# WHITE SHIELD, INC.

P.O. BOX 477 • GRANDVIEW, WA 98930 • (509) 882-1144
FAX (509) 882-4566


2/2



June 27, 1994

Mr. Lynne Koehler
The Boat Shop
1238 Columbia Drive S.E.
Richland, WA 98352

SUBJECT: LUST CLOSURE/INTERIM CLEANUP REPORT - THE BOAT SHOP - WSDOE SITE ID # 009266 - RICHLAND, WASHINGTON

Dear Mr. Koehler:

Enclosed, please find two copies of a LUST closure/interim cleanup report for the above referenced site, as required by the Washington State Department of Ecology (WSDOE). Based on the data and findings reported herein, petroleum contamination was discovered in the soil and groundwater. The petroleum contaminated soil has been removed from the excavation and the groundwater has been remediated.

The WSDOE requires that you retain this report for a minimum of ten years. We recommend that you retain it indefinitely. The WSDOE also requires us to submit a copy of the Underground Storage Tank Temporary/Permanent Closure and Site Assessment Notice and the Department of Ecology Checklist and Closure Form. They are attached to this report as Appendix D.

We appreciate the opportunity to provide you with technical assistance for your UST closure. Please call us at (509) 882-1144 should you have any question or need any additional information.



Respectfully,
WHITE SHIELD, INC.

Leroy Miller for Charles Robinson

Charles O. Robinson
Environmental Technician

Project #: RHS-1094

cc: R.H. Smith Distributing Company
Department of Ecology, Olympia Headquarters
Department of Ecology, Eastern Regional Office

# LUST CLOSURE/INTERIM CLEANUP REPORT



**The Boat Shop**
**WSDOE SITE # 009266**
**Richland, WA**

**Prepared For:**
**Mr. Lynne Koehler**
**The Boat Shop**
**1238 Columbia Drive S.E.**
**Richland, WA 98352**

**JUNE, 1994**

WHITE SHIELD INC.
P.O. BOX 477, 801 GRANDRIDGE ROAD, GRANDVIEW, WA 98930
TELEPHONE: (509) 882-1144 VOICE (509) 882-4566 FAX

# EXECUTIVE SUMMARY

White Shield, Inc. (WSI) provided site assessment services and interim cleanup technical services upon removal of two 1,000 gallon gasoline Underground Storage Tanks (UST). The tanks were located at the The Boat Shop at 1776 Columbia Drive SE, Richland, Washington.

The tanks were located end to end within a single excavation. The dispensers for the UST system were located between the two USTs within the confines of the excavation. The dispenser system and tanks had been removed prior to the arrival of WSI. Piping associated with the UST system was completely contained within the UST excavation and was removed along with the USTs.

Tank #1, located at the north end of the excavation, had three visible holes including two holes measuring approximately 1/2 inch in diameter and one gash, approximately 2 inches long. There was no visible evidence of soil contamination, but there was a slight sheen on the water in the excavation. The petroleum contamination was apparently the result of a spill of a small amount of product which remained in Tank #1 and was released during the tank removal. The product and groundwater in the excavation were immediately pumped out and stored in two 55 gallon drums located on site.

A single stockpile of soil was generated from the excavation. Approximately 20 cubic yards of soil was stockpiled on the north side of the excavation.

In order to meet the requirements of the Model Toxics Control Act (WAC 173-340-450 (3)(a)(iii) to document the possible migration of groundwater contamination on the site, WSI recommends installing at least one groundwater monitoring well upgradient, northwest, from the UST site and at least two groundwater monitoring wells downgradient, south and southeast, from the UST site, as required by the Model Toxics Control Act (WAC 173-340-450 (3)(a)(iii). We recommend continued monitoring of the groundwater monitoring wells in accordance with WAC 173-340-450 (3)(a)(iii).

# TABLE OF CONTENTS

## LIST OF FIGURES



## LIST OF TABLES



## LIST OF APPENDICES

# 1.0 Introduction

## 1.1 Purpose

This report describes findings and actions taken for work associated with the removal of two Underground Storage Tanks. The work and investigation responds to regulatory requirements set forth by the United States Environmental Protection Agency (EPA) and in compliance with Chapter 173-360 WAC and Chapter 173-340 WAC of the State of Washington and enforced by the Department of Ecology (WSDOE).

## 1.2 Scope of Work

White Shield, Inc. (WSI) provided site assessment services for the removal of two 1,000 gallon gasoline USTs. R.H. Smith Distributing Company (Smith) provided the backhoe and decommissioning services. Superior Precision Analytical, Inc. (Superior) provided the laboratory analyses. The site assessment services provided by WSI technicians include collecting a total of 13 soil samples and two groundwater sample for laboratory analysis and preparing and shipping the samples for laboratory analysis.

# 2.0 Background Information

## 2.1 Site Location

The site is located at 1776 Columbia Drive SE, Richland, Washington. The site is described as the NW 1/4, Section 29, T9N, R29E, W.M. Refer to Figure 1, Site Location.

## 2.2 Site Description and History

The USTs are approximately 25 years old and have been out of service for at least 7 years. The USTs were located in a single excavation approximately 22 feet north of The Boat Shop and approximately 40 feet south of the Columbia River. The property is owned by the U.S. Army Corps of Engineers, leased to Benton County, sub-leased to the City of Richland and sub-leased under a concession agreement to The Boat Shop, which is owned by Lynne Koehler, owner of Sundown Marina. The entire property is bounded by a chain link fence. Refer to Figure 2, Site Plan.

The site is located approximately 12 feet above the Columbia River normal pool elevation of 340 feet above mean sea level. Columbia Park is located immediately east of the subject site. Refer to Photos 1, 2, and 3. The area to the west of the site is undeveloped.

## 2.3 Soils Description

The soil in the UST excavation is a dark brown silty loam.

JRVEY

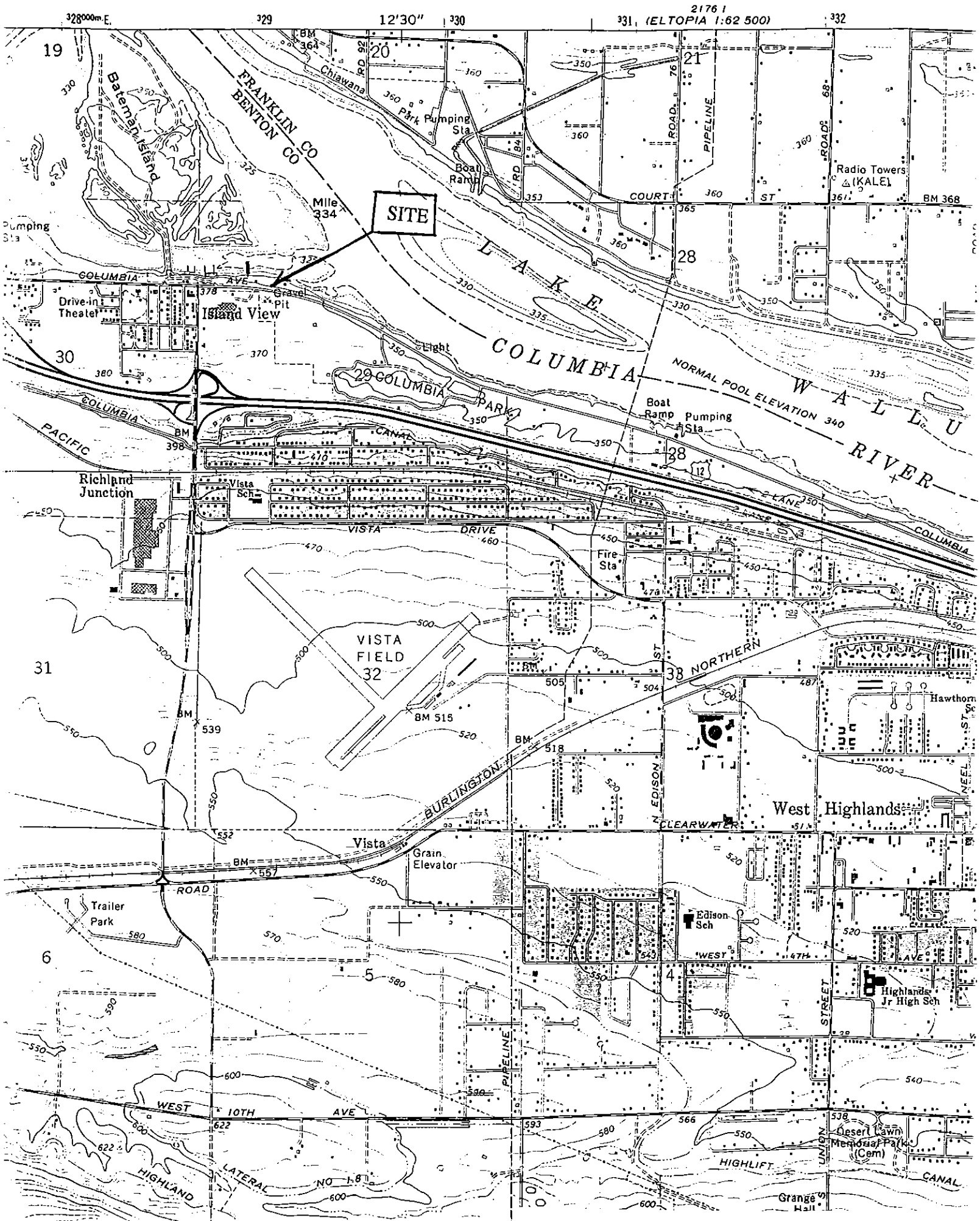



FIGURE 1 - SITE LOCATION MAP

**WHITE SHIELD INC.**
P.O. BOX 477, 801 GRANDRIDGE ROAD, GRANDVIEW, WA 98930
TELEPHONE: (509) 882-1144 VOICE (509) 882-4566 FAX

