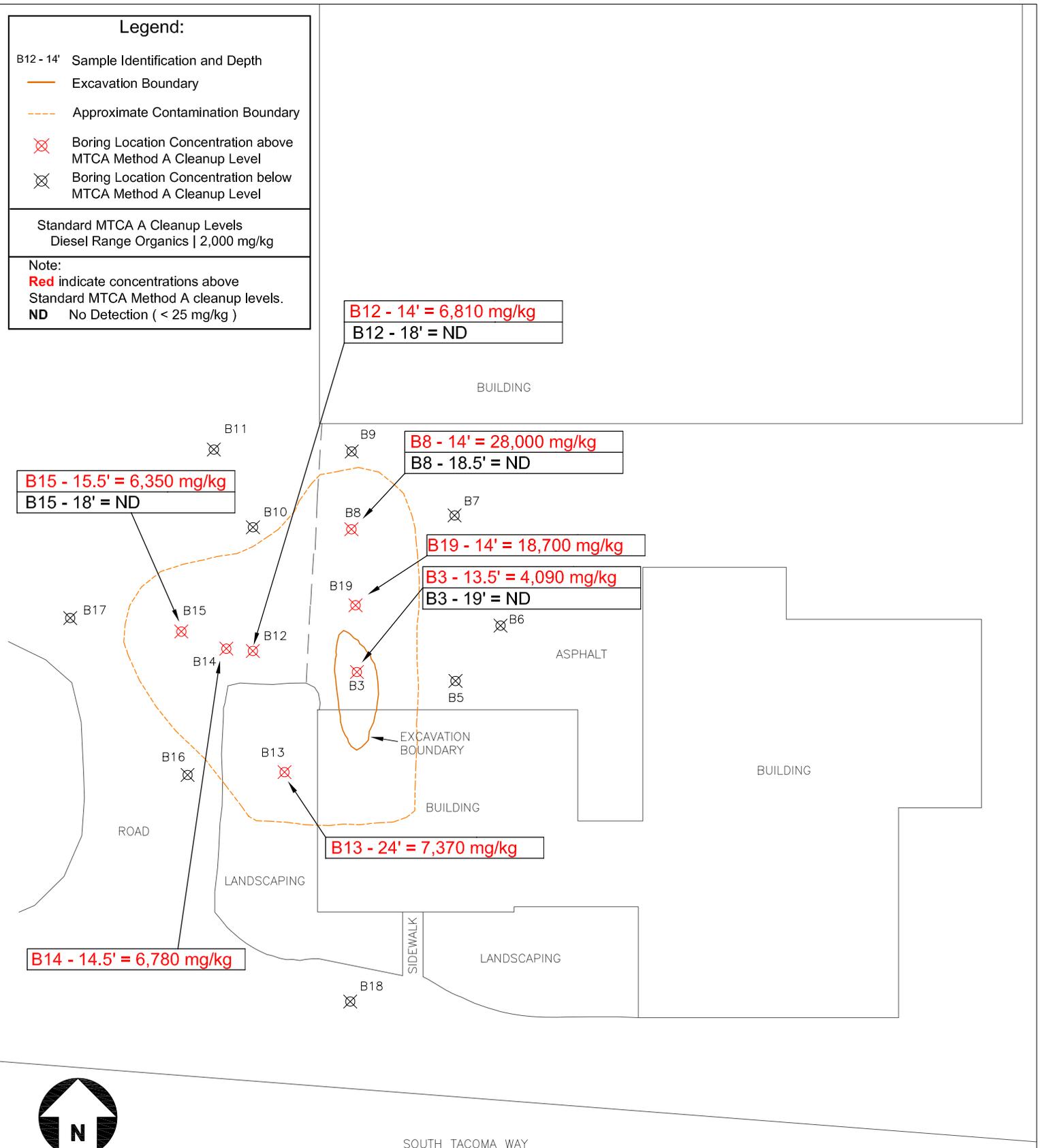
**B15 - 15.5' = 6,350 mg/kg**  
**B15 - 18' = ND**

**B19 - 14' = 18,700 mg/kg**

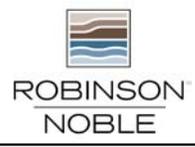
**B3 - 13.5' = 4,090 mg/kg**  
**B3 - 19' = ND**

**B13 - 24' = 7,370 mg/kg**

**B14 - 14.5' = 6,780 mg/kg**



SOUTH TACOMA WAY



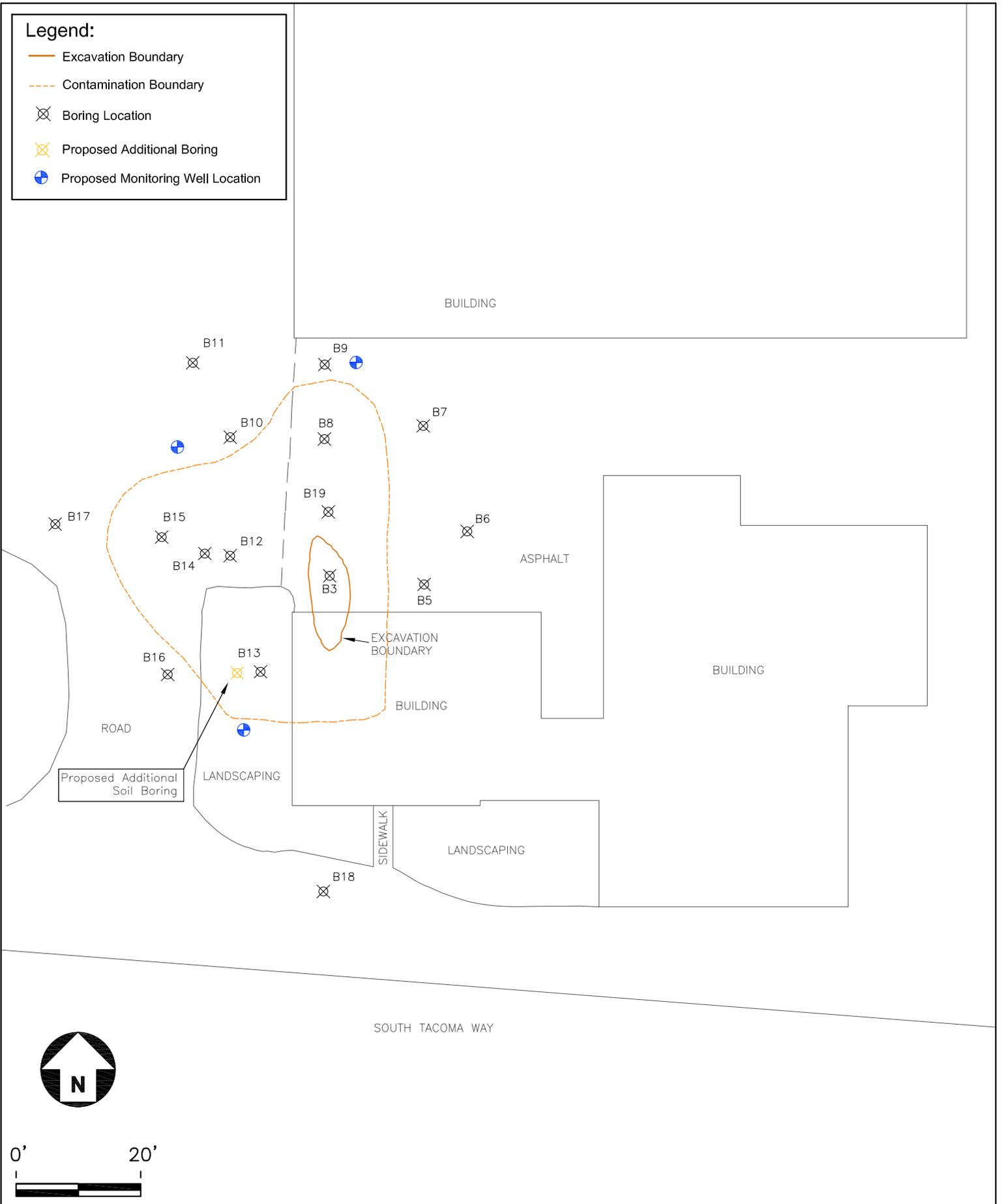
PM: JFH  
March 2013  
2754-001A/B

Pierce County  
T 20 N/R 03 E - 08  
Scale 1" = 20'

Figure 5  
**Heating Oil Tank Investigation Boring Location and Contamination Boundary Map**  
Founder's Choice Cabinets: 1517 South Tacoma Way Site Investigation

**Legend:**

-  Excavation Boundary
-  Contamination Boundary
-  Boring Location
-  Proposed Additional Boring
-  Proposed Monitoring Well Location



PM: JFH  
 March 2013  
 2754-001A/B

Pierce County  
 T 20 N/R 03 E - 08  
 Scale 1" = 20'

**Figure 6**  
**Proposed Monitoring Well and Boring Location Map**  
**Founder's Choice Cabinets: 1517 South Tacoma Way**

## APPENDIX A

---



# Libby Environmental, Inc.

4139 Libby Road NE • Olympia, WA 98506-2518

December 31, 2012

John Hildenbrand  
Robinson Noble  
3011 Huson Street South  
Suite A  
Tacoma, WA 98409

Dear Mr. Hildenbrand:

Please find enclosed the analytical data report for the Commencement Bank Project located in Tacoma, Washington. Soil samples were analyzed for Diesel by NWTPH-Dx, Volatile Petroleum Hydrocarbons by NWVPH and Extractable Petroleum Hydrocarbons by NWEPH on December 18, 23 & 28, 2012

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. All soil samples are reported on a dry weight basis. An invoice for this analytical work is enclosed.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Jamie L. Deyman  
*President*  
*Libby Environmental, Inc.*

Phone (360) 352-2110 • Fax (360) 352-4154 • [libbyenv@aol.com](mailto:libbyenv@aol.com)

[www.LibbyEnvironmental.com](http://www.LibbyEnvironmental.com)

# Libby Environmental, Inc.

4139 Libby Road NE

Olympia, WA 98506

Phone: (360) 352-2110

FAX: (360) 352-4154

Email: libbyenv@aol.com

## COMMENCEMENT BANK PROJECT

Robinson Noble

Tacoma, Washington

Libby Project # L121218-20

Client Project # 2754-001B

### Analyses of Diesel (NWTPH-Dx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)
Method Blank	12/18/12	97	nd
B15-15.5	12/18/12	int	6350
B15-18	12/18/12	102	nd
B15-18 Dup	12/18/12	104	nd
B16-25	12/18/12	116	47
B16-25 Dup	12/18/12	107	39
B17-20	12/18/12	112	nd
B17-20 Dup	12/18/12	100	nd
B18-29	12/18/12	111	52
B18-29 Dup	12/18/12	105	49
B19-14.5	12/18/12	int	18700
Practical Quantitation Limit			25

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Paul Burke



1311 N. 35th St.  
Seattle, WA 98103  
T: (206) 352-3790  
F: (206) 352-7178  
info@fremontanalytical.com

**Libby Environmental**  
Jamie Deyman  
4139 Libby Rd. NE  
Olympia, Washington 98506

**RE: Commencement Bank**  
**Lab ID: 1212127**

January 03, 2013

**Attention Jamie Deyman:**

Fremont Analytical, Inc. received 2 sample(s) on 12/20/2012 for the analyses presented in the following report.

*Extractable Petroleum Hydrocarbons by NWEPH*  
*Sample Moisture (Percent Moisture)*  
*Volatile Petroleum Hydrocarbons by NWVPH*

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

A handwritten signature in black ink, appearing to read "M. Dee".

Michael Dee  
Sr. Chemist / Principal



---

**CLIENT:** Libby Environmental  
**Project:** Commencement Bank  
**Lab Order:** 1212127

---

**Work Order Sample Summary**

---

<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Date/Time Collected</b>	<b>Date/Time Received</b>
1212127-001	B15-15.5	12/18/2012 10:30 AM	12/20/2012 9:45 AM
1212127-002	B19-14.5	12/18/2012 4:40 PM	12/20/2012 9:45 AM

---

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned



---

**CLIENT:** Libby Environmental  
**Project:** Commencement Bank

---

**I. SAMPLE RECEIPT:**

All samples were received intact. The internal ice chest temperatures were measured on receipt and are recorded on the attached Sample Receipt Checklist.

**II. GENERAL REPORTING COMMENTS:**

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

**III. ANALYSES AND EXCEPTIONS:**

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.



# Analytical Report

WO#: 1212127

Date Reported: 1/3/2013

**Client:** Libby Environmental  
**Project:** Commencement Bank  
**Lab ID:** 1212127-001  
**Client Sample ID:** B15-15.5

**Collection Date:** 12/18/2012 10:30:00 AM

**Matrix:** Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

**Extractable Petroleum Hydrocarbons by NWEPH**

Batch ID: 3840

Analyst: BR

Aliphatic Hydrocarbon (C8-C10)	10.5	5.70		mg/Kg-dry	1	12/28/2012 2:32:00 AM
Aliphatic Hydrocarbon (C10-C12)	108	5.70		mg/Kg-dry	1	12/28/2012 2:32:00 AM
Aliphatic Hydrocarbon (C12-C16)	1,160	57.0	D	mg/Kg-dry	10	12/28/2012 2:51:00 PM
Aliphatic Hydrocarbon (C16-C21)	1,380	57.0	D	mg/Kg-dry	10	12/28/2012 2:51:00 PM
Aliphatic Hydrocarbon (C21-C34)	201	57.0	D	mg/Kg-dry	10	12/28/2012 2:51:00 PM
Aromatic Hydrocarbon (C8-C10)	ND	5.70		mg/Kg-dry	1	12/28/2012 11:57:00 AM
Aromatic Hydrocarbon (C10-C12)	6.22	5.70		mg/Kg-dry	1	12/28/2012 11:57:00 AM
Aromatic Hydrocarbon (C12-C16)	95.3	5.70		mg/Kg-dry	1	12/28/2012 11:57:00 AM
Aromatic Hydrocarbon (C16-C21)	677	57.0	D	mg/Kg-dry	10	12/28/2012 5:03:00 PM
Aromatic Hydrocarbon (C21-C34)	94.6	5.70		mg/Kg-dry	1	12/28/2012 11:57:00 AM
Surr: 1-Chlorooctadecane	117	65-140		%REC	1	12/28/2012 2:32:00 AM
Surr: o-Terphenyl	91.3	65-140		%REC	1	12/28/2012 11:57:00 AM

