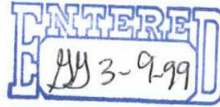


WEST SEATTLE MIDAS MUFFLER PROPERTY LIMITED SITE CHARACTERIZATION REPORT

December 29, 1996



DEPARTMENT OF ECOLOGY NWRO/TCP TANKS UNIT	
INTERIM CLEANUP REPORT	<input checked="" type="checkbox"/>
SITE CHARACTERIZATION	<input type="checkbox"/>
FINAL CLEANUP REPORT	<input type="checkbox"/>
OTHER _____	<input type="checkbox"/>
AFFECTED MEDIA: SOIL	<input checked="" type="checkbox"/>
OTHER _____ GW*	<input type="checkbox"/>
INSPECTOR (INIT.)	DATE 2-11-99

* gw not tested but present

1.0 INTRODUCTION

This report presents the results of a limited underground storage tank (UST) site investigation at the Midas Muffler property located in Seattle, Washington (See Figure 1, Vicinity Map). A total of six soil borings were drilled on the subject property to characterize a reported release of petroleum hydrocarbons to the soil in the vicinity of two 500 gallon USTs. The Midas Muffler property is reportedly a former gasoline service station.

1.1 PURPOSE AND SCOPE

This limited site investigation was conducted by Aquifer Associates at the request of Tankwise located in Seattle, WA, to assess the impact on subsurface soil from a reported release of petroleum hydrocarbons at the subject property. The scope of work included the following:

- Collect soil samples and test for petroleum hydrocarbons in the vicinity of two reported 500 gallon USTs (heating oil and waste oil)
- Perform field screening of samples and submit selected soil boring samples for analysis.
- Compile and analyze the collected data and analytical test results.
- Generate this report to present our findings, conclusions, and recommendations.

1.2 SITE LOCATION AND DESCRIPTION

The Midas Muffler property is located at 4457 Fauntleroy Way SW, in Seattle, Washington. The site is located in an area of commercial properties. The phone number of the subject property is 937-1950.

There were no bodies of surface water identified in the vicinity of the subject property.

1.3 SITE HISTORY

On October 30, 1996, Aquifer Associates was contacted by Tankwise to perform a limited site soil characterization in the vicinity of two 500 gallon underground storage tanks. After a preliminary round of sampling, a release of heavy oil range petroleum hydrocarbons to the soil was confirmed on November 1, 1996. The release was reported to the Washington State Department of Ecology and was assigned an ERTS incident number: N25406. Additional site characterization was performed on November 15, 1996 by Aquifer Associates.

1.4 SITE CONDITIONS

Two 500 gallon USTs are located on the western edge of the subject property. The USTs were reportedly used for waste oil and heating oil. The USTs were pumped and triple rinsed by Tankwise. The residual fluids and rinse water were taken off site for treatment/disposal by Tankwise. The USTs are located east of and adjacent to a large retaining wall. The northeastern ends of the tanks extend under an addition to the main Midas building. Due to the proximity of the tanks to the retaining wall, and the fact that the tanks were located under the building foundation, Tankwise recommended closing the tanks in place to prevent possible structural problems with the building foundation and the retaining wall.

2.0 SOIL BORINGS

On October 30, 1996, Aquifer Associates supervised the drilling of two soil borings adjacent to the two 500 gallon tanks by Tankwise of Seattle, Washington. The soil borings, designated B1 and B2, were drilled to 7 fbg (feet below grade). Soil samples were collected directly above the shallow water table, or at a depth where field screening methods indicated a significant concentration of petroleum hydrocarbons. The locations of the soil borings are shown in Figure 1 (Site Schematic).

Based upon the initial sample results from soil borings B1 and B2, four additional exploration borings (B3-B6) were drilled to a depth of 6 fbg on November 15, 1996 by Tankwise. Soil samples were collected at depth where field screening indicated possible petroleum hydrocarbon impacted soil. The locations of the borings B3-B6 are shown in Figure 1 (Site Schematic).

Several soil borings were attempted in the southwestern portion of the subject property. All of the borings along the southwestern edge of the subject property were unsuccessful due to a large underground obstruction at a depth of approximately 1 fbg (possibly a large, subsurface concrete slab).

3.0 SOIL SAMPLING ACTIVITIES

3.1 SOIL SAMPLING SUMMARY

Soil samples were collected from the soil borings on October 30, 1996, and November 15, 1996. A total of 6 borings were completed on the subject property. The samples were assigned appropriate soil boring numbers and depths in feet below grade¹. The soil sample from boring B-2 was designated B2-C (C for composite). Due to the insufficient sample amount derived from soil boring B-2, additional representative sample material was collected from the auger flight.

The soil samples were field screened for petroleum hydrocarbons using a sheen² test. Samples collected above the apparent static water level were analyzed for total petroleum hydrocarbons as heavy oil (Method WTPH-418.1) and gasoline (Method WTPH-G with BTEX³ distinction) when field screening indicated that possible gasoline range petroleum hydrocarbons were present.

All samples were collected using Aquifer Associates standard sampling and decontamination protocols. Sampling implements were washed with Alconox soap and double rinsed with activated charcoal filtered water between sampling events.

