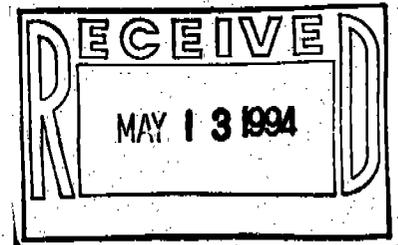


INITIAL SITE CHARACTERIZATION REPORT

2205 OAK HILL DRIVE
GREENSBORO, NORTH CAROLINA

MAY 4, 1994



LEGACY ENVIRONMENTAL SERVICES, INC.



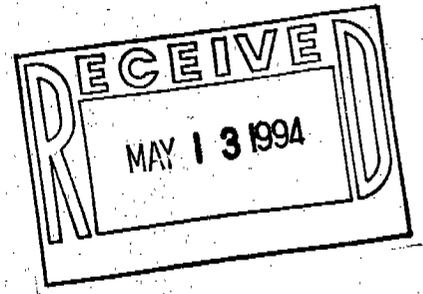


LEGACY ENVIRONMENTAL SERVICES, INC.

P.O. Box 4560, Greensboro, NC 27404-4560, Phone (910) 316-0452, FAX (910) 299-1961

May 11, 1994

Mr. Melvin Yarboro
1072 Tarry Church Road
Star, NC 27356



Reference: Initial Site Characterization
2205 Oak Hill Drive
Greensboro, North Carolina

Dear Mr. Yarboro:

In accordance with the requirements of North Carolina Administrative Code Title 15A, Chapter 2, Subchapter 2N, Section .0704, contained herein is an Initial Site Characterization report for the release which occurred at the above referenced facility. These activities have been conducted following discovery of high boiling-point petroleum fuel hydrocarbons above current regulatory action levels in soils below the former location of one 550 gallon #2 fuel oil (heating oil) UST formerly located at the site.

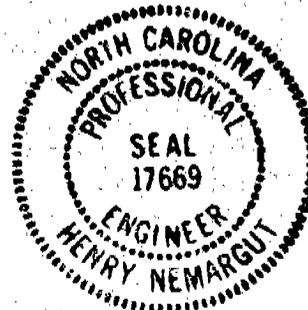
The activities conducted during our investigation consisted of field screening of soils and field sampling and laboratory analyses of ground water in the vicinity of the former underground storage tank removed from this facility. Also included with this report is an analysis of physical and demographic conditions in the area of the project site. All activities were conducted in accordance with North Carolina Department of Environment, Health, and Natural Resources (NCDEHNR) guidelines and the requirements of 15A NCAC 2N.

Mr. Yarboro, if you have questions regarding this report, please contact our office.

Sincerely,

Susan G. Feir
Project Manager

Henry Nemargut, P.E.
Chemical Engineer



INITIAL SITE CHARACTERIZATION REPORT

2205 OAK HILL DRIVE
GREENSBORO, NORTH CAROLINA

MAY 11, 1994

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Appendix D: Soil Boring Log
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INITIAL SITE CHARACTERIZATION

2205 Oak Hill Drive
Greensboro, North Carolina

1.0 Introduction and Background

1.1 Introduction

The residence at 2205 Oak Hill Drive in Greensboro, NC was the former site of one 550 gallon #2 fuel oil (heating oil) UST. Mr. Melvin D. Yarboro of Star, NC is the tank owner. Figure 1 illustrates the location of this site. This UST, which was reportedly taken out of use in 1980, was removed on February 24, 1993 by the G&H Oil Co., Inc. (G&H) in accordance with the requirements of 2N NCAC 15A. G&H excavated and removed the UST and conducted an assessment of the soils surrounding the tank during closure. Results of the G&H UST Closure Assessment indicated the following:

- A release of an unknown quantity of petroleum has occurred in the vicinity of the UST previously located at this site.
- Laboratory analytical results indicated that petroleum contaminated soils at a maximum level of 1,450 ppm (EPA Method 3550) remain in place at the site.

A copy of the G&H UST Closure Report is included in Appendix A.

In April, 1993 G&H subcontracted Richard Catlin & Associates, Inc. of Winston-Salem, NC to conduct a Site Sensitivity Evaluation (SSE) of the site. Catlin & Associates concluded that groundwater levels prevented proper performance of an SSE at the site. The Catlin & Associates SSE report, included as Appendix B, is discussed in more detail in Section 4.3 of this report.

Based on the data collected from the closure assessment and SSE, Mr. Yarboro contracted Legacy Environmental Services, Inc. (Legacy) to conduct initial site characterization activities at the site. The activities conducted during Legacy's investigation consisted of field activities aimed at determining subsurface conditions, groundwater quality and an analysis of physical and demographic conditions at the project site. All activities were conducted in accordance with North Carolina Department of Environment, Health, and Natural Resources (NCDEHNR) guidelines and the requirements of 15A NCAC 2N .0704.

1.2 Scope of Services

This Initial Site Characterization contains documentation concerning the following activities which have been conducted at this site:

- Physical and demographic analyses of the project site
- Monitor well construction
- Investigation for the presence of free product
- Ground water sampling
- Laboratory analyses of a groundwater sample conducted by Water Technology & Controls, Inc. of Reidsville, NC

2.0 Site and Vicinity Description

2.1 Topography/Surface Water

The subject property is located in the U.S.G.S. Greensboro Quadrangle in the approximate area shown in Figure 1. The site was constructed at an approximate elevation of 860' above mean sea level.

The partial U.S.G.S. map included as Figure 1 indicates that surface waters in the vicinity of the site drain generally toward the east, feeding an unnamed stream which drains into Buffalo Lake. The site lies within the upper part of the Cape Fear River Basin which is drained by the Haw & Deep Rivers.

2.2 Land Use

The land in the immediate vicinity of the site is used for residential purposes.

2.3 Demographics

The 1990 census indicated a population of 180,000 for Greensboro, North Carolina.

2.4 Climatological Conditions

Seasonal temperature in the Piedmont Triad area averages 44 degrees Fahrenheit in January, and 77 degrees Fahrenheit in July. Precipitation averages 46"/year; evaporation averages 41"/year; and thunderstorms occur on an average of 50 days/year.

2.5 Geology, Soils & Groundwater

The subject property is underlain by fine-grained residual soil typical of saprolite in the North Carolina Piedmont. The predominant soil types encountered during our subsurface investigation at the project site included silty clay, sandy silty clay and sandy, clayey silt. The deepest boring conducted at this site was advanced to a depth of 22'. Bedrock was not penetrated during the site assessment activities. A soil boring log prepared by Legacy is contained in Appendix A.

2.6 Water Quality & Use

A 1-1/2 mile radius around the project site is served by the City of Greensboro for the most part. Reconnaissance of the area surrounding the site failed to reveal any water supply wells within a 1500' radius.

Ground water in the Greensboro area is generally of good quality and is suitable for most industrial and municipal uses. Groundwater extracted from one monitoring well installed at the site was sampled and analyzed during this project. A summary of our findings is located in Section 3.5 of this report.

2.7 Subsurface Conditions

Subsurface investigation at the site indicated unconsolidated material to a depth of 22', the maximum subsurface depth explored during the subsurface investigation.

2.8 Subsurface Utilities

No subsurface utilities were identified within the suspected contamination zone at this site.

3.0 Assessment/Evaluation

3.1 Free Product Check

On March 18, 1994, Legacy Field technicians installed a 2" PVC groundwater monitoring well to a depth of 22' in the vicinity of the former tank location. Testing for free product at this site was conducted using a Keck oil/water interface probe, capable of detecting a free product layer of 1/8" or greater. The Keck probe did not detect the presence of a floating free product layer in this well installed at the site. Static ground water level was observed at a depth of approximately 13.21' below surface grade.

