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Golder Associates

SITE CHARACTERIZATION
GLENWOOD SHOPPING CENTER
418 SOUTH 48TH AVENUE
YAKIMA, WASHINGTON

Submitted to:

Epstein Family, LLC
508 3rd Avenue West
Seattle, Washington 98119

Submitted by:

Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, Washington 98052

Distribution:

1 Copy - Epstein Family, LLC
1 Copy - Golder Associates Inc.

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053-1378-100.000

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1.0 INTRODUCTION

This report summarizes the Site Characterization conducted at Glenwood Shopping Center located at 418 South 48th Avenue in Yakima, Washington (the subject property). The scope of services was conducted for the Epstein Family, LLC in accordance with our proposal P05-1115 dated February 28, 2005. The purpose of the Site Characterization was to investigate the extent of gasoline contamination in soil discovered during a prior investigation by Golder Associates Inc. (Preliminary Site Characterization, Golder Associates Inc., February 22, 2005). In addition, groundwater was investigated to assess whether the gasoline release had impacted groundwater.

1.1 Site Description

Glenwood Shopping Center is located at the northeastern corner of South 48th Avenue and at 418 South 48th Avenue in Yakima, Washington. The subject property is developed with a one-story retail building, with the remainder of the property covered with asphalt pavement. The topography slopes slightly to the southeast.

1.2 Background

Golder was provided with copies of portions of the following prior environmental reports concerning the subject property:

- *Phase I Environmental Audits of Seventeen Properties Owned by Noel Corporation*, Water and Air Research, Inc., September 1992.
- *Phase I Environmental Assessment - Glenwood Shopping Center, Yakima, Washington,* Technico Environmental Services, Inc., June 19, 1998.

According to these referenced reports, the subject property had a gas station that was located on the southeastern corner from the mid 1950's until 1985. The gas station had two generations of underground storage tanks (USTs). The original USTs were reportedly removed and replaced in 1975. The second generation of USTs was reportedly removed in 1985 when the gas station closed. No assessment or environmental sampling was apparently conducted at the time of the UST removals. The gas station discharged their wastewater to a septic system until 1975. Auto service was reportedly conducted at the property. The configuration of the former gas station and the specific locations of the USTs, septic system, dispenser islands, and other features were not identified in the referenced reports reviewed.

Golder performed a Preliminary Subsurface Investigation at the subject property on during January 2005 and reported in Golder's Preliminary Subsurface Investigation report dated February 22, 2005. The Preliminary Subsurface Investigation was performed for Glenwood Shopping Center, LLC. The Preliminary Subsurface Investigation included a geophysical survey, drilling four soil borings, and the collection and analysis of soil samples. Gasoline range organics and related constituents were identified in select soil samples collected from two borings located near the southeastern corner of the subject property at concentrations exceeding MTCA Method A cleanup levels (WAC 173-340). Diesel and oil range organics were not detected or were present at concentrations well below MTCA Method A cleanup levels. Lead was found at concentrations indicative of background lead concentrations. Methyl tert-butyl ether (MTBE) was not detected.

The geophysical survey identified two areas of potential past excavation and fill located below the existing parking lot. Also identified during the geophysical survey was potential located approximately six feet below the surface running across the subject property from north to south and the turning 90 degrees to the west. These features are shown on Figure 2.

Based on the findings of the Preliminary Subsurface Investigation, further characterization of the extent of soil impact and potential impact to groundwater was recommended.

2.0 SCOPE OF SERVICES

The Site Characterization scope of services included:

1. Review of historical aerial photographs to determine, if possible, the location of the former building footprints, dispenser islands, and other features.

2. Excavation of two test pits to investigate the potential buried pipe discovered during the prior geophysical investigation.

3. Drilling of nine soil borings and the collection soil samples using hollow-stem auger drilling methods at varying depths in select locations in order to characterize the extent of gasoline contamination. Installation of a groundwater monitoring well in one of the borings and the collection of a groundwater sample from that well.

The soil and groundwater samples were analyzed for the presence of gasoline-range organics /BTEX/MTBE using Method NWTPH-Gx/EPA Method 8021 and for the presence of diesel- and heavy oil-range organics using Method NWTPH-Dx.

3.0 SUBSURFACE INVESTIGATION AND ANALYTICAL RESULTS

3.1 Historical Aerial Photograph Review

Historical aerial photographs were reviewed at Walker and Associates located in Tukwila, Washington. The years reviewed included 1955, 1968, 1978, 1993, and 1998.

The 1955 photograph shows the shopping center building and parking lot but the gas station area at that time was a vacant unpaved lot. The 1968 and 1978 photographs show the former gas station. The configuration of the gas station was the same in the 1968 and 1978 photographs.

The 1968 photograph shows a square area in the pavement immediately east of the gas station canopy. The 1978 photographs shows a square area in the pavement immediately southeast of the canopy. These two pavement "patches" may represent the location of former underground storage tanks.

In 1968 a gas station was present immediately south of the subject property across Tieton Drive. Another gas station was present immediately to the southeast across the intersection of South 48th Avenue and Tieton Drive. A gas station is currently present at this location.

The former subject property gas station was no longer present in the 1993 and 1998 photographs.

The approximate outline of the former gas station building and canopy are shown on Figure 2. The outline is based on the information from the 1968 and 1978 photographs.

Copies of the 1955, 1968, and 1978 photographs are included in Appendix A.

3.2 Field Investigation

The field investigation including test pit excavation, soil borings, and well installation was conducted on March 9, 10, and 11, 2005.

3.2.1 Test Pits

Two test pits were excavated to investigate the potential pipe that was identified during the prior geophysical investigation. The location of the suspect pipe and the test pits are shown on Figure 2. The test pits are identified as TP-1 and TP-2 on Figure 2. The estimated depth of the pipe was approximately 6 feet below ground surface (bgs).

The approximate dimension of TP-1 was 3 feet by 10 feet. The approximate dimension of TP-2 was 3 feet by 5 feet. Both test pits were excavated to an approximate depth of 5½ feet bgs. At about 5½ feet bgs in both test pits, a dense caliche hardpan was encountered that suggested that the presence of a pipe was unlikely to occur deeper than the hardpan layer. No pipe or evidence for a pipe was observed in either test pit. No signs of contamination were observed in either test pit.

The test pits were backfilled and compacted with the excavated material. The surface was repaved with asphalt.

3.2.2 Soil Borings, Well Installation, and Sample Collection

Nine soil borings were drilled (MW-1 and BH-5 through BH-12) with a truck-mounted hollow-stem auger drilling rig. MW-1 was installed as a monitoring well. Boring depths varied from 10 feet bgs to 45 feet bgs as shown on the boring logs in Appendix B. All nine borings were drilled through asphalt pavement in the shopping center parking lot on the southeastern corner of the property. The boring locations are shown on Figure 2.

Soil samples were collected at 5 or 10-foot intervals using a standard two-inch-diameter split-spoon sampler driven by a 140-pound hammer falling a distance of 30 inches, in accordance with ASTM D-1586. Soil samples were removed from the split-spoon sampler and placed into laboratory provided containers appropriate for the analytical methods. Soil samples for volatile analysis were collected and handled in accordance with EPA Method 5035.

The drilling and sampling of soils were performed in accordance with GAI Technical Procedure TP-1.2-5, "Drilling, Sampling, and Logging of Soils." Soil samples were classified in accordance with GAI Technical Procedure TP-1.2-6, "Field Identification of Soil" which is summarized on the Soil Description Index in Appendix A. Boring logs describing the subsurface conditions are included in Appendix B. A Golder environmental scientist performed all subsurface sampling and logging of soils.

MW-1 was installed as a monitoring well using 2-inch diameter Schedule 40 PVC well casing. The total well depth was 43.19 feet bgs. Groundwater was sampled from MW-1 on March 16, 2005. Before purging and sample collection, depth to groundwater was measured at 41.74 feet below the top of casing. Approximately 5 gallons of water were purged from the well before sample collection. Groundwater samples were collected using a dedicated polyethylene bailer and placed into laboratory provided containers appropriate for the analytical methods.

The soil and groundwater samples were submitted to OnSite Environmental, Inc. in Redmond, Washington. Chain of custody procedures were followed during sample collection and transport to the laboratory. The samples were analyzed for the presence of gasoline-range organics/BTEX using Method NWTPH-Gx/EPA Method 8021, and for diesel-and heavy oil-range organics using Method NWTPH-Dx.

Investigation-derived waste (IDW), which included soil and decontamination rinsates, was placed and sealed into 55-gallon DOT drums. These drums were labeled and left in a designated on-site location pending proper disposal.

3.2.3 Site Geology

The subject property is covered by a surface layer of fill or reworked native soil consisting of mostly sand and silt with varying amounts of gravel and asphalt/brick debris. The fill material ranges from the surface to a depth of about 5 to 7 feet across the area of investigation. Fill ranged to a depth of about 15 to 16 feet in borings BH-1, BH-8, and BH-11 suggesting a potential tank excavation near the southeastern corner of the subject property.

A somewhat loose to medium dense silty clay/clayey silt with varying amounts of sand and gravel was present below the fill to a depth of about 30 feet. Sand and gravel content increases with depth. A sandy gravel with cobbles is present below the silty clay/clayey silt to the maximum depth explored at 45 feet (MW-1 and BH-11). Refusal or extremely difficult drilling due to cobbles was encountered in BH-7 at 33 feet, BH-8 at 29 feet, and in MW-1 at 45 feet bgs.

Groundwater was encountered at approximately 43 feet bgs in MW-1. The depth to groundwater was measured at 41.74 feet below the top of casing in MW-1 on March 16, 2005.

3.3 Analytical Results

The analytical results from this Site Characterization are discussed with the results from the prior Preliminary Subsurface Investigation (Golder, February 22, 2005). The analytical results are presented in Table 1 for soil and Table 2 for groundwater. The laboratory analytical results are included in Appendix C.

The soil and groundwater samples were analyzed for the presence of gasoline-range organics/BTEX using Method NWTPH-Gx/EPA Method 8021, and for diesel-and heavy oil-range organics using Method NWTPH-Dx.