4.0 ANALYTICAL RESULTS

Analytical results for each phase of the project are presented in this section. All samples were analyzed for total petroleum hydrocarbons (TPH) using Washington State Department of Ecology test methods (WTPH). Washington State Department of Ecology Model Toxics Control Act (MTCA) cleanup levels are given in Table 4.1.4.

4.1 SITE CHARACTERIZATION ANALYTICAL RESULTS

Analytical results for soil samples collected during the site characterization are given in Tables 4.1.1 through 4.1.3 and are discussed in Section 4.2. Complete analytical reports are in Appendix A.

¹ For example, sample B1-7 was collected from boring number 1 at a depth of 7 feet.

² A sheen test is performed by adding water to a portion of the soil sample to check for visible hydrocarbon sheens.

³ BTEX is the acronym for Benzene, Toluene, Ethylbenzene, and Xylenes.

TABLE 4.1.1
ANALYTICAL RESULTS: SOIL BORING SAMPLES
TOTAL PETROLEUM HYDROCARBONS - HEAVY OIL RANGE
METHOD WTPH-418.1

Sample results in parts per million (ppm)

SAMPLE NUMBER	DATE COLLECTED	SAMPLE MATRIX	WTPH (418.1)
B1-7	October 30, 1996	soil	<25
B2-C	October 30, 1996	soil	1200
B3-5	November 15, 1996	soil	390
B4-5	November 15, 1996	soil	710
B5-5	November 15, 1996	soil	46
B6-6	November 15, 1996	soil	400

TABLE 4.1.2
ANALYTICAL RESULTS: SOIL BORING SAMPLES
TOTAL PETROLEUM HYDROCARBONS GASOLINE (WTPH-G)
WITH BTEX DISTINCTION

Sample results in parts per million (ppm)

SAMPLE NUMBER	DATE COLLECTED	SAMPLE MATRIX	WTPH-G	B	T	E	X
B4-5	November 15, 1996	soil	2,600	<0.240	4.9	10.8	69
B6-5	November 15, 1996	soil	1,100	<0.048	2.4	4.6	32

B = benzene T = toluene E = ethylbenzene X = xylenes

TABLE 4.1.3
ANALYTICAL RESULTS: SOIL BORING SAMPLE
TOTAL LEAD

Sample results in parts per million (ppm)

SAMPLE NUMBER	DATE COLLECTED	SAMPLE MATRIX	TOTAL LEAD
B2-C	October 30, 1996	soil	27

TABLE 4.1.4
MTCA SOIL CLEANUP LEVELS
In parts per million (ppm)

MATRIX	TOTAL GASOLINE	TOTAL LEAD	TOTAL HEAVY OIL	B	T	E	X
SOIL	100	250	200	0.5	40.0	20.0	20.0

B = benzene T = toluene E = ethylbenzene X = xylenes

4.2 DISCUSSION OF ANALYTICAL RESULTS

Soil Boring Samples

Analytical results for soil samples collected from soil borings B2, B3, B4, and B6 had levels of heavy oil range petroleum hydrocarbons above the MTCA cleanup level of 200 ppm. Analytical results for soil samples collected from soil borings B4 and B6 had significant levels of gasoline range petroleum hydrocarbons. Based upon the low level of benzene relative to toluene/ethylbenzene/xylenes, the gasoline appears to be weathered. The analytical result for the soil sample collected from B2-C indicated low levels of total lead, well below MTCA cleanup levels.

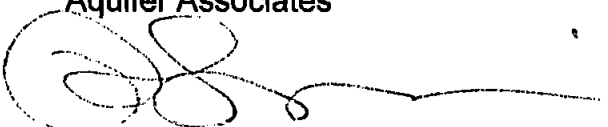
5.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon soil sample results, the soils in the vicinity of the two abandoned USTs were moderately impacted by heavy oil range petroleum hydrocarbons. Due to the proximity of the two 500 tanks to a substantial retaining wall, possible unstable subsurface soil conditions, and the fact that the USTs extended under the building foundation, the decision was made to close the tanks in place. During the limited site characterization, what appears to be gasoline range petroleum hydrocarbon impacted soil was discovered southeast of the UST site area. Additional investigation and subsequent cleanup of the impacted soil is recommended. Petroleum hydrocarbon impacted soil was found in contact with a shallow perched aquifer, indicating possible impacted groundwater. The installation of monitoring wells is recommended to characterize the extent of impacted groundwater. However, due to possible future site remediation activities, placement of monitoring wells should be delayed until excavation and remediation of petroleum impacted soil is complete.

6.0 LIMITATIONS

This Groundwater Characterization Report has been prepared for the exclusive use of Tankwise, Midas Muffler, and their associates. The report is based on data and information collected by Aquifer Associates personnel and their representatives. The recommendations and conclusions contained in this report represent our professional opinions. These opinions were derived in accordance with currently accepted environmental practices at this time and location. Other than this, no warranty is implied or intended.

