

RESULTS OF PHASE 2 ASSESSMENT

**645 Elmwood Avenue
Aurora, Illinois**

Prepared for:

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528 W. Roosevelt Road
Wheaton, Illinois 60187**

and

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1. INTRODUCTION

Advanced Environmental Corporation (AEC) was retained by Mr. Robert Rhodes (prospective purchaser of the subject property) to perform a Phase 2 Assessment (Phase 2) of the former Shell gasoline service station located at 645 Elmwood Avenue, Aurora, Illinois (the subject property) presently owned by Dr. Norris Erickson. The Phase 2 authorized by Mr. Rhodes on July 15, 1999, was conducted on July 22, 1999, in general conformance with AEC Proposal 99045P dated July 13, 1999.

It is our understanding of from the prospective purchaser and current owner of the property that two gasoline underground storage tanks (USTs) and one heating oil/used oil UST were removed buy Shell Oil Company prior to Federal and State UST registration regulations. Furthermore, we did not learn that the heating oil UST was also used for the disposal of used oil to fuel the on-site heating system until the day of the investigation. Our understanding of the layout of the former USTs, pump islands, facility building, and product piping is as presented in the Boring Location Plan.

The purpose of the Phase 2 was to determine with a reasonable minimum number of borings and laboratory analyses whether there is evidence of obvious leaking underground storage tank (LUST) contamination of the subject property.

2. SCOPE OF WORK

The authorized Phase 2 consisted of advancing three borings at the locations of the three former USTs to a depth of 15 feet each. The authorized scope of work allowed for the laboratory analysis of one soil sample from each boring. Two of the soil samples were to be from the gasoline UST area, and were to be analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX) and total lead, in accordance with the analytical requirements for USTs that formerly stored leaded gasoline as outlined in the Illinois UST law, 35 IAC Part 732. The third soil sample was to be selected from the boring located at the former heating oil UST site, and was to be analyzed for BTEX and polynuclear aromatic hydrocarbons (PNAs), also in accordance with the requirements of 35 IAC Part 732 for heating oil USTs. Although used oil screening generally involves a more extensive analysis than just BTEX and PNAs, BTEX and PNAs are mandatory base tests for used oil as well as heating oil USTs. Therefore BTEX and PNA analyses adequately assess contaminant conditions at the heating oil/used oil UST site for this level of study.

Based on visual observations of site conditions and the former facility layout at the time of the investigation and a discussion with the Property Owner, Dr. Norris Erickson, it was judged that three borings would not adequately assess potential contamination at all of the likely areas of impact; i.e. at the locations of the former USTs, at the former pump islands, and along product piping runs. Therefore, the investigation was modified in the field to allow the implementation of additional borings within the total authorized budget. The modified investigation consisted of reducing the depths of some of the borings, and applying that footage towards additional shallow borings at the pump islands and along product piping runs. A total of 5 borings to depths ranging from 5 feet to 15 feet were ultimately conducted. One soil sample from the heating oil/used oil UST area was analyzed for BTEX and PNAs, and two soil samples - one from the gasoline UST tank bed area, and the other from one of the other gasoline LUST borings exhibiting the most elevated VOCs screened in the field - were analyzed for BTEX and total lead.

3. SUBSURFACE INVESTIGATION

3.1 Drilling and Sampling Procedures

Borings B1 through B5 were advanced at the locations shown on the Boring Location Plan with hollow stem augers using a truck-mounted drill rig, with split spoon soil sampling performed through and ahead of the augers at 2.5-foot vertical intervals. All soil samples were screened at the time of collection for the presence of volatile organic compounds (VOCs) using a Photovac Microtip photoionization detector (PID). Screening was conducted by placing a small portion of each sample in a plastic ziplock bag, warming the sample in the sun to induce volatilization, and inserting the tip of the PID into the bag through a small opening to sample the headspace within the bag. Total VOC concentrations measured for each sample have been recorded on the boring logs in Appendix 1.

Sampling tools were washed in analconox bath, rinsed with tap water, and final rinsed with distilled water following each use to prevent cross contamination between samples. Augers were pressure washed inside and out between uses to ensure cross contamination between borings could not occur. Soil cuttings were returned to their respective borings following drilling and sampling.