3.2 Soil Screening

One soil boring was advanced to a depth of 21' at the site. This boring was performed utilizing a portable auger drilling rig. Representative soil samples were obtained at three foot intervals from the cylinder of the hand-auger advanced into the borehole. Field screening of auger samples was conducted utilizing a Foxboro Organic Vapor Analyzer (OVA). The unit was calibrated prior to use in accordance with manufacturer's recommended procedures with a 977 ppm calibration gas standard furnished by the manufacturer. Samples selected for field screening were placed into "ziplock" type bags, agitated and allowed to equilibrate in sunlight in order to obtain a representative value of soil off-gases.

OVA readings of the soils indicated soil gas levels of less than 10 ppm at 3' and 6' below grade. Readings increased to 63 ppm at 9', 70 ppm at 12', and 138 ppm at a depth of 15'. Soils at 18 feet were saturated with water and yielded an OVA reading of 104 ppm. At 21', the base of the borehole, the OVA reading had decreased to 18 ppm. Results from field screening operations are included in the boring log attached as Appendix D.

3.3 Site Sensitivity Evaluation

In April, 1993 representatives from Richard Catlin & Associates, Inc. visited to the site to perform a Site Sensitivity Evaluation ((SSE). Four auger borings were advanced at the site and following boring activities, water levels stabilized at depths of between 6' and 10' below grade. The Catlin report states that an SSE is in order only when contamination exists 5' or more above the water table, top of bedrock or transmissive, indurated sediments. Contamination at this site, according the G&H UST Closure report, was found at a depth of 8'. Catlin & Associates conclude that groundwater levels recorded during their investigation prevented the proper performance of an SSE at this site.

3.4 Monitor Well Construction

During the site investigation, one ground water monitoring well was constructed at the site in the borehole advanced during the soil assessment activities. This well was installed at the release source in the vicinity of the former UST location. The location of this monitor well, denoted MW-1, is illustrated on Figure 2.

Specific monitor well construction records are contained in Appendix E. The well was constructed with 2" PVC casing with a sand pack around all slotted portions, a bentonite seal, and a boring grouted to the land surface. The well was capped with locking watertight plug and a bolt secured water-tight manhole cover.

3.5 Groundwater Analyses

The monitoring well constructed at subject property was developed by removing a minimum of five well volumes following installation to ensure that the extracted sample was representative of actual ground water conditions. The well was developed and sampled on March 18, 1994, using an individual disposable bottom loading plastic bailer suspended with new nylon string. Following development of the ground water well, a sample was obtained from the disposable plastic bailer.

The sample was placed in laboratory supplied glassware, labeled with sample location, analysis to be performed, time, date and sampler's name. The sample jar was then immediately placed in a cooler, chilled with ice to approximately 4°C in preparation of transportation to the analytical laboratory utilizing EPA approved chain-of-custody procedures. At the analytical laboratory the ground water sample from MW-1 was analyzed for dissolved petroleum constituents utilizing EPA Methods 602 plus xylenes, and EPA Method 625 with the 10 largest peaks identified. The sample was also analyzed according to EPA Method 3030C for the presence of lead.

Laboratory results for the water sample extracted from MW-1, located at the release source, indicated that xylenes were detected in a total concentration of 0.017 ppb. This level is below the current 2L Standard of 530 ppb. No other 602 compounds were identified in concentrations above the laboratory's detection limits.

Naphthalene in a concentration of 0.015 ppm was reported in sample MW-1. A review of the 2L Standard does not indicate that a maximum allowable concentration for this compound has been established.

Seven compounds with a total combined concentration of 0.19 ppm were tentatively identified through laboratory library search analyses via Method 625 in the sample obtained from MW-1. A review of the 2L Standard does not indicate that maximum allowable concentrations for any of these seven compounds has been established. These tentatively identified compounds are listed on Table 1.

Lead levels were below the laboratory's instrument detection limits, according to EPA Method 3030C. Detected compounds are listed on Table 1 and Appendix F contains a copy of the laboratory analytical results and the EPA chain of custody records for these samples.

4.0 Nature and Estimated Quantity of Release

Evidence of petroleum release at the project site was confirmed through the presence of dissolved petroleum constituents in shallow ground water. The constituents identified in our investigation included compounds typically associated with petroleum contamination. The exact quantity of release was not determined by our activities but since free product was not observed on shallow ground water, the release is believed to be of a relatively small quantity.

5.0 Conclusions

5.1 General Summary

An Initial Site Characterization of the residential property at 2205 Oak Hill Drive has been completed. From a review of all information gathered during this project and the closure assessment, Legacy Environmental Services, Inc. makes the following conclusions:

- A petroleum release of unknown quantity has occurred at this site. Elevated TPH levels were noted in in-situ soils located below one 550 gallon #2 fuel oil UST during UST closure sampling.
- One shallow groundwater well was constructed at the site during this investigation. Free product was not observed in this well or during any phase of this project.
- Laboratory analysis of a groundwater sample extracted from the monitor well installed at this site indicates that dissolved petroleum constituents have been introduced into the ground water near the release source. Naphthalene at a level of 0.015 ppm was reported in the sample. Seven 625 library search compounds were tentatively identified in the water sample obtained from this well at a total concentration of 0.19 ppm. No EPA Method 602 compounds in concentrations above the current 2L Standard were reported in the MW-1 sample.
- Lead was not detected in the water sample collected during this investigation.
- The exact quantity of the release has not been determined by our investigation.

TABLES

TABLE 1

**DETECTED COMPOUNDS - EPA METHOD 602
GROUNDWATER SAMPLE**

2205 OAK HILL ROAD
GREENSBORO, NORTH CAROLINA

CONSTITUENT	DATE	SDL (ppm)	RESULT (ppb)	2L STANDARD (ppb)
m,p-Xylene	3/18/94	—	0.007	530 ppb
o-Xylene	3/18/94	—	0.010	530 ppb