Sincerely,
Aquifer Associates



Richard N. Simpson
Registered Site Assessor

Date of Report: November 1, 1996

Date Received: October 30, 1996

Project: Midas

Date Samples Extracted: October 31, 1996

Date Extracts Analyzed: October 31, 1996

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS**

BY METHOD 418.1 (5520.F)

Results Reported as $\mu\text{g/g}$ (ppm)

<u>Sample ID</u>	<u>Total Petroleum Hydrocarbons</u>
B1-7	<25
B2-C	1,200
Method Blank	<25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: November 1, 1996

Date Received: October 30, 1996

Project: Midas

Date Samples Extracted: October 30, 1996

Date Extracts Analyzed: October 31, 1996

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLE
FOR LEAD USING METHOD 6010

Samples Processed Using Method 3005A

Results Reported as $\mu\text{g/g}$ (ppm)

<u>Sample ID</u>	<u>Lead</u>
B2-C	27
Method Blank	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: November 1, 1996

Date Received: October 30, 1996

Project: Midas

QUALITY ASSURANCE RESULTS FOR TOTAL METALS BY INDUCTIVELY COUPLED PLASMA (ICP) (METHOD 6010)

Laboratory Code: 73610 (Duplicate)

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Sample Result</u>	<u>Duplicate Result</u>	<u>Relative Percent Difference</u>	<u>Acceptance Criteria</u>
Lead	ug/g (ppm)	27	26	4	0-20

Laboratory Code: 73610 (Matrix Spike)

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Spike Level</u>	<u>Sample Result</u>	<u>% Recovery</u>		<u>Acceptance Criteria</u>	<u>Relative Percent Difference</u>
				<u>MS</u>	<u>MSD</u>		
Lead	ug/g (ppm)	100	27	99	102	50-150	0-20

Laboratory Code: Spike Blank

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Spike Level</u>	<u>% Recovery</u>		<u>Acceptance Criteria</u>	<u>Relative Percent Difference</u>
			<u>MS</u>	<u>MSD</u>		
Lead	ug/g (ppm)	100	109	107	80-120	2

Date of Report: November 1, 1996

Date Received: October 30, 1996

Project: Midas

**QUALITY ASSURANCE RESULTS
FOR TOTAL PETROLEUM HYDROCARBONS
BY METHOD 418.1 (5520.F)**

Laboratory Code: 73609 (duplicate)

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Sample Result</u>	<u>Duplicate Result</u>	<u>Relative Percent Difference</u>	<u>Acceptance Criteria</u>
418.1	ug/g (ppm)	<25	<25	nm	0-20

Laboratory Code: Spike Blank

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Spike Level</u>	<u>% Recovery</u>		<u>Acceptance Criteria</u>	<u>Relative Percent Difference</u>
			<u>MS</u>	<u>MSD</u>		
418.1	ug/g (ppm)	250	83	84	80-120	1

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

Client: Tank Wise
Project: K-West / Midas WS
Project #: Midas WS
Matrix: Soil

Samples Submitted: 11/15/96
Date of Analysis: 11/20/96
File ID: 11-052
Analysis: WTPH-G / EPA 8020 (BTEX)
Units: mg/Kg (ppm)

Results

Lab ID	Client ID	Gasoline	Benzene	Toluene	Ethyl Benzene	Xylenes	FB % Surrogate Recovery	BFB % Surrogate Recovery
11-052-2	B4-5	2,600	<0.240	4.9	10.8	69	144%	139%
11-052-4	B6-5	1,100	<0.048	2.4	4.6	32	153%	141%

Quality Assurance

11/20/96-MB2	Method Blank	<0.05	<0.05	<0.05	<0.05	87%	89%
11/20/96-LCS	Lab. Control Spk	96%	97%			93%	96%

ppm = Parts Per Million.

Y = Interferences were present which prevented quantitation of the surrogate recovery.



Client: Tank Wise
Project: K-West/Midas WS
Project#:
Matrix: Soil

Samples Submitted: 11/15/96
Date of Analysis: 11/20/96
File ID: 11-052
Analysis: WTPH 418.1
Units: mg/Kg (ppm)

Results

Lab ID	Customer ID	TPH
11-052-1	B3-6	390
11-052-2	B4-5	710
11-052-3	B5-5	46
11-052-4	B6-5	400

Quality Assurance

Method Blank	<20
--------------	-----



ANALYTICAL LABORATORIES, INC.

8220 7th Avenue South
Seattle, WA 98108

Lab Report To Tank Wise
4455 35th Ave SW
Seattle, WA 98120

Client Contact Phone

standard

937-3995 fax 932-1007

[illegible]

Special Instructions tax results to 932-1007

Was Preservative Used? No ☐ Yes ☐ What Kind? chilled

1. Relinquished By [Signature] Date 11.15.96 Time 11:31

2. Relinquished By _____ Date _____ Time _____

What Analysis?

