This electronic collection of documents is provided for the convenience of the user and is Not a Certified Document –

The documents contained herein were originally issued and sealed by the individuals whose names and license numbers appear on each page, on the dates appearing with their signature on that page.
This file or an individual page shall not be considered a certified document.

GEOENVIRONMENTAL PHASE II INVESTIGATION
PARCEL 004 – JIMMY & DEBBIE KNIGHT
301 MAIN STREET
WALNUT COVE, STOKES COUNTY, NORTH CAROLINA
STATE PROJECT: R-5768
WBS ELEMENT: 44670.1.1
APRIL 30, 2019

Report prepared for:

Mr. Craig Haden
GeoEnvironmental Section
Geotechnical Engineering Unit
North Carolina Department of Transportation
1020 Birch Ridge Drive
Raleigh, NC 27610

DocuSigned by:
Eric Cross
3292E33596454F4...

Report prepared by:

NORTH CAROLINA LICENSED SEAL 2181 GEOLOGIST ERIC C. CROSS 4/30/19

Eric C. Cross, LG
NC License #2181
5/7/2019

Report reviewed by:

DocuSigned by:
Michael G. Jones
A7CBC72174E9413...

NORTH CAROLINA LICENSED SEAL 1168 GEOLOGIST MICHAEL GLENN JONES 04/30/19

Michael G. Jones, LG
NC License #1168
5/7/2019

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.
P.O. BOX 16265
GREENSBORO, NC 27416-0265
(336) 335-3174

C-257 –Geology
C-1251 – Engineering

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

FIGURES

TABLES

APPENDICES

Acronyms

BLS .....Below Land Surface
BTEX .....Benzene, Toluene, Ethylbenzene, & Xylenes
CADD .....Computer Aided Design and Drafting
COC .....Chain of Custody
CSA.....Comprehensive Site Assessment
DEQ .....Department of Environmental Quality
DRO .....Diesel Range Organics
DWM .....Division of Waste Management
EM.....Electromagnetic (as with EM-61)
EPA.....Environmental Protection Agency
GRO .....Gasoline Range Organics
GCLs .....Gross Contaminant Levels
GPR.....Ground Penetrating Radar
HASP .....Health & Safety Plan
MSCC .....Maximum Soil Contaminant Concentration
MTBE .....Methyl Tertiary Butyl Ether
µg/L.....Micrograms per Liter
mg/kg .....Milligrams per kilogram
NPDES.....National Pollutions Discharge Elimination System
NCAC .....North Carolina Administrative Code
NCDOT.....North Carolina Department of Transportation
OSHA.....Occupational Safety and Health Administration
OVA.....Organic Vapor Analyzer
PPM.....Parts Per Million
PID .....Photo-ionization Detector
PSA .....Preliminary Site Assessment
PVC.....Poly-vinyl Chloride
RFP .....Request for Proposal
ROW .....Right of Way
SVOCs .....Semi-Volatile Organic Compounds
TW .....Temporary Well
TPH.....Total Petroleum Hydrocarbons
UVF.....Ultraviolet Fluorescence (UVF) QED Analyzer
UST.....Underground Storage Tank
US EPA.....United States Environmental Protection Agency
VOCs.....Volatile Organic Compounds

GEOENVIRONMENTAL PHASE II INVESTIGATION
PARCEL 004 – JIMMY & DEBBIE KNIGHT
301 MAIN STREET
WALNUT COVE, STOKES COUNTY, NORTH CAROLINA

EXECUTIVE SUMMARY OF RESULTS

Pyramid Environmental & Engineering P.C. (Pyramid) has prepared this GeoEnvironmental Phase II Investigation (Phase II) report documenting background information, field activities, assessment activities, findings, conclusions, and recommendations for Parcel 004, owned by Jimmy & Debbie Knight. The property currently contains a vacant building surrounded by asphalt grass, and dirt surfaces at 301 Main Street, Walnut Cove, NC. This Phase II was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's February 22, 2019, technical proposal. This Phase II is a part of State Project R-5768.

The purpose of this assessment was to determine the presence or absence of underground storage tanks (USTs) and impacted soils between the existing edge of pavement and the proposed Right-Of-Way (ROW) and/or easements, whichever distance was greater. The Phase II was conducted with particular attention to the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features.

The following statements summarize the results of the Phase II:

- **Site History:** Pyramid interviewed DEQ personnel, interviewed property owners, and reviewed aerial photographs to assess past uses of the property. Pyramid reviewed aerial photographs from 1993 – 2018 obtained from Google Earth. Historical information reviewed as part of the Phase II indicated that the property appears to have remained in the same condition with its current building since at least 1993. The 1993 and 2018 aerial photographs are included in **Appendix A**.

  On March 29, 2019, Pyramid emailed the Stokes County parcel address to Ms. Linda Estikowski at the NC Department of Environmental Quality (NC DEQ), with a request to investigate any environmental incidents associated with the parcel. Ms. Estikowski responded to the email and indicated that there were not any environmental incidents associated with the property.

  Discussions with the NCDOT Project Manager Craig Haden indicated that a portion of the site may have been used as a waste disposal/dumping area in the past. As part of this Phase II, Pyramid was directed to investigated possible buried debris during the geophysical investigation. Additionally, during an interview he property

owner indicated that concrete and asphalt debris had been disposed of at the property in the past.

Pyramid Staff Professional Tim Leatherman performed a site investigation at the property. Mr. Leatherman did not observe any significant environmental risks on the property at the time of the investigation. No vent pipes were observed that could indicate the presence of USTs.

- **Geophysical Survey**: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of twelve EM anomalies were identified. The majority of the EM metal detection anomalies were directly attributed to visible cultural features at the ground surface. The EM61 metal detection survey located zones of metallic debris either at the ground surface or buried in the shallow subsurface. This was confirmed using GPR and the in-phase component of the EM31, which is sensitive to metal on or just below the surface.

  The EM61 and subsequent GPR surveys identified a no confidence anomaly in the west portion of the site that was approximately 8 feet long by 6 feet wide. The orientation of the GPR reflectors and the location of the anomaly suggest that this may potentially be a metallic drum or metallic object of similar size.

  The EM61 and GPR also identified a suspected septic tank off the northwest corner of the building. The suspected septic tank was approximately 10 feet long by 6 feet wide. There was a sewer pipe entering the ground above the suspected septic tank.

  Collectively, the UST geophysical data recorded evidence of a suspected septic tank and a no confidence anomaly within the survey area at Parcel 4. No evidence of any additional unknown USTs was observed.

  The EM31 ground conductivity survey identified a high conductivity zone just north of the building on the property. This high conductivity zone may be indicative of other waste buried at the site. The buried waste investigation also identified multiple zones of either surficial or shallow buried metallic debris across the site.

- **Limited Soil Assessment:** A total of nine soil borings were performed across the property. Soil samples were screened in the field using a Photo-Ionization Detector (PID) and select soil samples were analyzed for Diesel Range Organics (DRO) and Gasoline Range Organics (GRO) using a QED Analyzer. The DEQ action level for TPH-GRO is 50 milligrams per kilogram (mg/kg) and the action level for TPH-DRO is 100 mg/kg. Soil samples were screened with a PID and select soil samples were analyzed for DRO and GRO using a QED Analyzer.

None of the soil samples analyzed exhibited DRO or GRO concentrations above DEQ action levels.

- **Limited Groundwater Assessment:** The water table was not encountered in the upper 10 feet of the soil column that was sampled during this Phase II. Review of the NCDOT engineering plans for this parcel indicate that groundwater will not be encountered during construction activities. Therefore, it was not necessary to collect a groundwater sample.

- **Contaminated Soil Volumes:** None of the soil samples analyzed exhibited DRO or GRO concentrations above DEQ action levels.

  It should be noted that, if additional impacted soil is encountered during road construction outside of the area analyzed by this investigation, the impacted soil should be managed according to NC DEQ Division of Waste Management (DWM) guidelines and disposed of at a permitted facility.

- **Buried Waste and Metallic Debris:** Pyramid identified scattered surface metal debris and possible very shallow buried metallic debris across the site, as well as a zone of possible buried non-metallic waste. The NCDOT should be aware that they will encounter the metallic debris during construction, and may encounter non-metallic waste. Precautions and/or additional planning may be necessary to properly dispose of this debris/waste. There is no indication that the zone of possible buried non-metallic waste is environmentally hazardous.

1.0 INTRODUCTION

Pyramid Environmental & Engineering P.C. (Pyramid) has prepared this GeoEnvironmental Phase II Investigation (Phase II) report documenting background information, field activities, assessment activities, findings, conclusions, and recommendations for Parcel 004, owned by Jimmy & Debbie Knight. The property currently contains a vacant building surrounded by asphalt grass, and dirt surfaces at 301 Main Street, Walnut Cove, NC. This Phase II was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's February 22, 2019, technical proposal. This Phase II is a part of State Project R-5768.

The purpose of this assessment was to determine the presence or absence of underground storage tanks (USTs), possible buried waste/debris, and impacted soils across the entire property due to its designation as a total take. The Phase II was conducted with particular attention to the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features. The location of the subject site is shown on **Figure 1**.

1.1 Background Information

Based on the NCDOT's February 22, 2019, *Request for Technical and Cost Proposal (RFP),* the Phase II was conducted across all accessible portions of the property due to its designation as a total take, with emphasis on the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features and/or other utilities, in accordance with the CADD files provided to Pyramid by the NCDOT. The Phase II included the following:

- Research the properties for past uses and possible releases.
- Conduct a preliminary geophysical site assessment and limited soil assessment across the entire parcel with emphasis on the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features and/or other utilities.
- Include in the geophysical investigation both a survey for possible USTs and a survey to investigate for buried waste/debris.
- If groundwater is likely to be encountered by subsequent excavation required by construction, then Pyramid will attempt to obtain a groundwater sample from the parcel.

1.2 Project Information

Prior to field activities, a Health and Safety Plan was prepared. Prior to drilling activities, the public underground utilities were located and marked by the North Carolina One-Call Service. Pyramid's geophysical staff provided additional private utility locating services to mark the on-site private, buried utilities.

2.0 SITE HISTORY

The NCDOT GeoEnvironmental Planning Report for Parcel 004 in the RFP documents provided to Pyramid on February 18, 2019, provided the following background information related to the site:

> *"This facility currently is unoccupied and appears abandoned. The site is listed in the reviewed public records in the historical auto database, for records as an automotive supply and parts facility listed to, Grindstaff Joe, between 1992 to 1999. The site inspection of September 28, 2017, showed that the property contains a single structure that has been abandoned and is in a state of disuse. The remainder of the property is covered in grass or gravel, with a single tree adjacent to the building. The vegetation is sparse and stressed, but no visible signs of areas of affected growth is present. No ASTs or surface signs of USTs are present."*

Pyramid interviewed DEQ personnel, interviewed property owners, and reviewed aerial photographs to assess past uses of the property. Pyramid reviewed aerial photographs from 1993 – 2018 obtained from Google Earth. Historical information reviewed as part of the Phase II indicated that the property appears to have remained in the same condition with its current building since at least 1993. The 1993 and 2018 aerial photographs are included in **Appendix A**.

On March 29, 2019, Pyramid emailed the Stokes County parcel address to Ms. Linda Estikowski at the NC Department of Environmental Quality (NC DEQ), with a request to investigate any environmental incidents associated with the parcel. Ms. Estikowski responded to the email and indicated that there were not any environmental incidents associated with the property.

Discussions with the NCDOT Project Manager Craig Haden indicated that a portion of the site may have been used as a waste disposal/dumping area in the past. As part of this Phase II, Pyramid was directed to investigated possible buried debris during the geophysical investigation. Additionally, during an interview he property owner indicated that concrete and asphalt debris had been disposed of at the property in the past.

Pyramid Staff Professional Tim Leatherman performed a site investigation at the property. Mr. Leatherman did not observe any significant environmental risks on the property at the time of the investigation. No vent pipes were observed that could indicate the presence of USTs.

3.0 GEOPHYSICAL INVESTIGATION

Pyramid's classifications of USTs for the purposes of this Phase II report are based directly on the geophysical UST ratings provided to us by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of twelve EM anomalies were identified. The majority of the EM metal detection anomalies were directly attributed to visible cultural features at the ground surface. The EM61 metal detection survey located zones of metallic debris either at the ground surface or buried in the shallow subsurface. This was confirmed using GPR and the in-phase component of the EM31, which is sensitive to metal on or just below the surface.

The EM61 and subsequent GPR surveys identified a no confidence anomaly in the west portion of the site that was approximately 8 feet long by 6 feet wide. The orientation of the GPR reflectors and the location of the anomaly suggest that this may potentially be a metallic drum or metallic object of similar size.

The EM61 and GPR also identified a suspected septic tank off the northwest corner of the building. The suspected septic tank was approximately 10 feet long by 6 feet wide. There was a sewer pipe entering the ground above the suspected septic tank.

Collectively, the UST geophysical data recorded evidence of a suspected septic tank and a no confidence anomaly within the survey area at Parcel 4. No evidence of any additional unknown USTs was observed.

The EM31 ground conductivity survey identified a high conductivity zone just north of the building on the property. This high conductivity zone may be indicative of other waste buried at the site. The buried waste investigation also identified multiple zones of either surficial or shallow buried metallic debris across the site.

The full details of the geophysical investigation are documented in Pyramid's Geophysical Investigation Report, dated April 3, 2019, which is included as **Appendix B**.

4.0 SOIL SAMPLING ACTIVITIES & RESULTS

4.1 Soil Assessment Field Activities

On April 24, 2019, Pyramid mobilized to the site, drilled soil borings and collected the proposed soil samples for the Phase II. Nine (9) soil borings (4-1 through 4-9) were advanced on the subject property. The soil borings were completed using a truck-mounted Geoprobe drill rig. The selected locations were chosen to avoid public utilities along the adjacent roads and private utilities associated with the business while remaining in the proposed ROW and/or easement, or within other areas of concern such as proposed drainage features and areas designated for soil removal as indicated by the NCDOT engineering plans. The locations of the borings are shown on **Figure 2**.

Soil samples were continuously collected in four-foot long disposable sleeves from each boring for geologic description and visual examination for signs of contamination. Soil recovered from each sleeve was screened in the field using a Photo-Ionization Detector (PID) approximately every 2 feet, depending on the soil recovery. In general, the soil sample with the highest PID reading was selected from each boring for QED Ultra-Violet Fluorescence (UVF) laboratory analysis. If field screening detected multiple elevated readings, then additional soil samples from each boring were selectively chosen for UVF analysis. The soil boring logs with the soil descriptions, visual examination, and PID screening results are included in **Appendix C**. The PID field screening results are summarized in **Table 1**. To prevent cross-contamination, new disposable nitrile gloves were worn by the sampling technician during the sampling activities and were changed between samples. Petroleum odor was detected in boring 7B-4 from 2-10 feet below the ground surface during the field screening.

The soil samples selected for total petroleum hydrocarbon (TPH) analyses were analyzed utilizing the QED UVF HC-1 Analyzer system from RED Lab. The DEQ & NCDOT now accept this instrument as an analytical method to provide total petroleum hydrocarbon (TPH) results for soil analysis for Phase II projects. Pyramid preserved the samples for UVF analysis in methanol-filled containers provided by RED Lab. The samples were shipped to RED Lab for analysis following the soil collection. The soil samples selected for analysis using the QED Analyzer were analyzed for TPH as diesel range organics (DRO) and TPH as gasoline range organics (GRO).

4.2 Soil Sample Analytical Results

QED Results

The DEQ action level for TPH-GRO is 50 milligrams per kilogram (mg/kg) and the action level for TPH-DRO is 100 mg/kg. Soil samples were screened with an PID and select soil samples were analyzed for DRO and GRO using a QED Analyzer. None of the soil samples analyzed exhibited DRO or GRO concentrations above DEQ action levels. The soil sample QED results are summarized in **Table 2**. A copy of the QED analysis report is included in **Appendix D**.

4.3 Temporary Monitoring Well Installation

The water table was not encountered in the upper 10 feet of the soil column that was sampled during this Phase II. Review of the NCDOT engineering plans for this parcel indicate that groundwater will not be encountered during construction activities. Therefore, it was not necessary to collect a groundwater sample.

5.0 CONCLUSIONS AND RECOMMENDATIONS

As requested by the NCDOT, Pyramid has completed a Phase II at Parcel 004 (Jimmy & Debbie Knight) located at 301 Main St., Walnut Cove, NC. The following is a summary of the assessment activities and results.

5.1 Geophysical Investigation

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of twelve EM anomalies were identified. The majority of the EM metal detection anomalies were directly attributed to visible cultural features at the ground surface. The EM61 metal detection survey located zones of metallic debris either at the ground surface or buried in the shallow subsurface. This was confirmed using GPR and the in-phase component of the EM31, which is sensitive to metal on or just below the surface.

The EM61 and subsequent GPR surveys identified a no confidence anomaly in the west portion of the site that was approximately 8 feet long by 6 feet wide. The orientation of the GPR reflectors and the location of the anomaly suggest that this may potentially be a metallic drum or metallic object of similar size.

The EM61 and GPR also identified a suspected septic tank off the northwest corner of the building. The suspected septic tank was approximately 10 feet long by 6 feet wide. There was a sewer pipe entering the ground above the suspected septic tank.

Collectively, the UST geophysical data recorded evidence of a suspected septic tank and a no confidence anomaly within the survey area at Parcel 4. No evidence of any additional unknown USTs was observed.

The EM31 ground conductivity survey identified a high conductivity zone just north of the building on the property. This high conductivity zone may be indicative of other waste buried at the site. The buried waste investigation also identified multiple zones of either surficial or shallow buried metallic debris across the site.

5.2 Limited Soil Assessment

The DEQ action level for TPH-GRO is 50 milligrams per kilogram (mg/kg) and the action level for TPH-DRO is 100 mg/kg. Soil samples were screened with an PID and select soil samples were analyzed for DRO and GRO using a QED Analyzer. None of the soil samples analyzed exhibited DRO or GRO concentrations above DEQ action levels.

5.3 Limited Groundwater Assessment

The water table was not encountered in the upper 10 feet of the soil column that was sampled during this Phase II. Review of the NCDOT engineering plans for this parcel

indicate that groundwater will not be encountered during construction activities. Therefore, it was not necessary to collect a groundwater sample.

5.4 Recommendations

Petroleum-Impacted Soils

No evidence of petroleum-impacted soils (DRO/GRO > DEQ Action Levels) was observed during this investigation. Therefore, no recommendations for the treatment, handling, or disposal of such materials are warranted.

It should be noted that, if deeper soils are deemed unsuitable or if impacted soil is encountered during road construction outside of the area analyzed by this investigation, the impacted soil should be managed according to NC DEQ Division of Waste Management (DWM) guidelines and disposed of at a permitted facility.

Buried Waste and Metallic Debris

Pyramid identified scattered surface metal debris and possible very shallow buried metallic debris across the site, as well as a zone of possible buried non-metallic waste. The NCDOT should be aware that they will encounter the metallic debris during construction, and may encounter non-metallic waste. Precautions and/or additional planning may be necessary to properly dispose of this debris/waste. There is no indication that the zone of possible buried non-metallic waste is environmentally hazardous.

6.0 LIMITATIONS

The results of this preliminary investigation are limited to the boring locations completed during this limited assessment and presented in this report. The laboratory results only reflect the current conditions at the locations sampled on the date this Phase II was performed.

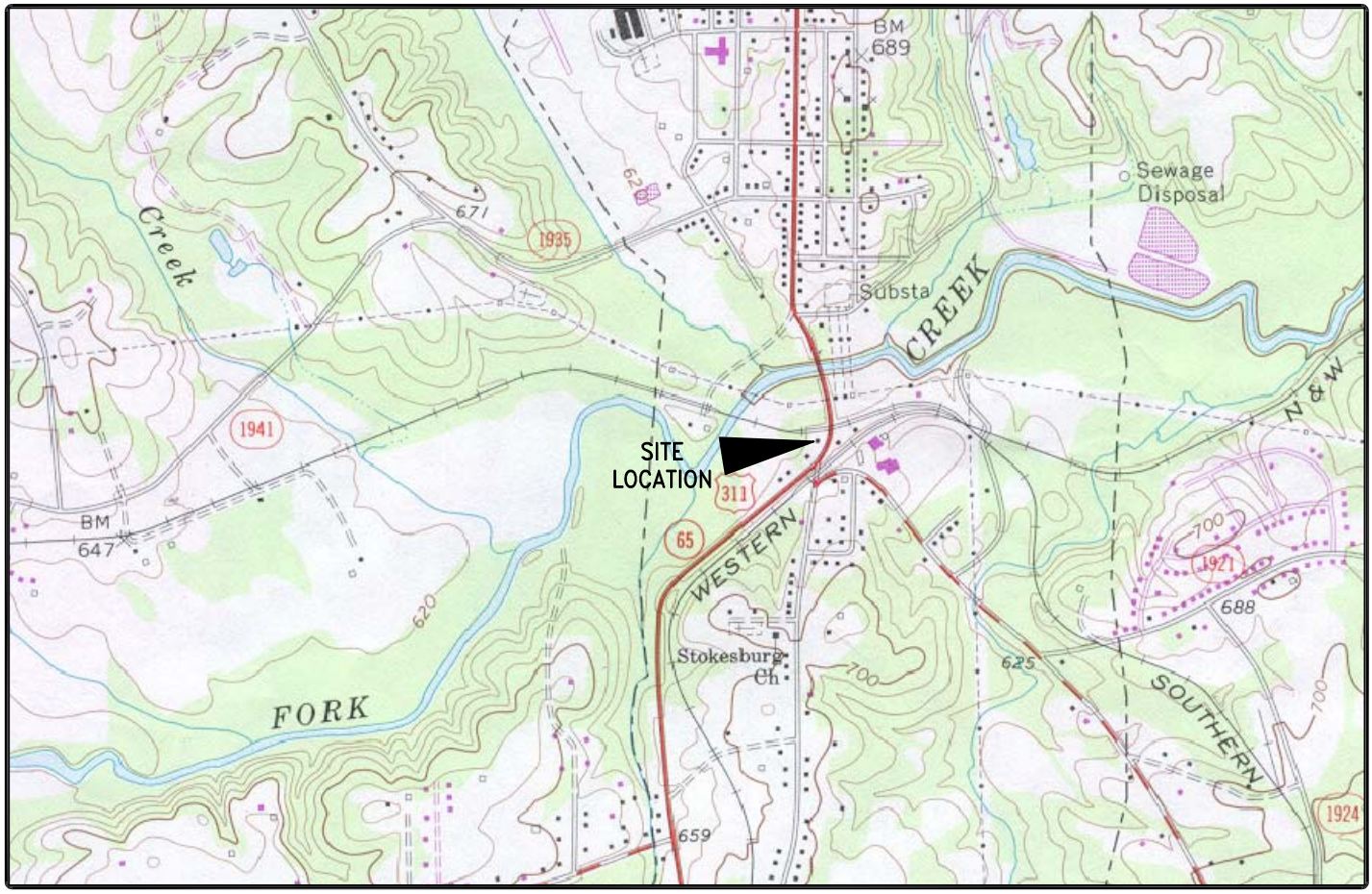
7.0 CLOSURE

This report was prepared for, and is available solely for use by, the NCDOT and their designees. The contents thereof may not be used or relied upon by any other person without the express written consent and authorization of Pyramid Environmental & Engineering, P.C. (Pyramid). The observations, conclusions, and recommendations documented in this report are based on site conditions and information reviewed at the time of Pyramid's investigation. Pyramid appreciates the opportunity to provide this environmental service.

FIGURES

USGS TOPOGRAPHIC MAP

SITE: 301 S. MAIN STREET LOCATION: WALNUT COVE, NORTH CAROLINA



USGS IDENTIFICATION

USGS 7.5 MINUTE MAP	WALNUT COVE, N.C.
ORIGINAL DATE:	1971
PHOTOREVISION DATE:	1986

	PRIMARY HIGHWAY, HARD SURFACE
	SECONDARY HIGHWAY, HARD SURFACE
	LIGHT-DUTY ROAD HARD OR IMPROVED SURFACE
	UNIMPROVED ROAD
	STATE ROAD
	U.S. ROUTE
	INTERSTATE ROUTE

SCALES

MILES: 1/2 0 1

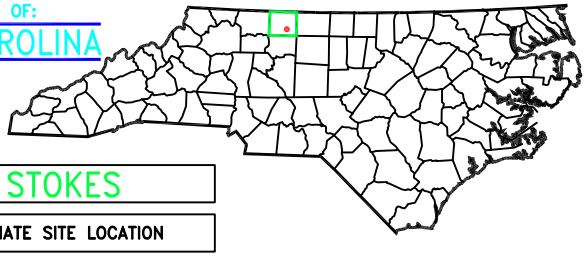
FEET: 1000 0 2000 4000 6000

1" = 2000'

NOTES: ▶ TOPOGRAPHICAL CONTOUR INTERVAL = 20 FEET
▶ PHOTOREVISIONS DENOTED IN PURPLE

MAGNETIC NORTH

COUNTY MAP OF: NORTH CAROLINA



COUNTY: STOKES

APPROXIMATE SITE LOCATION

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT: NCDOT PROJECT R-5768
PROPERTY NAME: 301 S. MAIN ST., PARCEL 4
CITY: WALNUT COVE STATE: NORTH CAROLINA
TITLE: TOPOGRAPHIC MAP

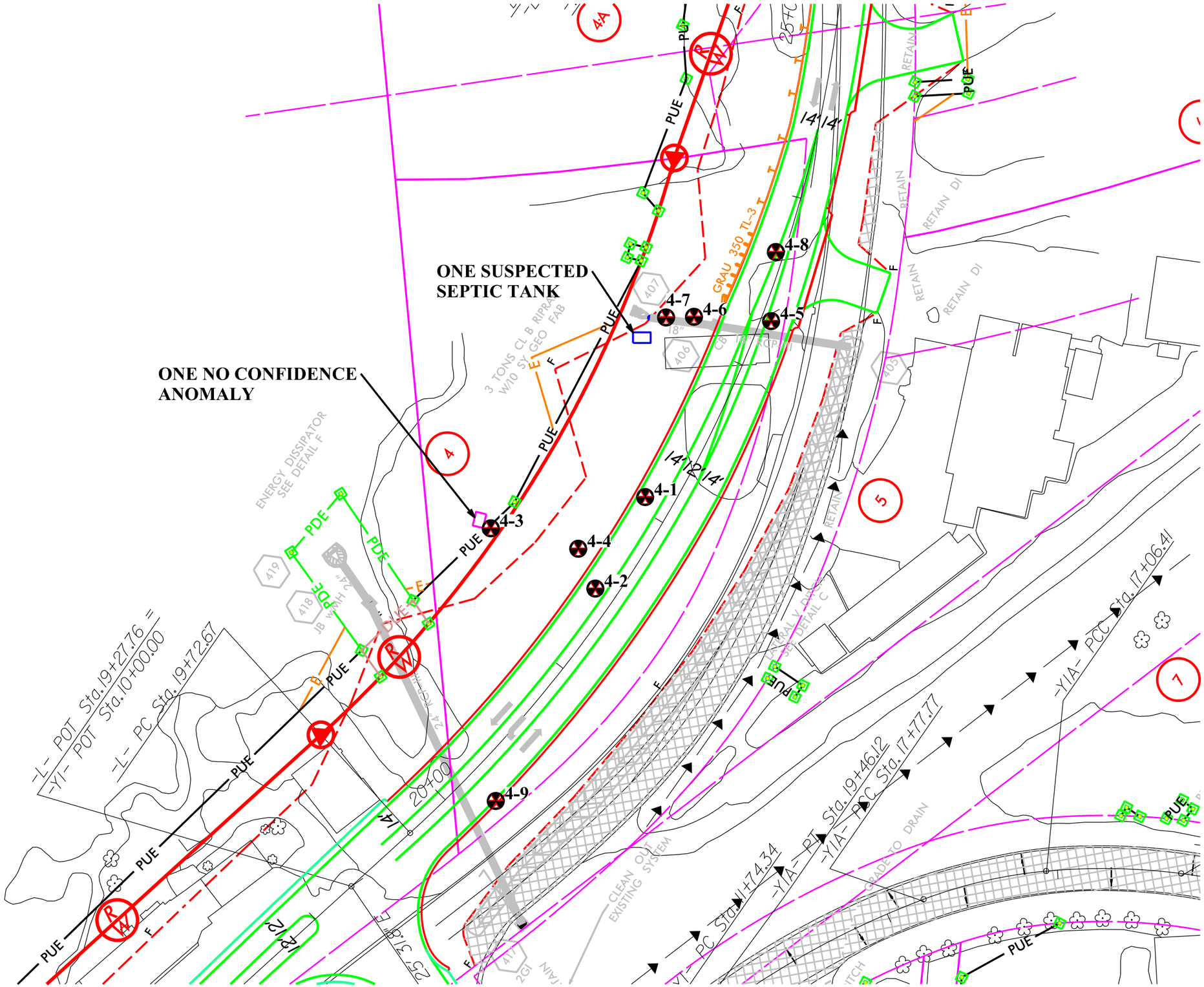
SCALE: 1"=2000'
DATE: 4/4/19
DRAWING NAME: USGSTOPO

DRAWN BY: KAM
CHECK BY: EC
JOB NO.: 2019-074
TYPE: PSA
FIGURE NUMBER: 1

NOTES

TOPOGRAPHIC MAP USED IN THIS GRAPHIC IS MAPPED, EDITED, AND PUBLISHED BY THE UNITED STATES GEOLOGIC SURVEY, DEPARTMENT OF THE INTERIOR, RESTON VIRGINIA.

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS.



LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED PERMANENT UTILITY EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- SUSPECTED SEPTIC TANK
- NO CONFIDENCE ANOMALY
- 4-1 SOIL SAMPLING LOCATION*

*ANALYTICAL DATA PRESENTED IN TABLE 2 OF PHASE II REPORT

0 30 60
FEET

N

TITLE
SOIL BORING LOCATIONS

PROJECT
PARCEL 4
WALNUT COVE, NORTH CAROLINA
NCDOT PROJECT R-5768

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
License # C1251 Eng. / #C257 Geology

DATE: 04-24-2019	REVISION NO. 0
PYRAMID PROJECT NO. 2019-074	FIGURE NO. 2

TABLES

TABLE 1
Summary of Soil Field Screening Results
NCDOT Project R-5768
Parcel 004 - Stokes County PSAs
Jimmy & Debbie Knight - 301 S. Main Street
Walnut Cove, Stokes County, North Carolina

SOIL BORING 4/24/2019	SAMPLE ID	DEPTH (feet bgs)	PID READINGS (PPM)
4-1	4-1-0-2	0 to 2	1.3
	4-1-2-4	2 to 4	3.0
	4-1-4-5	4 to 5	4.9
4-2	4-2-0-2	0 to 2	2.7
	4-2-2-4	2 to 4	1.5
	4-2-4-6	4 to 6	4.4
	4-2-6-8	6 to 8	4.9
	4-2-8-10	8 to 10	2.5
4-3	4-3-0-2	0 to 2	1.4
	4-3-2-4	2 to 4	1.2
	4-3-4-5.5	4 to 5.5	1.0
4-4	4-4-0-2	0 to 2	1.6
	4-4-2-4	2 to 4	1.7
	4-4-4-6	4 to 6	0.6
	4-4-6-8	6 to 8	1.6
	4-4-8-10	8 to 10	1.1
4-5	4-5-0-2	0 to 2	1.2
	4-5-2-4	2 to 4	1.5
	4-5-4-6	4 to 6	1.0
	4-5-6-8	6 to 8	1.1
	4-5-8-10	8 to 10	1.2
4-6	4-6-0-2	0 to 2	No Recovery
	4-6-2-4	2 to 4	2.6
	4-6-4-6	4 to 6	1.8
	4-6-6-7	6 to 7	2.3
4-7	4-7-0-2	0 to 2	2.5
	4-7-2-4	2 to 4	0.6
	4-7-4-6	4 to 6	2.6
	4-7-6-8	6 to 8	1.2
	4-7-8-10	8 to 10	2.4
4-8	4-8-0-2	0 to 2	1.7
	4-8-2-4	2 to 4	2.1
	4-8-4-6	4 to 6	1.8
	4-8-6-7	6 to 7	1.5
4-9	4-9-0-1	0 to 1	1.9
	4-9-1-2	1 to 2	1.4

bgs= below ground surface
PID= photo-ionization detector
PPM= parts-per-million
= sampled for lab analysis &/or QROS-QED analysis
OVA= Organic Vapor Analyzer

TABLE 2

Summary of Soil Sample QED Analytical Results for GRO/DRO

NCDOT State Project R-5768

Parcel 004 Jimmy & Debbie Knight - 301 S. Main Street

Walnut Cove, Stokes County, North Carolina

				QROS - QED Analysis		
SAMPLE ID	**DATE**	**DEPTH (feet)**	**PID (ppm)**	**GRO (mg/kg) (C5-C10)**	**DRO (mg/kg) (C10-C35)**	**TPH (mg/kg) (C5-C35)**
4-1-5	4/24/2019	4-5	39.0	<0.63	4.9	4.9
4-2-0-2	4/24/2019	0-2	0.3	<0.78	9.5	9.5
4-2-6-8	4/24/2019	6-8	1.2	<1.2	3.1	3.1
4-3-0-2	4/24/2019	0-2	0.7	<0.63	6.6	6.6
4-4-2-4	4/24/2019	2-4	55.7	<0.65	<0.65	<0.65
4-5-2-4	4/24/2019	2-4	1.2	<0.63	2.1	2.1
4-6-2-4	4/24/2019	2-4	0.6	<0.62	45.8	45.8
4-7-4-6	4/24/2019	4-6	0.6	<0.65	<0.65	<0.65
4-8-2-4	4/24/2019	2-4	0.9	<0.68	<0.68	<0.68
4-9-0-1	4/24/2019	0-1	1.1	<0.7	5.5	5.5
NC Initial Action Level - UST Section for 5035/5030-GRO; 3550-DRO				50	100	NA

PID= photo-ionizaton detector
PPM= parts-per-million
GRO= Gasoline Range Organics
DRO= Diesel Range Organics
mg/kg= milligrams-per-kilogram
TPH= Total Petroleum Hydrocarbons (GRO + DRO)
NA= Not Applicable

* Bold values indicate concentrations above initial action levels

APPENDIX A


Parcel 4
1993 Aerial
N Main St
311
S Main St
65
Google Earth
N
300 ft


Parcel 4
2018 Aerial
Cement Plant
N Main St
311
S Main St
Stokesburg Rd
North Carolina Hwy 65 E
Mcalster St
N
500 ft
Google Earth

APPENDIX B

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2019-074)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 4
NCDOT PROJECT R-5768 (44670.1.1)

301 MAIN STREET, WALNUT COVE, NC

APRIL 24, 2019

Report prepared for: **Craig Haden**
NCDOT Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

Prepared by: _____

Eric C. Cross, P.G.
NC License #2181

Reviewed by: _____

Douglas A. Canavello, P.G.
NC License #1066

503 INDUSTRIAL AVENUE, WALNUT COVE, NC 27406
P: 336.335.3174 F: 336.691.0648
C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 4 – 301 Main Street
Walnut Cove, Stokes County, North Carolina

Table of Contents

Figures

Appendices

LIST OF ACRONYMS

CADD .....Computer Assisted Drafting and Design
DF .....Dual Frequency
EM.....Electromagnetic
GPR.....Ground Penetrating Radar
GPS .....Global Positioning System
NCDOT.....North Carolina Department of Transportation
ROW .....Right-of-Way
UST .....Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT) at Parcel 4, located at 301 Main Street, in Walnut Cove, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project R-5768). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from April 2-4, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of twelve EM anomalies were identified. The majority of the EM metal detection anomalies were directly attributed to visible cultural features at the ground surface. The EM61 metal detection survey located zones of metallic debris either at the ground surface or buried in the shallow subsurface. This was confirmed using GPR and the in-phase component of the EM31, which is sensitive to metal on or just below the surface.

The EM61 and subsequent GPR surveys identified a no confidence anomaly in the west portion of the site that was approximately 8 feet long by 6 feet wide. The orientation of the GPR reflectors and the location of the anomaly suggest that this may potentially be a metallic drum or metallic object of similar size.

The EM61 and GPR also identified a suspected septic tank off the northwest corner of the building. The suspected septic tank was approximately 10 feet long by 6 feet wide. A sewer pipe was observed entering the ground above the suspected septic tank.

Collectively, the UST geophysical data recorded evidence of a suspected septic tank and a no confidence anomaly within the survey area at Parcel 4. No evidence of any additional unknown USTs was observed.

The EM31 ground conductivity survey identified a high conductivity zone just north of the building on the property. This high conductivity zone may be indicative of other waste buried at the site. The buried waste investigation also identified multiple zones of either surficial or shallow buried metallic debris across the site.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT) at Parcel 4, located at 301 Main Street, in Walnut Cove, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project R-5768). This property was understood to be a total take, and the survey was designed to include all accessible portions of the property. Conducted from April 2-4, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area. This property was also suspected of being a waste dumping site in the past and a secondary geophysical survey was conducted to investigate for buried waste on the site.

The site included a vacant building, surrounded by asphalt/gravel and grass/dirt surfaces. Discussions with the property owner indicated that the site had been used to store waste from a nearby concrete plant. There were large mounds of concrete and asphalt debris with visible metallic debris at or just below the surface. An aerial photograph showing the UST geophysical survey area boundaries and ground-level photographs are shown in **Figure 1** and the buried waste geophysical survey boundaries are shown in **Figure 2**. It should be noted that the limits of the buried waste survey area differ slightly from the UST geophysical survey area because the instrument used for the buried waste survey allows for slightly greater access in rough terrain than the UST geophysical instruments (methodology discussed below).

FIELD METHODOLOGY

The UST geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM metal detection data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A

boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending, generally parallel survey lines, spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on April 4, 2019, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

Pyramid also utilized electromagnetic and ground penetrating radar geophysical methods to investigate the potential buried waste at the subject property. Specifically, Pyramid utilized a Geonics EM31-MK1 (EM 31) ground conductivity meter which measures apparent ground conductivity (quadrature phase) and metal detection (in-phase) conditions down to a maximum depth of 18 feet below surface. The EM31 instrument was coupled to a Geode External GPS/GLONASS receiver to record the position of the EM data to sub-meter accuracy during the survey.

The EM31 method determines electrical properties of the earth materials by inducing electromagnetic currents in the ground and measuring the secondary magnetic field produced by these currents. An alternating current is generated in the transmitter coil located at one end of the instrument. The secondary magnetic field, which is produced by currents through the earth, induces a corresponding alternating current in the receiver coil located at the opposite end of the instrument.

After compensating for the primary field, which can be computed from the relative positions and orientations of both coils, the magnitude and relative phase of the secondary field are measured. These measurements are then converted to components of in-phase and 90 degrees out-of-phase (quadrature) with the transmitted field. The out-of-phase or quadrature component, using certain simple assumptions, is converted to a measure of apparent ground conductivity in millisiemens per meter (mS/m). The in-phase component responds to highly conductive areas (above 100 mS/m) or to areas containing metallic objects and debris and the values are expressed in terms of relative units or parts per thousand. Therefore, the in-phase data can be used to identify areas that may contain buried metallic material across areas recording lower conductivity values.

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF UST GEOPHYSICAL SURVEY RESULTS

Discussion of EM Results – UST Geophysical Survey

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 3**. Each EM anomaly is numbered for reference in the figure. The following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	**No Confidence Anomaly**	☑
2	Buried Metallic Debris	☑
3	**Suspected Septic Tank**	☑
4	Metal Sheet	
5	Guard Rail/Signs	
6	Drop Inlet	
7	Utility/Surface Debris	
8	Mailbox	
9	Utility	
10	Utility	
11	Buried Metallic Debris	☑

The majority of the EM anomalies identified using the EM61 were directly attributed to visible cultural features at the ground surface, including a metal sheet, a guard rail, signs, a drop inlet, surface debris, and utilities. The EM61 survey identified a number of medium to low amplitude features suspected to be associated with metallic debris at or just below the surface. These areas of suspected metallic debris are highlighted by the red dashed line in **Figure 3**. EM Anomalies 1-3 and 11 were all medium-sized, high-amplitude anomalies and were investigated with GPR to identify any potential USTs.

Discussion of GPR Results

Figure 4 presents the locations of the formal GPR transects performed at the property associated with the UST geophysical survey, as well as select transect images. All of the transect images can be found in **Appendix A**. A total of 8 formal GPR transects were

performed at the site. GPR Transects 1-2 and 5-6 were performed across EM Anomalies 11 and 2, respectively. These transects recorded isolated, high-amplitude hyperbolic reflectors and/or increases in signal penetration consistent with buried metallic debris.

GPR Transects 3 and 4 were performed across EM Anomaly 1. These transects both showed discreet high-amplitude lateral reflectors that are indicative of an isolated buried metal structure. The lack of a hyperbolic reflector would suggest that this feature is not a UST. As per the geophysical UST ratings provided by the NCDOT, this feature has been classified as a not confidence anomaly. The sloping lateral reflector in Transect 3 may indicate that this object is slightly tipped to one side, suggesting that this feature may potentially be a drum or other similarly sized metallic object. This anomaly measures approximately 8 feet long by 6 feet wide.

GPR Transects 7 and 8 were performed across EM Anomaly 3. These transects also both recorded discreet high-amplitude lateral reflectors. Given that this feature is located where a sewer pipe enters the ground, this has been classified as a suspected septic tank. GPR Transect 7, unlike the previously discussed Transect 3, was collected on a decline. The sloping lateral reflector seen in Transect 7 would indicate that this object is lying flat. The locations and dimensions of the no confidence anomaly and the suspected septic tank are presented in **Figure 5**, along with ground-level photographs.

Collectively, the UST survey geophysical data recorded evidence of a suspected septic tank and a no confidence anomaly within the survey area at Parcel 4. No evidence of other unknown metallic USTs was observed. **Figure 6** provides an overlay of the geophysical metal detection results, the suspected septic tank, and the no confidence anomaly onto the NCDOT MicroStation engineering plans for reference.

DISCUSSION OF BURIED WASTE GEOPHYSICAL SURVEY RESULTS

Discussion of EM Results – Buried Waste Investigation

A contour plot of the EM31 conductivity results obtained across the survey area at the property is presented in **Figure 7**. As discussed in the introduction, this site was previously used to store concrete and asphalt waste, which is visible at the ground surface. The subsurface conductivity results seen in **Figure 7** show an area of high conductivity in the northeast portion of the property, just north of the vacant building. GPR transects collected across the high conductivity feature (**Figure 7**) did not record any clear stratification in the subsurface that would suggest a buried waste deposit. However, the EM31 instrument averages the conductivity of the upper ~17 feet of soil. Therefore, this anomaly may be associated with buried waste or another conductivity high that is below the imaging depth of the GPR instrument.

In addition to the conductivity results, the EM31 records an in-phase component that is responsive to shallow buried metal. **Figure 8** provides a contour map of the in-phase results overlain on an aerial photograph of the property. The negative (green) responses are a typical indicator of either surface metallic debris or very shallow buried metal. These locations directly correlate to the interpreted zones of buried metal observed in the EM61 metal detection survey, providing a secondary method that verifies the locations of metallic debris at or near the ground surface across the property.

Figure 9 presents the final interpreted locations of interpreted metallic debris (either at the ground surface or buried just beneath the ground surface) overlain onto the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 4 in Walnut Cove, North Carolina, provides the following summary and conclusions:

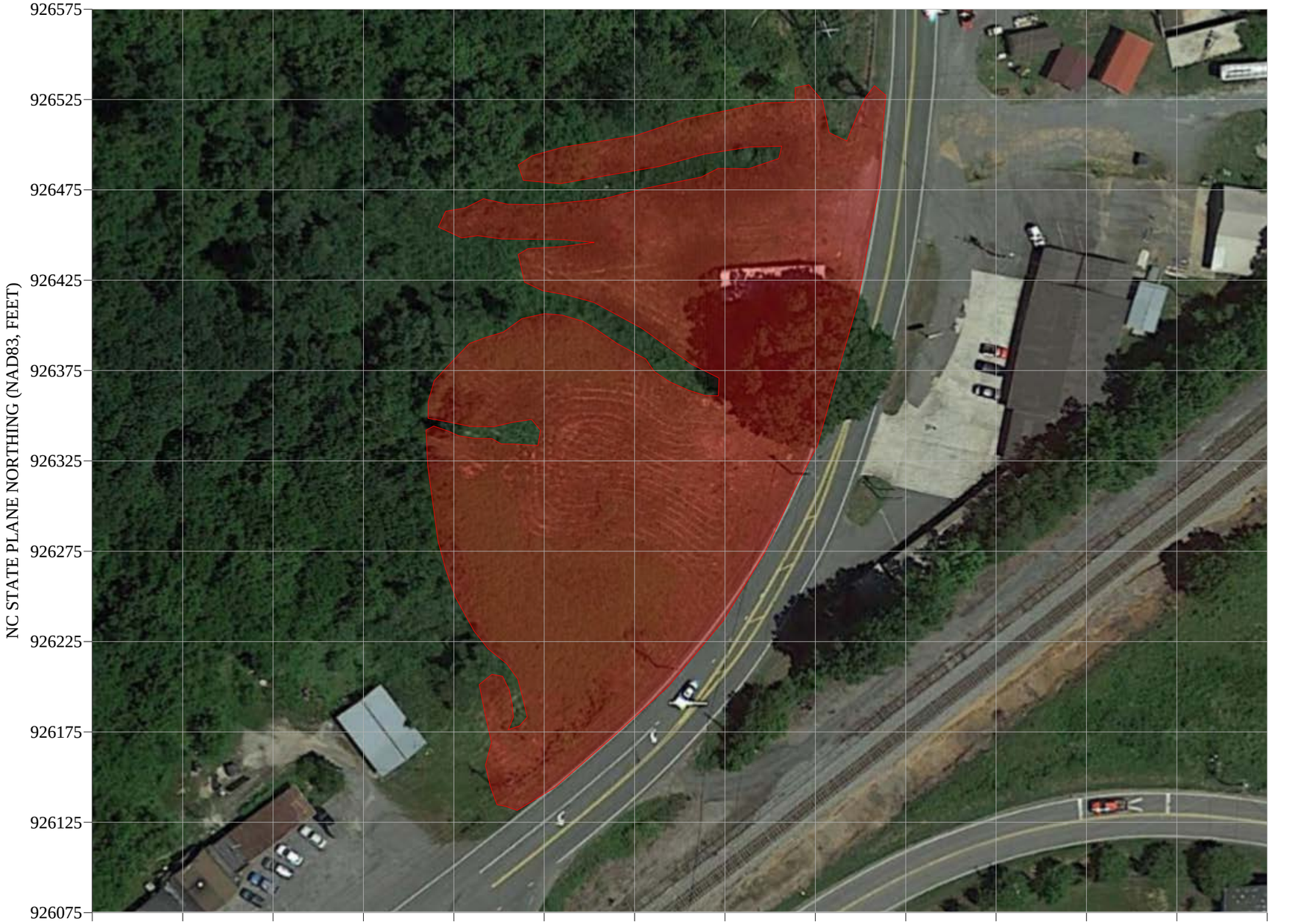
- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM metal detection anomalies were directly attributed to visible cultural features at the ground surface.
- The EM61 metal detection survey located zones of metallic debris either at the ground surface or buried in the shallow subsurface. This was confirmed using GPR and the in-phase component of the EM31, which is sensitive to metal on or just below the surface.
- The EM61 and subsequent GPR surveys identified a no confidence anomaly in the west portion of the site that was approximately 8 feet long by 6 feet wide. The orientation of the GPR reflectors and the location of the anomaly suggest that this may potentially be a metallic drum or metallic object of similar size.
- The EM61 and GPR also identified a suspected septic tank off of the northwest corner of the building. The suspected septic tank was approximately 10 feet long by 6 feet wide. A sewer pipe was observed entering the ground above the suspected septic tank.
- Collectively, the UST geophysical data recorded evidence of a suspected septic tank and a no confidence anomaly within the survey area at Parcel 4. No evidence of any additional unknown USTs was observed.
- The EM31 ground conductivity survey identified a high conductivity zone just north of the building on the property.
- This high conductivity zone may be indicative of other waste buried at the site.
- The buried waste investigation also identified multiple zones of either surficial or shallow buried metallic debris across the site.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for the NCDOT in accordance with generally accepted guidelines for EM and GPR surveys. It is generally recognized that the results of the EM and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

The EM31 and GPR results obtained for this project may delineate the approximate perimeters of buried waste at the suspected disposal area. However, some of the buried waste may not be detected by the geophysical investigation. Furthermore, some EM31 apparent conductivity anomalies may be in response to changes in soil character and not due to buried waste.