**DETECTED COMPOUNDS - EPA METHOD 625
GROUNDWATER SAMPLE**

CONSTITUENT	DATE	RESULT (ppm)	2L STANDARD (ppm)
Naphthalene	3/18/94	0.015	N/L

N/L = Not Listed

TABLE 1, Page 2

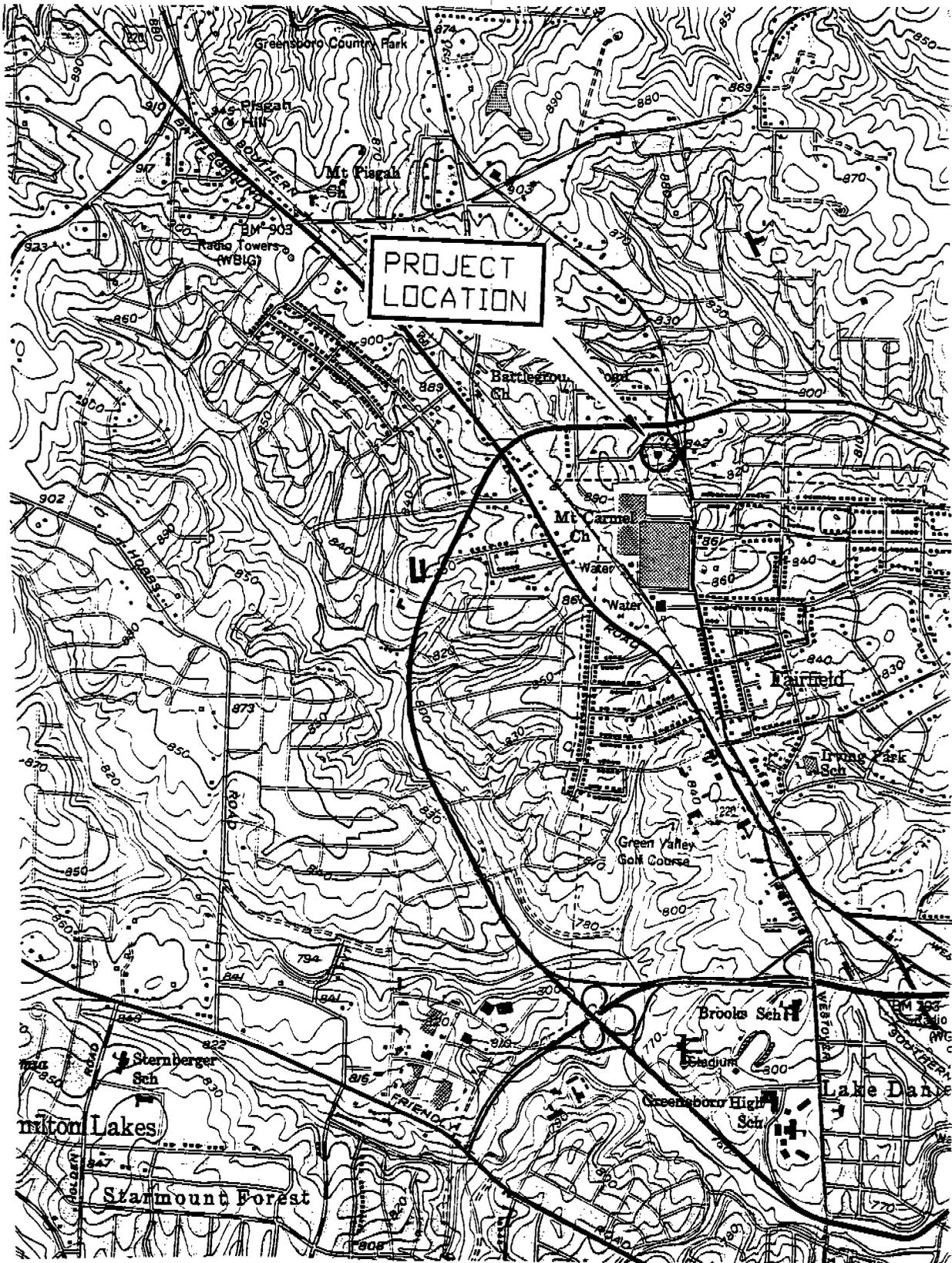
TENTATIVE IDENTIFICATION OF 10 MOST SIGNIFICANT PEAKS
 IN SEMI-VOLATILE FRACTION OF MW-1
 (LIBRARY SEARCH)

2205 OAK HILL ROAD
 GREENSBORO, NORTH CAROLINA

CONSTITUENT	DATE	RESULT (ppm)	2L STANDARD (ppm)
1,2,4-Trimethylbenzene	3/18/94	0.024	N/L
(E)-1-Phenyl-1-butene	3/18/94	0.011	N/L
1-Methylnaphthalene	3/18/94	0.017	N/L
1,5-Dimethylnaphthalene	3/18/94	0.027	N/L
2,3-dimethyl naphthalene	3/18/94	0.034	N/L
1,7-Dimethyl naphthalene	3/18/94	0.02	N/L
2-Methyl naphthalene	3/18/94	0.06	N/L

N/L = Not Listed

FIGURES



PROJECT
LOCATION



LEGACY
ENVIRONMENTAL
SERVICES, INC.
GREENSBORO, NORTH CAROLINA

CLIENT:
MELVIN YARBOROUGH
GREENSBORO NC

PROJECT:
UST CLOSURE
2205 OAK HILL DR.
GREENSBORO, NC

TITLE:
PROJECT LOCATION

SCALE: N.T.S.
DATE: 3/25/95
DWN.BY: CJS
DWG.# 194-133A

FIGURE 1

OAK HILL DR.

DRIVEWAY

CARPORT

RESIDENCE

PORCH

ROCKWALL

BRICKWALL

FORMER UST LOCATION

MW-1

LEGEND

SCALE
0' 10' 20'

⊗ MONITORING WELL LOCATION

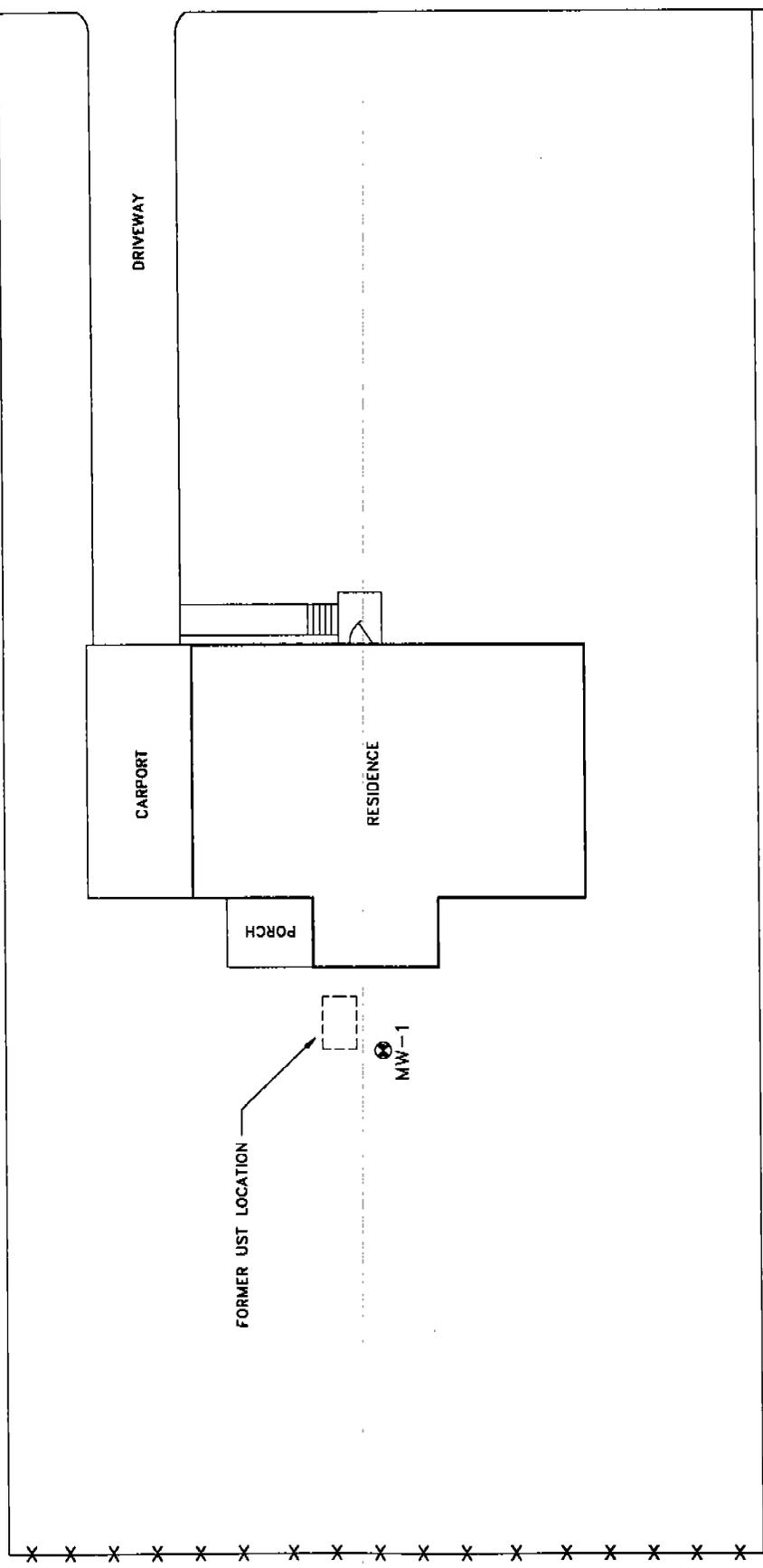


FIGURE 2

SCALE: 1" = 20'
 DATE: 3/25/95
 DWN.BY: CJS
 DWG.# L94-133

TITLE:
 SITE LAYOUT &
 MONITORING WELL LOCATION

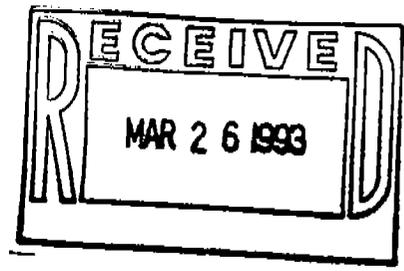
PROJECT: UST CLOSURE
 2205 OAK HILL DR.
 GREENSBORO, NC