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

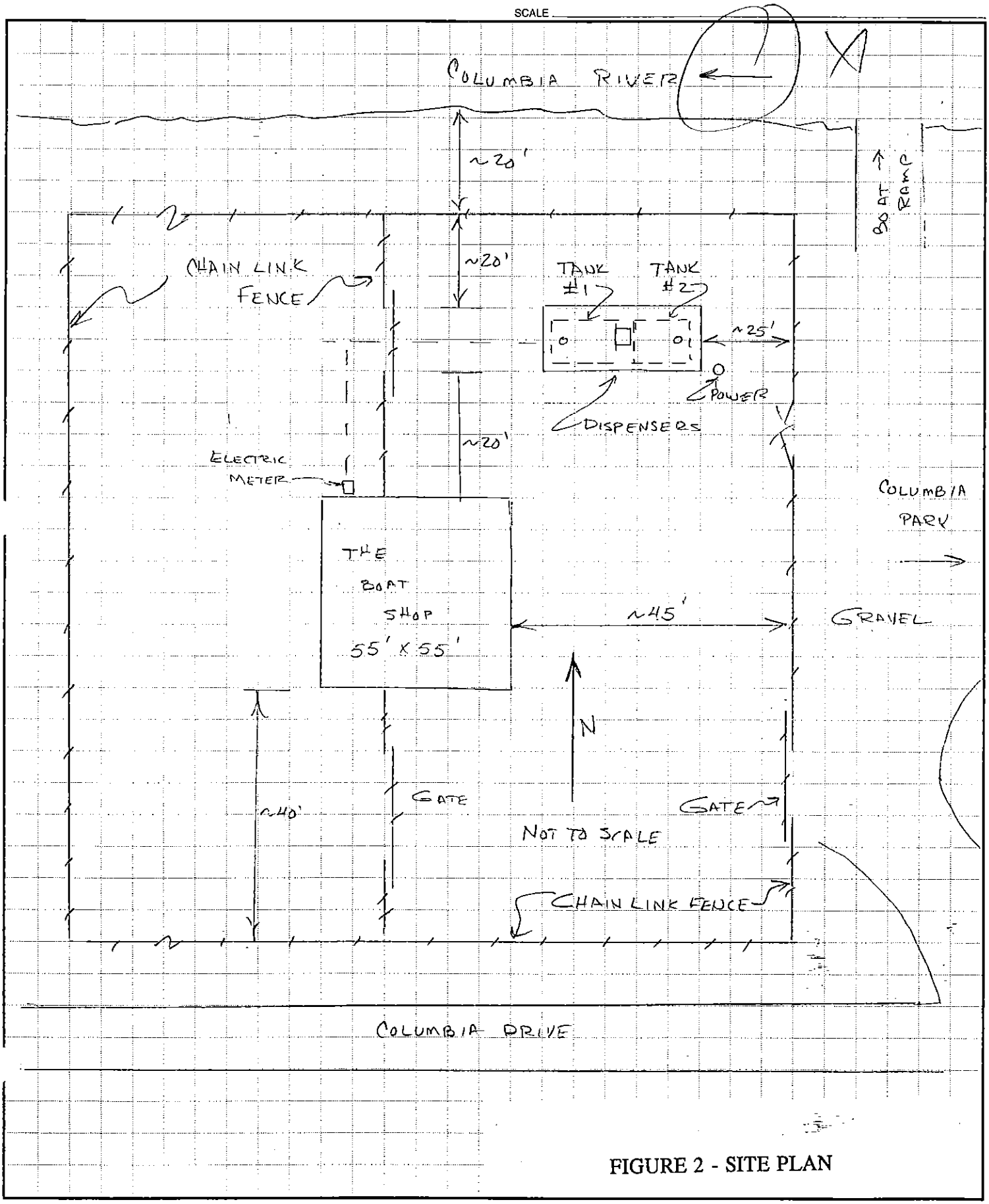



FIGURE 2 - SITE PLAN

## 3.0 Field Activities

### 3.1 General Investigative Methods

We visually inspected the USTs, the soil, the fill and the water in the excavation. We also used analytical laboratory analyses and interviews for data. The methods and general conclusions are discussed below.

#### 3.1.1 Soil Sampling

The Sampling Plan (Figure 3) shows the location, depth and types of samples taken. In general, sample collection and control followed the following protocol:

1. Select a laboratory certified clean sample jar for sample collection.

2. Using clean latex gloves and clean sampling utensils (tri-sodium phosphate, chlorine solution, and/or Alconox Detergent, tap water rinse and distilled water rinse cycle) tightly pack the soil sample in the sample jar (4 oz.) to the top of the jar to prevent any airspace. Collect co-located duplicate samples using the same procedure.

3. Label the jar with the soil sample number, the type of laboratory test required, the date, name of site and sampler. The sample is then entered on the chain of custody form.

4. Cool the sample in wet ice to approximately 4 degrees centigrade.

5. Repack the samples for shipment to the laboratory in blue ice and a cooler.

6. Relinquish sample to courier for shipment to the laboratory.

#### 3.1.2 Water Sampling

Water sampling followed the same general protocol as for soil sampling, except:

1. The water samples were collected with a clean disposable plastic bailer.

2. The water was transferred from the bailer, with a minimum of agitation, to two clean 40 ml vials and preserved with hydrochloric acid (HCl) for analysis for volatiles and a clean 500 ml plastic bottle and preserved with nitric acid ($HNO_3$) for analysis for total lead. The containers were completely filled so that no headspace was present in the containers.

## 3.2 Tank Inspection

We removed attached soil and scale to completely expose the tanks. With the soil and scale removed, we carefully examined the tanks. Tank #1 had 2 holes measuring approximately 1/2 inch in diameter located approximately 6 inches from the bottom of the tank and one 2 inch long gash at the bottom of the tank beneath the fill spout. Tank #2 appeared to be sound and in good condition with minimal corrosion. Refer to Photos 4 and 5.

## 3.3 Tank Removals/Site Assessment

Charles Robinson, WSI, a site assessor registered with the Washington State Department of Ecology Underground Storage Tank Program, performed the site assessment on April 8, 1994 after the removal of the USTs. The tanks had been removed prior to the arrival of WSI. Keith Withrow and Rod Smith, R.H. Smith Distributing Company, said that some residual fuel leaked from the holes in Tank #1, described in Section 3.2, as the tank was being removed from the excavation.

The turbines and fill pipes were left in place while the tanks were removed. The pump turbines and the fuel dispensers were located in the center of the excavation area between the two tanks. After the tanks were removed approximately 100 gallons of additional fuel was pumped out of Tank #1 and approximately 20 gallons, out of Tank #2. Keith Withrow and Rod Smith, R.H. Smith Distributing, said that the two tanks were sloping down toward the turbines, hence the residual fuel accumulated at the turbine end of the tanks and could not be reached when the fuel was pumped out prior to the removal.

The USTs were located end to end in a single excavation measuring approximately 23 feet x 10 feet x 8 feet deep. There was no visible contamination in the soil and a slight sheen was visible on the surface of the water in the excavation. Refer to Photo 6. Approximately 20 cu. yds. of soil were removed from this area and stockpiled on the north side of the excavation. Refer to Photo 1. The west end of the stockpiled soil from the vicinity of Tank #1 had a gasoline odor, however, sample RHS-1094-110SP, from the west end of the stockpile, revealed no gasoline above the MTCA Cleanup Level.

A total of six soil samples, RHS-1094-101 through RHS-1094-106, were collected from the excavation for laboratory analysis. Three samples, RHS-1094-101, 102 and 106, were collected from the side walls of the Tank #1 excavation. RHS-1094-101 was collected from the west wall at a depth of 6 feet, RHS-1094-102, from the north wall at a depth of 5 feet, and RHS-1094-106, from the south at a depth of 5 feet. Because the two tanks were end to end, no sample was collected from the east wall between the two tanks. Refer to Figure 2, Site Plan and Figure 3, Sample Location Sketch.

Three samples, RHS-1094-103 through 105, were collected from the side walls of the Tank #2 excavation. Sample RHS-1094-103 was collected from the north side wall at a depth of 5 feet, RHS-1094-104, from the east end wall at a depth of 6 feet, and RHS-1094-105, from the south side wall at a depth of 5 feet. Refer to Figure 2, Site Plan and Figure 3, Sample Location Sketch.

**WHITE SHIELD INC.**
P.O. BOX 477, 801 GRANDRIDGE ROAD, GRANDVIEW, WA 98930
TELEPHONE: (509) 882-1144 VOICE (509) 882-4566 FAX

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

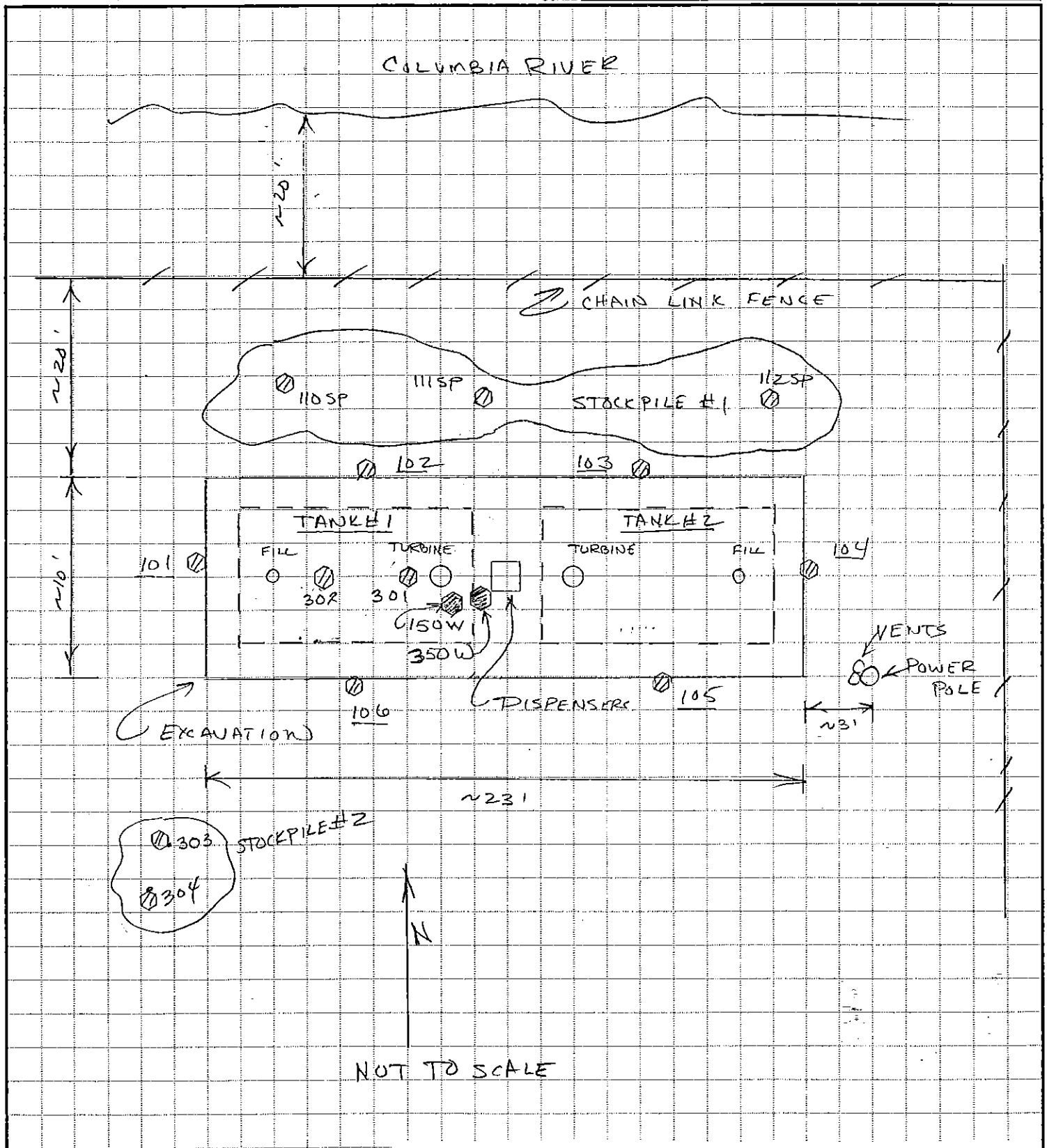



FIGURE 3 - SAMPLE LOCATION SKETCH

Three samples, RHS-1094-110SP through 112SP, were collected from the single stockpile for laboratory analysis.