3.3.1 Soil Analytical Results

The analytical results for soil indicate the presence of gasoline range organics and BTEX at detectable concentrations at the southeastern corner of the subject property (MW-1, BH-1, BH-2, BH-7, BH-8, BH-9, and BH-11). These detected concentrations exceeded MTCA Method A cleanup levels in nearly all the soil samples collected from these borings. The highest concentrations (exceeding 1,000 milligrams per kilogram of gasoline range organics) were from soil samples collected from BH-2, BH-8, and BH-11. Gasoline range organics and BTEX, where detected, range in depth from 15 feet bgs down to 40 feet bgs (MW-1) and 45 feet bgs (BH-11). No gasoline range organics and BTEX were detected from the 10 foot bgs samples.

The highest concentration of gasoline range organics was 3,500 milligrams per kilogram (mg/kg) from BH-8 at 20 feet bgs. The MTCA Method A cleanup level for gasoline range organics in soil is 30 mg/kg.

The highest concentration of benzene was 4.5 mg/kg from BH-8 at 20 feet bgs. The MTCA Method A cleanup level for benzene in soil is 0.03 mg/kg.

The highest concentration of toluene was 16 mg/kg from BH-11 at 20 feet bgs. The MTCA Method A cleanup level for toluene in soil is 7 mg/kg. Toluene exceeded the MTCA Method A cleanup level in only this sample.

The highest concentration of ethylbenzene was 38 mg/kg from BH-8 at 20 feet bgs. The MTCA Method A cleanup level for ethylbenzene in soil is 6 mg/kg.

The highest concentration of total xylenes was 199 mg/kg from BH-8 at 20 feet bgs. The MTCA Method A cleanup level for total xylenes in soil is 9 mg/kg.

MTBE was not detected in samples collected from BH-1 and BH-2 during the Preliminary Subsurface Investigation (Golder, February 22, 2005). Based on these prior findings, no analysis for MTBE was performed during this Site Characterization.

Total lead was found at typical background soil concentrations from BH-1 and BH-2 during the Preliminary Subsurface Investigation (Golder, February 22, 2005). Based on these prior findings, no analysis for total lead was performed during this Site Characterization.

Diesel and heavy oil range organics were not detected in soil samples except in samples from BH-1 (15 feet bgs) at low concentrations less than the 2,000 mg/kg MTCA Method A cleanup level for diesel and heavy oil range organics. A release of diesel and heavy oil range organics does not appear to be present in the area investigated.

3.3.2 Groundwater Analytical Results

Gasoline range organics and BTEX were detected in the groundwater sample collected from MW-1 at concentrations that exceed the MTCA Method A cleanup level for gasoline range organics, benzene, ethylbenzene, and total xylenes.

Gasoline range organics were detected at 39,000 micrograms per liter (µg/L) in groundwater from MW-1 exceeding the MTCA Method A cleanup level for gasoline range organics in groundwater of 800 µg/L.

Benzene was detected at 6,600 µg/L in groundwater collected from MW-1 exceeding the MTCA Method A cleanup level for benzene in groundwater of 5 µg/L.

Toluene was detected at 460 µg/L in groundwater collected from MW-1. The toluene concentration did not exceed the MTCA Method A cleanup level for toluene in groundwater is 1,000 µg/L.

Ethylbenzene was detected at 880 µg/L in groundwater collected from MW-1 exceeding the MTCA Method A cleanup level for ethylbenzene in groundwater of 700 µg/L.

Total xylenes were detected at 4,300 µg/L in groundwater collected from MW-1 exceeding the MTCA Method A cleanup level for total xylenes in groundwater of 1,000 µg/L.

MTBE was not detected in the groundwater sample from MW-1. Diesel and heavy oil range organics were not detected in the groundwater collected from MW-1.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

The results of the investigation indicate that soil and groundwater at the southeastern corner of the subject property has concentrations of gasoline range organics and BTEX that exceed MTCA Method A Cleanup Levels.

The conclusions of this investigation are summarized as follows:

- A release of gasoline fuel has impacted soil and groundwater at the southeastern corner of the subject property. The source of the release was likely a gas station that operated on the subject property from the 1950s to 1985. Other potential sources include two gas stations located across Tieton Drive to the south and southeast, one of which continues in operation. The findings of this investigation, particularly the relatively high concentrations in soil, suggest the release is primarily from the former subject property gas station. Aerial photographs showing patches in the pavement may indicate the locations of the former underground storage tanks in the area of highest soil concentrations. No impact was indicated in shallow soil (less than 10 feet logs) at the subject property. Therefore, off-site sources including the two neighboring gas stations are potential sources that should be considered.
- The gasoline release in soil appears to have been reasonably well defined by this investigation to the southeastern corner of the subject property. The release does not appear to extend to the north, northwest, or to the west into the subject property. However, the highest concentrations were indicated at BH-8 at the southeastern property line at the intersection of Tieton Drive and South 48th Avenue. This suggests a potential for soil impact to extend off-site to the east, southeast, and south.
- Soil impact appears to extend down to the water table as indicated at MW-1 and BH-11, which may provide a continuing source of contamination to the groundwater.
- Groundwater at MW-1 is impacted with concentrations of gasoline range organics, benzene, ethylbenzene, and total xylenes that exceed MTCA Method A cleanup levels.
- The extent of groundwater contamination is not known. Groundwater flow direction is not known and cannot be determined from a single well.
- MTBE is not likely a component of the gasoline release based on the analytical results and the likely pre-1985 date of the release.
- Lead does not appear to have impacted the soil in excess of typical background concentrations.
- A release of diesel or heavy oil does not appear to be present in the area investigated.

MTCA Method A Cleanup Levels are provided for comparison only and may not directly apply to any future remedial actions at the subject property. However, these referenced cleanup levels provide a reasonable baseline for evaluating analytical results and characterizing contamination.

4.2 Recommendations

Based on this Site Characterization and the Preliminary Subsurface Investigation on the subject property, Golder makes the following recommendations:

- The extent of groundwater impact should be investigated. A minimum of two additional groundwater monitoring wells will be needed to determine groundwater flow direction.
- Drill at least two more soil borings into the area of the former gas station building to investigate potential releases in this area.
- A feasibility study and cleanup action plan should be developed. Alternative cleanup technologies should be evaluated. Soil vapor extraction and air sparging are likely remedial technologies that may be considered.
- Review Washington State Department of Ecology files for neighboring gas station properties to determine if any recorded releases have occurred on these properties.

We can provide cost estimates for the recommended actions under separate cover.

Golder also recommends that this report will be provided to the owner and property owner provide a copy to the Washington State Department of Ecology as may be required under WAC 173-340-300 (Site Discovery and Reporting) and WAC 173-340-515 (Independent Remedial Actions). The address for the Washington State Department of Ecology – Central Regional Office is 15 West Yakima Avenue, Suite 200, Yakima, Washington 98902-3452.

5.0 LIMITATIONS

This Site Characterization has been prepared for the exclusive use of the Epstein Family, LLC. Golder has performed the Preliminary Subsurface Investigation in accordance with the scope of work presented in our proposal P05-1115 dated February 28, 2005.

This report includes data and information collected during the site visit and field investigation by Golder Associates, Inc. and is based solely on the condition of the property and the results of samples obtained and analyzed at the time of the site visit and field investigation. As in any investigation, the potential for impacted soils and groundwater to be present but not discovered is possible.

This report is not meant to represent a legal opinion. No other warranty, expressed or implied, is made. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Golder Associates Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

6.0 REFERENCES

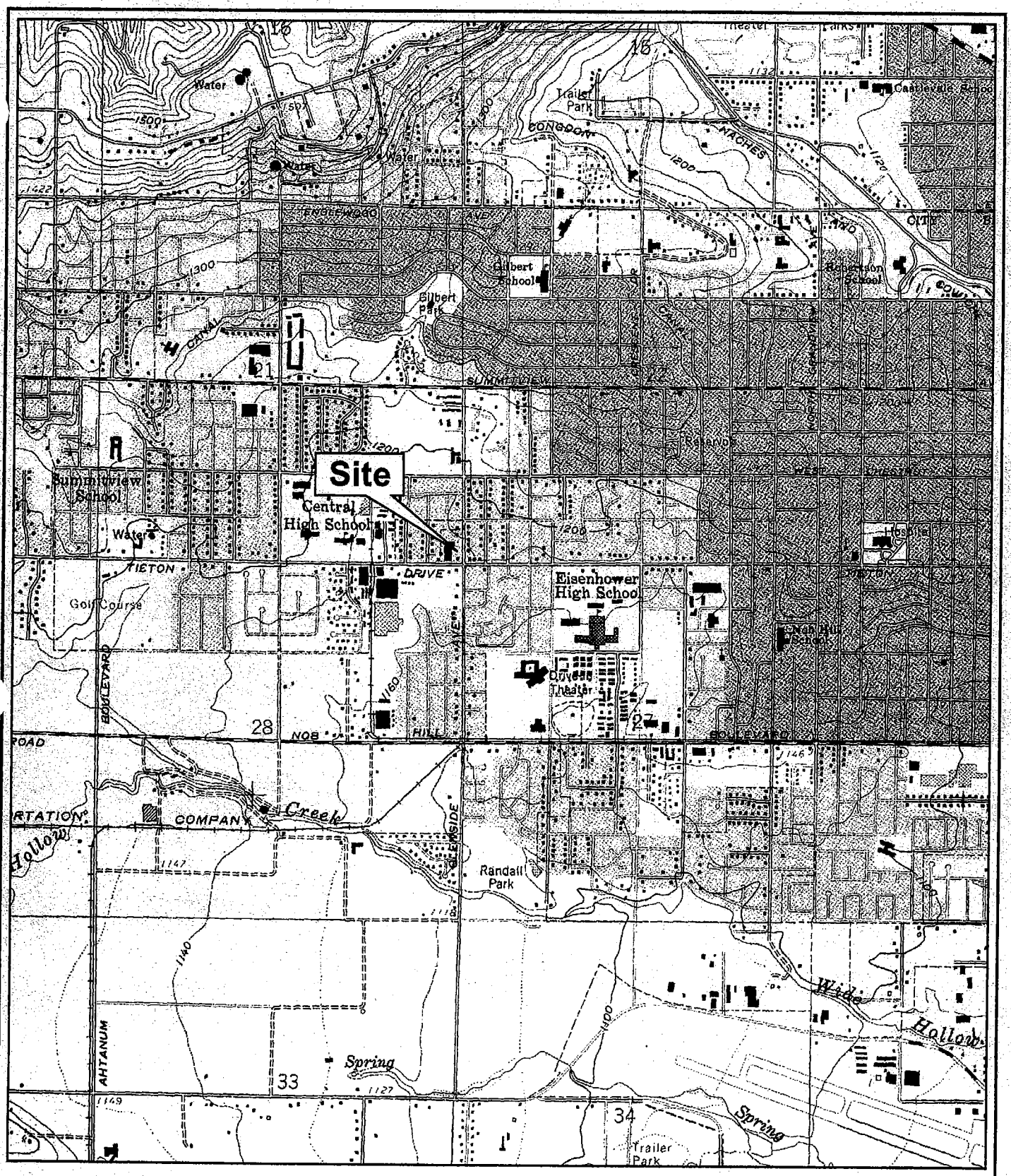
Washington State Department of Ecology, *Cleanup Levels and Risk Calculations under the Model Toxics Control Act Cleanup Regulation,* Version 3.1, November 2001.