CLIENT:
 MELVIN YARBOROUGH
 GREENSBORO, NC



LEGACY
 ENVIRONMENTAL
 SERVICES, INC.
 GREENSBORO, NORTH CAROLINA

APPENDIX A
G&H OIL UST CLOSURE REPORT



Underground Storage Tank
Closure Assessment

Residence of:
Mr. Melvin D. Yarboro
2205 Oak Hill Drive
Guilford County
Greensboro, NC

Prepared by:
G & H Oil Equipment, Inc.
Greensboro, NC
William V. Hill

March 24, 1993

Introduction

On February 24, 1993, G & H Oil Equipment, Inc., excavated and removed one (1) 550 gallon #2 Fuel Oil underground storage tank (UST) at the residence of Mr. Melvin D. Yarboro, 2205 Oak Hill Drive, Greensboro, NC. Mr. Yarboro currently resides at 1072 Tarry Church Road, Star, NC 27356.

The UST closure was being performed as a stipulation to the sale of the property. The UST was out-of-service since the heating system had previously been converted to natural gas.

Initial Investigation

On February 24, 1993, G & H excavated and removed one (1) 550 gallon #2 Fuel Oil UST. The removed UST was of steel construction, 48" diameter x 6'0" long. The top of the tank was buried under 2' of earth cover placing the tank bottom at 6' from the surface.

The tank was found to have 11" (approximately 75 gallons) of residual product and/or water. Liquid was pumped from the tank by G & H into 55 gallon drums and transported to Four Seasons Industrial Services for disposal.

The removed tank was found with several small holes in the bottom North end. No free product or ground water were encountered in the pit excavation.

The removed tank was transported to Safeway Tank Disposal, Inc., Colfax, NC. A copy of the Receiving Report (figure 1) and Certificate of Disposal (figure 2) are enclosed.

Two (2) soil samples were collected from the undisturbed backfill approximately 2' below the tank bottom at 8' from the surface. Samples were collected in laboratory furnished 4 oz. clear glass sample jars with teflon closures, preserved on ice, and delivered to Burlington Research. Samples were taken by Donnie Maness of G & H Oil Equipment, and a copy of the Chain of Custody (figure 3) is enclosed.

The tank pit excavation was backfilled pending results of soil analysis reports.

Soil Analysis Report

G & H has received Burlington Research's Report of Analysis No. 93-02-532 dated March 8, 1993. A copy of the report (figure 4) and our sketch of soil sample locations (figure 5) are enclosed.

Soil sample results are as follows:

Sample DN1 (93-02-532-01)

Collected at approximately 8' from the surface beneath the North end of the removed tank. Results indicate 89.7 ppm total petroleum hydrocarbons by EPA method 5030 and 103 ppm total petroleum hydrocarbons by EPA method 3550.

Sample DS2 (93-02-532-02)

Collected at approximately 8' from the surface beneath the South end of the removed tank. Results indicate 145 ppm total petroleum hydrocarbons by EPA method 5030 and 1,450 ppm total petroleum hydrocarbons by EPA method 3550.

Results of Soil Analysis Reports were telephoned to Ms. Kelly Gage at the Guilford County Department of Emergency Services as a notification of petroleum release. The owner and potential buyer were also advised of results and given recommendations for site remediation.

Conclusions and Recommendations

G & H has excavated, and removed one (1) 550 gallon #2 Fuel Oil UST at the residence of Mr. Melvin D. Yarboro, 2205 Oak Hill Drive, Greensboro, Guilford County, NC.

Results of Soil Analysis Reports indicate that detectable levels of total petroleum hydrocarbons are in excess of minimum action levels and that a release of petroleum into the soil has occurred.

Ms. Kelly Gage, Guilford County Department of Emergency Services, was notified of soil sample results and the following recommendations were given to Mr. Yarboro.

A Site Sensitivity Evaluation (SSE) should be performed to determine the minimum threshold for soil clean-up at this site. Upon completion of the SSE, soil should be excavated and removed from the tank pit to meet or exceed total petroleum hydrocarbon levels established by the SSE. Additional soil samples should be taken to confirm results and the petroleum contaminated soil disposed of with confirming documents provided to Guilford County.

Qualifications

Our services have been performed, our findings obtained, and our recommendations prepared in accordance with customary principles and practices in the field of tank closures. No other warranty, expressed or implied, is made as to the options included with this report. Opinions and recommendations presented herein apply to the site conditions existing at the time of our investigation.

G & H OIL EQUIPMENT, INC.

William V. Hill

William V. Hill
March 24, 1993

CHAIN OF CUSTODY RECORD

CLIENT: **G+H OIL Equipment, Inc.** CONTACT PERSON: **Bill Hill**
 Facility/Site: **Melvin Yarbero 2205 OAK HILL DR, Phone Number: (919) 292-5143**
 Sampler: (Print) **Donald Moness** Purchase Order #: **227**

Burlington Research
 • 815 Huffman Mill Road
 • Burlington, NC 27216
 • (919) 684-6564
 • Fax: (919) 684-6564, Ext. 202

SAMPLE ID	SAMPLE COLLECTION		SAMPLE TYPE			NO. OF CON-TAINERS SENT	ANALYSES REQUIRED	FOR LAB USE ONLY		
			COMPOSITE		GRAB			TEMPERATURE (°C)	SAMPLE INTEGRITY	PRESERVATION
			HAND	AUTO						
DS1 at 8'	DATE TIME STARTED: 1030	DATE TIME ENDED: 2/24/93			✓	1	5030, 3550 (#2 Fuel Oil)			
DS2 at 8'	DATE TIME STARTED: 1030	DATE TIME ENDED: 2/24/93			✓	1	5030, 3550 (#2 Fuel Oil)			

FOR CLIENT USE:

Relinquished by: (Signature) *Donald Moness*
 Shipped by: (Signature)

Received by: (Signature)
 Received by: (Signature)

Date: 2-25-93
 Date:

Time: 9:10 AM
 Time:

Method of Shipment:

FOR LAB USE ONLY
 Received in Lab FROM: (Signature) *Donald Moness*
 Method of Shipment: *Hand*

Received for Lab BY: (Signature) *[Signature]*
 Date: 2-25-93
 Sample Integrity Comment:

Date: 2-25-93
 Date:

Time: 0910
 Time:



Analytical Services • Aquatic Bioassay Testing • Aquatic Toxicity Reduction Evaluations
AATCC Testing Services • NPDES Testing • Reporting & Data Handling Services
PMN Aquatic Bioassay Evaluations

Post Office Box 2481 • 615 Huffman Mill Road • (919) 584-5564 • Burlington, NC 27216-2481

March 08, 1993

G and H Oil Equipment, Inc.
P.O. Box 7446
Greensboro, NC 27417

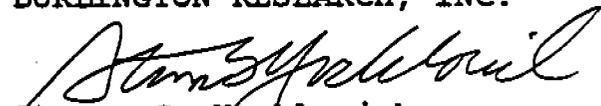
Attention: William "Bill" Hill

Enclosed find report(s) for your sample(s) received 02/25/93,
BRI Work Order # 93-02-532. Please call if you have any
questions.