Water was intersected in the excavation at a depth of 8 feet. Because of the water in the excavation, no soil samples were collected beneath either of the two tanks. A sump measuring approximately 3 feet square x 2 feet deep was excavated beneath the tanks, and 2 1/2 barrels, approximately 125 gallons, of contaminated water was pumped from the sump until no water remained in the excavation. The excavation was recharged with water in approximately 15 minutes. Sample RHS-1094-150W was collected with a disposable bailer from the groundwater at a depth of 9 feet for laboratory analysis.

The water showed a light brown scum and a slight oily sheen, but did not have the multicolored rainbow appearance typical of free petroleum on water. Refer to Photo 6.

## 4.0 Soil Analysis/Initial Site Assessment

### 4.1 Excavation

The laboratory analytical results of the initial samples revealed no gasoline contamination in the soil in the side walls of the excavation above the MTCA cleanup levels. However, gasoline contamination was detected in the groundwater at the bottom of the excavation (Refer to Section 3.5). The analytical results revealed gasoline at 39000 ppb (39 ppm) in the groundwater within the excavation. Refer to Field Sampling Log, Appendix A, laboratory analytical results, Appendix B and Table 1.

### 4.2 Stockpile

The initial stockpile contains approximately 20 cu. yds. of soil. The laboratory analytical results of Samples RHS-1094-110SP through 112SP revealed no gasoline contamination above the MTCA cleanup level. Refer to Field Sampling Log, Appendix A, laboratory analytical results, Appendix B and Table 1. The stockpile is classified as Class 1 soil according Table V. End Use Criteria for Petroleum Contaminated Soils, from the WSDOE Guidance for Remediation of Releases from Underground Storage Tanks, dated July, 1991 (Appendix E).

### 4.3 Dispensers

The fuel dispensers the UST system was located within the UST excavation area between the two tanks. The fuel dispensers had been removed prior to the arrival of WSI. Piping associated with the UST system was completely contained within the UST excavation and was removed along with the UST. No additional soil or groundwater samples were collected.

## 5.0 Groundwater Analysis/Site Assessment

A slight visible sheen was observed on the groundwater in the UST excavation. The groundwater appeared to be flowing in a southwesterly direction into the excavation. The laboratory analytical results revealed gasoline at 39,000 ppb (39 ppm) in the groundwater within the excavation. Refer to Field Sampling Log, Appendix A, laboratory analytical results, Appendix B and Table 1.

## 6.0 Cleanup Action

### 6.1 Cleanup of petroleum contaminated water

In an attempt to remediate the petroleum contaminated groundwater, The Boat Shop set up a small water aeration system within the excavation. On May 17, 1994, Charles Robinson returned to the site to collect an additional water sample. The water was pumped from the excavation into two 55 gallon barrels. The water did not recharge as expected, so Charles Robinson returned to collect a sample on May 23, 1994 after the water had an opportunity to recharge.

Since the water had not recharged a water sample RHS-1094-350W was collected from the water remaining in the excavation. The laboratory analysis revealed no petroleum contamination above the MTCA cleanup levels.

### 6.2 Cleanup of petroleum contaminated soil

The laboratory analytical results revealed that there is no petroleum contaminated soil in the side walls of the UST excavation or under the dispensers. Stockpile #1 from the initial excavation may be used for backfilling the excavation.

On May 23, 1994, a slight petroleum odor was detected in the soil beneath the tanks, therefore, soil sample #RHS-1094-301S was collected at a depth of approximately 9 feet or approximately 1 foot below the soil/water interface. The laboratory results revealed 6300 ppm, therefore Terry Miller, WSI Geologist, returned to the site for further remediation and sampling.

When Ms. Miller arrived at the site the groundwater level had dropped to just below the bottom of the excavation. Rod Smith had removed and stockpiled, Stockpile #2, approximately 7 cu. yds. of soil from the bottom of the excavation. Soil sample RHS-1094-302 was taken from the bottom of the excavation, just above the current groundwater level. Samples RHS-1094-303 and 304 were taken from Stockpile #2.

### 6.3 Residual Fuel

The residual fuel pumped from the two tanks was placed in 55 gallon barrels for recycling by R.H. Smith Distributors, Inc.

6.4 Soil & Groundwater Analysis/Final Cleanup

The laboratory analytical results of soil sample RHS-1094-302 from the bottom of the excavation and soil samples RHS-1094-303 and 304 from Stockpile #2 revealed no gasoline contamination below the MTCA Cleanup Levels. Stockpile #2 was taken to the City of Richland Landfill for disposal as a Class 2 soil.

The laboratory results reveal no gasoline contamination remaining in the soil or groundwater within the confines of the excavation.

## 7.0 Ground Water & Well Logs

The static level of the groundwater in the vicinity of this site is approximately 8 feet below the ground surface and is directly influenced by the rise and fall of the water level of the Columbia River, which is approximately 40 feet north of the UST excavation. Groundwater was intercepted in the excavation at a depth of 8 feet and subsequently fell approximately 1 foot to a depth of 9 feet. Refer to Section 3.3 and Table I & II for the sample location and laboratory analytical results of the groundwater in the excavation.

## 8.0 End Use of Soil

Stockpile #1, approximately 20 cu. yds., is classified as a class 1 soil and was used as backfill at the site, according the guidelines in Table V. End Use Criteria for Petroleum Contaminated Soils, from the WSDOE Guidance for Remediation of Releases from Underground Storage Tanks, dated July, 1991, and referenced in Appendix E. Stockpile #2, approximately 7 cu. yds., is classified as Class 2 soil and was transported to the City of Richland Landfill for disposal and/or remediation.

## TABLE I - Initial Sample Locations and Results

nd = not detected * = test not run

**SOIL**

| LOCATION AND DEPTH | SAMPLE # | Gasoline mg/kg | B | E | T | X | Pb |
|---|---|---|---|---|---|---|---|
| Tank #1 6 feet/ W end | RHS-1094-101 | nd | nd | nd | nd | nd | * |
| Tank #1 5 feet/ N wall | RHS-1094-102 | nd | nd | nd | nd | nd | * |
| Tank #2 5 feet/ N wall | RHS-1094-103 | nd | nd | nd | nd | nd | * |
| Tank #2 6 feet/ E end | RHS-1094-104 | nd | nd | nd | nd | nd | * |
| Tank #2 5 feet/ S wall | RHS-1094-105 | nd | nd | nd | nd | nd | * |
| Tank #1 5 feet/ S wall | RHS-1094-106 | nd | nd | nd | nd | nd | * |
| Bottom Excavation 9 feet | RHS-1094-301 (5/23/94) | 6300 | 12 | 105 | 302 | 637 | * |
| Stockpile | RHS-1094-110SP | 6 | nd | .007 | .012 | .63 | * |
| Stockpile | RHS-1094-111SP | nd | .017 | .012 | .062 | .069 | * |
| Stockpile | RHS-1094-112SP | | | | | | |
| MTCA Cleanup Level | --- | 100 | 0.5 | 20 | 40 | 20 | 250 |

**WATER**

| LOCATION AND DEPTH | SAMPLE # | Gasoline ug/L | B ug/L | E ug/L | T ug/L | X ug/l | Pb mg/L |
|---|---|---|---|---|---|---|---|
| Excavation 9 feet | RHS-1094-150W | 39 | 1.1 | 0.73 | 4.6 | 5.1 | .087 |
| MTCA Cleanup Level | --- | 1.0 | 5 | 30 | 40 | 20 | .005 |

## TABLE II - Final Sample Locations and Results

nd = not detected * = test not run

**SOIL**

| LOCATION AND DEPTH | SAMPLE # | Gasoline mg/kg | B | E | T | X | Pb |
|---|---|---|---|---|---|---|---|
| Bottom 9 feet | RHS-1094-302 (6/3/94) | 66 | nd | .25 | .27 | 4.1 | * |
| Bottom Excavation 8 feet | RHS-1094-301 (5/23/94) | 6300 | 12 | 302 | 105 | 637 | * |
| Bottom Excavation 9 feet | RHS-1094-302 (6/3/94) | 66 | nd | .25 | .27 | 4.1 | * |
| Stockpile #2 | RHS-1094-303 | 8.6 | .16 | nd | .27 | .94 | * |
| Stockpile #2 | RHS-1094-304 | 36.4 | .22 | .36 | .92 | 3.0 | * |
| MTCA Cleanup Level | --- | 100 | 0.5 | 20 | 40 | 20 | 250 |

**WATER**

| LOCATION AND DEPTH | SAMPLE # | Gasoline ug/L | B ug/L | E ug/L | T ug/L | X ug/l | Pb mg/L |
|---|---|---|---|---|---|---|---|
| Excavation 9 feet | RHS-1094-350W | nd | nd | nd | nd | nd | * |
| MTCA Cleanup Level | --- | 1.0 | 5 | 30 | 40 | 20 | .005 |

## 9.0 Conclusion

### 9.1 Summary

Based upon the analytical results and our investigation, WSI finds no evidence of petroleum concentrations remaining in the soil or groundwater within the confines of the excavation in excess of the Cleanup Levels as established by the Model Toxics Control Act (WAC 173-340-720). The existence of holes in Tank #1 provides evidence that the tank may have been leaking over an extended period of time and an unknown quantity of gasoline may have been released to the groundwater. There may be groundwater petroleum contamination in excess of the Cleanup Levels remaining within an unknown distance surrounding the former tank site.

The excavation was backfilled with clean soil. No determination was made regarding the limits of groundwater contamination.