Received By Lee Wharm Date 11-15-96 Time 11:31

Received By _____ Date _____ Time _____



UNDERGROUND STORAGE TANK Closure and Site Assessment Notice

See back of form for instructions

NW FOR OFFICE USE ONLY JS
Site ID #: 1985
Owner ID #: U10962

Please check the appropriate box(es)

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

Site Information

Site ID Number 001985
(Available from Ecology if the tanks are registered)
Site/Business Name MIDAS MUFFLER
Site Address 4457 FAUNTLEROY WAY SW
City/State Seattle WA
Zip Code 98126 Telephone (206) 937-1950
Owner's Signature [Signature]

Owner Information

(This form will be returned to this address)

UST Owner/Operator MIDAS REALTY CORP
Mailing Address P.O. Box 93687
Street P.O. Box 93687
City/State Chicago ILLINOIS
Zip Code _____ Telephone (____) _____

Tank Closure/Change-In-Service Company

Service Company TANK WISE
Certified Supervisor Tom WISE Decommissioning Certification No. 99415
Supervisor's Signature [Signature]
Address 4455 35th Ave SW
Street Seattle WA P.O. Box 98126 Telephone (206) 937-3895
City Seattle State WA Zip Code 98126

Site Check/Site Assessor

Certified Site Assessor Richard N. Simpson / Aquifer Associates
Address 246 SW 119th St
Street Seattle WA P.O. Box _____
City Seattle State WA Zip Code 98146 Telephone (206) 248 0274

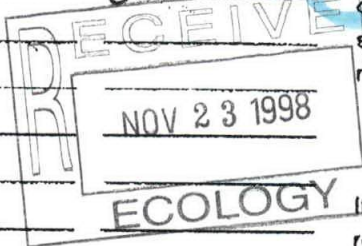
Tank Information

Tank ID	Closure Date	Closure Method	Tank Capacity	Substance Stored
1			500	Heating Oil
2			500	Waste Oil

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.

☒ Yes ☐ No
If contamination is present, has the release been reported to the appropriate regional office?



LB 12/8/98

CHECKLIST

Each item of the following checklist shall be initiated by the person registered with the Department of Ecology whose signature appears below.

	YES	NO
1. The location of the UST site is shown on a vicinity map.	✓	
2. A brief summary of information obtained during the site inspection is provided. (see Section 3.2 in site assessment guidance)	✓	
3. A summary of UST system data is provided. (see Section 3.1.)	✓	
4. The soils characteristics at the UST site are described. (see Section 5.2)	✓	
5. Is there any apparent groundwater in the tank excavation?		N/A
6. A brief description of the surrounding land use is provided. (see Section 3.1)	✓	
7. Information has been provided indicating the number and types of samples collected, methods used to collect and analyze the samples, and the name and address of the laboratory used to perform the analyses.	✓	
8. A sketch or sketches showing the following items is provided:		
- location and ID number for all field samples collected	✓	
- groundwater samples distinguished from soil samples (if applicable)	N/A	
- samples collected from stockpiled excavated soil	N/A	
- tank and piping locations and limits of excavation pit	✓	
- adjacent structures and streets	✓	
- approximate locations of any on-site and nearby utilities		✓
9. If sampling procedures different from those specified in the guidance were used, has justification for using these alternative sampling procedures been provided? (see Section 3.4)	✓	
10. A table is provided showing laboratory results for each sample collected including; sample ID number, constituents analyzed for and corresponding concentration, analytical method and detection limit for that method.	✓	
11. Any factors that may have compromised the quality of the data or validity of the results are described.	✓	
12. The results of this site check/site assessment indicate that a confirmed release of a regulated substance has occurred.	✓	

SITE ASSESSOR INFORMATION

Richard N. Simpson
 Person registered with Ecology

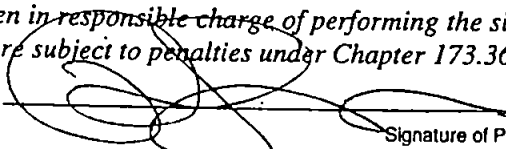
Aquifer Associates/Tankwise
 Firm Affiliated with

Business Address: 246 SW 119th St
 Seattle, WA
 City State Zip Code

Telephone: (206) 248 0274
 98146-2928

I hereby certify that I have been in responsible charge of performing the site check/site assessment described above. Persons submitting false information are subject to penalties under Chapter 173.360 WAC.

1-17-97
 Date


 Signature of Person Registered with Ecology



UNDERGROUND STORAGE TANK Site Check / Site Assessment Checklist

NW JS
Site #: 1985
Owner #: U10962

12/8/98

INSTRUCTIONS

When a release has **not** been confirmed and reported, this Site Check/Site Assessment Checklist must be completed and signed by a person certified by IFCI or a Washington registered professional engineer who is competent, by means of examination, experience, or education, to perform site assessments. **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 ASSESSEMENT: Please check the appropriate item.

CHECKLIST: Please initial each item in the appropriate box.