APPROXIMATE BOUNDARIES OF UST GEOPHYSICAL SURVEY AREA



View of Survey Area
(Facing Approximately West)

View of Survey Area
(Facing Approximately North)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 4 WALNUT COVE, NORTH CAROLINA NCDOT PROJECT R-5768	TITLE	PARCEL 4 - UST GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS
DATE	4/4/2019	CLIENT	NCDOT
PYRAMID PROJECT #:	2019-074		**FIGURE 1**

APPROXIMATE BOUNDARIES OF BURIED WASTE GEOPHYSICAL SURVEY AREA

View of Survey Area
(Facing Approximately West)

View of Survey Area
(Facing Approximately North)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

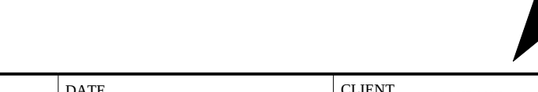
PROJECT: PARCEL 4 WALNUT COVE, NORTH CAROLINA NCDOT PROJECT R-5768	TITLE: PARCEL 4 - BURIED WASTE GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE: 4/4/2019	CLIENT: NCDOT
		PYRAMID PROJECT #: 2019-074	**FIGURE 2**

EM61 METAL DETECTION RESULTS

EVIDENCE OF ONE SUSPECTED SEPTIC TANK AND ONE NO CONFIDENCE ANOMALY OBSERVED. NO EVIDENCE OF ADDITIONAL METALLIC USTs WAS OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM61 data were collected on April 2-3, using a Geonics EM61 instrument. Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency 300/800 MHz antenna on April 4, 2019.

EM61 Metal Detection Response (millivolts)

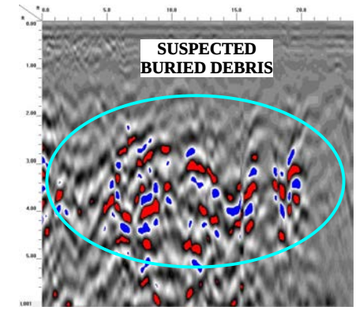


N

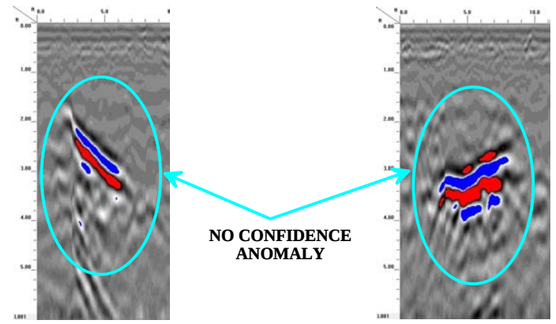
PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 4 WALNUT COVE, NORTH CAROLINA NCDOT PROJECT R-5768	TITLE	PARCEL 4 - EM61 METAL DETECTION CONTOUR MAP	DATE 4/4/2019 PYRAMID PROJECT #: 2019-074
				CLIENT NCDOT **FIGURE 3**

GPR TRANSECT LOCATIONS

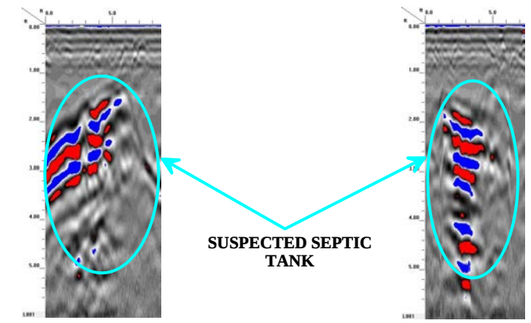


GPR TRANSECT 1 (T1)



GPR TRANSECT 3 (T3)

GPR TRANSECT 4 (T4)



GPR TRANSECT 7 (T7)

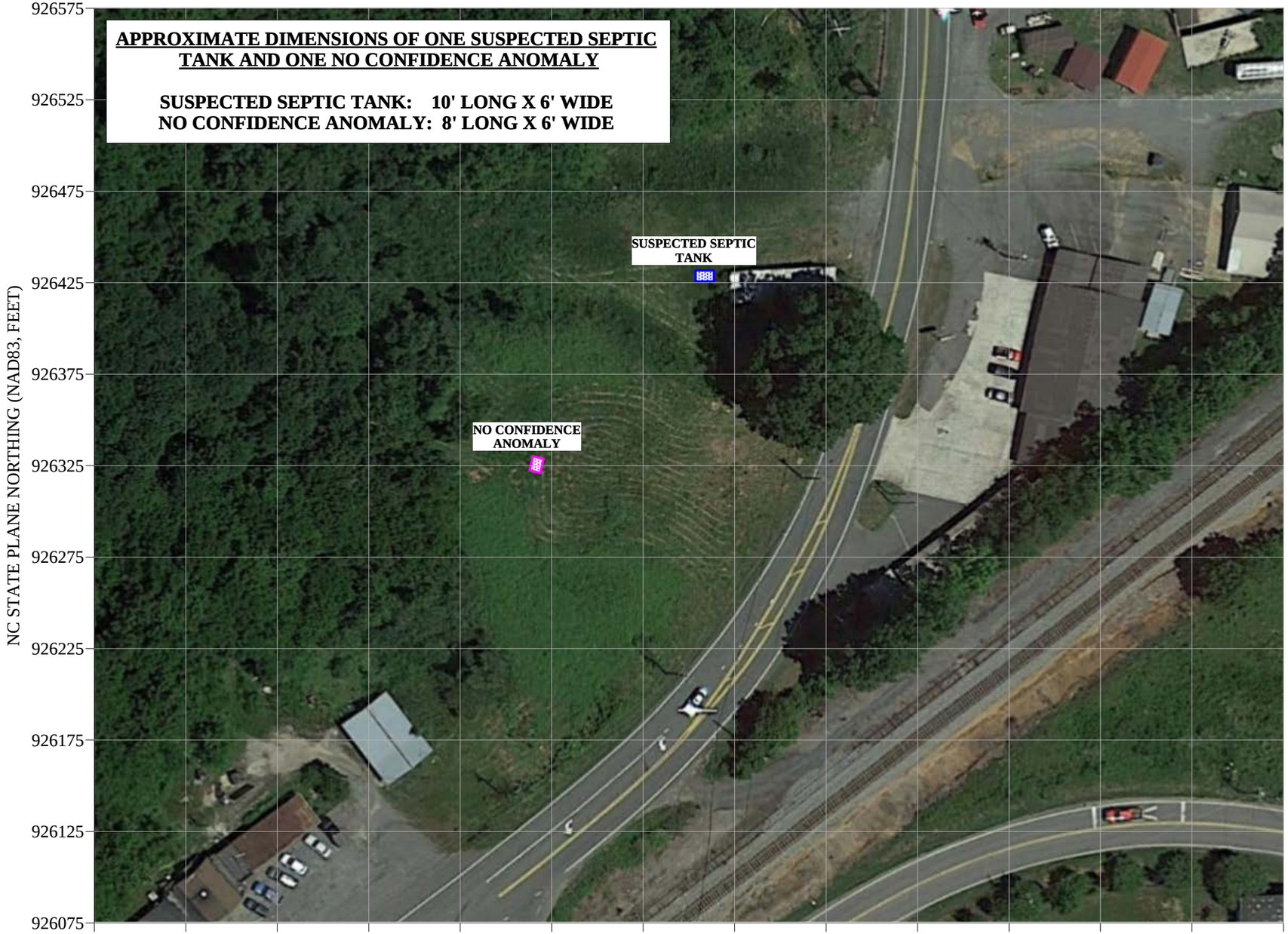
GPR TRANSECT 8 (T8)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 4 WALNUT COVE, NORTH CAROLINA NCDOT PROJECT U-5768	TITLE	PARCEL 4 - GPR TRANSECT LOCATIONS AND SELECT IMAGES	DATE 4/4/2019 PYRAMID PROJECT #: 2019-074
				CLIENT NCDOT **FIGURE 4**

LOCATIONS AND SIZES OF ONE SUSPECTED SEPTIC TANK AND ONE NO CONIFIDENCE ANOMALY



View of Suspected Septic Tank
(Facing Approximately East)

View of No Confidence Anomaly
(Facing Approximately West)

N

PYRAMID GEOPHYSICS 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT	PARCEL 4 WALNUT COVE, NORTH CAROLINA NCDOT PROJECT R-5768	TITLE	PARCEL 4 - LOCATIONS AND SIZES OF ONE SUSPECTED SEPTIC TANK AND ONE NO CONIFIDENCE ANOMALY	DATE 4/4/2019 PYRAMID PROJECT #: 2019-074 CLIENT NCDOT **FIGURE 5**

EM61 METAL DETECTION CONTOURS (SEE FIGURE 2 FOR ANOMALY LABELS)

ONE SUSPECTED SEPTIC TANK

ONE NO CONFIDENCE ANOMALY

LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED PERMANENT UTILITY EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- SUSPECTED SEPTIC TANK
- NO CONFIDENCE ANOMALY

MILLIVOLTS (mV)

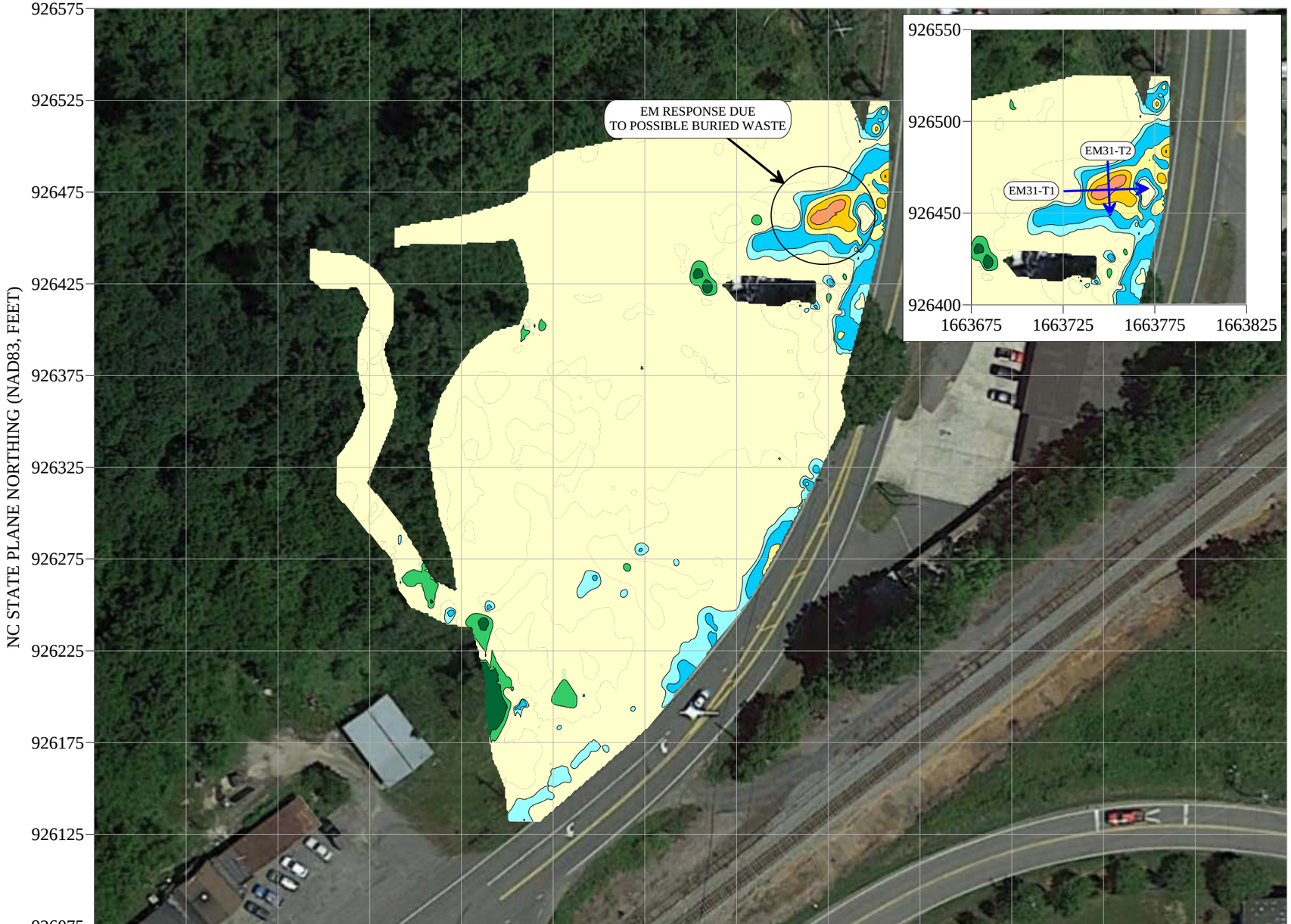
1000 750 500 400 300 200 150 100 75 60 50 40 30 -90 -100 -200 -400 -5000

0 30 60
FEET

N

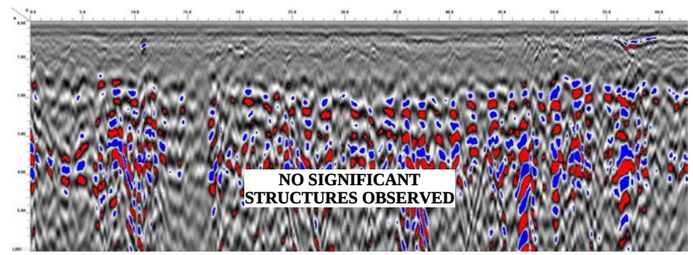
TITLE: OVERLAY OF METAL DETECTION RESULTS, SUSPECTED SEPTIC & NO CONFIDENCE ANOMALY ON NCDOT ENGINEERING PLANS	
PROJECT: PARCEL 4 WALNUT COVE, NORTH CAROLINA NCDOT PROJECT R-5768	
PYRAMID GEOPHYSICS 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 04-03-2019	REVISION NO. 0
PYRAMID PROJECT NO. 2019-074	FIGURE NO. 6

EM31 GROUND CONDUCTIVITY RESULTS AND RADAR IMAGES

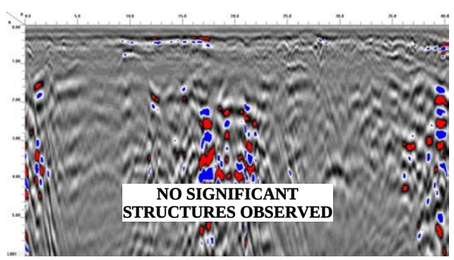


EM31 Conductivity Response
(mS/m)

50 40 35 30 25 22 15 -4 -5 -25 -200



EM31 GPR TRANSECT 1 (EM31-T1)



EM31 GPR TRANSECT 2 (EM31-T2)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT: PARCEL 4 WALNUT COVE, NORTH CAROLINA NCDOT PROJECT R-5768	TITLE: PARCEL 4 - EM31 GROUND CONDUCTIVITY CONTOUR MAP AND RADAR IMAGES	DATE: 4/4/2019 PYRAMID PROJECT #: 2019-074	CLIENT: NCDOT **FIGURE 7**

EM31 IN-PHASE METAL DETECTION RESULTS

NO EVIDENCE OF METALLIC USTs WAS OBSERVED.

The contour plot shows the in-phase results of the EM31 instrument in parts per thousand (ppt). The green contour intervals are indicative of metal on or just below the ground surface.

EM31 Metal Detection Response (ppt)

15 12 9 7 5 3 1 -3 -5 -7 -9 -25

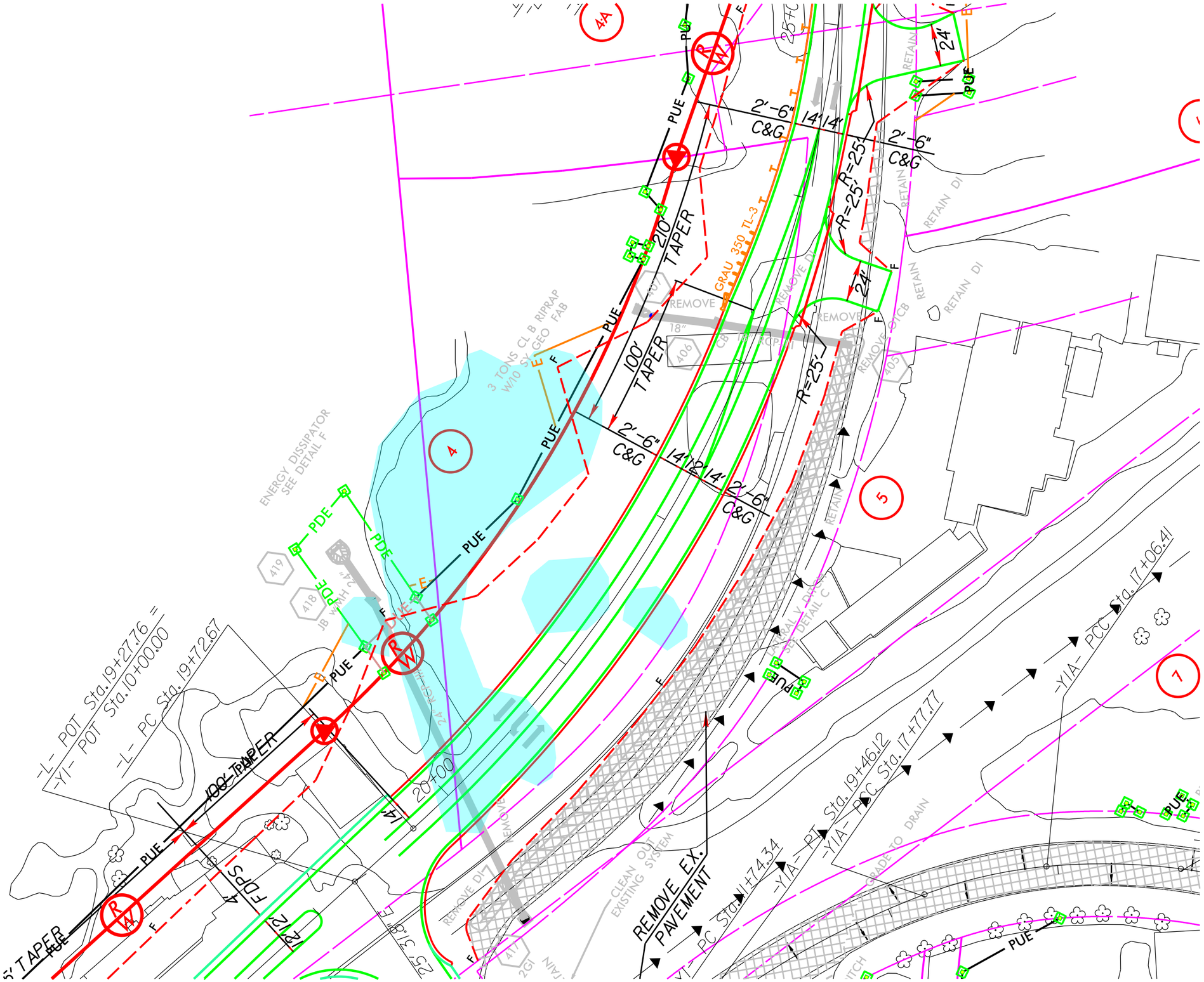
DEEPER BURIED METAL

SURFACE OR SHALLOW BURIED METAL

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 4 WALNUT COVE, NORTH CAROLINA NCDOT PROJECT R-5768	TITLE	PARCEL 4 - EM31 IN-PHASE METAL DETECTION CONTOUR MAP	DATE 4/4/2019 PYRAMID PROJECT #: 2019-074
				CLIENT NCDOT **FIGURE 8**



LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED PERMANENT UTILITY EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- AREA OF METALLIC DEBRIS

0 30 60
FEET

N

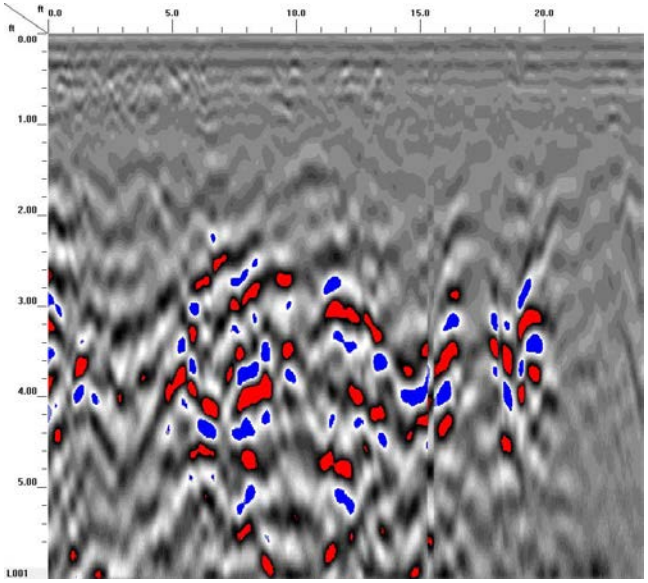
TITLE
OVERLAY OF SURFACE/SHALLOW METALLIC DEBRIS ON NCDOT ENGINEERING PLANS

PROJECT
PARCEL 4
WALNUT COVE, NORTH CAROLINA
NCDOT PROJECT R-5768

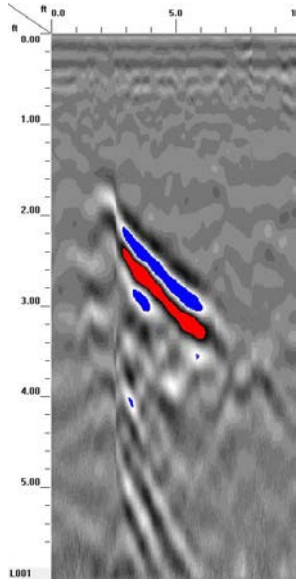
PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
License # C1251 Eng. / #C257 Geology

DATE: 04-03-2019	REVISION NO. 0
PYRAMID PROJECT NO. 2019-074	FIGURE NO. 9

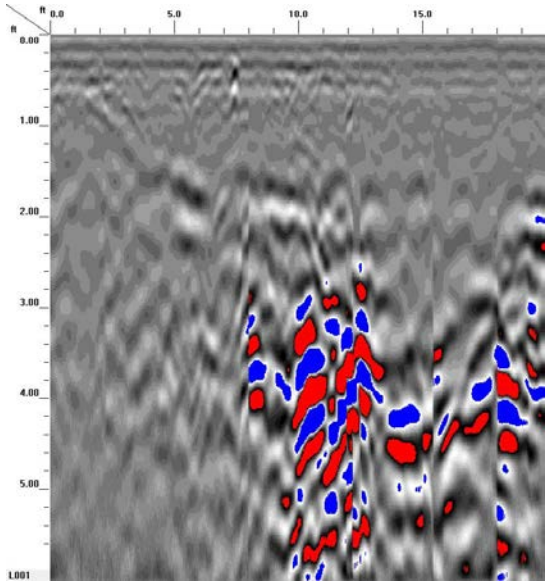
Appendix A – GPR Transect Images



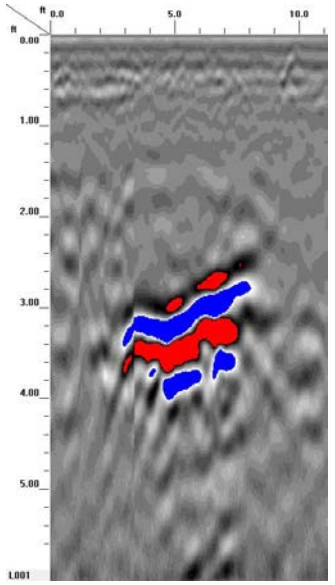
Transect 1



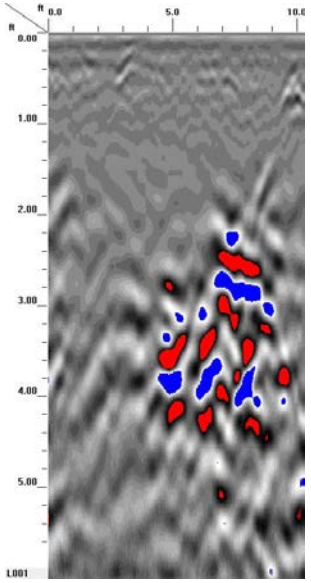
Transect 3



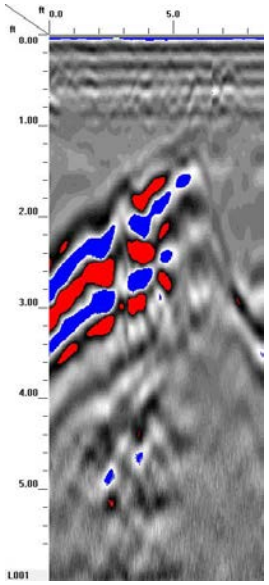
Transect 2



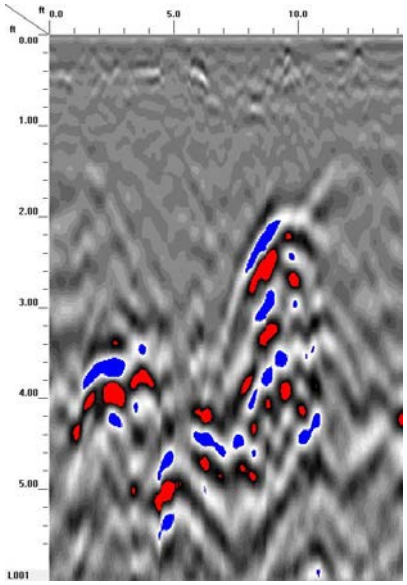
Transect 4



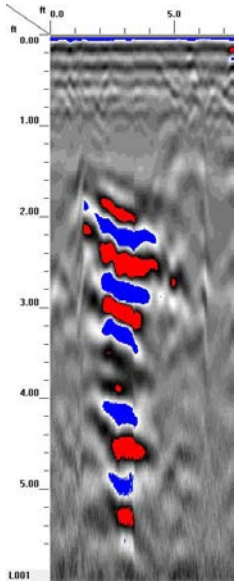
Transect 5



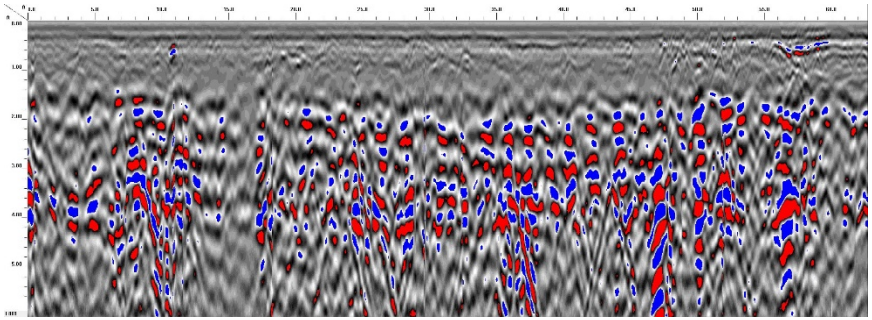
Transect 7



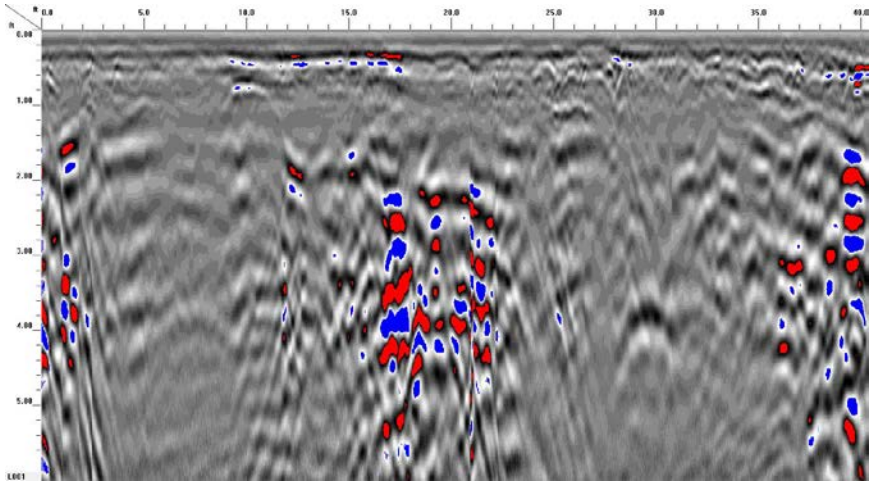
Transect 6



Transect 8



EM31 GPR Transect 1



EM31 GPR Transect 2

APPENDIX C

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 004, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	4-1
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 004, Center portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	5 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
	Surface - Asphalt	Core Sample Depths
0-2	Brown, sandy-silty-clay (CL), moist, no odor	PID= 1.3 PPM
2-4	Brown, sandy-silty-clay (CL), moist, no odor	PID= 3.0 PPM
4-5	Brown, sandy-silty-clay (CL), moist, no odor	PID= 4.9 PPM
	Decaying wood in the bottom of spoon	
	Geoprobe refusal at 5 feet.	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0___.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 004, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	4-2
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 004, South portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	10 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Surface - grass & dirt	Core Sample Depths
0-2	Brown, silty-sandy-clay (CL), moist, no odor	PID= 2.7 PPM
2-4	Brown, silty-sandy-clay (CL), moist, no odor	PID= 1.5 PPM
4-6	Brown, silty-sandy-clay (CL), moist, no odor	PID= 4.4 PPM
6-8	Brown, sandy-clayey-silt (ML), very moist, no odor	PID= 4.9 PPM
8-10	Brownish gray, clayey-sandy-silt (ML), moist to very moist, no odor	PID= 2.5 PPM
	No water in boring.	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 004, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	4-3
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 004, West portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	5.5 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Grass - Asphalt	Core Sample Depths
0-2	Brown, sandy-clayey-silt (ML), moist, no odor	PID= 1.4 PPM
2-4	Brown, sandy-clayey-silt (ML), moist, no odor	PID= 1.2 PPM
4-5.5	Dark brown to black, sandy-clayey-silt (ML), very moist, no odor	PID= 1.0 PPM
	Geoprobe refusal at 5.5 feet.	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0___.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 004, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	4-4
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 004, Center portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	10 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Surface - grass & dirt	Core Sample Depths
0-2	Brown, sandy-clayey-silt (ML), moist, no odor	PID= 1.6 PPM
2-4	Brown, sandy-clayey-silt (ML), moist, no odor	PID= 1.7 PPM
4-6	Brown, sandy-clayey-silt (ML), moist, no odor	PID= 0.6 PPM
6-8	Brown, sandy-clayey-silt (ML), moist to very moist, no odor	PID= 1.6 PPM
8-10	Brown to light gray, sandy-clayey-silt (ML), very moist, no odor	PID= 1.1 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 004, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	4-5
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 004, North portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	10 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
	Surface - grass & dirt	Core Sample Depths
0-2	Dark brown, clayey-silty-sand (SC), moist, no odor	PID= 1.2 PPM
2-4	Brown to tan, sandy-clayey-silt (ML), moist, no odor	PID= 1.5 PPM
4-6	Brown to tan, sandy-clayey-silt (ML), moist, no odor	PID= 1.0 PPM
6-8	Tan, saprolite, sandy-silty-clay (CL), moist, no odor	PID= 1.1 PPM
8-10	Tan, saprolite, sandy-silty-clay (CL), moist, no odor	PID= 1.2 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0___.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 004, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	4-6
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 004, North portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	7 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
	Grass & Gravel	Core Sample Depths
0-2	No Recovery	No Recovery
2-4	Dark brown to black, natural organic rich soil, sandy-silt (SM), moist,	PID= 2.6 PPM
	no odor	
4-6	Brown, sandy-clayey-silt (ML), moist to very moist, no odor	PID= 1.8 PPM
6-7	Brown, sandy-silty-clay (CL), firm, moist, no odor	PID= 2.3 PPM
	Geoprobe refusal at 7 feet.	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0___.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 004, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	4-7
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 004, North portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	10 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Surface - grass & dirt	Core Sample Depths
0-2	Brown, sandy-clayey-silt (CL), moist, no odor	PID= 2.5 PPM
2-4	Tan, silty-sand (SM), moist, no odor	PID= 0.6 PPM
4-6	Brown, sandy-silty-clay (CL), firm, moist, no odor	PID= 2.6 PPM
6-8	Brown, sandy-silty-clay (CL), firm, moist, no odor	PID= 1.2 PPM
8-10	Brown, sandy-silty-clay (CL), firm, moist, no odor	PID= 2.4 PPM
	No water in boring.	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 004, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	4-8
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 004, North portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	7 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Grass & Gravel	Core Sample Depths
0-2	Brown, sandy-silty-clay (CL), firm, moist, no odor	PID= 1.7 PPM
2-4	Brown, sandy-silty-clay (CL), firm, moist, no odor	PID= 2.1 PPM
4-6	Brown, sandy-silty-clay (CL), firm, moist, no odor	PID= 1.8 PPM
6-7	Brown, clayey-silty-sand (SC), moist, no odor	PID= 1.5 PPM
	Geoprobe refusal at 7 feet.	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 004, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	4-9
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 004, South portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Hand-Auger	**SAMPLE METHOD:**	Hand-Auger Bucket
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	2 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Surface - grass and dirt	Core Sample Depths
0-1	Brown, sandy-clayey-silt (ML), moist, no odor	PID= 1.9 PPM
1-2	Dark brown, sandy-clay-silt loam with some rock fragments (SM),	PID= 1.4 PPM
	moist, no odor	
	Hand-auger refusal at 2 feet.	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

APPENDIX D

QED REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS QROS

Hydrocarbon Analysis Results

Client: PYRAMID ENVIRONMENTAL
Address: 503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406

Samples taken Wednesday, April 24, 2019
Samples extracted Wednesday, April 24, 2019
Samples analysed Friday, April 26, 2019

Contact: TIM LEATHERMAN

Operator CAROLINE STEVENS

Project: NCDOT STOKES PARCEL 4 / 2019-074

F03640

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	4-1-5	25.4	<0.63	<0.63	4.9	4.9	4.4	<0.2	<0.025	0	69.5	30.5	Deg Fuel 73.7%,(FCM)
s	4-2-0-2	31.1	<0.78	<0.78	9.5	9.5	4.3	<0.25	<0.031	0	62.9	37.1	V.Deg.PHC 97.1%,(FCM)
s	4-2-6-8	48.5	<1.2	<1.2	3.1	3.1	1.6	<0.39	<0.048	0	76.9	23.1	Road Tar 73.7%,(FCM)
s	4-3-0-2	25.4	<0.63	<0.63	6.6	6.6	3.3	0.38	<0.025	0	67.5	32.5	Deg.PHC 78.4%,(FCM)
s	4-4-2-4	25.8	<0.65	<0.65	<0.65	<0.65	<0.13	<0.21	<0.026	0	44.2	55.8	PHC not detected
s	4-5-2-4	25.2	<0.63	<0.63	2.1	2.1	0.63	<0.2	<0.025	0	63.8	36.2	V.Deg.PHC 83.5%,(FCM)
s	4-6-2-4	24.8	<0.62	<0.62	45.8	45.8	29.5	1	<0.025	0	75	25	Deg Fuel 74.4%,(FCM)
s	4-7-4-6	25.8	<0.65	<0.65	<0.65	<0.65	<0.13	<0.21	<0.026	0	100	0	Residual HC
s	4-8-2-4	27.4	<0.68	<0.68	<0.68	<0.68	<0.14	<0.22	<0.027	0	0	0	PHC not detected,(BO)
s	4-9-0-1	28.1	<0.7	<0.7	5.5	5.5	2.2	<0.22	<0.028	0	62.4	37.6	Deg.PHC 85.1%,(FCM)

Initial Calibrator QC check OK Final FCM QC Check OK 102.3 %

Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

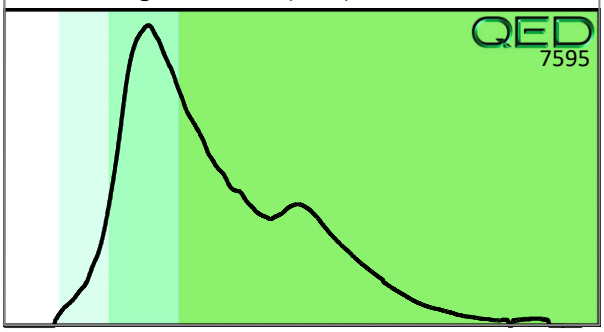
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

(SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

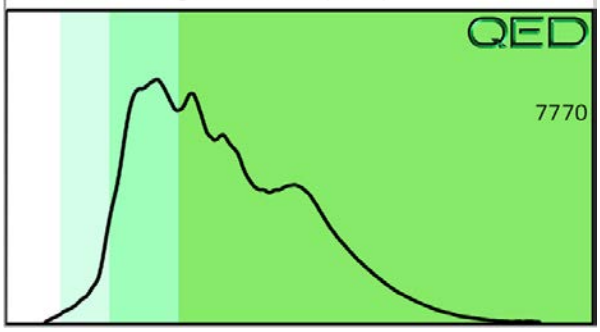
QED Hydrocarbon Fingerprints

Project: NCDOT STOKES PARCEL 4 / 2019-074 Friday, April 26, 2019

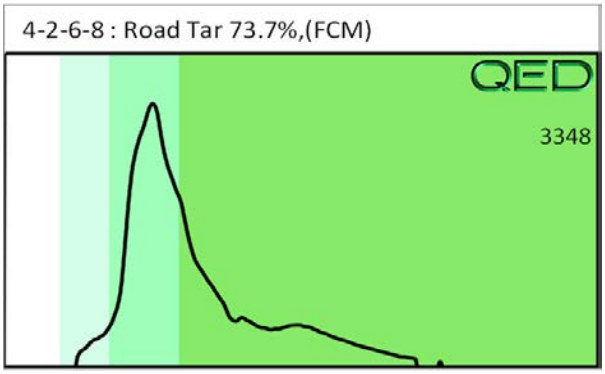
4-1-5 : Deg Fuel 73.7%,(FCM)



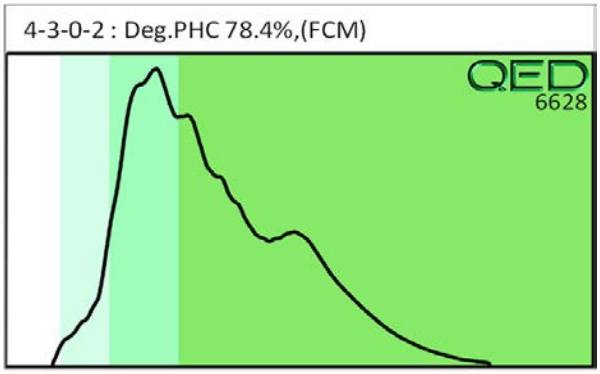
4-2-0-2 : V.Deg.PHC 97.1%,(FCM)



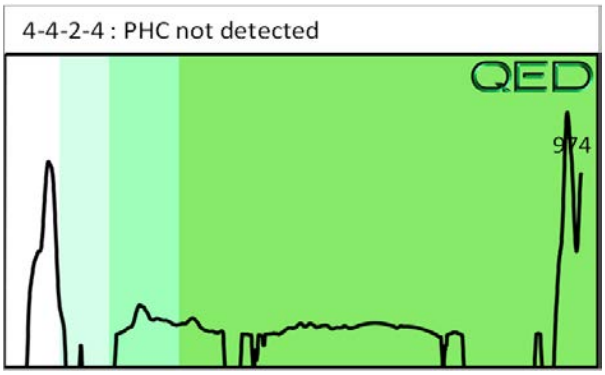
4-2-6-8 : Road Tar 73.7%,(FCM)



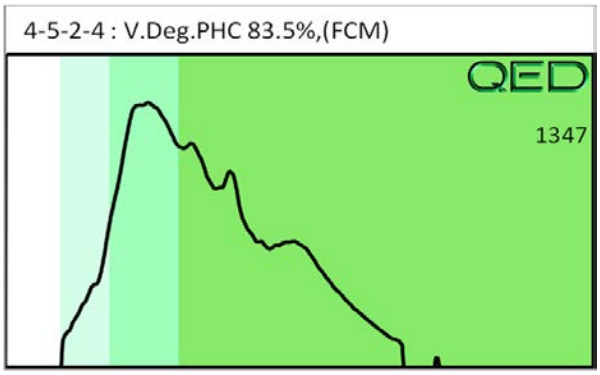
4-3-0-2 : Deg.PHC 78.4%,(FCM)



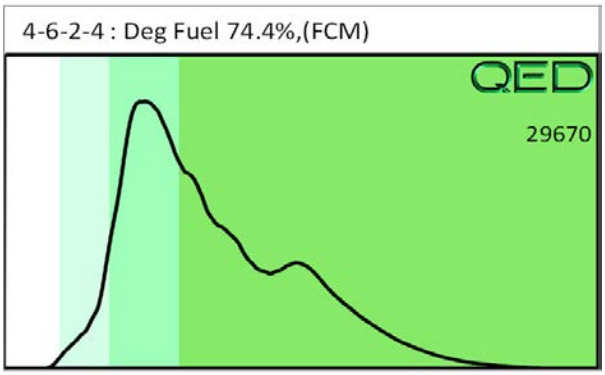
4-4-2-4 : PHC not detected



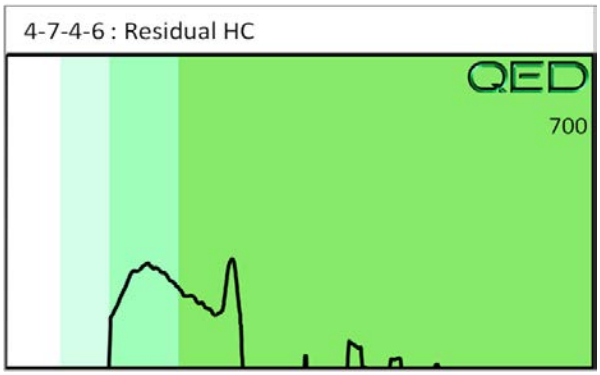
4-5-2-4 : V.Deg.PHC 83.5%,(FCM)



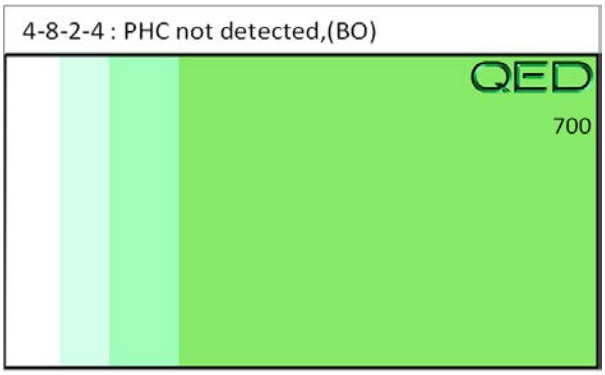
4-6-2-4 : Deg Fuel 74.4%,(FCM)



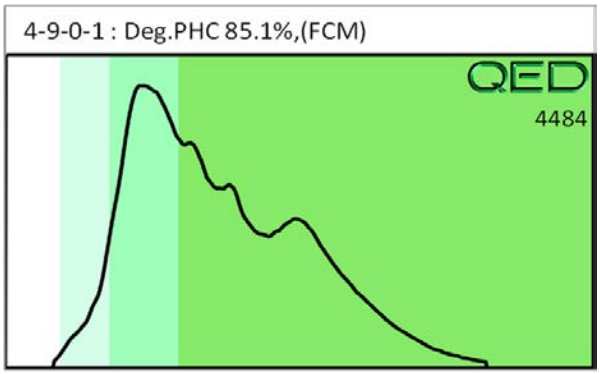
4-7-4-6 : Residual HC



4-8-2-4 : PHC not detected,(BO)



4-9-0-1 : Deg.PHC 85.1%,(FCM)



APPENDIX E

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT R-5768 Phase II **PROJECT NO.:** 2019-074

Name: Leatherman, Heenan **Dates:** 4/3/19 & 4/4/19

TASKS PERFORMED: Site reconnaissance, geophysical surveys, utility locating

T. Leatherman, J. Heenan
Mobilize to site. Site, recon, geophysics, utility locating.
Average daily time: ~8:00 AM - 5:00PM

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT R-5768 Phase II **PROJECT NO.:** 2019-074

Name: Leatherman **Dates:** 4/23/19 & 4/24/19

TASKS PERFORMED: Soil Sampling

T. Leatherman
Mobilize to site. soil sampling supervision, collection and analysis prep
Average daily time: ~8:00 AM - 5:00PM

GEOENVIRONMENTAL PHASE II INVESTIGATION

PARCEL 008 – V. L DEHART
403 STOKESBURGE ROAD
WALNUT COVE, STOKES COUNTY, NORTH CAROLINA
STATE PROJECT: R-5768
WBS ELEMENT: 44670.1.1
APRIL 30, 2019

Report prepared for:

Mr. Craig Haden
GeoEnvironmental Section
Geotechnical Engineering Unit
North Carolina Department of Transportation
1020 Birch Ridge Drive
Raleigh, NC 27610

Report prepared by:

DocuSigned by:
Eric Cross
3292E33596454F4...

