

## **1.0 INTRODUCTION**

This report presents the results of Sound Environmental & Safety's (SE&S) activities during the decommissioning by removal of five underground storage tanks (USTs). The USTs were buried at the Ernie's Fuel Stop, 320 Griffin Avenue South, Enumclaw, Washington. This site characterization report has been prepared in accordance with the "Guidance for Site Checks and Site Assessments for Underground Storage Tanks" by Washington State Department of Ecology (Ecology), UST Program, dated October 1992.

### **1.1 Purpose and Scope of Work**

The purpose of SE&S's activities was to observe and monitor the removal of five USTs, and to assess subsurface conditions within the excavation. The scope of work consisted of the following tasks:

- Observe the removal of the USTs;
- Collect a minimum of three soil samples for the first UST, plus one for each additional UST within the excavation, one for the removed piping, and one for each dispenser island;
- Observe the construction of a soil remediation cell at 256 Rainier Avenue, Enumclaw, Washington, located one block north of the site;
- Submit the collected soil samples to an analytical laboratory for chemical analysis of total petroleum hydrocarbons (TPH) as gasoline using Ecology Method WTPH-G, plus benzene, toluene, ethyl benzene and xylenes (BTEX) using EPA Method 8020. Selected soil samples were also analyzed for TPH as diesel using Ecology Method WTPH-D, and for total lead using EPA method 7420; and
- Prepare a report documenting SE&S's field activities, the laboratory analysis and conclusions.

## **1.2 Tank Background**

Limited historical information pertaining to the USTs was available. According to the current property owner, three of the single-wall steel USTs were installed in the early 1960s (three 4,000-gallon USTs), and two in 1973 (one 10,000-gallon and one 12,000-gallon UST). The USTs were nested together in one cavity at the northwest corner of the site. It is believed that four of the USTs were used to store gasoline and one to store diesel fuel. One of the 4,000-gallon tanks was abandoned in place in the early 1970s. Reasons for abandonment of this UST are not known.

In early 1993, a routine tightness test was performed on each of the four active USTs. At that time it was determined that the 4,000-gallon UST used to store diesel could not pass the tightness test. The top was exposed and the tank was determined to be unrepairable. Use of this UST was terminated. Removal of all USTs was scheduled for late 1993, so the out-of-service 4,000-gallon diesel UST was left in place but not used. Each of the other USTs was used for fuel storage until just prior to abandonment in November 1993.

## **2.0 SITE CONDITIONS**

### **2.1 Vicinity Description**

Ernie's Fuel Stop is located in the southeastern portion of the city of Enumclaw, Washington. Enumclaw is a small city with many historic buildings and numerous old timers full of retrospective wise tales. The downtown streets are lined with small service businesses that cater to local community. The area's rural character is reinforced by the abundant livestock and historic farms that dot the surrounding scenic valley. The valley terrain ranges from nearly level to gently rolling, providing spectacular views of local farms and Mt. Rainier.

State Highways 410, 169 and 164 are the major routes into and out of Enumclaw. Site access is from Griffin Avenue on the north or from Highway 410 on the south, as shown on the attached Site Location Map (Figure 1).

## **2.2 Site Description**

The triangular site is located on the south side of the street at 320 Griffin Avenue South. The approximate surface elevation at the site is 745 feet above sea level (USGS topographic map, SW 1/4 of SE 1/4 of Section 24, T20N, R6E, Enumclaw, Washington Quadrangle). The site is bounded by Griffin Avenue South on the northeast, by State Highway 410 (Roosevelt Avenue) on the southeast, and by 31 Flavors Ice Cream Parlor to the west. Surroundings are occupied by commercial, restaurant and retail businesses.

Ground surface at the site is generally flat and asphalt-covered. Original construction on the site was reported to have begun in the early 1960s as a fuel distribution point. Improvements present on the site included one single-story concrete block structure (convenience store), a nest of five USTs and two dispenser islands covered by a canopy. The five USTs were nested in a single cavity located on the north side of the store. The two east-west trending dispenser islands with two pumps each were positioned about 35 feet east of the front of the store. The site configuration is illustrated on the attached Site Map (Figure 2).

## **3.0 FIELD ACTIVITIES**

### **3.1 Observations and Monitoring**

On November 15, 16, 17 & 24, December 8 & 10, 1993, and January 6, 1994, an SE&S representative visited the site to observe removal of the USTs, overexcavation of petroleum contaminated soil (PCS) and to document the surrounding soil conditions. SE&S was not on site during pumping, washing and rinsing of the USTs, which occurred prior to the excavation and removal activities.