### 9.2 Recommendations

In order to meet the requirements of the Model Toxics Control Act (WAC 173-340-450 (3)(a)(iii) to document the possible migration of groundwater contamination, WSI recommends installing at least one groundwater monitoring well upgradient, north, from the UST site and at least two groundwater monitoring wells downgradient, southwest and southeast, from the UST site.

We recommend continued monitoring of the proposed groundwater monitoring wells to document the condition of the groundwater on the site.

## 10.0 Limitations

In performing our professional services, WSI uses a degree of care ordinarily exercised under similar circumstances by members of our profession. No warranty, expressed or implied, is made or intended. Our conclusions and recommendations, developed from our field and laboratory investigation reported herein, are based upon this firm's understanding of the project and are in concurrence with generally accepted practice.

# APPENDIX A

2145 ~~RFP~~-1094 The Boat Shop 4/8/94 - C. Robinson

R Funderburk

1145 Arrived
- Tanks not used for approx 7-10 years
- registered ~~but not yet~~ as out of service

Tank on west side (Tank #1) - 3 Holes
- has 2 holes up 5-7" from bottom - one a 2" gal
1 hole at bottom
- Tanks were thought to be empty when pulled & Rod Smith said Tank #1 had about 2" of product
- may have spilled into water during removal of Tank
- Visual examination does not reveal contaminated soil
- sheen on water - murky looking

Tank #1 2 Barrels
- one dispenser on top of excavation - {may have been another somewhere within excavation
- tanks were end to end in excavation
Tank #2 2000 gal
- there was another line headed ~~southwesterly~~ other - no visible dispenser

Property - owned by Corps of Engineers, leased to Benton County, leased to City of Richland, leased to Boat Shop (concession agreement), Sundown Marina -
owner - Lynne Koehler (Sundown Marina)

Soil silt loam: water @ bottom - with stem
ground water @ 8'
Tanks were out when we arrived
Ground surface approx 12' above river level
12:45 Complete soil sampling - No Field screen at client's request

Vents were on pole - Tanks ~ 6' x 9' - 2-1000 gal tanks

Tank #2 - no evidence of holes - some rust & pits on bottom

1:30 In process of pumping residual fuel from tanks

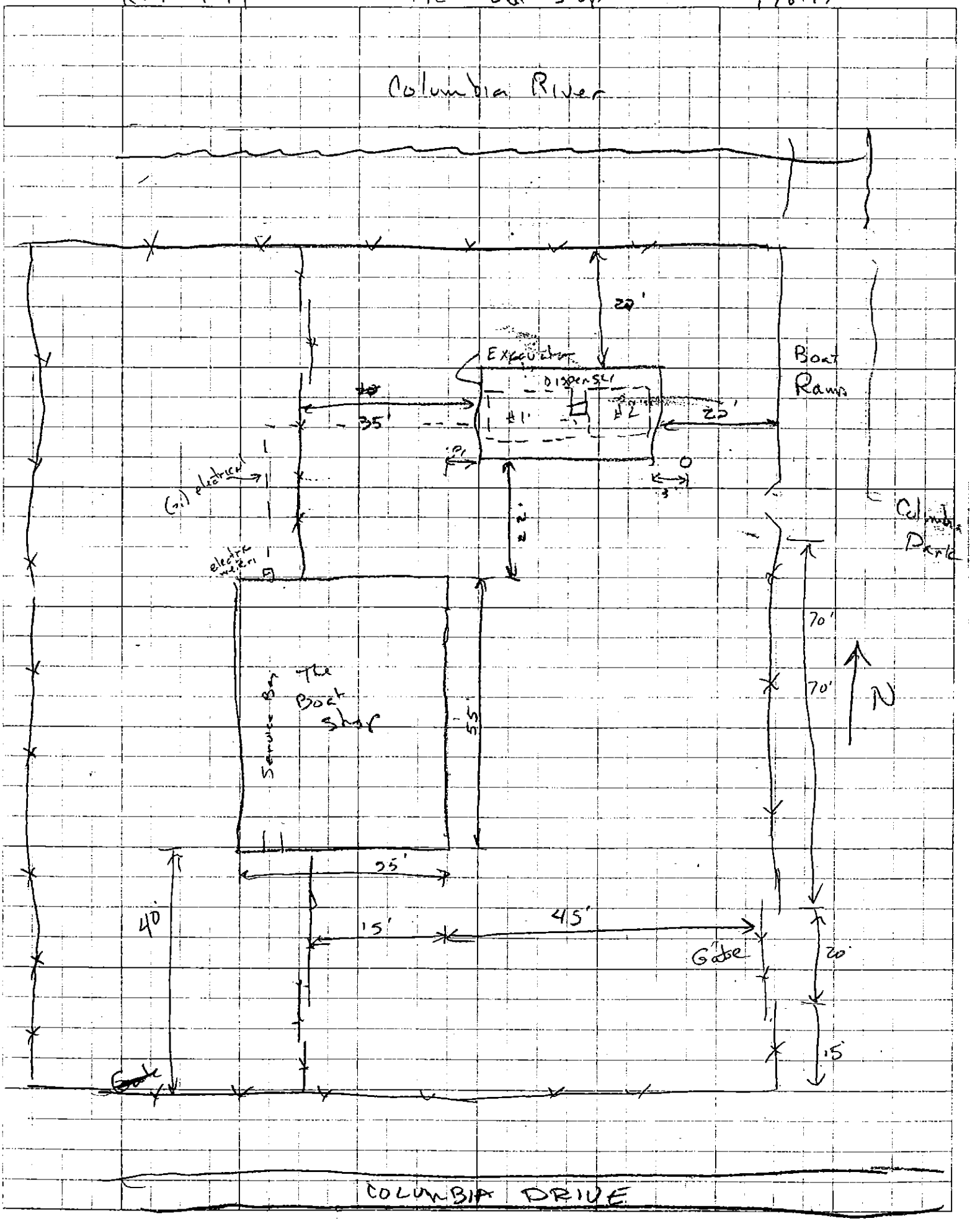
Keith Withrow & Rod Smith on site

2:15 - Pumping water out of pit beneath Tank #1 into barrels to recharge on assumption recharge water may not be contaminated

2:30 Crew left to get bigger pump - 2 foot deep sump dug to pump water

3:30 Excavation pumped dry - ~~5~~ 2½ barrels - 15 min to recharge 3:45 Collect sample 150W w/ Bailer

RHP-1094 The Boat Shop 4/8/94



RHS-1094

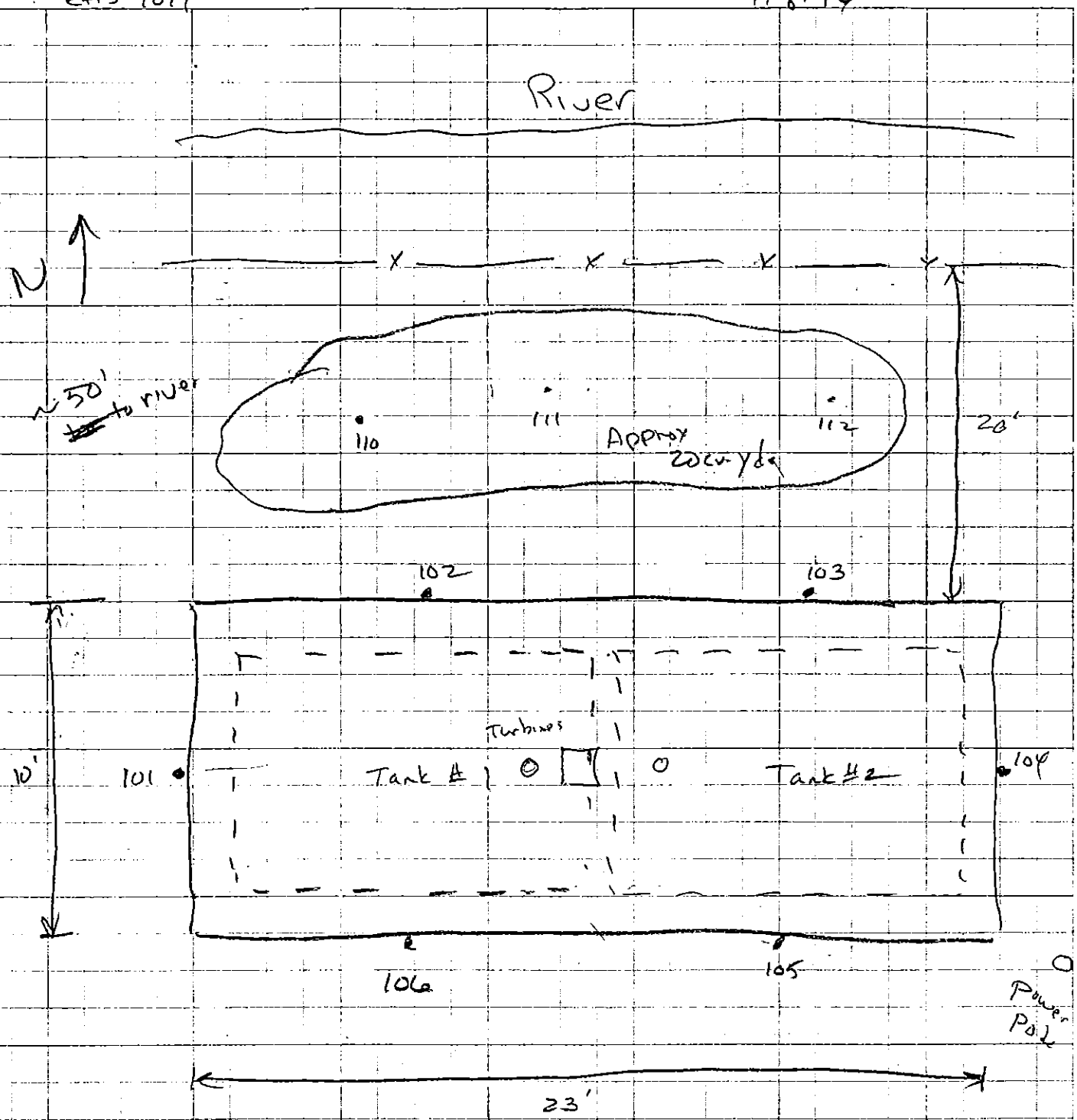
4/8/94

| SAMPLE # | LOCATION | DEPTH | ODOR |
|---|---|---|---|
| RHS-1094-101 | W. End Tank #1 | 6' | Slight |
| 102 | N. End Tank #1 | 5' | ↓ |
| 103 | N. End Tank #2 | 5' | |
| 104 | E. End Tank #2 | 6' | |
| 105 | S. End Tank #2 | 5' | |
| 106 | S. End Tank #2 | 3' | |
| RHS-1094-110SP | Stockpile | - | Strong |
| 111SP | Stockpile | - | None |
| 112SP | Stockpile | - | Slight |
| RHS-1094-150W | Water | 9' | — |

- sample collected w/ Bailer taking care not to get sheen.