Washington State Department of Ecology, *Model Toxics Control Act Cleanup Regulation,* Chapter 173-340, amended February 12, 2001.

Phase I Environmental Audits of Seventeen Properties Owned by Noel Corporation, Water and Air Research, Inc., September 1992.

Phase I Environmental Assessment - Glenwood Shopping Center, Yakima, Washington, Technico Environmental Services, Inc., June 19, 1998.

FIGURES



Source: USGS 7.5 Minute Topographic Quadrangle Map, Yakima West, WA, 1985

FIGURE 1
SITE LOCATION MAP
EPSTEIN/GLENWOOD SITE CHARACTER/WA

Golder Associates

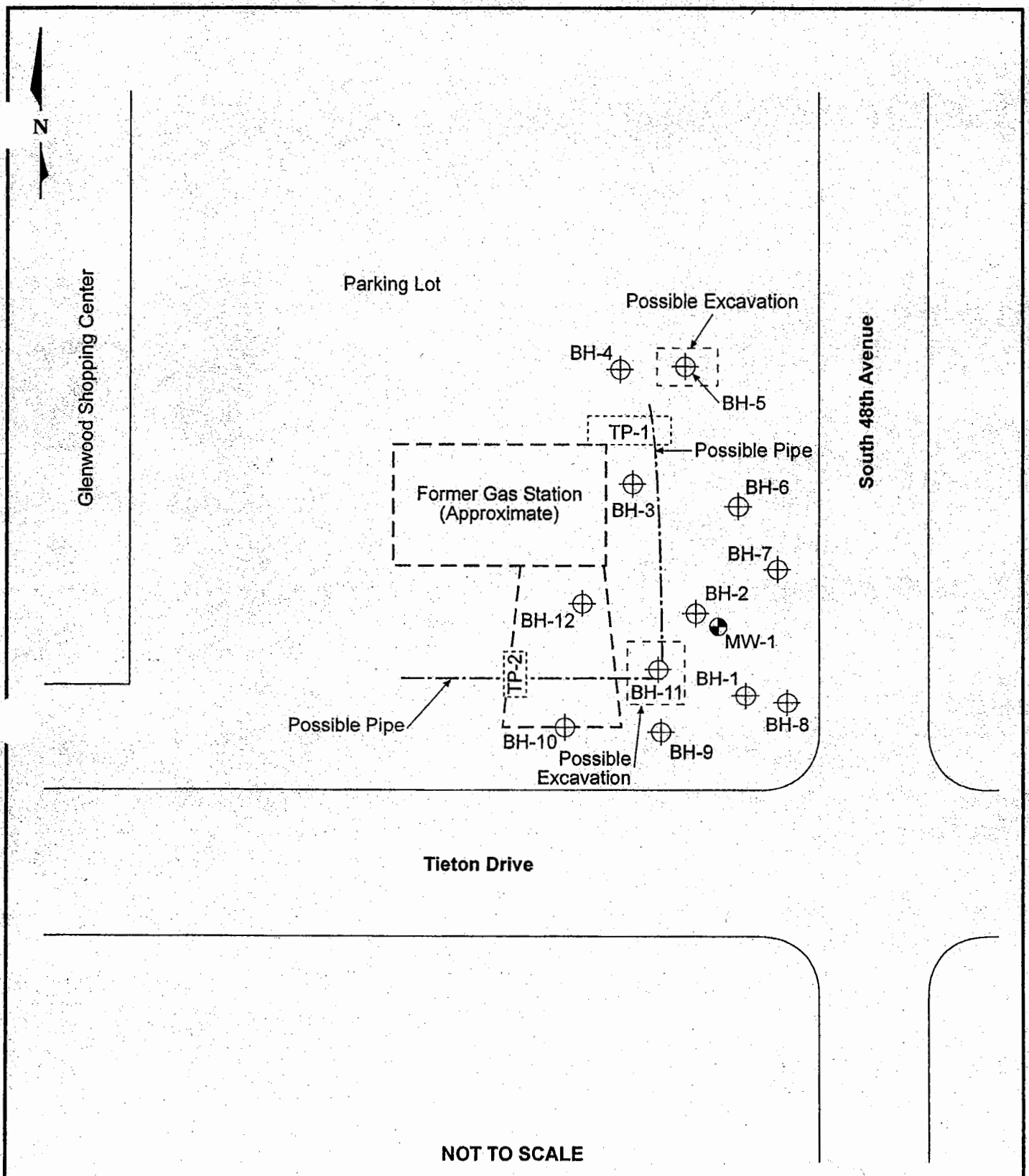


FIGURE **2**

SITE PLAN

EPSTEIN/GLENWOOD SITE CHARACTER/WA

APPENDIX A

AERIAL PHOTOGRAPHS


©WALKER & ASSOCIATES

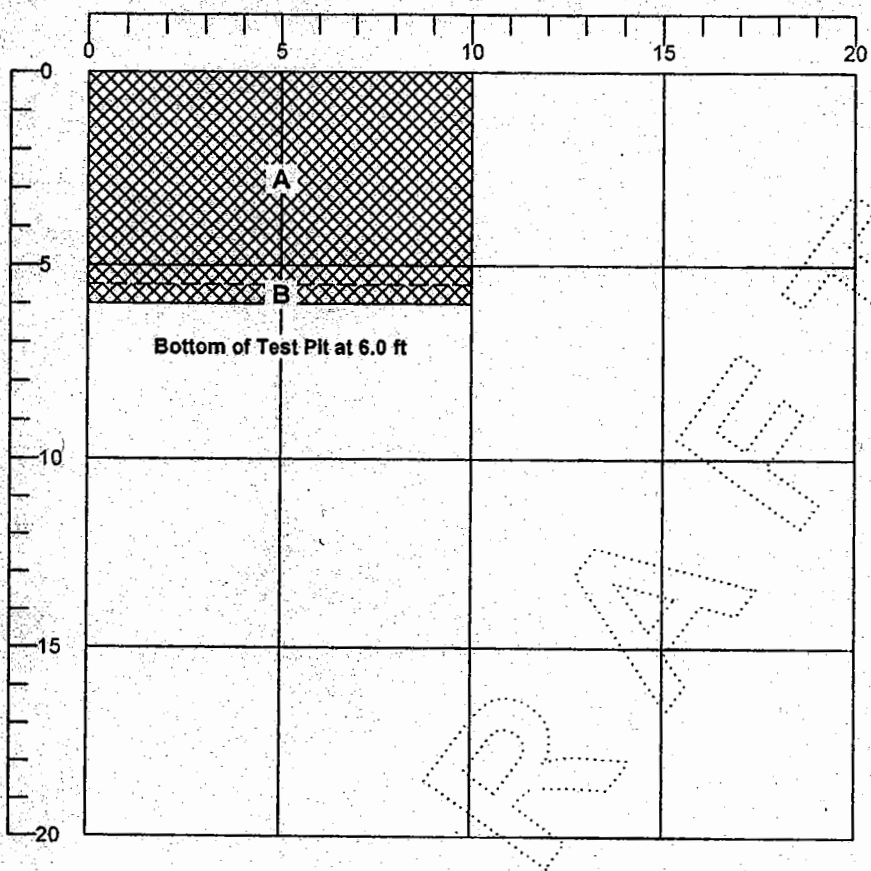
APPENDIX B

BORING LOGS

LOG OF TEST PIT TP-1

Golder Associates

Temp 60 °F Weather Clear | Engineer JK | Operator Neil
Equipment Akeuchi TB015 | Contractor Clear Creek | Date 03/09/05
Elevation | Datum MSL | Job 053-1378-100.000
Location Yakima, WA



SAMPLES		
NO.	DEPTH (ft)	MOISTURE (%)

LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

A 0.0 - 5.5 ft: Dark to light brown, clayey silty SAND, fill material, pieces of asphalt.

B 5.5 - 6.0 ft: Hard material

Dark to medium brown, medium stiff, CLAY with silt sand, some gravel, dry.

TIME	DEPTH OF HOLE (ft)	DEPTH TO W/L (ft)	DEPTH TO SEEPAGE (ft)

SPECIAL NOTES:

Pit Dimensions:
- 10' x 3' LxW
- 6' Depth

0930 Used jackhammer to break concrete

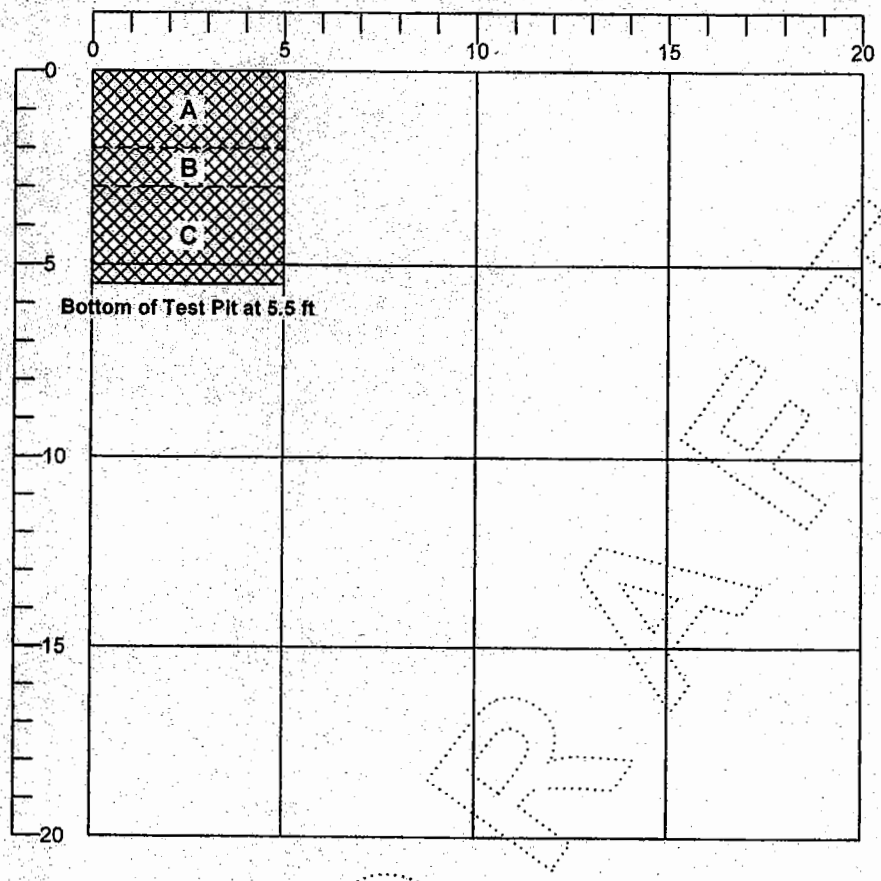
LOG OF TEST PIT TP-2

Golder Associates

emp 60 °F Weather Clear
Equipment Akeuchi TB015
Elevation
Location Yakima, WA

Engineer JK
Contractor Clear Creek
Datum MSL

Operator Neil
Date 03/09/05
Job 053-1378-100.000



SAMPLES		
NO.	DEPTH (ft)	MOISTURE (%)

LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

A 0.0 - 2.0 ft: Loose, dark brown, clayey silty SAND, fill material, asphalt mixed in, moist.