#### **3.1.1 UST Removal**

Excavation was performed by Lee Morse General Contractor of Seattle, Washington. First, dry ice was placed inside the USTs to purge flammable vapors. The USTs were then exposed and removed utilizing an excavator. The contractor operated the excavator and coordinated disposal of the USTs.

UST #5 (refer to Site Map) was removed on November 12, 1993, to allow for the installation of a sheet pile retention structure. The retention structure allowed for the removal of the remaining USTs and detectable PCS without compromising the integrity of surrounding structures or property boundaries. Additionally, the retention structure allowed for the installation of the new USTs.

USTs #1, 2 & 3 were removed on November 15, 1993. Overexcavation of PCS continued on November 16 & 17.

UST #4 was removed on November 24. Encountered PCS was also overexcavated on November 24, from the area of the UST nest. PCS in the area of the former dispenser islands was overexcavated on December 8 & 10, 1993, and January 18, 1994. Appendix A contains certificates of the UST disposals.

After removal, each UST was visually inspected for indications of holes or corrosion. The single-wall steel USTs were in good condition with no detectable holes or heavy corrosion. Appendix B contains photographs of the USTs and removal activities.

### **3.1.2 Soil Screening During UST Removal**

Soil excavated during the removal activities was screened for the potential presence of petroleum hydrocarbons. Screening techniques included visual classification and vapor analysis using an organic vapor meter (OVM). The OVM was equipped with a 10.2 electron-volt lamp and calibrated to an isobutylene standard gas. Soil vapors were assessed by holding the OVM probe near the soil surface, and by collecting soil samples, placing them in plastic bags and subsequently measuring volatile organic vapors in the headspace within the bags.

A slight sheen and moderate petroleum-like odor were associated with soils at the fill end of the USTs. The PCS was overexcavated and placed in a dump truck. The PCS was then transported to the remediation cell located one block north of the site.

### **3.1.3 Overexcavation and New Installation Observations**

After removal of the USTs, representative samples of soils exposed in the excavation were collected. Sample collection techniques are detailed in Section 3.2. The overexcavation

of PCS was continued until field observations indicated that the PCS was removed. The overexcavation in the area of the UST nest was completed on November 24, 1993. Visual observations suggested that PCS was not present below a depth of 12 feet below grade. The excavation was extended to a final depth of 15 feet to allow for installation of the new USTs.

Additional confirmation soil samples were collected after completion of the installation activities. This soil sampling was completed on April 13, and May 25, 1994. Soil samples were collected from each corner of the new UST nest. The soil samples were retrieved using a Geoprobe Sampler (sampler). The sampler was driven to the target depths of 14 feet to 17 feet below grade. The sampler was then opened and driven two additional feet. These final confirmation soil samples were also submitted for analytical testing.

#### **3.1.4 Soil Characteristics**

Excavated soils consisted of dark brown silty sands and gravels to an approximate depth of four to five feet below grade. These disturbed and organic rich soils were underlain by gray silty sands and clay. Some angular gravels were also noted. This fine-grained sand and mud unit appeared to be undisturbed with only a trace of organic material. The gray color grades to brownish at a depth of approximately ten feet below grade. This material is believed to be part of the Osceola Mudflow unit. The Osceola Mudflow is known to have a maximum thickness of up to 75 feet and is also known to have localized or perched water.

Petroleum-like characteristics were associated with the loose near-surface soils to a depth of six to eight feet below grade. No fill debris was observed during the overexcavation activities. Water was encountered during the overexcavation activities at a depth of about eight to ten feet below grade. It is believed that this water is perched above the more impermeable soils at depth (Osceola Mudflow unit). Site conditions suggest that the water encountered in the excavation resulted from (1) the utility trench along the north side of the UST cavity, and (2) rainy conditions during the UST removal activities. Utility trenches were dug elsewhere on the site during dry weather periods and did not encounter subsurface water. After removal of the sheet pile retention structure, minimal water accumulated in the tank cavity. Appendix B contains photographs of the excavation activities.

### **3.2 Sample Collection**

After removal of the USTs and during the overexcavation activities, soil samples were collected from beneath the USTs, piping and dispenser islands. Soil samples were collected from the excavation using the excavator bucket.