NORTH CAROLINA LICENSED SEAL 2181 GEOLOGIST ERIC C. CROSS 4/30/19

Erie C. Cross, LG
NC License #2181 5/7/2019

Report reviewed by:

DocuSigned by:
Michael G. Jones
A7CBC72174E9413...

NORTH CAROLINA LICENSED SEAL 1168 GEOLOGIST MICHAEL GALE JONES 04/30/19

Michael G. Jones, LG
NC License #1168 5/7/2019

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.
P.O. BOX 16265
GREENSBORO, NC 27416-0265
(336) 335-3174

C-257 –Geology
C-1251 – Engineering

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

FIGURES

TABLES

APPENDICES

Acronyms

BLS .....Below Land Surface
BTEX .....Benzene, Toluene, Ethylbenzene, & Xylenes
CADD .....Computer Aided Design and Drafting
COC .....Chain of Custody
CSA.....Comprehensive Site Assessment
DEQ .....Department of Environmental Quality
DRO .....Diesel Range Organics
DWM .....Division of Waste Management
EM.....Electromagnetic (as with EM-61)
EPA.....Environmental Protection Agency
GRO .....Gasoline Range Organics
GCLs .....Gross Contaminant Levels
GPR.....Ground Penetrating Radar
HASP .....Health & Safety Plan
MSCC .....Maximum Soil Contaminant Concentration
MTBE .....Methyl Tertiary Butyl Ether
µg/L.....Micrograms per Liter
mg/kg .....Milligrams per kilogram
NPDES.....National Pollutions Discharge Elimination System
NCAC .....North Carolina Administrative Code
NCDOT.....North Carolina Department of Transportation
OSHA.....Occupational Safety and Health Administration
OVA.....Organic Vapor Analyzer
PPM.....Parts Per Million
PID .....Photo-ionization Detector
PSA .....Preliminary Site Assessment
PVC.....Poly-vinyl Chloride
RFP .....Request for Proposal
ROW .....Right of Way
SVOCs .....Semi-Volatile Organic Compounds
TW .....Temporary Well
TPH.....Total Petroleum Hydrocarbons
UVF.....Ultraviolet Fluorescence (UVF) QED Analyzer
UST.....Underground Storage Tank
US EPA.....United States Environmental Protection Agency
VOCs.....Volatile Organic Compounds

GEOENVIRONMENTAL PHASE II INVESTIGATION
PARCEL 008 – V. L DEHART
403 STOKESBURGE ROAD
WALNUT COVE, STOKES COUNTY, NORTH CAROLINA

EXECUTIVE SUMMARY OF RESULTS

Pyramid Environmental & Engineering P.C. (Pyramid) has prepared this GeoEnvironmental Phase II Investigation (Phase II) report documenting background information, field activities, assessment activities, findings, conclusions, and recommendations for Parcel 008, owned by V. L DeHart. The property currently contains a vacant building surrounded by asphalt, grass and dirt surfaces at 403 Stokesburge Road, Walnut Cove, NC. This Phase II was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's February 28, 2019, technical proposal. This Phase II is a part of State Project R-5768.

The purpose of this assessment was to determine the presence or absence of underground storage tanks (USTs) and impacted soils across the entire site due to its designation as a total take by the NCDOT. The Phase II was conducted with particular attention to the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features.

The following statements summarize the results of the Phase II:

- **Site History:** Pyramid interviewed DEQ personnel, interviewed property owners, and reviewed aerial photographs to assess past uses of the property. Pyramid reviewed aerial photographs from 1993 – 2018 obtained from Google Earth. The photographs' resolutions are unclear, but appear to show the building in its current location since at least 1993. The 1993, 2008, 2010 and 2018 aerial photographs are included in **Appendix A**.

  Pyramid's background research revealed the following environmental incident number and associated information for the site: Incident 19490, UST Number WS-5571, Facility ID 00-0000008364, Incident Name: Former Friendly Food Mart #6. On March 29, 2019, Pyramid emailed the Stokes County parcel address (403 Stokesburge Road, Walnut Cove, NC) to Ms. Linda Estkowski at the NC Department of Environmental Quality (NC DEQ), with a request to investigate any environmental incidents associated with the parcel. Ms. Estkowski verified the above incident number for this property. She also indicated that the property was submitted to the NC State Lead Program in 2015.

Pyramid obtained all available environmental incident records and documents for this property associated with the above incident number. A summary timeline of events at the property, beginning with the removal of three 4,000-gallon USTs in 1998, is as follows:

- 7/30/1998 – UST Closure Report received by Winston-Salem Regional Office, UST Section
- 8/10/1998 – UST-2 Form Received
- 1/27/1999 – A Limited Site Assessment (LSA) was requested due to potential contamination.
- 6/3/1999 – 3/24/2000 – An LSA was conducted along with supplemental LSAs
- 12/21/2000 – Site was ranked intermediate by NCDENR.
- 2/27/2013 – Site was ranked I 144D by NCDENR.
- 5/22/2013 – The last monitoring report Pyramid could find was submitted.
  - The 2013 monitoring report encountered four inches of free product in one well (MW-2).
  - The 2013 monitoring report recorded 2,100 parts per billion (ppb) benzene and 5,600 ppb MTBE
- 10/1/2013 – NCDENR receives letter from responsible party (Dan River Oil Company) requesting the site be submitted to the State Lead Program.

Pyramid Staff Professional Tim Leatherman performed a site investigation at the property. Mr. Leatherman did not observe any significant environmental risks on the property at the time of the investigation. No vent pipes were observed that could indicate the presence of USTs. Mr. Leatherman did observe four of the monitor wells that were installed at the property as part of the above-described environmental incident. As part of this Phase II investigation, the monitor well closest to a proposed NCDOT drainage feature was gauged and sampled (discussed in detail in later sections). It has yet to be verified if the property was accepted into the State Lead Program.

- **Geophysical Survey**: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of ten EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR was performed across EM anomalies associated with the building, a trailer, and suspected buried metallic debris to verify that the metallic interference associated with these features did not obscure any potential USTs. GPR did not record any evidence of significant buried structures. EM and GPR evidence also show suspected utilities in areas where known buried utility lines are located. Collectively, the geophysical data did not record any evidence of metallic USTs within the geophysical survey area at Parcel 8.

- **Limited Soil Assessment:** A total of seven soil borings were performed across the property. Soil samples were screened in the field using a Photo-Ionization Detector (PID) and select soil samples were analyzed for Diesel Range Organics (DRO) and Gasoline Range Organics (GRO) using a QED Analyzer. The DEQ action level for TPH-GRO is 50 milligrams per kilogram (mg/kg) and the action level for TPH-DRO is 100 mg/kg. Soil samples were screened with a PID and select soil samples were analyzed for DRO and GRO using a QED Analyzer.

  Four borings exhibited DRO concentrations above action levels. Specifically, one sample from boring 8-1 (4-6 feet) recorded a DRO concentration of **170.6 mg/kg**. One sample from boring 8-3 (8-10 feet) recorded a GRO concentration of **803 mg/kg** and a DRO concentration of **6,627 mg/kg.** One sample from boring 8-4 (6-8 feet) recorded a DRO concentration of **181.5 mg/kg.** One sample from boring 8-5 (2-4 feet) a GRO concentration of **157.4 mg/kg** and a DRO concentration of **775.9 mg/kg.** None of the remaining soil samples analyzed exhibited DRO and GRO concentrations above action levels.

- **Limited Groundwater Assessment:** The water table was not encountered in the upper 10 feet of the soil column that was sampled during this Phase II. Review of the NCDOT engineering plans for this parcel indicate that groundwater will not be encountered during construction activities. Therefore, temporary monitoring wells were not installed. However, due to the environmental incident associated with this site and the five existing monitor wells located on-site, Pyramid performed gauging and sampling of one monitor well. This well is designated at MW-2 in the previous site assessment environmental documents and was located directly adjacent to a proposed NCDOT drainage feature.

  The 6200B laboratory analysis detected concentrations of benzene (**9,500 µg/kg**), ethyl benzene (**1,800 µg/kg**), isopropylbenzene (**95 µg/kg**), napthalene (**780 µg/kg**), toluene (**25,000 µg/kg**), total xylenes (**14,000 µg/kg**), n-Propylbenzene (**210 µg/kg),** sec-Butylbenzene **(130 µg/kg),** MTBE **(1,700 µg/kg),** 1,2,4 Trimenthylbenzene **(3,100 µg/kg),** and 1,3,5 Trimethylbenzene **(910 µg/kg)** that were above NCAC 2L groundwater standards in the sample.

- **Contaminated Soil Volumes:** Pyramid's Phase II investigation resulted in an **estimated volume of 1,420 cubic yards of impacted soil at the location of borings 8-1, 8-3, 8-4 and 8-5**. This was calculated using the bottom depth of the deepest contaminated sample (Boring 8-3, ten feet below ground surface). The NCDOT engineering plans indicate that these contaminated soils are within a potential zone of planned soil excavation associated with a proposed drainage

feature. The boundaries of the areas of contamination are approximate due to limited soil analytical data.

It should be noted that, if impacted soil is encountered during road construction outside of the area analyzed by this investigation, the impacted soil should be managed according to NC DEQ Division of Waste Management (DWM) UST Section Guidelines and disposed of at a permitted facility.

- **Petroleum-Impacted Groundwater:** Analytical results indicate that the petroleum contamination extends at least into the groundwater system at the location of MW-2. Pyramid utilized the groundwater benzene concentration map included in the historical environmental assessment documents to estimate the limits of contamination based on the benzene concentration contour lines. Pyramid estimates an **approximate area of 4,300 square feet of contaminated groundwater**.

  The groundwater monitoring wells present at the site will need to be properly abandoned prior to roadway project initiation. In the past, Pyramid has coordinated with the NCDEQ and the NCDOT to provide monitoring well abandonment on sites.

1.0 INTRODUCTION

Pyramid Environmental & Engineering P.C. (Pyramid) has prepared this GeoEnvironmental Phase II Investigation (Phase II) report documenting background information, field activities, assessment activities, findings, conclusions, and recommendations for Parcel 008, owned by V. L DeHart. The property currently contains a vacant building surrounded by asphalt, grass and dirt surfaces at 403 Stokesburge Road, Walnut Cove, NC. This Phase II was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's February 28, 2019, technical proposal. This Phase II is a part of State Project R-5768.

The purpose of this assessment was to determine the presence or absence of underground storage tanks (USTs) and impacted soils across all accessible portions of the property due to its designation as a total take. The Phase II was conducted with particular attention to the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features. The location of the subject site is shown on **Figure 1**.

1.1 Background Information

Based on the NCDOT's February 18, 2019, *Request for Technical and Cost Proposal (RFP),* the Phase II was conducted across all accessible portions of the property due to its designation as a total take with emphasis on the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features and/or other utilities, in accordance with the CADD files provided to Pyramid by the NCDOT. The Phase II included the following:

- Research the properties for past uses and possible releases.
- Conduct a preliminary geophysical site assessment and limited soil assessment across the entire parcel with emphasis on the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features and/or other utilities.
- If groundwater is likely to be encountered by subsequent excavation required by construction, then Pyramid will attempt to obtain a groundwater sample from the parcel.

1.2 Project Information

Prior to field activities, a Health and Safety Plan was prepared. Prior to drilling activities, the public underground utilities were located and marked by the North Carolina One-Call Service. Pyramid's geophysical staff provided additional private utility locating services to mark the on-site private, buried utilities.

2.0 SITE HISTORY

The NCDOT GeoEnvironmental Planning Report for Parcel 008 in the RFP documents provided to Pyramid on February 18, 2019, provided the following background information related to the site:

> *"This facility currently is abandoned. The facility is listed in the reviewed public records in the UST database, for three 4,000-gallon gasoline tanks, all removed – and LUST and LUST TRUST databases for an open case of petroleum release with gross benzene contamination of groundwater in February 2000, with clean-up completed in September 2001. Public records reviewed on October 5, 2017, designate the site as a former gasoline facility containing three 4,000-gallon gasoline USTs with unknown installation dates. The tanks were excavated on June 2, 1998, and removed for off-site disposal. Analytical laboratory results of soils excavated from beneath the USTs indicated the presence of petroleum concentrations below NC standards. Contaminated soils were identified near the dispenser island and the product lines with limited excavation removing impacted soils. High BTEX concentrations were detected in groundwater adjacent to NC 65. The site inspection on September 28, 2017, identified an abandoned building and small parking lot. No indication of USTs were identified, but a cover plate indicating the presence of four groundwater monitoring wells were noted."*

Pyramid interviewed DEQ personnel, interviewed property owners, and reviewed aerial photographs to assess past uses of the property. Pyramid reviewed aerial photographs from 1993 – 2018 obtained from Google Earth. The photographs' resolutions are unclear, but appear to show the building in its current location since at least 1993. The 1993, 2008, 2010 and 2018 aerial photographs are included in **Appendix A**.

Pyramid's background research revealed the following environmental incident number and associated information for the site: Incident 19490, UST Number WS-5571, Facility ID 00-0000008364, Incident Name: Former Friendly Food Mart #6. On March 29, 2019, Pyramid emailed the Stokes County parcel address (403 Stokesburge Road, Walnut Cove, NC) to Ms. Linda Estkowski at the NC Department of Environmental Quality (NC DEQ), with a request to investigate any environmental incidents associated with the parcel. Ms. Estkowski verified the above incident number for this property. She also indicated that the property was submitted to the NC State Lead Program in 2015.

Pyramid obtained all available environmental incident records and documents for this property associated with the above incident number. A summary timeline of events at the property, beginning with the removal of three 4,000-gallon USTs in 1998, is as follows:

- 7/30/1998 – UST Closure Report received by Winston-Salem Regional Office, UST Section

- 8/10/1998 – UST-2 Form Received
- 1/27/1999 – A Limited Site Assessment (LSA) was requested due to potential contamination.
- 6/3/1999 – 3/24/2000 – An LSA was conducted along with supplemental LSAs
- 12/21/2000 – Site was ranked intermediate by NCDENR.
- 2/27/2013 – Site was ranked I 144D by NCDENR.
- 5/22/2013 – The last monitoring report Pyramid could find was submitted.
    - The 2013 monitoring report encountered four inches of free product in one well (MW-2).
    - The 2013 monitoring report recorded 2,100 parts per billion (ppb) benzene and 5,600 ppb MTBE
- 10/1/2013 – NCDENR receives letter from responsible party (Dan River Oil Company) requesting the site be submitted to the State Lead Program.

All environmental documents obtained by Pyramid as part of the site research are included in **Appendix B**.

Pyramid Staff Professional Tim Leatherman performed a site investigation at the property. Mr. Leatherman did not observe any significant environmental risks on the property at the time of the investigation. No vent pipes were observed that could indicate the presence of USTs. Mr. Leatherman did observe four of the monitor wells that were installed at the property as part of the above-described environmental incident. As part of this Phase II investigation, the monitor well closest to a proposed NCDOT drainage feature was gauged and sampled (discussed in detail in later sections). It has yet to be verified if the property was accepted into the State Lead Program.

3.0 GEOPHYSICAL INVESTIGATION

Pyramid's classifications of USTs for the purposes of this Phase II report are based directly on the geophysical UST ratings provided to us by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of ten EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR was performed across EM anomalies associated with the building, a trailer, and suspected buried metallic debris to verify that the metallic interference associated with these features did not obscure any potential USTs. GPR did not record any evidence of significant buried structures. EM and GPR evidence also show suspected utilities in areas where known buried utility lines are located. Collectively, the geophysical data did not record any evidence of metallic USTs within the geophysical survey area at Parcel 8.

The full details of the geophysical investigation are documented in Pyramid's Geophysical Investigation Report, dated April 3, 2019, which is included as **Appendix C**.

4.0 SOIL SAMPLING ACTIVITIES & RESULTS

4.1 Soil Assessment Field Activities

On April 24, 2019, Pyramid mobilized to the site, drilled soil borings and collected the proposed soil samples for the Phase II. Seven (7) soil borings (8-1 through 8-7) were advanced on the subject property. The soil borings were completed using a truck-mounted Geoprobe drill rig. The selected locations were chosen to avoid public utilities along the adjacent roads and private utilities associated with the business while remaining in the proposed ROW and/or easement, or within other areas of concern such as proposed drainage features and areas designated for soil removal as indicated by the NCDOT engineering plans. The locations of the borings are shown on **Figure 2**.

Soil samples were continuously collected in four-foot long disposable sleeves from each boring for geologic description and visual examination for signs of contamination. Soil recovered from each sleeve was screened in the field using a Photo-Ionization Detector

(PID) approximately every 2 feet, depending on the soil recovery. In general, the soil sample with the highest PID reading was selected from each boring for QED Ultra-Violet Fluorescence (UVF) laboratory analysis. If field screening detected multiple elevated readings, then additional soil samples from each boring were selectively chosen for UVF analysis. The soil boring logs with the soil descriptions, visual examination, and PID screening results are included in **Appendix D**. The PID field screening results are summarized in **Table 1**. To prevent cross-contamination, new disposable nitrile gloves were worn by the sampling technician during the sampling activities and were changed between samples. Petroleum odor was detected in borings 8-3, 8-4 and 8-5 during the field screening.

The soil samples selected for total petroleum hydrocarbon (TPH) analyses were analyzed utilizing the QED UVF HC-1 Analyzer system from RED Lab. The DEQ & NCDOT now accept this instrument as an analytical method to provide total petroleum hydrocarbon (TPH) results for soil analysis for Phase II projects. Pyramid preserved the samples for UVF analysis in methanol-filled containers provided by RED Lab. The samples were shipped to RED Lab for analysis following the soil collection. The soil samples selected for analysis using the QED Analyzer were analyzed for TPH as diesel range organics (DRO) and TPH as gasoline range organics (GRO).

4.2 Soil Sample Analytical Results

QED Results

The DEQ action level for TPH-GRO is 50 milligrams per kilogram (mg/kg) and the action level for TPH-DRO is 100 mg/kg. Soil samples were screened with an PID and select soil samples were analyzed for DRO and GRO using a QED Analyzer. Four borings exhibited DRO concentrations above action levels. Specifically, one sample from boring 8-1 (4-6 feet) recorded a DRO concentration of **170.6 mg/kg**. One sample from boring 8-3 (8-10 feet) recorded a GRO concentration of **803 mg/kg** and a DRO concentration of **6,627 mg/kg.** One sample from boring 8-4 (6-8 feet) recorded a DRO concentration of **181.5 mg/kg.** One sample from boring 8-5 (2-4 feet) a GRO concentration of **157.4 mg/kg** and a DRO concentration of **775.9 mg/kg.** None of the remaining soil samples analyzed exhibited DRO and GRO concentrations above action levels. The soil sample QED results are summarized in **Table 2**. A copy of the QED analysis report is included in **Appendix E**.

4.3 Temporary Monitoring Well Installation

The water table was not encountered in the upper 10 feet of the soil column that was sampled during this Phase II. Review of the NCDOT engineering plans for this parcel indicate that groundwater will not be encountered during construction activities. Therefore, temporary monitoring wells were not installed. However, due to the environmental incident associated with this site and the five existing monitor wells located on-site, Pyramid performed gauging and sampling of one monitor well. This well is designated at MW-2 in the previous site assessment environmental documents (**Appendix B**) and was located

directly adjacent to a proposed NCDOT drainage feature. The locations of all five existing monitor wells are shown on **Figure 3.**

4.4 Groundwater Analytical Results

The groundwater sample MW-2 was placed in laboratory prepared containers for analysis of volatile organic compounds (VOCs) by EPA Method 6200B. The samples were shipped to Prism Labs for analysis. The 6200B laboratory analysis detected concentrations of benzene (**9,500 µg/kg**), ethyl benzene (**1,800 µg/kg**), isopropylbenzene (**95 µg/kg**), napthalene (**780 µg/kg**), toluene (**25,000 µg/kg**), total xylenes (**14,000 µg/kg**), n-Propylbenzene (**210 µg/kg),** sec-Butylbenzene **(130 µg/kg),** MTBE **(1,700 µg/kg),** 1,2,4 Trimenthylbenzene **(3,100 µg/kg),** and 1,3,5 Trimethylbenzene **(910 µg/kg)** that were above NCAC 2L groundwater standards in the sample. The groundwater results for sample MW-2 are summarized in **Table 3**. An estimated area of groundwater contamination is presented in **Figure 3**. A copy of the laboratory report and chain-of-custody is included in **Appendix F**.

5.0 CONCLUSIONS AND RECOMMENDATIONS

As requested by the NCDOT, Pyramid has completed a Phase II at Parcel 008 (V. L DeHart) located at 403 Stokesburge Road, Walnut Cove, NC. The following is a summary of the assessment activities and results.

5.1 Geophysical Investigation

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of ten EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR was performed across EM anomalies associated with the building, a trailer, and suspected buried metallic debris to verify that the metallic interference associated with these features did not obscure any potential USTs. GPR did not record any evidence of significant buried structures. EM and GPR evidence also show suspected utilities in areas where known buried utility lines are located. Collectively, the geophysical data did not record any evidence of metallic USTs within the geophysical survey area at Parcel 8.

5.2 Limited Soil Assessment

The DEQ action level for TPH-GRO is 50 milligrams per kilogram (mg/kg) and the action level for TPH-DRO is 100 mg/kg. Soil samples were screened with an PID and select soil samples were analyzed for DRO and GRO using a QED Analyzer. Four borings exhibited DRO concentrations above action levels. Specifically, one sample from boring 8-1 (4-6 feet) recorded a DRO concentration of **170.6 mg/kg**. One sample from boring 8-3 (8-10 feet) recorded a GRO concentration of **803 mg/kg** and a DRO concentration of **6,627 mg/kg.** One sample from boring 8-4 (6-8 feet) recorded a DRO concentration of **181.5 mg/kg.** One sample from boring 8-5 (2-4 feet) a GRO concentration of **157.4 mg/kg** and a DRO concentration of **775.9 mg/kg.** None of the remaining soil samples analyzed exhibited DRO and GRO concentrations above action levels.

5.3 Limited Groundwater Assessment

The water table was not encountered in the upper 10 feet of the soil column that was sampled during this Phase II. Review of the NCDOT engineering plans for this parcel indicate that groundwater will not be encountered during construction activities. Therefore, temporary monitoring wells were not installed. However, due to the environmental incident associated with this site and the five existing monitor wells located on-site, Pyramid performed gauging and sampling of one monitor well. This well is designated at MW-2 in the previous site assessment environmental documents and was located directly adjacent to a proposed NCDOT drainage feature.

The groundwater sample MW-2 was placed in laboratory prepared containers for analysis of volatile organic compounds (VOCs) by EPA Method 6200B. The samples were shipped to Prism Labs for analysis. The 6200B laboratory analysis detected concentrations of benzene (**9,500 µg/kg**), ethyl benzene (**1,800 µg/kg**), isopropylbenzene (**95 µg/kg**),

napthalene (**780 µg/kg**), toluene (**25,000 µg/kg**), total xylenes (**14,000 µg/kg**), n-Propylbenzene (**210 µg/kg),** sec-Butylbenzene **(130 µg/kg),** MTBE **(1,700 µg/kg),** 1,2,4 Trimenthylbenzene **(3,100 µg/kg),** and 1,3,5 Trimethylbenzene **(910 µg/kg)** that were above NCAC 2L groundwater standards in the sample.

5.4 Recommendations

Petroleum-Impacted Soils

During road construction activities, it is possible the NCDOT may encounter petroleum impacted soil near soil borings 8-1, 8-3, 8-4 and 8-5. DRO and/or GRO concentrations of soils from these borings exceeded action levels. The direct source of this petroleum is likely associated with the leaking UST described in the *Site History* section of this report. The NCDOT MicroStation plans indicate a proposed drainage feature at this location that may require excavation for installation.

Estimating the Area of Contamination

The estimated area of contamination is depicted on **Figure 2**. The boundaries of the area of contamination are generally estimated by applying a circular area of contamination around a boring exhibiting DRO/GRO levels above action levels with a radius equal to half the distance between that boring and the nearest "clean" boring. In cases where this approach is not feasible, such as near property boundaries or where data does not exist to provide a definitive boundary, the area of contamination is terminated using the distance to the property boundary as a radius, or an educated approximation is applied.

Pyramid's PSA investigation resulted in an **estimated volume of 1,420 cubic yards of impacted soil at the location of borings 8-1, 8-3, 8-4 and 8-5**. This was calculated using the bottom depth of the deepest contaminated sample (Boring 8-3, ten feet below ground surface). The NCDOT engineering plans indicate that these contaminated soils are within a potential zone of planned soil excavation associated with a proposed drainage feature. The boundaries of the areas of contamination are approximate due to limited soil analytical data.

It should be noted that, if impacted soil is encountered during road construction outside of the area analyzed by this investigation, the impacted soil should be managed according to NC DEQ Division of Waste Management (DWM) UST Section Guidelines and disposed of at a permitted facility.

Petroleum-Impacted Groundwater

The NCDOT may also encounter shallow groundwater during construction. While the geoprobe soil sampling did not encounter a clear water table, the gauging of MW-2 recorded a water level of approximately 4.5 feet below the ground surface. There is likely a confining layer in the subsurface that is preventing the groundwater from being observed in the soil samples; however, the monitor well was constructed to a total depth of 20 feet,

thereby allowing groundwater from below the confining unit to enter the well screen and raise to the gauged level.

Groundwater analytical results indicate that the petroleum contamination extends at least into the groundwater system at the location of MW-2. Pyramid utilized the groundwater benzene concentration map included in the historical environmental assessment documents (**Appendix B**) to estimate the limits of contamination based on the benzene concentration contour lines. **Figure 3** presents an estimated area of groundwater contamination, which shows an **approximate area of 4,300 square feet of contaminated groundwater**.

The groundwater monitoring wells present at the site will need to be properly abandoned prior to roadway project initiation. In the past, Pyramid has coordinated with the NCDEQ and the NCDOT to provide monitoring well abandonment on sites.

6.0 LIMITATIONS

The results of this preliminary investigation are limited to the boring locations completed during this limited assessment and presented in this report. The laboratory results only reflect the current conditions at the locations sampled on the date this Phase II was performed.

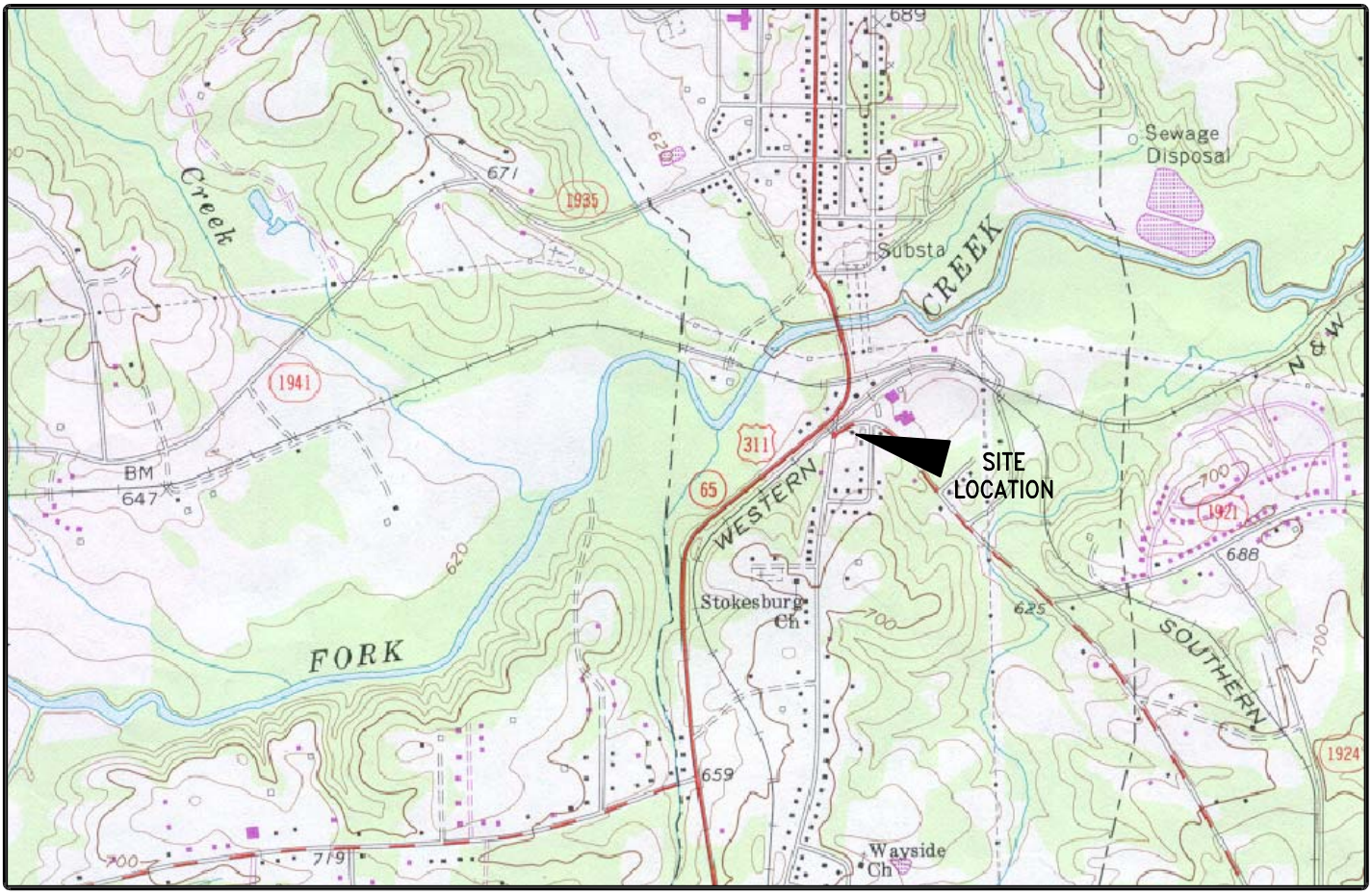
7.0 CLOSURE

This report was prepared for, and is available solely for use by, the NCDOT and their designees. The contents thereof may not be used or relied upon by any other person without the express written consent and authorization of Pyramid Environmental & Engineering, P.C. (Pyramid). The observations, conclusions, and recommendations documented in this report are based on site conditions and information reviewed at the time of Pyramid's investigation. Pyramid appreciates the opportunity to provide this environmental service.

FIGURES

USGS TOPOGRAPHIC MAP

SITE: 403 STOKESBURG RD. LOCATION: WALNUT COVE, NORTH CAROLINA



USGS IDENTIFICATION

USGS 7.5 MINUTE MAP	WALNUT COVE, N.C.
ORIGINAL DATE:	1971
PHOTOREVISION DATE:	1986

	PRIMARY HIGHWAY, HARD SURFACE
	SECONDARY HIGHWAY, HARD SURFACE
	LIGHT-DUTY ROAD HARD OR IMPROVED SURFACE
	UNIMPROVED ROAD
	STATE ROAD
	U.S. ROUTE
	INTERSTATE ROUTE

SCALES

MILES: 1/2 0 1

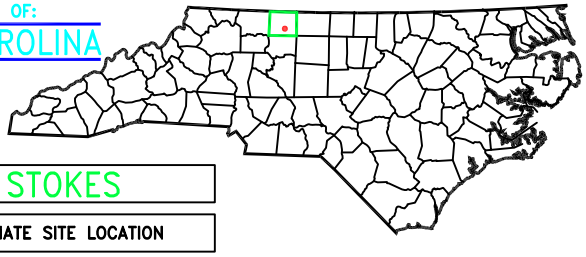
FEET: 1000 0 2000 4000 6000

1" = 2000'

NOTES:
- TOPOGRAPHICAL CONTOUR INTERVAL = 20 FEET
- PHOTOREVISIONS DENOTED IN PURPLE

MAGNETIC NORTH

COUNTY MAP OF: NORTH CAROLINA



COUNTY: STOKES

APPROXIMATE SITE LOCATION

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT: NCDOT PROJECT R-5768

PROPERTY NAME: 403 STOKESBURG RD., PARCEL 8

CITY: WALNUT COVE STATE: NORTH CAROLINA

TITLE: TOPOGRAPHIC MAP

SCALE: 1"=2000'

DATE: 4/4/19

DRAWING NAME: USGSTOPO

DRAWN BY: KAM

CHECK BY: EC

JOB NO.: 2019-074

TYPE: PSA

FIGURE NUMBER: 1

NOTES

TOPOGRAPHIC MAP USED IN THIS GRAPHIC IS MAPPED, EDITED, AND PUBLISHED BY THE UNITED STATES GEOLOGIC SURVEY, DEPARTMENT OF THE INTERIOR, RESTON VIRGINIA.

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS.

LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED PERMANENT UTILITY EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- 8-2 SOIL SAMPLING LOCATION*
- AREA OF SOIL CONTAMINATION

*ANALYTICAL RESULTS PRESENTED IN TABLE 2 OF PHASE II REPORT

0 25 50
FEET

N

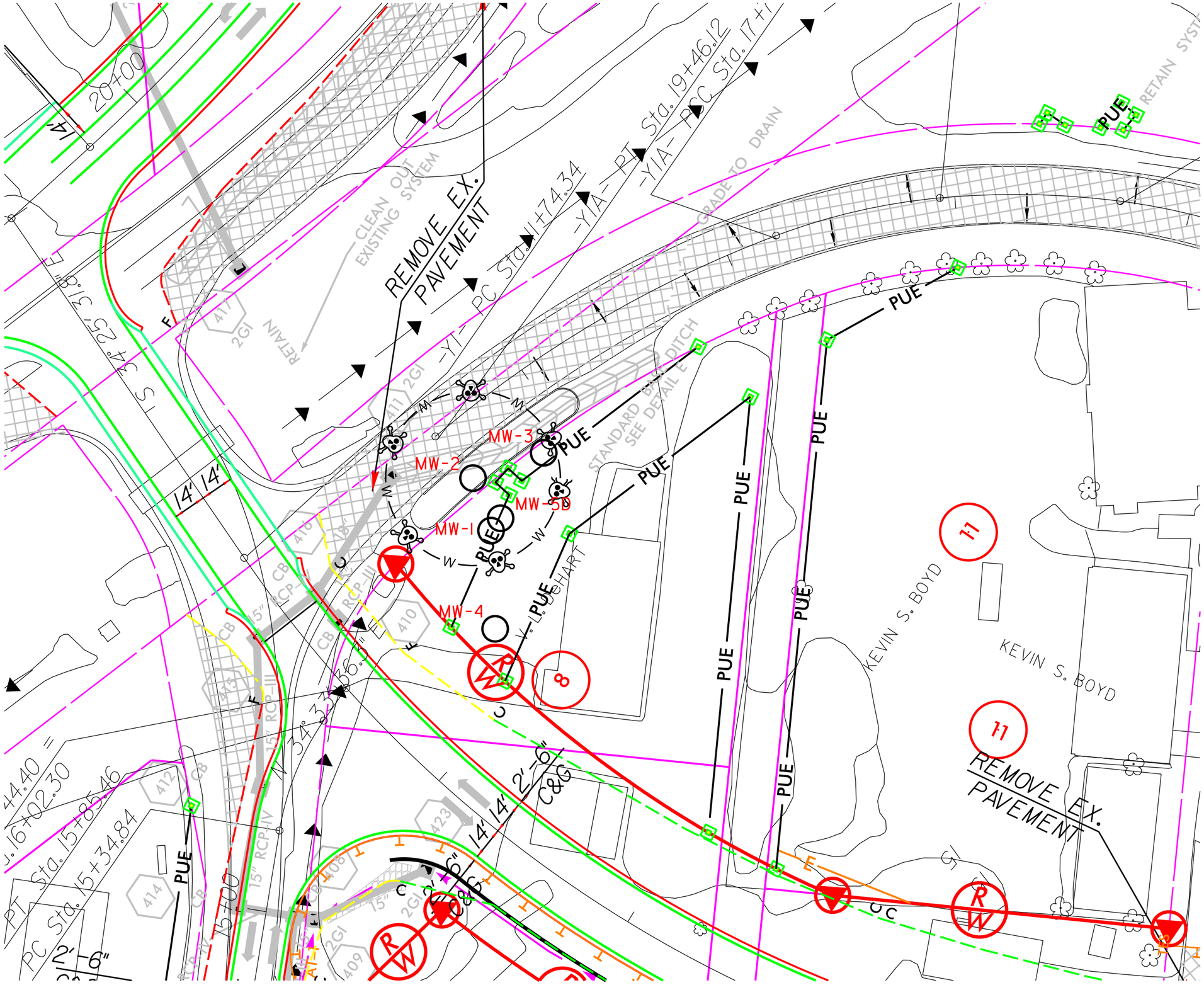
TITLE
SOIL BORING LOCATIONS AND ESTIMATED AREA OF SOIL CONTAMINATION

PROJECT
PARCEL 8
WALNUT COVE, NORTH CAROLINA
NCDOT PROJECT R-5768

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
License # C1251 Eng. / #C257 Geology

DATE: 04-24-2019 | REVISION NO. 0

PYRAMID PROJECT NO. 2019-074 | FIGURE NO. 2



LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED PERMANENT UTILITY EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- MONITOR WELL LOCATION*
- AREA OF GROUNDWATER CONTAMINATION

*MONITOR WELLS ARE FROM PREVIOUS ENVIRONMENTAL ASSESSMENTS. ANALYTICAL DATA FROM PYRAMID SAMPLING IS PRESENTED IN TABLE 3 OF PHASE II REPORT.

TITLE: MONITOR WELL LOCATIONS AND ESTIMATED AREA OF GROUNDWATER CONTAMINATION

PROJECT: PARCEL 8
WALNUT COVE, NORTH CAROLINA
NCDOT PROJECT R-5768

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
License # C1251 Eng. / #C257 Geology

DATE: 04-24-2019	REVISION NO. 0
PYRAMID PROJECT NO. 2019-074	FIGURE NO. 3

TABLES

TABLE 1
Summary of Soil Field Screening Results
NCDOT Project R-5768
Parcel 008 - Stokes County PSAs
V. L DeHart - 403 Stokesburg Road
Walnut Cove, Stokes County, North Carolina

SOIL BORING 4/24/2019	SAMPLE ID	DEPTH (feet bgs)	PID READINGS (PPM)
8-1	8-1-0-2	0 to 2	1.5
	8-1-2-4	2 to 4	2.2
	8-1-4-6	4 to 6	3.9
	8-1-6-8	6 to 8	3.3
8-2	8-2-0-2	0 to 2	2.0
	8-2-2-4	2 to 4	1.8
	8-2-4-6	4 to 6	3.5
	8-2-6-8	6 to 8	2.8
	8-2-8-10	8 to 10	3.0
8-3	8-3-0-2	0 to 2	1.2
	8-3-2-4	2 to 4	1.6
	8-3-4-6	4 to 6	1.3
	8-3-6-8	6 to 8	120.0
	8-3-8-10	8 to 10	4000.0
8-4	8-4-0-2	0 to 2	2.5
	8-4-2-4	2 to 4	1.9
	8-4-4-6	4 to 6	1.1
	8-4-6-8	6 to 8	65.0
	8-4-8-10	8 to 10	103.0
8-5	8-5-0-2	0 to 2	275.0
	8-5-2-4	2 to 4	3700.0
	8-5-4-6	4 to 6	3600.0
	8-5-6-7.5	6 to 7.5	1000.0
8-6	8-6-0-2	0 to 2	0.8
	8-6-2-4	2 to 4	0.9
	8-6-4-6	4 to 6	1.0
	8-6-6-8	6 to 8	0.9
	8-6-8-10	8 to 10	0.9
8-7	8-7-0-2	0 to 2	2.9
	8-7-2-4	2 to 4	1.6
	8-7-4-6	4 to 6	1.0
	8-7-6-8	6 to 8	2.8
	8-7-8-10	8 to 10	2.6

bgs= below ground surface
PID= photo-ionization detector
PPM= parts-per-million
= sampled for lab analysis &/or QROS-QED analysis
OVA= Organic Vapor Analyzer

TABLE 2

Summary of Soil Sample QED Analytical Results for GRO/DRO

NCDOT State Project R-5768
Parcel 008 V. L DeHart - 403 Stokesbruge Road
Walnut Cove, Stokes County, North Carolina

				QROS - QED Analysis		
SAMPLE ID	**DATE**	**DEPTH (feet)**	**PID (ppm)**	**GRO (mg/kg) (C5-C10)**	**DRO (mg/kg) (C10-C35)**	**TPH (mg/kg) (C5-C35)**
8-1-4-6	4/24/2019	4-6	3.9	<7.4	**170.6**	170.6
8-2-0-2	4/24/2019	0-2	2.0	<0.69	2.1	2.1
8-2-4-6	4/24/2019	4-6	3.5	<0.67	10	10
8-3-2-4	4/24/2019	2-4	1.6	<0.69	1.4	1.4
8-3-6-8	4/24/2019	6-8	120.0	<0.73	13	13
8-3-8-10	4/24/2019	8-10	4000.0	**803**	**6627**	7430
8-4-6-8	4/24/2019	6-8	65.0	36.8	**181.5**	218.3
8-4-8-10	4/24/2019	8-10	103.0	27.6	85	112.6
8-5-2-4	4/24/2019	2-4	3700.0	**157.4**	**775.9**	933.3
8-6-4-6	4/24/2019	4-6	1.0	<0.61	29	29
8-7-0-2	4/24/2019	0-2	2.9	<0.69	3.2	3.2
NC Initial Action Level - UST Section for 5035/5030-GRO; 3550-DRO				50	100	NA

PID= photo-ionizaton detector
PPM= parts-per-million
GRO= Gasoline Range Organics
DRO= Diesel Range Organics
mg/kg= milligrams-per-kilogram
TPH= Total Petroleum Hydrocarbons (GRO + DRO)
NA= Not Applicable

* Bold values indicate concentrations above initial action levels

TABLE 3
Summary of Groundwater Analytical Results
NCDOT State Project R-5768
Parcel 008 V.L. DeHart - 403 Stokesburg Road
Walnut Cove, Stokes County, North Carolina
(Former Friendly Mart #6)

PARAMETER	UNITS	SAMPLE ID	NCAC 2L GROUNDWATER STANDARD
		MW-2	
EPA Method 6200B VOCs; Sample Collection Date: 6/26/13			
Benzene	ug/L	**9500**	1
Chloroform	ug/L	ND	70
Diisopropyl Ether (IPE)	ug/L	ND	70
Ethyl Benzene	ug/L	**1800**	600
Isopropylbenzene (Cumene)	ug/L	**95**	70
Naphthalene	ug/L	**780**	6
Styrene	ug/L	ND	70
Toluene	ug/L	**25000**	600
Total Xylenes	ug/L	**14000**	500
n-Propylbenzene	ug/L	**210**	70
sec-Butylbenzene	ug/L	**130**	70
tert-Butyl methyl ether (MTBE)	ug/L	**1700**	20
tert-Butylbenzene	ug/L	ND	70
1,2,4-Trimethylbenzene	ug/L	**3100**	400
1,2-Dichloroethane	ug/L	ND	0.4
1,3,5-Trimethylbenzene	ug/L	**910**	400
4-Isopropyltoluene	ug/L	ND	25
All Other Parameters	ug/L	ND	NA

ug/L= micrograms-per-liter

ND= Not Detected at or above adjusted reporting limit.

NA= Not Applicable

APPENDIX A


Parcel 8
1993 Aerial
311
S Main St
North Carolina Hwy 65 E
Stokesburg Rd
65
Mcalister St
Google Earth
Image U.S. Geological Survey
N
300 ft


Parcel 8
2008 Aerial
311
S Main St
North Carolina Hwy 65 E
Stokesburg Rd
65
Mcalister St
N
300 ft
Google Earth


Parcel 8
2010 Aerial
311
S Main St
North Carolina Hwy 65
Stokesburg Rd
65
Mcalister St
Google Earth
N
300 ft


Parcel 8
2018 Aerial
311
S Main St
Stokesburg Rd
65
North Carolina Hwy 65 E
Mcalister St
Google Earth
N
300 ft

APPENDIX B

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

James B. Hunt, Jr., Governor

DEHNR
DIVISION OF WATER QUALITY
GROUNDWATER SECTION

SO/1

September 4, 1997

CERTIFIED MAIL P-536 317 976
RETURN RECEIPT REQUIRED

Mr. Chad Wall
Dan River Oil Company
202 N. Dalton Street
Madison, NC 27025

SUBJECT: NOTICE OF VIOLATION of 15A NCAC 2N

Friendly Food Mart #6
Rt. 2 Box 733
Walnut Cove, NC 27052
Stokes County
Facility ID#: 0-008364

Dear Mr. Wall:

The Division of Water Quality (DWQ) has discovered that Friendly Food Mart #6 is not in compliance with North Carolina Underground Storage Tank (UST) Regulations (North Carolina Administrative Code (NCAC) Title 15A Subchapter 2N "*Criteria and Standards Applicable to Underground Storage Tanks.*") According to those rules (15A NCAC 2N .0203), you are identified as the owner and/or operator of the UST(s) at Friendly Food Mart #6.

This Notice of Violation (Notice) includes references to parts of federal UST regulations (40 CFR 280 "Underground Storage Tanks; Technical Requirements".) These regulations were incorporated by reference in the state's UST regulations (15A NCAC 2N). Information pertaining to the following violation was obtained by Linda Estkowski.

VIOLATION 1:
Failure to notify the DWQ of compliance with permanent closure requirements within 30 days following closure (tank removal or abandonment) as required by 15A NCAC 2N .0405.

REQUIRED CORRECTIVE ACTION for Violation 1:
A tank closure report providing evidence of compliance with the requirements established in state regulation 15A NCAC 2N Sections .0802 and .0803 and the *Groundwater Section Guidelines for the Investigation and Remediation of Soils and Groundwater* must be submitted along with the GW/UST-2 form titled "Site Investigation Report for Permanent Closure or Change in Service."

Please immediately, submit the GW/UST-2 form and the tank closure report (GW/UST-12 format is required as of February 1, 1995) to Ms. Estkowski at the address on the bottom of the letterhead page.

> Note: Engineering or geological work must be performed under the supervision of a Professional Engineer (P.E.) or Licensed Geologist (L.G.), and subsequent reports must be signed and sealed by the P.E. or L.G. For information concerning the requirements of engineering or geological work, you may contact the appropriate licensing board.

Penalties may be assessed for the violations described in this notice. To avoid the assessment of other possible penalties, you should comply with the aforementioned corrective action requirements.