**Volatile Petroleum Hydrocarbons by NWVPH**

Batch ID: 3866

Analyst: EM

Aliphatic Hydrocarbon (C5-C6)	ND	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
Aliphatic Hydrocarbon (C6-C8)	1.06	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
Aliphatic Hydrocarbon (C8-C10)	1.97	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
Aliphatic Hydrocarbon (C10-C12)	9.73	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
Aromatic Hydrocarbon (C8-C10)	1.51	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
Aromatic Hydrocarbon (C10-C12)	29.1	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
Aromatic Hydrocarbon (C12-C13)	150	5.32	D	mg/Kg-dry	10	12/24/2012 6:10:00 PM
Benzene	ND	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
Toluene	ND	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
Ethylbenzene	ND	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
m,p-Xylene	ND	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
o-Xylene	ND	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
Naphthalene	ND	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
Methyl tert-butyl ether (MTBE)	ND	0.532		mg/Kg-dry	1	12/23/2012 3:09:00 AM
Surr: Bromofluorobenzene	139	65-140		%REC	1	12/23/2012 3:09:00 AM
Surr: Trifluorotoluene	80.5	65-140		%REC	1	12/23/2012 3:09:00 AM

**Sample Moisture (Percent Moisture)**

Batch ID: R6965

Analyst: JY

Percent Moisture	12.5			wt%	1	12/20/2012 9:41:46 AM
------------------	------	--	--	-----	---	-----------------------

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	D	Dilution was required
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits



# Analytical Report

WO#: 1212127

Date Reported: 1/3/2013

**Client:** Libby Environmental  
**Project:** Commencement Bank  
**Lab ID:** 1212127-002  
**Client Sample ID:** B19-14.5

**Collection Date:** 12/18/2012 4:40:00 PM  
**Matrix:** Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

**Extractable Petroleum Hydrocarbons by NWEPH**

Batch ID: 3840

Analyst: BR

Aliphatic Hydrocarbon (C8-C10)	52.9	5.72		mg/Kg-dry	1	12/28/2012 3:16:00 AM
Aliphatic Hydrocarbon (C10-C12)	227	57.2	D	mg/Kg-dry	10	12/28/2012 3:35:00 PM
Aliphatic Hydrocarbon (C12-C16)	1,290	57.2	D	mg/Kg-dry	10	12/28/2012 3:35:00 PM
Aliphatic Hydrocarbon (C16-C21)	1,310	57.2	D	mg/Kg-dry	10	12/28/2012 3:35:00 PM
Aliphatic Hydrocarbon (C21-C34)	226	57.2	D	mg/Kg-dry	10	12/28/2012 3:35:00 PM
Aromatic Hydrocarbon (C8-C10)	5.96	5.72		mg/Kg-dry	1	12/28/2012 12:41:00 PM
Aromatic Hydrocarbon (C10-C12)	37.8	5.72		mg/Kg-dry	1	12/28/2012 12:41:00 PM
Aromatic Hydrocarbon (C12-C16)	294	57.2	D	mg/Kg-dry	10	12/28/2012 5:47:00 PM
Aromatic Hydrocarbon (C16-C21)	865	57.2	D	mg/Kg-dry	10	12/28/2012 5:47:00 PM
Aromatic Hydrocarbon (C21-C34)	94.2	5.72		mg/Kg-dry	1	12/28/2012 12:41:00 PM
Surr: 1-Chlorooctadecane	106	65-140		%REC	1	12/28/2012 3:16:00 AM
Surr: o-Terphenyl	75.9	65-140		%REC	1	12/28/2012 12:41:00 PM

**Volatile Petroleum Hydrocarbons by NWVPH**

Batch ID: 3866

Analyst: EM

Aliphatic Hydrocarbon (C5-C6)	ND	0.540		mg/Kg-dry	1	12/23/2012 4:54:00 AM
Aliphatic Hydrocarbon (C6-C8)	10.5	0.540		mg/Kg-dry	1	12/23/2012 4:54:00 AM
Aliphatic Hydrocarbon (C8-C10)	52.7	5.40	D	mg/Kg-dry	10	12/24/2012 6:45:00 PM
Aliphatic Hydrocarbon (C10-C12)	169	5.40	D	mg/Kg-dry	10	12/24/2012 6:45:00 PM
Aromatic Hydrocarbon (C8-C10)	41.0	0.540		mg/Kg-dry	1	12/23/2012 4:54:00 AM
Aromatic Hydrocarbon (C10-C12)	400	54.0	D	mg/Kg-dry	100	12/28/2012 7:42:00 PM
Aromatic Hydrocarbon (C12-C13)	3.59	0.540		mg/Kg-dry	1	12/23/2012 4:54:00 AM
Benzene	ND	0.540		mg/Kg-dry	1	12/23/2012 4:54:00 AM
Toluene	ND	0.540		mg/Kg-dry	1	12/23/2012 4:54:00 AM
Ethylbenzene	ND	0.540		mg/Kg-dry	1	12/23/2012 4:54:00 AM
m,p-Xylene	ND	0.540		mg/Kg-dry	1	12/23/2012 4:54:00 AM
o-Xylene	ND	0.540		mg/Kg-dry	1	12/23/2012 4:54:00 AM
Naphthalene	0.565	0.540		mg/Kg-dry	1	12/23/2012 4:54:00 AM
Methyl tert-butyl ether (MTBE)	ND	0.540		mg/Kg-dry	1	12/23/2012 4:54:00 AM
Surr: Bromofluorobenzene	136	65-140		%REC	1	12/23/2012 4:54:00 AM
Surr: Trifluorotoluene	97.0	65-140		%REC	1	12/23/2012 4:54:00 AM

**Sample Moisture (Percent Moisture)**

Batch ID: R6965

Analyst: JY

Percent Moisture	13.8			wt%	1	12/20/2012 9:41:46 AM
------------------	------	--	--	-----	---	-----------------------

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	D	Dilution was required
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits



Date: 1/3/2013

Work Order: 1212127  
 CLIENT: Libby Environmental  
 Project: Commencement Bank

**QC SUMMARY REPORT**  
**Extractable Petroleum Hydrocarbons by NWEPH**

Sample ID: LCS-3840	SampType: LCS	Units: mg/Kg				Prep Date: 12/18/2012	RunNo: 7023				
Client ID: LCSS	Batch ID: 3840					Analysis Date: 12/24/2012	SeqNo: 139244				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C8-C10)	14.3	5.00	20.00	0	71.6	70	130				
Aliphatic Hydrocarbon (C10-C12)	7.16	5.00	10.00	0	71.6	70	130				
Aliphatic Hydrocarbon (C12-C16)	7.42	5.00	10.00	0	74.2	70	130				
Aliphatic Hydrocarbon (C16-C21)	7.67	5.00	10.00	0	76.7	70	130				
Aliphatic Hydrocarbon (C21-C34)	7.68	5.00	10.00	0	76.8	70	130				
Surr: 1-Chlorooctadecane	3.89		4.000		97.2	65	140				

Sample ID: 1212105-001BREP	SampType: REP	Units: mg/Kg-dry				Prep Date: 12/18/2012	RunNo: 7023				
Client ID: BATCH	Batch ID: 3840					Analysis Date: 12/24/2012	SeqNo: 139248				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C8-C10)	73.9	56.7						80.12	8.11	30	
Aliphatic Hydrocarbon (C10-C12)	290	56.7						262.6	9.77	30	
Aliphatic Hydrocarbon (C12-C16)	1,480	56.7						1,490	0.684	30	E
Aliphatic Hydrocarbon (C16-C21)	1,670	56.7						1,672	0.224	30	E
Aliphatic Hydrocarbon (C21-C34)	2,530	56.7						2,396	5.25	30	E
Surr: 1-Chlorooctadecane	36.4		45.37		80.3	65	140		0		

Sample ID: 1212105-001BREP	SampType: REP	Units: mg/Kg-dry				Prep Date: 12/18/2012	RunNo: 7023				
Client ID: BATCH	Batch ID: 3840					Analysis Date: 12/24/2012	SeqNo: 139249				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aromatic Hydrocarbon (C8-C10)	ND	56.7						0	0	30	
Aromatic Hydrocarbon (C10-C12)	ND	56.7						0	0	30	
Aromatic Hydrocarbon (C12-C16)	251	56.7						236.6	5.81	30	
Aromatic Hydrocarbon (C16-C21)	1,880	56.7						1,750	7.29	30	E
Aromatic Hydrocarbon (C21-C34)	3,280	56.7						3,156	3.74	30	E
Surr: o-Terphenyl	40.2		45.37		88.5	65	140		0		

**Qualifiers:** B Analyte detected in the associated Method Blank  
 D Dilution was required  
 E Value above quantitation range  
 H Holding times for preparation or analysis exceeded  
 J Analyte detected below quantitation limits  
 ND Not detected at the Reporting Limit  
 R RPD outside accepted recovery limits  
 RL Reporting Limit  
 S Spike recovery outside accepted recovery limits



Date: 1/3/2013

Work Order: 1212127  
 CLIENT: Libby Environmental  
 Project: Commencement Bank

**QC SUMMARY REPORT**  
**Extractable Petroleum Hydrocarbons by NWEPH**

Sample ID: 1212105-001BREP	SampType: REP	Units: mg/Kg-dry	Prep Date: 12/18/2012	RunNo: 7023							
Client ID: BATCH	Batch ID: 3840	Analysis Date: 12/24/2012	SeqNo: 139249								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: LCS-3840	SampType: LCS	Units: mg/Kg	Prep Date: 12/18/2012	RunNo: 7023							
Client ID: LCSS	Batch ID: 3840	Analysis Date: 12/24/2012	SeqNo: 139257								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aromatic Hydrocarbon (C8-C10)	15.4	5.00	20.00	0	76.9	70	130				
Aromatic Hydrocarbon (C10-C12)	7.47	5.00	10.00	0	74.7	70	130				
Aromatic Hydrocarbon (C12-C16)	8.10	5.00	10.00	0	81.0	70	130				
Aromatic Hydrocarbon (C16-C21)	8.58	5.00	10.00	0	85.8	70	130				
Aromatic Hydrocarbon (C21-C34)	8.58	5.00	10.00	0	85.8	70	130				
Surr: o-Terphenyl	3.70		4.000		92.5	65	140				

Sample ID: LCSD-3840	SampType: LCSD	Units: mg/Kg	Prep Date: 12/18/2012	RunNo: 7023							
Client ID: LCSS02	Batch ID: 3840	Analysis Date: 12/24/2012	SeqNo: 139258								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C8-C10)	14.1	5.00	20.00	0	70.4	70	130	14.33	1.73	20	
Aliphatic Hydrocarbon (C10-C12)	7.26	5.00	10.00	0	72.6	70	130	7.165	1.33	20	
Aliphatic Hydrocarbon (C12-C16)	7.78	5.00	10.00	0	77.8	70	130	7.416	4.74	20	
Aliphatic Hydrocarbon (C16-C21)	8.20	5.00	10.00	0	82.0	70	130	7.675	6.62	20	
Aliphatic Hydrocarbon (C21-C34)	8.20	5.00	10.00	0	82.0	70	130	7.678	6.56	20	
Surr: 1-Chlorooctadecane	4.16		4.000		104	65	140		0		

**Qualifiers:**

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1212127  
 CLIENT: Libby Environmental  
 Project: Commencement Bank

**QC SUMMARY REPORT**  
**Extractable Petroleum Hydrocarbons by NWEPH**

Sample ID: <b>LCSD-3840</b>	SampType: <b>LCSD</b>	Units: <b>mg/Kg</b>				Prep Date: <b>12/18/2012</b>	RunNo: <b>7023</b>				
Client ID: <b>LCSS02</b>	Batch ID: <b>3840</b>					Analysis Date: <b>12/24/2012</b>	SeqNo: <b>139259</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aromatic Hydrocarbon (C8-C10)	14.4	5.00	20.00	0	72.0	70	130	15.37	6.53	20	
Aromatic Hydrocarbon (C10-C12)	7.94	5.00	10.00	0	79.4	70	130	7.474	6.02	20	
Aromatic Hydrocarbon (C12-C16)	8.30	5.00	10.00	0	83.0	70	130	8.096	2.50	20	
Aromatic Hydrocarbon (C16-C21)	9.08	5.00	10.00	0	90.8	70	130	8.576	5.68	20	
Aromatic Hydrocarbon (C21-C34)	9.14	5.00	10.00	0	91.4	70	130	8.577	6.32	20	
Surr: o-Terphenyl	3.84		4.000		96.0	65	140		0		

Sample ID: <b>MB-3840</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>				Prep Date: <b>12/18/2012</b>	RunNo: <b>7023</b>				
Client ID: <b>MBLKS</b>	Batch ID: <b>3840</b>					Analysis Date: <b>12/24/2012</b>	SeqNo: <b>139260</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C8-C10)	ND	5.00									
Aliphatic Hydrocarbon (C10-C12)	ND	5.00									
Aliphatic Hydrocarbon (C12-C16)	ND	5.00									
Aliphatic Hydrocarbon (C16-C21)	ND	5.00									
Aliphatic Hydrocarbon (C21-C34)	ND	5.00									
Surr: 1-Chlorooctadecane	3.35		4.000		83.9	65	140				

Sample ID: <b>MB-3840</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>				Prep Date: <b>12/18/2012</b>	RunNo: <b>7023</b>				
Client ID: <b>MBLKS</b>	Batch ID: <b>3840</b>					Analysis Date: <b>12/24/2012</b>	SeqNo: <b>139261</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aromatic Hydrocarbon (C8-C10)	ND	5.00									
Aromatic Hydrocarbon (C10-C12)	ND	5.00									
Aromatic Hydrocarbon (C12-C16)	ND	5.00									
Aromatic Hydrocarbon (C16-C21)	ND	5.00									
Aromatic Hydrocarbon (C21-C34)	ND	5.00									
Surr: o-Terphenyl	3.68		4.000		92.0	65	140				

**Qualifiers:**

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits



Date: 1/3/2013

Work Order: 1212127  
 CLIENT: Libby Environmental  
 Project: Commencement Bank

**QC SUMMARY REPORT**  
**Extractable Petroleum Hydrocarbons by NWEPH**

Sample ID: <b>MB-3840</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/18/2012</b>	RunNo: <b>7023</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>3840</b>	Analysis Date: <b>12/24/2012</b>	SeqNo: <b>139261</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

<b>Qualifiers:</b>	B Analyte detected in the associated Method Blank	D Dilution was required	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits	ND Not detected at the Reporting Limit
	R RPD outside accepted recovery limits	RL Reporting Limit	S Spike recovery outside accepted recovery limits



Date: 1/3/2013

Work Order: 1212127  
 CLIENT: Libby Environmental  
 Project: Commencement Bank

**QC SUMMARY REPORT**  
**Volatile Petroleum Hydrocarbons by NWVPH**

Sample ID: 1212109-002AMS		SampType: MS		Units: mg/Kg-dry		Prep Date: 12/21/2012		RunNo: 7024			
Client ID: BATCH		Batch ID: 3866				Analysis Date: 12/22/2012		SeqNo: 139267			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C5-C6)	72.4	0.551	66.14	0	110	70	130				
Aliphatic Hydrocarbon (C6-C8)	23.4	0.551	22.05	0	106	70	130				
Aliphatic Hydrocarbon (C8-C10)	23.7	0.551	22.05	0	108	70	130				
Aliphatic Hydrocarbon (C10-C12)	26.3	0.551	22.05	0	119	70	130				
Aromatic Hydrocarbon (C8-C10)	109	0.551	110.2	0	98.6	70	130				
Aromatic Hydrocarbon (C10-C12)	22.5	0.551	22.05	0	102	70	130				
Aromatic Hydrocarbon (C12-C13)	27.0	0.551	22.05	0	122	70	130				
Benzene	21.4	0.551	22.05	0	97.1	70	130				
Toluene	23.2	0.551	22.05	0	105	70	130				
Ethylbenzene	23.1	0.551	22.05	0	105	70	130				
m,p-Xylene	45.0	0.551	44.09	0	102	70	130				
o-Xylene	22.4	0.551	22.05	0	101	70	130				
Naphthalene	16.9	0.551	22.05	0	76.6	70	130				
Methyl tert-butyl ether (MTBE)	23.6	0.551	22.05	0	107	70	130				
Surr: Bromofluorobenzene	1.08		1.102		98.0	65	140				
Surr: Trifluorotoluene	1.19		1.102		108	65	140				