Before collection of each discrete sample, new nitrile gloves were donned. The soil samples were placed with a gloved hand into the laboratory-supplied glass jars. Each jar was completely filled with soil to minimize head space and then sealed with a Teflon-lined screw cap. The sample jar was then labeled, and placed in a cooler filled with ice packs. Sample collection data are provided in Table I. The samples were promptly transported to the analytical laboratory and analyzed under priority turnaround.

Soil samples were collected from the bottom of the excavation (below the former tanks) and from the excavation sidewalls. The sidewall samples were collected at depths greater than the former UST bottoms. Sample locations are illustrated in Figure 2.

## **4.0 LABORATORY ANALYSIS**

### **4.1 Sample Handling**

A total of 21 soil samples were collected during the UST removal and overexcavation activities. Fourteen samples were collected from within the final excavation and seven samples from along the piping and dispenser islands. The samples were submitted under chain-of-custody protocol to North Creek Analytical of Bothell, Washington. The samples were chosen to best represent subsurface conditions remaining within the excavation. All submitted samples were analyzed as discrete samples.

### **4.2 Analytical Methods**

The samples were analyzed for TPH as gasoline using Washington State Method WTPH-G, plus BTEX using EPA Method 8020. Selected samples were also analyzed for TPH as diesel using Washington State Method WTPH-D, and for lead using EPA Method 7420. Laboratory data are summarized in Table II and complete laboratory data sheets

are presented in Appendix C. Analytical results were compared to cleanup levels promulgated under Model Toxics Control Act (MTCA) Cleanup Regulation (WAC 173-340) dated February 1991. The MTCA cleanup levels are presented at the bottom of Table II.

### **4.3 Analytical Results**

Nine of the 14 samples collected from within the excavation contained concentrations of TPH as gasoline and BTEX. However, none of those samples contained concentrations of TPH as gasoline in excess of MTCA cleanup levels.

Five samples (UST #1 middle @ 11', UST #1 E end @ 10.5'-11.5', UST #2 E end @ 9'-10', UST #4 N end @ 9'-11', UST #4 E wall @ 9'-11', and RW-1 @ 14'-16') contain concentrations of benzene slightly in excess of the MTCA soil cleanup level, which is 0.5 parts per million (ppm). These soils were overexcavated and stockpiled in the remediation cell. Lead was not detected in excess of the method detection limit (10 ppm) in any of the samples analyzed for lead.

Seven soil samples were collected in the area of the piping run and dispenser islands. Initial sampling (North Island @ 2.5'-3.0' and South Island @ 3.0') done in the area of the dispenser islands indicated that residual concentrations of TPH as gasoline, diesel and BTEX constituents were present in excess of MTCA soil cleanup levels. Additional overexcavating was completed in the dispenser island area and resulted in two additional sampling episodes of January 6 and 18, 1994. The results of these sampling episodes confirm that the residual concentrations of TPH in the dispenser island area have been reduced to levels below the MTCA soil cleanup level. The excavated soil was placed in the remediation cell.

No soil samples were collected from the stockpile of PCS. The stockpile has been constructed to act as a remediation cell. Remedial activities are in progress.

## 5.0 RESULTS AND CONCLUSIONS

Five USTs were exposed and removed from the site. Minimal corrosion was observed on the outer surface of the USTs. The USTs were disposed of as scrap metal. Laboratory analysis of the soil samples collected following removal of the USTs indicated that soils containing concentrations of TPH as gasoline and BTEX in excess of MTCA Method A soil cleanup levels were present. These visual observations and analytical results confirm that a release of petroleum hydrocarbons occurred at the site.

Overexcavation of PCS was carried out until field observations and laboratory testing indicated the end of detectable PCS. Water was encountered in the excavation at a depth of about ten feet below grade. Soil types, rainy weather, and geologic conditions at the site suggest that this water is perched in the more permeable backfill material within the UST cavity. The accumulated water was pumped from the excavation. The tank cavity did not recharge with groundwater.

Field observations and laboratory analysis of soil samples collected from the bottom and sidewalls of the resulting cavity indicate that TPH as gasoline, diesel and gasoline constituents, in excess of Ecology cleanup levels, has been removed from the areas excavated during this UST decommissioning activity. Confirmation soil sample analysis is present in Table II. The detectable PCS appeared to be concentrated in the more permeable near-surface sandy material. On the basis of the above data, additional soil characterization activities do not appear warranted at this time.