Unless another deadline has been specified in the applicable corrective actions for the violations identified above, all necessary information to verify compliance must be submitted to Linda Estkowski, at the address on the bottom of the letterhead page, **within 30 days after receipt of this Notice.**

It is your responsibility to comply with state and federal regulations for underground storage tanks. Copies of state regulations 15A NCAC 2N are available at this office.

If you believe that the findings are in error, or if you have any questions pertaining to this Notice, please contact Linda Estkowski at the letterhead phone number.

Sincerely,

Larry D. Coble

Larry D. Coble
Regional Supervisor
Winston-Salem Regional Office

LDC/SVK/LME/lme

Enclosures

cc: Ted Bush-Central Office
Stokes County Health Department
Stokes County Fire Marshal
Winston-Salem Regional Office Files

GW/UST-3 Notice of Intent: UST Permanent Closure or Change-In-Service

FOR TANKS IN **NC**

Return Completed Form To:
The appropriate DWQ Regional Office according to the county of the facility's location. [SEE REVERSE SIDE OF OWNER'S COPY (PINK) FOR REGIONAL OFFICE ADDRESS].

RECEIVED
JUN 12 1997
Winston-Salem

State Use Only
I. D. Number _____
Date Received _____

INSTRUCTIONS

Complete and return at least five (5) working days prior to closure or change-in-service if a Professional Engineer (P.E.) or a Licensed Geologist (L.G.) provides supervision for closure or change-in-service site assessment activities and signs and seals all closure reports. Otherwise, thirty (30) days notice is required.

I. OWNERSHIP OF TANK(S)

Tank Owner Name: Dan River Oil Company
(Corporation, Individual, Public Agency, or Other Entity)
Street Address: 202 N. Dalton Street
County: Rockingham
City: Madison State: NC Zip Code: 27025
Tele. No. (Area Code): 1(910)548-6275

II. LOCATION OF TANK(S)

Facility Name or Company: Friendly Food Mart #6
Facility ID # (if available): 0-008364
Street Address or State Road: Rt. 2, Box 733
County: Stokes City: Walnut Cove Zip Code: 27052
Tele. No. (Area Code):

III. CONTACT PERSON

Name: Chad Wall Job Title: Vice President Telephone Number: (910) 548-6275

IV. TANK REMOVAL, CLOSURE IN PLACE, CHANGE-IN-SERVICE

1. Contact Local Fire Marshall.
2. Plan the entire closure event.
3. Conduct Site Soil Assessments.
4. If Removing Tanks or Closing in Place refer to API Publications 2015 "Cleaning Petroleum Storage Tanks" & 1604 "Removal & Disposal of Used Underground Petroleum Storage Tanks".
5. Provide a sketch locating piping, tanks and soil sampling locations.
6. Submit a closure report in the format of GW/UST-12 and include the form GW/UST-2 within 30 days following the site investigation.
7. If a release from the tank(s) has occurred, the site assessment portion of the tank closure must be conducted under the supervision of a P.E. or L.G., with all closure site assessment reports bearing signature and seal of the P.E. or L.G. If a release has not occurred, the supervision, signature, or seal of a P.E. or L.G. is not required.
8. Keep closure records for 3 years.

V. WORK TO BE PERFORMED BY:

(Contractor) Name: Petroserve, Inc.
Address: 8550 Hudson James Road State: Summerfield, NC Zip Code: 27358
Contact: Rex Beck Phone: 1(910)643-8550
Primary Consultant: Legacy Environmental Services Phone: 1(910)316-0452

VI. TANK(S) SCHEDULED FOR CLOSURE OR CHANGE-IN-SERVICE

TANK ID#	TANK CAPACITY	LAST CONTENTS	PROPOSED ACTIVITY: CLOSURE – Removal	CLOSURE – Abandonment In Place	CHANGE-IN-SERVICE – New Contents Stored
T-1	4,000	Gasoline	☒	☐	
T-2	4,000	Gasoline	☒	☐	
T-3	4,000	Gasoline	☒	☐	
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	

VII. OWNER OR OWNER'S AUTHORIZED REPRESENTATIVE

Print name and official title
Henry Nemargut / Consultant
*Scheduled Removal Date: 6/19/97
Signature: Henry Nemargut
Date Submitted: 6/10/97

*If scheduled work date changes, notify your appropriate DWQ Regional Office 48 hours prior to originally scheduled date.

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

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

DEHNR

DIVISION OF WATER QUALITY
GROUNDWATER SECTION
June 19, 1997

Chad Wall
Dan River Oil Company
202 N. Dalton Street
Madison, NC 27025

Dear Mr. Wall:

This letter is to acknowledge your Notification of Tank Closure as received **June 12, 1997** and filed as **Friendly Food Mart #6.** All future correspondence must contain the file name as well as an address and county in the subject to ensure its receipt into our filing system.

Please be advised that work performed which involves site assessment or any work requiring detailed technical knowledge of site conditions, should be performed by persons, firms, or professional corporations who are duly licensed to offer geological or engineering services by the appropriate occupational licensing board. For regulated tanks, the results of the required assessment (NCAC Title 15A Subchapter 2N Section .0803) should be submitted to this office no later than thirty (30) days after the tank is closed. If there is evidence of a release or suspected release, it must be reported within twenty-four (24) hours.

Also, please remember that to permanently close a tank, owners and operators must empty and clean it by removing all liquids and accumulated sludges as required under 15A 2N 0802.

If a specific date for tank closure was not noted on the UST-3 form, then a specific date must be given 5 - 7 working days prior to tank closure. Groundwater Section staff will be conducting random site visits to insure that underground storage tank closures are conducted as required by 15A NCAC 2N .0802 and .0803. Any violations documented may be submitted for enforcement action.

Enclosed is an attachment that is to be used for the information required for closure assessment. Please contact the Groundwater Section if you have any questions concerning these requirements.

Sincerely,

Sherri V. Knight
Groundwater Supervisor

Enclosure
cc: WSRO
Stokes County Fire Marshal
Petroserve, Inc.

585 Waughtown Street, Winston-Salem, NC 27107-2241 Telephone 910-771-4600 FAX 910-771-4633

UNDERGROUND STORAGE TANK
CLOSURE REPORT

Friendly Food Mart # 6
Route 2 Box 733
Walnut Cove, North Carolina 27025
Facility ID # 0-008364

Submitted to:

Ms. Linda Estkowski
North Carolina Department of Environment and Natural Resources
Division of Water Quality - Winston Salem Regional Office
Winston Salem, North Carolina 27107
585 Waughtown Street
(336) 771-4600

Prepared for:

Mr. Chad Wall
Dan River Oil Company
202 N. Dalton Street
Madison, North Carolina 27025
Rockingham County
(336) 548-6275

Prepared by:

Jason B. Johnson
Omega Environmental Services
3619 Hobbs Road
Greensboro, North Carolina 27410
(336) 286-3337

Omega Project # R98-142

July 30, 1998

SCALE 1:24.000

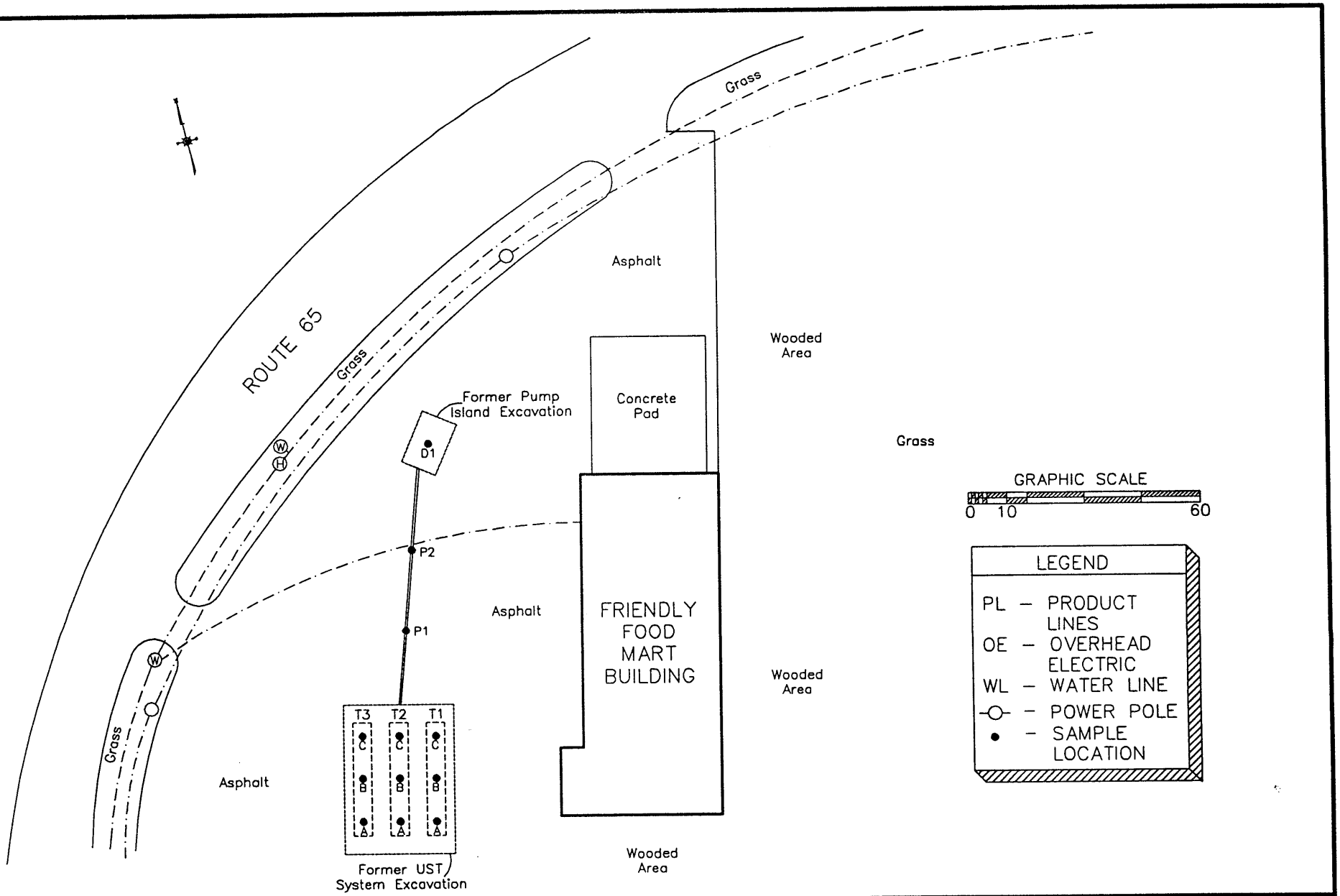
1 1/2 0 1 MILE

7000 FEET

N

USGS 7.5 MINUTE TOPOGRAPHIC SURVEY MAP OF WALNUT COVE, NC QUADRANGLE. PHOTO REVISED 1986

FIGURE NO.: FIGURE 1	
FIGURE NAME: SITE VICINITY MAP	
CLIENT: DAN RIVER OIL	R98-142
SITE: Friendly Food Mart #6	DATE: 7/20/98



OMEGA ENVIRONMENTAL SERVICES	FIGURE NO.: 2 FIGURE NAME: DETAILED SITE MAP	CLIENT: DAN RIVER OIL COMPANY SITE: FRIENDLY FOOD MART #6	JOB NO.: R98-142 DATE: 7-20-98

1.0 UST SYSTEM CLOSURE

1.1 SITE LOCATION AND DESCRIPTION

The site is located inside the Town limits of Walnut Cove, North Carolina at the intersection of Highway 311 and Route 65. (Figure 1). The site consists of approximately 1/4 acres and is improved with a concrete/asphalt driveway and concrete block building (Figure 2). Grassed areas are located along the western and southern boundaries of the property. The property is currently zoned as commercial. Topographically, elevation at the site is approximately 760 feet above sea level, and is characterized by low to moderate relief sloping to the North towards Town Fork Creek. The site is not located on a 100 year floodplain.

The site is a former gasoline storage and dispensing facility. Currently the property is vacant. The property is presently owned by Mrs. Dehart (Walnut Cove, North Carolina).

1.2 UST SYSTEM

The excavated UST system consisted of three 4,000 gallon gasoline USTs and product lines. The UST system dispensers were removed prior to the closure. The dates of installation of the USTs are unknown. The UST's were constructed of steel coated with fiberglass and contained overfill containment and leak detection systems. The UST system was also equipped with cathodic protection. Tank/piping data is shown in Table 1.

Table 1. Underground Storage Tank Data			
	UST 1	UST 1	UST 3
Product	unleaded	unleaded	unleaded
Volume (gal)	4,000	4,000	4,000
UST	steel fiberglass coated	steel fiberglass coated	steel fiberglass coated
Regulated	yes	yes	yes
Date Installed	unknown	unknown	unknown
Leak Detection	yes	yes	yes
Overfill Containment	yes	yes	yes
Piping	steel/suction	steel/suction	steel/suction
Tank Dimensions	64"x 24'	64"x 24'	64''x 24'
Previous Contents	Same	Same	Same

1.3 SITE CHARACTERISTICS

1.3.1 Vicinity Description

The site is bound by State Road 65 to the North and East, open grassed areas to the South and residential property to the West. The area surrounding the site is zoned commercial/residential and has been developed for over fifty years.

According to the Stokes County Administration Office, as of January 1990, Stokes County has a population of 37,233. Census information concerning the City of Walnut Cove was not available, however Town Administration estimated the population to be approximately 1,500.

1.3.2 Nearby Water Supplies/Water Bodies

The area is supplied with municipal water. According to County Administration, the area obtains its water from municipal supply wells located throughout the area. Omega identified a surface water body approximately 300 feet north of the site. No water supply wells were located during this investigation. Surface waters in the area include Town Fork Creek and tributaries of Town

Fork Creek, named Ash Camp Creek and Mills Creek. These surface waters are located within one mile from the site.

1.3.3 Past Investigations/Releases

No past releases or investigations have been associated with the UST system at this site.

1.3.4 Site Geology/Hydrology

The soils beneath the UST basin are characterized as red to brown, moderately dense, sandy clays underlain by red to gray saprolite. Soil development on-site is relatively limited and has been modified by past construction in the area.

The site is located within the Inner Piedmont Belt of the Piedmont Physiographic Province. Inner Piedmont rocks were deposited during the Late Proterozoic to Early Paleozoic. The Inner Peidmont is generally characterized as well rounded hills and long low ridges containing extensively weathered and eroded rocks forming an undulating plateau. The Inner Piedmont Belt consists of the most intensely deformed and metamorphosed segment of the Piedmont Province. Metamorphosed rocks range from 500 to 700 million years in age. They include gneiss and schist which have been intruded by younger granitic rocks (North Carolina/Geologic Map, 1991).

The Inner Piedmont Belt has a variable potential for the development of ground water supplies depending on soil thickness, and the extent of bedrock fractures. The weathered and fractured crystalline rocks of the Piedmont are one of the nation's most reliable aquifers for domestics supplies tapped by thousands of wells most of which are less than 150 feet deep. Ground water is typically limited to the upper 300 feet. The topography of the Inner Piedmont Belt is generally described as a moderately elevated region with low to moderate relief.

2.0 CLOSURE PROCEDURES

2.1 PRE-CLOSURE ACTIVITIES

Prior to commencing closure activities, the required GW-UST-3 form was submitted to the appropriate DWQ regional office. Brad Cheek, the local fire marshal was notified of intent prior to conducting closure activities. According City Administration, a building permit was not required to perform the UST closure.

Omega Environmental Services was contracted to collect soils samples and prepare a UST closure report for closure activities at the Friendly Food Mart #6, while Petroserve performed excavation activities.

Prior to excavation activities the three USTs were checked for existing product and were found to be empty. The USTs were de-gassed by petroserve prior to removal.

2.2 UST EXCAVATION

On June 2, 1998, Petro-serve excavated the USTs. The top of the USTs lay approximately 3-4 feet below surface. Product lines were removed during the excavation while the dispensers were removed prior to the UST excavation. Product lines were properly capped to avoid spillage during removal.

After removal of the USTs and surrounding soils, one UST basin was created. The UST basin measured approximately 25 feet wide by 33 feet long by 11 feet deep. The USTs were transported by Petroserve personnel and taken to an approved facility for disposal. Disposal records are included in Appendix B of this report. Approximately 20 tons of sandy, clayey fill soil and gravel was excavated from the UST basin during closure activities. Excavation beneath the three gasoline USTs was terminated at 11 feet deep because native clean soils were encountered. The excavated soils from beneath the USTs were used as backfill as it appeared clean and free of petroleum contamination. Analytical results indicated soils contained hyrdocarbon concentrations below North Carolinas action levels.

During excavation of the soils beneath the product lines and the former dispensers 20.6 cubic yards of contaminated soil was removed. These soils were transported by Petroserve personnel to Soil Solutions for proper disposal. The excavation was terminated at approximately 10 feet below the center of the former dispenser island. Contaminated soils appeared to extend further than the 8 foot wide by 12 feet long by 8 foot deep excavation. The excavation was susequently filled with approximately 20 tons of clean sandy clay soil.

During excavation of the UST system, ground water and bedrock were not encountered in the UST basin. Pitting and holes were not observed on the UST systems, the gasoline UST's appeared to be in good condition. Stained soils were not observed on the bottom or sides of the UST basin. Petroleum odors were not present in the soils beneath the USTs. Petroleum odors were observed during the removal of the product lines in the vicinity of the former dispenser.

3.0 SITE INVESTIGATION

3.1 SOIL SAMPLING AND CHEMICAL ANALYSES

One grab soil sample per 10 foot length of each UST was collected 1 to 2 feet beneath each UST at a depth of approximately 11 feet. One soil sample was also collected from beneath the former dispenser island. The distance between the dispensers and the UST basin was approximately 50 feet therefore, two soil samples were collected from beneath the product lines. Samples were submitted for method EPA 8260 as well as MADEP for VPH for the gasoline UST system excavated soils(Figure 2). Soil samples were submitted to Air, Water and Soils, Inc. (2119 A.N. Hamilton Street, Richmond Virginia 23230) and were tested for TPH using method 8015. Analytical results indicated that the soil samples collected from the UST basin contained BDL concentrations (Table 2). Analytical results indicated that the soil samples collected from beneath the dispensers and product lines contained elevated VOC, Alkanes and Aromatic concentrations above Maximum Soil Contaminant Concentrations (Table 2). Certificates of Analyses and Chains of Custody are included in Appendix C. Sampling protocols and procedures are described in Omega's QA/QC program (Appendix D).

TABLE 2. ANALYTICAL RESULTS

Sample #	Laboratory Sample I.D.	Sample Type/ Collection Procedure	Sample Depth (feet)	Gasoline Range Organics (mg/kg)	C5-C18 Aliphatic Hydrocarbons (mg/kg)	C9-C12 Aliphatic Hydrocarbons (mg/kg)	C9-C10 Aromatic Hydrocarbons (mg/kg)
T1A	1200	Grab/UST1	11.0	BDL	NS	NS	NS
T1B	1201	Grab/UST1	11.0	BDL	NS	NS	NS
T1C	1202	Grab/UST1	11.0	BDL	BDL	BDL	BDL
T2A	1203	Grab/UST2	11.0	BDL	NS	NS	NS
T2B	1204	Grab/UST2	11.0	BDL	NS	NS	NS
T2C	1205	Grab/UST2	11.0	BDL	BDL	BDL	BDL
T3A	1206	Grab/UST3	11.0	BDL	NS	NS	NS
T3B	1207	Grab/UST3	11.0	BDL	NS	NS	NS
T3C	1208	Grab/UST3	11.0	BDL	BDL	BDL	BDL
Dispen	1209	Grab/Dispenser	2.0	187	88,300	3,710	63,500
Comp.1	1210	Comp/UST Basin	na	202	NS	NS	NS
PL1 See App. C	1211	Grab/Product Line	3.5	~~NS~~ BDL	~~NS~~ BDL	~~NS~~ BDL	~~NS~~ BDL
PL2	1212	Grab/Product Line	3.5	356	151,000	11,200	95,000

NS = No Sample Taken
mg/kg = milligram per kilogram
ppm = parts per million
BDL = Below Detection Limit

tolvene = 26.2 ppm
E.Ben = 13.1
Naph = 9.6
xyl = 66.9
etc.

tolvene = 35.2 ppm.
E.Ben = 29.2
Naph = 14.0
xyl = 154
etc.

3.2 OTHER OBSERVATIONS

During excavation of the UST system, ground water and bedrock were not encountered in the UST basin. Small amounts of water formed in the base of the basin but were believed to be perched water. The USTs appeared to be in good condition with no signs of corrosion or pitting. Stained soils were not observed on the bottom nor along the sides of the UST basin. No petroleum odors were observed in the UST basin during excavation activities. During excavation of the UST system piping and dispensers, petroleum odors were observed beneath the dispensers and the product lines closest to the dispensers.

4.0 RECEPTOR SURVEY

A receptor survey was conducted by Omega personnel to evaluate the sensitivity of groundwater to contaminated soils from the UST system. No water supply wells were identified within 1000 feet of the site. The area obtains its water from municipal water supply wells. A search of the NCDENR's database may reveal that additional water supply wells are located within 1500 feet of the site.

Town Fork Creek is the nearest surface water body and is located approximately 300 feet north of the site. Surface waters in the area also include tributaries of Town Fork Creek, named Ash Camp Creek and Mills Creek. These surface waters are located within 1 mile from the site. Gradient at the site appears to slope toward Town Fork Creek. Town Fork Creek is classified as Class "C" waters. Presently Town Fork Creek and its tributaries are used for recreational purposes and are not used as water supply sources.

5.0 INITIAL ABATEMENT MEASURES

5.1 CONTAMINANT MIGRATION PREVENTION

The excavated soils from the UST basin were temporarily stored onsite and appropriately contained to prevent contamination migration. Soils excavated from beneath the dispensers and product lines appeared to be impacted by petroleum contamination. Laboratory results confirmed this fact and the soils were transported to an approved facility for disposal.

5.2 REMOVAL OF REGULATED SUBSTANCE

Product was not removed from the UST prior to removal since the USTs were empty before excavation activity. Approximately 198 gallons of residue were removed from the tanks by the disposal facility.

5.3 SOIL DISPOSAL

Analytical results indicated that the soils excavated from beneath the three 4,000 gallon USTs were clean and therefore used as back-fill in the tank basin. Approximately 20.6 tons of soil excavated from beneath the dispensers and product lines were transported to Soil Solutions for proper disposal (Appendix B).

5.4 FREE PRODUCT

No free product was observed in the UST basins, product line trenches or beneath the dispensers.

5.5 FIRE AND SAFETY HAZARDS

No fire or safety hazards were identified at this site during our site visit. Omega personnel were present during the excavation activities to ensure that activities were conducted properly and safely.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Analytical results indicate that soil samples collected from the UST basin contained BDL concentrations for low boiling point fuels. Analytical results for the soils collected from beneath the gasoline dispensers and product lines nearest to the dispensers contained elevated volatile organic compounds(VOC) concentrations as well as elevated Aliphatic and Aromatic hydrocarbon concentrations. Analytical results obtained from composite soils collected from the excavated UST basin contained BDL, VOC concentrations. Composite soils collected from beneath the dispensers contained TPH concentrations above North Carolina's action levels for TPH - volatiles.

Based on analytical results obtained from soil samples collected during the UST system excavations, Omega Environmental Services recommends that the NCDENR be notified of these results and recommends a Limited Site Assessment be conducted for the site.

Omega has sent a copy of this report be sent to:

Ms. Linda Estkowski
North Carolina - Department of Environment and Natural Resources
Division of Water Quality
Winston Salem Regional Office
585 Waughtown Street.
Winston Salem, North Carolina
(336) 771-4600

The Site Investigation Report For Permanent Closure of U.S.T. (GW/UST-2) is included in Appendix A. Limitations of this study are included in Appendix E.

7.0 REFERENCES

Generalized Geologic Map of North Carolina, 1991, North Carolina Geologic Survey.

Groundwater and Wells, 1986, Driscoll, Fletcher G., pp 133-135.

FOR TANKS IN **NC**

Return Completed Form To:
The appropriate DWQ Regional Office according to the county of the facility's location. [SEE REVERSE SIDE OF OWNER'S COPY (PINK) FOR REGIONAL OFFICE ADDRESS].

RECEIVED MAY 12 1998 Winston-Salem

Staff Use Only
I. D. Number _____
Date Received _____

INSTRUCTIONS

Complete and return at least five (5) working days prior to closure or change-in-service if a Professional Engineer (P.E.) or a Licensed Geologist (L.G.) provides supervision for closure or change-in-service site assessment activities and signs and seals all closure reports. Otherwise, thirty (30) days notice is required.

I. OWNERSHIP OF TANK(S)

Tank Owner Name: Dan River Oil Company
(Corporation, Individual, Public Agency, or Other Entity)
Street Address: 202 N. Dalton Street
County: Rockingham
City: Madison State: NC Zip Code: 27025
Tele. No. (Area Code): 1(910)548-6275

II. LOCATION OF TANK(S)

Facility Name or Company: Friendly Food Mart #6
Facility ID # (if available): 0-008364
Street Address or State Road: Rt. 2, Box 733
County: Stokes City: Walnut Cove Zip Code: 27052
Tele. No. (Area Code): _____

III. CONTACT PERSON

Name: Chad Wall Job Title: Vice President Telephone Number: (910) 548-6275

IV. TANK REMOVAL, CLOSURE IN PLACE, CHANGE-IN-SERVICE

1. Contact Local Fire Marshall.
2. Plan the entire closure event.
3. Conduct Site Soil Assessments.
4. If Removing Tanks or Closing in Place refer to API Publications 2015 "Cleaning Petroleum Storage Tanks" & 1604 "Removal & Disposal of Used Underground Petroleum Storage Tanks".
5. Provide a sketch locating piping, tanks and soil sampling locations.
6. Submit a closure report in the format of GW/UST-12 and include the form GW/UST-2 within 30 days following the site investigation.
7. If a release from the tank(s) has occurred the site assessment portion of the tank closure must be conducted under the supervision of a P.E. or L.G., with all closure site assessment reports bearing signature and seal of the P.E. or L.G. If a release has not occurred, the supervision, signature, or seal of a P.E. or L.G. is not required.
8. Keep closure records for 3 years.

V. WORK TO BE PERFORMED BY:

(Contractor) Name: Petroserve, Inc.
Address: 8550 Hudson James Road State: Summerfield, NC Zip Code: 27358
Contact: Rex Beck Phone: 1(910)643-8550
Primary Consultant: Environmental Services Phone: 1(910) _____

VI. TANK(S) SCHEDULED FOR CLOSURE OR CHANGE-IN-SERVICE

TANK ID#	TANK CAPACITY	LAST CONTENTS	PROPOSED ACTIVITY: CLOSURE – Removal	CLOSURE – Abandonment In Place	CHANGE-IN-SERVICE – New Contents Stored
T-1	4,000	Gasoline	X		
T-2	4,000	Gasoline	X		
T-3	4,000	Gasoline	X		

VII. OWNER OR OWNER'S AUTHORIZED REPRESENTATIVE

Print name and official title
OMEGA ENVIRONMENTAL SERVICES/CONSULTANT
*Scheduled Removal Date: 5/27/98
Signature: Jesse Johnson
Date Submitted: 5/18/98

*If scheduled work date changes, notify your appropriate DWQ Regional Office 48 hours prior to originally scheduled date.

GW/UST-3 (Rev. 10/96) White Copy - Regional Office Yellow Copy - Central Office Pink Copy - Owner

GW/UST-2 Site Investigation Report For Permanent Closure or Change-in-Service of U.S.T.

FOR TANKS IN **NC**

Return Completed Form To:
The appropriate DWQ Regional Office according to the county of the facility's location. [SEE MAP ON REVERSE SIDE OF OWNER'S COPY (PINK) FOR REGIONAL OFFICE ADDRESS].

State Use Only
I.D. Number _____
Date Received _____

INSTRUCTIONS

Complete and return within (30) days following completion of site investigation.

I. Ownership of Tank(s)

Owner Name: Dan River Oil Company
Corporation, Individual, Public Agency, or Other Entity)
Street Address: 202 N. Dalton Street
County: Rockingham
City: Madison State: NC Zip Code: 27025
Telephone Number: (336) 548 - 6275
(Area Code)

II. Location of Tank(s)

Facility Name: Friendly Food Mart #6
(or Company)
Facility ID # (if available): 0-008364
Street Address Route 2 Box 733
(or State Road) Walnut Cove
County: Stokes City: Zip Code: 27052
Telephone Number: ( )
(Area Code)

III. Contact Person

Name: Chad Wall Job Title: Vice President Tel. No.: (336)548-6275
Closure Contractor: Petroserve Inc Address: 8550 Hudson James Road, Summerfield, NC 27358 Tel. No.: (336) 643-8550
Primary Consultant: Omega Environmental Address: 3619 Hobbs Road, Greensboro, NC 27410 Tel. No.: (336) 286-3337
Lab: Air, Water + Soil Address: 2119 A N Hamilton Street, Richmond, VA 23230 Tel. No.: (804) 358-8295

IV. U.S.T. Information / V. Excavation Condition

Tank No.	Size in Gallons	Tank Dimensions	Last Contents	Water In Excavation Yes	Water In Excavation No	Free Product Yes	Free Product No	Notable Odor or Visible Soil Contamination Yes	Notable Odor or Visible Soil Contamination No
1	4000	64" x 34'	Gasoline		X		X		X
2	4000	64" x 34'	Gasoline		X		X		X
3	4000	64" x 34'	Gasoline		X		X		X

VI. Additional Information Required

See reverse side of pink copy (owner's copy) for additional information required by N.C. - DWQ in the written report and sketch.

NOTE: If a release from the tank(s) has occurred, the site assessment portion of the tank closure must be conducted under the supervision of a P.E. or L.G., with all closure site assessment reports bearing the signature and seal of the P.E. or L.G.

VII. Check List (Check the activities completed)

PERMANENT CLOSURE (For Removing or Abandoning-in-place)

- [x] Contact local fire marshal.
- [x] Notify DWQ Regional Office before abandonment.
- [x] Drain & flush piping into tank.
- [x] Remove all product and residuals from tank.
- [x] Excavate down to tank.
- [x] Clean and inspect tank.
- [ ] Remove drop tube, fill pipe, gauge pipe, vapor recovery tank connections, submersible pumps and other tank fixtures.
- [x] Cap or plug all lines except the vent and fill lines.
- [x] Purge tank of all product & flammable vapors.
- [ ] Cut one or more large holes in the tanks.
- [x] Backfill the area.

Date Tank(s) Permanently closed: 6/2/1998
Date of Change-in-Service: _____

ABANDONMENT IN PLACE

- [ ] Fill tank until material overflows tank opening.
- [ ] Plug or cap all openings.
- [ ] Disconnect and cap or remove vent line.
- [ ] Solid inert material used - specify: _____

REMOVAL

- [x] Create vent hole.
- [x] Label tank.
- [x] Dispose of tank in approved manner.

Final tank destination: Safeway Tank Disposal Inc.

VIII. Certification (Read and Sign)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Print name and official title of owner or owner's authorized representative	Signature	Date Signed
Jason Johnson / Project Geologist	Jason Johnson	7/20/98

SAFEWAY TANK DISPOSAL, Inc.

CERTIFICATE OF TANK DISPOSAL

Customer
PETROSERV
138-E Furlong Ind. Dr.
Kernersville, N.C. 27284

Date June 19, 1998

Transported by: Customer

TANK #	SIZE	WEIGHT	PRODUCT	RESIDUE	ORIGIN
1476	4,000	3640#	Gas.	6 gals	Amoco Station
	Fiber-	glass	coated		Hwy. 65
1479	4,000	3640#	Gas.	4 gals	Walnut Cove, N.C.
	Fiber-	glass	coated		
1480	4,000	3640#	Gas.	188gals	
	Fiber-	glass	coated		
			Total residue	198gals	

Tanks were disposed in accordance with API 1604, 1987 Removal and Disposal of used Underground Petroleum Storage Tanks. Residue was Disposed in accordance with U.S.EPA Regulations by licensed sub-contractor. Lead free scrap steel was recycled by

Landfilled by PSLF

[signature]

SOIL SOLUTIONS

CERTIFICATE OF ACCEPTANCE

Soil Solutions, Inc. does hereby certify that 20.6 tons of non-hazardous contaminated material were received on 6/4/98 from:

Generator: Dan River Oil/Friendly Food Mart #6

Originating at: Rt. 2 Box 733 Walnut Cove, NC

SSI Waste ID#: SF069811

This non-hazardous material has been accepted by Soil Solutions, Inc. and will be remediated in their Soil Treatment Facility in Winston-Salem, North Carolina. Soil Solutions, Inc. guarantees the contaminated material will be treated to below regulatory standards established by the North Carolina Department of Environment, Health and Natural Resources for clean soil.

Thomas W. Hammett

Signature

Thomas W. Hammett, Senior Vice President
Name/Title
Soil Solutions, Inc.

Date 06 / 04 / 98

1703 Vargrave Street Winston-Salem, NC 27107
(336) 725-5844 FAX (336) 725-6244

Water Technology and Controls, Inc.
Environmental Laboratory (NC # 165)
Reidsville, North Carolina 27320
(336) 342-4748

Client: Omega Environmental
Project: 98-134
Analyst: VWV

Total Petroleum Hydrocarbons

WTC #	Sample # (Location)	Date / Time	Matrix	Date Analyzed	DRO - 3550 (mg/kg)	GRO - 5030 (mg/kg)
06109825	OEG - 1601 - Comp	06/04/98 1400	S	06/19/98	Diesel A.N.R.	Gasoline 202

S = Soil
W = Water

A.N.R = Analysis Not Requested.

I hereby certify that I have reviewed and approve these data.

Mike Vaughan
Maurice H. Vaughan, Jr.
Laboratory Supervisor

Water Technology and Controls, Inc.
642 Tamco Road
Reidsville, NC 27320
tel. (910)342-4748
fax. (910)342-1522

Chain of Custody Record

If Composite?

Client: Omega Environmental Services	Tel: 336-286-3337
Address: 3619 Hobbs Road.	Fax: 336-286-3962
Attention: Jason Johnson	P.O.#:
Person Taking Sample (signature): Jason Johnson	Project # 98-134

Lab Use Only

Sample Location/ID#	Date 1	Time 1	Date 2	Time 2	Comp? Grab?	# of Conts.	Tests Required	On Ice?	pH OK? Cl2 OK?
OEG-1601-comp	6/4/98	14:00			Comp	1	5030	3.0°C	

Method of Shipment:
- ☐ UPS
- ☐ Fed Ex
- ☑ Hand Delivery
- ☐ Other _____

Comments:

Jason Johnson 6/10/98 10:05 — Relinquished by: — Date: — Time:

Claudia Craven 6/10/98 10:05 — Received by: — Date: — Time:

Relinquished by: — Date: — Time:

Received by: — Date: — Time:

Relinquished by: — Date: — Time:

Received @ Lab by: — Date: — Time:

AIR WATER & SOIL Laboratories, Inc.

2119A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804)358-8295 Fax: (804)358-8297

North Carolina Certification #495

Certificate of Analysis

Client Name:	Omega Environmental Services	Date Received:	June 04, 1998
Client Project I.D.:	Friendly Food Mart #6 Job #98-134	Date Issued:	June 11, 1998
Submitted to:	Jason Johnson		

Reference Method: SW846 method 8260

Thirteen soil samples were analyzed for the following Volatile Organic Compounds.

Parameter	OEG-T1A-1200 (mg/kg)	OEG-T1B 1201 (mg/kg)	OEG-T1C 1202 (mg/kg)	OEG-T2A 1203 (mg/kg)	OEG-T2B 1204 (mg/kg)	OEG-T2C 1205 (mg/kg)	Det. Limit (mg/kg)
Dichlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chloromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Vinyl Chloride	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromomethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Trichlorofluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Acetone	BDL	BDL	BDL	BDL	BDL	BDL	0.5
Iodomethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Carbon disulfide	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Methylene Chloride	BDL	BDL	BDL	BDL	BDL	BDL	0.1
trans-1,2-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Vinyl acetate	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2,2-Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
cis-1,2-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2-Butanone (MEK)	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromochloromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chloroform	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,1-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Carbon tetrachloride	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1-Dichloro-1-propene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Benzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Trichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Dibromomethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromodichloromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
cis-1,3-Dichloro-1-propene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
4-Methyl-2-Pentanone	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Toluene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
trans-1,3-Dichloro-1-propene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,2-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1

BDL = Below Detection Limit

Carmela L. Tombes
Laboratory Director

AIR WATER & SOIL Laboratories, Inc.

2119A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804)358-8295 Fax: (804)358-8297

North Carolina Certification #493

Certificate of Analysis

Client Name:	Omega Environmental Services	Date Received:	June 04, 1998
Client Project I.D.:	Friendly Food Mart #6 Job #98-134	Date Issued:	June 11, 1998
Submitted to:	Jason Johnson		

Reference Method: SW846 method 8260 continued

Parameter	OEG-T1A-1200 (mg/kg)	OEG-T1B 1201 (mg/kg)	OEG-T1C 1202 (mg/kg)	OEG-T2A 1203 (mg/kg)	OEG-T2B 1204 (mg/kg)	OEG-T2C 1205 (mg/kg)	Det. Limit (mg/kg)
Tetrachloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,3-Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2-Hexanone	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Dibromochloromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dibromoethane (EDB)	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,1,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Ethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Xylenes	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Styrene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromoform	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Isopropylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,2,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,3-Trichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Propylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2-Chlorotoluene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
4-Chlorotoluene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,3,5-Trimethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
tert-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,4-Trimethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
sec-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,3-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
p-Isopropyltoluene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,4-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
n-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dibromo-3-chloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,4-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Hexachlorobutadiene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Naphthalene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,3-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
IPE	BDL	BDL	BDL	BDL	BDL	BDL	0.1
MTBE	BDL	BDL	BDL	BDL	BDL	BDL	0.1

BDL = Below Detection Limit

Carmela L. Tombes

Carmela Tombes
Laboratory Director

AIR WATER & SOIL Laboratories, Inc.

2119A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804)358-8295 Fax: (804)358-8297

North Carolina Certification #495

Certificate of Analysis

Client Name:	Omega Environmental Services	Date Received:	June 04, 1998
Client Project I.D.:	Friendly Food Mart #6 Job #98-134	Date Issued:	June 11, 1998
Submitted to:	Jason Johnson		

Reference Method: SW846 method 8260 continued

Thirteen soil samples were analyzed for the following Volatile Organic Compounds.

Parameter	OEG-T3A-1206 (mg/kg)	OEG-T3B 1207 (mg/kg)	OEG-T3C 1208 (mg/kg)	OEG-Dispen 1209 * (mg/kg)	OEG-Comp 1210 (mg/kg)	OEG-PL1 1211 (mg/kg)	OEG-PL2 1212 * (mg/kg)	Det. Limit (mg/kg)
Dichlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Vinyl Chloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromomethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Trichlorofluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Acetone	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.5
Iodomethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Carbon disulfide	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Methylene Chloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
trans-1,2-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Vinyl acetate	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2,2-Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
cis-1,2-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2-Butanone (MEK)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromochloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chloroform	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,1-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Carbon tetrachloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1-Dichloro-1-propene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Trichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Dibromomethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromodichloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
cis-1,3-Dichloro-1-propene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
4-Methyl-2-Pentanone	BDL	BDL	BDL	BDL	BDL	BDL	BDL 35,200 ppb	0.1
Toluene	BDL	BDL	BDL	26.2 26,200 ppb	BDL	BDL	35.2	0.1
trans-1,3-Dichloro-1-propene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,2-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1

* Detection limit = 2.0 mg/kg

BDL = Below Detection Limit

Carmela L. Tombes

Carmela L. Tombes
Laboratory Director

AIR WATER & SOIL Laboratories, Inc.

2119A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804)358-8295 Fax: (804)358-8297

North Carolina Certification #495

Certificate of Analysis

Client Name: Omega Environmental Services
Client Project I.D.: Friendly Food Mart #6 Job #98-134
Submitted to: Jason Johnson

Date Received: June 04, 1998
Date Issued: June 11, 1998

Reference Method: SW846 method 8260 continued

Parameter	OEG-T3A-1206 (mg/kg)	OEG-T3B 1207 (mg/kg)	OEG-T3C 1208 (mg/kg)	OEG-Dispen 1209 • (mg/kg)	OEG-Comp 1210 (mg/kg)	OEG-PL1 1211 (mg/kg)	OEG-PL2 1212 • (mg/kg)	Det. Limit (mg/kg)
Tetrachloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,3-Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2-Hexanone	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Dibromochloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dibromoethane (EDB)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,1,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Ethylbenzene	BDL	BDL	BDL	13.1	BDL	BDL	29.2	0.1
Xylenes	BDL	BDL	BDL	66.9	BDL	BDL	154	0.1
Styrene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromoform	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Isopropylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,2,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,3-Trichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Propylbenzene	BDL	BDL	BDL	9.0	BDL	BDL	15.9	0.1
2-Chlorotoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
4-Chlorotoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,3,5-Trimethylbenzene	BDL	BDL	BDL	16.7	BDL	BDL	29.8	0.1
tert-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,4-Trimethylbenzene	BDL	BDL	BDL	45.6	BDL	BDL	77.8	0.1
sec-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,3-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
p-Isopropyltoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,4-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
n-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dibromo-3-chloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,4-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Hexachlorobutadiene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Naphthalene	BDL	BDL	BDL	9.6	BDL	BDL	14.0	0.1
1,2,3-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
IPE	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
MTBE	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1

• Detection limit = 2.0 mg/kg

BDL - Below Detection Limit

Carmela L Tombes

Carmela Tombes
Laboratory Director

AIR WATER & SOIL Laboratories, Inc.

2119A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804)358-8295 Fax: (804)358-8297

North Carolina Certification #495

Certificate of Analysis

Client Name:	Omega Environmental Services	Date Received:	June 04, 1998
Client Project I.D.:	Friendly Food Mart #6 Job #98-134	Date Issued:	June 11, 1998
Submitted to:	Jason Johnson	Date Reissued:	July 7, 1988

Reference Method: MADEP VPH

Five soil samples were analyzed for the following Volatile Petroleum Hydrocarbons.

		Sample I.D.	OEG-T1C-1202	OEG-T2C-1205	OEG-T3C-1208	OEG-Dispen-1209	OEG-P1.2-1212
		Date Analyzed	6-19-98	6-19-98	6-19-98	6-19-98	6-19-98
		Dilution Factor	1	1	1	20	20
		% Moisture	16.2	11.5	19.8	25.2	18.5
Range/Target Analyte	Reporting Limit	Units					
Benzene	0.2	mg/kg	BDL	BDL	BDL	<2.9	<2.7
Ethylbenzene	0.2	mg/kg	BDL	BDL	BDL	<2.9	6.3
Methyl-tert-butylether	0.2	mg/kg	BDL	BDL	BDL	<2.9	<2.7
Naphthalene	0.2	mg/kg	BDL	BDL	BDL	<2.9	<2.7
Toluene	0.2	mg/kg	BDL	BDL	BDL	6.5	21.7
m&p-Xylenes	0.2	mg/kg	BDL	BDL	BDL	5.3	23.3
o-Xylene	0.2	mg/kg	BDL	BDL	BDL	<2.9	9.3
C5-C18 Aliphatic Hydrocarbons	10	mg/kg	BDL	BDL	BDL	88,300	151,000
C9-C12 Aliphatic Hydrocarbons	10	mg/kg	BDL	BDL	BDL	3,710	11,200
C9-C10 Aromatic Hydrocarbons	10	mg/kg	BDL	BDL	BDL	63,500	95,000
FID Surrogate % Recovery			125	129	103	81	62

BDL = Below Detection Limit

Carmela Tombes

Carmela Tombes
Laboratory Director
98065094

AIR WATER & SOIL Laboratories, Inc.

2119-A NORTH HAMILTON STREET
RICHMOND, VIRGINIA 23230
(804) 358-8295 PHONE
(804) 358-8297 FAX

CHAIN OF CUSTODY

CLIENT NAME: Omega Environmental Services

CLIENT PROJECT NAME: Friendly Food Mart #6 Job# 98-134

CLIENT CONTACT: Jason Johnson

CLIENT ADDRESS: 3619 Hobbs Road, Greensboro, NC 27410

CLIENT PHONE/FAX No. 336-286-3337

CLIENT P.O. No. 47-2040

Sampler(s) I.D. (print/signature): Jason Johnson / Jason Johnson

COMMENTS: Normal TAT

(Please Note Sample Preservative)

CLIENT SAMPLE I.D.	DATE	TIME	# CONT	MATRIX	GRAB	COMP	ANALYSIS: 8260 w/ IPE + MTBE	ANALYSIS: MADEP VPH Aliphatics/Aromatics							
1. OEG-T1A-1200	6/2/98	11:20	1	S	✓		✓								
2. " -T1B-1201	"	11:30	1	S	✓		✓								
3. " -T1C-1202	"	11:40	3	S	✓		✓	✓							
4. " -T2A-1203	"	11:00	1	S	✓		✓								
5. " -T2B-1204	"	11:10	1	S	✓		✓								
6. " -T2C-1205	"	11:20	3	S	✓		✓	✓							
7. " -T3A-1206	"	10:30	1	S	✓		✓								
8. " -T3B-1207	"	10:40	1	S	✓		✓								
9. " -T3C-1208	"	10:45	3	S	✓		✓	✓							
10. " -Dispen-1209	"	13:35	3	S	✓		✓	✓							

RELINQUISHED:	RECEIVED:	DATE / TIME
Jason Johnson 6/3/98	[illegible] (AWS)	DATE: [illegible] TIME: [illegible]
RELINQUISHED:	RECEIVED:	DATE: TIME:
RELINQUISHED:	RECEIVED:	DATE: TIME:

LAB USE ONLY

Preservative(s): ____

Temperature (°C): ____

Lab I.D. No.: [illegible]

AIR WATER & SOIL Laboratories, Inc.

2119-A NORTH HAMILTON STREET
RICHMOND, VIRGINIA 23230
(804) 358-8295 PHONE
(804) 358-8297 FAX

CHAIN OF CUSTODY

CLIENT NAME: Omega Environmental Services
CLIENT PROJECT NAME: Friendly Food Mart #6 Job # 98-134
CLIENT CONTACT: Jason Johnson
CLIENT ADDRESS: Sanic
CLIENT PHONE/FAX No. 336-286-3337
CLIENT P.O. No.
Sampler(s) I.D. (print/signature): Jason Johnson

CLIENT SAMPLE I.D.	DATE	TIME	# CONT	MATRIX	GRAB	COMP	ANALYSIS: BTEX & MTBE	ANALYSIS: PADEP VPH Aliphatics/Aromatics	COMMENTS
1. OEG-Comp-1210	6/2/98	14:20	1	S		✓	✓		Normal TAT
2. OEG-PL1-1211	"	13:50	1	S	✓		✓		(Please Note Sample Preservative)
3. OEG-PL2-1212	"	14:00	3	S	✓		✓	✓	
4.									
5.									
6.									
7.									
8.									
9.									
10.									