Sample ID: LCS-3866		SampType: LCS		Units: mg/Kg		Prep Date: 12/21/2012		RunNo: 7024			
Client ID: LCSS		Batch ID: 3866				Analysis Date: 12/21/2012		SeqNo: 139271			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C5-C6)	55.8	0.500	60.00	0	93.0	70	130				
Aliphatic Hydrocarbon (C6-C8)	18.2	0.500	20.00	0	91.1	70	130				
Aliphatic Hydrocarbon (C8-C10)	17.4	0.500	20.00	0	87.1	70	130				
Aliphatic Hydrocarbon (C10-C12)	17.4	0.500	20.00	0	87.2	70	130				
Aromatic Hydrocarbon (C8-C10)	89.6	0.500	100.0	0	89.6	70	130				
Aromatic Hydrocarbon (C10-C12)	21.4	0.500	20.00	0	107	70	130				
Aromatic Hydrocarbon (C12-C13)	17.2	0.500	20.00	0	86.1	70	130				

**Qualifiers:** B Analyte detected in the associated Method Blank      D Dilution was required      E Value above quantitation range  
 H Holding times for preparation or analysis exceeded      J Analyte detected below quantitation limits      ND Not detected at the Reporting Limit  
 R RPD outside accepted recovery limits      RL Reporting Limit      S Spike recovery outside accepted recovery limits



Date: 1/3/2013

Work Order: 1212127  
 CLIENT: Libby Environmental  
 Project: Commencement Bank

**QC SUMMARY REPORT**  
**Volatile Petroleum Hydrocarbons by NWVPH**

Sample ID: LCS-3866	SampType: LCS	Units: mg/Kg				Prep Date: 12/21/2012	RunNo: 7024				
Client ID: LCSS	Batch ID: 3866					Analysis Date: 12/21/2012	SeqNo: 139271				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	17.4	0.500	20.00	0	87.1	70	130				
Toluene	18.8	0.500	20.00	0	93.8	70	130				
Ethylbenzene	19.3	0.500	20.00	0	96.6	70	130				
m,p-Xylene	40.4	0.500	40.00	0	101	70	130				
o-Xylene	20.8	0.500	20.00	0	104	70	130				
Naphthalene	19.5	0.500	20.00	0	97.5	70	130				
Methyl tert-butyl ether (MTBE)	20.3	0.500	20.00	0	102	70	130				
Surr: Bromofluorobenzene	0.907		1.000		90.7	65	140				
Surr: Trifluorotoluene	1.27		1.000		127	65	140				

Sample ID: LCSD-3866	SampType: LCSD	Units: mg/Kg				Prep Date: 12/21/2012	RunNo: 7024				
Client ID: LCSS02	Batch ID: 3866					Analysis Date: 12/21/2012	SeqNo: 139272				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C5-C6)	58.2	0.500	60.00	0	97.0	70	130	55.83	4.18	20	
Aliphatic Hydrocarbon (C6-C8)	18.8	0.500	20.00	0	93.9	70	130	18.22	3.00	20	
Aliphatic Hydrocarbon (C8-C10)	18.5	0.500	20.00	0	92.5	70	130	17.42	5.99	20	
Aliphatic Hydrocarbon (C10-C12)	20.0	0.500	20.00	0	100	70	130	17.45	13.7	20	
Aromatic Hydrocarbon (C8-C10)	94.3	0.500	100.0	0	94.3	70	130	89.60	5.06	20	
Aromatic Hydrocarbon (C10-C12)	24.3	0.500	20.00	0	121	70	130	21.40	12.6	20	
Aromatic Hydrocarbon (C12-C13)	19.0	0.500	20.00	0	95.2	70	130	17.21	10.1	20	
Benzene	17.7	0.500	20.00	0	88.7	70	130	17.42	1.84	20	
Toluene	19.0	0.500	20.00	0	94.8	70	130	18.75	1.04	20	
Ethylbenzene	19.6	0.500	20.00	0	97.9	70	130	19.33	1.26	20	
m,p-Xylene	40.9	0.500	40.00	0	102	70	130	40.36	1.32	20	
o-Xylene	21.0	0.500	20.00	0	105	70	130	20.81	1.02	20	
Naphthalene	17.2	0.500	20.00	0	85.9	70	130	19.51	12.7	20	
Methyl tert-butyl ether (MTBE)	22.4	0.500	20.00	0	112	70	130	20.35	9.40	20	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits



Date: 1/3/2013

Work Order: 1212127  
 CLIENT: Libby Environmental  
 Project: Commencement Bank

**QC SUMMARY REPORT**  
**Volatile Petroleum Hydrocarbons by NWVPH**

Sample ID: <b>LCSD-3866</b>	SampType: <b>LCSD</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/21/2012</b>	RunNo: <b>7024</b>							
Client ID: <b>LCSS02</b>	Batch ID: <b>3866</b>		Analysis Date: <b>12/21/2012</b>	SeqNo: <b>139272</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene	1.12		1.000		112	65	140		0		
Surr: Trifluorotoluene	1.21		1.000		121	65	140		0		

Sample ID: <b>MB-3866</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/21/2012</b>	RunNo: <b>7024</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>3866</b>		Analysis Date: <b>12/21/2012</b>	SeqNo: <b>139273</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C5-C6)	ND	0.500		0	0						
Aliphatic Hydrocarbon (C6-C8)	ND	0.500		0	0						
Aliphatic Hydrocarbon (C8-C10)	ND	0.500		0	0						
Aliphatic Hydrocarbon (C10-C12)	ND	0.500		0	0						
Aromatic Hydrocarbon (C8-C10)	ND	0.500		0	0						
Aromatic Hydrocarbon (C10-C12)	ND	0.500		0	0						
Aromatic Hydrocarbon (C12-C13)	ND	0.500		0	0						
Benzene	ND	0.500		0	0						
Toluene	ND	0.500		0	0						
Ethylbenzene	ND	0.500		0	0						
m,p-Xylene	ND	0.500		0	0						
o-Xylene	ND	0.500		0	0						
Naphthalene	ND	0.500		0	0						
Methyl tert-butyl ether (MTBE)	ND	0.500		0	0						
Surr: Bromofluorobenzene	1.26		1.000		126	65	140				
Surr: Trifluorotoluene	1.02		1.000		102	65	140				

**Qualifiers:**

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits



Date: 1/3/2013

Work Order: 1212127  
 CLIENT: Libby Environmental  
 Project: Commencement Bank

**QC SUMMARY REPORT**  
**Volatile Petroleum Hydrocarbons by NWVPH**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C5-C6)	ND	0.540		0	0			0	0	25	
Aliphatic Hydrocarbon (C6-C8)	11.1	0.540		0	0			10.47	5.83	25	
Aliphatic Hydrocarbon (C8-C10)	41.1	0.540		0	0			39.23	4.71	25	E
Aliphatic Hydrocarbon (C10-C12)	41.3	0.540		0	0			37.66	9.26	25	E
Aromatic Hydrocarbon (C8-C10)	46.4	0.540		0	0			40.96	12.4	25	
Aromatic Hydrocarbon (C10-C12)	112	0.540		0	0			104.9	6.27	25	E
Aromatic Hydrocarbon (C12-C13)	3.68	0.540		0	0			3.589	2.53	25	
Benzene	ND	0.540		0	0			0	0	25	
Toluene	ND	0.540		0	0			0	0	25	
Ethylbenzene	ND	0.540		0	0			0	0	25	
m,p-Xylene	ND	0.540		0	0			0	0	25	
o-Xylene	ND	0.540		0	0			0	0	25	
Naphthalene	0.592	0.540		0	0			0	0	25	
Methyl tert-butyl ether (MTBE)	ND	0.540		0	0			0.5650	4.62	25	
Surr: Bromofluorobenzene	1.46		1.080		135	65	140	0	0	25	
Surr: Trifluorotoluene	1.14		1.080		105	65	140	0	0	25	

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits  
 D Dilution was required  
 J Analyte detected below quantitation limits  
 RL Reporting Limit  
 E Value above quantitation range  
 ND Not detected at the Reporting Limit  
 S Spike recovery outside accepted recovery limits



## Sample Log-In Check List

Client Name: <b>LIBBY</b>	Work Order Number: <b>1212127</b>
Logged by: <b>Clare Griggs</b>	Date Received: <b>12/20/2012 9:45:00 AM</b>

### Chain of Custody

1. Were custodial seals present?      Yes       No       Not Required
2. Is Chain of Custody complete?      Yes       No       Not Present
3. How was the sample delivered?      UPS

### Log In

4. Coolers are present?      Yes       No       NA
5. Was an attempt made to cool the samples?      Yes       No       NA
6. Were all coolers received at a temperature of >0° C to 10.0°C      Yes       No       NA
7. Sample(s) in proper container(s)?      Yes       No
8. Sufficient sample volume for indicated test(s)?      Yes       No
9. Are samples properly preserved?      Yes       No
10. Was preservative added to bottles?      Yes       No       NA
11. Is there headspace present in VOA vials?      Yes       No       NA
12. Did all sample containers arrive in good condition?(unbroken)      Yes       No
13. Does paperwork match bottle labels?      Yes       No
14. Are matrices correctly identified on Chain of Custody?      Yes       No
15. Is it clear what analyses were requested?      Yes       No
16. Were all holding times able to be met?      Yes       No

### Special Handling (if applicable)

17. Was client notified of all discrepancies with this order?      Yes       No       NA

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

18. Additional remarks/Discrepancies

### Item Information

Item #	Temp °C	Condition
Cooler	8.8	Good







# Libby Environmental, Inc.

4139 Libby Road NE • Olympia, WA 98506-2518

November 15, 2012

John Hildenbrand  
Robinson Noble  
3011 Huson Street South  
Suite A  
Tacoma, WA 98409

Dear Mr. Hildenbrand:

Please find enclosed the analytical data report for the Commencement Bank 1517 South Tacoma Way Project located in Tacoma, Washington. Soil samples were analyzed for Diesel by NWTPH-Dx on November 14, 2012.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. All soil samples are reported on a dry weight basis. An invoice for this analytical work is enclosed.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Jamie L. Deyman  
*President*  
*Libby Environmental, Inc.*

Phone (360) 352-2110 • Fax (360) 352-4154 • [libbyenv@aol.com](mailto:libbyenv@aol.com)

[www.LibbyEnvironmental.com](http://www.LibbyEnvironmental.com)

# Libby Environmental, Inc.

4139 Libby Road NE  
Olympia, WA 98506  
Phone: (360) 352-2110  
FAX: (360) 352-4154  
Email: libbyenv@aol.com

COMMENCEMENT BANK 1517 SOUTH TACOMA WAY PROJECT  
Robinson Noble  
Tacoma, Washington  
Libby Project # L121114-20  
Client Project # 2754-001B

## Analyses of Diesel (NWTPH-Dx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)
Method Blank	11/14/12	85	nd
B5-15.5'	11/14/12	89	nd
B5-18'	11/14/12	84	nd
B6-16'	11/14/12	91	nd
B6-19'	11/14/12	86	nd
B7-16'	11/14/12	98	nd
B7-20'	11/14/12	80	nd
B8-14'	11/14/12	int	28000
B8-18.5'	11/14/12	82	nd
B8-18.5' Dup	11/14/12	79	nd
B9-14.5'	11/14/12	92	nd
B9-17'	11/14/12	79	nd
B10-14.5'	11/14/12	int	231
B10-18'	11/14/12	87	nd
B11-15'	11/14/12	int	323
B11-18.5'	11/14/12	84	nd
B11-18.5' Dup	11/14/12	83	nd
B12-14'	11/14/12	int	6810
B12-18'	11/14/12	114	nd
B13-24'	11/14/12	int	7370
B14-14.5'	11/14/12	int	6780
Practical Quantitation Limit			25

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%  
ANALYSES PERFORMED BY: Jamie Deyman





# Libby Environmental, Inc.

4139 Libby Road NE • Olympia, WA 98506-2518

November 6, 2012

John Hildenbrand  
Robinson Noble  
3011 Huson Street South  
Suite A  
Tacoma, WA 98409

Dear Mr. Hildenbrand:

Please find enclosed the analytical data report for the Commencement Bank 1517 South Tacoma Way Project located in Tacoma, Washington. Soil samples were analyzed for Diesel by NWTPH-Dx and Gasoline by NWTPH-Gx and BTEX by EPA Method 8021B on October 30, 2012.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. All soil samples are reported on a dry weight basis. An invoice for this analytical work is enclosed.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Jamie L. Deyman  
*President*  
*Libby Environmental, Inc.*

Phone (360) 352-2110 • Fax (360) 352-4154 • [libbyenv@aol.com](mailto:libbyenv@aol.com)

[www.LibbyEnvironmental.com](http://www.LibbyEnvironmental.com)

# Libby Environmental, Inc.

4139 Libby Road NE  
Olympia, WA 98506  
Phone: (360) 352-2110  
FAX: (360) 352-4154  
Email: libbyenv@aol.com

COMMENCEMENT BANK 1517 SOUTH TACOMA WAY PROJECT  
Robinson Noble  
Tacoma, Washington  
Libby Project # L121030-20  
Client Project # 2754-001B

## Analyses of Diesel (NWTPH-Dx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)
Method Blank	10/30/12	90	nd
Method Blank	10/30/12	91	nd
E4S3D4.5	10/30/12	100	nd
E6S6D5	10/30/12	80	nd
E8S2D4.5	10/30/12	94	nd
Stockpile North	10/30/12	92	133
Stockpile W	10/30/12	92	97
Stockpile S	10/30/12	100	nd
Stockpile East	10/30/12	94	nd
E6N6D11	10/30/12	int	4110
N3E7D8.5	10/30/12	103	nd
N6.5E5.5D12.5	10/30/12	int	31400
N7E6.5D13.5	10/30/12	int	2370
N7E6.5D15	10/30/12	int	307
N6E9D10	10/30/12	int	42.4
N6E9D10 Dup	10/30/12	int	40.6
N6E3D10	10/30/12	105	nd
N12E4D10	10/30/12	105	nd
N6E9D13	10/30/12	int	5600
N6E3D13	10/30/12	int	2900
N2E5.5D10	10/30/12	123	150
N2E5.5D10 Dup	10/30/12	117	150
N2E5.5D13	10/30/12	int	16000
N12E4D13	10/30/12	133	150
Practical Quantitation Limit			25

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Jamie Deyman

# Libby Environmental, Inc.

4139 Libby Road NE

Olympia, WA 98506

Phone: (360) 352-2110

FAX: (360) 352-4154

Email: libbyenv@aol.com

## COMMENCEMENT BANK 1517 SOUTH TACOMA WAY PROJECT

Robinson Noble

Tacoma, Washington

Libby Project # L121030-20

Client Project # 2754-001B

### Analyses of BTEX by EPA Method 8021B in Soil

Sample Number	Date Analyzed	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Surrogate Recovery (%)
Method Blank	10/30/12	nd	nd	nd	nd	81
LCS	10/30/12	81%	93%			89
N6.5E5.5D12.5	10/30/12	nd	nd	nd	nd	103
N6.5E5.5D12.5 Dup	10/30/12	nd	nd	nd	nd	107
N7E6.5D13.5	10/30/12	nd	nd	nd	nd	83
N6.5E5.5D12.5 MS	10/30/12	94%	85%			107
Practical Quantitation Limit		0.02	0.10	0.05	0.15	

"nd" Indicates not detected at the listed detection limits.