## 6.0 LIMITATIONS

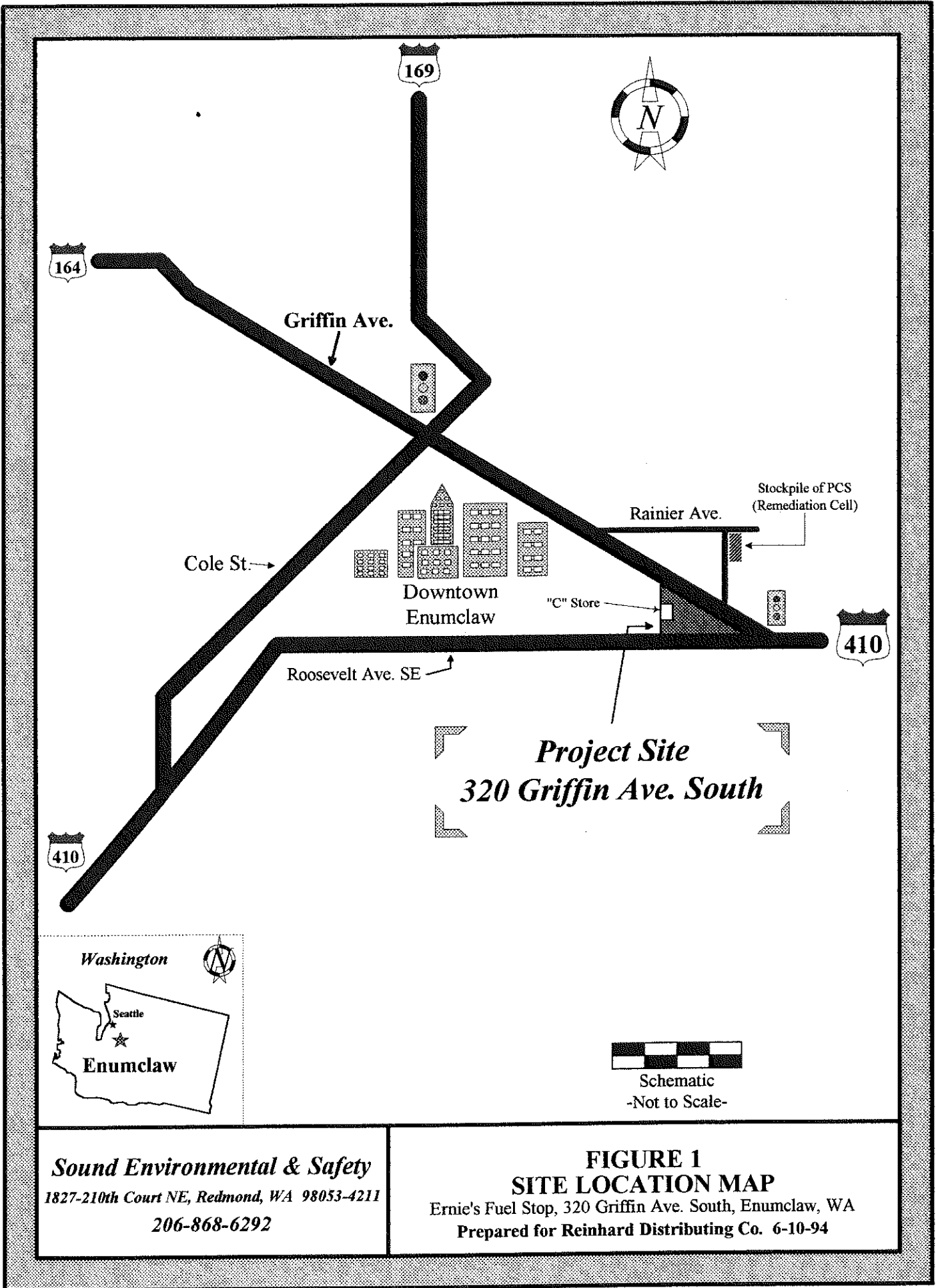
SE&S has prepared this report for use by Reinhard Distributing Company and its authorized agents in their evaluation of subsurface conditions at Ernie's Fuel Stop, 320 Griffin Avenue South, Enumclaw, Washington. This report may be made available to lenders and regulatory agencies. This report is not intended for use by others and the information contained herein is not applicable to other sites.