3.2 Results of VOC Field Screening

Total VOC concentrations measured in the field at the time of the investigation

have been recorded on the boring logs in Appendix 1. Boring B1 was situated in the center of the gravel area understood to be the site of the former gasoline USTs. Soil conditions at B1 bore this out as original tank backfill pea gravel was still present between the depths of 6 and 11 feet which exhibited a gasoline odor. VOC concentrations in B1 ranged from 35.7 ppm to 61.7 ppm within the pea gravel, and sharply decreased in underlying native soils to 1.5 ppm at a depth of 15 feet.

Very low VOC concentrations were measured at B2, situated at the location of the former heating oil/used oil UST. VOC concentrations ranged from 0 ppm at a depth of 10 feet, to 4.3 ppm at a depth of 3.5 feet.

The highest VOC concentrations were detected at the two pump islands/product piping runs. The highest VOC concentration of 353 ppm was detected in boring B3 along the piping run adjacent to the north pump island, and the second highest VOC concentration of 218 ppm was detected in boring B5 at the location of the former west pump island. Very low VOCs (maximum 6.3 ppm) were detected in B4 located at the edge of the gasoline UST bed, indicating that LUST contamination is possibly confined to within the tank bed area.

3.3 Results of Laboratory Analysis

As discussed previously, one soil sample was selected from the soil sample exhibiting the highest VOCs during field screening from the boring at the heating oil/used oil UST site for laboratory analysis of BTEX and PNAs, one soil sample was selected from the soil sample exhibiting the highest VOCs from the boring in the center of the gasoline UST field for laboratory analysis of BTEX and total lead, and the soil sample exhibiting the highest VOCs from the remaining three borings was selected for laboratory analysis of BTEX and total lead.

The depth of each soil sample selected for laboratory analysis is indicated both on the boring logs in Appendix 1, and on the sample Chain of Custody Record included in Appendix 2.

Soil samples were maintained in a cooler until delivery to First Environmental Laboratories (First), Naperville, Illinois, for chemical analysis. Proper sample handling, preservation, and chain of custody protocols were maintained at all times.

Analytical results have been compared with Tier 1 soil corrective action objectives (CAOs) for Residential Properties outlined in 35 Illinois Administrative Code Part 742, "Tiered Approach to Corrective Action Objectives (TACO)", as published in the TACO release dated June 5, 1997. An analytical summary and analytical data sheets are included in Appendix 2.

The following summarizes the comparison of the soil results with TACO Tier 1 CAOs.

Sample B1-3 (6.0'-6.2'). This sample was from the tank bed area of the former USTs where a total VOC concentration of 61.7 ppm was measured during field screening. It was analyzed for BTEX and total lead. IEPA Tier 1 CAOs were not exceeded for any of the compounds analyzed.

Sample B2-2 (3.5'-3.7'). This sample was from the former heating oil/used oil UST site where a total VOC concentration of 4.3 ppm was measured during field screening. It was analyzed for BTEX and PNAs. BTEX and PNAs were not detected in this sample.

Sample B3-1 (1.4'-1.7'). This sample was from along the product piping run adjacent to the north pump island area where a total VOC concentration of 353 ppm was measured during field screening. It was analyzed for BTEX and total lead. Benzene was detected at a concentration of 0.101 ppm, which is approximately 3.4 times higher than the IEPA Tier 1 CAO for this compound. The other BTEX compounds and lead did not exceed their respective Tier 1 CAO.

4. CONCLUSIONS

Based on the results of this Phase 2, there is evidence of some LUST contamination in excess of Tier 1 CAOs along the piping runs. This contamination likely extends beneath the pump islands, and although not detected in the single soil sample obtained from the gasoline tank bed, olfactory indications of the presence of gasoline in the original tank backfill materials that still remain in the excavation area would tend to indicate that there is likely some LUST contamination within the former tank area. However, judging from the findings of this study and the relatively low contaminant concentrations, the extent of LUST contamination exceeding Tier 1 CAOs is anticipated to be relatively minor.

5. LIMITATIONS

AEC warrants that the Phase 2 study presented in this Report has been performed in a professional manner using the degree of care and skill exercised for similar projects under similar conditions as those used by other reputable and competent environmental consultants. The findings and conclusions presented by AEC are limited to the date of evaluation, and are based solely on the scope of work conducted, observations made, and limited explorations described in this Report, and not on scientific tasks or procedures beyond the scope of agreed

upon services, or time and budget restraints imposed by the Client. No warranty, expressed or implied, is made as to the professional opinions included in this Report.