B 2.0 - 3.0 ft: P-gravel, fill, sand, clay tile drain pipe.

C 3.0 - 5.5 ft: Loose, dark brown, clayey silty SAND, , fill material, asphalt mixed in, moist.

TIME	DEPTH OF HOLE (ft)	DEPTH TO W/L (ft)	DEPTH TO SEEPAGE (ft)

SPECIAL NOTES:

RECORD OF BOREHOLE MW-1

SHEET 1 of 2

PROJECT: Epstein/Glenwood
PROJECT NUMBER: 053-1378-100.000
LOCATION: Yakima, WA

DRILLING METHOD:
DRILLING DATE: 03/09/05
DRILL RIG: Ingersol-Rand A-400

DATUM: MSL
AZIMUTH: N/A
COORDINATES: not surveyed

ELEVATION:
INCLINATION: -90

DEPTH (ft)	BORING METHOD	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	NUMBER	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N	REC / ATT	PENETRATION RESISTANCE BLOWS / ft ■ (10 20 30 40) / WATER CONTENT (PERCENT) W_p ⊢ W ⊣ W_l	NOTES WATER LEVELS / GRAPHIC
0		0.0 - 3.5 Fill material, gravel.										
		3.5 - 5.5 Loose, dark brown, clayey silt SAND, dry.			3.5							
5		5.5 - 31.0 Loose, dark brown, CLAY with sand and gravel, dry.			5.5							
10												
15												
20												Bentonite Seal 0'-~38' bgs
25												
30								50/5"	50/5"			
		31.0 - 41.0 Loose, dark brown, CLAY with sand and gravel, dry. More small boulder stones, difficult drilling.			31.0							
35								64-5	5			
40		Log continued on next page										Filter Pack Sand 38'-44' bgs

1 in to 5 ft
DRILLING CONTRACTOR: Cascade Drilling
DRILLER:

LOGGED: JK
CHECKED:
DATE:

Golder Associates

BOREHOLE RECORD 0531378100.GPJ GLDR_WA.GDT 4/5/05

RECORD OF BOREHOLE MW-1

SHEET 2 of 2

PROJECT: Epstein/Glenwood
PROJECT NUMBER: 053-1378-100.000
LOCATION: Yakima, WA
DRILLING METHOD:
DRILLING DATE: 03/09/05
DRILL RIG: Ingersol-Rand A-400
DATUM: MSL
AZIMUTH: N/A
COORDINATES: not surveyed
ELEVATION:
INCLINATION: -90

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N	REC / ATT	PENETRATION RESISTANCE BLOWS / ft ■ (10 20 30 40) WATER CONTENT (PERCENT) W_p W W_l	NOTES WATER LEVELS GRAPHIC
40								20-3	3			
		41.0 - 45.0 Loose to medium dense, dark to medium brown, GRAVEL-SAND, silty gravels, silt mix, some boulders, dry.			41.0							5' Screen 39'-44' bgs
45		Boring completed at 45.0 ft.			45.0			50-1	1			
50												
55												
60												
65												
70												
75												
80												

1 in to 5 ft
DRILLING CONTRACTOR: Cascade Drilling
DRILLER:
LOGGED: JK
CHECKED:
DATE:

Golder Associates

BOREHOLE RECORD 0531378100.GPJ GLDR_WA.GDT 4/5/05

RECORD OF BOREHOLE BH-5

SHEET 1 of 1

PROJECT: Epstein/Glenwood
PROJECT NUMBER: 053-1378-100.000
LOCATION: Yakima, WA

DRILLING METHOD:
DRILLING DATE: 03/09/05
DRILL RIG: Ingersol-Rand A-400

DATUM: MSL
AZIMUTH: N/A
COORDINATES: not surveyed

ELEVATION:
INCLINATION: -90

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N	REC / ATT	PENETRATION RESISTANCE BLOWS / ft ■ (10 20 30 40) / WATER CONTENT (PERCENT) W_p — W — W_l	NOTES WATER LEVELS
0		0.0 - 4.5 Loose, dark brown, clayey silty SAND, fill with pieces of brick and asphalt mixed in.										
5		4.5 - 10.0 Same as above but darker (black) in color. Septic smell.			4.5			3-3-3	6		■	BH-5 (5) OVM = 0.0ppm
10		Boring completed at 10.0 ft.			10.0			0-0-2	2		■	BH-5 (10) OVM = 0.0ppm
15												
20												
25												
30												
35												
40												

1 in to 5 ft

DRILLING CONTRACTOR: Cascade Drilling
DRILLER:

LOGGED: JK
CHECKED:
DATE:

Golder Associates

BOREHOLE RECORD 0531378100.GPJ GLDR_WA.GDT 4/5/05

RECORD OF BOREHOLE BH-6

SHEET 1 of 1

PROJECT: Epstein/Glenwood
PROJECT NUMBER: 053-1378-100.000
LOCATION: Yakima, WA

DRILLING METHOD:
DRILLING DATE: 03/11/05
DRILL RIG: Ingersol-Rand A-400

DATUM: MSL
AZIMUTH: N/A
COORDINATES: not surveyed

ELEVATION:
INCLINATION: -90

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (140 lb hammer, 30 inch drop)	N	REC / ATT	PENETRATION RESISTANCE BLOWS / ft ■ (10 20 30 40) WATER CONTENT (PERCENT) W_p W W_l	NOTES WATER LEVELS
0		0.0 - 4.2 Loose, fill material, silt/sand/gravel, brick debris with some asphalt, dry.										
5		4.2 - 10.4 Loose to medium dense, dark brown, clayey SILT, moist.			4.2							
10		10.4 - 25.0 Same as above, darker. Some gravel (small amount).			10.4			16-28-31	>50			>> BH-6 (10) OVM = 0.0ppm
15												
20								5-12-13	25		■	BH-6 (20) OVM = 0.0ppm
25		25.0 - 30.0 Same as above with more gravel. Loose, dark brown, dry.			25.0							
30		Boring completed at 30.0 ft.			30.0			7-9-53	>50			>> BH-6 (30) OVM = 0.0ppm
35												
40												

1 in to 5 ft
DRILLING CONTRACTOR: Cascade Drilling
DRILLER:

LOGGED: JK
CHECKED:
DATE:

Golder Associates

BOREHOLE RECORD 0531378100.GPJ GLDR_WA.GDT 4/5/05

RECORD OF BOREHOLE BH-7

SHEET 1 of 1

PROJECT: Epstein/Glenwood
PROJECT NUMBER: 053-1378-100.000
LOCATION: Yakima, WA

DRILLING METHOD:
DRILLING DATE: 03/11/05
DRILL RIG: Ingersol-Rand A-400

DATUM: MSL
AZIMUTH: N/A
COORDINATES: not surveyed

ELEVATION:
INCLINATION: -90

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (140 lb hammer, 30 inch drop)	N	REC / ATT	PENETRATION RESISTANCE BLOWS / ft ■ (10 20 30 40) / WATER CONTENT (PERCENT) W_p W W_l	NOTES WATER LEVELS
0		0.0 - 6.9 Fill material										
		6.9 - 20.4 Medium stiff, light to dark brown, CLAY with silt, dry.			6.9			20-39-39	>50			>> BH-7 (10) OVM = 0.0ppm
20		20.4 - 30.5 Same as above. Gray stained and slight odor (petroleum).			20.4			8-22-40	>50			>> BH-7 (20) OVM = 28.4ppm
30		30.5 - 33.5 Loose to medium dense, light brown, gravelly CLAY, dry.			30.5			19/5-15/5	15/5			BH-7 (30) OVM = 1153+ ppm
		Boring completed at 33.5 ft.			33.5							No Sample Recovered OVM = 5.3ppm
40												

1 in to 5 ft

DRILLING CONTRACTOR: Cascade Drilling
DRILLER:

LOGGED: JK
CHECKED:
DATE:

Golder Associates

BOREHOLE RECORD 053137B100.GPJ GLDR_WA.GDT 4/5/05

RECORD OF BOREHOLE BH-8

SHEET 1 of 1

PROJECT: Epstein/Glenwood
PROJECT NUMBER: 053-1378-100.000
LOCATION: Yakima, WA
DRILLING METHOD:
DRILLING DATE: 03/10/05
DRILL RIG: Ingersol-Rand A-400
DATUM: MSL
AZIMUTH: N/A
COORDINATES: not surveyed
ELEVATION:
INCLINATION: -90

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N	REC / ATT	PENETRATION RESISTANCE BLOWS / ft ■ (10 20 30 40) WATER CONTENT (PERCENT) W_p W W_l	NOTES WATER LEVELS
0		0.0 - 5.0 Dark brown, fill material, silt/sand/gravel, brick and asphalt debris.										
5		5.0 - 15.0 Fill P-gravel with silt.			5.0							
10								4-3-2	5		■	BH-8 (10) OVM = 0.0ppm
15		15.0 - 29.0 Loose to medium dense, dark brown, clayey SILT, moist.			15.0							
20												BH-8 (20) OVM = 2000+ ppm
25												
30		29.0 - 30.0 Cobbles. Same as above. Boring completed at 30.0 ft.			29.0 30.0							BH-8 (30) OVM = 2000+ ppm
35												
40												

