



ASSOCIATED  
ENVIRONMENTAL  
GROUP, LLC

**PHASE II  
SITE CHARACTERIZATION**

*Conducted on:*

**Reid Auto**  
3512 South 84<sup>th</sup> Street  
Lakewood, Washington 98499

**June 23, 2003**

Prepared for:

**Mr. Daniel Reid**  
3512 South 84<sup>th</sup> Street  
Lakewood, Washington

**Associated Environmental Group, LLC**

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## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>2</b>
1.1	SITE HISTORY .....	2
<b>2.0</b>	<b>DELINEATION AND EXCAVATION OF CONTAMINATED SOIL .....</b>	<b>4</b>
2.1	SUBSURFACE DELINEATION .....	4
2.2	SOIL CHARACTERISTICS .....	5
2.3	SOIL SAMPLING & ANALYTICAL RESULTS .....	5
<b>3.0</b>	<b>CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>7</b>
<b>4.0</b>	<b>LIMITATIONS .....</b>	<b>8</b>

APPENDIX A: Site Detail

APPENDIX B: Analytical Tables

APPENDIX C: Site Photographs

APPENDIX D: Laboratory Documents

## 1.0 INTRODUCTION

The purpose of this Phase II Site Characterization Study was to further characterize the subsurface contamination associated with a floor drain system running north from the building of Reid's Auto in Lakewood, WA. This area of contamination was previously identified by Hart Crowser in June of 2002. Additional site activities were conducted by Associated Environmental Group, LLC (AEG) in February of 2003. The scope of work included:

- Exploratory excavation pit at the north end of the north parking lot in efforts to identify the northern boundary of the contaminated soil and the destination of the piping system.
- Exploratory excavation pit at the south end of the north parking lot, adjacent to the building, in efforts to identify the southern boundary of the contaminated soil.
- Subsurface soil samples at the northern excavation pit from the north, west and east walls and from the excavation floor. Analyze samples for total petroleum hydrocarbons and quantify detectable levels of hydrocarbons.
- Subsurface soil sample at the southern excavation pit adjacent to the drainage pipe. Analyze samples for total petroleum hydrocarbons and quantify detectable levels of hydrocarbons.

This report represents comprehensive documentation of activities relating to site work, excavation activities, sampling and laboratory sample analysis.

### 1.1 Site History

The subject property formerly operated as Art's Auto Doctor automobile service station. Hart Crowser of Seattle, WA conducted a Modified Phase I Assessment at the subject property in June of 2002. The site work included a Phase I ESA as per ASTM E 1527-00 and subsurface investigations at three locations inside the building and six locations at the exterior of the property.

Hart Crowser identified soil contamination on the exterior of the property north of the building, sample number SP-5. The soil contamination had detectable levels of gasoline and gasoline constituents above the current MTCA Method-A Cleanup Levels. Soil sample number SP-1, SP-2 and SP-3 had detectable levels of heavy oil below the current MTCA Method-A Levels. No groundwater was encountered during Hart Crowser's site activities. Hart Crowser was unable to identify the source of contamination.

According to Hart Crowser's Modified Phase I Assessment, an oil-water separator UST was identified on the Department of Ecology (Ecology) UST database. Hart Crowser explained and

provided documentation that the UST was housed at the site and was converted to a water drainage system in 1991 used by the facility. Ecology noted the change in service for the UST and remitted the tank status in their public files. According to the Modified Phase I, Hart Crowser did not pursue the former registered UST as a potential environmental concern.

However, Ms. Julie Wukelic, Hart Crowser Principal, informed AEG that Hart Crowser and subcontractor, GeoRecon, conducted a ground-penetrating radar scan of the exterior of the property, including the north parking lot, to identify potential UST(s). The scan did not indicate the presence of any USTs. Documentation of the scan was not available at the time this report was compiled. (*Interview 6/20/03*)

## 2.0 DELINEATION AND EXCAVATION OF CONTAMINATED SOIL

On February 6, 2003, AEG and subcontractor Canon Construction initiated soil excavation activities around SP-5 boring location, previously identified by Hart Crowser, to remove the known contaminated soil. The excavation process consisted of cutting a 20 x 10 foot area of the asphalt surface cover over the SP-5 location and excavating down to ten feet depth. Minor contamination was identified at approximately four feet below ground surface (bgs) which extended to the east of the excavation area. At approximately five feet bgs, saturated soil contamination was discovered three feet east of the SP-5 location. Upon further excavation to the east, AEG discovered a four inch perforated plastic pipe containing free product (waste oil) extending from the subject building to the north.