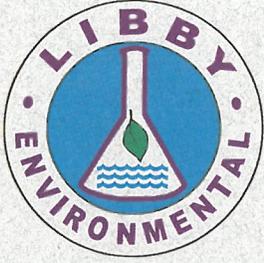
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Trifluorotoluene): 65% TO 135%

ANALYSES PERFORMED BY: Jamie Deyman







# Libby Environmental, Inc.

4139 Libby Road NE • Olympia, WA 98506-2518

September 18, 2012

John Hildenbrand  
Robinson Noble  
3011 Huson Street South  
Suite A  
Tacoma, WA 98409

Dear Mr. Hildenbrand:

Please find enclosed the analytical data report for the 1517 South Tacoma Way Project located in Tacoma, Washington. Soil samples were analyzed for Gasoline by NWTPH-Gx, Diesel by NWTPH-Dx and Volatile Organic Compounds by EPA Method 8260C on September 14, 2012.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. All soil samples are reported on a dry weight basis. An invoice for this analytical work is enclosed.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Sherry L. Chilcutt  
*Lab Manager*  
*Libby Environmental, Inc.*

Phone (360) 352-2110 • Fax (360) 352-4154 • [libbyenv@aol.com](mailto:libbyenv@aol.com)

[www.LibbyEnvironmental.com](http://www.LibbyEnvironmental.com)

# Libby Environmental, Inc.

1517 SOUTH TACOMA WAY PROJECT  
 Robinson Noble, Inc.  
 Tacoma, Washington  
 Libby Project # L120912-2  
 Client Project # 2754-001A

4139 Libby Road NE  
 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@aol.com

## Volatile Organic Compounds by EPA Method 8260C in Soil

Sample Description	Method	B1-25'	B2-30'	B4-19'	
	Blank				
Date Sampled	Reporting	N/A	9/12/12	9/12/12	9/12/12
Date Analyzed	Limits	9/14/12	9/14/12	9/14/12	9/18/12
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Dichlorodifluoromethane	0.06	nd	nd	nd	nd
Chloromethane	0.06	nd	nd	nd	nd
Vinyl chloride	0.02	nd	nd	nd	nd
Bromomethane	0.09	nd	nd	nd	nd
Chloroethane	0.06	nd	nd	nd	nd
Trichlorofluoromethane	0.05	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd
Methylene chloride	0.02	nd	nd	nd	nd
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.02	nd	nd	nd	nd
<i>trans</i> -1,2-Dichloroethene	0.02	nd	nd	nd	nd
1,1-Dichloroethane	0.02	nd	nd	nd	nd
2,2-Dichloropropane	0.05	nd	nd	nd	nd
<i>cis</i> -1,2-Dichloroethene	0.02	nd	nd	nd	nd
Chloroform	0.02	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.02	nd	nd	nd	nd
Carbon tetrachloride	0.02	nd	nd	nd	nd
1,1-Dichloropropene	0.02	nd	nd	nd	nd
Benzene	0.02	nd	nd	nd	nd
1,2-Dichloroethane (EDC)	0.03	nd	nd	nd	nd
Trichloroethene (TCE)	0.03	nd	nd	nd	nd
1,2-Dichloropropane	0.02	nd	nd	nd	nd
Dibromomethane	0.04	nd	nd	nd	nd
Bromodichloromethane	0.02	nd	nd	nd	nd
<i>cis</i> -1,3-Dichloropropene	0.02	nd	nd	nd	nd
Toluene	0.02	nd	nd	nd	nd
Trans-1,3-Dichloropropene	0.03	nd	nd	nd	nd
1,1,2-Trichloroethane	0.03	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.02	nd	nd	nd	nd
1,3-Dichloropropane	0.05	nd	nd	nd	nd
Dibromochloromethane	0.03	nd	nd	nd	nd
1,2-Dibromoethane (EDB) *	0.005	nd	nd	nd	nd
Chlorobenzene	0.02	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.03	nd	nd	nd	nd
Ethylbenzene	0.03	nd	nd	nd	nd
Total Xylenes	0.03	nd	nd	nd	nd
Styrenes	0.02	nd	nd	nd	nd

# Libby Environmental, Inc.

4139 Libby Road NE  
 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@aol.com

1517 SOUTH TACOMA WAY PROJECT  
 Robinson Noble, Inc.  
 Tacoma, Washington  
 Libby Project # L120912-2  
 Client Project # 2754-001A

## Volatile Organic Compounds by EPA Method 8260C in Soil

Sample Description	Method	B1-25'	B2-30'	B4-19'	
	Blank				
Date Sampled	Reporting	9/12/12	9/12/12	9/12/12	
Date Analyzed	Limits	9/14/12	9/14/12	9/18/12	
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	
Bromoform	0.02	nd	nd	nd	
Isopropylbenzene	0.08	nd	nd	nd	
1,2,3-Trichloropropane	0.02	nd	nd	nd	
Bromobenzene	0.03	nd	nd	nd	
1,1,2,2-Tetrachloroethane	0.02	nd	nd	nd	
n-Propylbenzene	0.02	nd	nd	nd	
2-Chlorotoluene	0.02	nd	nd	nd	
4-Chlorotoluene	0.02	nd	nd	nd	
1,3,5-Trimethylbenzene	0.02	nd	nd	nd	
tert-Butylbenzene	0.02	nd	nd	nd	
1,2,4-Trimethylbenzene	0.02	nd	nd	nd	
sec-Butylbenzene	0.02	nd	nd	nd	
1,3-Dichlorobenzene	0.02	nd	nd	nd	
Isopropyltoluene	0.02	nd	nd	nd	
1,4-Dichlorobenzene	0.02	nd	nd	nd	
1,2-Dichlorobenzene	0.02	nd	nd	nd	
n-Butylbenzene	0.02	nd	nd	nd	
1,2-Dibromo-3-Chloropropane	0.03	nd	nd	nd	
1,2,4-Trichlorobenzene	0.05	nd	nd	nd	
Hexachloro-1,3-butadiene	0.10	nd	nd	nd	
Naphthalene	0.03	nd	nd	nd	
1,2,3-Trichlorobenzene	1.0	nd	nd	nd	
<b>Surrogate Recovery</b>					
Dibromofluoromethane	105	88	101	91	
1,2-Dichloroethane-d4	127	113	114	105	
Toluene-d8	87	73	81	87	
4-Bromofluorobenzene	84	80	82	84	

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

\* INSTRUMENT DETECTION LIMIT

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE 65% TO 135%

ANALYSES PERFORMED BY: Sherry Chilcutt

# Libby Environmental, Inc.

1517 SOUTH TACOMA WAY PROJECT  
 Robinson Noble, Inc.  
 Tacoma, Washington  
 Libby Project # L120912-2  
 Client Project # 2754-001A

4139 Libby Road NE  
 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@aol.com

## QA/QC Data - EPA 8260C Analyses

Sample Identification: L120914-10							
	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	
1,1-Dichloroethene	0.50	0.33	66	0.50	0.35	70	5.9
Benzene	0.50	0.67	134	0.50	0.61	122	9.4
Toluene	0.50	0.62	124	0.50	0.65	130	4.7
Chlorobenzene	0.50	0.55	110	0.50	0.63	126	13.6
Trichloroethene (TCE)	0.50	0.60	120	0.50	0.62	124	3.3
<b>Surrogate Recovery</b>							
Dibromofluoromethane			89			84	
1,2-Dichloroethane-d4			132			92	
Toluene-d8			84			94	
4-Bromofluorobenzene			90			75	

Laboratory Control Sample			
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
1,1-Dichloroethene	0.50	0.35	70
Benzene	0.50	0.61	122
Toluene	0.50	0.59	118
Chlorobenzene	0.50	0.61	122
Trichloroethene (TCE)	0.50	0.60	120
<b>Surrogate Recovery</b>			
Dibromofluoromethane			100
1,2-Dichloroethane-d4			110
Toluene-d8			87
4-Bromofluorobenzene			88

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 65%-135%  
 ACCEPTABLE RPD IS 35%

ANALYSES PERFORMED BY: Sherry Chilcutt

# Libby Environmental, Inc.

4139 Libby Road NE  
Olympia, WA 98506  
Phone: (360) 352-2110  
FAX: (360) 352-4154  
Email: libbyenv@aol.com

1517 SOUTH TACOMA WAY PROJECT  
Robinson Noble, Inc.  
Tacoma, Washington  
Libby Project # L120912-2  
Client Project # 2754-001A

## Analyses of Gasoline (NWTPH-Gx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Gasoline (mg/kg)
Method Blank	9/14/12	87	nd
Method Blank	9/18/12	93	nd
B1-25'	9/14/12	73	nd
B2-30'	9/14/12	81	nd
B4-19'	9/18/12	87	nd
Practical Quantitation Limit			10

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Toluene-d8): 65% TO 135%

ANALYSES PERFORMED BY: Sherry Chilcutt

# Libby Environmental, Inc.

4139 Libby Road NE  
Olympia, WA 98506  
Phone: (360) 352-2110  
FAX: (360) 352-4154  
Email: libbyenv@aol.com

1517 SOUTH TACOMA WAY PROJECT  
Robinson Noble, Inc.  
Tacoma, Washington  
Libby Project # L120912-2  
Client Project # 2754-001A

## Analyses of Diesel (NWTPH-Dx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)
Method Blank	9/14/12	84	nd
B3-13.5'	9/14/12	int	4090
B3-19'	9/14/12	82	nd
B3-19' Dup	9/14/12	89	nd
Practical Quantitation Limit			25

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Sherry Chilcutt

# Libby Environmental, Inc.

# Chain of Custody Record

4139 Libby Road NE  
Olympia, WA 98506

Ph: 360-352-2110  
Fax: 360-352-4154

Date: 9-12-12 Page: 1 of 1

Client: Robinson Noble

Project Manager: JFH

Address: 3011 South Hudson ST, Suite H Tac WA

Project Name: 1517 South Tacoma Way

Phone: 253-475-7711 Fax:

Location: Tacoma WA

Client Project # 2754-001A

Collector: ACY Date of Collection: 9-12-12

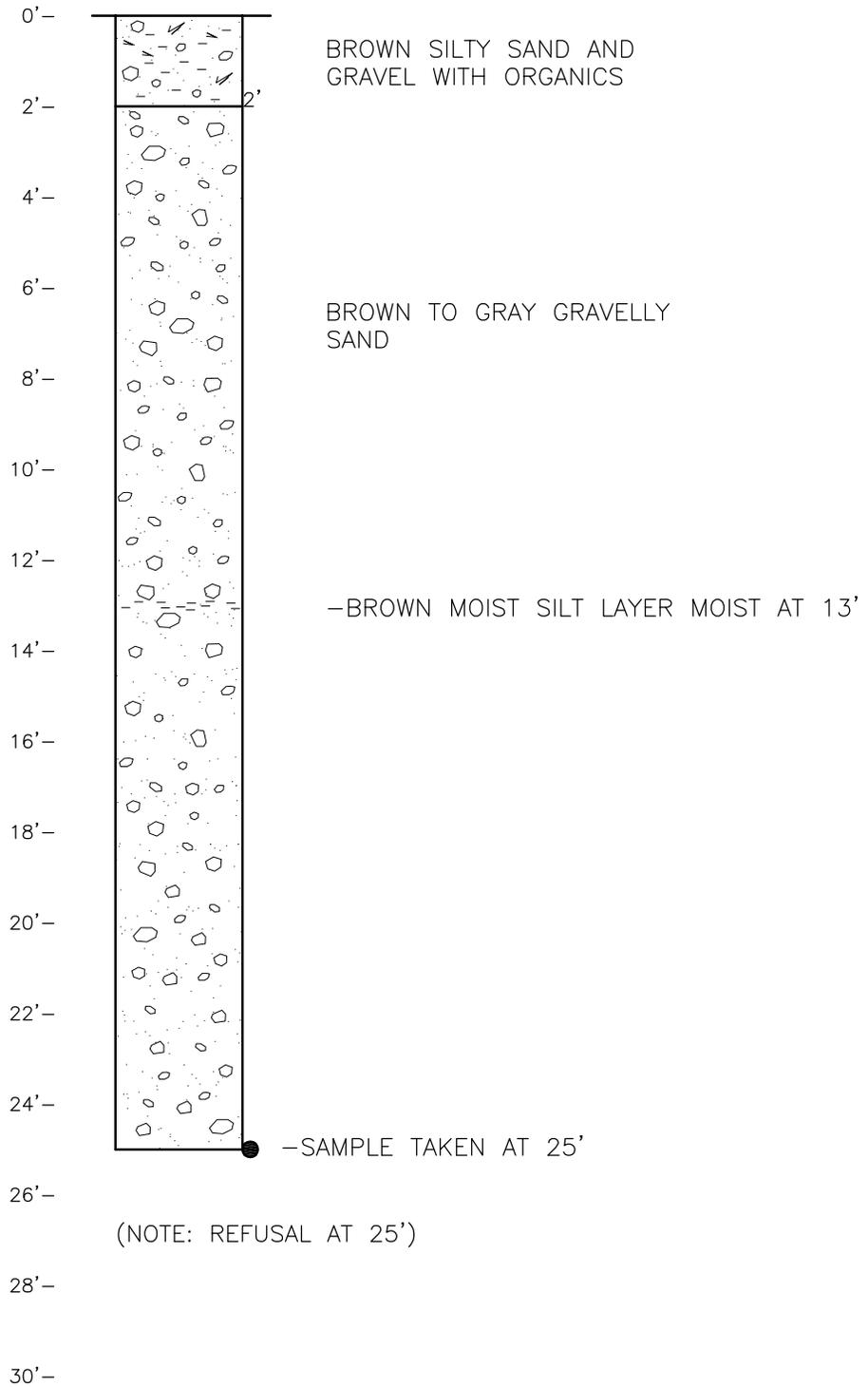
Sample Number	Depth	Time	Sample Type	Container Type	Analytes											Field Note/# Containers								
					VOA 8021B	VOA 8021B BTEX-Only	VOA 8260	SEMI VOL 8270	NWTPH-HCID	NWTPH-Gx	NWTPH-Dx	PAH 8270	PCB's 8082	MTCA 5 Metals										
1	B1-25'	25'	Soil	4oz	✓	✓																		
2	B2-30	30'	↓	4oz	✓	✓																		
3	B3-13.5	13.5'	↓	4oz																				
4	B3-19'	19'	↓	4oz																				
5	B4-19'	19'	↓	4oz	✓	✓																		
6					↑																			
7					do not																			
8					run																			
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								