Thank you.

Sincerely,

BURLINGTON RESEARCH, INC.



Steven G. Yocklovich
Vice President, Customer &
Technical Services

Analytical Services • Aquatic Bioassay Testing • Aquatic Toxicity Reduction Evaluation
 AATCC Testing Services • NPDES Testing • Reporting & Data Handling Services
 PMN Aquatic Bioassay Evaluations



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ANALYTICAL REPORT

CUSTOMER:	G and H Oil Equipment, Inc.	WORK ORDER #:	93-02-532-01
FACILITY:	4232 High Point Road	COLLECTED:	02/24/93
REPORT TO:	William "Bill" Hill	RECEIVED:	02/25/93
SAMPLE:	Melvin Yarboro	REPORTED:	03/08/93
	DN-1 at 8' Grab 2/24/93		

PARAMETER	METHOD	STARTED	ANALYZED	RESULT
TPH-I, Soils	EPA 5030/GC	03/01/93	03/01/93	Attached
TPH-II, Soil	EPA 3550/GC	02/26/93	03/05/93	Attached



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AATCC Testing Services • NPDES Testing • Reporting & Data Handling Services
PMN Aquatic Bioassay Evaluations

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EPA METHOD 5030 WITH CALIFORNIA GC METHOD
TOTAL PETROLEUM HYDROCARBONS - TYPE I, IN SOILS

WORK ORDER #: 93-02-532-01

TPH: 89.7 mg/kg (ppm)

TPH Standard used: Fuel Oil #2

% Recovery of Standard: 83

% Solids: 73



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AATCC Testing Services • NPDES Testing • Reporting & Data Handling Services
PMN Aquatic Bioassay Evaluations

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EPA METHOD 3550 WITH CALIFORNIA GC METHOD

TOTAL PETROLEUM HYDROCARBONS - TYPE II
IN SOILS

WORK ORDER #: 93-02-532-01

TPH: 103 mg/Kg (ppm)

TPH Standard used: #2 Heating Oil

% Recovery of Standard: 94

% Solids: 73



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 AATCC Testing Services • NPDES Testing • Reporting & Data Handling Services
 PMN Aquatic Bioassay Evaluations

Post Office Box 2481 • 615 Huffman Mill Road • (919) 584-5564 • Burlington, NC 27216-2481

ANALYTICAL REPORT

CUSTOMER: G and H Oil Equipment, Inc.
FACILITY: 4232 High Point Road
REPORT TO: William "Bill" Hill
SAMPLE: Melvin Yarboro
 DS-2 at 8' Grab 2/24/93

WORK ORDER #: 93-02-532-02
COLLECTED: 02/24/93
RECEIVED: 02/25/93
REPORTED: 03/08/93

PARAMETER	METHOD	STARTED	ANALYZED	RESULT
TPH-I, Soils	EPA 5030/GC	03/01/93	03/01/93	Attached
TPH-II, Soil	EPA 3550/GC	02/26/93	03/05/93	Attached



Analytical Services • Aquatic Bioassay Testing • Aquatic Toxicity Reduction Evaluations
AATCC Testing Services • NPDES Testing • Reporting & Data Handling Services
PMN Aquatic Bioassay Evaluations

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EPA METHOD 5030 WITH CALIFORNIA GC METHOD
TOTAL PETROLEUM HYDROCARBONS - TYPE I, IN SOILS

WORK ORDER #: 93-02-532-02

TPH: 145 mg/kg (ppm)

TPH Standard used: Fuel Oil #2

% Recovery of Standard: 83

% Solids: 75

Analytical Services • Aquatic Bioassay Testing • Aquatic Toxicity Reduction Evaluation
AATCC Testing Services • NPDES Testing • Reporting & Data Handling Services
PMN Aquatic Bioassay Evaluations



Post Office Box 2481 • 615 Huffman Mill Road • (919) 584-5564 • Burlington, NC 27216-2481

EPA METHOD 3550 WITH CALIFORNIA GC METHOD

TOTAL PETROLEUM HYDROCARBONS - TYPE II
IN SOILS

WORK ORDER #: 93-02-532-02

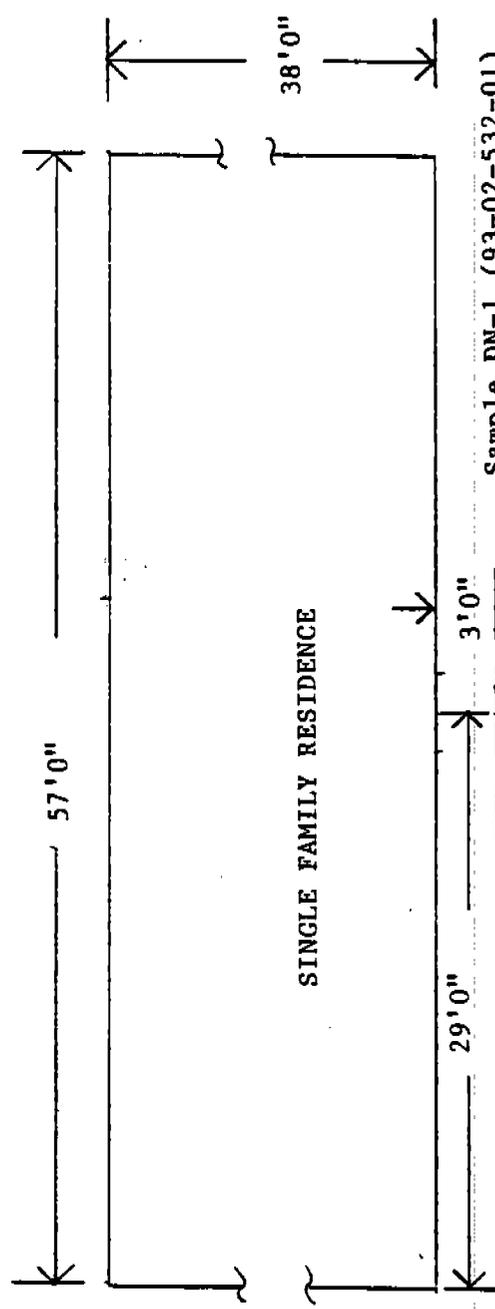
TPH: 1,450 mg/Kg (ppm)

TPH Standard used: #2 Heating Oil

% Recovery of Standard: 94

% Solids: 75

2205 OAK HILL DRIVE



Sample DN-1 (93-02-532-01)

@ 8' from surface

89.7 ppm TPH by method 5030

103 ppm TPH by method 3550

Sample DS-2 (93-02-532-02)

@ 8' from surface

145 ppm TPH by method 5030

1,450 ppm TPH by method 3550

Tank #1:
550 gallon capacity
#2 Fuel Oil

SOIL SAMPLE LOCATIONS:

Residence of: Melvin D. Yarboro
2205 Oak Hill Drive
Gullford County
Greensboro, NC



March 31, 93
Stor, N.C.

Dear Mrs Gage

I am writing in reference to the oil tank removal at my home in Hellsboro. I have made arrangements with H & H Oil Equipment Co. to do the work. Enclosed is a copy of that agreement. Please let me know if there is anything else I should do.

Thank you
Melvin H. Gage

RECEIVED
N.C. Dept. of EHNR
APR 1 - 1993
Winston-Salem
Regional Office



G & H OIL EQUIPMENT, INC.