In an effort to identify the extent of the contamination, excavation was continued to the east and to a total depth of ten feet bgs. The contamination was localized to two feet east and west of the perforated pipe and appears to extend slightly beyond ten feet bgs.

Soil samples were taken from the north wall of the excavation above the perforated pipe and on the south wall below the perforated pipe. Analytical results indicated elevated levels of gasoline, gasoline constituents, heavy oil and lead above the current MTCA Method-A Cleanup Levels. Groundwater was not encountered during the site activities. The pit was lined with plastic and backfilled to the original grade until further delineation activities could be conducted.

### 2.1 *Subsurface Delineation*

On June 5, 2003, AEG and subcontractor Canon Construction returned to the site to further delineate the extent of contamination and the pathway of the four inch perforated pipe. Subsurface activities were conducted immediately south of the northern property boundary, parallel to South 84<sup>th</sup> Street. The pit was excavated 10 feet running east and west and 16 feet running north and south and approximately 11 feet bgs. The four inch perforated pipe was exposed along the south wall of the excavation approximately 20 south of the north property boundary and approximately 6 feet bgs. Free product was encountered surrounding the pipe, 3-4 feet on east and west sides of the pipe and extended slightly beyond nine feet bgs.

The end of the pipe had a U-shaped pipe connection extending the pipe south toward the building, parallel to the pipe heading north from the building. Onsite soil screening was conducted with a portable photo ionization detector (PID) that revealed levels of Volatile Organic Chemicals (VOCs) over 2000 parts per million (ppm) around the immediate area of the perforated pipe in the north and south excavation pits. Field screening revealed non-detect results in the north excavation pit for the north, west and east sidewalls and from the base of the excavation pit.

The southern excavation was conducted immediately north of the building; the pit was excavated 10 feet running east and west and 15 feet running north and south and approximately 8 feet bgs. During the excavation activities, AEG identified a 500-gallon UST, potentially the former oil-water separator, eight feet north of the building and approximately four feet bgs.

The UST had three visible 6-inch ports atop the tank with a six inch Polyvinyl chloride (PVC) pipe extending horizontally from the north end of the building into the south port. A six inch vertical PVC pipe was protruding from the center port of the tank which stopped at approximately two feet bgs. The north port of the tank was fitted with the four inch perforated plastic pipe that has been identified on the site extending the length of the parking lot. The pipe contained free product (waste oil).

The UST was filled with very oily water; extensive soil contamination was observed surrounding the tank. AEG was unable to remove the UST during the site work.

Refer to Appendix A: Site Detail for the site layout and excavation details and Appendix C: Site Photographs for photo documentation of the site activities.

## **2.2 Soil Characteristics**

The soil type was consistent throughout the two excavation pits conducted onsite. The soil consisted of a brown very gravelly sandy loam from 0-2 feet bgs, dark to light brown very compacted very gravelly sandy loam from 2-7 feet bgs and dark to light brown very compacted gravelly sandy loam from 7-12 feet bgs. According to ASTM Designation D-2487 Unified Soil Classification System, the soil type was consistent with "poorly graded gravels and gravel-sand mixtures, little or no fines (GP)". Groundwater was not encountered during the site activities.

## **2.3 Soil Sampling & Analytical Results**

Based on the field observations, AEG collected soil samples from the north excavation pit from the north, east and west walls and from the base of the excavation. One representative sample was collected from the contaminated material from the south excavation on the east side of the UST. Refer to Appendix A: Site Detail for the locations of the samples.

The soil samples were placed in labeled four-ounce glass jars with Teflon-lined lids. The sample containers were placed in a cooler to keep sample temperature at 34 degrees F and transported under a chain-of-custody to Libby Environmental of Olympia, WA 98506.