Relinquished by: <u>Adam King</u>	Date / Time: <u>9-12-12</u>	Received by: <u>James L. Dayman</u>	Date / Time: <u>9/12/12 2:31pm</u>	Sample Receipt:	Remarks:	
Relinquished by:	Date / Time:	Received by:	Date / Time:		Good Condition?	
Relinquished by:	Date / Time:	Received by:	Date / Time:		Cold?	
Relinquished by:	Date / Time:	Received by:	Date / Time:		Seals Intact?	
				Total Number of Containers	TAT 24HR 48HR 5-Day	

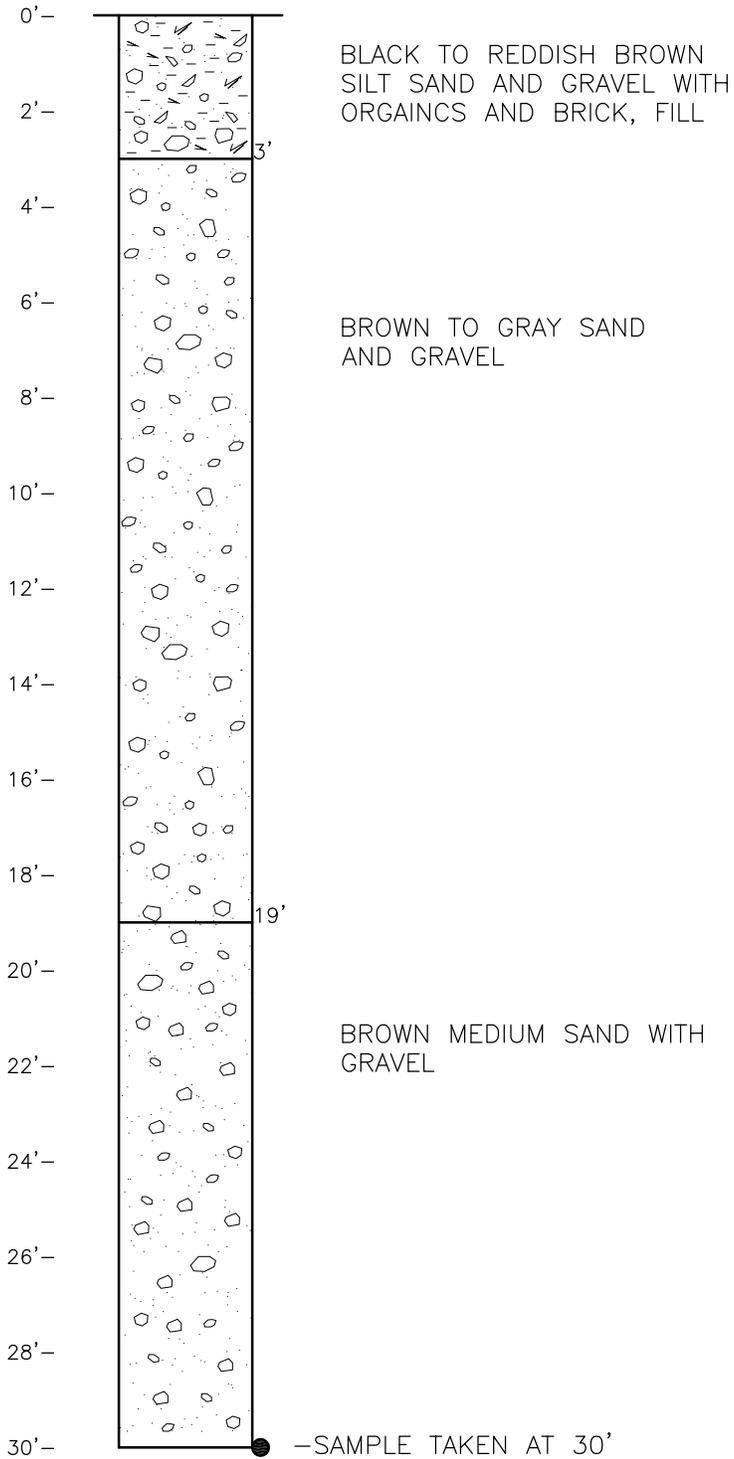
## APPENDIX B

---

GEOLOGIC LOG  
B1

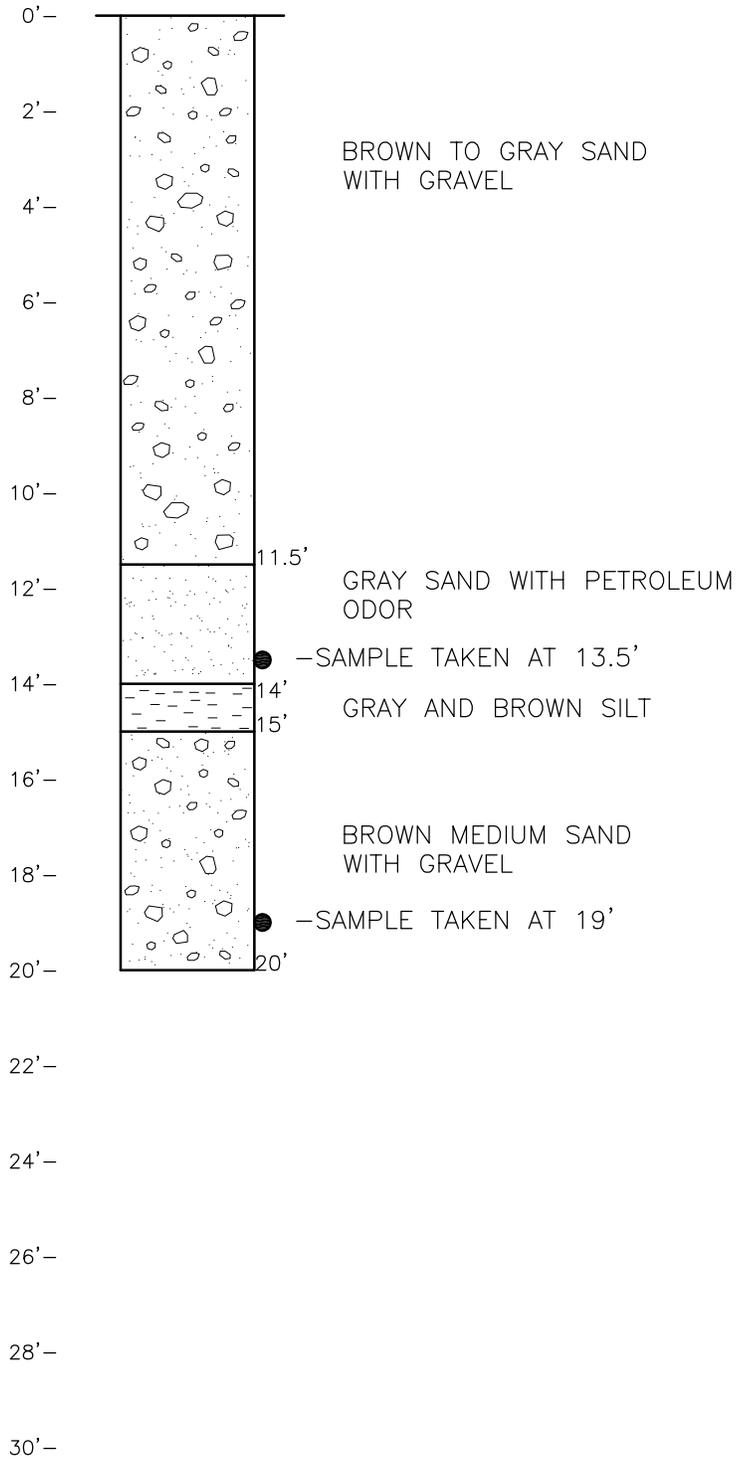


GEOLOGIC LOG  
B2

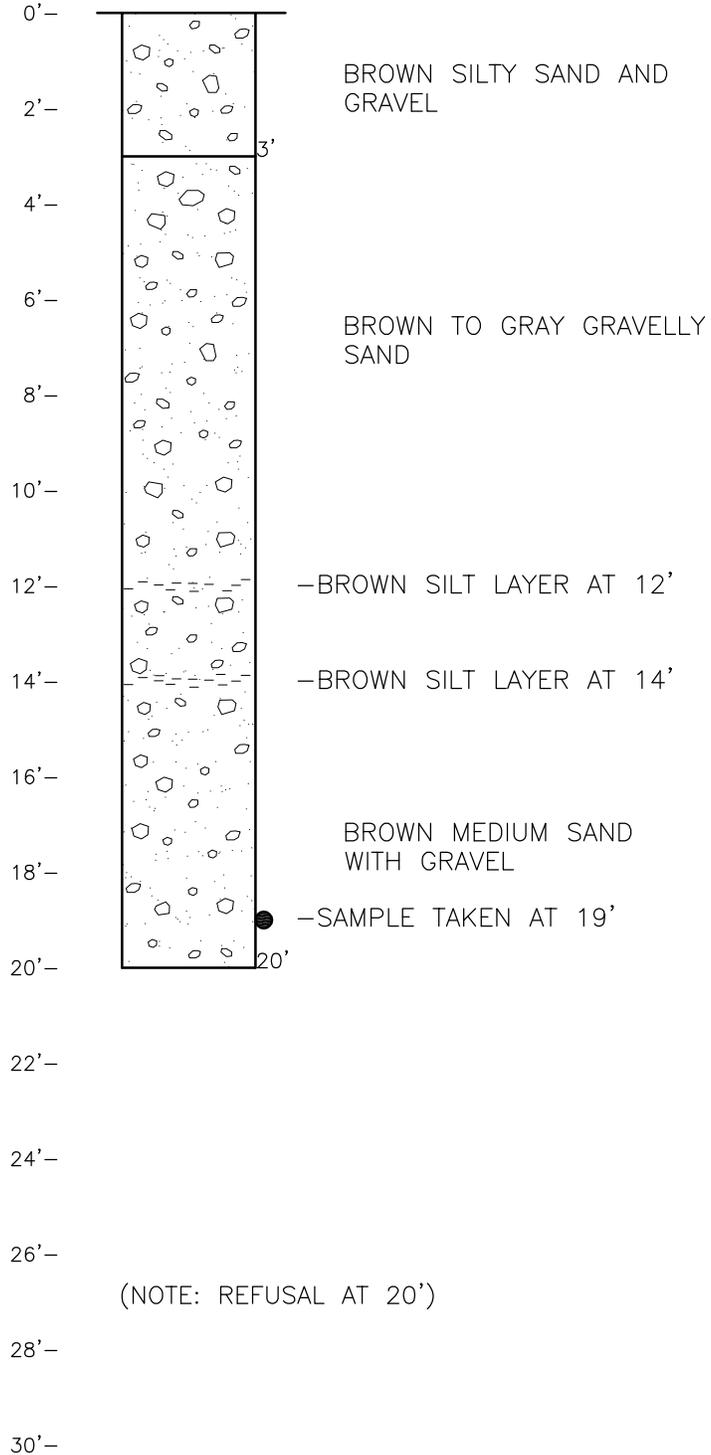


(NOTE: REFUSAL AT 30')