RHS-1094

4/8/94



5/17/94 - RHS-1094 C. Robinson

3:00 Lv. To resample in personal vehicle
mileage 76159 Begin } 81 miles
76240 End

3:45 Arrive @ site
- Crew started purging pit
- water brown but does not look contaminated

4:00 Pumped out water

4:30 Pit was not recharging
- Collected very dirty ~~soil~~ water samples (4-40ml, one 500ml)
- could not ~~eliminate~~ eliminate headspace because of soil in water - Sample RHS-1094-250W
- there is a frog living in water in pit

John Door will check tomorrow to see if pit has recharged - maybe get ~~a~~ another sample

5/23/94 - RHS-1094

9:15 Lv. office

10:00 Return to site -
- There is no more water in excavation than on 5/17/94
- Not recharging

Sample RHS-1094-350W collected from water

RHS-1094-301S Collected from soil

10:15 Soil sample RHS-1094-301S from soil below puddle of water in bottom of excavation - @ ~9' ~ 1ft below soil/water interface
- has dark stains & a petroleum odor
- probably need to dig out more soil from bottom ~~of the~~ of
- ~~some~~ foot
- puddle of water approx 6' deep at 8' from surface

# APPENDIX B

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

WHITE SHIELD INC.
Attn: STUART FRICKE

Project RHS-1094
Reported 17-April-1994

## WASHINGTON TOTAL PETROLEUM HYDROCARBONS - GASOLINE (WTPH-G)

| Laboratory Number | Sample Identification | Matrix |
|---|---|---|
| 91458- 1 | RHS-1094-101 | Soil |
| 91458- 2 | RHS-1094-102 | Soil |
| 91458- 3 | RHS-1094-103 | Soil |
| 91458- 4 | RHS-1094-104 | Soil |
| 91458- 5 | RHS-1094-105 | Soil |
| 91458- 6 | RHS-1094-106 | Soil |
| 91458- 7 | RHS-1094-110 SP | Soil |
| 91458- 8 | RHS-1094-111, 112SP | Soil |
| 91458- 9 | RHS-1094-150W | Water |

### RESULTS OF ANALYSIS

| Laboratory Number: | 91458- 1 | 91458- 2 | 91458- 3 | 91458- 4 | 91458- 5 |
|---|---|---|---|---|---|
| Gasoline: | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| Benzene: | ND<.005 | ND<.005 | ND<.005 | ND<.005 | ND<.005 |
| Toluene: | ND<.005 | ND<.005 | ND<.005 | ND<.005 | ND<.005 |
| Ethyl Benzene: | ND<.005 | ND<.005 | ND<.005 | ND<.005 | ND<.005 |
| Total Xylenes: | ND<.005 | ND<.005 | ND<.005 | ND<.005 | ND<.005 |
| Concentration: | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| -- Surrogate % Recoveries -- | | | | | |
| Trifluorotoluene (SS): | 129 | 102 | 87 | 106 | 106 |

| Laboratory Number: | 91458- 6 | 91458- 7 | 91458- 8 | 91458- 9 |
|---|---|---|---|---|
| Gasoline: | ND<1 | 6 | ND<1 | 39000 |
| Benzene: | ND<.005 | ND<.005 | 0.017 | 1100 |
| Toluene: | ND<.005 | 0.012 | 0.062 | 4600 |
| Ethyl Benzene: | ND<.005 | 0.007 | 0.012 | 730 |
| Total Xylenes: | ND<.005 | 0.63 | 0.069 | 5100 |
| Concentration: | mg/kg | mg/kg | mg/kg | ug/L |
| -- Surrogate % Recoveries -- | | | | |
| Trifluorotoluene (SS): | 108 | 96 | 110 | 88 |

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

# WASHINGTON TOTAL PETROLEUM HYDROCARBONS - GASOLINE (WTPH-G)

## Quality Assurance and Control Data - Soil

Laboratory Number 91458

| Compound | Method Blank (mg/kg) | RL (mg/kg) | Spike Recovery (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|
| Gasoline: | ND<1 | 1 | 81/73 | 70-130 | 10% |
| Benzene: | ND<.005 | .005 | 95/93 | 70-130 | 2% |
| Toluene: | ND<.005 | .005 | 100/92 | 70-130 | 8% |
| Ethyl Benzene: | ND<.005 | .005 | 79/91 | 70-130 | 14% |
| Total Xylenes: | ND<.005 | .005 | 93/97 | 70-130 | 4% |

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
mg/kg = Parts per million (ppm)
QC File No. 91458

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

# WASHINGTON TOTAL PETROLEUM HYDROCARBONS - GASOLINE (WTPH-G)

## Quality Assurance and Control Data - Water

Laboratory Number 91458

| Compound | Method Blank (ug/L) | RL (ug/L) | Spike Recovery (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|
| Gasoline: | ND<50 | 50 | 126/126 | 70-130 | 0% |
| Benzene: | ND<0.5 | 0.5 | 88/90 | 70-130 | 2% |
| Toluene: | ND<0.5 | 0.5 | 90/95 | 70-130 | 5% |
| Ethyl Benzene: | ND<0.5 | 0.5 | 83/86 | 70-130 | 4% |
| Total Xylenes: | ND<0.5 | 0.5 | 95/100 | 70-130 | 5% |

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
ug/L = Parts per billion (ppb)
QC File No. 91458

Michael R. Verona
Senior Chemist
Account Manager

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

WHITE SHIELD INC.
Attn: STUART FRICKE

Project RHS-1094
Reported 18-April-1994

ANALYSIS FOR TOTAL LEAD
by EPA Method SW-846 7421

Chronology

Laboratory Number 91458

| Identification | Sampled | Received | Extracted | Analyzed | Run # | Lab # |
|---|---|---|---|---|---|---|
| RHS-1094-150W | 04/08/94 | 04/12/94 | 04/13/94 | 04/15/94 | | 9 |

Superior Precision Analytical, inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

WHITE SHIELD INC.
Attn: STUART FRICKE

Project RHS-1094
Reported 18-April-1994

## ANALYSIS FOR TOTAL LEAD

| Laboratory Number | Sample Identification | Matrix |
|---|---|---|
| 91458- 9 | RHS-1094-150W | Water |

### RESULTS OF ANALYSIS

Laboratory Number: 91458- 9

| | | |
|---|---|---|
| Lead | (Pb): | 0.087 |
| Concentration: | | mg/L |

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

ANALYSIS FOR TOTAL LEAD
Quality Assurance and Control Data - Water

Laboratory Number 91458

| Compound | | Method Blank (mg/L) | RL (mg/L) | Spike Recovery (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| Lead | (Pb): | ND<.005 | .005 | 100/98 | 80-120 | 2% |

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
mg/L = Parts per million (ppm)
QC File No. 91458

Michael R. Vuono
Senior Chemist
Account Manager

91458

# Chain of Custody and Analysis Request

Page 1 of 1

White Shield, Inc. The Boat Shop
Address: P. O. Box 477
City : Grandview State Zip: WA 98930
Phone: (509) 882-1144 Fax: (509) 882-4566
Project Manager: Stuart Fricke
Alternate Contact: Chuck Robinson
Project No.: RHS-1094 P.O. No.

**TURN AROUND TIME** (circle one)
Same Day 72 Hrs.
24 Hrs. 48 Hrs.
Normal 5 Day

Superior Precision Analytical Inc.
P.O. Box 1545
Martinez, California 94553
Martinez I: (510) 229-1512
Martinez II: (510) 229-0166
San Francisco: (415) 647-2081

**Section II: Analysis Request**

Sampler: Charles Robinson
Regulatory Agency: Washington DOE

| Sample Identification | S=Soil A=Air W=Water Matrix | EPA 418.1 | WTPH-G | WTPH-D | BTEX | WTPH G/BTEX | EPA 601 | EPA 8080 (PCBs) | TCLP Metals | EPA 7421 (Pb) | Total Lead | | | Date Sampled | Time Sampled | # of Containers | Preservatives (yes or no) | Sampling Remarks: Bioremediation, UST, Monitoring, Recent Contamination, Unknown Compounds, COMMENTS: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 RHS-1094-101 | S | | | | | X | | | | | | | | 4/8/94 | | 1 | No | |
| 2 RHS-1094-102 | S | | | | | X | | | | | | | | | | 1 | | |
| 3 RHS-1094-103 | S | | | | | X | | | | | | | | | | 1 | | |
| 4 RHS-1094-104 | S | | | | | X | | | | | | | | | | 1 | | |
| 5 RHS-1094-105 | S | | | | | X | | | | | | | | | | 1 | | |
| 6 RHS-1094-106 | S | | | | | X | | | | | | | | | | 1 | | |
| 7 RHS-1094-110SP | S | | | | | X | | | | | | | | | | 1 | | |
| 8 RHS-1094-111SP | S | | | | | X | | | | | | | | | | 1 | | Composite 111SP & |
| 9 RHS-1094-112SP | S | | | | | | | | | | | | | | | 1 | | 112SP |
| 10 | | | | | | | | | | | | | | | | | | |
| 11 RHS-1094-150W | | | | | | X | | | | | | | | | | 2 | HCl | |
| 12 RHS-1094-150W | | | | | | | | | | | X | | | | | 1 | $HNO_3$ | |

| | | | | | |
|---|---|---|---|---|---|
| Relinquished By: Charles Robinson | Date/Time 4/11/94 12hrs | Received By: | Date/Time | Lab: Please initial the following: | |
| Organization: White Shield | | Organization: | | Samples Stored in Ice: | yes 6°C |
| Reliquished By: | Date/Time | Received By: | Date/Time | Appropriate Containers: | yes |
| Organization: | | Organization: | | Samples Preserved: | NO |
| Relinquished By: | Date/Time | Received By: | Date/Time 3:45 | VOAs without headspace: | ok |
| Organization: | | Laboratory: | 4-12-94 | Comments: | |

**Superior Precision Analytical, Inc.**
309 S. Cloverdale St., Suite B-24 ▪ Seattle, Washington 98108 ▪ (800) 221-6655 / (206) 763-2992 / fax (206) 763-8429

White Shield, Inc.
Attn: Terry Miller

Project RHS-1094
Reported 01-June-1994

---

WASHINGTON TOTAL PETROLEUM HYDROCARBONS - GASOLINE
(WTPH-G)
and Benzene, Toluene, Ethyl Benzene, and Xylenes