RELINQUISHED: Jason Johnson	RECEIVED: Teresa Clarke (AWS)	DATE: 6/4/98	LAB USE ONLY
RELINQUISHED:	RECEIVED:	TIME: 1130	Preservative(s):
RELINQUISHED:	RECEIVED:	DATE:	Temperature (°C):
		TIME:	Lab I.D. No.: 9806594
		DATE:	
		TIME:	

OMEGA ENVIRONMENTAL SERVICES, INC. QA/QC PROGRAM

The QA/QC plan adopted by Omega Environmental Services, Inc. is in accordance with acceptable methodology and analytical procedures set forth by various regulatory agencies and private industry. The methods employ accepted USEPA (United States Environmental Protection Agency) sampling, decontamination, and analytical techniques (United States Environmental, Characterization of Hazardous Waste Sites, A Methods Manual, 1984).

SOIL SAMPLING SPECIFICATIONS

A Simco 2400 trailer-mounted drilling rig or a CME-75 truck-mounted drilling rig is used to collect soil samples at designated locations when desired sampling depths are greater than one foot (a hand operated split spoon sampler and stainless steel trowel are used where applicable). Soil samples are obtained from each bore hole using hollow stem augers and a split spoon sampler. Soil samples are collected by driving a two foot long decontaminated split spoon sampler ahead of the augers. Once the spoon has penetrated a minimum of two feet of sediment, it is brought to the surface for sample collection. The sample is examined and logged in the field by a qualified technician for physical characteristics including coloration, texture, odor, and signs of obvious contamination. It is then stored in a cooler at four degrees Celsius for later reference or laboratory analysis.

During drilling operations, a portable monitoring device such as a PID (photo-ionization detector), FID (flame ionization detector), or a CGI (combustible gas indicator) is used to perform head space organic vapor analysis on all samples collected during drilling to detect possible explosive conditions, and to assist in selecting samples for analysis. A soil sample to be analyzed for organic vapor is containerized immediately upon recovery by placement into a wide mouth glass jar (with head space) sealed with aluminum foil, and secured with a rubber band. The sample is shaken to allow vapor trapped within the pore space to occupy the head space of the jar. After being stored for a uniform period of time, a clean probe is injected through the foil to measure the organic vapor.

Samples designated for analysis of VOCs (volatile organic compounds) are placed in air-tight vials (with no head space). The rest of the sample (with head space) is placed in wide mouth jars for analyzing additional analytical parameters. All samples are labeled and refrigerated for transport to a laboratory. All soil samples for laboratory analysis are selected based on organic vapor analysis and/or specifically targeted depths. In instances where organic vapor analysis reveals no detectable levels, samples are selected based on visual examination of physical characteristics of the soil.

MONITOR WELL SPECIFICATIONS

Bore holes for monitor wells are drilled using hollow stem augers (6-5/8 inch I.D. for 4 inch wells and 4-1/4 inch I.D. for 2 inch wells). When drilling in rock, a 3' 7/8" down-hole air hammer is utilized. Monitor well specifications consist of either a 2" or 4" PVC flush joint casing, and slotted PVC screen. No glues or solvents are used during construction of monitor wells. A ten foot well screen is placed approximately seven feet below and three feet above the static water level (where applicable). The bore holes are backfilled with clean, #2 well-sorted sand to two feet above the well screen followed by two feet of bentonite pellets. The remaining annular space is filled with bentonite grout to approximately one foot below grade. The well heads are encased in access boxes and secured in place with concrete at grade. Locking well caps are installed at the completion of each well.

MONITOR WELL DEVELOPMENT

Ground water monitor wells are developed by removing five times the volume of the water in the well using either a disposable bailer or a decontaminated PVC bailer. Typically, a new disposable bailer is used for each well to prevent cross-contamination.

GROUND WATER LEVEL MEASUREMENTS

Prior to measuring ground water levels in the monitor wells, the well head elevation is determined by a site survey. Ground water depth measurements are obtained using a conductive water level probe with an audible signal. The field data is used to determine the local ground water flow direction. Water level measurements are taken prior to collection of ground water samples and approximately 72 hours after well completion.

GROUND WATER SAMPLING SPECIFICATIONS

Ground water monitor wells are sampled according to the following protocol:

1. Depth to ground water is determined in each monitor well prior to sampling.
2. The volume of water in the monitor well is calculated.
3. Wells are purged by removing five times the volume of water in each well using a disposable bailer.
4. Ground water samples are collected using nylon rope and single-use disposable bailers which are discarded after each use.
5. Ground water samples are placed in appropriate containers, labeled, and refrigerated.

DECONTAMINATION PROTOCOL

Reusable sampling equipment is decontaminated after each use as follows:

1. Non-phosphate detergent plus tap water wash.
2. Tap-water rinse.
3. Deionized water rinse.
4. 10 percent nitric acid rinse.*
5. Deionized water rinse.*
6. Acetone rinse.**
7. Air Dry.**
8. Deionized water rinse.**

* only if sample is analyzed for metal
** only if sample is analyzed for organic constituents

Drilling equipment, including hollow stem augers, drill rods, drill bits, etc., are pressure-cleaned prior to use at each boring followed by a non-phosphate detergent plus tap water wash.

LABORATORY ANALYSES

All samples are collected by qualified Omega personnel in accordance with established sampling and decontamination protocols.

Preservation techniques, holding times, containerization and laboratory methods for a variety of soil and aqueous samples are described in the Table below.

Table. Soil, Sludge and Ground Water Sample Protocols

Parameter	Laboratory Method	Container	Preservation	Maximum Holding Time
Halogenated and Aromatic Volatile Organic Compounds (includes BTEX)	601/602 624/625 8010/8020 8240/8270	Glass, teflon lined cap	Cool, 4°C.	7 days
Arsenic	206.3	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.
Barium	200.7	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.
Cadmium	213.2	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.

Table. Soil, Sludge and Ground Water Sample Protocols				
Parameter	**Laboratory Method**	**Container**	**Preservation**	**Maximum Holding Time**
Chromium	218.1	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.
Lead	239.2	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.
Mercury	245.1	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	28 days
Selenium	270.3	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.
Silver	272.1	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.
Organo-chlorine Pesticides	608/8010	Glass teflon lined cap	Cool, 4°C.	7 days
PCB's	608/8080	Glass teflon lined cap	Cool, 4°C.	7 days
pHenoxy-acid Herbicides	615/8150	Poly., Glass	Cool, 4°C.	7 days
Organo-phosphorous pesticides	8140	Poly., Glass	Cool, 4°C.	7 days
TCLP Extractions Volatiles		Glass, teflon lined cap	Cool, 4°C.	7 days
TCLP Extraction Semi-volatiles		Glass, teflon lined cap	Cool, 4°C	7 days
TOC	415.1	Glass, teflon lined cap	Cool, 4°C, HCl to pH<2	28 days
TOX	450.0	Glass, teflon lined cap	Cool 4°C, 1 ml 0.1 M sodium sulfite	7 days
TPH	California Method	Glass, teflon lined cap	Cool, 4°C. No Headspace.	7 days (extract) 40 days (analyze)
TPH	418.1	Glass, teflon lined cap	Cool, 4°C. H_2SO_4 to pH<2	28 days

Chain-of-Custody measures are followed to allow for the tracing of possession and handling of individuals samples from the time of field collection through laboratory analysis.

The Chain of Custody program includes the following:

1. Sample labels
2. Sample seals
3. Field logbook
4. Chain-of-Custody Form
5. Sample analysis request sheets
6. Laboratory analysis logbook

UNDERGROUND LINE LOCATION

Underground line location is performed by visual inspection of above ground connections and surface features, marking by Miss Utility (in Virginia), inspection of public records, discussions with local residents, and by tracing with a magnetic line locator.

JOB TRAINING AND SAFETY PROCEDURES

Omega field personnel complete a 40-hour Health and Safety Training course that complies with OSHA 1910.120(e)(2). Field personnel attend an annual Health and Safety refresher course. Field supervisors complete and 8-hour supervisory training course to comply with OSHA 1910.120(e)(3).

Omega employees will be CPR (Cardiopulmonary Resuscitation) and First Aid certified.

Omega employees will wear appropriate safety equipment at all times.

Omega employees who are 40-hour health and safety trained will undergo periodic medical monitoring.

Omega employees will undergo random drug screening.

LIMITATIONS

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with customary principles and practices in the fields of geology and environmental science. This warranty is in lieu of all other warranties either expressed or implied. This company is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration and laboratory test data presented in this report.

The work performed in conjunction with this assessment and the data developed are intended as a description of available information at the dates and locations given. This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

omega
environmental
services

December 8, 1998
Omega Project # R98-142

Ms. Linda Estkowski
North Carolina Department of Environment and
Natural Resources - Division of Water Quality
Winston-Salem Regional Office
585 Waughtown Street
Winston-Salem, North Carolina 27107

Regarding: LSA at Friendly Food Mart #6 (FFM)
Walnut Cove, NC

Dear Ms. Estkowski:

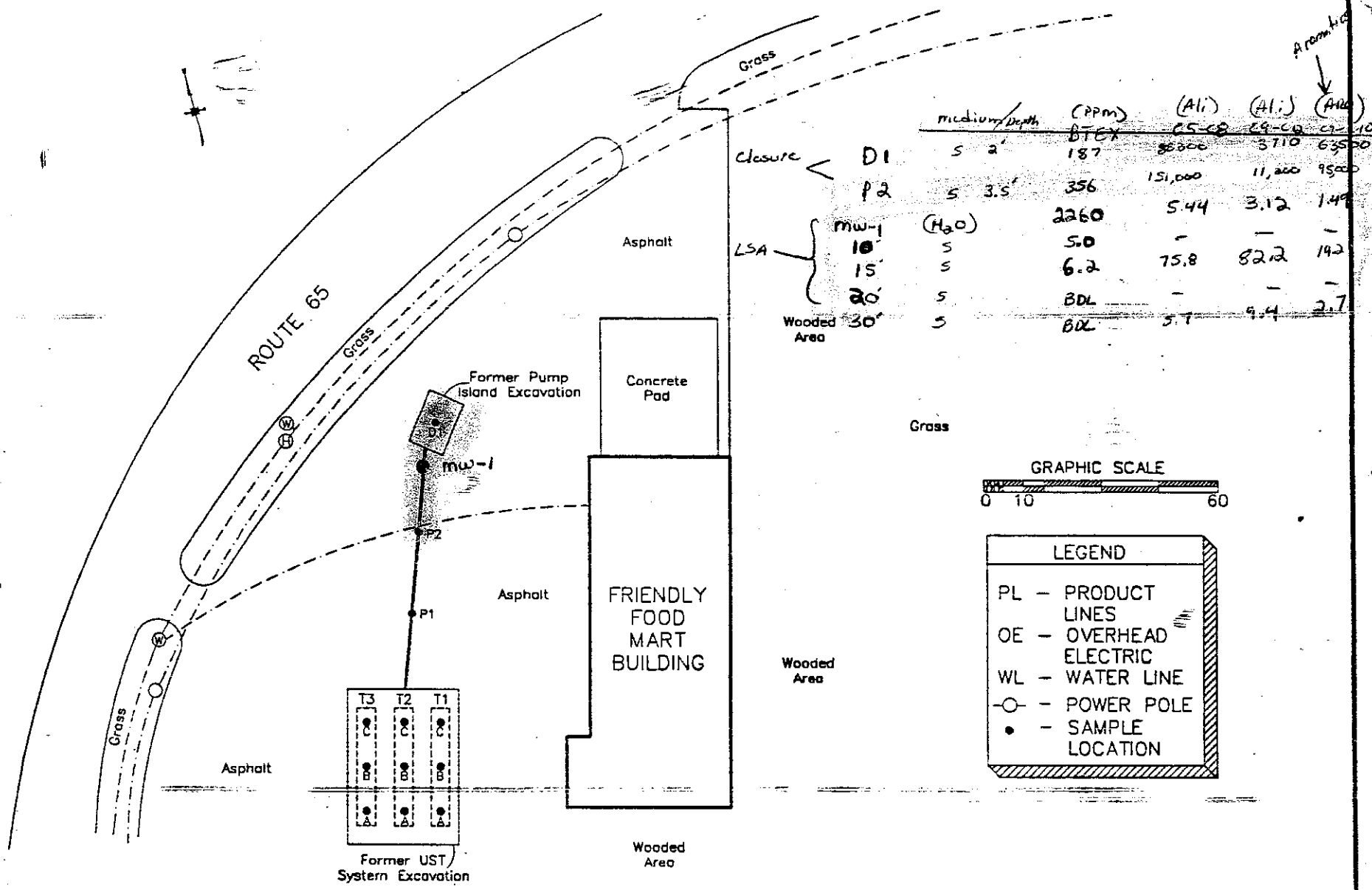
Enclosed are the materials regarding the Friendly Food Mart #6 site. I have included a site map showing sample locations with a summary of analytical results. Also included are copies of chain custody documents and analytical reports. Ground water contamination has been found on-site but appears to be below the 10 fold (guideline) standard, except for benzene. Soil results indicate BDL concentration from 15' to 30'. Considering these results and the lack of down-gradient supply well receptors it would appear that the installation of four additional monitoring wells may be excessive.

If you have any questions or concerns regarding this matter please contact the undersigned at (336) 286-3337.

Sincerely,
OMEGA ENVIRONMENTAL SERVICES

Jason Johnson
Project Geologist

Enclosure:



		medium/depth	(PPM) BTEX	(Al) C5-C8	(Al) C9-C9	(Al) C9-C10
Closure	D1	S 2'	187	88000	3710	63500
	P2	S 3.5'	356	151,000	11,200	95000
LSA	mw-1	(H_2O)	2260	5.44	3.12	1.49
	10'	S	5.0	–	–	–
	15'	S	6.2	75.8	82.2	142
	20'	S	BDL	–	–	–
Wooded Area	30'	S	BDL	5.7	9.4	2.7

Aromatics

OMEGA ENVIRONMENTAL SERVICES	FIGURE NO.: 2 FIGURE NAME: DETAILED SITE MAP	CLIENT: DAN RIVER OIL COMPANY SITE: FRIENDLY FOOD MART #6	JOB NO.: R98-142 DATE: 7-20-98

VPH (Aliphatics/Aromatics) Laboratory Reporting Form Continued

Client Name	Omega	**Laboratory Name**	Water Technology & Controls
Project Name	R-98-142	**NC Certification # (Lab)**	165
Site Location	Friendly Food Mart #6		

Sample Information and Analytical Results								
Lab Identification #	11119851	Trp Blk						
Sample Identification	OEG-100-MW-1	Trip Blank						
Sample Matrix	Water	Water						
Collection Option (for soil)*	NA	NA						
Date Collected	11/9/98	11/9/98						
Date Received	11/11/98	11/11/98						
Date Extracted	NA	NA						
Date Analyzed	11/16/98	11/16/98						
Dry Weight	NA	NA						
Dilution Factor	10	NA						
C5-C8 Aliphatics(mg/L)**	**5.44**	< 0.066						
C9-C12 Aliphatics(mg/L)**	**3.12**	< 0.034						
C9-C10 Aromatics(mg/L)**	**1.49**	< 0.016						
Surrogate % Recovery - PID	102%	104%						
Surrogate % Recovery - FID	102%	107%						

*Option 1 = Established fill line on vial Option 2 = Sampling Device(IndicateBrand) Option3 = Field weight of soil

**Unadjusted Value. Should exclude the concentration of any surrogate(s), internal standards, and/or concentrations of other ranges that elute within the specified range.

***See attatched report.

	C5-C8 Aliphatic	C9-C12 Aliphatic	C9-C10 Aromatic
Percent Recovery - Fortified Blank (Spike) - PID			99%
Relative Percent Difference - PID Duplicate			1.30%
Percent Recovery - Fortified Blank (Spike) - FID	125%	113%	
Relative Percent Difference - FID Duplicate	0.18%	0.32%	

Reviewed By M. H. Vaughan

rev. 05/06/98

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

VPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 09/25/98

Calibration Ranges and Limits

Range	MDL	ML	RL	Units
C5-C8 Aliphatics	0.00328	0.0104	0.066	mg/L
C9-C12 Aliphatics	0.00301	0.00957	0.034	mg/L
C9-C10 Aromatics	0.00099	0.00315	0.016	mg/L

Method of Quantitation (circle one): (Curve) or Average Response Factor

Calibration Concentration Levels

Range	Levels	%RSD or CCC
C5-C8 Aliphatics	0.015	0.9987
	0.18	
	0.9	
	1.5	
	2.4	
C9-C12 Aliphatics	0.011	0.9993
	0.132	
	0.66	
	1.1	
	1.76	
C9-C10 Aromatics	0.002	0.9986
	0.024	
	0.12	
	0.2	
	0.32	

Calibration Check Date 11/16/98

Calibration Check

Ranges	Level	RPD	Units
C5-C8 Aliphatics	0.9	9.46%	mg/L
C9-C12 Aliphatics	0.66	0.77%	mg/L
C9-C10 Aromatics	0.12	12.52%	mg/L

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reporting Limit

RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental Services	WT&C ID:	11119851TB
Project:	R 98-142	Analysis:	11/23/98
Client Sample ID:	OEG-101 Trip Blank	Analyst:	TW

EPA 601/602 - VOLATILE ANALYSIS

Parameter	Result
Benzene	<1.0 ug/L
Bromodichloromethane	<1.0 ug/L
Bromoform	<1.0 ug/L
Bromomethane	<5.0 ug/L
Carbon Tetrachloride	<1.0 ug/L
Chlorobenzene	<1.0 ug/L
Chloroethane	<5.0 ug/L
2-Chloroethylvinyl Ether	<5.0 ug/L
Chloroform	<1.0 ug/L
Chloromethane	<5.0 ug/L
Dibromochloromethane	<1.0 ug/L
1,2-Dichlorobenzene	<1.0 ug/L
1,3-Dichlorobenzene	<1.0 ug/L
1,4-Dichlorobenzene	<1.0 ug/L
Dichlorodifluoromethane	<5.0 ug/L
1,1-Dichloroethane	<1.0 ug/L
1,2-Dichloroethane	<1.0 ug/L
1,1-Dichloroethene	<1.0 ug/L
1,2-Dichloropropane	<1.0 ug/L
cis-1,3-Dichloropropene	<1.0 ug/L
trans-1,3-Dichloropropene	<1.0 ug/L
Ethylbenzene	<1.0 ug/L
Methylene Chloride	**7.8 ug/L**
1,1,2,2-Tetrachloroethane	<1.0 ug/L
Tetrachloroethene	<1.0 ug/L
Toluene	<1.0 ug/L
1,1,1-Trichloroethane	<1.0 ug/L
1,1,2-Trichloroethane	<1.0 ug/L
Trichloroethene	<1.0 ug/L
Trichlorofluoromethane	<5.0 ug/L
Vinyl Chloride	<5.0 ug/L

Additional Compounds	Result
Isopropyl Ether	<5.0 ug/L
MtBE	<5.0 ug/L
m/p-Xylenes	<1.0 ug/L
o-Xylene	<1.0 ug/L
Ethylene Dibromide	<1.0 ug/L

I hereby certify that I have reviewed and approve these data. Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

* Sample pH greater than 2 as received.

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental Services	WT&C ID:	11119851
Project:	R 98-142	Analysis:	11/23/98
Client Sample ID:	OEG-1000-MW-1	Analyst:	TW
Sample Collection:	11/09/98 1300		

EPA 601/602 - VOLATILE ANALYSIS

Parameter	Result
Benzene	**440 ug/L**
Bromodichloromethane	<1.0 ug/L
Bromoform	<1.0 ug/L
Bromomethane	<5.0 ug/L
Carbon Tetrachloride	<1.0 ug/L
Chlorobenzene	<1.0 ug/L
Chloroethane	<5.0 ug/L
2-Chloroethylvinyl Ether	<5.0 ug/L
Chloroform	<1.0 ug/L
Chloromethane	<5.0 ug/L
Dibromochloromethane	<1.0 ug/L
1,2-Dichlorobenzene	<1.0 ug/L
1,3-Dichlorobenzene	<1.0 ug/L
1,4-Dichlorobenzene	<1.0 ug/L
Dichlorodifluoromethane	<5.0 ug/L
1,1-Dichloroethane	<1.0 ug/L
1,2-Dichloroethane	<1.0 ug/L
1,1-Dichloroethene	<1.0 ug/L
1,2-Dichloropropane	<1.0 ug/L
cis-1,3-Dichloropropene	<1.0 ug/L
trans-1,3-Dichloropropene	<1.0 ug/L
Ethylbenzene	**110 ug/L**
Methylene Chloride	<1.0 ug/L
1,1,2,2-Tetrachloroethane	<1.0 ug/L
Tetrachloroethene	<1.0 ug/L
Toluene	**700 ug/L**
1,1,1-Trichloroethane	<1.0 ug/L
1,1,2-Trichloroethane	<1.0 ug/L
Trichloroethene	<1.0 ug/L
Trichlorofluoromethane	<5.0 ug/L
Vinyl Chloride	<5.0 ug/L

Additional Compounds	**Result**
Isopropyl Ether	<5.0 ug/L
MtBE	**1970 ug/L**
m/p-Xylenes	**730 ug/L**
o-Xylene	**480 ug/L**
Ethylene Dibromide	<1.0 ug/L

I hereby certify that I have reviewed and approve these data. Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

Water Technology and Controls, Inc.

Environmental Laboratory

Laboratory Certification No. 165

Client: Omega Environmental Services
Contact: Mr. Jason Johnson

Report Date: 11/24/98
Date Sample Rcvd: 11/11/98
Project # R98-142

WT&C Work Order # 11119851 Sample: OEG-100-MW-1 11/9/98

Parameters	***Results***
3030C Lead	<0.010 mg/l

I hereby certify that I have reviewed and approve these data.

Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

642 Tamco Road, Reidsville, North Carolina 27320
tel.(910)342-4748 fax.(910)342-1522

CHAIN OF CUSTODY TRACKING FORM

Omega

PAGE 1 OF 1

LAB DESTINATION: Water Technology + Controls
SEND LAB RESULTS TO: Jason Johnson 3619 Hobbs Rd. Greensboro, NC 27410
SEND BILLING TO: Tracye, OES, Lakeland, FL 20 Lake Wire Drive, 33801
LEGAL CUSTODY: PRECLEANED CONTAINERS VERIFIED AND RELINQUISHED BY:

PROJECT NO.	PROJECT NAME	LOCATION
R 98-142	Friendly Food Mart #6	Walnut Cove, NC

SAMPLED BY: Jason Johnson

SAMPLE NUMBER	LAB ID	COLLECTION DATE	COLLECTION TIME	SAMPLE MATERIAL	NUMBER OF CONTAINERS	FIELD READINGS pH	FIELD READINGS COND.	FIELD READINGS TEMP.	601 + 602 w/ MTBE, TPE, EDB/1,2-DCA	3030C	MADEP VPH								REMARKS
OE6-100	mw 1	11/9/98	13:00	GW	4				X	X	X								3030c preserved w HNO3
OE6-101	Trip Blank	—	—	W	3				X										601+602 " " HCl

SPECIAL INSTRUCTIONS:

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	11/10/98	17:00	[signature]

RELINQUISHED BY:	DATE	TIME	RECEIVED BY COMMON CARRIER:

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RELINQUISHED BY:	DATE	TIME	RECEIVED AT LAB BY:
	11/11/98	4pm	[signature]

DWG. CHART32

AIR WATER & SOIL Laboratories, Inc.

2119A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804)358-8295 Fax: (804)358-8297

Certificate of Analysis

Client Name: Omega Environmental Services
Client Project I.D.: Friendly Food Mart #6
Submitted to: Jason Johnson

Date Received: November 6, 1998
Date Issued: November 13, 1998

Reference Method: SW846 method 8260 continued

Parameter	OEG-MW1-5' (mg/kg)	OEG-MW1-10' (mg/kg)	OEG-MW1-15' (mg/kg)	OEG-MW1-20' (mg/kg)	OEG-MW1-25' (mg/kg)	OEG-MW1-30' (mg/kg)	Det. Limit (mg/kg)
Tetrachloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,3-Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2-Hexanone	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Dibromochloromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dibromoethane (EDB)	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,1,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Ethylbenzene	BDL	0.4	0.8	BDL	BDL	BDL	0.1
Xylenes	0.5	3.2	4.8	BDL	BDL	BDL	0.1
Styrene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromoform	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Isopropylbenzene	BDL	BDL	0.1	BDL	BDL	BDL	0.1
Bromobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,2,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,3-Trichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Propylbenzene	0.2	0.3	0.6	BDL	BDL	BDL	0.1
2-Chlorotoluene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
4-Chlorotoluene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,3,5-Trimethylbenzene	0.3	1.1	1.9	BDL	BDL	BDL	0.1
tert-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,4-Trimethylbenzene	1.2	3.4	6.2	BDL	BDL	BDL	0.1
sec-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,3-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
p-Isopropyltoluene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,4-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
n-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dibromo-3-chloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,4-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Hexachlorobutadiene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Naphthalene	0.9	1.2	0.8	BDL	BDL	BDL	0.1
1,2,3-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
MTBE	BDL	0.5	0.4	BDL	BDL	BDL	0.1

BDL = Below Detection Limit

Carmela L. Tombes
Laboratory Director

AIR WATER & SOIL Laboratories, Inc.
2119A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804)358-8295 Fax: (804)358-8297

Certificate of Analysis

North Carolina Certification # 495

Client Name: Omega Environmental Services
Client Project I.D.: Friendly Food Mart #6
Submitted to: Jason Johnson

Date Received: November 6, 1998
Date Issued: November 13, 1998

Reference Method: SW-846 method 8260

Six soil samples were analyzed for the following Volatile Organic Compounds.

Parameter	OEG-MW1-5' (mg/kg)	OEG-MW1-10' (mg/kg)	OEG-MW1-15' (mg/kg)	OEG-MW1-20' (mg/kg)	OEG-MW1-25' (mg/kg)	OEG-MW1-30' (mg/kg)	Det. Limit (mg/kg)
Dichlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chloromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Vinyl Chloride	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromomethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Trichlorofluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1-Dichlorocthene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Acetone	BDL	0.2	BDL	BDL	BDL	BDL	0.1
Iodomethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Carbon disulfide	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Methylene Chloride	BDL	BDL	BDL	BDL	BDL	BDL	0.1
trans-1,2-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Vinyl acetate	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2,2-Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
cis-1,2-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2-Butanone (MEK)	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromochloromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chloroform	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,1-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Carbon tetrachloride	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1-Dichloro-1-propene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Benzene	BDL	0.3	BDL	BDL	BDL	BDL	0.1
1,2-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Trichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Dibromomethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromodichloromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
cis-1,3-Dichloro-1-propene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
4-Methyl-2-Pentanone	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Toluene	BDL	1.1	0.6	BDL	BDL	BDL	0.1
trans-1,3-Dichloro-1-propene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,2-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1

BDL = Below Detection Limit

Carmela L. Tombes
Laboratory Director

98116191

AIR WATER & SOIL Laboratories, Inc.

2119A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804)358-8295 Fax: (804)358-8297

Certificate of Analysis

Client Name: Omega Environmental Services
Client Project I.D.: Friendly Food Mart #6
Submitted to: Jason Johnson

Date Received: November 6, 1998
Date Issued: November 13, 1998

Reference Method: MADEP VPH

Two soil samples were analyzed for the following Volatile Petroleum Hydrocarbons.

		Sample I.D.	OEG-MW1-15'	OEG-MW1-30'		
		Date Analyzed	11/10/98	11/10/98		
		Dilution Factor	---	---		
		% Moisture	17.8	11.0		
Range/Target Analyte	**Reporting Limit**	**Units**				
C5-C8 Aliphatic Hydrocarbons	0.5	mg/kg	75.8	5.7		
C9-C12 Aliphatic Hydrocarbons	0.5	mg/kg	82.2	9.4		
C9-C10 Aromatic Hydrocarbons	0.5	mg/kg	19.2	2.7		
FID Surrogate % Recovery			132%	102%		
PID Surrogate % Recovery			113%	98%		

BDL = Below Detection Limit

Carmela L. Tombes

Carmela Tombes
Laboratory Director

CHAIN OF CUSTODY TRACKING FORM

Omega

PO# 47-2428

PAGE 1 OF 1

LAB DESTINATION: Air Water & Soil

SEND LAB RESULTS TO: Jason Johnson, 3619

SEND BILLING TO: Trayce Smith 20 Lakewire Dr. Richmond, VA 23801

LEGAL CUSTODY: PRECLEANED CONTAINERS VERIFIED AND RELINQUISHED BY: _____

PROJECT NO.	PROJECT NAME	LOCATION
R98-142	Friendly Food Mart #6	Walnut Cove, NC

SAMPLED BY: Jason Johnson

SAMPLE NUMBER	LAB ID	COLLECTION DATE	COLLECTION TIME	SAMPLE MATERIAL	NUMBER OF CONTAINERS	FIELD READINGS pH	FIELD READINGS COND.	FIELD READINGS TEMP.	8260 w/ IPE + MTBE	MaDEP VPH	Normal TAT	REMARKS
OE6-mw1-5'		11/4	10:30	S	1				X			
OE6-mw1-10'		"	10:45	S	1				X			
OE6-mw1-15'		"	11:00	S	2				X	X		
OE6-mw1-20'		"	11:15	S	1				X			
OE6-mw1-25'		"	11:30	S	1				X			
OE6-mw1-30'		"	11:50	S	2				X	X		

SPECIAL INSTRUCTIONS: NC Job

RELINQUISHED BY	DATE	TIME	RECEIVED BY
Jason Johnson	11/5/98	17:00	
RELINQUISHED BY	DATE	TIME	RECEIVED BY COMMON CARRIER

RELINQUISHED BY	DATE	TIME	RECEIVED BY
RELINQUISHED BY	DATE	TIME	RECEIVED AT LAB BY
	11-6	1pm	Emily Duff

ORIGIN QUARTZ

02111-191

POLLUTION INCIDENT/ SUSPECTED LEAK REPORTING FORM

Department of Environment, Health, Natural Resources
Division of Environmental Management
GROUNDWATER SECTION

updated 12/21/00 L. Estkowski

Confirm. GW Contamination (Y/N) Y
Major Soil Contamination (Y/N) ____
Minor Soil Contaminatin (Y/N) ____

Incident # 19490.

Date Incident Occurred or Leak Detected 6/2/98.

INCIDENT DESCRIPTION

Incident Location/Name Family Food Mart # 6
Address Route 2, Box 733
City/Town Walnut Cove | County Stokes | Region WSRO
Briefly Describe Incident Three gas USTs pulled 6/2/98. groundwater high = 440 ppb. Benzene

POTENTIAL SOURCE OWNER-OPERATOR

Potential Source Owner-Operator contact person = Chad Wall | Telephone (336) 548-6275
Company Dan River Oil Company | Street Address 202 N. Dalton Street
City Madison | County Rockingham | State NC | Zip Code 27025

OWNERSHIP
0. N/A 1. Municipal 2. Military 3. Unknown (4.Private) 5.Federal 6. County 7. State

OPERATION TYPE
0. N/A 1. Public Service 2. Agricultrural 3. Residential 4. Educational/Relig. 5. Industrial (6. Commercial) 7. Mining

POLLUTANTS INVOLVED

MATERIALS INVOLVED	AMOUNT LOST	AMOUNT RECOVERED
gas	?	?

SOURCE OF POLLUTION

PRIMARY SOURCE OF POLLUTION (Select one)
1. Intentional dump
2. Pit, pond, lagoon
(3. Leak-underground)
4. Spray irrigation
5. Land application
6. Animal feedlot
7. Source unknown
8. Septic tank
9. Sewer line
10. Stockpile
11. Landfill
12. Spill-surface
13. Well
14. Above-ground Storage Tank
15. Nonpoint source

PRIMARY POLLUTANT TYPE (Select one)
1. Pesticide/herbicide
2. Radioactive waste
(3. Gasoline/diesel)
4. Heating oil
5. Other petroleum prod.
6. Sewage/septage
7. Fertilizers
8. Sludge
9. Solid waste leachate
10. Metals
11. Other inorganics
12. Other organics

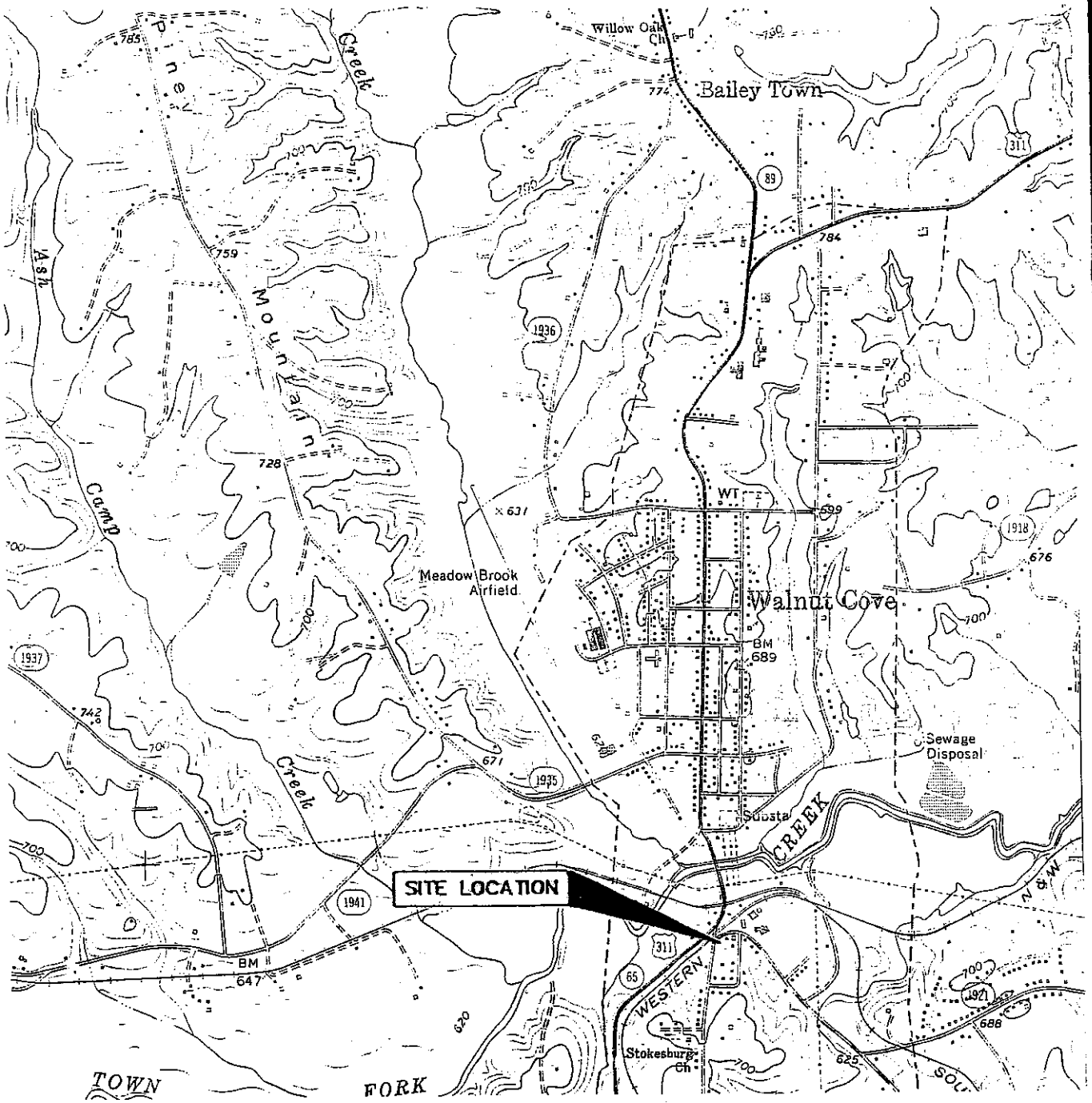
LOCATION
(1. Facility)
2. Railroad
3. Waterway
4. Pipeline
5. Dumpsite
6. Highway
7. Residence
8. Other

SETTING
(1. Residential)
2. Industrial
(3. Urban)
4. Rural

Site Priority Ranking I.

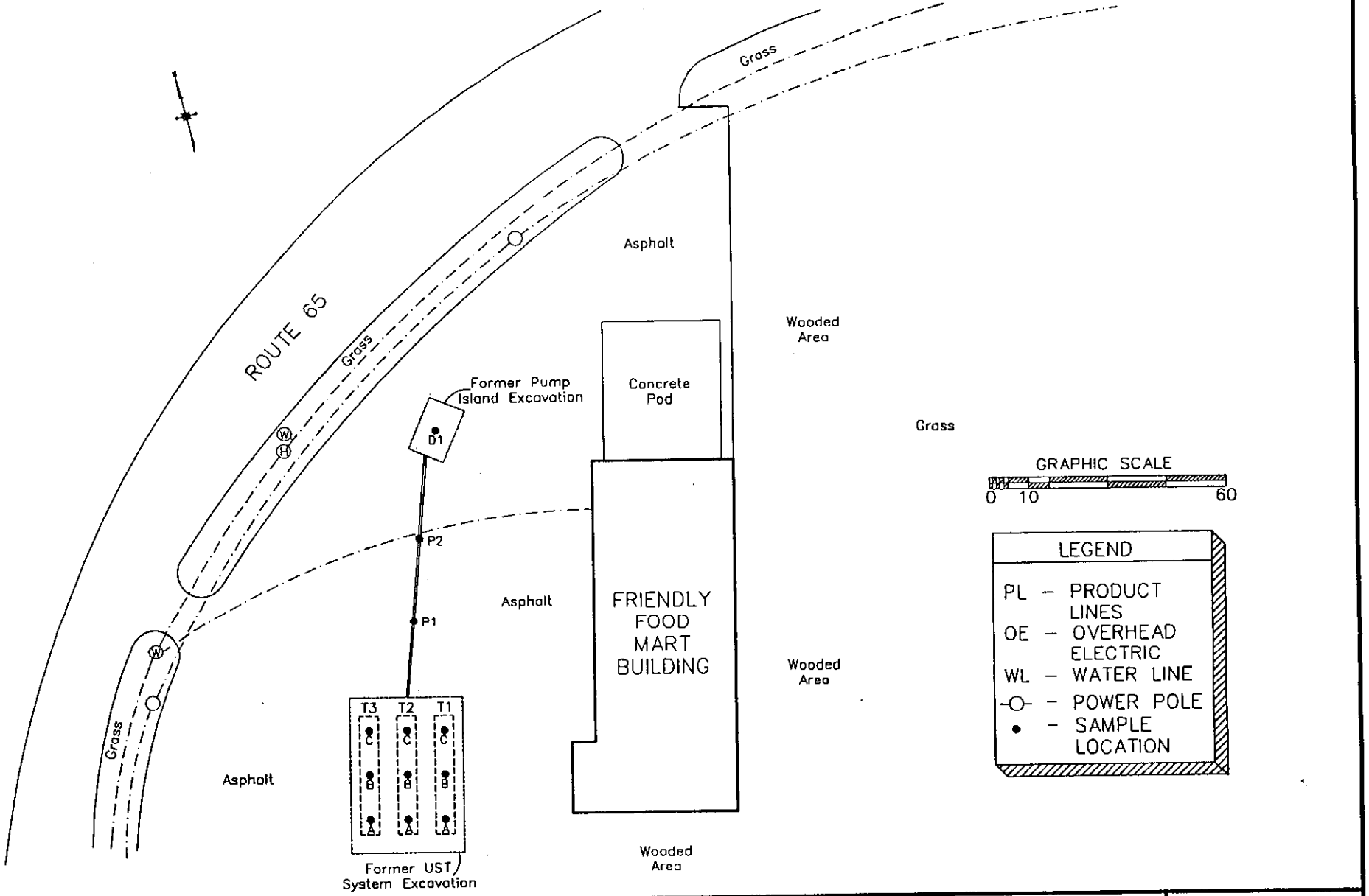
D.E.M. Regional Contact DWM LINDA Estkowski | Signature Linda Es Dcouski | Date 1-27-99.

GW-61 Revised 2/95



USGS 7.5 MINUTE TOPOGRAPHIC SURVEY MAP OF WALNUT COVE, NC QUADRANGLE. PHOTO REVISED 1986

FIGURE NO.: FIGURE 1	
FIGURE NAME: SITE VICINITY MAP	
CLIENT: DAN RIVER OIL	R98-142
SITE: Friendly Food Mart #6	DATE: 7/20/98



OMEGA ENVIRONMENTAL SERVICES	FIGURE NO.: 2 FIGURE NAME: DETAILED SITE MAP	CLIENT: DAN RIVER OIL COMPANY SITE: FRIENDLY FOOD MART #6	JOB NO.: R98-142 DATE: 7-20-98

30/4

NCDENR

JAMES B. HUNT JR.
GOVERNOR

WAYNE MCDEVITT
SECRETARY

WILLIAM L. MEYER
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT
DIVISION OF WASTE MANAGEMENT
UST SECTION

January 27, 1999

CERTIFIED MAIL P-536 306 610
RETURN RECEIPT REQUESTED

Mr. Chad Wall
Dan River Oil Company
202 N. Dalton Street
Madison, NC 27025

RE: Notice of Regulatory Requirements
15A NCAC 2L .0115(c)
RISK-BASED ASSESSMENT AND
CORRECTIVE ACTION FOR
PETROLEUM UNDERGROUND
STORAGE TANKS

Friendly Food Mart #6
Route 2 Box 733, Walnut Cove
Stokes County, NC
Incident No. Pending

Dear Mr. Wall:

Information received by this office on August 10, 1998 confirms a release or discharge from a petroleum underground storage tank (UST) system at the above referenced location. Records indicate that you are the owner of this UST tank system. This letter is a standard notice explaining the actions you must take as a result of the release or discharge in accordance with North Carolina statutes and rules. The UST Section of the Division of Waste Management administers the state's rules for USTs and the required response for petroleum releases. Those rules are located in Title 15A, Subchapter 2L and Title 15A, Subchapter 2N of the North Carolina Administrative Code (NCAC).

As a responsible party, you are required to comply with the release response and corrective action requirements of 15A NCAC 2L .0115(c), which include the requirements established in 15A NCAC 2N. Listed is a general description of actions you must take to comply with State rules. For a detailed description of your requirements please refer to the enclosed rules and the January 1998 *Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater, Volume II* ("the Guidelines"). The Guidelines are available on the Internet at

UST SECTION
P.O. BOX 29616, RALEIGH, NC 27626-0616 / 2728 CAPITAL BLVD., RALEIGH, NC 27604
PHONE 919-733-8486 FAX 919-733-9413

http://gw.ehnr.state.nc.us or may be purchased from the UST Section for a fee of $7.00. To purchase a copy of the Guidelines, please send a check made payable to

DENR to:

DENR/DWM/UST Section
P.O. Box 29616
Raleigh, NC 27626-0616

Required Actions:

1) If you have not already done so, you must take immediate action to prevent any further release of the regulated substance into the environment and to identify and mitigate any fire, explosion and vapor hazards; remove any free product; and comply with the requirements of Rules .0601 through .0604 and .0701 through .0703 and .0705 of Subchapter 2N;

2) Incorporate the requirements of 15A NCAC 2N .0704 into the report to be submitted in accordance with 15A NCAC 2L .0115 (c)(3) or (c)(4), whichever is applicable (see Item #3 below). This shall constitute compliance with the reporting requirements of 15A NCAC 2N .0704(b);

3) If you can demonstrate that no soil remains in the unsaturated zone in the sidewalls and at the base of the UST system excavation with contaminant levels exceeding either the "soil-to-groundwater" or the residential maximum soil contaminant concentrations (See Guidelines), whichever are lower, then submit a Soil Contamination Report in accordance with 15A NCAC 2L.0115(c)(3). The Soil Contamination Report, if applicable, is due in this office within **90 days** of the date of receipt of this notice. Upon approval of this report, the Department will issue a notice indicating that no further action related to this incident is required; or,

4) If the requirements of 15A NCAC .0115(c)(3) cannot be met as described in Item #3 above, submit a Limited Site Assessment (LSA) Report in accordance with 15A NCAC 2L .0115(c)(4), containing information needed by the Department to classify the level of risk to human health and the environment posed by the discharge or release. The LSA Report is due in this office within **120 days** of the date of receipt of this notice. Based on a review of the information submitted in the LSA, the Department will classify the risk of the discharge or release as high, intermediate or low. At that time, the Department will also classify the land use of the site as either residential or industrial/commercial. You will be notified of the risk and land use classifications once review of your LSA Report is completed.

If you believe that any of the information requested above has already been submitted, please notify me of the date, title, and content of the documents that contain the information.

Your prompt attention to the items described herein is required. Failure to comply with the state's rules in the manner and time specified, may result in the assessment of civil penalties and /or the use of other enforcement mechanisms available to the State. Each day that a violation continues may be considered a separate violation. If you believe you are not the responsible party notify the UST Section within 15 days of receipt of this letter.

Please note that performing assessment and cleanup work that is not required under 15A NCAC 2L.0115 is not reimbursable from the Commercial or Noncommercial Leaking Petroleum Underground Storage Tank Cleanup Funds.

If you have any questions regarding the actions that must be taken or the rules mentioned in this letter, please contact me at the letterhead address and/or at (336) 771-4600, extension 284. If you have any questions regarding trust fund eligibility or reimbursement, please contact the UST Section at (919) 733-8486.

Sincerely,

Linda Estkowski
Hydrogeologist II

Enclosures: 15A NCAC 2L .0115

cc: Ted Bush - Central Office
Winston-Salem Regional Office

LIMITED SITE ASSESSMENT REPORT

Friendly Food Mart # 6
Route 2 Box 733
Walnut Cove, North Carolina 27052
Facility ID # 0-008364

Submitted to:
Ms. Linda Estkowski
North Carolina Department of Environment and Natural Resources
Division of Waste Management
Winton-Salem Regional Office
Winston-Salem, North Carolina
585 Waughtown Street
(336) 771-4600

Prepared for:
Mr. Chad Wall
Dan River Oil Company
202 N. Dalton Street
Madison, North Carolina 27025
Rockingham County
(336) 548-6275

Prepared by:
Jason B. Johnson
Omega Environmental Services
3619 Hobbs Road
Greensboro, North Carolina 27410
(336) 286-3337

Omega Project # R98-142

June 2, 1999

omega
environmental
services

June 2, 1999
Omega Project Number R98-142

Mr. Chad Wall
202 N. Dalton Street
Madison, North Carolina 27025
(336) 548-6275

Reference: Friendly Food Mart # 6
Route 2, Box 733
Walnut Cove, North Carolina 27052

Dear Mr. Wall:

Omega Environmental Services has completed a Limited Site Assessment investigation for the above-referenced site in Walnut Cove, North Carolina. Please find enclosed copies of the Limited Site Assessment Report that details our technical services and findings. If you have any questions regarding this report, or if we can be of further assistance, please feel free to contact the undersigned at (336) 286-3337.