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

Underground Storage Tank Section
Department of Ecology
PO Box 47655
Olympia WA 98504-7655

ASSESSOR INFORMATION

Site ID Number (Available from Ecology if the tanks are registered): 001985
Business Name: Midas Muffler
Address: 4457 Fawcett Way SW
Seattle WA
City Street State Zip Code
Telephone: (206) 937-1950
98126

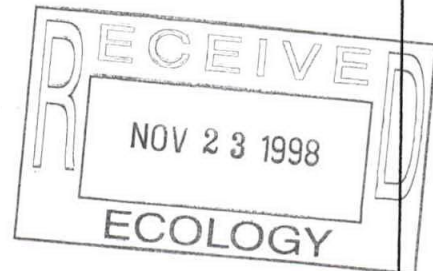
TANK INFORMATION

Tank ID No.	Tank Capacity	Substance Stored
1	500	heating oil
2	500	waste oil

REASON FOR CONDUCTING SITE CHECK / SITE ASSESSEMENT

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 service.
- ☐ 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):



Department of Ecology - Northwest Regional Office
Underground Storage Tank Notice of Confir Release

LUST#

Incident #: 487222

Date Ecology Notified:

11-7-96
11-23-98

Received by:

V. Gilleg - ERTS
HQ - UST - US Mail

UST #:

1985

Incident Reported by:

? ~~OSARL~~

Phone:

ERTS #:

N25406

Site



Owner

Name: Midas Muffler, FannHeroy
Address: 4457 FannHeroy Way SW
City: Seattle
Zip + 4: 98126
County: King
Phone:
Contact:

Name:
Address:
City:
Zip + 4:
County:
Phone:
Contact:

Consultant/Other Contacts

Contact Name	Affiliation	Phone	Ext.

Affected Media

☒ Soil ☐ GW ☐ DW ☐ SW ☐ Sed.
possible-not tested

Free Product?

☐ Yes ☒ No ☐ Excavation? ☐ GW?

Tank Information

Tank ID	Substance	Status	Status Date
1.	1	heat oil soogal	closed in place 10-30-96
2.	2	waste oil "	" "
3.			
4.			
5.			

Tank ID	Substance	Status	Status Date
6.			
7.			
8.			
9.			
10.			

Cleanup Status: ☐ Assessing ☒ In Progress ☐ Monitoring ☐ Conducted ☐ Unknown

Comments (include remediation methods, PCS status, and if this is a "limited" cleanup): Consultant recommended soil excavation and monitoring wells. Apparently, the release was not reported, and only came to light when tank closure info was requested. Upon further investigation this release was found in the ERTS database - N425406 instead of N25406. Shyley Inubush 3-9-99



File as UST 1985

(see UST 487222, Midas Muffler
Remediation for full report)

RECEIVED
JUL 13 1998
DEPT. OF ECOLOGY

**WEST SEATTLE MIDAS MUFFLER PROPERTY
LIMITED SITE CHARACTERIZATION
REPORT**

Aquifer Associates
Seattle, Washington

Prepared for:
TANKWISE
December 29, 1996

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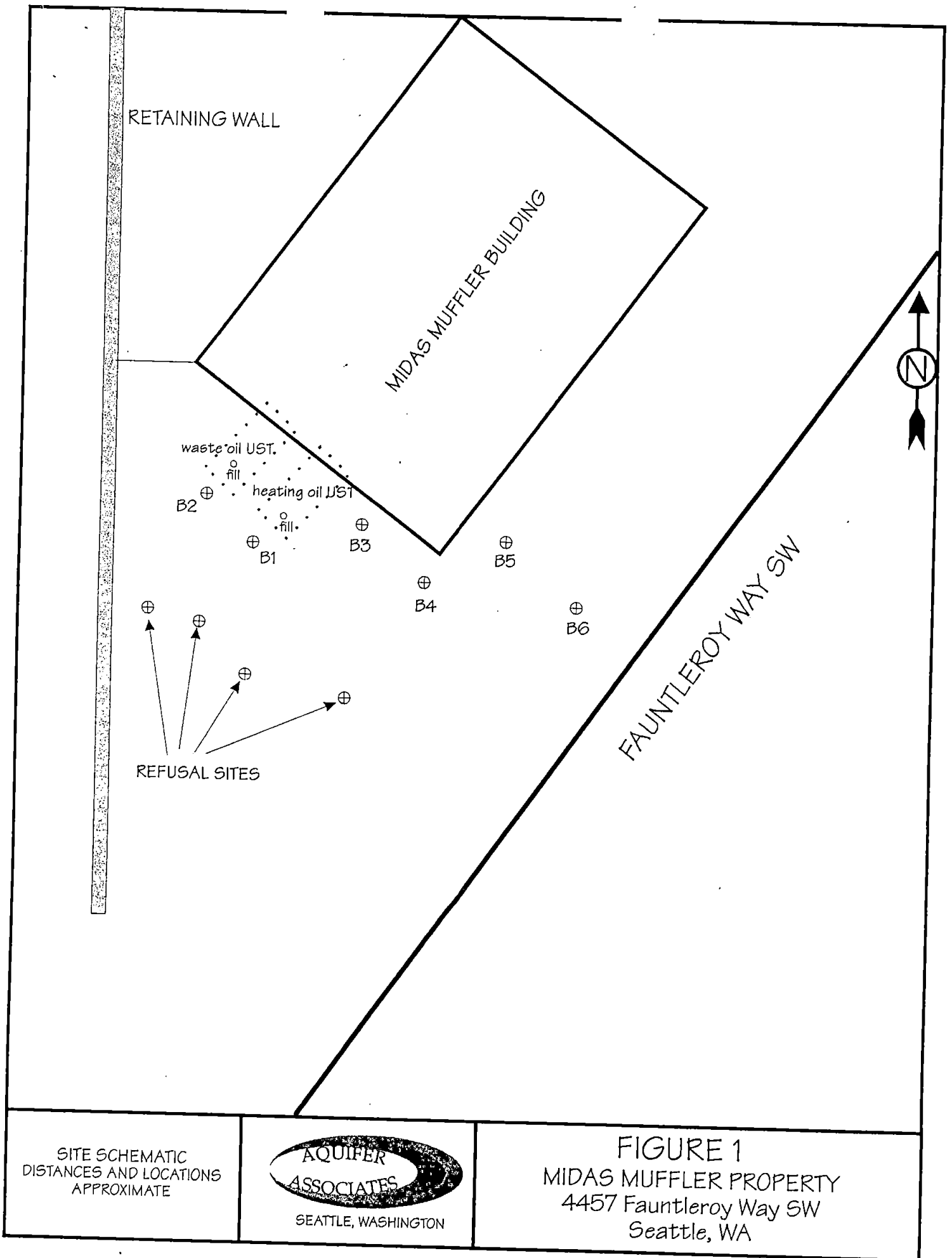
FIGURES