All samples were analyzed for hydrocarbon identification (NWTPH-HCID) and quantified for the detectable levels of hydrocarbons in the heavy oil and gasoline ranges. The analytical results indicated levels of hydrocarbons in the heavy oil and gasoline ranges above the current MTCA

Method-A Cleanup Levels (WAC-173-340) in sample number 23401-B05 collected adjacent to the UST. Low levels of heavy oil range hydrocarbons were identified below MTCA Method-A Cleanup Levels in sample number 23401-B02 (north excavation, west wall) and 23401-B04 (north excavation, east wall).

The analytical results are attached in Appendix B: Analytical Tables.

### 3.0 CONCLUSIONS AND RECOMMENDATIONS

Based on field and laboratory sampling, and site observations, AEG has concluded the following:

- The subsurface contamination extends from the building approximately 72 feet north and approximately 10 feet east and west with a vertical limit between 10-12 feet below ground surface, approximately 320 cubic yards of contaminated soil.
- AEG identified a 500-gallon UST, potentially the former oil-water separator, eight feet north of the building and approximately four feet bgs.
- The UST was filled with very oily water and extensive soil contamination was observed surrounding the tank.
- High levels of gasoline and heavy oil range hydrocarbons above the MTCA Method-A Cleanup Levels are present in the contaminated soils.

Based on the laboratory results and the site conditions, AEG recommends the following:

- Excavation and disposal of the contaminated soils 1-2 feet beyond the contaminated materials.
- Collect confirmation soil samples from the excavation sidewalls and excavation base and analyze for gasoline, gasoline constituents and heavy oil.
- Decommission the UST by removing and disposing the oily water in the tank and properly inerting, excavating and disposing of the UST.
- Backfill and compact the excavation with clean imported soils to the original grade.



#### 4.0 LIMITATIONS

This report summarizes the findings of the services authorized under our agreement. It has been prepared using generally accepted professional practices, related to the nature of the work accomplished. This report was prepared for the exclusive use of Mr. Daniel Reid of Reid's Auto and his designated representatives for the specific application to the project purpose.

Recommendations, opinions, site history and proposed actions contained in this report apply to conditions and information available at the time this report was created. Since conditions and regulations beyond our control can change at any time after completion of this report, or our proposed work, we are not responsible for any impacts of any changes in conditions, standards, practices and/or regulations subsequent to our performance of services. We cannot warrant or validate the accuracy of information supplied by others, in whole or part.

## **APPENDIX A – Site Detail**

## **APPENDIX B – Analytical Tables**

**Table 1. Summary of Analytical Results**  
**Ried Auto**  
 Lakewood Washington

Sample Number	Gasoline Range mg/Kg	Diesel Range mg/Kg	Mineral Oil Range mg/Kg	Heavy Oil Range mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethylbenzene mg/Kg	Xylenes mg/Kg	Gasoline Extended mg/Kg	Diesel Extended mg/Kg	Mineral Oil Extended mg/Kg	Oil Extended mg/Kg
23401-B01	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA
23401-B02	ND	ND	ND	D	NA	NA	NA	NA	NA	ND	ND	127
23401-B03	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA
23401-B04	ND	ND	ND	D	NA	NA	NA	NA	NA	ND	ND	188
23104-B05	D	ND	ND	D	1.15	5.7	5.6	35.3	432	ND	ND	12400
23401-B05 - Duplicate	D	ND	ND	D	1.09	0.5	4.3	27.8	407	27.8	407	NA
MDL	20	50	100	100	0.02	0.05	0.05	0.05	10	20	40	40

mg/Kg = milligrams per Kilogram.

D = Detected above laboratory MDL.