March 15, 1993

Mr. Melvin D. Yarboro
1072 Tarry Church Road
Star, NC 27356

Subject: Underground Storage Tank Closure
2205 Oak Hill Drive
Greensboro, NC

Dear Mr. Yarboro:

This letter is to confirm our telephone conversation of March 11, 1993, regarding the subject tank closure.

I unfortunately had to report to you that the removed tank was found with several holes in the tank bottom and results of soil analysis reports confirm a petroleum release into the soil.

As required by tank closure regulations, I have contacted Ms. Kelly C. Gage at the Guilford County Department of Emergency Services to report the confirmed petroleum release. Ms. Gage is responsible for tank closure activities in Guilford County and her office telephone number is (919) 373-7565. You will be receiving a "Notice of Violation" from her office and will probably be asked to report your intentions related to site remediation.

Ms. Gage has suggested that a Site Sensitivity Evaluation (SSE) be performed to determine the minimum thresholds for soil clean-up at your home. Typically the results of a SSE will allow for higher levels of total petroleum hydrocarbons that are normally enforced. Current action levels are over 10 ppm by EPA method 5030 and 40 ppm by EPA method 3550. Copies of the original soil analysis reports are enclosed with this letter. Results indicate 89.7 ppm and 145 ppm by method 5030 and 103 ppm and 1,450 ppm by method 3550. SSE's are performed by a subcontracted environmental engineering firm. The estimated cost would be approximately \$600.00.

Upon completion of the SSE, G & H would resume excavation of contaminated soil from the tank pit, stockpile contaminated soil on site, and collect additional soil samples for laboratory analysis. Samples would confirm that all detected petroleum contaminated soil had been removed from the pit and provide our soil disposal subcontractor with needed information to estimate the per ton disposal fee. Additional laboratory fees will be approximately \$2,000.00. Excavating, stockpiling, and replacing excavated soil

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APR 1 - 1993
Winston-Salem
Regional Office

would be performed on a time and materials basis. The soil disposal fees average between \$80.00 - \$100.00 per ton. Until excavation has been completed, there is no way to know how many tons of petroleum contaminated soil are involved.

As we discussed, this process can get very expensive. Some costs related to remediation may be recoverable through the State of North Carolina Non-Commercial Tank Fund; however, it would be your responsibility to pursue this if you wish to do so. All work performed by G & H or our subcontractors would be invoiced directly to you and payment would be due within thirty (30) days from date of invoice.

If you would like for G & H to proceed with our proposed scope of work, please sign and return a copy of this letter to me as your acceptance of estimated charges and terms. If you have any questions, please call me at 1-800-632-0415.

Sincerely,

G & H OIL EQUIPMENT, INC.

William V. Hill

William V. Hill
Vice President

Enclosures

Acceptance of Estimates: The above estimates, specifications, and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Date Accepted

3-19-1993

Signature

Melvin D. York

APPENDIX B

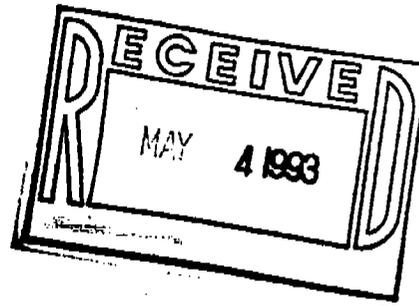
**RICHARD CATLIN & ASSOCIATES'
SITE SENSITIVITY EVALUATION
(SSE)**



G & H OIL EQUIPMENT, INC.

April 30, 1993

Mr. Melvin D. Yarboro
1072 Tarry Church Road
Star, NC 27356



Subject: Additional Environmental Investigation
UST Closure Assessment
Residence of Mr. Melvin Yarboro
2205 Oak Hill Drive
Guilford County
Greensboro, NC

Dear Mr. Yarboro:

Our original Closure Assessment recommended that a Site Sensitivity Evaluation (SSE) be performed to determine the minimum threshold for soil clean-up at this subject location.

Given your authorization to perform the SSE, G & H employed Mr. Gregory M. Stephenson of Richard Catlin & Associates, Inc., to perform this service. A copy of their completed Investigation Report is enclosed.

This report indicates that apparent ground water levels prevent the proper performance of a Site Sensitivity Evaluation and that there may be ground water impacted by the release of petroleum from the removed fuel oil UST. To protect your eligibility for reimbursement through the State Non-Commercial Trust Fund, the finding of this limited investigation should be reported to the proper State and County officials.

A copy of this letter and Environmental Investigation report are also being forwarded to Ms. Kelly C. Gage, Guilford County Department of Emergency Services. Please let us know if we can be of further assistance.

Sincerely,

William V. Hill
Vice President

Enclosure

Copy to: Kelly C. Gage, GCDES

Richard Catlin & Associates, Inc.

ENVIRONMENTAL CONSULTANTS

RC&A

April 27, 1993

G&H Equipment Company
Attn. Bill Hill
4232 High Point Road
P.O. Box 7446
Greensboro, N.C. 27417

Re: Environmental Investigation of Former
Heating Oil Tank Basin
Melvin D. Yarborough Residence
2205 Oak Hill Drive
Greensboro, N.C.

Dear Mr. Hill:

Per your request Richard Catlin and Associates initiated an environmental investigation of the tank basin at the above referenced site for the purpose of completing a Site Sensitivity Evaluation. A Site Sensitivity Evaluation was necessitated by the presence of medium boiling point hydrocarbons (#2 fuel oil, #2 heating oil) in excess of 40 PPM in soil samples taken by G&H Equipment Company at the time of the tank removal. According to the tank removal report these samples were gathered from beneath the north and south ends of the tank at a depth of approximately eight feet.

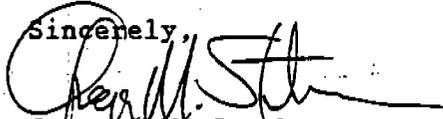
On April 6, 1993 an initial hand augered boring was advanced through the south end of the former tank basin in an effort to determine the horizontal extent of contamination as well as to determine the approximate distance from the deepest contaminated soil to the water table. While advancing this boring hydrocarbon odors were evident in the backfilled soils. The soils became very damp at approximately seven feet, and appeared saturated at eight feet. The boring was terminated at eight feet and after one hour the water level stabilized at approximately six feet. Because it was suspected that the water encountered was the result of the recent heavy precipitation pooling in the disturbed soils of the former tank basin, the hand auger was decontaminated and a second borehole was advanced to a depth of eight feet approximately 15 feet east of and apparently down gradient from the original tank basin boring. No hydrocarbon odors were evident in the soils removed from this boring. As in the first boring the soil became very damp at seven to eight feet and the water level stabilized at approximately six feet.

On April 14, 1993 a second site visit was made and two additional hand augered borings were completed at the north and south boundaries of the property. No evidence of hydrocarbon odors were noted in the soils removed from these borings. Water was observed to stabilize at approximately 10 feet in the northernmost boring and at approximately 8.5 feet at the southernmost boring.

Because the water table in this vicinity would normally be expected to be encountered at depths ranging from 20 to 40 feet it could be conjectured that the water levels observed in the four borings do not represent the true water table but are due to some localized conditions such as a septic leach field or perched water resulting from prior backfilling activity. We do not at this point have any evidence to substantiate that such conditions exist and must, based on the limited data presently available, assume that the seasonal high water table is encountered at between six and ten feet across the site.

The completion of a Site Sensitivity Evaluation is in order only when it can be demonstrated that the contaminated soils are located five feet or more from the water table, top of bedrock, or transmissive indurated sediments. For this reason no SSE has been completed at this time. It is our opinion that in order to protect his eligibility for reimbursement through the state Non-Commercial Trust Fund Mr. Yarborough should report the findings of our limited investigations to the proper state and county officials and await their decision as to the need for any additional activities. This opinion was conveyed to Mr. Yarborough by phone on April 26, at which time he indicated that he would be getting in touch with you concerning this matter. Please let us know if we can be of any further assistance.