Figure

Boring Location Plan

Appendices

Appendix 1 - Soil Boring Logs
Appendix 2 - Analytical Results

RESULTS OF PHASE 2 ASSESSMENT
645 N. Elmwood Avenue
Aurora, Illinois

APPENDIX 1
SOIL BORING LOGS

SOIL BORING LOG

Project Number 99045T01
 Client AEC
 Contractor CHICAGO DRILLING Co.
 Drilling Method 2 1/4" HSA
 Hole Size 5 1/2" Ø
 Driller M. SHIMON
 Logged by D. Yacko

Project Name 645 N. ELMWOOD

WATER LEVEL				
TIME				
DATE				

Sample Hammer: Weight 140 #
 Drop 30"
 Sampler Dimensions 2" Ø SPLIT SILEN

Boring No. B1
 Location CENTER OF UST FIE
 Coordinates: N
 E
 Ground Elevation
 Total Depth 15.0'
 Date Started 7/22/99
 Date Completed 7/22/99

Depth (ft/m)	Sample Depth (ft/m)	Sample No.	Sampler Type	Blows per 6 in/15 cm	Length Driven (in/cm)	Length Recovered (in/cm)	Casing Depth (ft/m)	Unified Soil Classification	SOIL DESCRIPTION	NOTES AND FIELD TESTS
									Surface Conditions: <u>STONE BACKFILL IN GAS UST AREA</u>	
1								GP	<u>CRUSHED LIMESTONE</u>	
2		1	SS		<u>SKIPPED</u>				<u>+3" CRUSHED CONCRETE</u>	<u>TOO COARSE TO SPT</u>
3										
4		2	SS	2	18	6		CL	<u>BR-GR SI-CL w/ FI- CO SA, FI-M GVL; WET; PLASTIC (SOFT)</u>	<u>PID = 0 ppm @ 4'</u>
5				2						
6		3	SS	2	18	2		GP	<u>PEA GRAVEL; WET (DENSE)</u>	<u>PID = 61.7 ppm @ 6.2'</u>
7				2						<u>GASOLINE ODOR</u>
8				8						
9		4	SS	2	18	2				<u>PID = 35.7 ppm @ 8.7'</u>
10				2						<u>GASOLINE ODOR</u>
11				1						
12		5	SS	6	18	12		CL	<u>GR SI-CL w/ SO FI SA, TR FI GVL; MOIST; M. PLASTICITY (V. STIFF)</u>	<u>PID = 8.1 ppm @ 12'</u>
13				8						
14		6	SS	8	18	18				<u>PID = 1.5 ppm @ 15'</u>
15				10						
				12						
									<u>BORING TERMINATED @ 15'</u>	
									<u>WATER ENCOUNTERED @ 26'</u>	

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Aurora, Illinois

APPENDIX 2
ANALYTICAL RESULTS

645 Elmwood Avenue
 Aurora, Illinois
 99045T01.WK1
 07/30/99

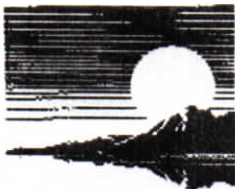
SUMMARY OF PHASE 2 ASSESSMENT SAMPLE ANALYSIS

Sample	Parameter (concentration in ppm)							P/*
	Benzene	Toluene	Ethyl Benzene	Xylenes	Total BTEX	PNA's	Total Lead	
IEPA Soil Cleanup Objective [1]	0.03	12.0	13.0	150.0	175.03		400.0	
B1-3 (6.0'-6.2')	0.0074	BDL	0.1280	0.0059	0.1413	-	6.6	P
B2-2 (3.5'-3.7')	BDL	BDL	BDL	BDL	BDL	BDL	-	P
B3-1 (1.4'-1.7')	0.1010	0.0343	0.4220	0.4860	1.0433	-	33.6	*

[1] IEPA "Tiered Approach to Corrective Action Objectives (TACO)", 35 IAC Part 742, Tier 1 Corrective Action Objectives for Residential Properties, June 5, 1997.

[2] P = meets all IEPA Tier 1 Corrective Action Objectives (CAOs); * = one or more IEPA Tier 1 CAO exceeded

BDL = concentration of analyte below the Reportable Detection Limit (RDL) or Practical Quantitation Limit (PQL)



**First
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1600 Shore Road • Naperville, Illinois 60563 • Phone (630) 778-1200 • Fax (630) 778-1233
IEPA Certification #100292

July 29, 1999

Mr. David G. Yacko
SITE ENVIRONMENTAL SERVICES, INC.
15774 South LaGrange Road, Suit 990
Orland Park IL 60462-4766

Dear Mr. Yacko:

Enclosed are the analytical results in support of the project identified Rhodes 99045T01", received by First Environmental Laboratories, Inc. on July 22, 1999. These samples were analyzed as directed on the enclosed chain of custody form.