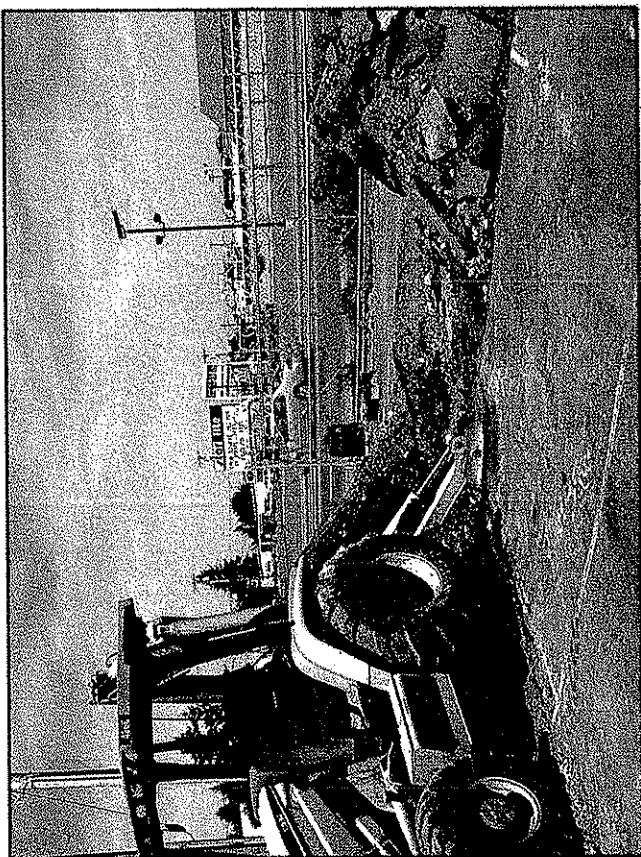
MDL = Method Detection Limit

ND = Not detected above laboratory method detection limit

NA = Not Analyzed/Not Applicable

## **APPENDIX C – Site Photographs**

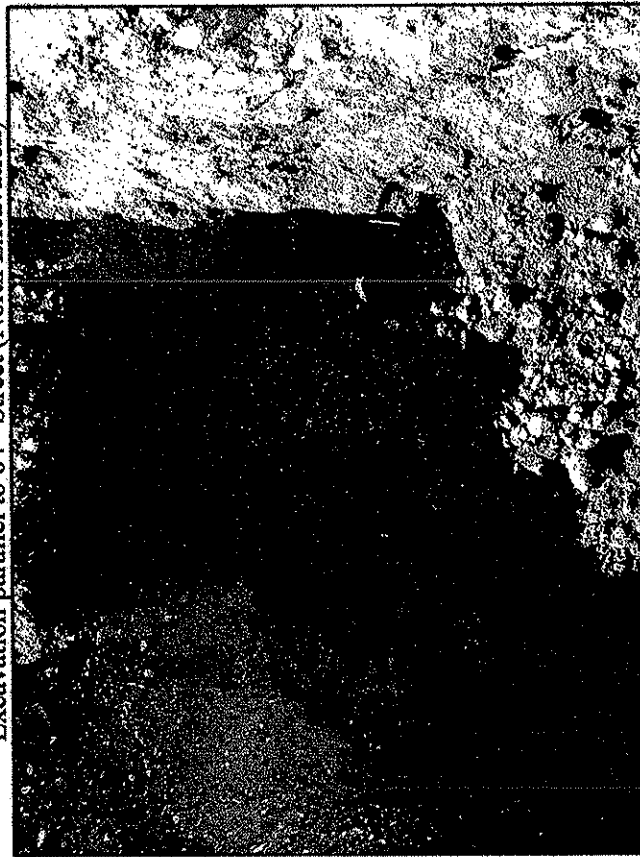
Site Assessment photographs – Reid Auto



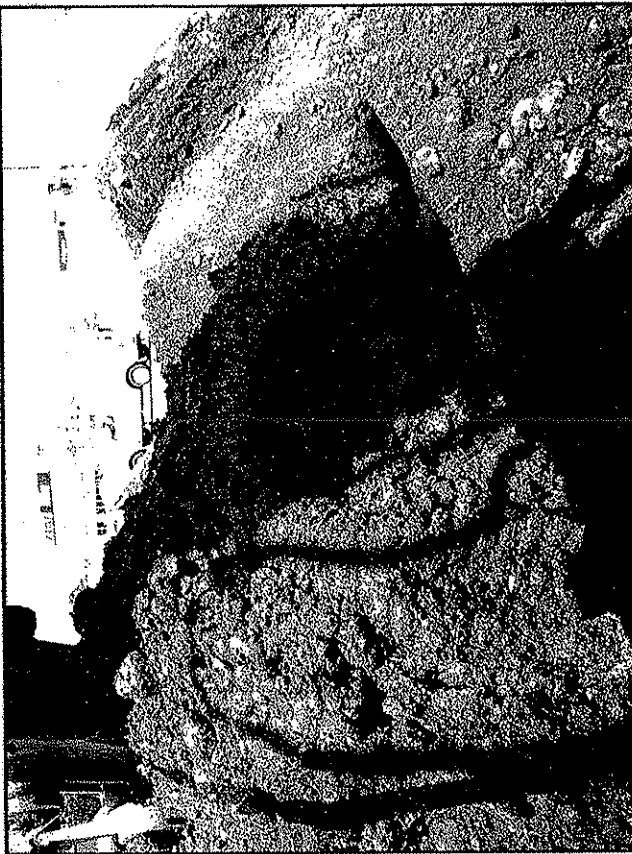
Excavation parallel to 84<sup>th</sup> Street (North Excavation)