1 in to 5 ft
DRILLING CONTRACTOR: Cascade Drilling
DRILLER:
LOGGED: JK
CHECKED:
DATE:

Golder Associates

BOREHOLE RECORD 053137810O.GPJ GLDR_WA.GDT 4/5/05

RECORD OF BOREHOLE BH-9

SHEET 1 of 1

PROJECT: Epstein/Glenwood
PROJECT NUMBER: 053-1378-100.000
LOCATION: Yakima, WA

DRILLING METHOD:
DRILLING DATE: 03/10/05
DRILL RIG: Ingersol-Rand A-400

DATUM: MSL
AZIMUTH: N/A
COORDINATES: not surveyed

ELEVATION:
INCLINATION: -90

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N	REC / ATT	PENETRATION RESISTANCE BLOWS / ft (10 20 30 40) WATER CONTENT (PERCENT) W_p W W_l	NOTES WATER LEVELS
0		0.0 - 6.7 Fill material										
		6.7 - 22.0 Loose, dark brown, clayey SILT, moist.			6.7			25-32-36	>50			>>
								2-8-20	28			
		22.0 - 27.4 Same as above with gravel.			22.0							
		27.4 - 30.0 Loose, dark brown, GRAVEL, poorly graved gravels with some silt and clay.			27.4							
		Boring completed at 30.0 ft.			30.0			28/5-50/3	50/3			

1 in to 5 ft

DRILLING CONTRACTOR: Cascade Drilling
DRILLER:

LOGGED: JK
CHECKED:
DATE:

Golder Associates

BOREHOLE RECORD 0531378100.GPJ GLDR_WA.GDT 4/5/05

RECORD OF BOREHOLE BH-10

SHEET 1 of 1

PROJECT: Epstein/Glenwood
PROJECT NUMBER: 053-1378-100.000
LOCATION: Yakima, WA
DRILLING METHOD:
DRILLING DATE: 03/10/05
DRILL RIG: Ingersol-Rand A-400
DATUM: MSL
AZIMUTH: N/A
COORDINATES: not surveyed
ELEVATION:
INCLINATION: -90

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N	REC / ATT	PENETRATION RESISTANCE BLOWS / ft ■ (10 20 30 40) / WATER CONTENT (PERCENT) W_p ⊢ W ⊣ W_l	NOTES WATER LEVELS
0		0.0 - 6.0 Fill material										
5												
		6.0 - 23.0 Loose, dark brown, CLAY with silt and some sand, moist.			6.0							
10								20-48-12	>50			>> ■ BH-10 (10) OVM = 0.0ppm
15												
20								3-4-4	8		■	BH-10 (20) OVM = 0.0ppm
		23.0 - 27.0 Same as above with more gravel.			23.0							
25												
		27.0 - 30.0 Loose, dark brown, GRAVEL, poorly graded, gravel with some silt/sand/clay.			27.0							
30		Boring completed at 30.0 ft.			30.0			1-3-34	37		■	BH-10 (30) OVM = 0.0ppm
35												
40												

1 in to 5 ft
DRILLING CONTRACTOR: Cascade Drilling
DRILLER:
LOGGED: JK
CHECKED:
DATE:

Golder Associates

BOREHOLE RECORD 053137810O.GPJ GLDR_WA.GDT 4/5/05

RECORD OF BOREHOLE BH-11

SHEET 1 of 2

PROJECT: Epstein/Glenwood
PROJECT NUMBER: 053-1378-100.000
LOCATION: Yakima, WA

DRILLING METHOD:
DRILLING DATE: 03/10/05
DRILL RIG: Ingersol-Rand A-400

DATUM: MSL
AZIMUTH: N/A
COORDINATES: not surveyed

ELEVATION:
INCLINATION: -90

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N	REC / ATT	PENETRATION RESISTANCE BLOWS / ft (10 20 30 40) / WATER CONTENT (PERCENT) W_p W W_l	NOTES WATER LEVELS
0		0.0 - 15.0 Fill material: Gravel with sand and some debris brick, asphalt and brick.										
5												
10								5-8-10	18			BH-11 (10) OVM = 0.0ppm
15		15.0 - 23.0 Loose, dark grown, SAND with silt and gravel, moist.			15.0							
20								1-2-10	12			BH-11 (10) OVM = 1102ppm
25		23.0 - 32.5 Loose, dark brown, CLAY with silt and gravel, moist.			23.0							
30								28/6-50/4	50/4			BH-11 (10) OVM = 243ppm
35		32.5 - 39.0 Loose, silty GRAVELS, gravel/sand/silt, slight petroleum odor, moist.			32.5							
40					39.0							

Log continued on next page

1 in to 5 ft

DRILLING CONTRACTOR: Cascade Drilling
DRILLER:

LOGGED: JK
CHECKED:
DATE:

Golder Associates

BOREHOLE RECORD 053137B100.GPJ GLDR_WA.GDT 4/5/05

RECORD OF BOREHOLE BH-11

SHEET 2 of 2

PROJECT: Epstein/Glenwood
PROJECT NUMBER: 053-1378-100.000
LOCATION: Yakima, WA
DRILLING METHOD:
DRILLING DATE: 03/10/05
DRILL RIG: Ingersol-Rand A-400
DATUM: MSL
AZIMUTH: N/A
COORDINATES: not surveyed
ELEVATION:
INCLINATION: -90

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N	REC / ATT	PENETRATION RESISTANCE BLOWS / ft (10 20 30 40) / WATER CONTENT (PERCENT) W_p W W_l	NOTES WATER LEVELS
40		39.0 - 45.0 Same as above with large poorly graded gravel *(Continued)*										BH-11 (40) No Recovery
45		Boring completed at 45.0 ft.			45.0			50/2	50/2			BH-11 (45) OVM = 31.0ppm
50												
55												
60												
65												
70												
75												
80												

1 in to 5 ft
DRILLING CONTRACTOR: Cascade Drilling
DRILLER:
LOGGED: JK
CHECKED:
DATE:

Golder Associates

BOREHOLE RECORD 053137B100.GPJ GLDR_WA.GDT 4/5/05

RECORD OF BOREHOLE BH-12

SHEET 1 of 1

PROJECT: Epstein/Glenwood
PROJECT NUMBER: 053-1378-100.000
LOCATION: Yakima, WA

DRILLING METHOD:
DRILLING DATE: 03/10/05
DRILL RIG: Ingersol-Rand A-400

DATUM: MSL
AZIMUTH: N/A
COORDINATES: not surveyed

ELEVATION:
INCLINATION: -90

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (140 lb hammer, 30 inch drop)	N	REC / ATT	PENETRATION RESISTANCE BLOWS / ft ■ (10 20 30 40) / WATER CONTENT (PERCENT) W_p W W_l	NOTES WATER LEVELS
0		0.0 - 6.4 Fill material.										
5												
		6.4 - 23.4 Loose to medium dense, dark brown, clayey SILT, moist.			6.4							
10								23-37-50/5.5	50/5.5			BH-12 (10) OVM = 2.8ppm
15												
20								2-3-15	18		■	BH-12 (20) OVM = 21.8ppm
		23.4 - 28.0 Same as above with gravel.			23.4							
25												
		28.0 - 30.0 Loose, dark brown, GRAVEL, poorly graded gravel with silt and clay.			28.0							
30		Boring completed at 30.0 ft.			30.0			50-50-50	>50			>> ■ BH-12 (30) OVM = 0.0ppm
35												
40												

1 in to 5 ft
DRILLING CONTRACTOR: Cascade Drilling
DRILLER:

LOGGED: JK
CHECKED:
DATE:

Golder Associates

BOREHOLE RECORD 0531378100.GPJ GLDR_WA.GDT 4/5/05

APPENDIX C

LABORATORY ANALYTICAL RESULTS

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

March 21, 2005

Neil Gilham
Golder Associates Inc.
18300 NE Union Hill Road
Suite 200
Redmond, WA 98052-3333

Re: Analytical Data for Project 053-1378-100.000
Laboratory Reference No. 0503-118

Dear Neil:

Enclosed are the analytical results and associated quality control data for samples submitted on March 11, 2005.

The standard policy of OnSite Environmental Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

Case Narrative

Samples were collected on March 10 and 11, 2005 and received by the laboratory on March 11, 2005. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