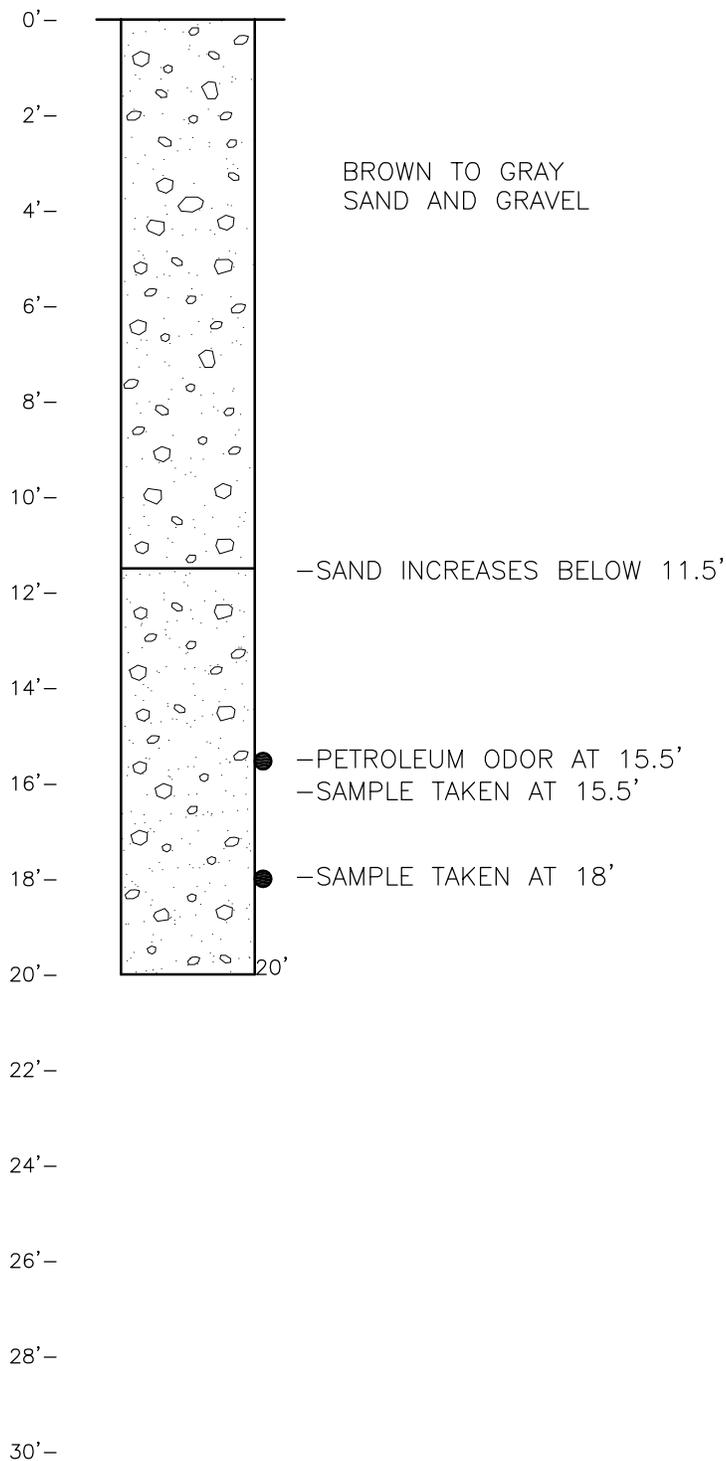
# GEOLOGIC LOG B3



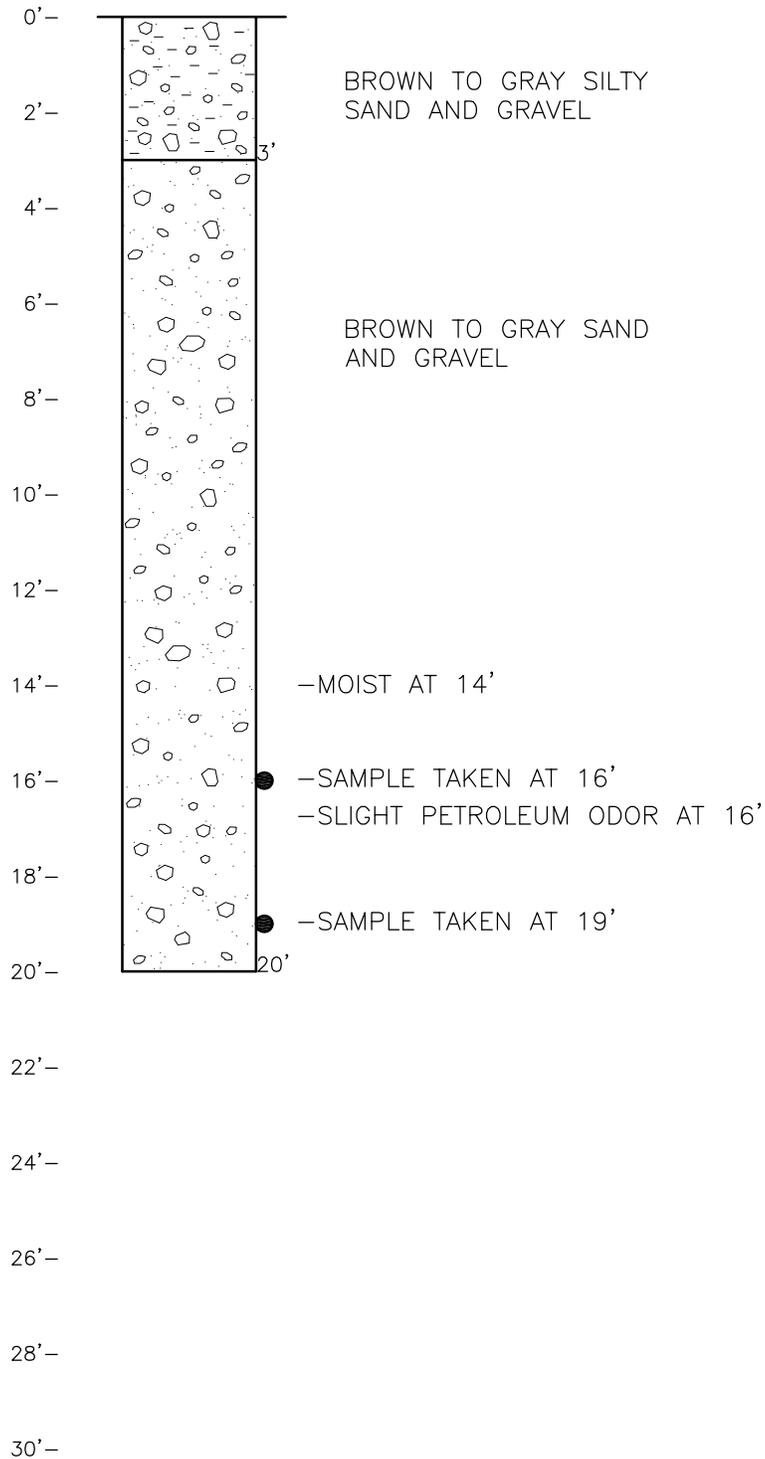
# GEOLOGIC LOG B4



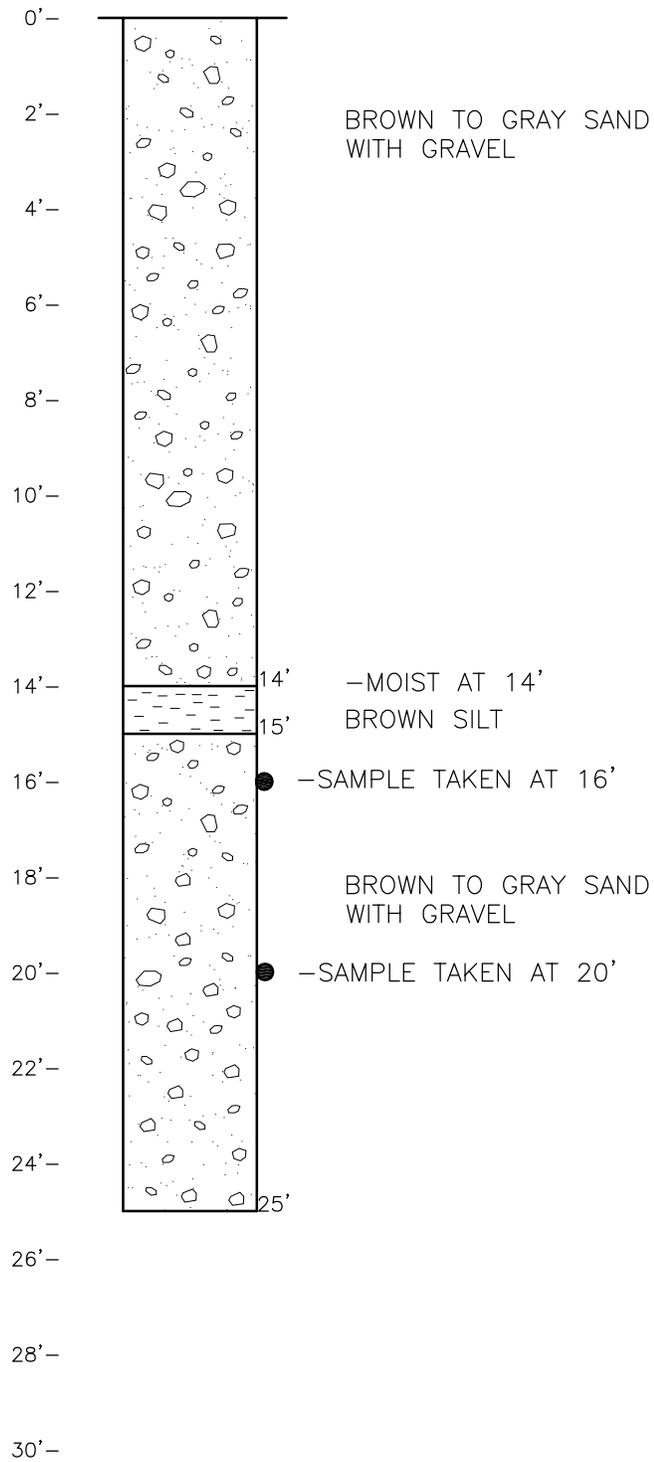
GEOLOGIC LOG  
B5



GEOLOGIC LOG  
B6



# GEOLOGIC LOG B7



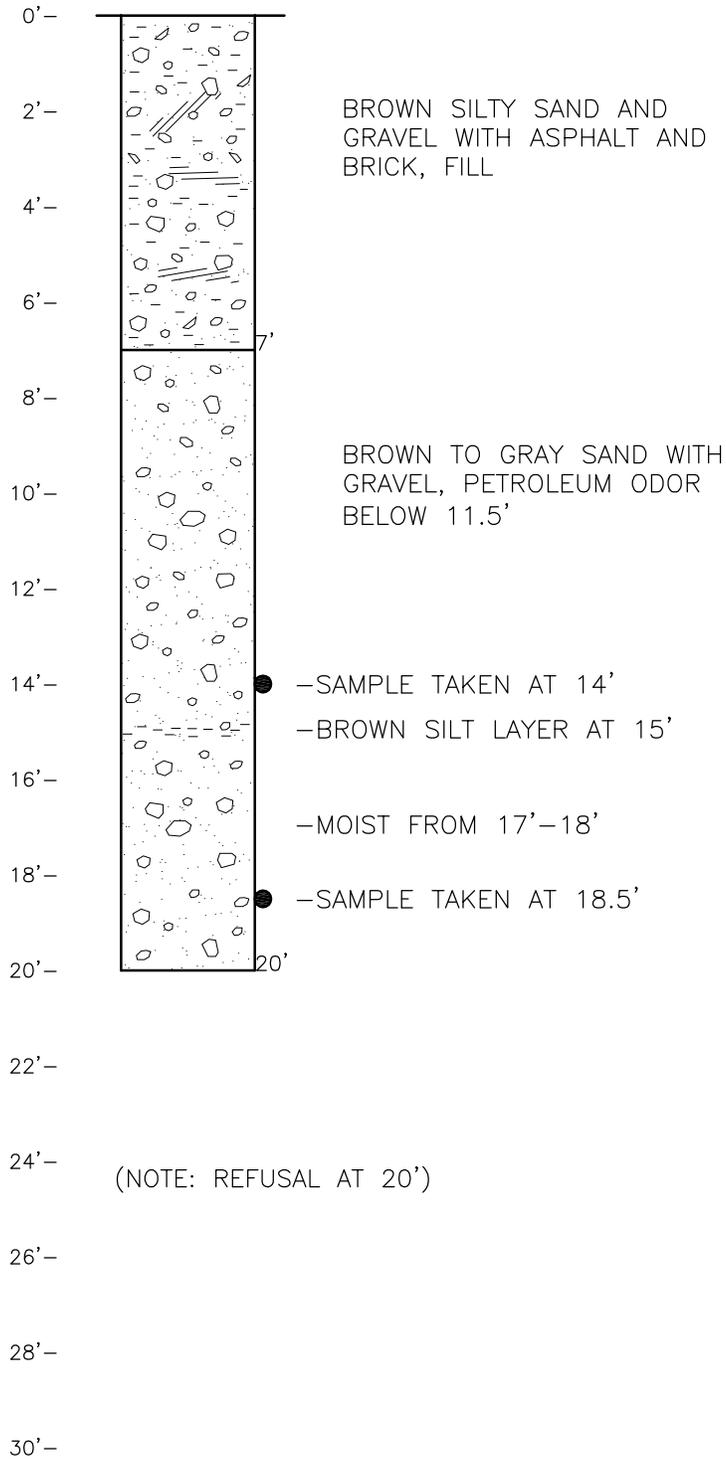
**ROBINSON  
NOBLE**

PM: JFH  
March 2013  
2754-001A/B

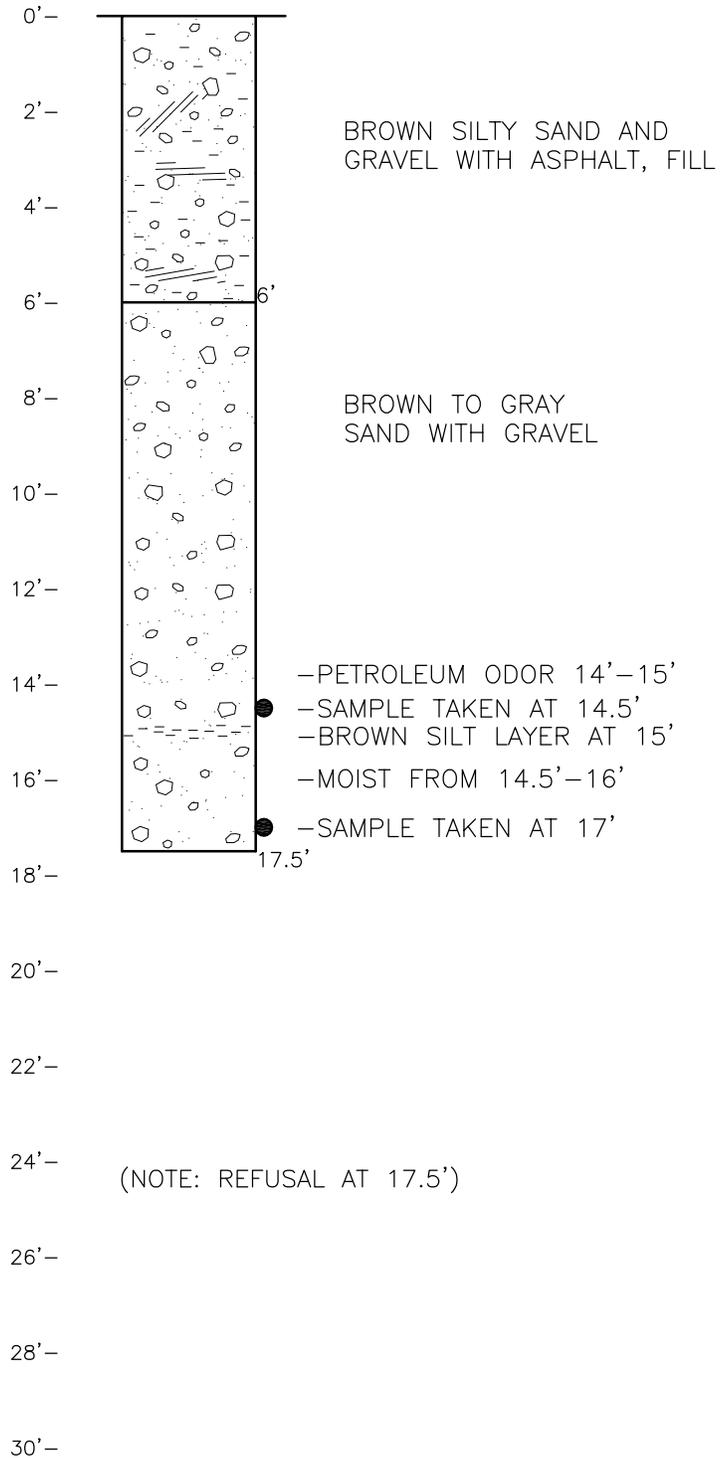
Pierce County  
T 20 N/R 03 E - 08  
Scale 1" = 4.0'