The data reported herein are based on visual observations, field data, and soil sampling at locations on the subject site. SE&S has relied upon information provided by others in our

Reinhard Distributing Company, Inc.  
Ernie's Fuel Stop, Enumclaw, WA  
June 10, 1994

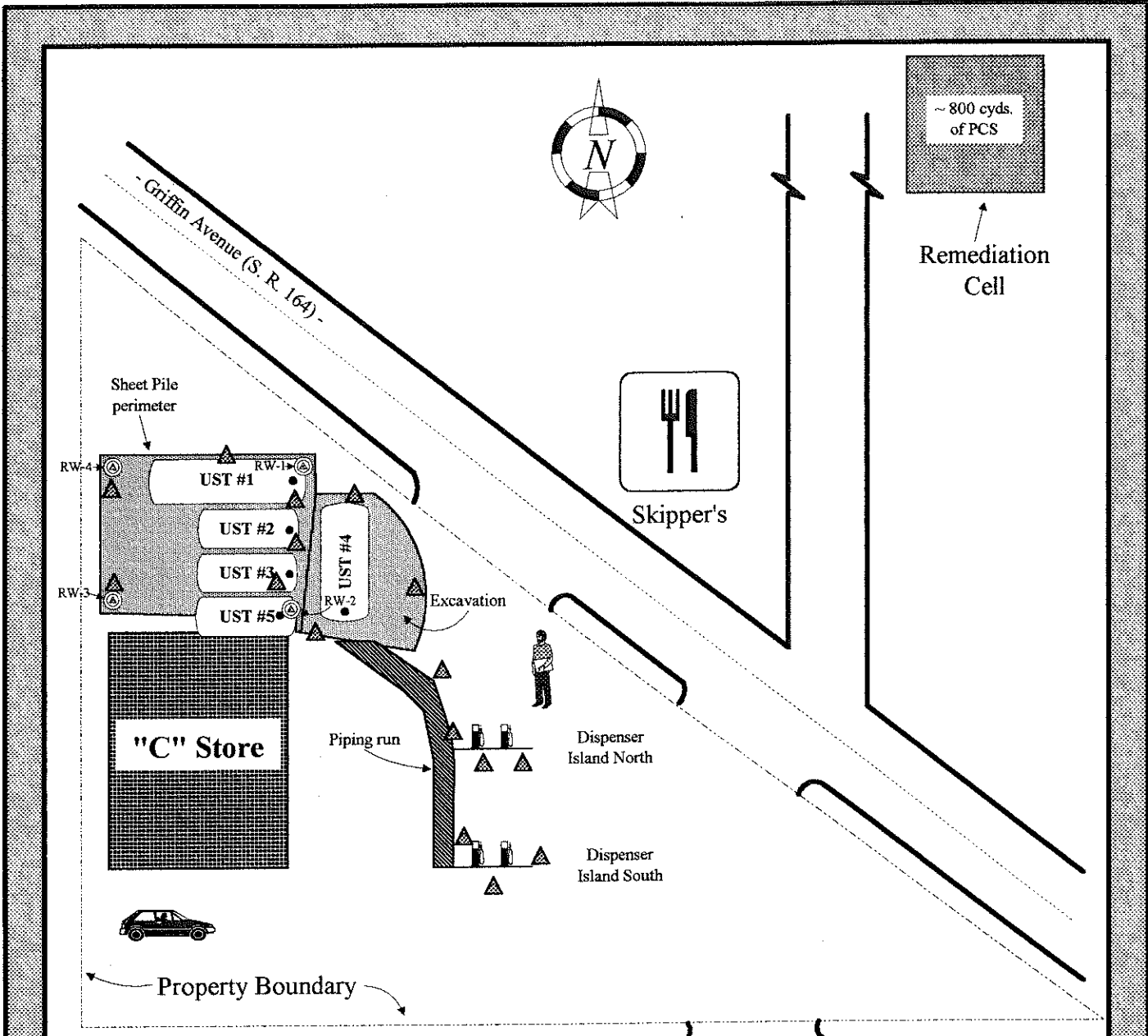
description of historical conditions. The available data do not provide definitive information with regard to all past uses, operations or incidences at the site. It is always possible that contamination exists in portions of the site that were not explored or sampled. Further evaluation of such potential contamination would require additional exploration and testing.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices for environmental site assessments in this area at the time this report was prepared. No warranty, express or implied, should be understood.