Respectfully Submitted,
OMEGA ENVIRONMENTAL SERVICES, INC.

Jason B. Johnson, CPG
Project Geologist

NORTH CAROLINA LICENSED SEAL 1093 GEOLOGIST JOHN ELDRIDGE MASON

John E. Mason, CPG
Senior Project Geologist

Enclosures:

TABLE OF CONTENTS

FIGURES

TABLES

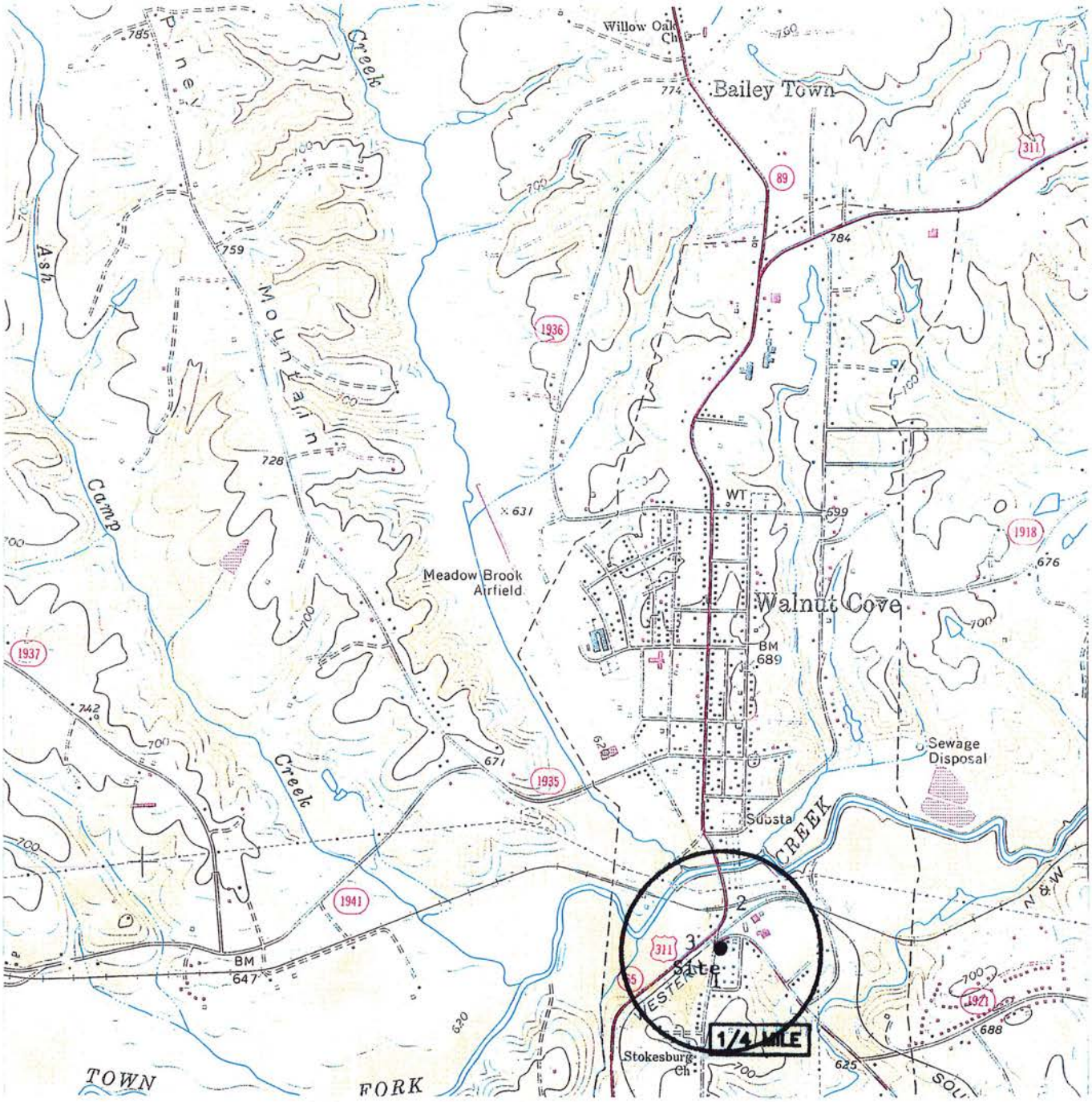
APPENDICES

1.0 GENERAL FACILITY INFORMATION

The Friendly Food Mart #6 (FFM#6) is located inside the city limits of Walnut Cove, North Carolina at the intersection of Highway 311 and Route 65 (Figure 1). Currently the property is vacant and is presently owned by Mrs. Frances DeHart of Walnut Cove, North Carolina. The site is a former gasoline storage and dispensing facility. The site consists of approximately 1/4 acres and is improved with a concrete/gravel driveway and a concrete block building (Figure 3). Grassed areas are located along the eastern and southern boundaries of the property. The property is currently zoned business district and the surrounding area is zoned heavy residential, business district and light industrial. Topographically, elevation at the site is approximately 800 feet above sea level, and is characterized by slight to moderate relief sloping to the north towards Town Fork Creek. The site is not located on a 100 year flood-plain.

Dan River Oil Company owned and operated three 4,000 gallon gasoline USTs at the site. On June 2, 1998, the UST system was permanently closed by removal. During the system closure, contaminated soils were identified in the vicinity of the dispenser island and the product lines nearest to the dispensers. The release was reported to the North Carolina Department of Environment and Natural Resources on June 3, 1998. The quantity of the release is undetermined. The cause of the release is unconfirmed, however it appears to be associated with the UST system dispenser and system piping. Limited excavation was conducted to investigate and remove impacted soils. The release incident number is pending. The Facility Identification Number for the site is 0-008364.

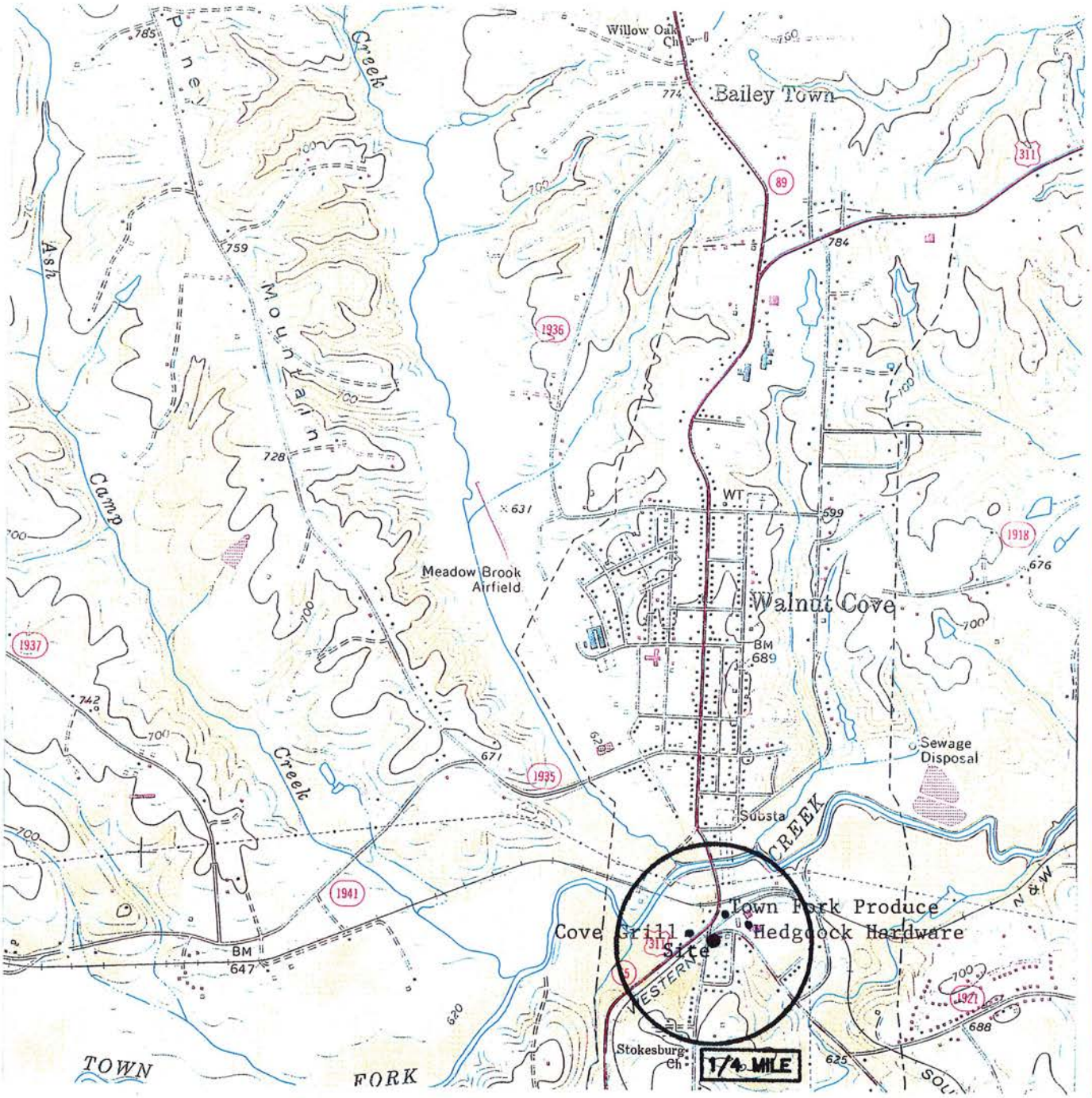
Site Latitude: 36° 17' 30"
Site Longitude: 80° 8" 30"



USGS 7.5 MINUTE TOPOGRAPHIC SURVEY MAP OF WALNUT COVE, NC QUADRANGLE. PHOTO REVISED 1986

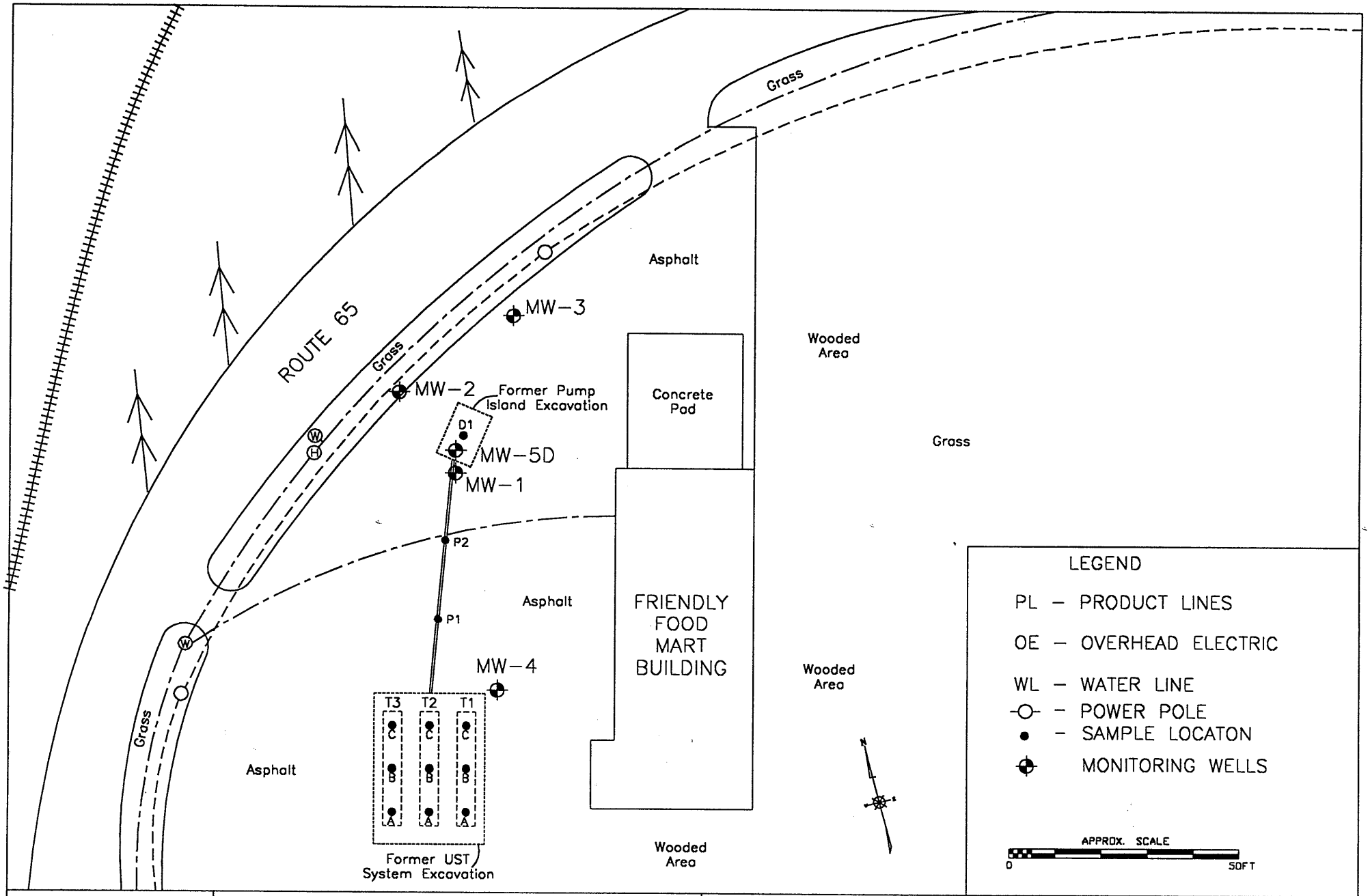
1. Terry Meeks Well
2. Piedmont Concrete Well
3. Carwash Well

FIGURE NO.: FIGURE 1	
FIGURE NAME: Site Vicinity Map Showing Receptors	
CLIENT: DAN RIVER OIL	R98-142
SITE: Friendly Food Mart #6	DATE: 1/20/99



USGS 7.5 MINUTE TOPOGRAPHIC SURVEY MAP OF WALNUT COVE, NC QUADRANGLE. PHOTO REVISED 1986

FIGURE NO.: FIGURE 2	
FIGURE NAME: Areas of Public Assembly	
CLIENT: DAN RIVER OIL	R98-142
SITE: Friendly Food Mart #6	DATE: 1/20/99



OMEGA ENVIRONMENTAL SERVICES	FIGURE NO.: 3 FIGURE NAME: DETAILED SITE MAP	CLIENT: DAN RIVER OIL COMPANY SITE: FRIENDLY FOOD MART #6	JOB NO.: R98-142 DATE: 5/1/99

2.0 SITE HISTORY

On June 2, 1998, Dan River Oil Company closed the UST system at the Friendly Food Mart #6. The closure was performed by Petroserve of High Point North, Carolina and supervised by Omega personnel. The closure consisted of the removal of three 4,000 gallon gasoline USTs , approximately 50 feet of product lines and the former dispenser island. The system dispensers had been removed and recycled prior to closure of the UST's. Soils samples collected during the closure indicated evidence of a release in the vicinity of the dispensers and the product lines closest to the dispensers. Limited excavation was conducted to investigate the extent of the adsorbed phase impacted soils. Approximately 20.6 tons of soil was removed from beneath the dispensers and transported to Soil Solutions Inc. for disposal. The excavation was discontinued observing the five foot rule. The excavation measured approximately 8 feet wide by 12 feet long by 8 feet deep. A hand auger soil boring to a depth of 10 feet was advanced at the base of the excavation, the analytical results indicate that contamination appears to extend further than the excavation limits.

UST's formerly located at the site include:

Tank	Type	Use	Volume(gal)	Contents	Date Installed	Closure Date
1	Steel	resale	4000	gasoline	unknown	June 2, 1998
2	Steel	resale	4000	gasoline	unknown	June 2, 1998
3	Steel	resale	4000	gasoline	unknown	June 2, 1998

Dan River Oil Company contracted Omega Environmental Services to prepare a Phase 1 - Limited Site Assessment (LSA) based on data and samples collected by Omega personnel at the Friendly Food Mart #6 store. Based on groundwater sampling results from the Phase 1 investigation, Omega completed Phase II of the Limited Site Assessment investigation. Groundwater samples in one monitor well indicate benzene concentrations above North Carolina Gross Contaminant Levels (GCLs). Results also indicate that three monitor wells contain petroleum compounds above North Carolina Groundwater Standards.

3.0 Risk Classification

Risk characterization is outlined in the following questionnaire.

Limited Site Assessment Risk Classification and Land Use Form

Part I – Groundwater/Surface water/Vapor Impacts

High Risk

1. Has the discharge or release contaminated any water supply well including any used for non-drinking purposes? YES/(NO)
   If yes, explain. None known.

2. Is a water supply well used for drinking water located within 1000 feet of the source area the discharge or release? YES/(NO)

3. Is a water supply well used for any purpose (e.g., irrigation, washing cars, industrial cooling water, filling swimming pools) located within 250 feet of the source area of the release or discharge? YES/(NO)

4. Does groundwater within 500 feet of the source area of the discharge or release have the potential for future use in that there is no other source of water supply other than the groundwater? YES/(NO)
   Explain. Entire area is supplied with municipal water.

5. Do vapors from the discharge or release pose a threat of explosion because of accumulation of the vapors in a confined space or pose any other serious threat to public health, public safety or the environment? YES/(NO)
   If yes, explain. No threat known or suspected

6. Are there any other factors that would cause the discharge or release to pose an imminent danger to public health, public safety, or the environment? (YES)/NO
   If yes, explain. There is a potential danger at the creek located offsite.

Intermediate Risk

7. Is a surface water body located within 500 feet of the source area of the discharge or release? YES (NO)

If yes, does the maximum groundwater contaminant concentration exceed the surface water quality standards and criteria found in 15A NCAC 2B .0200 by a factor of 10? (YES) NO

Benzene concentrations exceed surface water quality standards by a factor greater than 10.

8. Is the source area of the discharge or release located within a designated wellhead protection area as defined in 42 USC 300h-7(e)? YES (NO)
If yes, explain. No WHPAs present within the area.

9. Is the discharge or release located in the Coastal Plain physiographic region as designated on a map entitled "Geology of North Carolina" published by the Department in 1985?

Site is in Piedmont. YES (NO)

If yes, is the source area of the discharge or release located in an area in which there is recharge to an unconfined or semi-confined deeper aquifer that is being used or may be used as a source of drinking water? YES (NO)
If yes, explain.

10. Do the levels of groundwater contamination for any contaminant exceed the gross contamination levels established (see Table 7) by the Department. (YES) NO

Benzene concentrations exceed GCLs.

Part II - Land Use

Property Containing Source Area of Discharge or Release

The questions below pertain to the property containing the source area of the release.

1. Does the property contain one or more primary or secondary residences (permanent or temporary)? YES (NO)
   Explain. Store is currently not in use. No residences associated with this property.

2. Does the property contain a school, daycare center, hospital, playground, park, recreation area, church, nursing home, or other place of public assembly? YES (NO)
   Explain.

3. Does the property contain a commercial (e.g., retail, warehouse, office/business space, etc.) or industrial (e.g., manufacturing, utilities, industrial research and development, chemical/petroleum bulk storage, etc.) enterprise, an inactive commercial or industrial enterprise, or is the land undeveloped? (YES) NO
   Explain. The property contains an inactive commercial enterprise.

4. Do children visit the property? (YES) NO
   Explain. Occasionally may visit the property.

5. Is access to the property reliably restricted consistent with its use (e.g., by fences, security personnel or both)? (YES) NO
   Explain. Typical restrictions for a retail store.

6. Do pavement, buildings, or other structures cap the contaminated soil? (YES) NO
   Explain. Asphalt cap the contaminated soil.

   If yes, what mechanisms are in place or can be put into place to ensure that the contaminated soil will remain capped in the foreseeable future?
   Impacted soils and surrounding area are capped with asphalt.

7. What is the zoning status of the property? The property is zoned B-1, Business District.

8. Is the use of the property likely to change in the next 20 years? (YES/NO)
Explain. Use is likely to change.

Property Surrounding Source Area of Discharge or Release

The questions below pertain to the area within 1500 feet of the source area of the discharge or release (excludes property containing source area of the release):

11. What is the distance from the source area of the release to the nearest primary or secondary residence (permanent or temporary)? 200 feet +/-.

12. What is the distance from the source area of the release to the nearest school, daycare center, hospital, playground, park, recreation area, church, nursing home or other place of public assembly? 2000 ft +/-.

13. What is the zoning status of properties in the surrounding area? Zoning in the area includes B-1, Business District, I-1, Light Industrial and R-8, Heavy Residential.

14. Briefly characterize the use and activities of the land in the surrounding area. Surrounding area is primarily commercial retail business, residential and undeveloped.

4.0 Receptor Information

Potential receptors and migrational pathways are discussed in the following sections. Property maps were reviewed at the Stokes County Administration Office to determine ownership of the surrounding properties. A door to door survey was conducted to determine the presence and construction specifications of water supply wells in the area. Town administrative personnel were also interviewed regarding the water supply in the site area.

4.1 Water Supply Wells

As shown in Figure 1, Friendly Food Mart #6 is located within the City Limits of Walnut Cove, North Carolina. A well survey indicated three supply wells within 1000 ft radius of the site. The supply wells are located at a nearby residence, a concrete company and a car-wash located across 311. The well located at the car-wash across 311 is owned by Charlie Bowman. According to Mr. Bowman the well is used for backup purposes for washing cars at the facility. The well is not used for consumption purposes. The well owned by Terry Meeks is out of service and has been for over ten years. According to Mr. Boyd Hole, owner of Piedmont Concrete, the well on his property is used for mixing concrete only. Municipal water is available or in use at each of the properties listed in Table 1. The well survey was performed by a combination of visual inspections within 1,500 ft radius of the site and communication with local residents and City technical and administrative personnel.

TABLE 1. SUPPL WELL DATA

Property Owner/Occupant	Map #	Property Usage	Supply Well	Well Type /Depth	Well Usage	Approximate Distance/ Direction from Source
Terry Meeks	1	Residence	Yes Not-for drinking.	Hand Dug / 50 feet	none	400 feet/west
Boyd Hole "Piedmont Concrete"	2	Retail Service	Yes Not-for drinking.	Bored / 215 feet	Concrete mix	500 feet/north
Charlie Bowman	3	Carwash	Yes For washing cars. (Back up).	Bored / 90 feet	Backup to wash cars	400 feet/south

4.2 Public Water Supplies

According to Mr. Bicycle Williams with Walnut Cove Public Utlilies and Mr. Darren Rhodes, the Town Manager, public water supply and sewer is in use at the site and at all surrounding properties. Water is carried through an 8" main along Hwy. 311 and N. C. Route 65. Municipal water is supplied by five municipal wells, all of which are greater than 1,500 feet from the site. Based on a door to door survey, it appears that each of the residences in the vicinity of the site utilize municipal water for their water supply. The resident who has a private groundwater supply well indicated that the well was not in use.

4.3 Surface Water

The nearest surface water to the site is Town Fork Creek which is located approximately 900 feet north of the source area. Town Fork Creek ultimately drains into the Dan River. Surface water runoff is towards this creek. No other surface water intakes were located within 1,500 feet of the source area.

4.4 Wellhead Protection Areas

Well-head protection areas are not known to exist within 1,500 feet of the source area.

4.5 Deep Aquifers in the Coastal Plain Physiographic Region

Friendly Food Mart #6 is located in the Piedmont Physiographic Region.

4.6 Subsurface Structures

No septic system or basement was located on the site or at adjacent properties. Subsurface structures were located during the removal of the USTs and system. The site does not appear to pose a hazardous vapor threat to public health, public safety or the environment.

4.7 Land Use

Land use in the area is for commercial and residential purposes. Adjacent residences are located to the south of the property and up-gradient from the source area. Commercial property is located to the north , east and west of the source area.

Recreational activities within 1,500 ft radius of the site are limited to off-site areas and none of these are suspect to be threatened. Public assembly areas within 1500 feet of the site are provided in Figure 2.

4.8 Property Owners and Occupants

Property owners and occupants, names, addresses and property usage within and adjacent to the site are shown in Table 2 as follows.

well #

See Table 1 also -

TABLE 2. SURROUNDING PROPERTY OWNERS/USAGE			
Property Owner/Occupant	**Property Usage**	**Supply Well**	**Address**
Johnathan Nelson	Abandoned	No	521 Stokeburg Road.
Johnathan Nelson	Abandoned	No	523 Stokeburg Road
Shirley Ore	Residence	No	511 Stokesburg Road
DorathyGreen	Residence	No	515 Stokesburg Road
Steve Berrier	Residence	No	410 Stokesburg Road
1 Terry Meeks	Residence	Yes - Not in use	418 Stokesburg Road ~400
Jerry Gearhart	Residence	No	503 Stokesburg Road
H.L. Dodson	Residence	No	506 Stokesburg Road
Sherri	Residence	No	105 Cameron Street
Marcus Hooker	Residence	No	111 Cameron Street
Todd Wishon	Residence	No	112 Cameron Street
Tommy Badget	Residence	No	117 Cameron Street
Mr. Carlson	Residence	No	119 Cameron Street
Alma Cox	Residence	No	516 McCalster Street
Junior Duncan	Residence	No	517 McCalster Street
Mary Neil	Residence	No	511 McCalster Street
Jonny Slate	Residence	No	507 HWY 65 East
Jeff Winfield	Residence	No	505 HWY 65 East
Jo Beasly	Residence	No	519 HWY 65 East
Stephen Berrier	Residence	No	410 Stokesburg Road
L.D. Sutphin	Retail / Restaurant	No	Cove Grill/Variety Florist, 341 Route 5
Bob O'Dear	Retail	No	Town Fork Produce, HWY 311
2 Boyd Hole	Retail / Service	Not drinking Yes	Piedmont Concrete, HWY 311 ~700
Daryl Boyd	Retail / Service	No	Boyd Home Improvement, 501 McCalster
Jasper Hedgecock	Retail	No	Hedgcock Hardware, HWY 65
3 Charlie Bowman	Carwash	Not drinking Yes	Quickwash, HWY 311 ~650

(90' deep bored well.

Note: MW-5D (onsite) is 50' deep in unconsolidated material.
g.w. flow to North.
carwash well is 650' to west of site.

5.0 SITE GEOLOGY AND HYDROGEOLOGY

Friendly Food Mart #6 is located in the Piedmont Physiographic Province. Subsurface materials at the site predominantly consist of tan to reddish pink sandy to silty clays. The site located in Walnut Cove, which lies within the Triassic Basins of the Piedmont Physiographic Province. The Triassic Basins are characterized as filled basins of sedimentary rocks forming approximately 200 million years ago.

Based on published reports and data from wells installed at the site, site hydrogeology consists of an unconfined, surficial aquifer with water table depth approximately 12.0 - 13.0 feet below land surface. Based upon potentiometric surface data, groundwater flow appears to be in a northwestern direction. Data gathered during sampling events indicate a calculated a hydraulic gradient (i) of 0.0367. Potentiometric surface and groundwater flow direction are shown in Figure 5.

6.0 SAMPLING RESULTS

6.1 Soil Sampling Result

Soil analytical results obtained during this investigation indicate Aliphatic, Aromatic and BTEX concentrations above detection limits in soil borings for MW-1, MW-2, and MW-5D. Detectable trimethylbenzene and naphthalene was found in borings MW-1, MW-2, MW-3 and MW-5 Figure 4). Using soil to groundwater risk classification, the maximum soil contaminant concentrations were exceeded in the borings for MW-1, MW-2 and MW-5D.

TABLE 3a. Soil Chemical Analyses (VPH/BTEX)

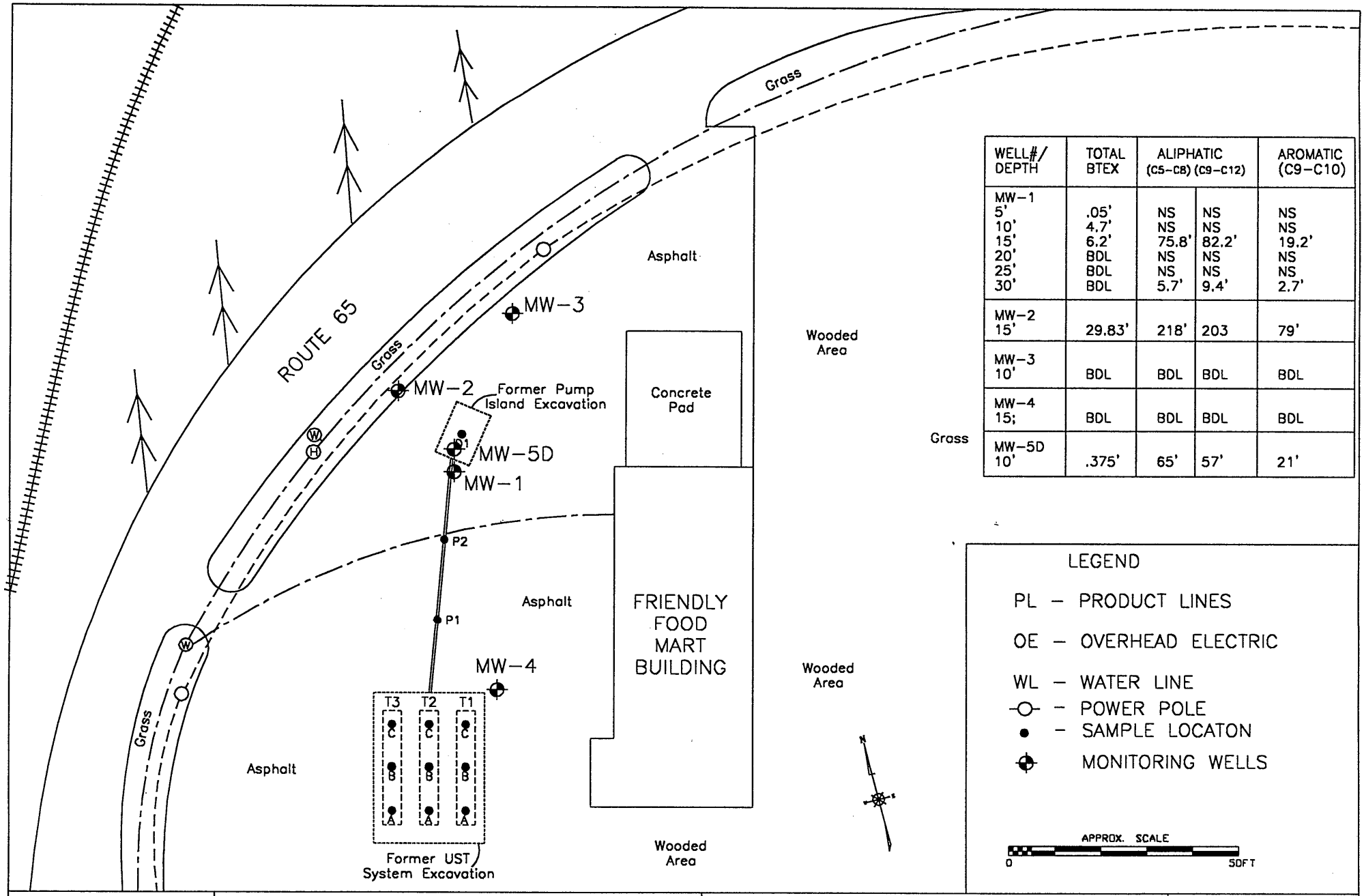
Location	Sample Depth (feet)	Sample date	C5-C8 Aliphatics (mg/kg)	C9-C12 Aliphatics (mg/kg)	C9-C10 Aromatics (mg/kg)	8260 Total BTEX (mg/kg)
LSA - June 1999						
MW-1	5'	11/4/98	-	-	-	0.5
MW-1	10'	11/4/98	-	-	-	5.0
MW-1	15'	11/4/98	75.8	82.2	19.2	6.2
MW-1	20'	11/4/98	-	-	-	BDL
MW-1	25'	11/4/98	-	-	-	BDL
MW-1	30'	11/4/98	5.7	9.4	2.7	BDL
MW-2	10'	1/13/99	218.0	203.0	79.0	10.0
MW-3	10'	1/6/99	BDL	BDL	BDL	BDL
MW-4	15'	1/6/99	BDL	BDL	BDL	BDL
MW-5D	10'	1/6/99	65.0	57.0	21.0	0.528
MSCC			72	3255	34	na

Note: MSCC = Maximum Soil Contaminant Concentration-Soil to Groundwater Classification
BDL = Below Detection Limits
mg/kg = milligram per kilogram = parts per million

Table 3b. Soil Chemical Analyses (Other)

Location	Sample Depth (feet)	Sample date	1,2,4 Trimethylbenzene (mg/kg)	1,3,5 Trimethylbenzene (mg'kg)	Naphthalene (mg/kg)
LSA - June 1999					
MW-1	5'	11/4/98	1.20	0.30	0.90
MW-1	10'	11/4/98	3.40	1.10	1.20
MW-1	15'	11/4/98	6.20	1.9	0.80
MW-1	20'	11/4/98	BDL	BDL	BDL
MW-1	25'	11/4/98	BDL	BDL	BDL
MW-1	30'	11/4/98	BDL	BDL	BDL
MW-2	10'	1/13/99	13.6	4.00	2.76
MW-3	10'	1/6/99	0.016	BDL	0.053
MW-4	15'	1/6/99	BDL	BDL	BDL
MW-5D	10'	1/6/99	1.34	0.250	0.830
MSCC			8	7	.058

Note: MSCC = Maximum Soil Contaminant Concentration-Soil to Groundwater Classification
BDL = Below detection limits
mg/kg = milligram per kilogram = parts per million



WELL#/ DEPTH	TOTAL BTEX	ALIPHATIC (C5-C8)	ALIPHATIC (C9-C12)	AROMATIC (C9-C10)
MW-1				
5'	.05'	NS	NS	NS
10'	4.7'	NS	NS	NS
15'	6.2'	75.8'	82.2'	19.2'
20'	BDL	NS	NS	NS
25'	BDL	NS	NS	NS
30'	BDL	5.7'	9.4'	2.7'
MW-2 15'	29.83'	218'	203	79'
MW-3 10'	BDL	BDL	BDL	BDL
MW-4 15;	BDL	BDL	BDL	BDL
MW-5D 10'	.375'	65'	57'	21'

OMEGA ENVIRONMENTAL SERVICES

FIGURE NO.: 4

FIGURE NAME: RESIDUAL PHASE CONCENTRATION MAP (mg/Kg)

CLIENT: DAN RIVER OIL COMPANY

SITE: FRIENDLY FOOD MART #6

JOB NO.: R98-142

DATE: 5/1/99

6.2 Groundwater Sampling Results

The groundwater sampling investigation performed at this site included sampling five monitoring wells. Groundwater samples were collected from MW-1 on November 9, 1998, and were collected from MW-2, MW-3, MW-4 and MW-5D on January 21,1999. All groundwater samples were sent to Water Technology and Controls, Inc. for analysis. The groundwater samples were analyzed using EPA methods 601/602, 3030c for lead and MADEP methods for VPH. Following well development and water level equilibration, samples were collected using pre-cleaned disposable bailers. Analytical results indicate petroleum contaminants to be present above North Carolina Ground Water Standards in MW-1, MW-2 and MW-3. Analytical results are summarized in tables 4a and 4b. Gross contaminant levels for benzene are exceeded in MW-2. Groundwater concentrations for benzene, Total BTEX and MTBE are provided in Figures 5-8. Laboratory analysis and chains of custody are provided in Appendix B.

TABLE 4a. Groundwater Chemical Analyses (BTEX)

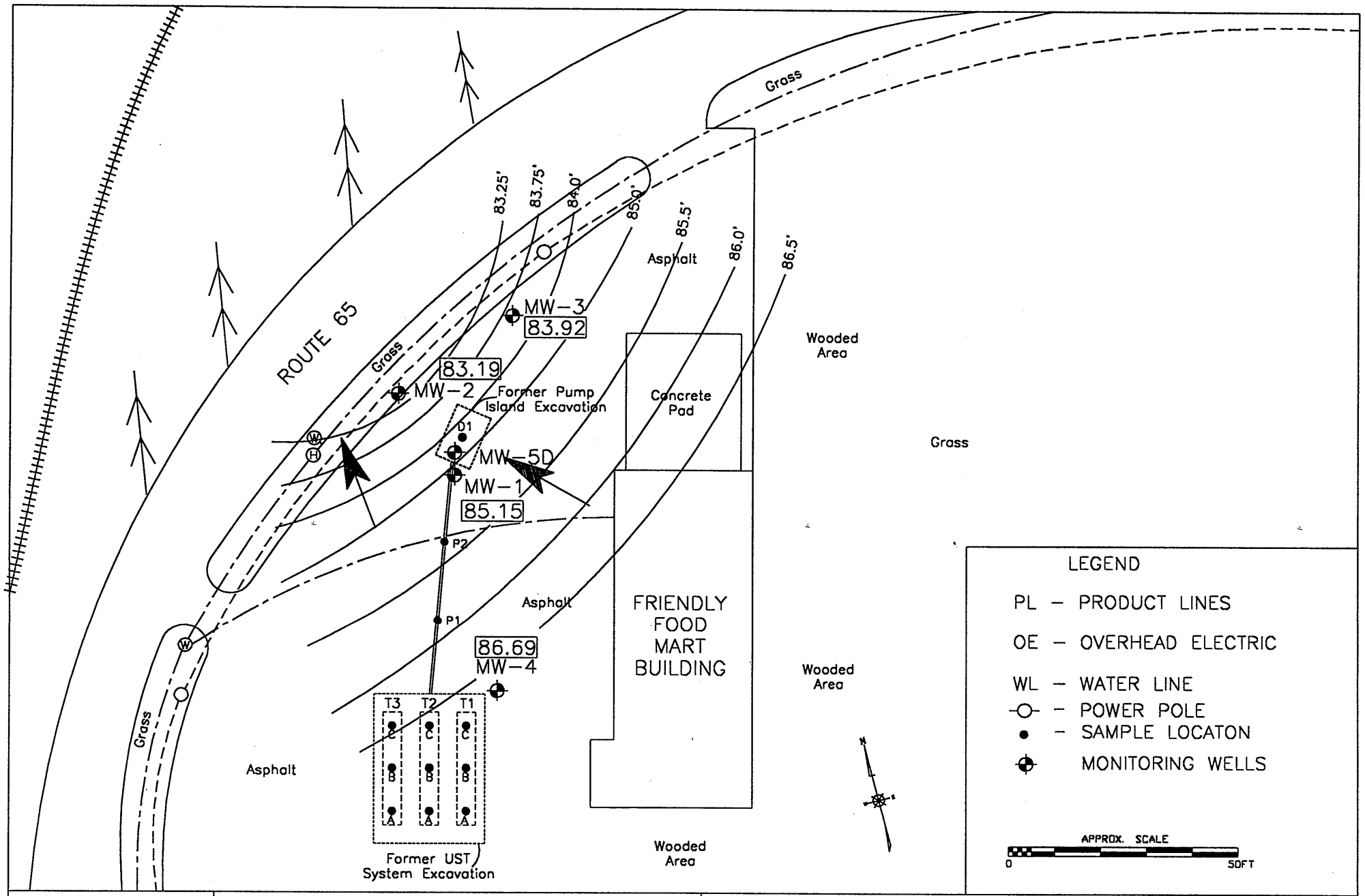
Location	Sample Date	Benzene (ug/l)	Toluene (ug/l)	Ethly-benzene (ug/l)	Xylenes (ug/l)	Total BTEX (ug/l)
LSA - June 1999						
MW-1	11/9/98	440.0	700.0	110.0	1200.0	2450.0
MW-2	1/21/99	6180.0	11900.0	2180.0	14570.0	34830.0
MW-3	1/21/99	150.0	310.0	30.0	380.0	870.0
MW-4	1/21/99	BDL	BDL	BDL	BDL	BDL
MW-5D	1/21/99	BDL	BDL	BDL	BDL	BDL
NCGWS 2L		1.0	1000.0	29.0	530.0	--

Note: BDL = Below Detection Limits
mg/l = milligram per liter = parts per million
ug/l = microgram per liter = parts per billion

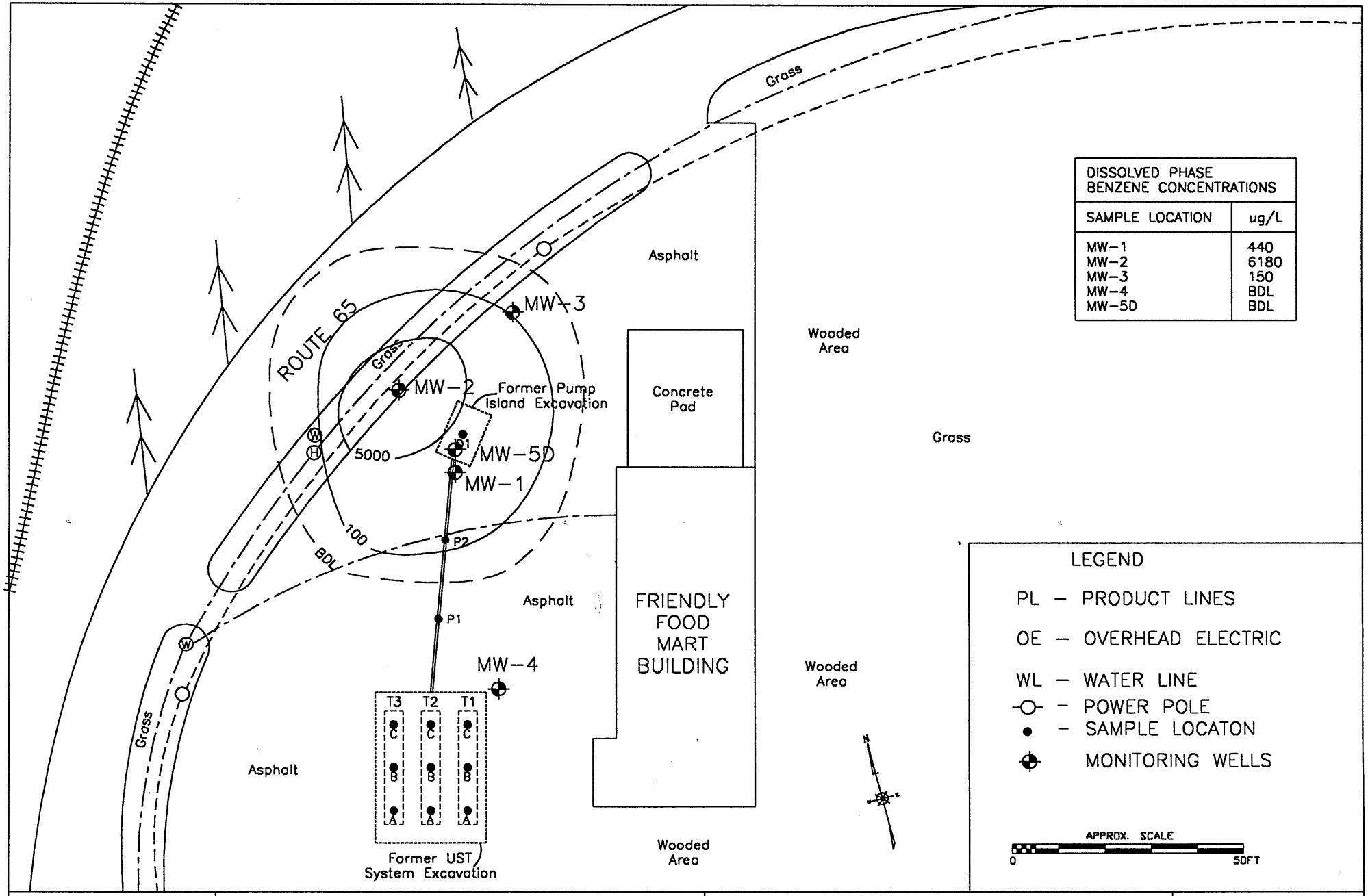
Table 4b. Groundwater Chemical Analyses (Other)

Location	Sample Date	Lead (mg/l)	MTBE (ug/l)	Isopropyl Ether (ug/l)	C5-C8 Aliphatics (mg/l)	C9-C12 Aliphatics (mg/l)	C9-C10 Aromatics (mg/l)
LSA - June 1999							
MW-1	11/9/98	BDL	BDL	BDL	5.44	3.12	1.49
MW-2	1/21/99	BDL	9660.0	BDL	42.1	49.3	19.4
MW-3	1/21/99	BDL	240.0	BDL	3.06	1.91	0.825
MW-4	1/21/99	BDL	12.0	BDL	BDL	BDL	BDL
MW-5D	1/21/99	BDL	20.0	BDL	BDL	BDL	BDL
NCGWS 2L		0.015	200.0	70.0	65.0	57.0	21.0