North excavation looking south



Four inch perforated pipe



U-shaped four inch perforated pipe connection

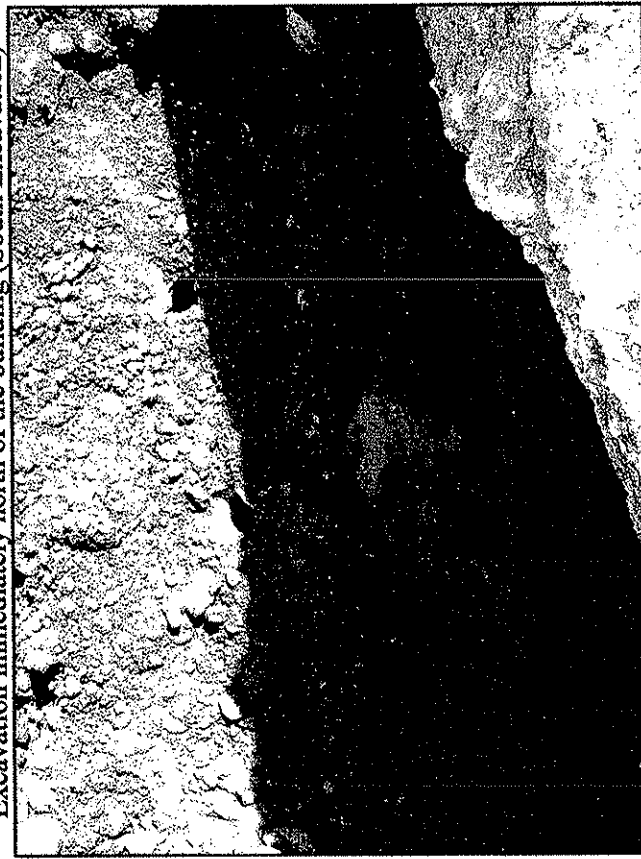
Site Assessment photographs – Reid Auto



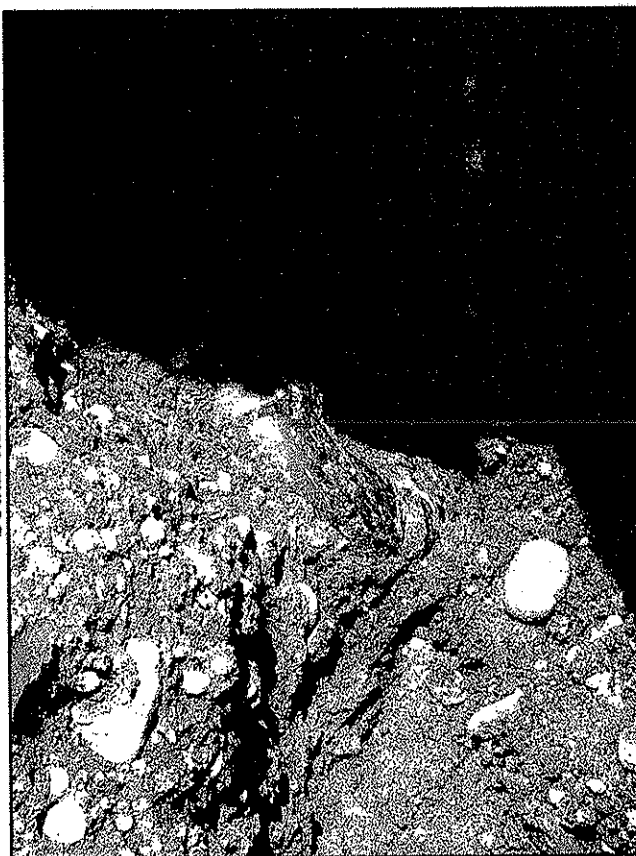
Excavation immediately north of the building (South Excavation)