**Sound Environmental & Safety**  
 1827-210th Court NE, Redmond, WA 98053-4211  
 206-868-6292

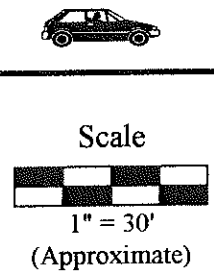
**FIGURE 1**  
**SITE LOCATION MAP**  
 Ernie's Fuel Stop, 320 Griffin Ave. South, Enumclaw, WA  
 Prepared for Reinhard Distributing Co. 6-10-94



**Legend**

- UST # 1 = 12,000 gal. (installed ~ 1973)
- UST # 2 = 10,000 gal. (installed ~ early 1960's)
- UST # 3 = 4,000 gal. (installed ~ early 1960's)
- UST # 4 = 4,000 gal. (installed ~ 1973)
- UST # 5 = 4,000 gal. (installed ~ early 1960's, Abandoned 1973)
- ▲ - Soil Sample Location
- - UST Fill end
- PCS = Petroleum-contaminated soil
- RW-1 → ⊙ (Constructed for future as needed.)

- Roosevelt Avenue SE (S. R. 410) -



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**FIGURE 2**  
**SITE PLAN with SOIL SAMPLE LOCATIONS**  
Ernie's Fuel Stop, 320 Griffin Ave. South, Enumclaw, WA  
Prepared for Reinhard Distributing Co. 6-10-94

**TABLE I**  
**SOIL SAMPLE COLLECTION DATA**  
**ERNIE'S FUEL STOP, ENUMCLAW, WA**

Sample I.D.	Date Collected	Approx. Depth (ft.)	Location
UST #1 west end @ 7'-9'	11-15-93	7'-9'	West end of UST #1
SW corner @ 12'	11-15-93	12'	Southwest corner of UST nest
UST #1 middle @ 11'	11-15-93	11'	Beneath the middle of UST #1
UST #1 E. end @ 10.5'-11.5'	11-15-93	10.5'-11.5'	East end of UST #1
UST #2, E. end @ 9'-10'	11-17-93	9'-10'	East end of UST #2
UST #3, E. end @ 10'-11'	11-17-93	10'-11'	East end of UST #3
UST #4, S. end @ 7'-9'	11-24-93	7'-9'	South end of UST #4
UST #4, N. end @ 9'-11'	11-24-93	9'-11'	North end of UST #4
UST # 4, E. wall @ 9'-11'	11-24-93	9'-11'	East wall of excavation for UST # 4 (approx. middle of UST)
North Island @ 2.5'-3.0'	12-10-93	2.5'-3.0'	Approx. middle of north Island
South Island @ 3.0'	12-10-93	3.0'	Approx. middle of south Island
Piping @ 2.5'	12-10-93	3.0'	Approx. midway between Islands and UST nest
North Island B @ 2.5'-3.0'	1-6-94	2.0'-3.0'	North Island
South Island B @ 3.0'	1-6-94	2.0'-3.0'	South Island
North Island C @ 2.5'-3.0'	1-18-94	2.5'-3.0'	North Island
South Island C @ 3.0'	1-18-94	3.0'	South Island
RW-1 @ 14'-16'	4-13-94	14.0'-16.0'	NE corner of final UST cavity. Sample collected after new USTs installed.
RW-2 @ 14'-16'	4-13-94	14.0'-16.0'	SE corner of final UST cavity. Sample collected after new USTs installed.
RW-3 @ 14'-16'	4-13-94	14.0'-16.0'	SW corner of final UST cavity. Sample collected after new USTs installed.
RW-4 @ 14'-16'	4-13-94	14.0'-16.0'	NW corner of final UST cavity. Sample collected after new USTs installed.
NE Well (resample of RW-1)	5-27-94	16.0'-17.0'	NE corner of final UST cavity. Sample collected after new USTs installed.