Sincerely,



Gregory M. Stephenson
Project Manager

APPENDIX C
NCDEHNR CORRESPONDENCE



State of North Carolina
Department of Environment, Health, and Natural Resources
Winston-Salem Regional Office

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary

Margaret Plemmons Foster
Regional Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT
GROUNDWATER SECTION

NOTICE OF VIOLATION OF THE OIL POLLUTION AND
HAZARDOUS SUBSTANCES CONTROL ACT

March 18, 1993

CERTIFIED MAIL NUMBER P 131 598 009
RETURN RECEIPT REQUESTED

Melvin Yarboro
1072 Tarry Church Rd.
Star, NC 27356

Subject: 2205 Oakhill Dr., Greensboro, Guilford County, NC

Dear Mr. Yarboro:

Chapter 143, North Carolina General Statutes, authorizes and directs the Environmental Management Commission of the Department of Environment, Health, and Natural Resources to protect and preserve the water and air resources of the State. The Division of Environmental Management has the delegated authority to enforce adopted pollution control rules and regulations.

On March 10, 1993 this office was notified of a release from an Underground Storage Tank System at the subject location.

Such a discharge is in violation of G.S. 143-215.75 et. seq. Oil Pollution and Hazardous Substances Control Act of 1978. Please reference the following excerpts from the Act:

143-215.83. Discharges.--(a) Unlawful Discharges. --It shall be unlawful, except as otherwise provided in this Part, for any person to discharge, or cause to be discharged, oil or other hazardous substances into or upon any waters, tidal flats, beaches, or lands within this state, or into any sewer, surface water drain or

Mr. Melvin D. Yarboro
December 2, 1993
Page Two

If I may be further of assistance, please do not hesitate to contact me at (919) 733-1332.

Sincerely,



George C. Matthis, Jr., Supervisor
State Trust Fund Group

GCM/Yarboro.stf

cc: Cindy Rintoul, Winston-Salem Regional Office

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Environmental Management



James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
A. Preston Howard, Jr., P.E., Director

GROUNDWATER SECTION

December 2, 1993

Mr. Melvin D. Yarboro
1072 Tarry Church Road
Star, North Carolina 27356-3817

Dear Mr. Yarboro:

This letter is to acknowledge receipt of and respond to your request for eligibility determination for access to the North Carolina Leaking Petroleum Underground Storage Tank Cleanup Funds for property at 2205 Oakhill Drive in Greensboro, N.C. Your request was forwarded to this office for response after review by the Winston-Salem Regional Office.

Information supplied to the State Trust Fund indicates that a 500 gallon heating oil underground storage tank which has a reported release has been owned and operated by yourself. The tank was taken out of use in 1980 and was excavated in February of 1993. Since the tank is classified as noncommercial, no tank operating fees are required.

Based on the aforementioned information, the State Trust Fund finds this incident conditionally eligible for reimbursement from the Noncommercial Trust Fund. In order to remain eligible, you must proceed with corrective action as required. Failure to mitigate the spread of contamination may cause you to be determined to be ineligible to receive reimbursement from the Noncommercial Trust Fund.

Finally, in accordance with N.C.G.S. 143-215.94E, only reasonable and necessary costs incurred in the environmental cleanup of this site will be eligible for reimbursement.

Please confer with either this office or the Winston-Salem Regional Office should there be any questions regarding completion of reimbursement forms, or activities that may require additional cost documentation prior to implementation, such as soil or groundwater remediation systems.

other waters that drain into the waters of this State, regardless of the fault of the person having control over the oil or other hazardous substances, or regardless of whether the discharge was the result of intentional or negligent conduct, accident or other cause.

143-215.84. Removal of prohibited discharges. -- (a) Person Discharging. -- Any person having control over all oil or other hazardous substances discharged in violation of this Article shall immediately undertake to collect and remove the discharge and to restore the area affected by the discharge as nearly as may be to the condition existing prior to the discharge.

It is our understanding that you and/or your firm are responsible for violation of the Oil Pollution and Hazardous Substances Control Act. Therefore, you are required to immediately undertake clean-up of contamination and restoration of the affected area. Toward this end you must submit a site assessment report which describes the full vertical and horizontal extent of the contamination. An adequate report must be received by this office on or before May 19, 1993. If the investigation indicates that a corrective action plan (remedial action plan) is required, it should be submitted to this office within sixty (60) days after submitting a site assessment report.

It is requested that within fifteen (15) days, you submit a written response describing your plans to achieve compliance with the Act. Should you dispute our assessment of responsibility, please include documentation of your position in your response.

Failure to submit the report required or failure to promptly undertake clean-up and restoration of the affected area may result in the recommendation of enforcement action including: (1) the issuance of a special order against you under the authority of G.S. 143-215.2, (2) a request to the Attorney General to institute an action for injunctive relief, and (3) a civil penalty of up to \$5,000 in accordance with G. S. 143-215.91.

Please do not hesitate to contact Kelly C. Gage at (919) 373-7565 regarding any questions you may have about this matter.