South excavation



Abandon UST in south excavation



Six inch PVC pipe horizontal pipe plumbed from building to UST

## **APPENDIX D – Laboratory Documents**



# LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

REIDS AUTO PROJECT

Lakewood, Washington

AEG

Client Project #22-234-01

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

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)	Mineral Oil (mg/kg)	Oil (mg/kg)
Method Blank	6/11/2003	80	nd	nd	nd
23401-B02	6/11/2003	129	nd	nd	127
23401-B04	6/11/2003	133	nd	nd	188
23401-B05	6/11/2003	int	nd	nd	12400
Practical Quantitation Limit			20	40	40

"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%

## LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

REIDS AUTO PROJECT  
Lakewood, Washington  
AEG  
Client Project #22-234-01

### Analyses of Gasoline (NWTPH-Gx) & BTEX (EPA Method 8021B) in Soil

Sample Number	Date Analyzed	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Gasoline (mg/kg)	Surrogate Recovery (%)
Method Blank	6/10/2003	nd	nd	nd	nd	nd	85
LCS	6/10/2003	87%	92%				84
23401-B05	6/10/2003	1.15	5.7	5.6	35.3	432	105
23401-B05 Dup	6/10/2003	1.09	5.0	4.3	27.8	407	103
23401-B05 MS	6/10/2003	82%	80%				118
Practical Quantitation Limit		0.02	0.05	0.05	0.05	10	

"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: Sherry Chilcutt

# LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

REIDS AUTO PROJECT

Lakewood, Washington

AEG, Inc.

Client Project #22-234-01

## Hydrocarbon Identification by NWTPH-HCID for Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Gasoline (mg/kg)	Diesel (mg/kg)	Mineral Oil (mg/kg)	Heavy Oil (mg/kg)
Method Blank	6/9/2003	131	nd	nd	nd	nd
23401-B01	6/9/2003	100	nd	nd	nd	nd
23401-B02	6/9/2003	100	nd	nd	nd	D
23401-B03	6/9/2003	113	nd	nd	nd	nd
23401-B04	6/9/2003	109	nd	nd	nd	D
23401-B05	6/9/2003	int	D	nd	nd	D
23401-B05 Dup	6/9/2003	int	D	nd	nd	D
Practical Quantitation Limit			20	50	100	100

"nd" Indicates not detected at listed detection limits.

"D" Indicates detected above the listed detection limit.

"int" Indicates that interference prevents determination.