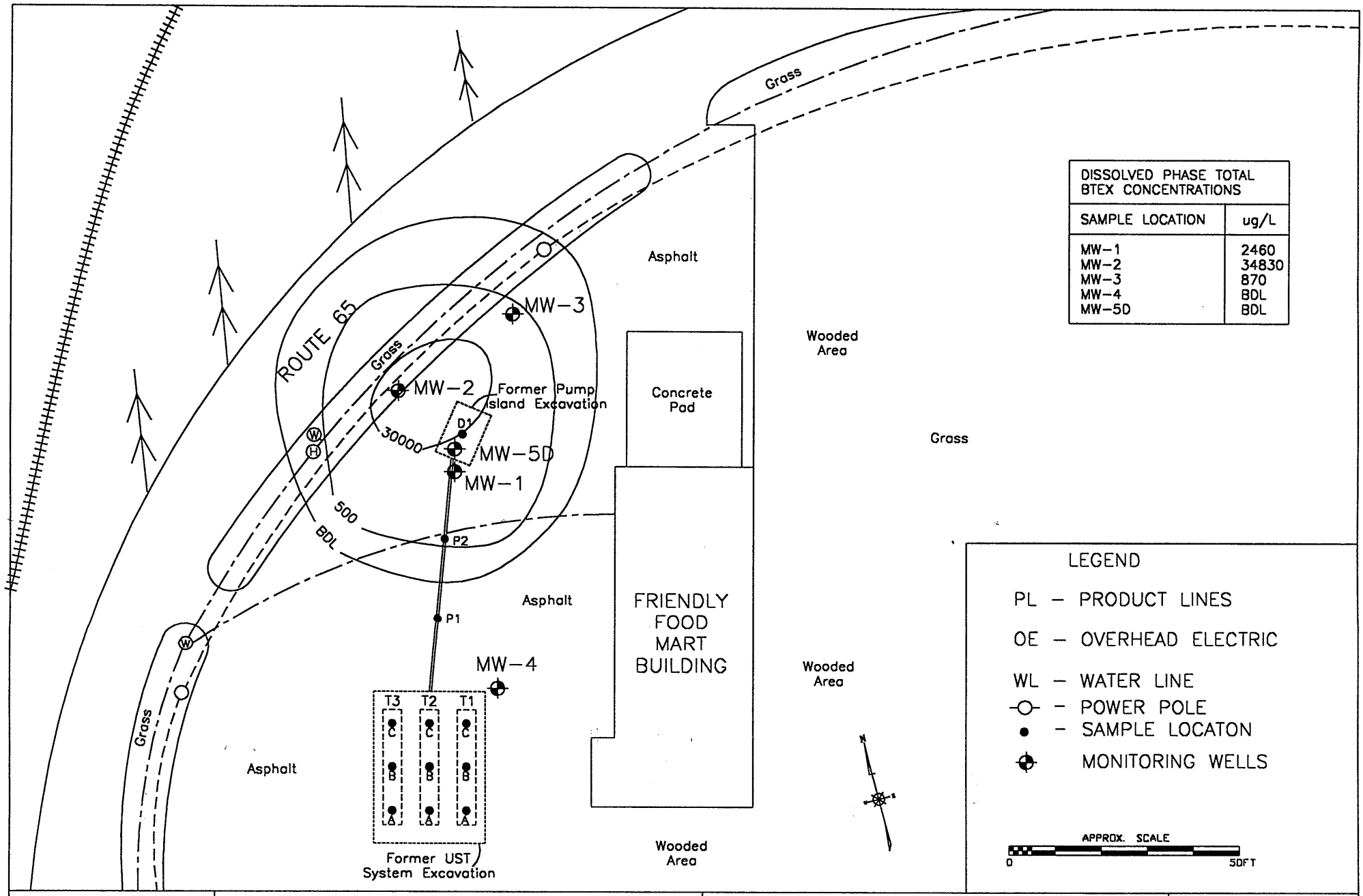
Note: BDL = Below Detection Limits
mg/l = milligram per kilogram = parts per million
ug/l = microgram per liter = parts per billion



OMEGA ENVIRONMENTAL SERVICES	FIGURE NO.: 5 FIGURE NAME: POTENTIOMETRIC SURFACE AND GROUNDWATER FLOW DIRECTION MAP	CLIENT: DAN RIVER OIL COMPANY SITE: FRIENDLY FOOD MART #6	JOB NO.: R98-142 DATE: 5/1/99



OMEGA ENVIRONMENTAL SERVICES	FIGURE NO.: 6 FIGURE NAME: DISSOLVED PHASE BENZENE CONCENTRATION MAP (ug/L)	CLIENT: DAN RIVER OIL COMPANY SITE: FRIENDLY FOOD MART #6	JOB NO.: R98-142 DATE: 5/1/99



DISSOLVED PHASE TOTAL BTEX CONCENTRATIONS	
SAMPLE LOCATION	ug/L
MW-1	2460
MW-2	34830
MW-3	870
MW-4	BDL
MW-5D	BDL

LEGEND

PL – PRODUCT LINES

OE – OVERHEAD ELECTRIC

WL – WATER LINE

–O– – POWER POLE

• – SAMPLE LOCATON

⊕ MONITORING WELLS

OMEGA ENVIRONMENTAL SERVICES

FIGURE NO.: 7

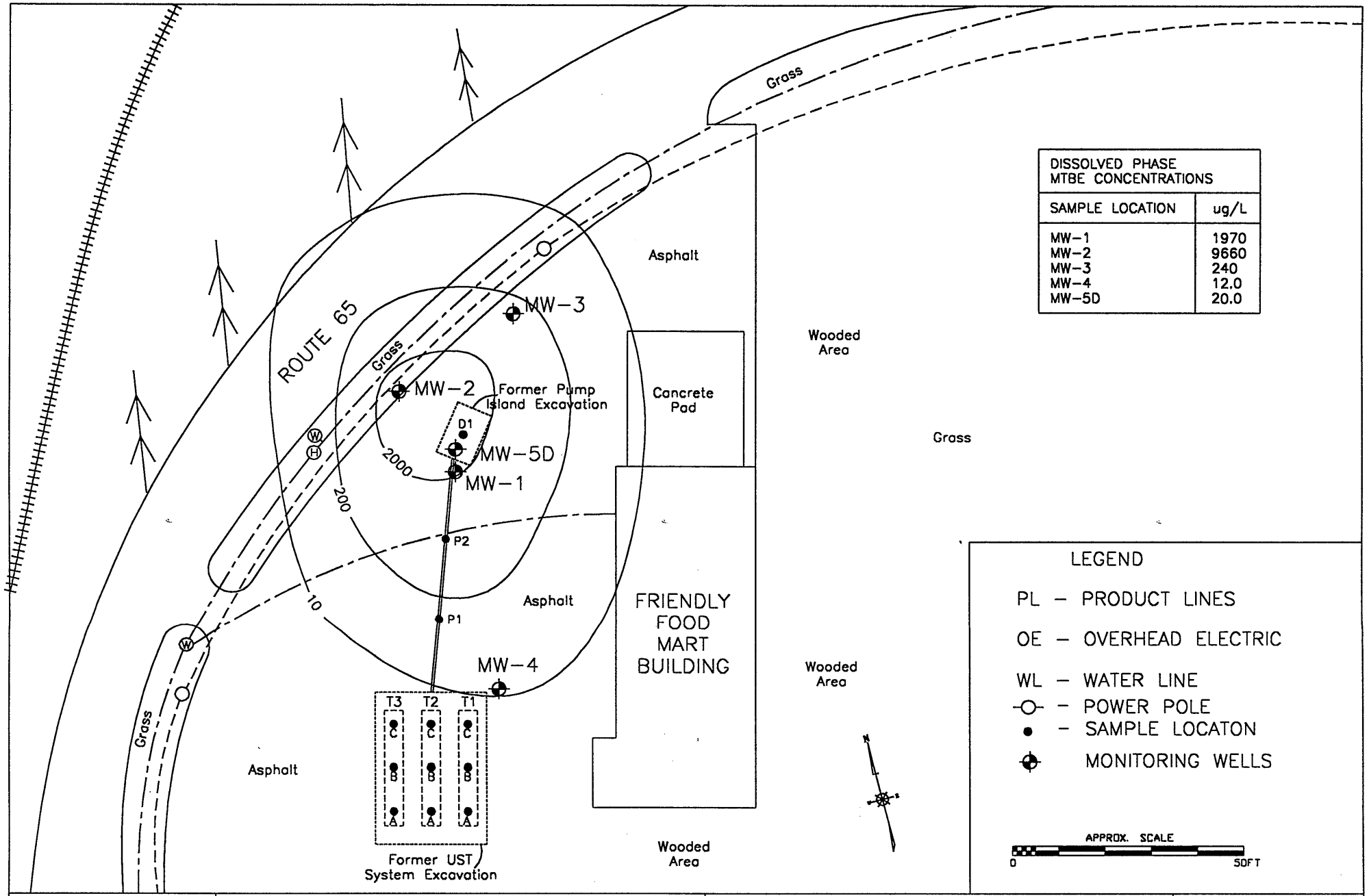
FIGURE NAME: DISSOLVED PHASE TOTAL BTEX CONCENTRATION MAP (ug/L)

CLIENT: DAN RIVER OIL COMPANY

SITE: FRIENDLY FOOD MART #6

JOB NO.: R98-142

DATE: 5/1/99



OMEGA ENVIRONMENTAL SERVICES

FIGURE NO.: 8

FIGURE NAME: DISSOLVED PHASE MTBE CONCENTRATION MAP (ug/L)

CLIENT: DAN RIVER OIL COMPANY

SITE: FRIENDLY FOOD MART #6

JOB NO.: R98-142

DATE: 5/1/99

6.3 Monitoring Well Installation

Groundwater was evaluated by installing five monitoring wells (MW-1 through MW-5D). On November 11, 1998, Omega mobilized to the site and installed MW-1 in an 8.25" bore-hole, using an Ingersol-Rand A-300 drill rig with 4.25" hollow stem augers. Due to the present of contamination, additional wells were needed. On January 6, 1999, Omega returned to the site to complete three additional shallow wells and a Type III cased deep well. Due to the difficulty encountered utilizing the auger rig, a Reich air rotary rig was used to install MW-3, MW-4 and MW-5D. Due to overhead power lines, an auger rig was used on January 13, 1999 to complete MW-2. Each shallow monitor well was constructed using schedule 40 pvc casing and 0.010" slotted screen. The annulus of the borings were filled with #3 sand to approximately one foot above the screened interval. One foot of hydrated bentonite was placed above the sand. The remainder of the well annulus was capped with a grout seal. Each well was completed with a 2'x2' concrete pad with an 8" manhole. Deep monitoring well MW-5D was completed utilizing 30' of 6" schedule 40 PVC grouted to the surface and drilled to a total depth of 50' below surface. The deep well was completed by extending the sand one foot above the screen, topped with one foot of hydrated bentonite, capped with grout, and finished with a concrete pad and 8" manhole. The Well Records and Boring Logs are presented in Appendix A.

The monitoring wells were purged by removing up to five well volumes of water and sampled with disposable bailers. Appendix C contains the Field Records. Monitoring well details are tabulated in Table 5 as follows. Omega's QA/QC program is included as Appendix D.

Table 5. Monitoring Well Data

Location	Sample Date	Casing Diameter (inches)	Screened Interval (feet)	Total Well Depth (feet)	Relative Elevation (feet)	Water Level (feet)	Relative Water Level (feet)
MW-1	1/21/99	2	10-30	30	97.79	12.64	85.15
MW-2	1/21/99	2	5-20	20	96.60	13.41	83.19
MW-3	1/21/99	2	5-25	25	96.00	12.08	83.92
MW-4	1/21/99	2	5-25	25	98.83	12.14	86.69
MW-5D	1/21/99	2	45-50	50	--	20.23	--

7.0 CONCLUSIONS AND RECCOMMENDATIONS

Analytical result obtained during this investigation indicate soil contamination above Maximum Soil Contaminant Concentrations. Analytical results also indicate groundwater contamination exceeds Gross Contaminant Levels. Based on these results and the presence of nearby supply wells and surface water receptors, Omega recommends completion of a Comprehensive Site Assessment. Completion of the Comprehensive Site Assessment will assist in the development of a long-term plan for addressing contamination at the Friendly Food Mart #6 Site. Omega also recommends sampling the three nearby supply wells with results to be included with the proposed Comprehensive Site Assessment.

Omega has sent a copy of this report to:

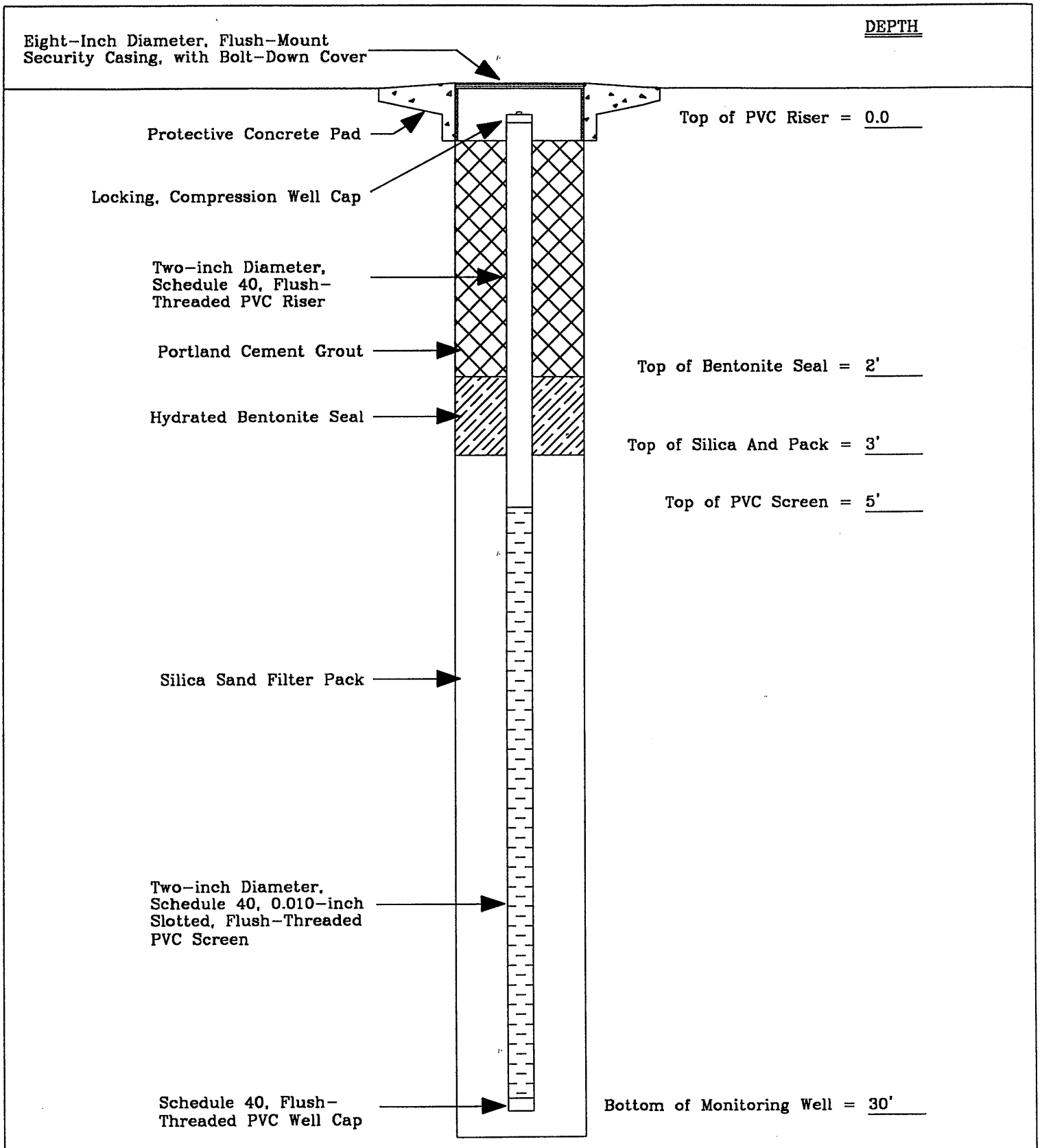
Ms. Linda Estkowski
North Carolina Department of Environment and Natural Resources
Division of Waste Management- UST Section
Winston-Salem Regional Office
585 Waughtown Street
Winston-Salem, North Carolina 27107
(336) 771-4600

8.0 FREE PRODUCT INVESTIGATION/RECOVERY

No free product was encountered during this investigation.

Job No.:	R98-142	Site:	Friendly Food Mart #6	Boring No.:	MW-1
City, State:	Walnut Cove, NC	Client:	Dan River Oil Co.	Date Drilled:	11/14/98
Crew Chief:	J. Johnson	Surface Elevation:	N/A	Total Depth/Screen:	30.0'/20'
Sample Type:	split spoon	Driller:	Aquadrill	Drilling Method:	4.25" auger

Depth (feet)	Well Diagram	Sample Interval	Blow Count	FID (ppm)	Lithologic Description	Comments
–0					Fill, gravel and clay	no petro. odor
-		4' / 6'		10,000 +	Sandy clay (CL), firm, red, VF-EXFine, dry	med.- strong petro. odor
–10		9' / 11'		10,000+	Silty Clay (CL), mottled dk. Red-brown-gray, dry, firm-stiff	strong petro. odor
–		14' / 16'		10,000+	Same as above	med.-strong petro. odor
–20		19' / 21'		1,500	Clayey sand (SC), fine-very fine, red-brown, firm, sl. damp	slight petro. odor
–		24' / 26'		800	Clayey sand (SC), fine-very fne, red-brown, micas 5% saprolitic texture	slight petro. odor
–30		29' / 31'		500	Same as above	slight petro. odor



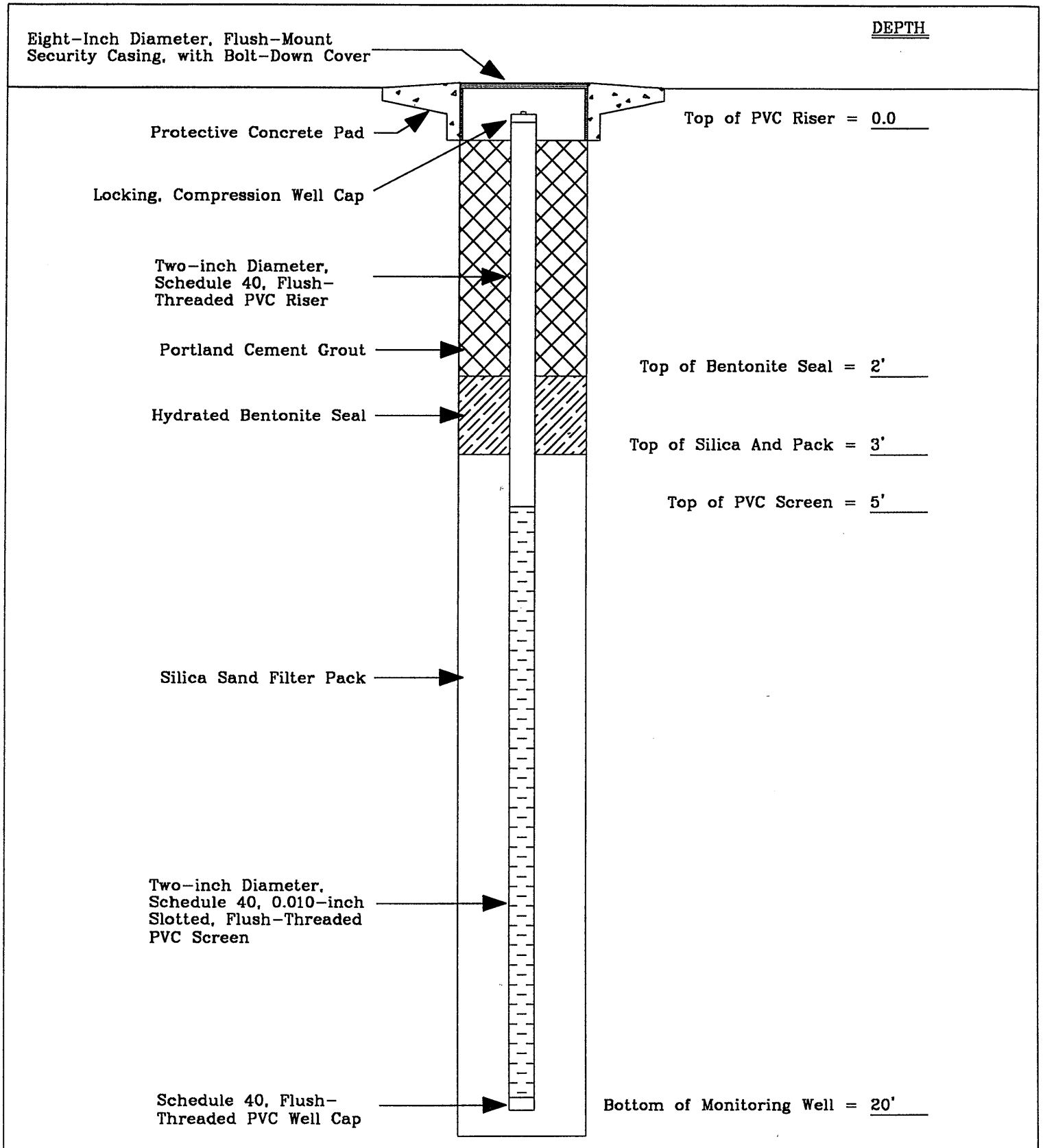
Omega File u:\consult\acadmaps\welldiag.dwg

Installation Date: 00/00/00

MONITORING WELL NO.: MW-1	CLIENT: VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY PROJECT NAME: FRIENDLY FOOD MART #6	JOB NO.: R98-142 DATE: 11/14/98	OMEGA ENVIRONMENTAL SERVICES

Job No.: R98-142	**Site:** Friendly Food Mart #6	**Boring No.:** MW-2	
City, State: Walnut Cove, NC	**Client:** Dan River Oil Co.	**Date Drilled:** 1/13/99	
Crew Chief: J. Johnson	**Surface Elevation:** N/A	**Total Depth/Screen:** 20.0'/15'	
Sample Type: Split Spoon	**Driller:** Aqua Drill/Paul	**Drilling Method:** 4 1/4" I.D. HSA	

Depth (feet)	Well Diagram	Sample Interval	Blow Count	FID (ppm)	Lithologic Description	Comments
--0						
-					Fill, gravel and clay	no petro. odor
-						
-		4'		10,000 +	Sandy clay (CL), firm, tan-orange, VF-EXFine, dry	med. petro. odor
-		/				
--		6'				
-						
-						
-		9'		10,000+	Clay (CL), Red-brown, dry, firm	med. petro. odor
-		/				
--10		11'				
-						
-						
-		14'				
-		/		10,000+	Same as above	med. petro. odor
--		16'		to lab		
-						
-						
-		19'		no sample	Clayey sand (SC), red-brown, soft-firm, sl. damp	med. petro. odor
-		/				
--20		21'				
-						
-						
-						
-						
--						
-						
-						
-						
--30						
-						
-						
-						
-						
--						
-						
-						
-						
-						
-						



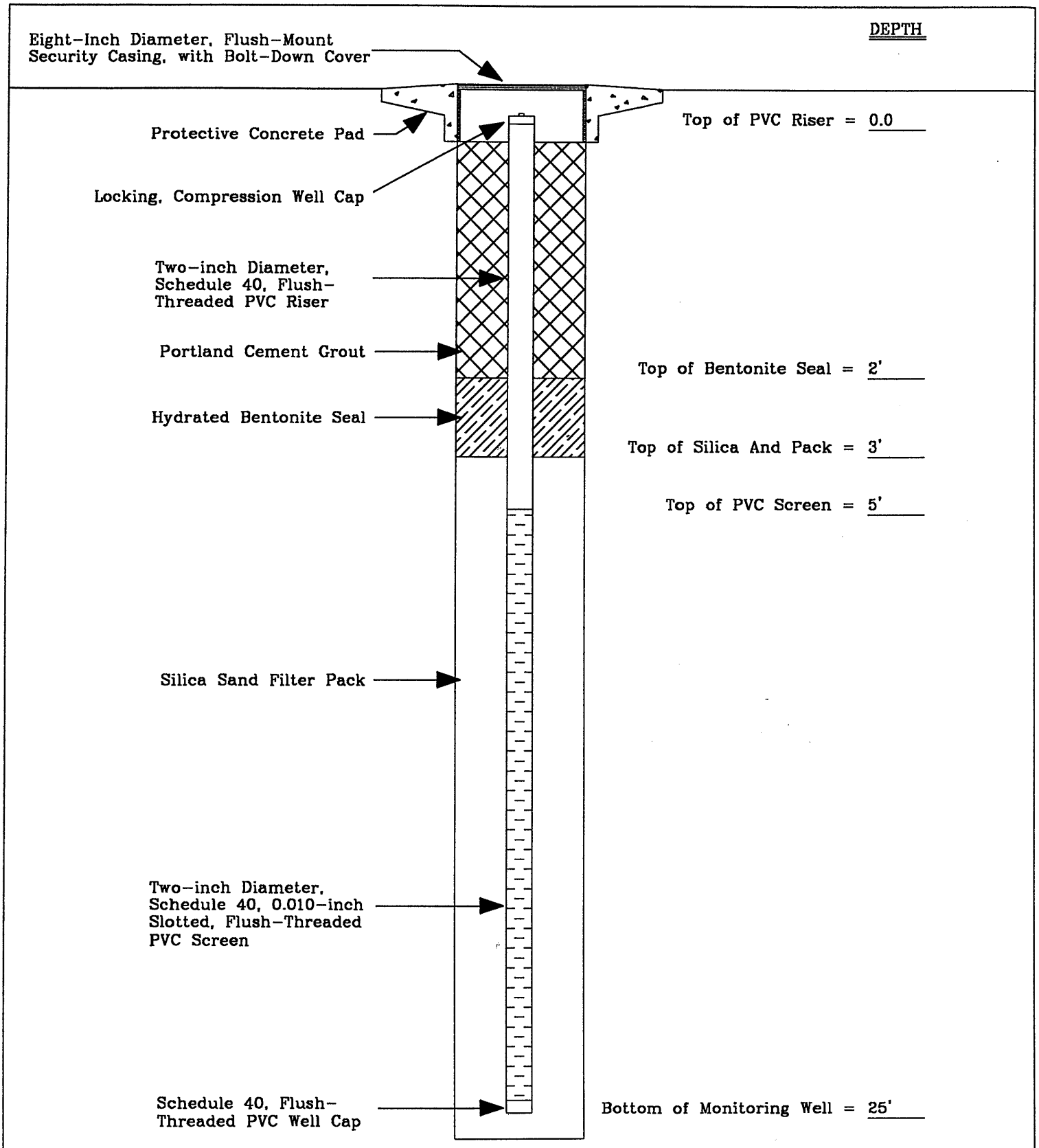
Omega File u:\consult\acadmaps\welldiag.dwg

Installation Date: 00/00/00

MONITORING WELL NO.: MW-2	CLIENT: VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY PROJECT NAME: FRIENDLY FOOD MART #6	JOB NO.: R98-142 DATE: 11/13/98	OMEGA ENVIRONMENTAL SERVICES

Job No.: R98-142	**Site:** Friendly Food Mart #6	**Boring No.:** MW-3	
City, State: Walnut Cove, NC	**Client:** Dan River Oil Co.	**Date Drilled:** 1/6/99	
Crew Chief: J. Johnson	**Surface Elevation:** N/A	**Total Depth/Screen:** 25.0'/20'	
Sample Type: Grab	**Driller:** Aqua Drill/Paul	**Drilling Method:** 6" Air Hammer	

Depth (feet)	Well Diagram	Sample Interval	Blow Count	FID (ppm)	Lithologic Description	Comments
--0					Fill, gravel and clay	no petro. odor
-						
-						
-		4'		750	Silty clay (CL), lean, firm, red, VF-Ex.Fine, sl. moisture	slight petro. odor
-		/				
--		6'				
-						
-						
-		9'		1,000	Silty Clay (CL), mottled tan-red, dry,	slight petro. odor
--10		/		to lab	firm-stiff	
-		11'				
-						
-						
-		14'				
--		/		450	Same as above, moist sl. damp	no odor
-		16'				
-						
-						
-						
--20		19'				
-		/		175	Sandy clay (SC), fine-very fine, red-brown, firm, sl.	no odor
-		21'			damp, micas 5%	
-						
-						
--		24'				
-		/		40	Clayey sand (SC), fine-very fne, tan-red, micas 5%	no odor
-		26'			saprolitic texture	
-						
-						
-30						
-						
-						
-						
-						
--						
-						
-						
-						



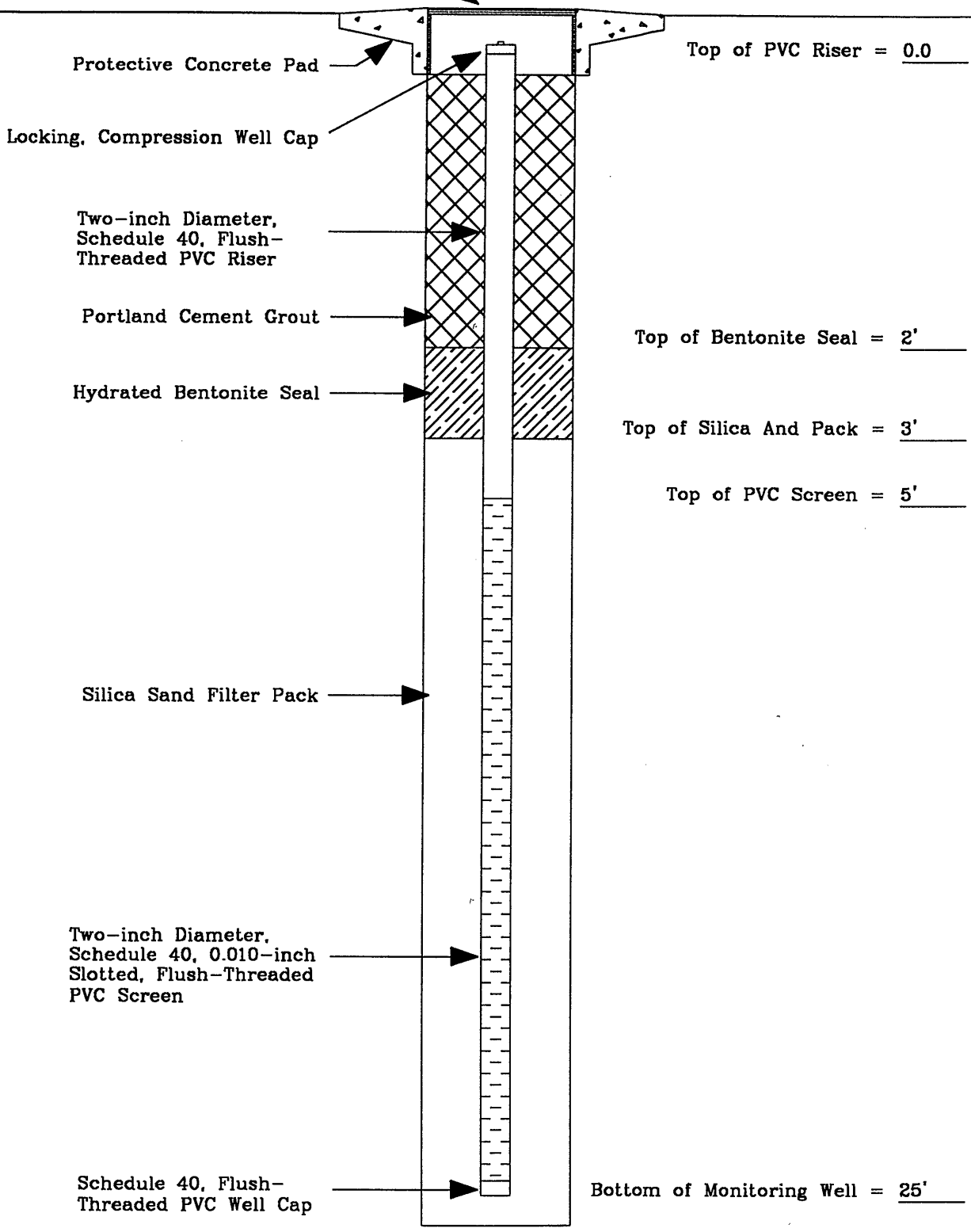
Omega File u:\consult\acadmaps\welldiag.dwg

Installation Date: 00/00/00

MONITORING WELL NO.: MW-3	CLIENT: VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY PROJECT NAME: FRIENDLY FOOD MART #6	JOB NO.: R98-142 DATE: 11/6/98	OMEGA ENVIRONMENTAL SERVICES

Job No.: R98-142	**Site:** Friendly Food Mart #6	**Boring No.:** MW-4	
City, State: Walnut Cove, NC	**Client:** Dan River Oil, Co.	**Date Drilled:** 1/6/99	
Crew Chief: J. Johnson	**Surface Elevation:** N/A	**Total Depth/Screen** 25.0'/20'	
Sample Type: Split Spoon	**Driller:** Aqua Drill/Paul	**Drilling Method:** 6" Air Hammer	

Depth (feet)	Well Diagram	Sample Interval	Blow Count	FID (ppm)	Lithologic Description	Comments
0						
					Fill, gravel and clay	no petro. odor
		4' / 6'		2	sandy clay (CL), firm, red, vf-ex fine, dry	no petro. odor
		9' / 11'		1	Silty clay (CL), mottled dk. Red-brown-gray, dry, firm	no petro. odor
10						
		14' / 16'		2 to lab	Same as above	no petro. odor
		19' / 21'		1	Clayey sand (SC), very fine-ex. fine, red-brown, firm, sl. damp	no petro. odor
		24' / 26'		1	Clayey sand (SC), fine-very fne, soft-firm, red-brown, micas 5%	no petro. odor
20						
30						



Omega File u:\consult\acadmaps\welldiag.dwg

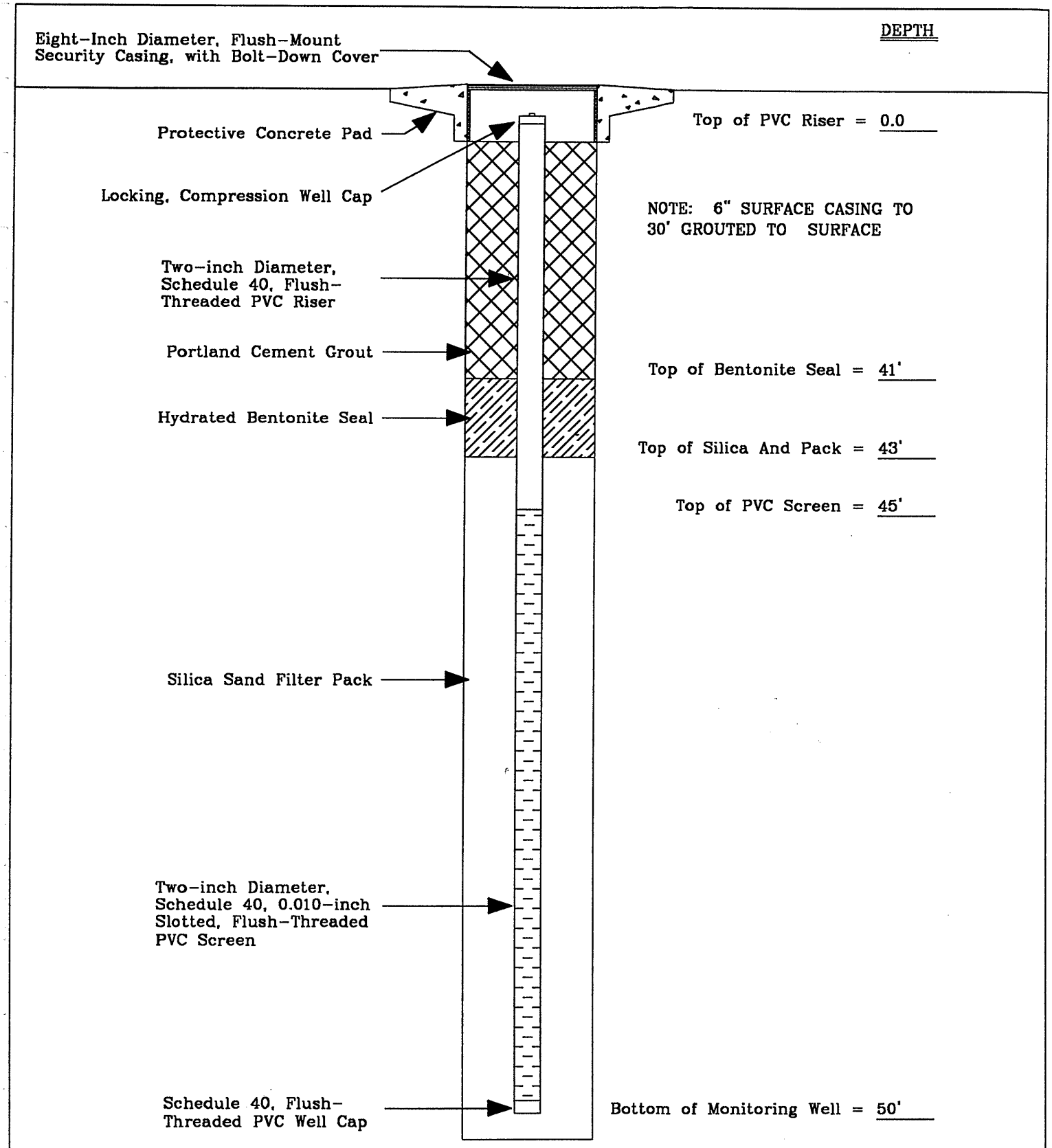
Installation Date: 00/00/00

MONITORING WELL NO.: MW-4	CLIENT: VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY PROJECT NAME: FRIENDLY FOOD MART #6	JOB NO.: R98-142 DATE: 11/6/98	OMEGA ENVIRONMENTAL SERVICES

Job No.: R98-142	**Site:** Friendly Food Mart #6	**Boring No.:** MW-5D
City, State: Walnut Cove, NC	**Client:** Dan River Oil Co.	**Date Drilled:** 1/6/99
Crew Chief: J. Johnson	**Surface Elevation:** N/A	**Total Depth/Screen:** 50.0'/ 5', 30' grouted casing
Sample Type: Grab	**Driller:** Aquadrill	**Drilling Method:** 6"/4.25" Air Hammer

Depth (feet)	Well Diagram	Sample Interval	Blow Count	FID (ppm)	Lithologic Description	Comments
--0						
-						
-						
-		3.0		10000+	clay (CL), red-rust color, firm, slight moisture, lean	medium petroleum
-		/				odor; moist
--		5.0'				
-						
-						
-		8.0		10000+	silty-clay (CL), tan, firm-stiff light brown	medium petroleum
				to lab		odor
-		/				
--10		10.0'				
-						
-						
-		13.0		400	clay (CL), saprolitic texture, good relict grains, pink with tan-gray mottling	slight - medium
-		/				odor; moist
--		15.0'				
-						
-						
-		18.0		80	clay (CL) with lithic frags, pink -tan, good relict grains	slight
-		/			soft-firm	odor; moist
--20		20.0'				
-						
-						
-		23.0			sandy clay (CL), very fine, red moist	slight petroleum
-		/		80		odor;
--		25.0'				
-						
-						
-		28.0		50	clayey sand (SC), very fine, dk red-rust color, moist	no odor
-		/				
--30		30.0'				
-						
-						
-		33.0		0	clayey sand, ex fine-very fine, tan-orange, soft, wet	no odor

-		/				
--		35.0'				
-						
-						
-		38.0		0	sandy clay (CL), ex-fine, dk brown-rust, soft, damp	no odor
-		/				
--40		40.0'				
-						
-						
-						
-		43.0				no odor
--		/		0	clay (CL), red, firm, mottled	
-		45.0'				
-						
-		48.0				no odor
-		/		0	clay (CL), red, firm, mottled	
--50		50.0'				
-						
-						
-						
-						
--						



Omega File u:\consult\acadmaps\welldiag.dwg

Installation Date: 00/00/00

MONITORING WELL NO.: MW-5D	CLIENT: VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY PROJECT NAME: FRIENDLY FOOD MART #6	JOB NO.: R98-142 DATE: 11/7/98	OMEGA ENVIRONMENTAL SERVICES

AIR WATER SOIL Laboratories, Inc.
2119A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804)358-8295 Fax: (804)358-8297

Certificate of Analysis

Client Name: Omega Environmental Services
Client Project I.D.: Friendly Food Mart #6
Submitted to: Jason Johnson

Date Received: November 6, 1998
Date Issued: November 13, 1998

Reference Method: SW846 method 8260 continued

Parameter	OEG-MW1-5' (mg/kg)	OEG-MW1-10' (mg/kg)	OEG-MW1-15' (mg/kg)	OEG-MW1-20' (mg/kg)	OEG-MW1-25' (mg/kg)	OEG-MW1-30' (mg/kg)	Det. Limit (mg/kg)
Tetrachloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,3-Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2-Hexanone	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Dibromochloromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dibromoethane (EDB)	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,1,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Ethylbenzene	BDL	0.4	0.8	BDL	BDL	BDL	0.1
Xylenes	0.5	3.2	4.8	BDL	BDL	BDL	0.1
Styrene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromoform	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Isopropylbenzene	BDL	BDL	0.1	BDL	BDL	BDL	0.1
Bromobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,2,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,3-Trichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Propylbenzene	0.2	0.3	0.6	BDL	BDL	BDL	0.1
2-Chlorotoluene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
4-Chlorotoluene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,3,5-Trimethylbenzene	0.3	1.1	1.9	BDL	BDL	BDL	0.1
tert-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,4-Trimethylbenzene	1.2	3.4	6.2	BDL	BDL	BDL	0.1
sec-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,3-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
p-Isopropyltoluene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,4-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
n-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dibromo-3-chloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2,4-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Hexachlorobutadiene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Naphthalene	0.9	1.2	0.8	BDL	BDL	BDL	0.1
1,2,3-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
MTBE	BDL	0.5	0.4	BDL	BDL	BDL	0.1

BDL = Below Detection Limit

Carmela L. Tombes
Laboratory Director

AIR WATER SOIL Laboratories, Inc.
2119A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804)358-8295 Fax: (804)358-8297

Certificate of Analysis

North Carolina Certification # 495

Client Name:	Omega Environmental Services	Date Received:	November 6, 1998
Client Project I.D.:	Friendly Food Mart #6	Date Issued:	November 13, 1998
Submitted to:	Jason Johnson		

Reference Method: SW-846 method 8260

Six soil samples were analyzed for the following Volatile Organic Compounds.

Parameter	OEG-MW1-5' (mg/kg)	OEG-MW1-10' (mg/kg)	OEG-MW1-15' (mg/kg)	OEG-MW1-20' (mg/kg)	OEG-MW1-25' (mg/kg)	OEG-MW1-30' (mg/kg)	Det. Limit (mg/kg)
Dichlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chloromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Vinyl Chloride	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromomethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Trichlorofluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Acetone	BDL	0.2	BDL	BDL	BDL	BDL	0.1
Iodomethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Carbon disulfide	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Methylene Chloride	BDL	BDL	BDL	BDL	BDL	BDL	0.1
trans-1,2-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Vinyl acetate	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2,2-Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
cis-1,2-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
2-Butanone (MEK)	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromochloromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Chloroform	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,1-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Carbon tetrachloride	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1-Dichloro-1-propene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Benzene	BDL	0.3	BDL	BDL	BDL	BDL	0.1
1,2-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Trichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,2-Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Dibromomethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Bromodichloromethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1
cis-1,3-Dichloro-1-propene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
4-Methyl-2-Pentanone	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Toluene	BDL	1.1	0.6	BDL	BDL	BDL	0.1
trans-1,3-Dichloro-1-propene	BDL	BDL	BDL	BDL	BDL	BDL	0.1
1,1,2-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	0.1

BDL = Below Detection Limit

Carmela L. Tombes
Laboratory Director

AIR WATER SOIL Laboratories, Inc.
2119A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804)358-8295 Fax: (804)358-8297

Certificate of Analysis

Client Name: Omega Environmental Services
Client Project I.D.: Friendly Food Mart #6
Submitted to: Jason Johnson

Date Received: November 6, 1998
Date Issued: November 13, 1998

Reference Method: MADEP VPH

Two soil samples were analyzed for the following Volatile Petroleum Hydrocarbons.

		Sample I.D.	OEG-MW1-15'	OEG-MW1-30'		
		Date Analyzed	11/10/98	11/10/98		
		Dilution Factor	---	---		
		% Moisture	17.8	11.0		
Range/Target Analyte	**Reporting Limit**	**Units**				
C5-C8 Aliphatic Hydrocarbons	0.5	mg/kg	75.8	5.7		
C9-C12 Aliphatic Hydrocarbons	0.5	mg/kg	82.2	9.4		
C9-C10 Aromatic Hydrocarbons	0.5	mg/kg	19.2	2.7		
FID Surrogate % Recovery			132%	102%		
PID Surrogate % Recovery			113%	98%		

BDL = Below Detection Limit

Carmela L. Tombes
Carmela Tombes
Laboratory Director

CHAIN OF CUSTODY TRACKING FORM

Omega

PO# 47-2428

PAGE 1 OF 1

LAB DESTINATION: Air Water + Soil
SEND LAB RESULTS TO: Jason Johnson, 3619
SEND BILLING TO: Traycee Smith 20 Lakewire Dr. Richmond, VA 33801
LEGAL CUSTODY: PRECLEANED CONTAINERS VERIFIED AND RELINQUISHED BY:

PROJECT NO.	PROJECT NAME	LOCATION
R98-142	Friendly Food Mart #6	Walnut Cove, NC

SAMPLED BY: Jason Johnson

SAMPLE NUMBER	LAB ID	COLLECTION DATE	COLLECTION TIME	SAMPLE MATERIAL	NUMBER OF CONTAINERS	FIELD READINGS pH	FIELD READINGS COND.	FIELD READINGS TEMP.	ANALYSES REQUESTED: 8260 w/ IPE + MTBE, MaDEP, VPH										REMARKS
OE6-mw1-5'		11/4	10:30	S	1				X										
OE6-mw1-10'		"	10:45	S	1				X										
OE6-mw1-15'		"	11:00	S	2				X	X									
OE6-mw1-20'		"	11:15	S	1				X										
OE6-mw1-25'		"	11:30	S	1				X										
OE6-mw1-30'		"	11:50	S	2				X	X									

Normal TAT

SPECIAL INSTRUCTIONS: NC Job

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Jason Johnson	11/5/98	17:00	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY COMMON CARRIER:

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED AT LAB BY:
	11-6	1pm	Emily Duff

DWG# CHART32

02111-191

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental Services	WT&C ID:	11119851TB
Project:	R 98-142	Analysis:	11/23/98
Client Sample ID:	OEG-101 Trip Blank	Analyst:	TW

EPA 601/602 - VOLATILE ANALYSIS

Parameter	Result
Benzene	<1.0 ug/L
Bromodichloromethane	<1.0 ug/L
Bromoform	<1.0 ug/L
Bromomethane	<5.0 ug/L
Carbon Tetrachloride	<1.0 ug/L
Chlorobenzene	<1.0 ug/L
Chloroethane	<5.0 ug/L
2-Chloroethylvinyl Ether	<5.0 ug/L
Chloroform	<1.0 ug/L
Chloromethane	<5.0 ug/L
Dibromochloromethane	<1.0 ug/L
1,2-Dichlorobenzene	<1.0 ug/L
1,3-Dichlorobenzene	<1.0 ug/L
1,4-Dichlorobenzene	<1.0 ug/L
Dichlorodifluoromethane	<5.0 ug/L
1,1-Dichloroethane	<1.0 ug/L
1,2-Dichloroethane	<1.0 ug/L
1,1-Dichloroethene	<1.0 ug/L
1,2-Dichloropropane	<1.0 ug/L
cis-1,3-Dichloropropene	<1.0 ug/L
trans-1,3-Dichloropropene	<1.0 ug/L
Ethylbenzene	<1.0 ug/L
Methylene Chloride	**7.8 ug/L**
1,1,2,2-Tetrachloroethane	<1.0 ug/L
Tetrachloroethene	<1.0 ug/L
Toluene	<1.0 ug/L
1,1,1-Trichloroethane	<1.0 ug/L
1,1,2-Trichloroethane	<1.0 ug/L
Trichloroethene	<1.0 ug/L
Trichlorofluoromethane	<5.0 ug/L
Vinyl Chloride	<5.0 ug/L

Additional Compounds	Result
Isopropyl Ether	<5.0 ug/L
MtBE	<5.0 ug/L
m/p-Xylenes	<1.0 ug/L
o-Xylene	<1.0 ug/L
Ethylene Dibromide	<1.0 ug/L

I hereby certify that I have reviewed and approve these data. Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

* Sample pH greater than 2 as received.