**Geologic Logs for Borehole B7 at Heating Oil Area**  
Founder's Choice Cabinets: 1517 South Tacoma Way

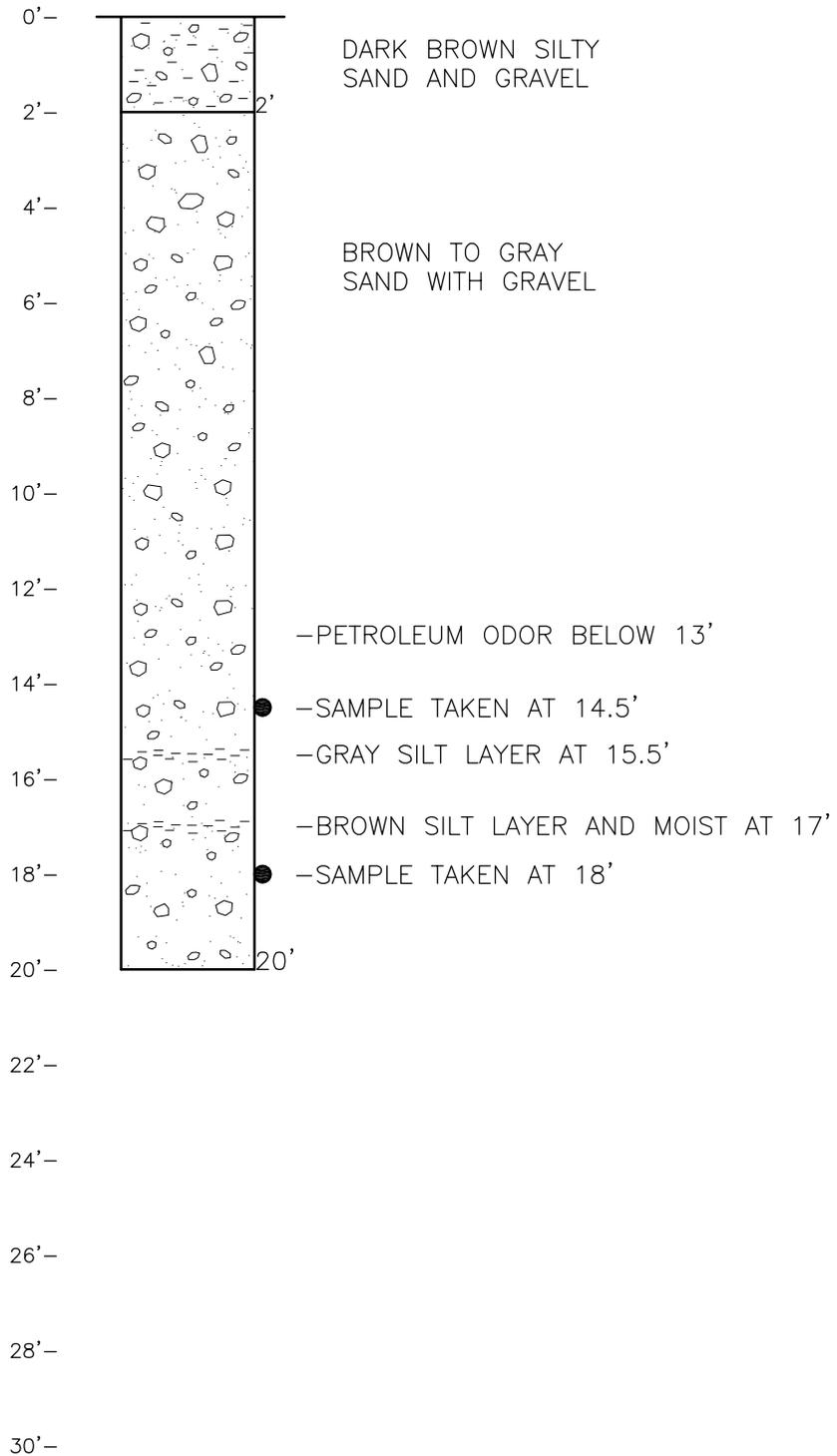
# GEOLOGIC LOG B8



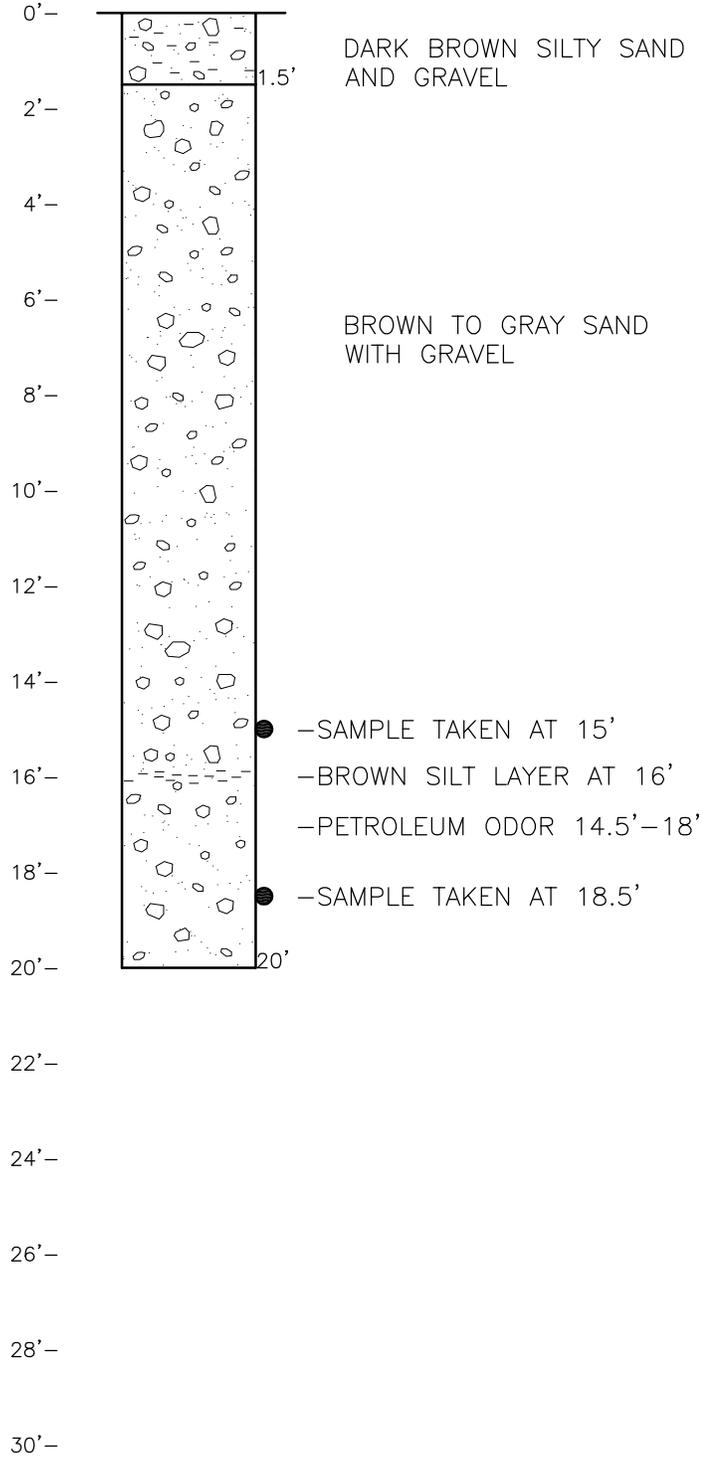
GEOLOGIC LOG  
B9



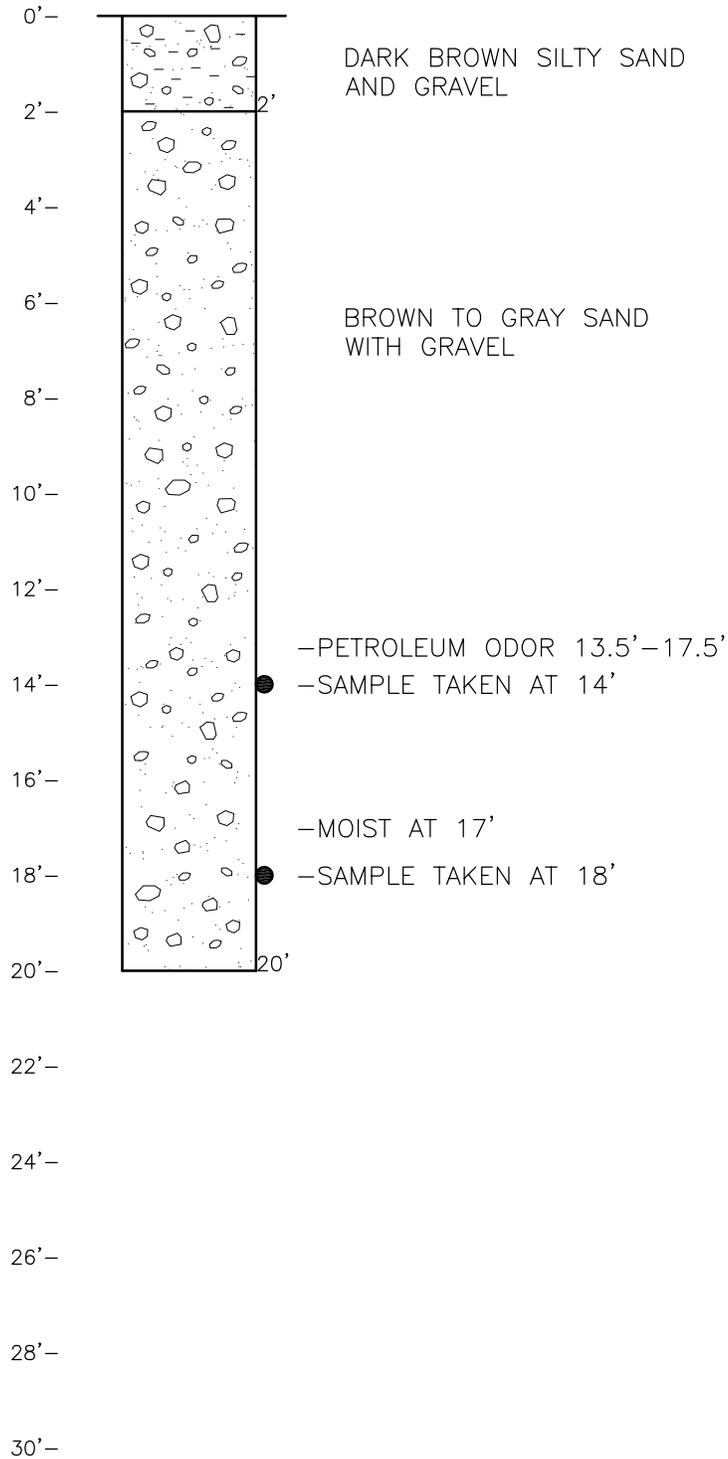
GEOLOGIC LOG  
B10



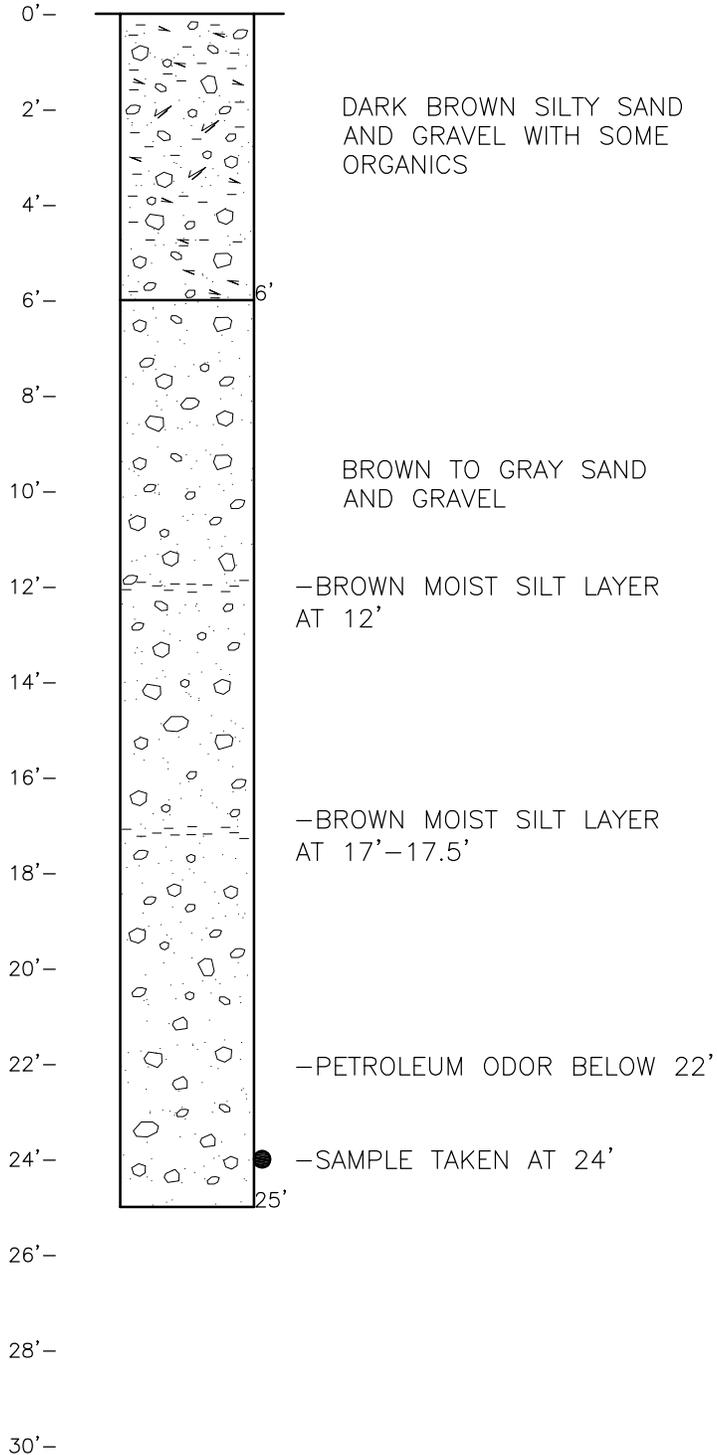
# GEOLOGIC LOG B11



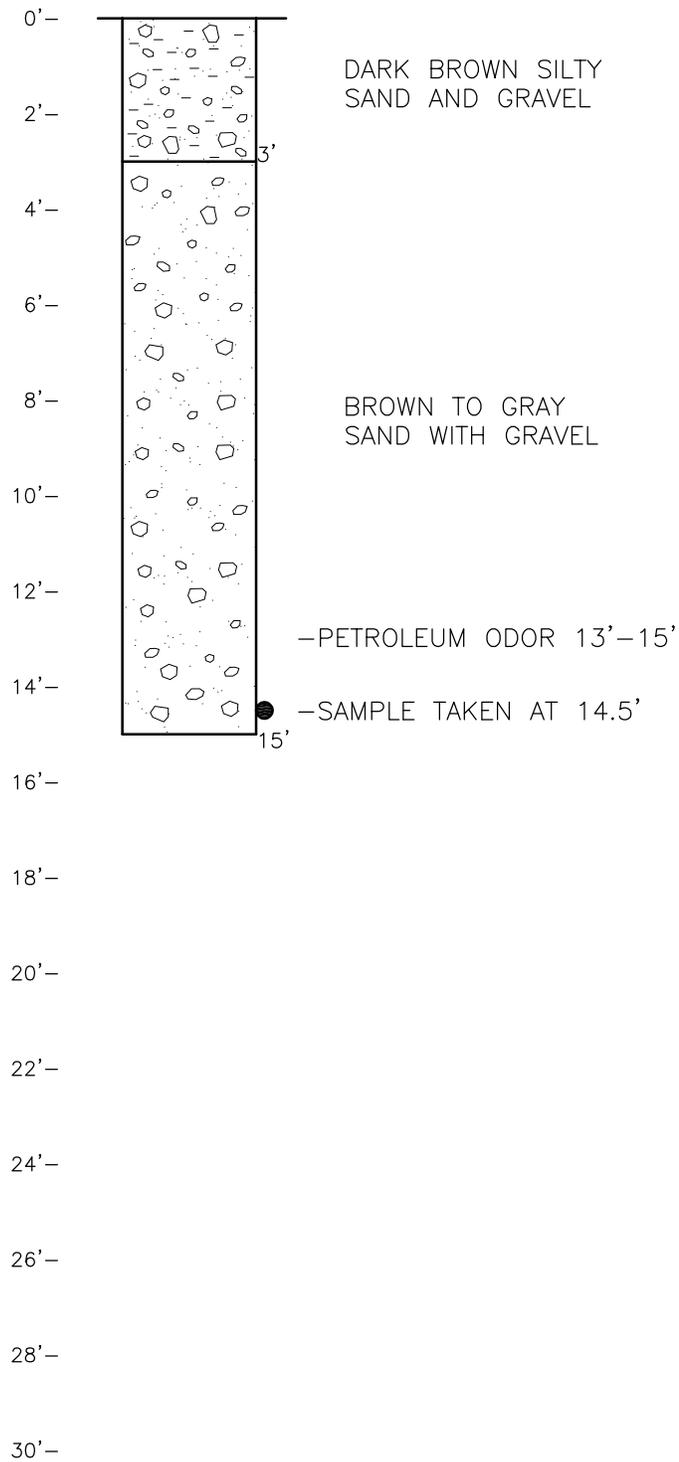