NWTPH Gx/BTEX Analysis

Per EPA Method 5035A, samples were received by the laboratory in preweighed 40 mL VOA vials within 48 hours of sample collection. They were stored in a freezer at between -7°C and -20°C until extraction or analysis.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-16-05
Date Analyzed: 3-16&18-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	BH-11 (10)			BH-11 (20)		
Lab ID:	03-118-01			03-118-02		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.020	**2.2**		0.22
Toluene	**ND**		0.065	**16**		1.1
Ethyl Benzene	**ND**		0.065	**17**		1.1
m,p-Xylene	**ND**		0.065	**76**		1.1
o-Xylene	**ND**		0.065	**25**		1.1
TPH-Gas	**ND**		6.5	**1200**		110
Surrogate Recovery:						
Fluorobenzene	81%			110%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-16-05
Date Analyzed: 3-18&20-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	BH-11 (30)			BH-11 (45)		
Lab ID:	03-118-03			03-118-04		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**2.5**		0.13	**0.068**		0.020
Toluene	**3.6**		0.67	**ND**		0.046
Ethyl Benzene	**7.2**		0.67	**0.38**		0.046
m,p-Xylene	**37**		0.67	**0.97**		0.046
o-Xylene	**13**		0.67	**0.36**		0.046
TPH-Gas	**830**		67	**83**		4.6
Surrogate Recovery:						
Fluorobenzene	94%			67%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-16-05
Date Analyzed: 3-16-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	BH-10 (10)			BH-10 (20)		
Lab ID:	03-118-05			03-118-06		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	ND		0.020	ND		0.020
Toluene	ND		0.074	ND		0.056
Ethyl Benzene	ND		0.074	ND		0.056
m,p-Xylene	ND		0.074	ND		0.056
o-Xylene	ND		0.074	ND		0.056
TPH-Gas	ND		7.4	ND		5.6
Surrogate Recovery:						
Fluorobenzene	78%			80%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-16-05
Date Analyzed: 3-16-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**BH-10 (30)**			**BH-9 (10)**		
Lab ID:	03-118-07			03-118-08		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.020	**ND**		0.020
Toluene	**ND**		0.052	**ND**		0.075
Ethyl Benzene	**ND**		0.052	**ND**		0.075
m,p-Xylene	**ND**		0.052	**ND**		0.075
o-Xylene	**ND**		0.052	**ND**		0.075
TPH-Gas	**ND**		5.2	**ND**		7.5
Surrogate Recovery:						
Fluorobenzene	85%			76%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-16-05
Date Analyzed: 3-16&20-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	BH-9 (20)			BH-9 (30)		
Lab ID:	03-118-09			03-118-10		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**0.040**		0.020	**0.55**		0.020
Toluene	**ND**		0.085	**2.0**		0.059
Ethyl Benzene	**0.48**		0.085	**4.9**		0.059
m,p-Xylene	**1.8**		0.085	**25**		0.30
o-Xylene	**0.57**		0.085	**5.1**		0.059
TPH-Gas	**130**		8.5	**500**		5.9
Surrogate Recovery:						
Fluorobenzene	86%			91%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-16-05
Date Analyzed: 3-17-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	BH-12 (10)			BH-12 (20)		
Lab ID:	03-118-11			03-118-12		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.020	**ND**		0.020
Toluene	**ND**		0.064	**ND**		0.053
Ethyl Benzene	**ND**		0.064	**ND**		0.053
m,p-Xylene	**ND**		0.064	**ND**		0.053
o-Xylene	**ND**		0.064	**ND**		0.053
TPH-Gas	**ND**		6.4	**ND**		5.3
Surrogate Recovery: Fluorobenzene	79%			78%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-16-05
Date Analyzed: 3-17-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**BH-12 (30)**			**BH-8 (10)**		
Lab ID:	03-118-13			03-118-14		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.020	**ND**		0.020
Toluene	**ND**		0.054	**ND**		0.053
Ethyl Benzene	**ND**		0.054	**ND**		0.053
m,p-Xylene	**ND**		0.054	**ND**		0.053
o-Xylene	**ND**		0.054	**ND**		0.053
TPH-Gas	**ND**		5.4	**ND**		5.3
Surrogate Recovery:						
Fluorobenzene	76%			86%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-16-05
Date Analyzed: 3-20-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**BH-8 (20)**			**BH-8 (30)**		
Lab ID:	03-118-15			03-118-16		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**4.5**		0.28	**3.4**		0.24
Toluene	**ND**		1.4	**ND**		1.2
Ethyl Benzene	**38**		1.4	**24**		1.2
m,p-Xylene	**170**	**E**	1.4	**91**		1.2
o-Xylene	**29**		1.4	**19**		1.2
TPH-Gas	**3500**		140	**1900**		120
Surrogate Recovery:						
Fluorobenzene	89%			82%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-16-05
Date Analyzed: 3-17&20-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	BH-6 (10)			BH-6 (20)		
Lab ID:	03-118-17			03-118-18		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.020	**ND**		0.020
Toluene	**ND**		0.058	**ND**		0.065
Ethyl Benzene	**ND**		0.058	**ND**		0.065
m,p-Xylene	**ND**		0.058	**ND**		0.065
o-Xylene	**ND**		0.058	**ND**		0.065
TPH-Gas	**ND**		5.8	**ND**		6.5
Surrogate Recovery:						
Fluorobenzene	76%			75%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-16-05
Date Analyzed: 3-17&20-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**BH-6 (30)**			**BH-7 (10)**		
Lab ID:	03-118-19			03-118-20		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.020	**ND**		0.020
Toluene	**ND**		0.066	**ND**		0.082
Ethyl Benzene	**ND**		0.066	**ND**		0.082
m,p-Xylene	**ND**		0.066	**ND**		0.082
o-Xylene	**ND**		0.066	**ND**		0.082
TPH-Gas	**ND**		6.6	**ND**		8.2
Surrogate Recovery: Fluorobenzene	76%			92%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-16-05
Date Analyzed: 3-17-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	BH-7 (20)			BH-7 (30)		
Lab ID:	03-118-21			03-118-22		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.020	**0.39**		0.020
Toluene	**ND**		0.064	**ND**		0.066
Ethyl Benzene	**ND**		0.064	**0.58**		0.066
m,p-Xylene	**ND**		0.064	**0.52**		0.066
o-Xylene	**ND**		0.064	**0.12**		0.066
TPH-Gas	**ND**		6.4	**150**		6.6
Surrogate Recovery:						
Fluorobenzene	92%			80%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 3-16-05
Date Analyzed: 3-16-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: MB0316S1

	Result	Flags	PQL
Benzene	ND		0.020
Toluene	ND		0.050
Ethyl Benzene	ND		0.050
m,p-Xylene	ND		0.050
o-Xylene	ND		0.050
TPH-Gas	ND		5.0

Surrogate Recovery:
Fluorobenzene 105%

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 3-16-05
Date Analyzed: 3-16-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: MB0316S2

	Result	Flags	PQL
Benzene	ND		0.020
Toluene	ND		0.050
Ethyl Benzene	ND		0.050
m,p-Xylene	ND		0.050
o-Xylene	ND		0.050
TPH-Gas	ND		5.0

Surrogate Recovery:
Fluorobenzene 93%

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 3-16-05
Date Analyzed: 3-16-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: MB0316S3

	Result	Flags	PQL
Benzene	ND		0.020
Toluene	ND		0.050
Ethyl Benzene	ND		0.050
m,p-Xylene	ND		0.050
o-Xylene	ND		0.050
TPH-Gas	ND		5.0

Surrogate Recovery:
Fluorobenzene 92%

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 3-16-05
Date Analyzed: 3-16-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID:	03-118-01 Original	03-118-01 Duplicate	RPD	Flags
Benzene	ND	ND	NA	
Toluene	ND	ND	NA	
Ethyl Benzene	ND	ND	NA	
m,p-Xylene	ND	ND	NA	
o-Xylene	ND	ND	NA	
TPH-Gas	ND	ND	NA	
Surrogate Recovery:				
Fluorobenzene	81%	81%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 3-16-05
Date Analyzed: 3-17-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID:	03-118-22 Original	03-118-22 Duplicate	RPD	Flags
Benzene	**0.275**	**0.287**	4	
Toluene	**ND**	**ND**	NA	
Ethyl Benzene	**0.414**	**0.417**	1	
m,p-Xylene	**0.372**	**0.383**	3	
o-Xylene	**0.0829**	**0.0918**	10	
TPH-Gas	**109**	**112**	2	
Surrogate Recovery:				
Fluorobenzene	80%	82%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 3-16-05
Date Analyzed: 3-17-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID:	03-161-01 Original	03-161-01 Duplicate	RPD	Flags
Benzene	ND	ND	NA	
Toluene	ND	ND	NA	
Ethyl Benzene	ND	ND	NA	
m,p-Xylene	ND	ND	NA	
o-Xylene	ND	ND	NA	
TPH-Gas	ND	ND	NA	
Surrogate Recovery:				
Fluorobenzene	77%	75%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 3-16-05
Date Analyzed: 3-16-05

Matrix: Soil
Units: mg/kg (ppm)

Spike Level (ppm): 2.40

Lab ID:	03-118-01 **MS**	Percent Recovery	03-118-01 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**2.41**	**101**	**2.47**	**103**	2	
Toluene	**2.46**	**102**	**2.50**	**104**	2	
Ethyl Benzene	**2.47**	**103**	**2.52**	**105**	2	
m,p-Xylene	**2.48**	**103**	**2.51**	**105**	2	
o-Xylene	**2.49**	**104**	**2.53**	**105**	1	
Surrogate Recovery:						
Fluorobenzene	87%		87%			

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 3-16-05
Date Analyzed: 3-17-05

Matrix: Soil
Units: mg/kg (ppm)

Spike Level (ppm): 2.36

Lab ID:	03-118-22 **MS**	Percent Recovery	03-118-22 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**2.76**	**105**	**2.78**	**106**	1	
Toluene	**2.57**	**109**	**2.60**	**110**	1	
Ethyl Benzene	**3.07**	**113**	**3.10**	**114**	1	
m,p-Xylene	**2.94**	**109**	**2.97**	**110**	1	
o-Xylene	**2.67**	**110**	**2.71**	**111**	2	
Surrogate Recovery:						
Fluorobenzene	85%		85%			

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Dx

Date Extracted: 3-14-05
Date Analyzed: 3-14-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	BH-11 (10)	BH-11 (20)	BH-11 (30)
Lab ID:	03-118-01	03-118-02	03-118-03
Diesel Range:	ND	ND	ND
PQL:	34	32	36
Identification:	---	---	---
Lube Oil Range:	ND	ND	ND
PQL:	68	64	71
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	105%	98%	108%
Flags:	Y	Y	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Dx

Date Extracted:	3-14-05
Date Analyzed:	3-14-05
Matrix:	Soil
Units:	mg/kg (ppm)

Client ID:	**BH-11 (45)**	**BH-10 (10)**	**BH-10 (20)**
Lab ID:	03-118-04	03-118-05	03-118-06
Diesel Range:	**ND**	**ND**	**ND**
PQL:	33	35	33
Identification:	---	---	---
Lube Oil Range:	**ND**	**ND**	**100**
PQL:	67	70	65
Identification:	---	---	Lube Oil
Surrogate Recovery			
o-Terphenyl:	100%	108%	110%
Flags:	Y	Y	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Dx

Date Extracted: 3-15-05
Date Analyzed: 3-15-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**BH-12 (30)**	**BH-8 (10)**	**BH-8 (20)**
Lab ID:	03-118-13	03-118-14	03-118-15
Diesel Range:	**ND**	**ND**	**ND**
PQL:	31	29	36
Identification:	---	---	---
Lube Oil Range:	**ND**	**ND**	**ND**
PQL:	63	59	71
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	104%	111%	101%
Flags:	Y	Y	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Dx

Date Extracted:	3-15-05
Date Analyzed:	3-15-05
Matrix:	Soil
Units:	mg/kg (ppm)

Client ID:	**BH-8 (30)**	**BH-6 (10)**	**BH-6 (20)**
Lab ID:	03-118-16	03-118-17	03-118-18
Diesel Range:	**ND**	**ND**	**ND**
PQL:	35	33	39
Identification:	---	---	---
Lube Oil Range:	**ND**	**250**	**ND**
PQL:	69	66	77
Identification:	---	Lube Oil	---
Surrogate Recovery			
o-Terphenyl:	99%	95%	102%
Flags:	Y	Y	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Dx