PROJECT SUMMARY

Analyses were performed in accordance with methods found in the USEPA publication, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, December, 1996. Results are reported on a dry weight basis per method protocols.

All analyses were performed within established holding times, and all Quality Control criteria as outlined in the methods have been met. QA/QC documentation and raw data will remain on file for future reference.

I thank you for the opportunity to be of service, and look forward to working with you again in the future. Should you have any questions regarding any of the enclosed analytical data or need additional information, please contact me at (630) 778-1200.

Sincerely,

W. Matczek for
Stan Zaworski
Project Manager

Date: 7/29/99	Pages: 5	QUICK FAX™ OfficeMax	
To: <i>Yacko</i>	From: <i>Bill</i>		
Co./Dept:	Co./Dept:		
Fax:	Fax:		
Phone:	Phone:		
Note:	E-Mail:		



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Analytical Report

Client: SITE ENVIRONMENTAL SERVICES
Project ID: Rhodes 99045T01 Date Received: 07/22/99
Sample Number: 80762 Date Taken: 07/22/99
Sample Description: B1-3 (6.0'-6.2') Date Reported: 07/29/99

Analyte	Result	Units	Flags
Solids, Total	92.82	%	

BTEX Method 5035/8260B

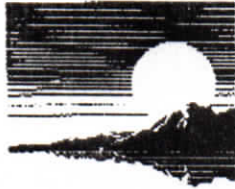
Analysis Date: 07/26/99

Benzene	7.4	ug/kg	
Toluene	< 5.0	ug/kg	
Ethyl benzene	128	ug/kg	
Xylenes (total)	5.9	ug/kg	

Method 6010B

Analysis Date: 07/29/99

Lead	6.6	mg/kg	
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Analytical Report

Client: SITE ENVIRONMENTAL SERVICES
Project ID: Rhodes 99045T01
Sample Number: 80763
Sample Description: B2-2 (3.5'-3.7')

Date Received: 07/22/99
Date Taken: 07/22/99
Date Reported: 07/29/99

Analyte	Result	Units	Flags
Solids, Total	87.78	%	

BTEX Method 5035/8260B

Analysis Date: 07/26/99

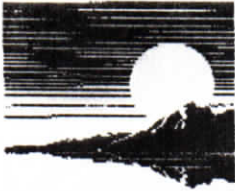
Benzene	< 2.0	ug/kg	
Toluene	< 5.0	ug/kg	
Ethyl benzene	< 5.0	ug/kg	
Xylenes (total)	< 5.0	ug/kg	

Polynuclear Aromatic Compounds Method 8270C

Preparation Date: 07/25/99

Analysis Date: 07/27/99

Naphthalene	< 25	ug/kg	
Acenaphthylene	< 50	ug/kg	
Acenaphthene	< 50	ug/kg	
Fluorene	< 50	ug/kg	
Phenanthrene	< 50	ug/kg	
Anthracene	< 50	ug/kg	
Fluoranthene	< 50	ug/kg	
Pyrene	< 50	ug/kg	
Benzo[a]anthracene	< 8.7	ug/kg	
Chrysene	< 50	ug/kg	
Benzo[b]fluoranthene	< 11	ug/kg	
Benzo[k]fluoranthene	< 11	ug/kg	
Benzo[a]pyrene	< 15	ug/kg	
Indeno[1,2,3-cd]pyrene	< 29	ug/kg	
Dibenz[a,h]anthracene	< 20	ug/kg	
Benzo[g,h,i]perylene	< 50	ug/kg	



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Analytical Report

Client: SITE ENVIRONMENTAL SERVICES
Project ID: Rhodes 99045T01 Date Received: 07/22/99
Sample Number: 80764 Date Taken: 07/22/99
Sample Description: B3-1 (1.4'-1.7') Date Reported: 07/29/99

Analyte	Result	Units	Flags
Solids, Total	77.66	%	

BTEX Method 5035/8260B

Analysis Date: 07/26/99

Benzene	101	ug/kg	
Toluene	34.3	ug/kg	
Ethyl benzene	422	ug/kg	
Xylenes (total)	486	ug/kg	

Method 6010B

Analysis Date: 07/29/99

Lead	33.6	mg/kg	
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