**TABLE II**

**SOIL SAMPLE ANALYTICAL RESULTS  
 ERNIE'S FUEL STOP, ENUMCLAW, WA**

Sample I.D.	Date Collected	TPH as gasoline	TPH as diesel	B	T	E	X	Lead
UST #1 west end @ 7'-9'	11-15-93	<1.0	NA	0.071	<0.050	<0.050	<0.10	<10
SW corner @ 12'	11-15-93	<1.0	NA	<0.050	<0.050	<0.050	<0.10	<10
UST #1 middle @ 11'	11-15-93	44	NA	<b>1.8</b>	0.29	0.59	2.7	NA
UST #1 E. end @ 10.5'-11.5'	11-15-93	25	NA	<b>3.3</b>	0.28	0.70	2.3	<10
UST #2, E. end @ 9'-10'	11-17-93	14	NA	1.7	0.073	0.33	1.2	NA
UST #3, E. end @ 10'-11'	11-17-93	24	63	<0.050	.50	0.17	0.98	NA
UST #4, S. end @ 7'-9'	11-24-93	<1.0	<10	<0.050	<0.050	<0.050	<0.10	NA
UST #4, N. end @ 9'-11'	11-24-93	9.0	NA	<b>0.99</b>	<0.050	0.14	0.24	NA
UST #4, E. wall @ 9'-11'	11-24-93	1.9	NA	<b>0.74</b>	<0.050	<0.050	<0.10	NA
North Island @ 2.5'-3.0'	12-10-93	<b>1,200</b>	<b>470</b>	0.15	0.87	3.6	11	NA
South Island @ 3.0'	12-10-93	<b>330</b>	<b>310</b>	<b>2.7</b>	<b>7.4</b>	<b>6.2</b>	<b>33</b>	NA
Piping @ 2.5'	12-10-93	46	NA	<0.050	<0.050	0.10	0.62	NA
North Island B @ 2'-3'	1-6-94	<b>670</b>	<b>1,300</b>	<0.050	<0.050	1.6	26	NA
South Island B @ 2'-3'	1-6-94	26	94	<0.050	<0.050	<0.050	<0.10	NA
MDL		1.0	10	0.050	0.050	0.050	0.10	10
MTCA Method A Soil Cleanup Level		100	200	0.5	40.0	30.0	20.0	250

notes:  
 All values reported in mg/Kg (ppm).  
 TPH as gasoline using Ecology Method WTPH-G, TPH as diesel using Ecology Method WTPH-D, BTEX using EPA Method 8020 and Lead using EPA Method 7420.  
 Values in **bold** exceed the MTCA Cleanup Level.  
 Shaded sample locations have been overexcavated and material placed in soil remediation cell.  
 NA = Sample not analyzed for indicated analyte.  
 MDL = Analytical Method Detection Limit.  
 MTCA = Model Toxics Control Act Method A Soil Cleanup Levels, WAC Chapter 173-340-720 (2) (a) (i), dated February 1991.  
 A complete laboratory report is attached as Appendix C.

TABLE II (continued)

SOIL SAMPLE ANALYTICAL RESULTS  
 ERNIE'S FUEL STOP, ENUMCLAW, WA

Sample I.D.	Date Collected	TPH as gasoline	TPH as diesel	B	T	E	X	Lead
North Island C @ 2-3'	1-18-94	<6	44	<0.028	<0.028	0.028	0.028	NA
South Island C @2-3'	1-18-94	26	46	<0.028	0.029	<0.028	<0.071	NA
<b>RW-1 @ 14'-16'</b>	4-13-94	<b>3.6</b>	<b>NA</b>	<b>1.6</b>	<b>&lt;0.050</b>	<b>0.31</b>	<b>0.13</b>	<b>NA</b>
RW-2 @ 14'-16'	4-13-94	4.4	NA	0.075	<0.050	0.098	0.21	NA
RW-3 @ 14'-16'	4-13-94	<1.0	NA	<0.050	<0.050	<0.050	<0.10	NA
RW-4 @ 14'-16'	4-13-94	<1.0	NA	<0.050	<0.050	<0.050	<0.10	NA
NE Well @16'-17' (resample of RW-1)	5-25-94	<1.0	NA	<0.050	<0.050	<0.050	<0.10	NA
MDL		1.0	10	0.050	0.050	0.050	0.10	10
MTCA Method A Soil Cleanup Level		100	200	0.5	40.0	30.0	20.0	250

notes:

All values reported in mg/Kg (ppm).

TPH as gasoline using Ecology Method WTPH-G, TPH as diesel using Ecology Method WTPH-D, BTEX using EPA Method 8020 and Lead using EPA Method 7420.

Values in **bold** exceed the MTCA Cleanup Level.

Shaded sample location was resampled (NE Well is resample of RW-1).

NA = Sample not analyzed for indicated analyte.

MDL = Analytical Method Detection Limit.

MTCA = Model Toxics Control Act Method A Soil Cleanup Levels, WAC Chapter 173-340-720 (2) (a) (i), dated February 1991.

A complete laboratory report is attached as Appendix C.