Sincerely,

Larry D. Coble

Larry D. Coble
Regional Supervisor

LDC/ahl

APPENDIX D
SOIL BORING LOG

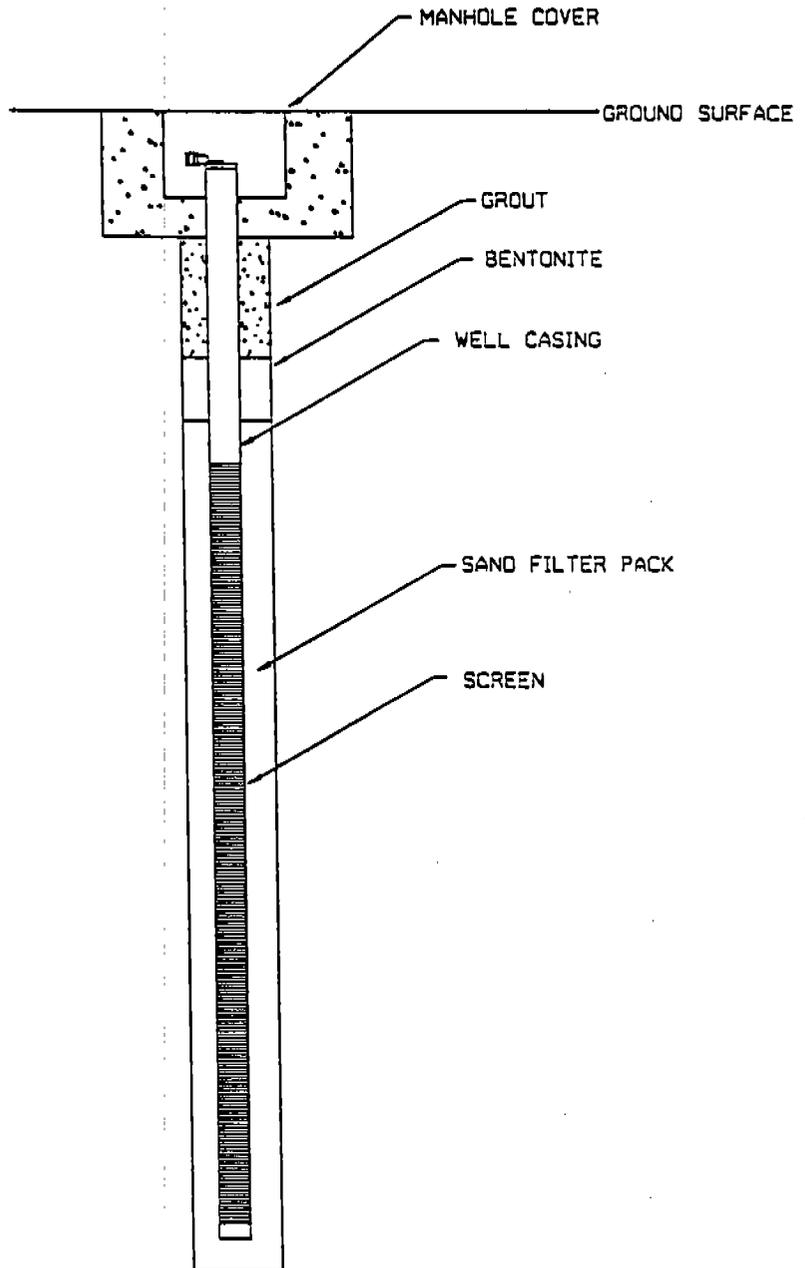
APPENDIX E
WELL CONSTRUCTION RECORDS

WELL CONSTRUCTION DETAIL

WELL NUMBER: MW-1
 DATE STARTED: 3-18-94
 DATE COMPLETED: 3-18-94
 DRILLING METHOD: Auger
 DRILLING FLUIDS: None
 STATIC WATER LEVEL: 13.21'

NOTES: _____

O.D. OF BOREHOLE: 7-8"
 O.D. OF CASING: 2"
 PIPE STICKUP: N/A
 SURFACE ELEVATION: N/A
 GROUT TYPE: Portland Type I
 CASING TYPE: Sch 40 PVC
 CASING SIZE: 2"
 DEPTH TO BOTTOM OF CASING: 7'
 DEPTH TO TOP OF BENTONITE: 5'
 DEPTH TO TOP OF SAND PACK: 6"
 DEPTH TO TOP OF SCREEN: 7'
 DEPTH TO BOTTOM OF SCREEN: 22'
 LENGTH OF SCREEN: 15'
 SCREEN OPENING SIZE: .01
 SCREEN TYPE: Sch 40 PVC
 SCREEN SIZE: 2"



SCALE: N/A TITLE: MONITORING WELL SCHEMATIC
 DATE: 8/18/93 CLIENT: _____
 DWN BY: HN PROJECT: _____
 DWG. # L-93-364



LEGACY ENVIRONMENTAL SERVICES, INC.
 GREENSBORO, NORTH CAROLINA

APPENDIX F
GROUND WATER
ANALYTICAL
RESULTS



WATER TECHNOLOGY AND CONTROLS, INC.

Water Treatment Chemistries & Environmental Laboratory

April 7, 1994

Mr. Ed Setzer
Legacy Environmental Services, Inc.
114 S. Westgate Dr.
Greensboro, NC 27419

Dear Mr. Setzer:

Enclosed are results for the following sample:

<u>W. O. #</u>	<u>SAMPLE</u>	<u>DATE</u>
03219401A	MW-1 GRAB	3/18/94

If you have any questions concerning these data please contact me.

Sincerely,

Mike Vaughan
Laboratory Supervisor



Water Technology and Controls, Inc.
Water Treatment Chemistries and Environmental Laboratory
Reidsville, North Carolina 27320
(910) 342-4748

April 7, 1994
Project: 2205 Oak Hill
Project Number: P-342

Semivolatile Organics by EPA 625

<u>PARAMETER</u>	<u>MW-1</u>
N-nitrosodimethylamine	<0.010 mg/L
Phenol	<0.010 mg/L
bis(2-Chloroethyl)ether	<0.010 mg/L
2-Chlorophenol	<0.010 mg/L
1,3-Dichlorobenzene	<0.010 mg/L
1,4-Dichlorobenzene	<0.010 mg/L
1,2-Dichlorobenzene	<0.010 mg/L
bis(2-chloroisopropyl)ether	<0.010 mg/L
Hexachloroethane	<0.010 mg/L
2-Methylphenol	<0.010 mg/L
4-Methylphenol	<0.010 mg/L
n-Nitroso-di-n-propylamine	<0.010 mg/L
Nitrobenzene	<0.010 mg/L
Isophorone	<0.010 mg/L
2-Nitrophenol	<0.010 mg/L
2,4-Dimethylphenol	<0.010 mg/L
bis(2-Chloroethoxy)methane	<0.010 mg/L
2,4-Dichlorophenol	<0.010 mg/L
1,2,4-Trichlorobenzene	<0.010 mg/L
Naphthalene	0.015 mg/L
Hexachlorobutadiene	<0.010 mg/L
4-Chloro-3-methylphenol	<0.010 mg/L
Hexachlorocyclopentadiene	<0.025 mg/L
2,4,6-Trichlorophenol	<0.010 mg/L
2-Chloronaphthalene	<0.010 mg/L
Dimethylphthalate	<0.010 mg/L
Acenaphthylene	<0.010 mg/L
1,2-Diphenylhydrazine	<0.010 mg/L
2,6-Dinitrotoluene	<0.010 mg/L
Acenaphthene	<0.010 mg/L
2,4-Dinitrophenol	<0.025 mg/L
4-Nitrophenol	<0.010 mg/L
2,4-Dinitrotoluene	<0.010 mg/L
Fluorene	<0.010 mg/L
Diethylphthalate	<0.010 mg/L
4-Chlorophenyl-phenylether	<0.010 mg/L
4,6-Dinitro-2-methylphenol	<0.010 mg/L
n-Nitrosodiphenylamine	<0.010 mg/L
4-Bromophenyl-phenylether	<0.010 mg/L
Hexachlorobenzene	<0.010 mg/L
Pentachlorophenol	<0.010 mg/L
Phenanthrene	<0.010 mg/L
Anthracene	<0.010 mg/L
Di-n-butylphthalate	<0.010 mg/L
Fluoranthene	<0.010 mg/L
Pyrene	<0.010 mg/L
Benzidine	<0.010 mg/L
Butylbenzylphthalate	<0.010 mg/L
Benzo[a]anthracene	<0.010 mg/L
3,3'-Dichlorobenzidine	<0.010 mg/L
Chrysene	<0.010 mg/L
bis(2-Ethylhexyl)phthalate	<0.010 mg/L
Di-n-octylphthalate	<0.010 mg/L
Benzo[b]fluoranthene	<0.010 mg/L
Benzo[k]fluoranthene	<0.010 mg/L
Benzo[a]pyrene	<0.010 mg/L
Dibenz[a,h]anthracene	<0.010 mg/L
Benzo[g,h,i]perylene	<0.010 mg/L
Indeno[1,2,3-cd]pyrene	<0.010 mg/L

Tentative Identification of 10 Most Significant
Peaks in Semi-Volatile fraction of MW-1:
Compound (Library Search) Estimated Conc.

1,2,4-Trimethylbenzene	0.024 mg/L
(E)-1-Phenyl-1-butene	0.011 mg/L
1-Methylnaphthalene	0.017 mg/L
1,5-Dimethylnaphthalene	0.027 mg/L
2,3-dimethylnaphthalene	0.034 mg/L
1,7-Dimethylnaphthalene	0.02 mg/L
2-Methylnaphthalene	0.06 mg/L

EPA 602 by GC/MS

<u>PARAMETER</u>	<u>MW-1</u>
Benzene	< 5 ug/L
Toluene	< 5 ug/L
Chlorobenzene	< 5 ug/L
Ethylbenzene	< 5 ug/L
m,p-Xylene	0.007 ug/L
o-Xylene	0.010 ug/L
1,3-Dichlorobenzene	< 5 ug/L
1,4-Dichlorobenzene	< 5 ug/L
1,2-Dichlorobenzene	< 5 ug/L

Metals	<u>MW-1</u>
Lead by EPA 3030c	< 0.050 mg/L