FIGURE 1 SITE SCHEMATIC

APPENDIX A

LABORATORY ANALYTICAL REPORTS

*Closure & Site Assessment Notice
Site check/site Assessment Checklist*



WEST SEATTLE MIDAS MUFFLER PROPERTY LIMITED SITE CHARACTERIZATION REPORT

December 29, 1996

1.0 INTRODUCTION

This report presents the results of a limited underground storage tank (UST) site investigation at the Midas Muffler property located in Seattle, Washington (See Figure 1, Vicinity Map). A total of six soil borings were drilled on the subject property to characterize a reported release of petroleum hydrocarbons to the soil in the vicinity of two 500 gallon USTs. The Midas Muffler property is reportedly a former gasoline service station.

1.1 PURPOSE AND SCOPE

This limited site investigation was conducted by Aquifer Associates at the request of Tankwise located in Seattle, WA, to assess the impact on subsurface soil from a reported release of petroleum hydrocarbons at the subject property. The scope of work included the following:

- Collect soil samples and test for petroleum hydrocarbons in the vicinity of two reported 500 gallon USTs (heating oil and waste oil)
- Perform field screening of samples and submit selected soil boring samples for analysis.
- Compile and analyze the collected data and analytical test results.
- Generate this report to present our findings, conclusions, and recommendations.

1.2 SITE LOCATION AND DESCRIPTION

The Midas Muffler property is located at 4457 Fauntleroy Way SW, in Seattle, Washington. The site is located in an area of commercial properties. The phone number of the subject property is 937-1950.

There were no bodies of surface water identified in the vicinity of the subject property.

1.3 SITE HISTORY

On October 30, 1996, Aquifer Associates was contacted by Tankwise to perform a limited site soil characterization in the vicinity of two 500 gallon underground storage tanks. After a preliminary round of sampling, a release of heavy oil range petroleum hydrocarbons to the soil was confirmed on November 1, 1996. The release was reported to the Washington State Department of Ecology and was assigned an ERTS incident number: N25406. Additional site characterization was performed on November 15, 1996 by Aquifer Associates.

1.4 SITE CONDITIONS

Two 500 gallon USTs are located on the western edge of the subject property. The USTs were reportedly used for waste oil and heating oil. The USTs were pumped and triple rinsed by Tankwise. The residual fluids and rinse water were taken off site for treatment/disposal by Tankwise. The USTs are located east of and adjacent to a large retaining wall. The northeastern ends of the tanks extend under an addition to the main Midas building. Due to the proximity of the tanks to the retaining wall, and the fact that the tanks were located under the building foundation, Tankwise recommended closing the tanks in place to prevent possible structural problems with the building foundation and the retaining wall.

2.0 SOIL BORINGS

On October 30, 1996, Aquifer Associates supervised the drilling of two soil borings adjacent to the two 500 gallon tanks by Tankwise of Seattle, Washington. The soil borings, designated B1 and B2, were drilled to 7 fbg (feet below grade). Soil samples were collected directly above the shallow water table, or at a depth where field screening methods indicated a significant concentration of petroleum hydrocarbons. The locations of the soil borings are shown in Figure 1 (Site Schematic).

Based upon the initial sample results from soil borings B1 and B2, four additional exploration borings (B3-B6) were drilled to a depth of 6 fbg on November 15, 1996 by Tankwise. Soil samples were collected at depth where field screening indicated possible petroleum hydrocarbon impacted soil. The locations of the borings B3-B6 are shown in Figure 1 (Site Schematic).

Several soil borings were attempted in the southwestern portion of the subject property. All of the borings along the southwestern edge of the subject property were unsuccessful due to a large underground obstruction at a depth of approximately 1 fbg (possibly a large, subsurface concrete slab).