Date Extracted: 3-15-05
Date Analyzed: 3-15-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**BH-6 (30)**	**BH-7 (10)**	**BH-7 (20)**
Lab ID:	03-118-19	03-118-20	03-118-21
Diesel Range:	**ND**	**ND**	**ND**
PQL:	40	37	34
Identification:	---	---	---
Lube Oil Range:	**ND**	**ND**	**ND**
PQL:	79	74	68
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	98%	98%	98%
Flags:	Y	Y	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Dx

Date Extracted:	3-15-05
Date Analyzed:	3-15-05
Matrix:	Soil
Units:	mg/kg (ppm)
Client ID:	**BH-7 (30)**
Lab ID:	03-118-22
Diesel Range:	**ND**
PQL:	35
Identification:	---
Lube Oil Range:	**ND**
PQL:	70
Identification:	---
Surrogate Recovery	
o-Terphenyl:	81%
Flags:	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	3-14-05
Date Analyzed:	3-14-05
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0314S1
Diesel Range:	**ND**
PQL:	25
Identification:	---
Lube Oil Range:	**ND**
PQL:	50
Identification:	---
Surrogate Recovery	
o-Terphenyl:	105%
Flags:	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	3-15-05
Date Analyzed:	3-15-05
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0315S1
Diesel Range:	**ND**
PQL:	25
Identification:	---
Lube Oil Range:	**ND**
PQL:	50
Identification:	---
Surrogate Recovery	
o-Terphenyl:	102%
Flags:	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	3-14-05
Date Analyzed:	3-14-05
Matrix:	Soil
Units:	mg/kg (ppm)

Lab ID:	03-118-05	03-118-05 DUP
Diesel Range:	**ND**	**ND**
PQL:	25	25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	108%	97%
Flags:	Y	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted: 3-15-05
Date Analyzed: 3-15-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID:	03-124-03	03-124-03 DUP
Diesel Range:	**ND**	**ND**
PQL:	25	25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	86%	84%
Flags:	Y	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-118
Project: 053-1378-100.000

% MOISTURE

Date Analyzed: 3-14&15-05

Client ID	Lab ID	% Moisture
BH-11 (10)	03-118-01	26
BH-11 (20)	03-118-02	22
BH-11 (30)	03-118-03	30
BH-11 (45)	03-118-04	25
BH-10 (10)	03-118-05	29
BH-10 (20)	03-118-06	23
BH-10 (30)	03-118-07	15
BH-9 (10)	03-118-08	33
BH-9 (20)	03-118-09	30
BH-9 (30)	03-118-10	29
BH-12 (10)	03-118-11	23
BH-12 (20)	03-118-12	19
BH-12 (30)	03-118-13	20
BH-8 (10)	03-118-14	15
BH-8 (20)	03-118-15	30
BH-8 (30)	03-118-16	28
BH-6 (10)	03-118-17	24
BH-6 (20)	03-118-18	35
BH-6 (30)	03-118-19	37
BH-7 (10)	03-118-20	32
BH-7 (20)	03-118-21	26
BH-7 (30)	03-118-22	29

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

G - Insufficient sample quantity for duplicate analysis.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

O - Hydrocarbons indicative of diesel fuel are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a silica gel cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • Fax: (425) 885-4603

Laboratory Number: U3-118

Company: Golder

Project Number: G 053-1378-100,000

Project Name: Glenwood Phase II

Project Manager: Neil Gilhuly

Sampled by: J Kennedy 425-736-8125

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☑ Standard (7 working days)
- ☐ _____ (other)

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH	% Moisture
1	BH-11 (10)	3-10-05	0755	Soil			X	X													X
2	BH-11 (20)		0810				X	X													
3	BH-11 (30)		0830				X	X													
4	BH-11 (~~40~~ 45)		0910				X	X													
5	BH-10 (10)		1005				X	X													
6	BH-10 (20)		1015				X	X													
7	BH-10 (30)		1035				X	X													
8	BH-9 (10)		1140				X	X													
9	BH-9 (20)		1145				X	X													
10	BH-9 (30)		1200	Soil			X	X													

	Signature	Company	Date	Time
Relinquished by		Golder	3-11-05	3:35 pm
Received by		OnSite	3/11/05	1535
Relinquished by				
Received by				
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions:

Chromatograms with final report ☐

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OnSite Environmental Inc.
14... NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • Fax: (425) 885-4603

Company: Golder Golder
Project Number: 053-1378-100,000
Project Name: Glenwood / Yakima
Project Manager: Neil Gilham
Sampled by: Joe Kennedy 425 736 8125

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☑ Standard (7 working days)
- ☐ _____ (other)

Laboratory Number: U3-1

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH				% Moisture
11	BH-12 (10)	3-10-05	1420	Soil	2		X	X																X
12	BH-12 (20)	3-10-05	1440				X	X																
13	BH-12 (30)		1458				X	X																
14	BH-8 (10)		1605				X	X																
15	BH-8 (20)		1620				X	X																
16	BH-8 (30)	3-10-05	1640				X	X																
17	BH-6 (10)	3-11-05	0735				X	X																
18	BH-6 (20)	3-11-05	0800				X	X																
19	BH-6 (30)	3-11-05	0810	Soil	2		X	X																

	Signature	Company	Date	Time
Relinquished by		Golder	3-11-05	3:35 pm
Received by		CAS Inc Eu.	3/11/05	1535
Relinquished by				
Received by				
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions:

Chromatograms with final report ☐

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OnSite Environmental Inc.
[illegible] NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • Fax: (425) 885-4603

Company: Golder
Project Number: 053-1378-100.1100
Project Name: Glenwood / Yakima
Project Manager: Neil Gilham
Sampled by:

Turnaround Request (in working days)
(Check One)
☒ Same Day ☐ 1 Day
☐ 2 Day ☐ 3 Day
☑ Standard (7 working days)
☐ _____ (other)

Laboratory Number: 03-[illegible]8

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH				% Moisture
20	BH-7 (10)	3-11-05	0910	soil	2		X	X																X
21	BH-7 (20)	3-11-05	0920	1	1		X	X																↓
22	BH-7 (30	3-11-05	0930	soil	2		X	X																
15																								
16																								
17																								
18																								
19																								

	Signature	Company	Date	Time	Comments/Special Instructions:
Relinquished by		Golder	3-11-05	3:35pm	
Received by		OnSite Env.	3/11/05	1535	
Relinquished by					
Received by					
Relinquished by					
Received by					
Reviewed by/Date		Reviewed by/Date			Chromatograms with final report ☐

DIST[illegible]ION L[illegible]D: W[illegible]nSite [illegible]Yellow[illegible]ort Co[illegible]nk - C[illegible]py

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

March 21, 2005

Neil Gilham
Golder Associates Inc.
18300 NE Union Hill Road
Suite 200
Redmond, WA 98052-3333

Re: Analytical Data for Project 053-1378-100.000
Laboratory Reference No. 0503-114

Dear Neil:

Enclosed are the analytical results and associated quality control data for samples submitted on March 11, 2005.

The standard policy of OnSite Environmental Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

Case Narrative

Samples were collected on March 9, 2005 and received by the laboratory on March 11, 2005. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

NWTPH Gx/BTEX Analysis

Per EPA Method 5035A, samples were received by the laboratory in preweighed 40 mL VOA vials within 48 hours of sample collection. They were stored in a freezer at between -7°C and -20°C until extraction or analysis.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-15-05
Date Analyzed: 3-15&16-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	MW-1 (5)			MW-1 (10)		
Lab ID:	03-114-01			03-114-02		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.020	**ND**		0.020
Toluene	**ND**		0.064	**ND**		0.085
Ethyl Benzene	**ND**		0.064	**ND**		0.085
m,p-Xylene	**ND**		0.064	**ND**		0.085
o-Xylene	**ND**		0.064	**ND**		0.085
TPH-Gas	**ND**		6.4	**ND**		8.5
Surrogate Recovery:						
Fluorobenzene	83%			79%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-15-05
Date Analyzed: 3-15&16-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**MW-1 (30)**			**MW-11 (30)**		
Lab ID:	03-114-03			03-114-04		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**1.9**		0.064	**1.0**		0.070
Toluene	**0.75**		0.32	**0.59**		0.35
Ethyl Benzene	**7.2**		0.32	**4.3**		0.35
m,p-Xylene	**25**		0.32	**13**		0.35
o-Xylene	**6.7**		0.32	**2.9**		0.35
TPH-Gas	**630**		32	**600**		35
Surrogate Recovery:						
Fluorobenzene	102%			105%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-15-05
Date Analyzed: 3-15&18-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	MW-1 (40)			BH-5 (5)		
Lab ID:	03-114-05			03-114-06		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**0.96**		0.023	**ND**		0.020
Toluene	**0.16**		0.11	**ND**		0.063
Ethyl Benzene	**1.2**		0.11	**ND**		0.063
m,p-Xylene	**2.4**		0.11	**ND**		0.063
o-Xylene	**2.0**		0.11	**ND**		0.063
TPH-Gas	**200**		11	**ND**		6.3
Surrogate Recovery:						
Fluorobenzene	97%			93%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

NWTPH-Gx/BTEX

Date Extracted: 3-15-05
Date Analyzed: 3-18-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID: **BH-5 (10)**
Lab ID: 03-114-07

	Result	Flags	PQL
Benzene	ND		0.020
Toluene	ND		0.070
Ethyl Benzene	ND		0.070
m,p-Xylene	ND		0.070
o-Xylene	ND		0.070
TPH-Gas	ND		7.0
Surrogate Recovery:			
Fluorobenzene	89%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 3-15-05
Date Analyzed: 3-15-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: MB0315S1

	Result	Flags	PQL
Benzene	ND		0.020
Toluene	ND		0.050
Ethyl Benzene	ND		0.050
m,p-Xylene	ND		0.050
o-Xylene	ND		0.050
TPH-Gas	ND		5.0
Surrogate Recovery:			
Fluorobenzene	94%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 3-15-05
Date Analyzed: 3-15-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID:	03-124-01 Original	03-124-01 Duplicate	RPD	Flags
Benzene	ND	ND	NA	
Toluene	ND	ND	NA	
Ethyl Benzene	ND	ND	NA	
m,p-Xylene	ND	ND	NA	
o-Xylene	ND	ND	NA	
TPH-Gas	ND	ND	NA	
Surrogate Recovery:				
Fluorobenzene	93%	88%		