Chronology

Laboratory Number 70013

| Identification | Sampled | Received | Extracted | Analyzed | Run # | Lab # |
|---|---|---|---|---|---|---|
| RHS-1094-350W | 05/23/94 | 05/25/94 | 05/26/94 | 05/26/94 | | 1 |
| RHS-1094-301S | 05/23/94 | 05/25/94 | 05/31/94 | 05/31/94 | | 2 |
| RHS-1094-301S Du | 05/23/94 | 05/25/94 | 05/31/94 | 05/31/94 | | 3 |

**Superior Precision Analytical, Inc.**
309 S. Cloverdale St., Suite B-24 ▪ Seattle, Washington 98108 ▪ (800) 221-6655 / (206) 763-2992 / fax (206) 763-8429

White Shield, Inc.
Attn: Terry Miller

Project RHS-1094
Reported 01-June-1994

## WASHINGTON TOTAL PETROLEUM HYDROCARBONS - GASOLINE (WTPH-G)

| Laboratory Number | Sample Identification | Matrix |
|---|---|---|
| 70013- 1 | RHS-1094-350W | Water |
| 70013- 2 | RHS-1094-301S | Soil |
| 70013- 3 | RHS-1094-301S Duplicate | Soil |

RESULTS OF ANALYSIS

| Laboratory Number: | 70013- 1 | 70013- 2 | 70013- 3 |
|---|---|---|---|
| Gasoline: | ND<50 | 6300 | 4500 |
| Benzene: | ND<1 | 12 | 4.6 |
| Toluene: | ND<1 | 302 | 192 |
| Ethyl Benzene: | ND<1 | 105 | 68 |
| Total Xylenes: | ND<3 | 637 | 422 |
| Concentration: | ug/L | mg/kg | mg/kg |
| -- Surrogate % Recoveries -- | | | |
| Trifluorotoluene (SS): | 83 | a | a |

**Superior Precision Analytical, Inc.**
309 S. Cloverdale St., Suite B-24 • Seattle, Washington 98108 • (800) 221-6655 / (206) 763-2992 / fax (206) 763-8429

# WASHINGTON TOTAL PETROLEUM HYDROCARBONS - GASOLINE (WTPH-G)

## Quality Assurance and Control Data - Soil/Water

Laboratory Number 70013

| Compound | Method Blank (ug/L) | RL (ug/L) | Spike Recovery (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|
| Gasoline: | ND<50 | 50 | 86/97 | 70-130 | 12% |
| Benzene: | ND<1 | 1 | 93/96 | 70-130 | 3% |
| Toluene: | ND<1 | 1 | 84/90 | 70-130 | 7% |
| Ethyl Benzene: | ND<1 | 1 | 75/81 | 70-130 | 8% |
| Total Xylenes: | ND<3 | 3 | 74/81 | 70-130 | 9% |

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
·/L = Parts per billion (ppb)
File No. 70013

**Superior Precision Analytical, Inc.**
309 S. Cloverdale St., Suite B-24 • Seattle, Washington 98108 • (800) 221-6655 / (206) 763-2992 / fax (206) 763-8429

# WASHINGTON TOTAL PETROLEUM HYDROCARBONS - GASOLINE (WTPH-G)

## Quality Assurance and Control Data - Soil/Water

Laboratory Number 70013

| Compound | Method Blank (mg/kg) | RL (mg/kg) | Spike Recovery (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|
| Gasoline: | ND<5.0 | 5.0 | 98/109 | 70-130 | 11% |
| Benzene: | ND<0.1 | 0.1 | 98b/109 b | 70-130 | 11% |
| Toluene: | ND<0.1 | 0.1 | 98b/107 b | 70-130 | 9% |
| Ethyl Benzene: | ND<0.1 | 0.1 | 96b/105 b | 70-130 | 9% |
| Total Xylenes: | ND<0.3 | 0.3 | 98b/107 b | 70-130 | 9% |

Definitions:
a = The surrogate standard was diluted out of the calibration range and could not be quantitated.
b = The matrix spike and matrix spike duplicate were not used due to matrix interference; percent recoveries from laboratory control samples were used instead.
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
~~/kg = Parts per million (ppm)
File No. 70013

Account Manager

# Chain of Custody and Analysis Request

Page 1 of 1

White Shield, Inc.
Address: P. O. Box 477
City : Grandview State Zip: WA 98930
Phone: (509) 882-1144 Fax: (509) 882-4566
Project Manager: Stuart Fricke
Alternate Contact:
Project No.: RHS-1094 P.O. No.

**TURN AROUND TIME**
(circle one)
Same Day 72 Hrs.
24 Hrs. 48 Hrs.
Normal 5 Day

Superior Precision Analytical Inc.
P.O. Box 1545
Martinez, California 94553

Martinez I: (510) 229-1512
Martinez II: (510) 229-0166
San Francisco: (415) 647-2081

**Section II: Analysis Request**

Sampler: Chuck Ostrom
Regulatory Agency: USDOE

| Sample Identification | S = Soil A = Air W = Water Matrix | EPA 418.1 | WTPH-G | WTPH-D | BTEX | WTPH G/BTEX | EPA 601 | EPA 8080 (PCBs) | TCLP Metals | EPA 7421 (Pb) | | | | Date Sampled 5/23/94 per C.R. | Time Sampled | # of Containers | Preservatives (yes or no) | Sampling Remarks: Bioremediation, UST, Monitoring, Recent Contamination, Unknown Compounds, COMMENTS: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 RHS-1094-3SW | W | | | | | X | | | | | | | | | | 2 | Yes | |
| 2 | | | | | | | | | | | | | | | | | | |
| 3 RHS-1094-3SS | S | | | | | X | | | | | | | | | | 1 | No | |
| 4 | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Relinquished By: Chuck Ostrom | Date/Time 5/24/94 10:50 | Received By: | Date/Time | Lab: Please initial the following: | |
| Organization: White Shield | | Organization: | | Samples Stored in Ice: | Yes |
| Reliquished By: | Date/Time | Received By: | Date/Time | Appropriate Containers: | Yes |
| Organization: | | Organization: | | Samples Preserved: | Yes |
| Relinquished By: | Date/Time | Received By: Kelly K. Sneed | Date/Time 5/25/94 1330 | VOAs without headspace: | Yes |
| Organization: | | Laboratory: Supervisor | | Comments: | 5°C |

**Superior Precision Analytical, Inc.**
309 S. Cloverdale St., Suite B-24 ▪ Seattle, Washington 98108 ▪ (800) 221-6655 / (206) 763-2992 / fax (206) 763-8429

White Shield, Inc.
Attn: Terry Miller

Project RHS1094
Reported 10-June-1994

WASHINGTON TOTAL PETROLEUM HYDROCARBONS - GASOLINE
(WTPH-G)
and Benzene, Toluene, Ethyl Benzene, and Xylenes

Chronology

Laboratory Number 70016

| Identification | Sampled | Received | Extracted | Analyzed | Run # | Lab # |
|---|---|---|---|---|---|---|
| RHS1094-302 | 06/03/94 | 06/06/94 | 06/06/94 | 06/06/94 | | 1 |
| RHS1094-303 | 06/03/94 | 06/06/94 | 06/07/94 | 06/07/94 | | 2 |
| RHS1094-304 | 06/03/94 | 06/06/94 | 06/07/94 | 06/07/94 | | 3 |
| RHS1094-302 Dupl | 06/03/94 | 06/06/94 | 06/06/94 | 06/06/94 | | 4 |

**Superior Precision Analytical, Inc.**
309 S. Cloverdale St., Suite B-24 ▪ Seattle, Washington 98108 ▪ (800) 221-6655 / (206) 763-2992 / fax (206) 763-8429

White Shield, Inc.
Attn: Terry Miller

Project RHS1094
Reported 10-June-1994

## WASHINGTON TOTAL PETROLEUM HYDROCARBONS - GASOLINE (WTPH-G)

| Laboratory Number | Sample Identification | Matrix |
|---|---|---|
| 70016- 1 | RHS1094-302 | Soil |
| 70016- 2 | RHS1094-303 | Soil |
| 70016- 3 | RHS1094-304 | Soil |
| 70016- 4 | RHS1094-302 Duplicate | Soil |

### RESULTS OF ANALYSIS

| Laboratory Number: | 70016- 1 | 70016- 2 | 70016- 3 | 70016- 4 |
|---|---|---|---|---|
| Gasoline: | 66 | 8.6 | 36.4 | 63 |
| Benzene: | ND<.1 | .16 | .22 | .15 |
| Toluene: | .27 | .27 | .93 | .29 |
| Ethyl Benzene: | .25 | ND<.1 | .36 | .36 |
| Total Xylenes: | 4.1 | .94 | 3.0 | 4.0 |
| Concentration: | mg/kg | mg/kg | mg/kg | mg/kg |
| -- Surrogate % Recoveries -- | | | | |
| Trifluorotoluene (SS): | 84 | 75 | 116 | 98 |

**Superior Precision Analytical, Inc.**
309 S. Cloverdale St., Suite B-24 ▪ Seattle, Washington 98108 ▪ (800) 221-6655 / (206) 763-2992 / fax (206) 763-8429

# WASHINGTON TOTAL PETROLEUM HYDROCARBONS - GASOLINE (WTPH-G)

## Quality Assurance and Control Data - Soil

Laboratory Number 70016

| Compound | Method Blank (mg/kg) | RL (mg/kg) | Spike Recovery (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|
| Gasoline: | ND<5 | 5 | 111/107 | 70-130 | 4% |
| Benzene: | ND<.1 | .1 | 68*/78 | 70-130 | 14% |
| Toluene: | ND<.1 | .1 | 68*/79 | 70-130 | 15% |
| Ethyl Benzene: | ND<.1 | .1 | 68*/76 | 70-130 | 11% |
| Total Xylenes: | ND<.3 | .3 | 94/79 | 70-130 | 17% |

Definitions:
* = Matrix spike recoveries were low due to matrix inteference; gasoline recoveries were reported using laboratory control samples (LCS).
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
mg/kg = Parts per million (ppm)
QC File No. 70016

Account Manager

70016

# Chain of Custody and Analysis Request

Page 1 of 1

White Shield, Inc.
Address: P. O. Box 477
City : Grandview State Zip: WA 98930
Phone: (509) 882-1144 Fax: (509) 882-4566
Project Manager: ~~Stuart Fricke~~ T. Miller
Alternate Contact: Chuck
Project No.: RHS1094 P.O. No.