3.0 SOIL SAMPLING ACTIVITIES

3.1 SOIL SAMPLING SUMMARY

Soil samples were collected from the soil borings on October 30, 1996, and November 15, 1996. A total of 6 borings were completed on the subject property. The samples were assigned appropriate soil boring numbers and depths in feet below grade¹. The soil sample from boring B-2 was designated B2-C (C for composite). Due to the insufficient sample amount derived from soil boring B-2, additional representative sample material was collected from the auger flight.

The soil samples were field screened for petroleum hydrocarbons using a sheen² test. Samples collected above the apparent static water level were analyzed for total petroleum hydrocarbons as heavy oil (Method WTPH-418.1) and gasoline (Method WTPH-G with BTEX³ distinction) when field screening indicated that possible gasoline range petroleum hydrocarbons were present.

All samples were collected using Aquifer Associates standard sampling and decontamination protocols. Sampling implements were washed with Alconox soap and double rinsed with activated charcoal filtered water between sampling events.

4.0 ANALYTICAL RESULTS

Analytical results for each phase of the project are presented in this section. All samples were analyzed for total petroleum hydrocarbons (TPH) using Washington State Department of Ecology test methods (WTPH). Washington State Department of Ecology Model Toxics Control Act (MTCA) cleanup levels are given in Table 4.1.4.

4.1 SITE CHARACTERIZATION ANALYTICAL RESULTS

Analytical results for soil samples collected during the site characterization are given in Tables 4.1.1 through 4.1.3 and are discussed in Section 4.2. Complete analytical reports are in Appendix A.

¹ For example, sample B1-7 was collected from boring number 1 at a depth of 7 feet.

² A sheen test is performed by adding water to a portion of the soil sample to check for visible hydrocarbon sheens.

³ BTEX is the acronym for Benzene, Toluene, Ethylbenzene, and Xylenes.

TABLE 4.1.1
ANALYTICAL RESULTS: SOIL BORING SAMPLES
TOTAL PETROLEUM HYDROCARBONS - HEAVY OIL RANGE
METHOD WTPH-418.1

Sample results in parts per million (ppm)

SAMPLE NUMBER	DATE COLLECTED	SAMPLE MATRIX	WTPH (418.1)
B1-7	October 30, 1996	soil	<25
B2-C	October 30, 1996	soil	1200
B3-5	November 15, 1996	soil	390
B4-5	November 15, 1996	soil	710
B5-5	November 15, 1996	soil	46
B6-6	November 15, 1996	soil	400

TABLE 4.1.2
ANALYTICAL RESULTS: SOIL BORING SAMPLES
TOTAL PETROLEUM HYDROCARBONS GASOLINE (WTPH-G)
WITH BTEX DISTINCTION

Sample results in parts per million (ppm)

SAMPLE NUMBER	DATE COLLECTED	SAMPLE MATRIX	WTPH-G	B	T	E	X
B4-5	November 15, 1996	soil	2,600	<0.240	4.9	10.8	69
B6-5	November 15, 1996	soil	1,100	<0.048	2.4	4.6	32

B = benzene T = toluene E = ethylbenzene X = xylenes

TABLE 4.1.3
ANALYTICAL RESULTS: SOIL BORING SAMPLE
TOTAL LEAD

Sample results in parts per million (ppm)

SAMPLE NUMBER	DATE COLLECTED	SAMPLE MATRIX	TOTAL LEAD
B2-C	October 30, 1996	soil	27

TABLE 4.1.4
MTCA SOIL CLEANUP LEVELS
In parts per million (ppm)

MATRIX	TOTAL GASOLINE	TOTAL LEAD	TOTAL HEAVY OIL	B	T	E	X
SOIL	100	250	200	0.5	40.0	20.0	20.0

B = benzene T = toluene E = ethylbenzene X = xylenes

4.2 DISCUSSION OF ANALYTICAL RESULTS

Soil Boring Samples

Analytical results for soil samples collected from soil borings B2, B3, B4, and B6 had levels of heavy oil range petroleum hydrocarbons above the MTCA cleanup level of 200 ppm. Analytical results for soil samples collected from soil borings B4 and B6 had significant levels of gasoline range petroleum hydrocarbons. Based upon the low level of benzene relative to toluene/ethylbenzene/xylenes, the gasoline appears to be weathered. The analytical result for the soil sample collected from B2-C indicated low levels of total lead, well below MTCA cleanup levels.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon soil sample results, the soils in the vicinity of the two abandoned USTs were moderately impacted by heavy oil range petroleum hydrocarbons. Due to the proximity of the two 500 tanks to a substantial retaining wall, possible unstable subsurface soil conditions, and the fact that the USTs extended under the building foundation, the decision was made to close the tanks in place. During the limited site characterization, what appears to be gasoline range petroleum hydrocarbon impacted soil was discovered southeast of the UST site area. Additional investigation and subsequent cleanup of the impacted soil is recommended. Petroleum hydrocarbon impacted soil was found in contact with a shallow perched aquifer, indicating possible impacted groundwater. The installation of monitoring wells is recommended to characterize the extent of impacted groundwater. However, due to possible future site remediation activities, placement of monitoring wells should be delayed until excavation and remediation of petroleum impacted soil is complete.