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 3-15-05
Date Analyzed: 3-15-05

Matrix: Soil
Units: mg/kg (ppm)

Spike Level (ppm): 2.50

Lab ID:	03-124-01 MS	Percent Recovery	03-124-01 MSD	Percent Recovery	RPD	Flags
Benzene	2.59	104	2.57	103	1	
Toluene	2.64	106	2.61	104	1	
Ethyl Benzene	2.67	107	2.62	105	2	
m,p-Xylene	2.66	106	2.61	104	2	
o-Xylene	2.69	107	2.62	105	2	
Surrogate Recovery:						
Fluorobenzene	95%		95%			

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

NWTPH-Dx

Date Extracted:	3-11-05
Date Analyzed:	3-11-05
Matrix:	Soil
Units:	mg/kg (ppm)

Client ID:	MW-1(5)	MW-1(10)	MW-1(30)
Lab ID:	03-114-01	03-114-02	03-114-03
Diesel Range:	ND	ND	ND
PQL:	33	40	37
Identification:	---	---	---
Lube Oil Range:	ND	ND	ND
PQL:	66	81	74
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	94%	90%	102%
Flags:	Y	Y	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1376-100.000

NWTPH-Dx

Date Extracted: 3-11-05
Date Analyzed: 3-11-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	MW-11(30)	MW-1(40)	BH-5(5)
Lab ID:	03-114-04	03-114-05	03-114-06
Diesel Range:	ND	ND	ND
PQL:	37	31	34
Identification:	---	---	---
Lube Oil Range:	ND	ND	ND
PQL:	75	63	68
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	92%	114%	91%
Flags:	Y	Y	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

NWTPH-Dx

Date Extracted:	3-11-05
Date Analyzed:	3-11-05
Matrix:	Soil
Units:	mg/kg (ppm)

Client ID:	**BH-5(10)**
Lab ID:	03-114-07
Diesel Range:	**ND**
PQL:	37
Identification:	---
Lube Oil Range:	**ND**
PQL:	75
Identification:	---
Surrogate Recovery	
o-Terphenyl:	76%
Flags:	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	3-11-05
Date Analyzed:	3-11-05
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0311S1
Diesel Range:	**ND**
PQL:	25
Identification:	---
Lube Oil Range:	**ND**
PQL:	50
Identification:	---
Surrogate Recovery	
o-Terphenyl:	122%
Flags:	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted: 3-11-05
Date Analyzed: 3-11-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID:	03-112-02	03-112-02 DUP
Diesel Range:	**ND**	**ND**
PQL:	25	25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	89%	96%
Flags:	Y	Y

Date of Report: March 21, 2005
Samples Submitted: March 11, 2005
Laboratory Reference: 0503-114
Project: 053-1378-100.000

% MOISTURE

Date Analyzed: 3-11-05

Client ID	Lab ID	% Moisture
MW-1 (5)	03-114-01	24
MW-1 (10)	03-114-02	38
MW-1 (30)	03-114-03	32
MW-11 (30)	03-114-04	33
MW-1 (40)	03-114-05	20
BH-5 (5)	03-114-06	26
BH-5 (10)	03-114-07	33

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

G - Insufficient sample quantity for duplicate analysis.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

O - Hydrocarbons indicative of diesel fuel are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a silica gel cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • Fax: (425) 885-4603

Company: Golder (3.11.05 9:21)
Project Number: ~~053-1378~~ 053-1378-100.000
Project Name: Glenwood Phase II
Project Manager: Neil Gilhooly
Sampled by: Joe Kennedy

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☑ Standard (7 working days)
- ☐ _____ (other)

Laboratory Number: 03-114

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH	% Moisture
1	MW-1 (5)	3-9-05	~~1115~~ 1050	Soil	2		X	X													X
2	MW-1 (10)		1115 ~~1220~~	"	2		X	X													X
3	MW-1 (30)		1140	"	2		X	X													X
4	MW-11 (30)		1145	"	2		X	X													X
~~5~~	~~MW-1 (35) *~~		1200	"	~~2~~		X														
5	MW-1 (40) *		1200	"	2		X	X													X
6	BH-5 (5)		1545	"	2		X	X													X
7	BH-5 (10)	3-9-05	1605	"	2		X	X													X
					X																

	Signature	Company	Date	Time
Relinquished by		Golder	3-10-05	1400
Received by			3.11.05	7:00A
Relinquished by				
Received by				
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions:
3/11 AS PER JOE KENNEDY - Project # WAS Changed

Chromatograms with final report ☐

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OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

March 23, 2005

Neil Gilham
Golder Associates Inc.
18300 NE Union Hill Road
Suite 200
Redmond, WA 98052-3333

Re: Analytical Data for Project 053-1378
Laboratory Reference No. 0503-171

Dear Neil:

Enclosed are the analytical results and associated quality control data for samples submitted on March 17, 2005.

The standard policy of OnSite Environmental Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: March 23, 2005
Samples Submitted: March 17, 2005
Laboratory Reference: 0503-171
Project: 053-1378

Case Narrative

Samples were collected on March 16, 2005 and received by the laboratory on March 17, 2005. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: March 23, 2005
Samples Submitted: March 17, 2005
Laboratory Reference: 0503-171
Project: 053-1378

NWTPH-Gx/BTEX

Date Extracted: 3-21&22-05
Date Analyzed: 3-21&22-05

Matrix: Water
Units: ug/L (ppb)

Client ID: **MW-1**
Lab ID: 03-171-01

	Result	Flags	PQL
MTBE	**ND**		10
Benzene	**6600**		100
Toluene	**460**		50
Ethyl Benzene	**880**		50
m,p-Xylene	**2500**		50
o-Xylene	**1800**		50
TPH-Gas	**39000**		5000

Surrogate Recovery:
Fluorobenzene 109%

Date of Report: March 23, 2005
Samples Submitted: March 17, 2005
Laboratory Reference: 0503-171
Project: 053-1378

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 3-22-05
Date Analyzed: 3-22-05

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0322W2

	Result	Flags	PQL
MTBE	**ND**		10
Benzene	**ND**		1.0
Toluene	**ND**		1.0
Ethyl Benzene	**ND**		1.0
m,p-Xylene	**ND**		1.0
o-Xylene	**ND**		1.0
TPH-Gas	**ND**		100

Surrogate Recovery:
Fluorobenzene 96%

Date of Report: March 23, 2005
Samples Submitted: March 17, 2005
Laboratory Reference: 0503-171
Project: 053-1378

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 3-21-05
Date Analyzed: 3-21-05

Matrix: Water
Units: ug/L (ppb)

Lab ID:	03-126-08 Original	03-126-08 Duplicate	RPD	Flags
MTBE	ND	ND	NA	
Benzene	ND	ND	NA	
Toluene	ND	ND	NA	
Ethyl Benzene	ND	ND	NA	
m,p-Xylene	ND	ND	NA	
o-Xylene	ND	ND	NA	
TPH-Gas	ND	ND	NA	
Surrogate Recovery:				
Fluorobenzene	97%	96%		

Date of Report: March 23, 2005
Samples Submitted: March 17, 2005
Laboratory Reference: 0503-171
Project: 053-1378

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 3-21-05
Date Analyzed: 3-21-05

Matrix: Water
Units: ug/L (ppb)

Spike Level: 50.0 ppb

Lab ID:	03-126-08 **MS**	Percent Recovery	03-126-08 **MSD**	Percent Recovery	**RPD**	**Flags**
MTBE	**54.4**	**109**	**53.2**	**106**	2	
Benzene	**53.1**	**106**	**52.6**	**105**	1	
Toluene	**54.4**	**109**	**53.7**	**107**	1	
Ethyl Benzene	**54.5**	**109**	**53.8**	**108**	1	
m,p-Xylene	**54.1**	**108**	**53.3**	**107**	2	
o-Xylene	**54.3**	**109**	**53.5**	**107**	1	

Surrogate Recovery:

Fluorobenzene	102%	100%

Date of Report: March 23, 2005
Samples Submitted: March 17, 2005
Laboratory Reference: 0503-171
Project: 053-1378

NWTPH-Dx

Date Extracted:	3-17-05
Date Analyzed:	3-17-05
Matrix:	Water
Units:	mg/L (ppm)
Client ID:	**MW-1**
Lab ID:	03-171-01
Diesel Range:	**ND**
PQL:	0.31
Identification:	---
Lube Oil Range:	**ND**
PQL:	0.50
Identification:	---
Surrogate Recovery	
o-Terphenyl:	97%
Flags:	Y

Date of Report: March 23, 2005
Samples Submitted: March 17, 2005
Laboratory Reference: 0503-171
Project: 053-1378

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	3-17-05
Date Analyzed:	3-17-05
Matrix:	Water
Units:	mg/L (ppm)
Lab ID:	MB0317W1
Diesel Range:	**ND**
PQL:	0.25
Identification:	---
Lube Oil Range:	**ND**
PQL:	0.40
Identification:	---
Surrogate Recovery	
o-Terphenyl:	96%
Flags:	Y

Date of Report: March 23, 2005
Samples Submitted: March 17, 2005
Laboratory Reference: 0503-171
Project: 053-1378

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	3-17-05
Date Analyzed:	3-17-05
Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	03-150-01	03-150-01 DUP
Diesel Range:	ND	ND
PQL:	0.31	0.31
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	87%	85%
Flags:	Y	Y

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

G - Insufficient sample quantity for duplicate analysis.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

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O - Hydrocarbons indicative of diesel fuel are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

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S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

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Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

nSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • Fax: (425) 885-4603

Company: GOLDER
Project Number: 053-1378
Project Name:
Project Manager: Neil Gilham
Sampled by:

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Day 3/21
- ☒ 3 Day
- ☒ Standard (7 working days) DB
- ☐ _____ (other)

Laboratory Number: 03-171

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX + MTBE	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH				% Moisture
1	MW-1	3-16-05	1245	WATER			X	X																
	~~Matrix~~																							

	Signature	Company	Date	Time	Comments/Special Instructions:
Relinquished by		Golder	3-17-05	0635	
Received by	Alson	CSE	3-17-05	6:35A	
Relinquished by					
Received by					
Relinquished by					
Received by					
Reviewed by/Date		Reviewed by/Date			Chromatograms with final report ☐

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