TURN AROUND TIME
(circle one)
Same Day 72 Hrs.
24 Hrs. Sample 302 48 Hrs.
Normal 5 Day Samples 303 and 304

Superior Precision Analytical Inc.
P.O. Box 1545
Martinez, California 94553

Martinez I: (510) 229-1512
Martinez II: (510) 229-0166
San Francisco: (415) 647-2081

Section II: Analysis Request

Sampler: T. Miller
Regulatory Agency: WSDOE

| Sample Identification | S = Soil A = Air W = Water Matrix | EPA 418.1 | WTPH-G | WTPH-D | BTEX | WTPH G/BTEX | EPA 601 | EPA 8080 (PCBs) | TCLP Metals | EPA 7421 (Pb) | | | | Date Sampled | Time Sampled | # of Containers | Preservatives (yes or no) | Sampling Remarks<br>Bioremediation<br>UST<br>Monitoring<br>Recent Contamination<br>Unknown Compounds<br>COMMENTS: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 RHS1094-302 | | | X | | X | | | | | | | | | | | | | 24 hR T.A. |
| 2 RHS1094-303 | | | X | | X | | | | | | | | | | | | | 5 day T.A. |
| 3 RHS1094-304 | | | X | | X | | | | | | | | | | | | | 5 day T.A. |
| 4 | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | |

Relinquished By: Terri Miller
Organization: UST
Date/Time 6/3/94 1:00

Reliquished By:
Organization:
Date/Time

Relinquished By:
Organization:
Date/Time

Received By:
Organization:

Received By:
Organization:

Received By: Kelly K. Green
Laboratory: Sequoia
Date/Time 6/4/94 1000

Lab: Please initial the following:
Samples Stored in Ice: Yes 18°
Appropriate Containers: Yes
Samples Preserved:
VOAs without headspace:
Comments: Stamped Saturday Delivery

# APPENDIX C

Method A Cleanup Levels - Soil [a]

| Hazardous Substance | CAS Number | Cleanup Level |
|---|---|---|
| Arsenic | 7440-38-2 | 20.0 mg/kg [b] |
| Benzene | 71-43-2 | 0.5 mg/kg [c] |
| Cadmium | 7440-43-9 | 2.0 mg/kg [d] |
| Chromium | 7440-47-3 | 100.0 mg/kg [e] |
| DDT | 50-29-3 | 1.0 mg/kg [f] |
| Ethylbenzene | 100-41-4 | 20.0 mg/kg [g] |
| Ethylene dibromide | 106-93-4 | 0.001 mg/kg [h] |
| Lead | 7439-92-1 | 250.0 mg/kg [i] |
| Lindane | 58-89-9 | 1.0 mg/kg [j] |
| Methylene chloride | 75-09-2 | 0.5 mg/kg [k] |
| Mercury (inorganic) | 7439-97-6 | 1.0 mg/kg [l] |
| PAHs (carcinogenic) | | 1.0 mg/kg [m] |
| PCB Mixtures | | 1.0 mg/kg [n] |
| Tetrachloroethylene | 127-18-4 | 0.5 mg/kg [o] |
| Toluene | 108-88-3 | 40.0 mg/kg [p] |
| TPH (gasoline) | | 100.0 mg/kg [q] |
| TPH (diesel) | | 200.0 mg/kg [r] |
| TPH (other) | | 200.0 mg/kg [s] |
| 1,1,1 Trichloroethane | 71-55-6 | 20.0 mg/kg [t] |
| Trichloroethylene | 79-01-5 | 0.5 mg/kg [u] |
| Xylenes | 1330-20-7 | 20.0 mg/kg [v] |

Method A Cleanup Levels – Ground Water[a]

| Hazardous Substance | CAS Number | Cleanup Level |
|---|---|---|
| Arsenic | 7440-38-2 | 5.0 ug/liter[b] |
| Benzene | 71-43-2 | 5.0 ug/liter[c] |
| Cadmium | 7440-43-9 | 5.0 ug/liter[d] |
| Chromium (Total) | 7440-47-3 | 50.0 ug/liter[e] |
| DDT | 50-29-3 | 0.1 ug/liter[f] |
| 1,2 Dichloroethane | 107-06-2 | 5.0 ug/liter[g] |
| Ethylbenzene | 100-41-4 | 30.0 ug/liter[h] |
| Ethylene dibromide | 106-93-4 | 0.01 ug/liter[i] |
| Gross Alpha Particle Activity | | 15.0 pCi/liter[j] |
| Gross Beta Particle Activity | | 4.0 mrem/yr[k] |
| Lead | 7439-92-1 | 5.0 ug/liter[l] |
| Lindane | 58-89-9 | 0.2 ug/liter[m] |
| Methylene chloride | 75-09-2 | 5.0 ug/liter[n] |
| Mercury | 7439-97-6 | 2.0 ug/liter[o] |
| PAHs (carcinogenic) | | 0.1 ug/liter[p] |
| PCB mixtures | | 0.1 ug/liter[q] |
| Radium 226 and 228 | | 5.0 pCi/liter[r] |
| Radium 226 | | 3.0 pCi/liter[s] |
| Tetrachloroethylene | 127-18-4 | 5.0 ug/liter[t] |
| Toluene | 108-88-3 | 40.0 ug/liter[u] |
| Total Petroleum Hydrocarbons | | 1000.0 ug/liter[v] |
| 1,1,1 Trichloroethane | 71-55-6 | 200.0 ug/liter[w] |
| Trichloroethylene | 79-01-5 | 5.0 ug/liter[x] |
| Vinyl chloride | 75-01-4 | 0.2 ug/liter[y] |
| Xylenes | 1330-20-7 | 20.0 ug/liter[z] |

[a] Caution on misusing method A tables. Method A tables have been developed for specific purposes. They are intended to provide conservative cleanup levels for sites undergoing routine cleanup actions or those sites with relatively few hazardous substances. The tables may not be appropriate for defining cleanup levels at other sites. For these reasons, the values in these tables should not automatically be used to define cleanup levels that must be met for financial, real estate, insurance coverage or placement, or similar transactions or purposes. Exceedances of the values in these tables do not necessarily trigger requirements for cleanup action under this chapter.

# APPENDIX D

# UNDERGROUND STORAGE TANK
## Site Check/Site Assessment Checklist

ECOLOGY

| For Office Use Only | |
|---|---|
| Owner # | |
| Site # | |

## INSTRUCTIONS

When a release has **not** been confirmed and reported, this Site Check/Site Assessment Checklist must be completed and signed by a person registered with Ecology. **The results of the site check or site assessment must be included with this checklist.** This form must be submitted to Ecology at the address shown below within 30 days after completion of the site check/site assessment.

SITE INFORMATION: Include the Ecology site ID number if the tanks are registered with Ecology. This number may be found on the tank owner's invoice or tank permit.

TANK INFORMATION: Please list all tanks for which the site check or site assessment is being conducted. Use the owner's tank ID numbers if available, and indicate tank capacity and substance stored.

REASON FOR CONDUCTING SITE CHECK/SITE ASSESSMENT: Please check the appropriate item.

CHECKLIST: Please initial each item in the appropriate box.

SITE ASSESSOR INFORMATION: This form must be signed by the registered site assessor who is responsible for conducting the site check/site assessment.

Underground Storage Tank Section
Department of Ecology
P. O. Box 47655
Olympia, WA 98504-7655

## SITE INFORMATION

Site ID Number (on invoice or available from Ecology if the tanks are registered): ϕϕ9266

Site/Business Name: The Boat Shop

Site Address: 1776 Columbia Drive SE (Street) Telephone: ( )

Richland (City) WA (State) 99352 (ZIP Code)

## TANK INFORMATION

| Tank ID No. | Tank Capacity | Substance Stored |
|---|---|---|
| 1 | 1,000 | Leaded gasoline |
| 2 | 1,000 | Leaded gasoline |
| | | |
| | | |

## REASON FOR CONDUCTING SITE CHECK/SITE ASSESSMENT

Check one:

- ____ Investigate suspected release due to on-site environmental contamination
- ____ Investigate suspected release due to off-site environmental contamination.
- ____ Extend temporary closure of UST system for more than 12 months.
- ____ UST system undergoing change-in-service.
- ____ UST system permanently closed-in-place.
- ✓ UST system permanently closed with tank removed.
- ____ Abandoned tank containing product.
- ____ Required by Ecology or delegated agency for UST system closed before 12/22/88.
- ____ Other (describe): ____

# APPENDIX E

TABLE V. END USE CRITERIA FOR PETROLEUM-CONTAMINATED SOILS

| Analyte | Analytical Method | Soil Class (ppm) 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| Heavy fuel hydrocarbons (C24-C30) | WTPH-418.1 mod. | <60 | 60-200 | 200-2000 | >2000 |
| Diesel (C12-C24) | WTPH-D | <25 | 25-200 | 200-500 | >500 |
| Gasoline (C6-C12) | WTPH-G | <5 | 5-100 | 100-250 | >250 |
| Benzene | 8020 | <0.005 | 0.005-0.5 | ≤0.5 | >0.5 |
| Ethylbenzene | 8020 | <0.005 | 0.005-20 | ≤20 | >20 |
| Toluene | 8020 | <0.005 | 0.005-40 | ≤40 | >40 |
| Xylenes (total) | 8020 | <0.005 | 0.005-20 | ≤20 | >20 |

Treatment is recommended for all Class 3 and 4 soils.

NOTES:

Class 1 Soil Uses:
Any use which will not cause threat to human health or the environment.

Class 2 Soil Uses:
Backfill at the cleanup site
Fill in commercial or industrial areas
Cover or fill in permitted landfills
Road subgrade or other road construction fill
Fill in or near: wetlands, surface water, ground water, drinking water wells or utility trenches is NOT recommended. Use as residential topsoil is also NOT recommended.

Class 3 Soil Uses:
Treatment
Disposal at the original site (no solid waste diposal permit needed)
Road construction (no solid waste diposal permit needed)
Use or disposal in permitted, municipal landfills.
Permitted as a new PCS landfill
(An evaluation should be made to ensure that disposal will not cause a threat to human health or the environment, e.g. use near water bodies)

Class 4 Soil Uses:
Treatment
Disposal in a permitted, municipal landfill
Permitted as a new PCS landfill

WASHINGTON STATE DEPARTMENT OF ECOLOGY

# UNDERGROUND STORAGE TANK TEMPORARY/PERMANENT CLOSURE and SITE ASSESSMENT NOTICE

See back of form for instructions
Please ☑ the appropriate box(es)
Please type or print information

| For Office Use Only |
|---|
| Owner # |
| Site # |

☐ Temporary Tank Closure ☑ Permanent Tank Closure ☐ Change-In-Service ☐ Site Assessment/ Site Check

## SITE INFORMATION:

Site ID Number (on invoice or available from Ecology if the tanks are registered): 00 9266

Site/Business Name: The Boat Shop

Site Address: 1776 Columbia Drive SE (Street) Telephone: ( )

Richland, WA (City) (State) 98532 (ZIP-Code)

## TANK INFORMATION:

| Tank ID | Closure Date | Tank Capacity | Substance Stored |
|---|---|---|---|
| 1 | 4/8/94 | 1,000 | Gasoline |
| 2 | 4/8/94 | 1,000 | Gasoline |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**CONTAMINATION PRESENT AT THE TIME OF CLOSURE**

☑ Yes ☐ No

☐ Unknown

Check unknown if no obvious contamination was observed and sample results have not yet been received from analytical lab.