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

ANALYSES PERFORMED BY: Sherry Chilcutt

## LIBBY ENVIRONMENTAL, LLC

360-352-2110

## CHAIN-OF-CUSTODY RECORD

1-5

CLIENT: AEL DATE: 6-6-03 PAGE 1 OF 1

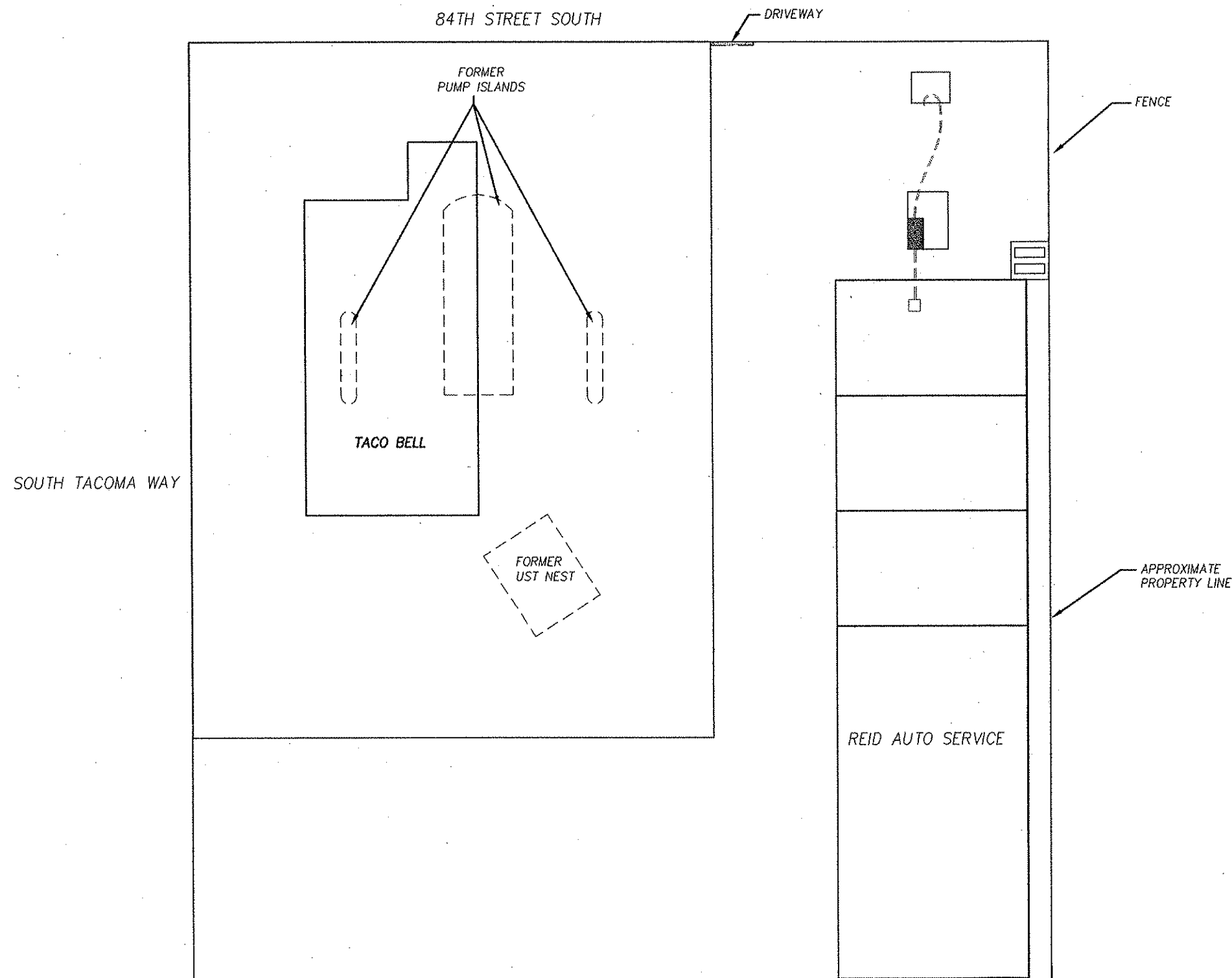
ADDRESS: 120 E UNION AVE #108 PROJECT NAME: REIDS AUTO