6.0 LIMITATIONS

This Groundwater Characterization Report has been prepared for the exclusive use of Tankwise, Midas Muffler, and their associates. The report is based on data and information collected by Aquifer Associates personnel and their representatives. The recommendations and conclusions contained in this report represent our professional opinions. These opinions were derived in accordance with currently accepted environmental practices at this time and location. Other than this, no warranty is implied or intended.

Sincerely,
Aquifer Associates



Richard N. Simpson
Registered Site Assessor

APPENDIX A
LABORATORY ANALYTICAL REPORTS

Date of Report: November 1, 1996

Date Received: October 30, 1996

Project: Midas

Date Samples Extracted: October 31, 1996

Date Extracts Analyzed: October 31, 1996

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS

BY METHOD 418.1 (5520.F)

Results Reported as $\mu\text{g/g}$ (ppm)

<u>Sample ID</u>	<u>Total Petroleum Hydrocarbons</u>
B1-7	<25
B2-C	1,200
Method Blank	<25

Date of Report: November 1, 1996

Date Received: October 30, 1996

Project: Midas

Date Samples Extracted: October 30, 1996

Date Extracts Analyzed: October 31, 1996

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLE
FOR LEAD USING METHOD 6010**

Samples Processed Using Method 3005A
Results Reported as $\mu\text{g/g}$ (ppm)

<u>Sample ID</u>	<u>Lead</u>
B2-C	27
Method Blank	<1

FRIEDMAN & BRUYA,

ENVIRONMENTAL CHEMISTS

Date of Report: November 1, 1996

Date Received: October 30, 1996

Project: Midas

QUALITY ASSURANCE RESULTS
FOR TOTAL METALS BY
INDUCTIVELY COUPLED PLASMA (ICP)
(METHOD 6010)

Laboratory Code: 73610 (Duplicate)

Analyte:	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Lead	ug/g (ppm)	27	26	4	0-20

Laboratory Code: 73610 (Matrix Spike)

Analyte:	Reporting Units	Spike Level	Sample Result	% Recovery MS MSD		Acceptance Criteria	Relative Percent Difference
Lead	ug/g (ppm)	100	27	99	102	50-150	0-20

Laboratory Code: Spike Blank

Analyte:	Reporting Units	Spike Level	% Recovery MS MSD		Acceptance Criteria	Relative Percent Difference
Lead	ug/g (ppm)	100	109	107	80-120	2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: November 1, 1996

Date Received: October 30, 1996

Project: Midas

QUALITY ASSURANCE RESULTS FOR TOTAL PETROLEUM HYDROCARBONS BY METHOD 418.1 (5520.F)

Laboratory Code: 73609 (duplicate)

Analyte:	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
418.1	ug/g (ppm)	<25	<25	nm	0-20

Laboratory Code: Spike Blank

Analyte:	Reporting Units	Spike Level	% Recovery MS MSD		Acceptance Criteria	Relative Percent Difference
418.1	ug/g (ppm)	250	83	84	80-120	1

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

Client: Tank Wise
Project: K-West / Midas WS
Project #: Midas WS
Matrix: Soil

Samples Submitted: 11/15/96
Date of Analysis: 11/20/96
File ID: 11-052
Analysis: WTPH-G / EPA 8020 (BTEX)
Units: mg/Kg (ppm)

Results

Lab ID	Client ID	Gasoline	Benzene	Toluene	Ethyl Benzene	Xylenes	FB % Surrogate Recovery	BFB % Surrogate Recovery
11-052-2	B4-5	2,600	<0.240	4.9	10.8	69	144%	139%
11-052-4	B6-5	1,100	<0.048	2.4	4.6	32	153%	141%

Quality Assurance

11/20/96-MB2	Method Blank	<0.05	<0.05	<0.05	<0.05	87%	89%
11/20/96-LCS	Lab. Control Spk	96%	97%			93%	96%

ppm = Parts Per Million.

Y = Interferences were present which prevented quantitation of the surrogate recovery.



Client: Tank Wise
Project: K-West/Midas WS
Project#:
Matrix: Soil

Samples Submitted: 11/15/96
Date of Analysis: 11/20/96
File ID: 11-052
Analysis: WTPH 418.1
Units: mg/Kg (ppm)

Results

Lab ID	Customer ID	TPH
11-052-1	B3-6	390
11-052-2	B4-5	710
11-052-3	B5-5	46
11-052-4	B6-5	400

Quality Assurance

Method Blank	<20
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ANALYTICAL LABORATORIES, INC.

8220 7th Avenue South
Seattle, WA 98108

Balch **11 052**

Client Contact Tom Wise / Richard Simpson

Send Lab Report To Tank Wise
4455 35th Ave SW
Seattle, WA 98120

Client Contact Phone 937-3995 fax 932-1007

[illegible]

Special Instructions fax results to 932-1007

Was Preservative Used? No ☐ Yes ☐ What Kind? chilled

1. Relinquished By [Signature] Date 11-15-96 Time 11:31

2. Relinquished By _____ Date _____ Time _____

What Analysis?

Received By [Signature] Date 11-15-98 Time 11:31

Received By _____ Date _____ Time _____