## UST SYSTEM OWNER/OPERATOR:

UST Owner/Operator: Lynne Koehler

Owners Signature: Lynn Koehler Telephone: (509) 783-1649

Address: 1238 Columbia Drive S.E. (Street)

Richland (City) WA (State) 99352 (ZIP-Code) (P.O. Box)

## TANK CLOSURE/CHANGE-IN-SERVICE PERFORMED BY:

Service Provider: Smith Petroleum Services License Number: 5000451

Licensed Supervisor: Keith Withrow Decommissioning License Number: W001011

Supervisors Signature: Keith Withrow

Address: 315 E. Wine Country Rd (Street) 6 (P.O. Box)

Grandview (City) WA (State) 98930 (ZIP-Code)

Telephone: (509) 882-6037

## SITE CHECK/SITE ASSESSMENT CONDUCTED BY:

Name of Registered Site Assessor: Charles Robinson

Telephone: (509) 882-1144 - White Shield, Inc

Address: 801 Grandridge Road (Street) P.O. Box 477 (P.O. Box)

Grandview (City) WA (State) 98930 (ZIP-Code)

ECY 020-34

WASHINGTON STATE DEPARTMENT OF ECOLOGY

# UNDERGROUND STORAGE TANK TEMPORARY/PERMANENT CLOSURE and SITE ASSESSMENT NOTICE

See back of form for instructions
Please ☑ the appropriate box(es)
Please type or print information

| For Office Use Only |
|---|
| Owner # |
| Site # |

☐ Temporary Tank Closure ☑ Permanent Tank Closure ☐ Change-In-Service ☐ Site Assessment/ Site Check

## SITE INFORMATION:

Site ID Number (on invoice or available from Ecology if the tanks are registered): ØØ9266

Site/Business Name: The Boat Shop

Site Address: 1776 Columbia Drive SE (Street) Telephone: ( )

Richland (City) WA (State) 98532 (ZIP-Code)

## TANK INFORMATION:

| Tank ID | Closure Date | Tank Capacity | Substance Stored |
|---|---|---|---|
| 1 | 4/8/94 | 1,000 | gasoline |
| 2 | 4/8/94 | 1,000 | gasoline |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**CONTAMINATION PRESENT AT THE TIME OF CLOSURE**

☑ Yes ☐ No

☐ Unknown

Check unknown if no obvious contamination was observed and sample results have not yet been received from analytical lab.

## UST SYSTEM OWNER/OPERATOR:

UST Owner/Operator: Lynne Koehler

Owners Signature: Lynn Koehler Telephone: (509) 783-1649

Address: 1238 Columbia Drive . S.E. (Street)

Richland (City) P.O. Box WA (State) 99352 (ZIP-Code)

## TANK CLOSURE/CHANGE-IN-SERVICE PERFORMED BY:

Service Provider: Smith Petroleum Services License Number: 5000451

Licensed Supervisor: Keith Withrow Decommissioning License Number: W001011

Supervisors Signature: Keith Withrow

Address: 315 E. Wine Country Rd (Street) 6 (P.O. Box)

Grandview (City) WA (State) 98930 (ZIP-Code)

Telephone: (509) 882-6037

## SITE CHECK/SITE ASSESSMENT CONDUCTED BY:

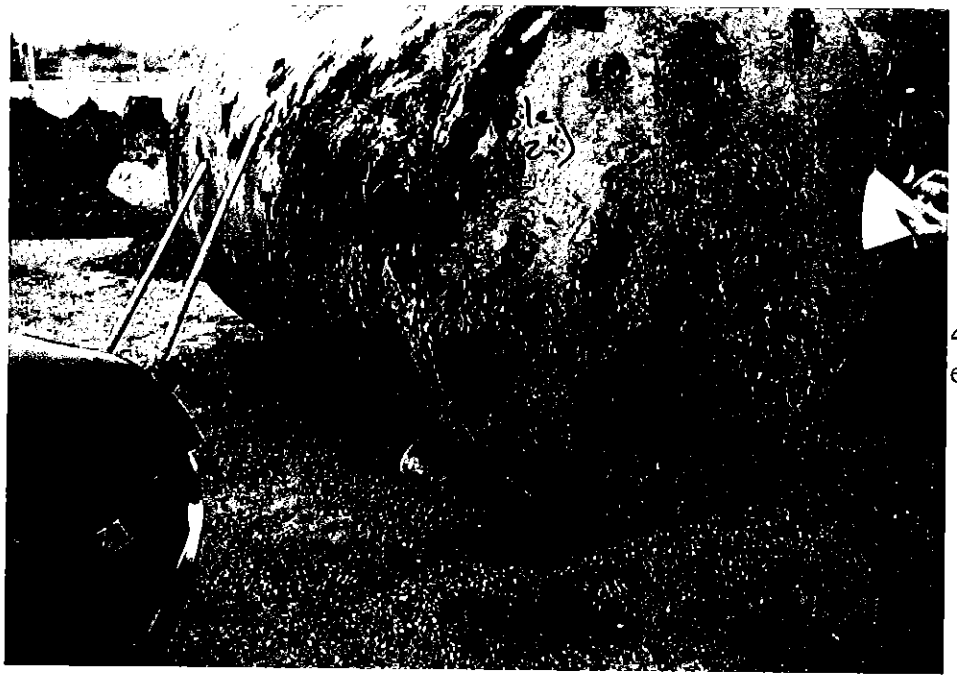
Name of Registered Site Assessor: Charles Robinson

Telephone: (509) 882-1144 - White Shield, Inc

Address: 801 Grandridge Road (Street) P.O. Box 477 (P.O. Box)

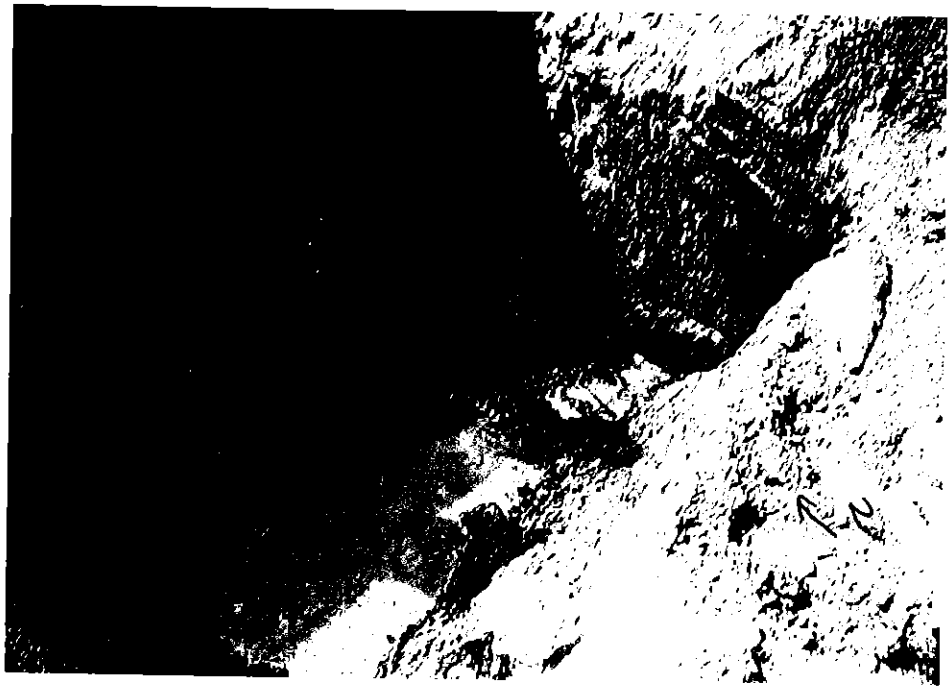
Grandview (City) WA (State) 98930 (ZIP-Code)

ECY 020-34



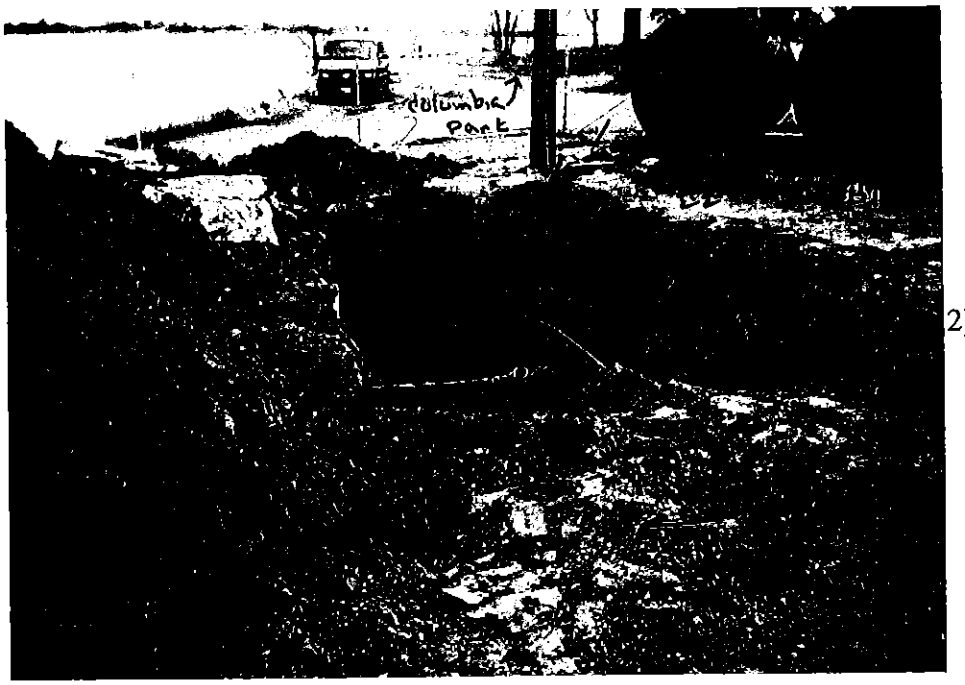
4) Holes in Tank #1 (Note esp. 2 inch gash)

5) Two small holes in Tank #1



6) Water in excavation - April 8, 1994

1) UST Location




2) UST Excavation

3) Columbia River & boat launch located 40 feet north of UST excavation