PHONE: \_\_\_\_\_ LOCATION: LAKEWOOD

CLIENT PROJECT #: 22-234-01 PROJECT MANAGER: ML COLLECTOR: ML DATE OF COLLECTION: 6-6-03

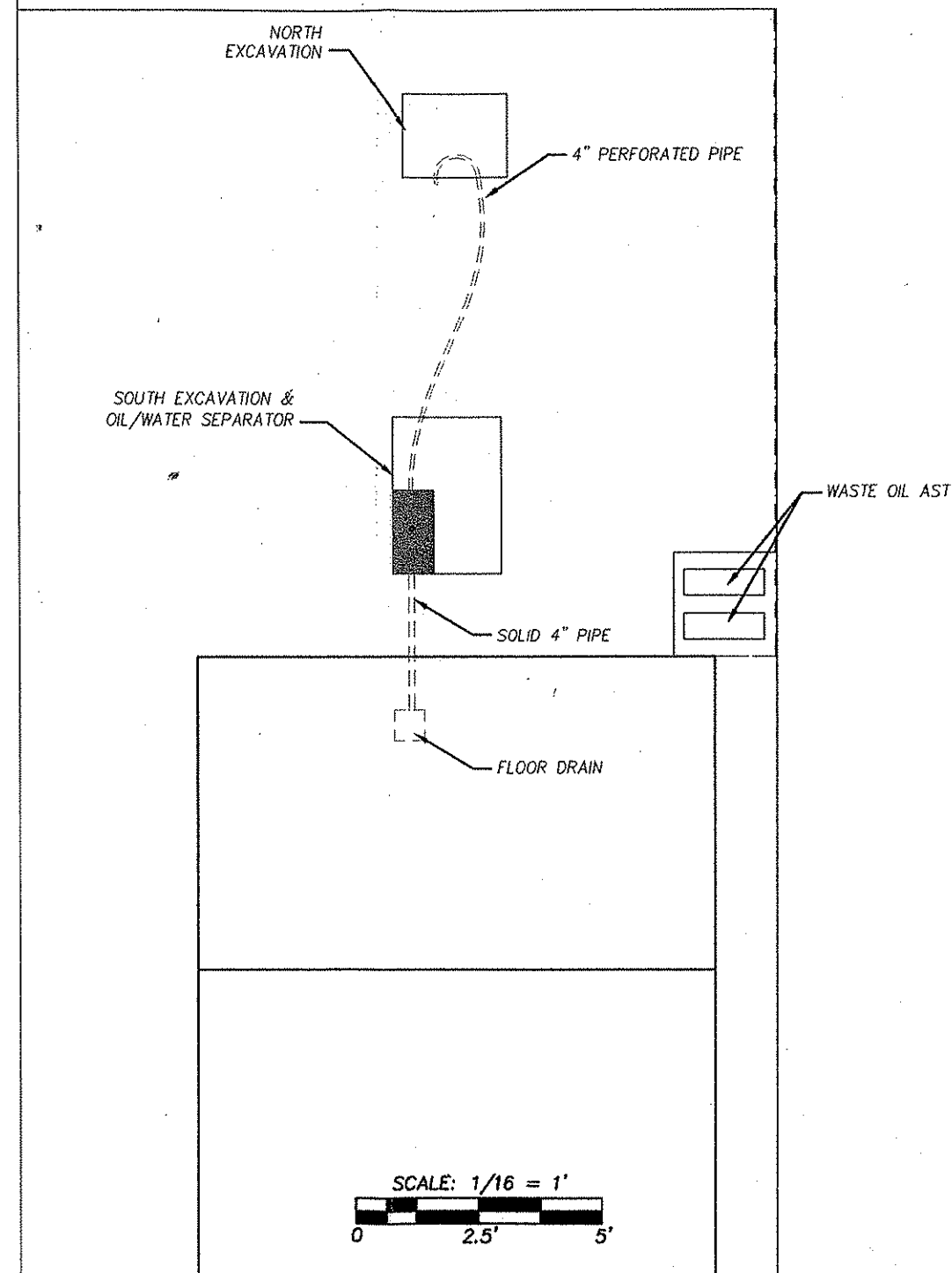
Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES	VOA 8021B	VOA 8021B BTEX ONLY	TPH - HCLD	NMTPH-GX	NMTPH-DX	PAH 8100	PCBS 8082	EPH	VPH	pH	Turbidity	Zinc	Metals	NOTES	Total Number of Containers	Laboratory Note Number
1.23401-B01			SOIL	4 oz																1	
2.23401-B02			SOIL	4 oz																1	
3.23401-B03			SOIL	4 oz																1	
4.23401-B04			SOIL	4 oz																1	
5.23401-B05			SOIL	4 oz																1	
6.																					
7.																					
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17.																					
18.																					

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME	SAMPLE RECEIPT	
<u>John D. Hubert</u>	<u>6-9-03 12:36p</u>	<u>John D. Hubert</u>	<u>6-9-03 12:37p</u>	TOTAL NUMBER OF CONTAINERS	5
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME	CHAIN OF CUSTODY SEALS Y/N	Y
				SEALS INTACT? Y/N	Y
				RECEIVED GOOD COND./COLD	
				NOTES:	
Special Instructions:				Turn Around Time: 24 HR 48 HR 5 DAY	



SCALE: 1/32 = 1'

0 5' 10'



SCALE: 1/16 = 1'

0 2.5' 5'



No.	Revision/Issue	Date



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### EXCAVATION DETAIL

**REID AUTO SERVICE**

3512 SOUTH 84TH STREET  
 LAKEWOOD WA

Project: 22-234-01 Date: 6/23/03  
 File: REID Sheet 1 of 1