# GEOLOGIC LOG B12



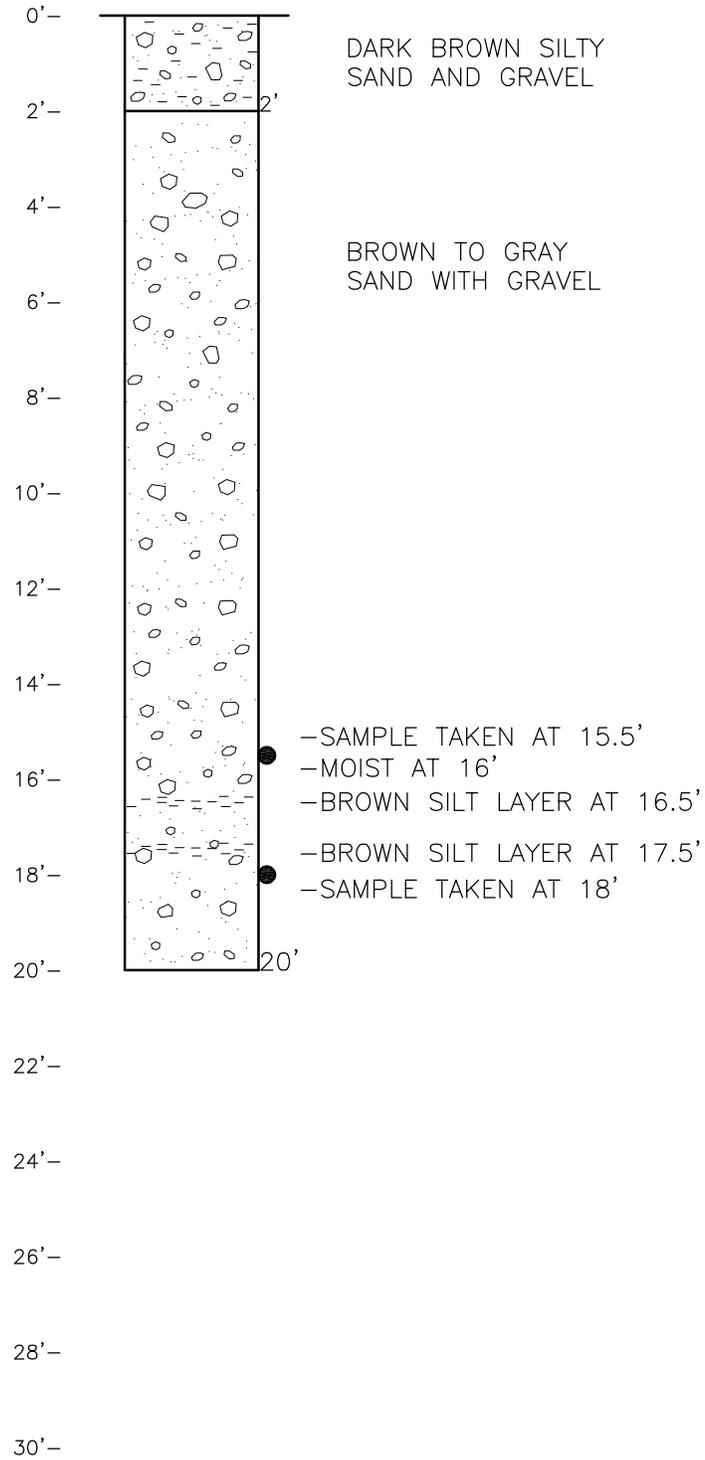
# GEOLOGIC LOG B13



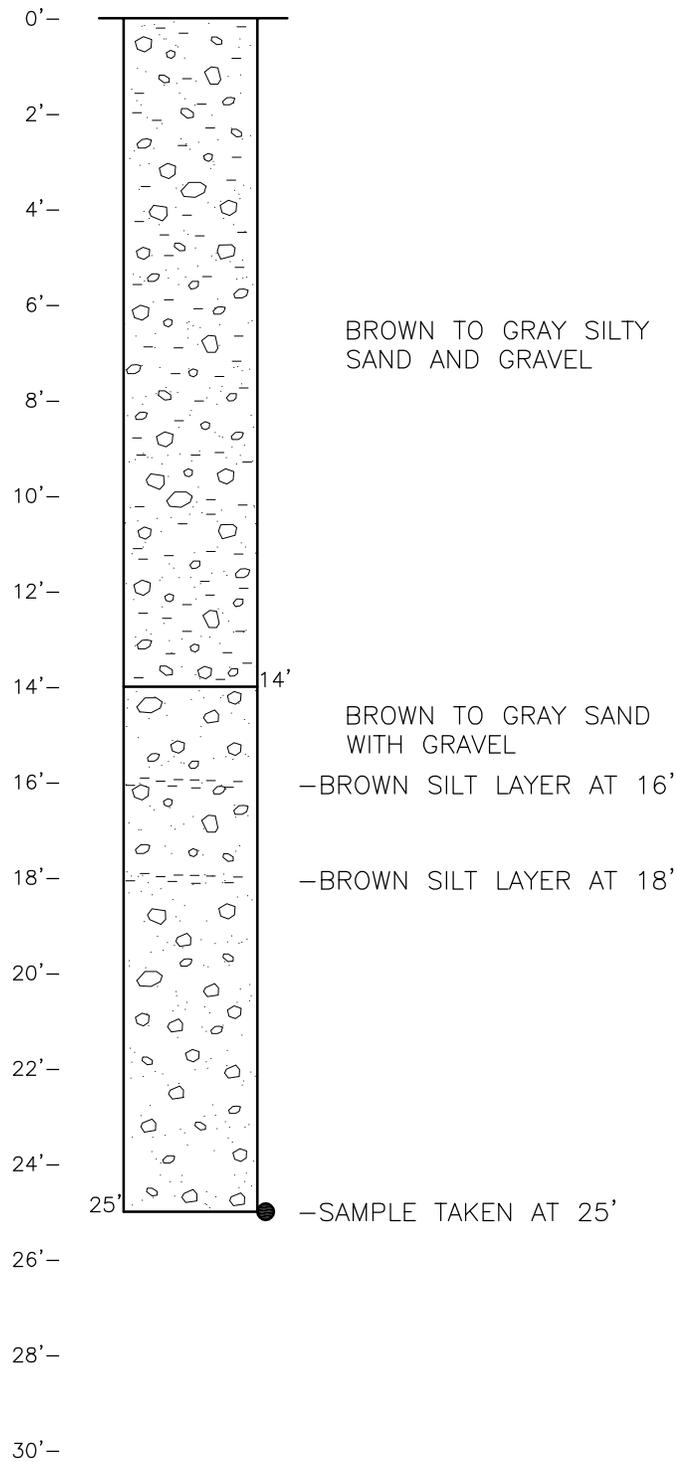
GEOLOGIC LOG  
B14



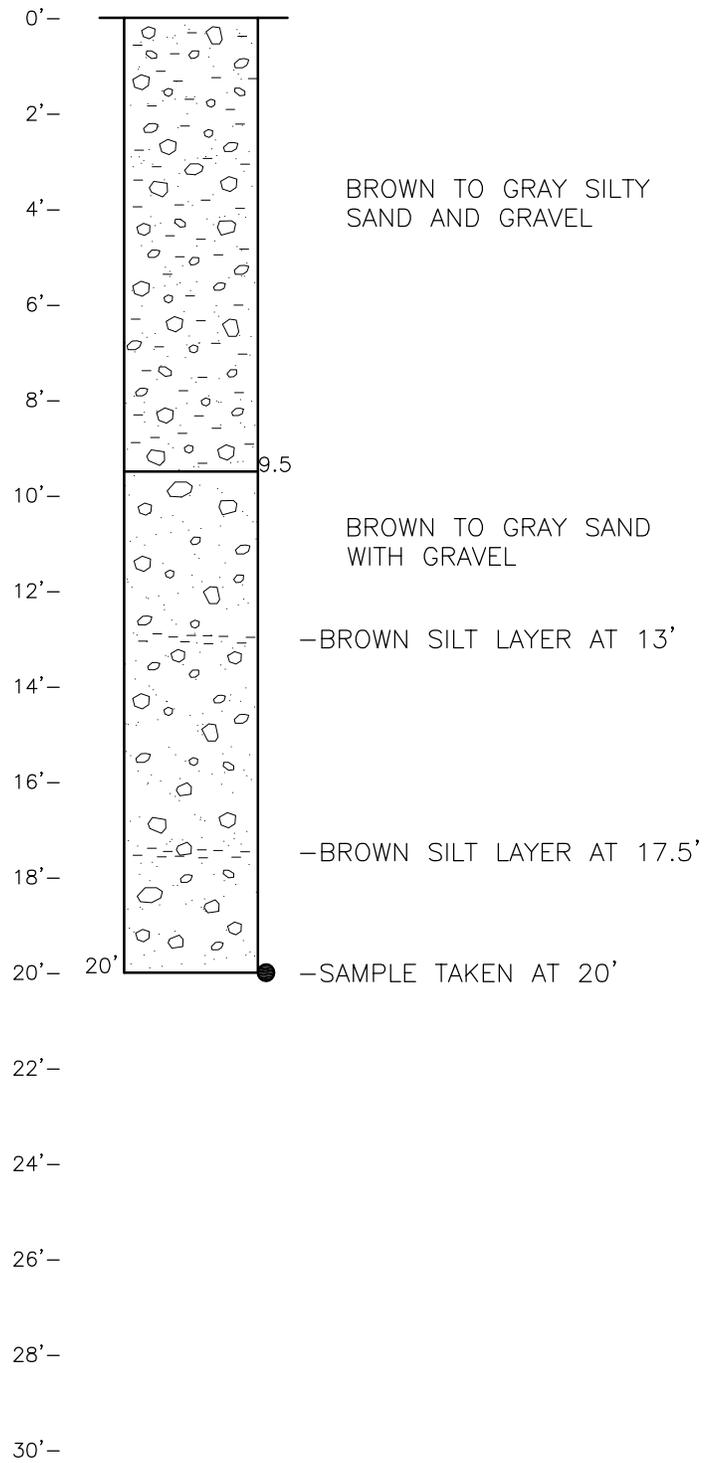
# GEOLOGIC LOG B15



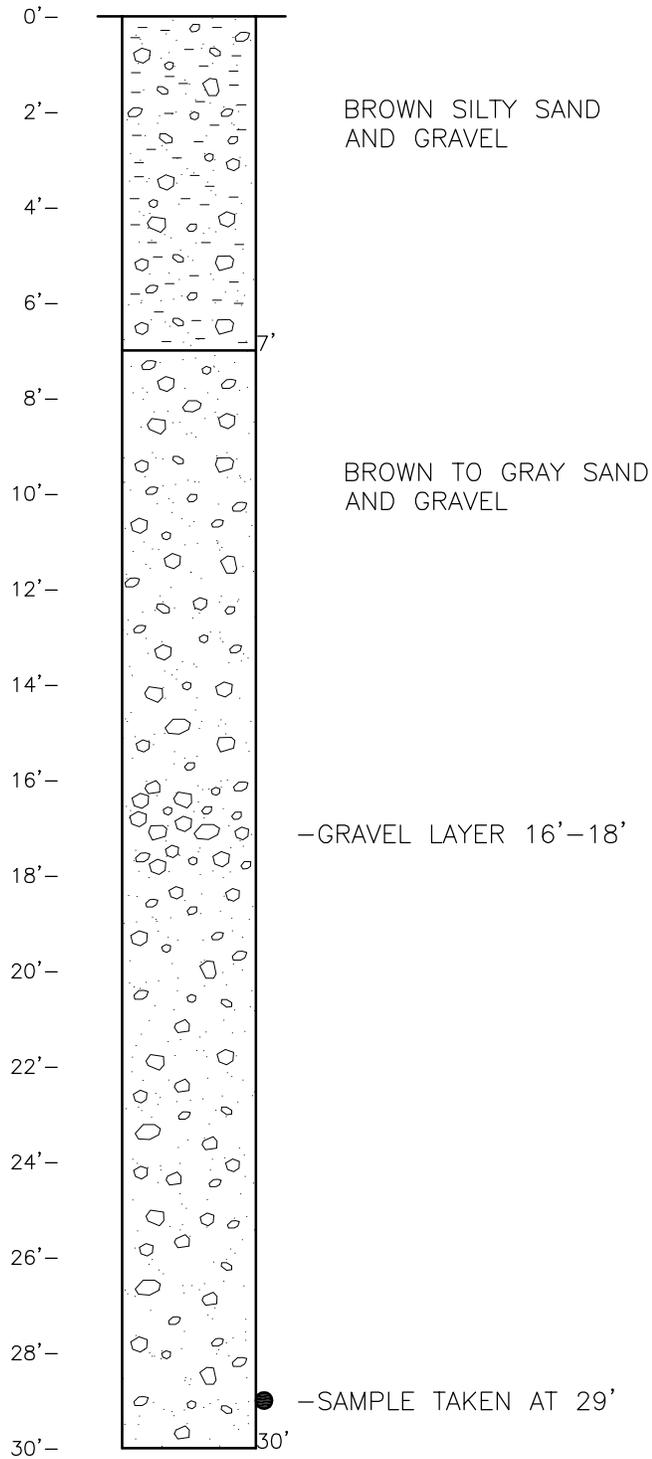
GEOLOGIC LOG  
B16



# GEOLOGIC LOG B17



GEOLOGIC LOG  
B18



GEOLOGIC LOG  
B19