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental Services	WT&C ID:	11119851
Project:	R 98-142	Analysis:	11/23/98
Client Sample ID:	OEG-1000-MW-1	Analyst:	TW
Sample Collection:	11/09/98 1300		

EPA 601/602 - VOLATILE ANALYSIS

Parameter	Result
Benzene	**440 ug/L**
Bromodichloromethane	<1.0 ug/L
Bromoform	<1.0 ug/L
Bromomethane	<5.0 ug/L
Carbon Tetrachloride	<1.0 ug/L
Chlorobenzene	<1.0 ug/L
Chloroethane	<5.0 ug/L
2-Chloroethylvinyl Ether	<5.0 ug/L
Chloroform	<1.0 ug/L
Chloromethane	<5.0 ug/L
Dibromochloromethane	<1.0 ug/L
1,2-Dichlorobenzene	<1.0 ug/L
1,3-Dichlorobenzene	<1.0 ug/L
1,4-Dichlorobenzene	<1.0 ug/L
Dichlorodifluoromethane	<5.0 ug/L
1,1-Dichloroethane	<1.0 ug/L
1,2-Dichloroethane	<1.0 ug/L
1,1-Dichloroethene	<1.0 ug/L
1,2-Dichloropropane	<1.0 ug/L
cis-1,3-Dichloropropene	<1.0 ug/L
trans-1,3-Dichloropropene	<1.0 ug/L
Ethylbenzene	**110 ug/L**
Methylene Chloride	<1.0 ug/L
1,1,2,2-Tetrachloroethane	<1.0 ug/L
Tetrachloroethene	<1.0 ug/L
Toluene	**700 ug/L**
1,1,1-Trichloroethane	<1.0 ug/L
1,1,2-Trichloroethane	<1.0 ug/L
Trichloroethene	<1.0 ug/L
Trichlorofluoromethane	<5.0 ug/L
Vinyl Chloride	<5.0 ug/L

Additional Compounds	Result
Isopropyl Ether	<5.0 ug/L
MtBE	**1970 ug/L**
m/p-Xylenes	**730 ug/L**
o-Xylene	**480 ug/L**
Ethylene Dibromide	<1.0 ug/L

I hereby certify that I have reviewed and approve these data. Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

Water Technology and Controls, Inc.
Environmental Laboratory
Laboratory Certification No. 165

Client:	Omega Environmental Services	Report Date:	11/24/98
Contact:	Mr. Jason Johnson	Date Sample Rcvd:	11/11/98
		Project #	R98-142

WT&C Work Order # 11119851 Sample: OEG-100-MW-1 11/9/98

Parameters	***Results***
3030C Lead	<0.010 mg/l

I hereby certify that I have reviewed and approve these data.

Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

642 Tamco Road, Reidsville, North Carolina 27320
tel.(910)342-4748 fax.(910)342-1522

111151

VPH (Aliphatics/Aromatics) Laboratory Reporting Form Continued

Client Name	Omega	**Laboratory Name**	Water Technology & Controls
Project Name	R-98-142	**NC Certification # (Lab)**	165
Site Location	Friendly Food Mart #6		

Sample Information and Analytical Results								
Lab Identification #	11119851	Trp Blk						
Sample Identification	OEG-100-MW-1	Trip Blank						
Sample Matrix	Water	Water						
Collection Option (for soil)*	NA	NA						
Date Collected	11/9/98	11/9/98						
Date Received	11/11/98	11/11/98						
Date Extracted	NA	NA						
Date Analyzed	11/16/98	11/16/98						
Dry Weight	NA	NA						
Dilution Factor	10	NA						
C5-C8 Aliphatics(mg/L)**	**5.44**	< 0.066						
C9-C12 Aliphatics(mg/L)**	**3.12**	< 0.034						
C9-C10 Aromatics(mg/L)**	**1.49**	< 0.016						
Surrogate % Recovery - PID	102%	104%						
Surrogate % Recovery - FID	102%	107%						

*Option 1 = Established fill line on vial Option 2 = Sampling Device(IndicateBrand) Option3 = Field weight of soil

**Unadjusted Value. Should exclude the concentration of any surrogate(s), internal standards, and/or concentrations of other ranges that elute within the specified range.

***See attatched report.

	C5-C8 Aliphatic	C9-C12 Aliphatic	C9-C10 Aromatic
Percent Recovery - Fortified Blank (Spike) - PID			99%
Relative Percent Difference - PID Duplicate			1.30%
Percent Recovery - Fortified Blank (Spike) - FID	125%	113%	
Relative Percent Difference - FID Duplicate	0.18%	0.32%	

Reviewed By M. H. Vaughan

rev. 05/06/98

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

VPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 09/25/98

Calibration Ranges and Limits

Range	MDL	ML	RL	Units
C5-C8 Aliphatics	**0.00328**	**0.0104**	**0.066**	**mg/L**
C9-C12 Aliphatics	**0.00301**	**0.00957**	**0.034**	**mg/L**
C9-C10 Aromatics	**0.00099**	**0.00315**	**0.016**	**mg/L**

Method of Quantitation (circle one): (Curve) or Average Response Factor

Calibration Concentration Levels

Range	Levels	%RSD or CCC
C5-C8 Aliphatics	0.015	0.9987
	0.18	
	0.9	
	1.5	
	2.4	
C9-C12 Aliphatics	0.011	0.9993
	0.132	
	0.66	
	1.1	
	1.76	
C9-C10 Aromatics	0.002	0.9986
	0.024	
	0.12	
	0.2	
	0.32	

Calibration Check Date 11/16/98

Calibration Check

Ranges	Level	RPD	Units
C5-C8 Aliphatics	0.9	9.46%	**mg/L**
C9-C12 Aliphatics	0.66	0.77%	**mg/L**
C9-C10 Aromatics	0.12	12.52%	**mg/L**

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reporting Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

rev. 05/06/98

CHAIN OF CUSTODY TRACKING FORM

Omega

LAB DESTINATION: Water, Technology + Controls
SEND LAB RESULTS TO: Jason Johnson 3619 Hobbs Rd, Greensboro, NC 27410
SEND BILLING TO: Tracye, OES, Lakeland, Fl. 20 Lake wire Drive, 33801
LEGAL CUSTODY: PRECLEANED CONTAINERS VERIFIED AND RELINQUISHED BY: ____

PROJECT NO.	PROJECT NAME	LOCATION
R 98-142	Friendly Food Mart #6	Walnut Cove, NC

SAMPLED BY: Jason Johnson [illegible signature]

ANALYSES REQUESTED

SAMPLE NUMBER	LAB ID	COLLECTION DATE	COLLECTION TIME	SAMPLE MATERIAL	NUMBER OF CONTAINERS	FIELD READINGS pH	FIELD READINGS COND.	FIELD READINGS TEMP.	601 + 602 w/ MTBE, IPE, EDB BTEX	3030 C	MADEP VPH							REMARKS
OE6-100	-mw 1	11/9/98	13:00	GW	4				X	X	X							3030c preserved w HNO_3
OE6-101	Trip Blank	–	–	W	3				X									601 + 602 " " HCl

SPECIAL INSTRUCTIONS: ____

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible signature]	11/11/98	17:00	[illegible signature]				

RELINQUISHED BY:	DATE	TIME	RECEIVED BY COMMON CARRIER:	RELINQUISHED BY:	DATE	TIME	RECEIVED AT LAB BY:
					11/11/98	400P	[illegible signature]

DWG. CHART32

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental	WT&C ID:	01149910
Project:	R98-142	Analysis:	01/25/99
Client Sample ID:	OEG-MW-2	Analyst:	FAP
Sample Collection:	01/13/98 1000		

SW846-8260 VOLATILE ORGANICS

Parameter	Result
Benzene	< 0.200 mg/kg
Bromobenzene	< 0.200 mg/kg
Bromodichloromethane	< 0.200 mg/kg
Bromoform	< 0.200 mg/kg
Bromomethane	< 1.00 mg/kg
n-Butylbenzene	< 0.200 mg/kg
sec-Butylbenzene	< 0.200 mg/kg
tert-Butylbenzene	< 0.200 mg/kg
Carbon Tetrachloride	< 0.200 mg/kg
Chlorobenzene	< 0.200 mg/kg
Chloroethane	< 1.00 mg/kg
2-Chloroethylvinyl Ether	< 1.00 mg/kg
Chloroform	< 0.200 mg/kg
Chloromethane	< 1.00 mg/kg
2-Chlorotoluene	< 0.200 mg/kg
4-Chlorotoluene	< 0.200 mg/kg
Dibromochloromethane	< 0.200 mg/kg
1,2-Dibromo-3-chloropropane	< 0.200 mg/kg
1,2-Dibromoethane (EDB)	< 0.200 mg/kg
Dibromomethane	< 0.200 mg/kg
Dichlorodifluoromethane	< 1.00 mg/kg
1,1-Dichloroethane	< 0.200 mg/kg
1,2-Dichloroethane	< 0.200 mg/kg
1,4-Dichlorobenzene	< 0.200 mg/kg
1,2-Dichlorobenzene	< 0.200 mg/kg
1,3-Dichlorobenzene	< 0.200 mg/kg
1,1-Dichloroethene	< 0.200 mg/kg
cis-1,2-Dichloroethene	< 0.200 mg/kg
trans-1,2-Dichloroethene	< 0.200 mg/kg
1,2-Dichloropropane	< 0.200 mg/kg
1,3-Dichloropropane	< 0.200 mg/kg
2,2-Dichloropropane	< 0.200 mg/kg
1,1-Dichloropropene	< 0.200 mg/kg
1,2-Dichloropropene	< 0.200 mg/kg
cis-1,3-Dichloropropene	< 0.200 mg/kg
trans-1,3-Dichloropropene	< 0.200 mg/kg
Ethyl benzene	**3.76 mg/kg**
Hexachlorobutadiene	< 0.200 mg/kg
Isopropylbenzene	**0.450 mg/kg**
p-Isopropyltoluene	**0.440 mg/kg**
Methylene chloride	< 0.200 mg/kg
Naphthalene	**2.76 mg/kg**
n-Propylbenzene	**2.15 mg/kg**
Styrene	< 0.200 mg/kg
1,1,1,2-Tetrachloroethane	< 0.200 mg/kg
1,1,2,2-Tetrachloroethane	< 0.200 mg/kg
Tetrachloroethene	< 0.200 mg/kg
Toluene	**5.87 mg/kg**
1,1,1-Trichloroethane	< 0.200 mg/kg
1,1,2-Trichloroethane	< 0.200 mg/kg
Trichloroethene	< 0.200 mg/kg
1,2,3-Trichlorobenzene	< 0.200 mg/kg
1,2,4-Trichlorobenzene	< 0.200 mg/kg
1,2,3-Trichloropropane	< 0.200 mg/kg
Trichlorofluoromethane	< 1.00 mg/kg
1,2,4-Trimethylbenzene	**13.6 mg/kg**
1,3,5-Trimethylbenzene	**4.00 mg/kg**
Vinyl chloride	< 1.00 mg/kg
Xylenes (total)	**20.2 mg/kg**

Additional Compounds

Methyl-tert-butyl Ether	**1.44 mg/kg**
Isopropyl Ether	< 1.00 mg/kg

I hereby certify that I have reviewed and approve these data.

Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

Water Technology and Controls, Inc.
642 Tamco Road
Reidsville, NC 27320
tel. (336)342-4748
fax. (336)342-1522

Client: Omega Environmental
Tel: 286-3337
Address: 3619 Hobbs Road, Greensboro, NC 27410
Fax: 286-3962
Attention: JASON JOHNSON
P.O.#: 47-2541
Person Taking Sample (signature): Jason Johnson
Project # R 98-142

Chain of Custody Record

If Composite?

Lab Use Only

Sample Location/ID#	Date 1	Time 1	Date 2	Time 2	Comp? Grab?	# of Conts.	Tests Required	On Ice?	pH OK? Cl2 OK?
OEG-MW2	1/13	10:00	01/14/10		Grab	3	MADEP VPH / 8260 IPE + MTBE		
Trip Blank	1/13	NA			-	2	"		

Method of Shipment:
UPS
Fed Ex
Hand Delivery
Other

Comments:

Will these results be used for regulatory purposes? Yes X No

Relinquished by: Jason Johnson	Date: 1/13/99	Time: 17:00	Received by: Claudia Creston	Date: 1/13/99	Time: 5:05
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received @ Lab by: Elizabeth	Date: 1/14/99	Time: 7:30 AM

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental	WT&C ID:	01119914
Project:	R 98-142	Analysis:	01/18/99
Client Sample ID:	OEG-220-MW-3	Analyst:	FAP
Sample Collection:	01/06/99 1145		

SW846-8260 VOLATILE ORGANICS

Parameter	Result	Parameter	Result
Benzene	< 0.005 mg/kg	cis-1,3-Dichloropropene	< 0.005 mg/kg
Bromobenzene	< 0.005 mg/kg	trans-1,3-Dichloropropene	< 0.005 mg/kg
Bromodichloromethane	< 0.005 mg/kg	Ethyl benzene	< 0.005 mg/kg
Bromoform	< 0.005 mg/kg	Hexachlorobutadiene	< 0.005 mg/kg
Bromomethane	< 0.025 mg/kg	Isopropylbenzene	< 0.005 mg/kg
n-Butylbenzene	< 0.005 mg/kg	p-Isopropyltoluene	< 0.005 mg/kg
sec-Butylbenzene	< 0.005 mg/kg	Methylene chloride	< 0.005 mg/kg
tert-Butylbenzene	< 0.005 mg/kg	**Naphthalene**	**0.053 mg/kg**
Carbon Tetrachloride	< 0.005 mg/kg	n-Propylbenzene	< 0.005 mg/kg
Chlorobenzene	< 0.005 mg/kg	Styrene	< 0.005 mg/kg
Chloroethane	< 0.025 mg/kg	1,1,1,2-Tetrachloroethane	< 0.005 mg/kg
2-Chloroethylvinyl Ether	< 0.025 mg/kg	1,1,2,2-Tetrachloroethane	< 0.005 mg/kg
Chloroform	< 0.005 mg/kg	Tetrachloroethene	< 0.005 mg/kg
Chloromethane	< 0.025 mg/kg	Toluene	< 0.005 mg/kg
2-Chlorotoluene	< 0.005 mg/kg	1,1,1-Trichloroethane	< 0.005 mg/kg
4-Chlorotoluene	< 0.005 mg/kg	1,1,2-Trichloroethane	< 0.005 mg/kg
Dibromochloromethane	< 0.005 mg/kg	Trichloroethene	< 0.005 mg/kg
1,2-Dibromo-3-chloropropane	< 0.005 mg/kg	1,2,3-Trichlorobenzene	< 0.005 mg/kg
1,2-Dibromoethane (EDB)	< 0.005 mg/kg	1,2,4-Trichlorobenzene	< 0.005 mg/kg
Dibromomethane	< 0.005 mg/kg	1,2,3-Trichloropropane	< 0.005 mg/kg
Dichlorodifluoromethane	< 0.025 mg/kg	Trichlorofluoromethane	< 0.025 mg/kg
1,1-Dichloroethane	< 0.005 mg/kg	**1,2,4-Trimethylbenzene**	**0.016 mg/kg**
1,2-Dichloroethane	< 0.005 mg/kg	1,3,5-Trimethylbenzene	< 0.005 mg/kg
1,4-Dichlorobenzene	< 0.005 mg/kg	Vinyl chloride	< 0.025 mg/kg
1,2-Dichlorobenzene	< 0.005 mg/kg	Xylenes (total)	< 0.005 mg/kg
1,3-Dichlorobenzene	< 0.005 mg/kg		
1,1-Dichloroethene	< 0.005 mg/kg		
cis-1,2-Dichloroethene	< 0.005 mg/kg		
trans-1,2-Dichloroethene	< 0.005 mg/kg		
1,2-Dichloropropane	< 0.005 mg/kg		
1,3-Dichloropropane	< 0.005 mg/kg		
2,2-Dichloropropane	< 0.005 mg/kg		
1,1-Dichloropropene	< 0.005 mg/kg		
1,2-Dichloropropene	< 0.005 mg/kg		

I hereby certify that I have reviewed and approve these data.

Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental	WT&C ID:	01119915
Project:	R 98-142	Analysis:	01/18/99
Client Sample ID:	OEG-221-MW-4	Analyst:	FAP
Sample Collection:	01/06/99 1030		

SW846-8260 VOLATILE ORGANICS

Parameter	Result	Parameter	Result
Benzene	< 0.005 mg/kg	cis-1,3-Dichloropropene	< 0.005 mg/kg
Bromobenzene	< 0.005 mg/kg	trans-1,3-Dichloropropene	< 0.005 mg/kg
Bromodichloromethane	< 0.005 mg/kg	Ethyl benzene	< 0.005 mg/kg
Bromoform	< 0.005 mg/kg	Hexachlorobutadiene	< 0.005 mg/kg
Bromomethane	< 0.025 mg/kg	Isopropylbenzene	< 0.005 mg/kg
n-Butylbenzene	< 0.005 mg/kg	p-Isopropyltoluene	< 0.005 mg/kg
sec-Butylbenzene	< 0.005 mg/kg	Methylene chloride	< 0.005 mg/kg
tert-Butylbenzene	< 0.005 mg/kg	Naphthalene	< 0.005 mg/kg
Carbon Tetrachloride	< 0.005 mg/kg	n-Propylbenzene	< 0.005 mg/kg
Chlorobenzene	< 0.005 mg/kg	Styrene	< 0.005 mg/kg
Chloroethane	< 0.025 mg/kg	1,1,1,2-Tetrachloroethane	< 0.005 mg/kg
2-Chloroethylvinyl Ether	< 0.025 mg/kg	1,1,2,2-Tetrachloroethane	< 0.005 mg/kg
Chloroform	< 0.005 mg/kg	Tetrachloroethene	< 0.005 mg/kg
Chloromethane	< 0.025 mg/kg	Toluene	< 0.005 mg/kg
2-Chlorotoluene	< 0.005 mg/kg	1,1,1-Trichloroethane	< 0.005 mg/kg
4-Chlorotoluene	< 0.005 mg/kg	1,1,2-Trichloroethane	< 0.005 mg/kg
Dibromochloromethane	< 0.005 mg/kg	Trichloroethene	< 0.005 mg/kg
1,2-Dibromo-3-chloropropane	< 0.005 mg/kg	1,2,3-Trichlorobenzene	< 0.005 mg/kg
1,2-Dibromoethane (EDB)	< 0.005 mg/kg	1,2,4-Trichlorobenzene	< 0.005 mg/kg
Dibromomethane	< 0.005 mg/kg	1,2,3-Trichloropropane	< 0.005 mg/kg
Dichlorodifluoromethane	< 0.025 mg/kg	Trichlorofluoromethane	< 0.025 mg/kg
1,1-Dichloroethane	< 0.005 mg/kg	1,2,4-Trimethylbenzene	< 0.005 mg/kg
1,2-Dichloroethane	< 0.005 mg/kg	1,3,5-Trimethylbenzene	< 0.005 mg/kg
1,4-Dichlorobenzene	< 0.005 mg/kg	Vinyl chloride	< 0.025 mg/kg
1,2-Dichlorobenzene	< 0.005 mg/kg	Xylenes (total)	< 0.005 mg/kg
1,3-Dichlorobenzene	< 0.005 mg/kg		
1,1-Dichloroethene	< 0.005 mg/kg		
cis-1,2-Dichloroethene	< 0.005 mg/kg		
trans-1,2-Dichloroethene	< 0.005 mg/kg		
1,2-Dichloropropane	< 0.005 mg/kg		
1,3-Dichloropropane	< 0.005 mg/kg		
2,2-Dichloropropane	< 0.005 mg/kg		
1,1-Dichloropropene	< 0.005 mg/kg		
1,2-Dichloropropene	< 0.005 mg/kg		

I hereby certify that I have reviewed and approve these data.

Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental	WT&C ID:	01119916
Project:	R 98-142	Analysis:	01/18/99
Client Sample ID:	OEG-222-MW-5D	Analyst:	FAP
Sample Collection:	01/06/99 1400		

.038
.320
.017

SW846-8260 VOLATILE ORGANICS

Parameter	Result
Benzene	< 0.005 mg/kg
Bromobenzene	< 0.005 mg/kg
Bromodichloromethane	< 0.005 mg/kg
Bromoform	< 0.005 mg/kg
Bromomethane	< 0.025 mg/kg
n-Butylbenzene	< 0.005 mg/kg
sec-Butylbenzene	**0.024 mg/kg**
tert-Butylbenzene	< 0.005 mg/kg
Carbon Tetrachloride	< 0.005 mg/kg
Chlorobenzene	< 0.005 mg/kg
Chloroethane	< 0.025 mg/kg
2-Chloroethylvinyl Ether	< 0.025 mg/kg
Chloroform	< 0.005 mg/kg
Chloromethane	< 0.025 mg/kg
2-Chlorotoluene	< 0.005 mg/kg
4-Chlorotoluene	< 0.005 mg/kg
Dibromochloromethane	< 0.005 mg/kg
1,2-Dibromo-3-chloropropane	< 0.005 mg/kg
1,2-Dibromoethane (EDB)	< 0.005 mg/kg
Dibromomethane	< 0.005 mg/kg
Dichlorodifluoromethane	< 0.025 mg/kg
1,1-Dichloroethane	< 0.005 mg/kg
1,2-Dichloroethane	< 0.005 mg/kg
1,4-Dichlorobenzene	< 0.005 mg/kg
1,2-Dichlorobenzene	< 0.005 mg/kg
1,3-Dichlorobenzene	< 0.005 mg/kg
1,1-Dichloroethene	< 0.005 mg/kg
cis-1,2-Dichloroethene	< 0.005 mg/kg
trans-1,2-Dichloroethene	< 0.005 mg/kg
1,2-Dichloropropane	< 0.005 mg/kg
1,3-Dichloropropane	< 0.005 mg/kg
2,2-Dichloropropane	< 0.005 mg/kg
1,1-Dichloropropene	< 0.005 mg/kg
1,2-Dichloropropene	< 0.005 mg/kg
cis-1,3-Dichloropropene	< 0.005 mg/kg
trans-1,3-Dichloropropene	< 0.005 mg/kg
Ethyl benzene	**0.038 mg/kg**
Hexachlorobutadiene	< 0.005 mg/kg
Isopropylbenzene	**0.016 mg/kg**
p-Isopropyltoluene	**0.060 mg/kg**
Methylene chloride	< 0.005 mg/kg
Naphthalene	**0.830 mg/kg**
n-Propylbenzene	**0.092 mg/kg**
Styrene	< 0.005 mg/kg
1,1,1,2-Tetrachloroethane	< 0.005 mg/kg
1,1,2,2-Tetrachloroethane	< 0.005 mg/kg
Tetrachloroethene	< 0.005 mg/kg
Toluene	**0.017 mg/kg**
1,1,1-Trichloroethane	< 0.005 mg/kg
1,1,2-Trichloroethane	< 0.005 mg/kg
Trichloroethene	< 0.005 mg/kg
1,2,3-Trichlorobenzene	< 0.005 mg/kg
1,2,4-Trichlorobenzene	< 0.005 mg/kg
1,2,3-Trichloropropane	< 0.005 mg/kg
Trichlorofluoromethane	< 0.025 mg/kg
1,2,4-Trimethylbenzene	**1.34 mg/kg**
1,3,5-Trimethylbenzene	**0.250 mg/kg**
Vinyl chloride	< 0.025 mg/kg
Xylenes (total)	**0.320 mg/kg**

I hereby certify that I have reviewed and approve these data.

Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

VPH (Aliphatics/Aromatics) Laboratory Reporting Form Continued

Client Name	Omega Environmental	**Laboratory Name**	Water Technology & Controls
Project Name	R 98-142	**NC Certification # (Lab)**	165
Site Location	OEG		

Sample Information and Analytical Results									
Lab Identification #	01119914	01119915	01119916	Trip Blank					
Sample Identification	220-MW3	221-MW4	222-MW5D	Trip Blank					
Sample Matrix	Soil	Soil	Soil	methanol					
Collection Option (for soil)*	1	1	1	NA					
Date Collected	01/06/99	01/06/99	01/06/99	01/06/99					
Date Received	01/11/99	01/11/99	01/11/99	01/11/99					
Date Extracted	01/13/99	01/13/99	01/13/99	NA					
Date Analyzed	01/13/99	01/13/99	01/13/99	01/13/99					
Dry Weight	83%	85%	82%	NA					
Dilution Factor	NA	NA	NA	NA					
C5-C8 Aliphatics(mg/kg)**	< 13	< 13	**65**	< 13					
C9-C12 Aliphatics(mg/kg)**	< 7.2	< 7.2	**57**	< 7.2					
C9-C10 Aromatics(mg/kg)**	< 3.2	< 3.2	**21**	< 3.2					
Surrogate % Recovery - PID	80%	74%	90%	79%					
Surrogate % Recovery - FID	108%	104%	121%	109%					

*Option 1 = Established fill line on vial Option 2 = Sampling Device(IndicateBrand) Option3 = Field weight of soil

**Unadjusted Value. Should exclude the concentration of any surrogate(s), internal standards, and/or concentrations of other ranges that elute within the specified range.

***See attatched report.

	C5-C8 Aliphatic	C9-C12 Aliphatic	C9-C10 Aromatic
Percent Recovery - Fortified Blank (Spike) - PID			76%
Relative Percent Difference - PID Duplicate			NA
Percent Recovery - Fortified Blank (Spike) - FID	103%	111%	
Relative Percent Difference - FID Duplicate	NA	NA	

reviewed by M. H. Vaughan

rev. 05/06/98

VPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 09/25/98

Calibration Ranges and Limits

Range	MDL	ML	RL	Units
C5-C8 Aliphatics	3.86	12.27	12.8	mg/kg
C9-C12 Aliphatics	1.5	4.77	7.2	mg/kg
C9-C10 Aromatics	0.893	2.84	3.2	mg/kg

Method of Quantitation (circle one): (Curve) or Average Response Factor

Calibration Concentration Levels

Range	# Levels	%RSD or CCC
C5-C8 Aliphatics	15	0.9992
	180	
	900	
	1500	
	2400	
C9-C12 Aliphatics	11	0.9987
	132	
	660	
	1100	
	1760	
C9-C10 Aromatics	2	0.9986
	24	
	120	
	200	
	320	

Calibration Check Date 01/13/99

Calibration Check

Ranges	Level	RPD	Units
C5-C8 Aliphatics	900	16.85%	mg/kg
C9-C12 Aliphatics	660	6.91%	mg/kg
C9-C10 Aromatics	120	24.07%	mg/kg

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reporting Limit

RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

rev. 05/06/98

Water Technology and Controls, Inc.
642 Tamco Road
Reidsville, NC 27320
tel. (336)342-4748
fax. (336)342-1522

Client: Omega Environmental | Tel: 336-286-3337
Address: 3619 Hobbs Road, Greensboro, NC, 27410 | Fax: 336-286-3962
Attention: Jason Johnson | P.O.#:
Person Taking Sample (signature): Jason Johnson | Project # R 98-142 | Lab Use Only

Chain of Custody Record

If Composite?

Sample Location/ID#	Date 1	Time 1	Date 2	Time 2	Comp? Grab?	# of Conts.	Tests Required	On Ice?	pH OK? Cl2 OK?
OEG-220-MW3	1/6/99	11:45	#01119914		Grab	3	MADEP VPH / 8260	Yes 0.9°C	
OEG-221-MW4	1/6/99	10:30	#01119915		"	3	" "		
OEG-222-MW5D	1/6/99	14:00	#01119916		"	3	" "		
Trip Blank	1/6/99	-			-	2	"		

Method of Shipment:
- ☐ UPS
- ☐ Fed Ex
- ☒ Hand Delivery
- ☐ Other _____

Comments:

Will these results be used for regulatory purposes? Yes X No ___

Relinquished by: Jason Johnson	Date: 1/8/99	Time: 16:00	Received by: [illegible]	Date: 1/8/99	Time: 4:10
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received @ Lab by: [illegible]	Date: 1/11/99	Time: 2:10 pm

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental Services	WT&C ID:	01229916TB
Project:	R98-142	Analysis:	01/27/99
Client Sample ID:	Trip Blank	Analyst:	TW

EPA 601/602 - VOLATILE ANALYSIS

Parameter	Result
Benzene	<1.0 ug/L
Bromodichloromethane	<1.0 ug/L
Bromoform	<1.0 ug/L
Bromomethane	<5.0 ug/L
Carbon Tetrachloride	<1.0 ug/L
Chlorobenzene	<1.0 ug/L
Chloroethane	<5.0 ug/L
2-Chloroethylvinyl Ether	<5.0 ug/L
Chloroform	<1.0 ug/L
Chloromethane	<5.0 ug/L
Dibromochloromethane	<1.0 ug/L
1,2-Dichlorobenzene	<1.0 ug/L
1,3-Dichlorobenzene	<1.0 ug/L
1,4-Dichlorobenzene	<1.0 ug/L
Dichlorodifluoromethane	<5.0 ug/L
1,1-Dichloroethane	<1.0 ug/L
1,2-Dichloroethane	<1.0 ug/L
1,1-Dichloroethene	<1.0 ug/L
1,2-Dichloropropane	<1.0 ug/L
cis-1,3-Dichloropropene	<1.0 ug/L
trans-1,3-Dichloropropene	<1.0 ug/L
Ethylbenzene	<1.0 ug/L
Methylene Chloride	<1.0 ug/L
1,1,2,2-Tetrachloroethane	<1.0 ug/L
Tetrachloroethene	<1.0 ug/L
Toluene	<1.0 ug/L
1,1,1-Trichloroethane	<1.0 ug/L
1,1,2-Trichloroethane	<1.0 ug/L
Trichloroethene	<1.0 ug/L
Trichlorofluoromethane	<5.0 ug/L
Vinyl Chloride	<5.0 ug/L

Additional Compounds	**Result**
Isopropyl Ether	<5.0 ug/L
MtBE	<5.0 ug/L
m/p-Xylenes	<2.0 ug/L
o-Xylene	<1.0 ug/L

I hereby certify that I have reviewed and approve these data. Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental Services	WT&C ID:	01229916
Project:	R98-142	Analysis:	01/27/99
Client Sample ID:	OEG-200-MW2	Analyst:	TW
Sample Collection:	01/21/99 1400		

EPA 601/602 - VOLATILE ANALYSIS

Parameter	Result
Benzene	**6180 ug/L**
Bromodichloromethane	< 100 ug/L
Bromoform	< 100 ug/L
Bromomethane	< 500 ug/L
Carbon Tetrachloride	< 100 ug/L
Chlorobenzene	< 100 ug/L
Chloroethane	< 500 ug/L
2-Chloroethylvinyl Ether	< 500 ug/L
Chloroform	< 100 ug/L
Chloromethane	< 500 ug/L
Dibromochloromethane	< 100 ug/L
1,2-Dichlorobenzene	< 100 ug/L
1,3-Dichlorobenzene	< 100 ug/L
1,4-Dichlorobenzene	< 100 ug/L
Dichlorodifluoromethane	< 500 ug/L
1,1-Dichloroethane	< 100 ug/L
1,2-Dichloroethane	< 100 ug/L
1,1-Dichloroethene	< 100 ug/L
1,2-Dichloropropane	< 100 ug/L
cis-1,3-Dichloropropene	< 100 ug/L
trans-1,3-Dichloropropene	< 100 ug/L
Ethylbenzene	**2180 ug/L**
Methylene Chloride	< 100 ug/L
1,1,2,2-Tetrachloroethane	< 100 ug/L
Tetrachloroethene	< 100 ug/L
Toluene	**11900 ug/L**
1,1,1-Trichloroethane	< 100 ug/L
1,1,2-Trichloroethane	< 100 ug/L
Trichloroethene	< 100 ug/L
Trichlorofluoromethane	< 500 ug/L
Vinyl Chloride	< 500 ug/L

Additional Compounds	Result
Isopropyl Ether	< 500 ug/L
MtBE	**9660 ug/L**
m/p-Xylenes	**9920 ug/L**
o-Xylene	**4650 ug/L**

I hereby certify that I have reviewed and approve these data. Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental Services	WT&C ID:	01229917
Project:	R98-142	Analysis:	01/28/99
Client Sample ID:	OEG-200-MW3	Analyst:	TW
Sample Collection:	01/21/99 1600		

EPA 601/602 - VOLATILE ANALYSIS

Parameter	Result
Benzene	**150 ug/L**
Bromodichloromethane	<10 ug/L
Bromoform	<10 ug/L
Bromomethane	<50 ug/L
Carbon Tetrachloride	<10 ug/L
Chlorobenzene	<10 ug/L
Chloroethane	<50 ug/L
2-Chloroethylvinyl Ether	<50 ug/L
Chloroform	<10 ug/L
Chloromethane	<50 ug/L
Dibromochloromethane	<10 ug/L
1,2-Dichlorobenzene	<10 ug/L
1,3-Dichlorobenzene	<10 ug/L
1,4-Dichlorobenzene	<10 ug/L
Dichlorodifluoromethane	<50 ug/L
1,1-Dichloroethane	<10 ug/L
1,2-Dichloroethane	<10 ug/L
1,1-Dichloroethene	<10 ug/L
1,2-Dichloropropane	<10 ug/L
cis-1,3-Dichloropropene	<10 ug/L
trans-1,3-Dichloropropene	<10 ug/L
Ethylbenzene	**30 ug/L**
Methylene Chloride	<10 ug/L
1,1,2,2-Tetrachloroethane	<10 ug/L
Tetrachloroethene	<10 ug/L
Toluene	**310 ug/L**
1,1,1-Trichloroethane	<10 ug/L
1,1,2-Trichloroethane	<10 ug/L
Trichloroethene	<10 ug/L
Trichlorofluoromethane	<50 ug/L
Vinyl Chloride	<50 ug/L

Additional Compounds	Result
Isopropyl Ether	<50 ug/L
MtBE	**240 ug/L**
m/p-Xylenes	**220 ug/L**
o-Xylene	**160 ug/L**

I hereby certify that I have reviewed and approve these data. Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental Services	WT&C ID:	01229918
Project:	R98-142	Analysis:	01/28/99
Client Sample ID:	OEG-200-MW4	Analyst:	TW
Sample Collection:	01/21/99 1445		

EPA 601/602 - VOLATILE ANALYSIS

Parameter	Result
Benzene	<1.0 ug/L
Bromodichloromethane	<1.0 ug/L
Bromoform	<1.0 ug/L
Bromomethane	<5.0 ug/L
Carbon Tetrachloride	<1.0 ug/L
Chlorobenzene	<1.0 ug/L
Chloroethane	<5.0 ug/L
2-Chloroethylvinyl Ether	<5.0 ug/L
Chloroform	<1.0 ug/L
Chloromethane	<5.0 ug/L
Dibromochloromethane	<1.0 ug/L
1,2-Dichlorobenzene	<1.0 ug/L
1,3-Dichlorobenzene	<1.0 ug/L
1,4-Dichlorobenzene	<1.0 ug/L
Dichlorodifluoromethane	<5.0 ug/L
1,1-Dichloroethane	<1.0 ug/L
1,2-Dichloroethane	<1.0 ug/L
1,1-Dichloroethene	<1.0 ug/L
1,2-Dichloropropane	<1.0 ug/L
cis-1,3-Dichloropropene	<1.0 ug/L
trans-1,3-Dichloropropene	<1.0 ug/L
Ethylbenzene	<1.0 ug/L
Methylene Chloride	<1.0 ug/L
1,1,2,2-Tetrachloroethane	<1.0 ug/L
Tetrachloroethene	<1.0 ug/L
Toluene	<1.0 ug/L
1,1,1-Trichloroethane	<1.0 ug/L
1,1,2-Trichloroethane	<1.0 ug/L
Trichloroethene	<1.0 ug/L
Trichlorofluoromethane	<5.0 ug/L
Vinyl Chloride	<5.0 ug/L

Additional Compounds	**Result**
Isopropyl Ether	<5.0 ug/L
MtBE	**12.0 ug/L**
m/p-Xylenes	<2.0 ug/L
o-Xylene	<1.0 ug/L

I hereby certify that I have reviewed and approve these data. Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

Client:	Omega Environmental Services	WT&C ID:	01229919
Project:	R98-142	Analysis:	01/28/99
Client Sample ID:	OEG-200-MW50	Analyst:	TW
Sample Collection:	01/21/99 1330		

EPA 601/602 - VOLATILE ANALYSIS

Parameter	Result
Benzene	<1.0 ug/L
Bromodichloromethane	<1.0 ug/L
Bromoform	<1.0 ug/L
Bromomethane	<5.0 ug/L
Carbon Tetrachloride	<1.0 ug/L
Chlorobenzene	<1.0 ug/L
Chloroethane	<5.0 ug/L
2-Chloroethylvinyl Ether	<5.0 ug/L
Chloroform	<1.0 ug/L
Chloromethane	<5.0 ug/L
Dibromochloromethane	<1.0 ug/L
1,2-Dichlorobenzene	<1.0 ug/L
1,3-Dichlorobenzene	<1.0 ug/L
1,4-Dichlorobenzene	<1.0 ug/L
Dichlorodifluoromethane	<5.0 ug/L
1,1-Dichloroethane	<1.0 ug/L
1,2-Dichloroethane	<1.0 ug/L
1,1-Dichloroethene	<1.0 ug/L
1,2-Dichloropropane	<1.0 ug/L
cis-1,3-Dichloropropene	<1.0 ug/L
trans-1,3-Dichloropropene	<1.0 ug/L
Ethylbenzene	<1.0 ug/L
Methylene Chloride	<1.0 ug/L
1,1,2,2-Tetrachloroethane	<1.0 ug/L
Tetrachloroethene	<1.0 ug/L
Toluene	<1.0 ug/L
1,1,1-Trichloroethane	<1.0 ug/L
1,1,2-Trichloroethane	<1.0 ug/L
Trichloroethene	<1.0 ug/L
Trichlorofluoromethane	<5.0 ug/L
Vinyl Chloride	<5.0 ug/L

Additional Compounds	**Result**
Isopropyl Ether	<5.0 ug/L
MtBE	**20.0 ug/L**
m/p-Xylenes	<2.0 ug/L
o-Xylene	<1.0 ug/L

I hereby certify that I have reviewed and approve these data. Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

Water Technology and Controls, Inc.
Environmental Laboratory
Laboratory Certification No. 165

Client:	Omega	Report Date:	2/8/99
Contact:	Mr. Jason Johnson	Date Sample Rcvd:	1/22/99
Project:	R98-142	Sample Date:	1/21/99

WT&C Work Order # 01229916 Sample: OEG-200-MW2 Grab

Parameters	Results
3030C Lead	<0.010 mg/l

WT&C Work Order # 01229917 Sample: OEG-201-MW3 Grab

Parameters	Results
3030C Lead	0.010 mg/l

WT&C Work Order # 01229918 Sample: OEG-201-MW4 Grab

Parameters	Results
3030C Lead	0.011 mg/l

WT&C Work Order # 01229919 Sample: OEG-201-MW5D Grab

Parameters	Results
3030C Lead	<0.010 mg/l

I hereby certify that I have reviewed and approve these data.

Mike Vaughan

Maurice H. Vaughan, Jr.
Laboratory Supervisor

642 Tamco Road, Reidsville, North Carolina 27320
tel.(910)342-4748 fax.(910)342-1522

VPH (Aliphatics/Aromatics) Laboratory Reporting Form Continued

Client Name	Omega Environmental	**Laboratory Name**	Water Technology & Controls
Project Name	R98-142	**NC Certification # (Lab)**	165
Site Location			

Sample Information and Analytical Results									
Lab Identification #	Trip Blank	01229916	01229917	01229918	01229919				
Sample Identification	Trip Blank	200-MW2	201-MW3	201-MW4	201-MW50				
Sample Matrix	Water	Water	Water	Water	Water				
Collection Option (for soil)*	NA	NA	NA	NA	NA				
Date Collected	1/21/99	1/21/99	1/21/99	1/21/99	1/21/99				
Date Received	1/22/99	1/22/99	1/22/99	1/22/99	1/22/99				
Date Extracted	NA	NA	NA	NA	NA				
Date Analyzed	2/3/99	2/4/99	2/3/99	2/3/99	2/3/99				
Dry Weight	NA	NA	NA	NA	NA				
Dilution Factor	NA	500	5	NA	NA				
C5-C8 Aliphatics(mg/L)**	< 0.066	**42.1**	**3.06**	< 0.066	< 0.066				
C9-C12 Aliphatics(mg/L)**	< 0.034	**49.3**	**1.91**	< 0.034	< 0.034				
C9-C10 Aromatics(mg/L)**	< 0.016	**19.4**	**0.825**	< 0.016	< 0.016				
Surrogate % Recovery - PID	75%	79%	80%	85%	78%				
Surrogate % Recovery - FID	92%	83%	99%	108%	105%				

*Option 1 = Established fill line on vial Option 2 = Sampling Device(IndicateBrand) Option3 = Field weight of soil

**Unadjusted Value. Should exclude the concentration of any surrogate(s), internal standards, and/or concentrations of other ranges that elute within the specified range.

***See attatched report.

	C5-C8 Aliphatic	C9-C12 Aliphatic	C9-C10 Aromatic
Percent Recovery - Fortified Blank (Spike) - PID			80%
Relative Percent Difference - PID Duplicate			NA
Percent Recovery - Fortified Blank (Spike) - FID	106%	116%	
Relative Percent Difference - FID Duplicate	NA	NA	

Reviewed By Mike Vaughan

rev. 05/06/98

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

VPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 01/23/99

Calibration Ranges and Limits

Range	MDL	ML	RL	Units
C5-C8 Aliphatics	**0.00328**	**0.0104**	**0.066**	**mg/L**
C9-C12 Aliphatics	**0.00301**	**0.00957**	**0.034**	**mg/L**
C9-C10 Aromatics	**0.00099**	**0.00315**	**0.016**	**mg/L**

Method of Quantitation (circle one): (Curve) or Average Response Factor

Calibration Concentration Levels

Range	Levels	%RSD or CCC
C5-C8 Aliphatics	0.015	0.9989
	0.18	
	0.9	
	1.5	
	2.4	
C9-C12 Aliphatics	0.011	0.9954
	0.132	
	0.66	
	1.1	
	1.76	
C9-C10 Aromatics	0.002	0.9979
	0.024	
	0.12	
	0.2	
	0.32	

Calibration Check Date 02/03/99

Calibration Check

Ranges	Level	RPD	Units
C5-C8 Aliphatics	0.9	9.83%	**mg/L**
C9-C12 Aliphatics	0.66	11.61%	**mg/L**
C9-C10 Aromatics	0.12	16.59%	**mg/L**

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reporting Limit

RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

Water Technology and Controls, Inc.
Water Treatment Chemistries Environmental Laboratory
Reidsville, North Carolina 27320
(336) 342-4748

VPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 02/04/99

Calibration Ranges and Limits

Range	MDL	ML	RL	Units
C5-C8 Aliphatics	0.00328	0.0104	0.066	mg/L
C9-C12 Aliphatics	0.00301	0.00957	0.034	mg/L
C9-C10 Aromatics	0.00099	0.00315	0.016	mg/L

Method of Quantitation (circle one): (Curve) or Average Response Factor

Calibration Concentration Levels

Range	Levels	%RSD or CCC
C5-C8 Aliphatics	0.015	0.9996
	0.18	
	0.9	
	1.5	
	2.4	
C9-C12 Aliphatics	0.011	0.9997
	0.132	
	0.66	
	1.1	
	1.76	
C9-C10 Aromatics	0.002	0.9995
	0.024	
	0.12	
	0.2	
	0.32	

Calibration Check Date

Calibration Check

Ranges	Level	RPD	Units
C5-C8 Aliphatics	0.9	-----	mg/L
C9-C12 Aliphatics	0.66	-----	mg/L
C9-C10 Aromatics	0.12	-----	mg/L

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reporting Limit

RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

rev. 05/06/98

Water Technology and Controls, Inc.
642 Tamco Road
Reidsville, NC 27320
tel. (910)342-4748
fax. (910)342-1522

Client: Omega Environmental Services	Tel: 336-286-3337
Address: 3619 Hobbs Road, Greensboro, NC 27410	Fax: 336-286-3962
Attention: Jason Johnson	P.O.#:
Person Taking Sample (signature): Jason Johnson	Project # R98-142

Chain of Custody Record

If Composite?

Lab Use Only

Sample Location/ID#	Date 1	Time 1	Date 2	Time 2	Comp? Grab?	# of Conts.	Tests Required	On Ice?	pH OK? Cl2 OK?
OE6-200-mw2	1/21	14:00	#01229916		Grab	5	MADEP VPH/~~EPH~~ 601/602, 3030; IPE, MTBE, Xylenes; ~~[illegible]~~	Yes	
" 201-mw3	"	16:00	#01229917		"	5	" " " " "		
" " -mw4	"	17:45	#01229918		"	5	" " " " "		
" " -mw5D	"	13:30	#01229919		"	5	" " " " "		
Trip Blank	"	-			NA	2	"		

Method of Shipment:
- ☐ UPS
- ☐ Fed Ex
- ☒ Hand Delivery
- ☐ Other _____

Comments: Extract 3510c by 1/22 !

Jason Johnson 1/22 11:10

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received @ Lab by:	Date: 1/22/99	Time: 1140 AM

WELL SAMPLING DATA

Job #: R98-142	Date: 1/21/98	Site: Friendly Food Mart #6	By: JJ

MW #	Time	Water Level (ft)	Total Well Depth (ft)	Vol Bails Removed	Analysis Required	Decon Procedure	Free Product Thickness (ft)
1	13:20	12.64	30	Not Sampled,	MADEP VPH 602/602, 8030C	Alconox wash	-
2	13:15	13.41	20	15	"	"	Sheen
3	13:10	12.08	25	30	"	"	-
4	13:00	12.14	25	31	"	"	-
SD	13:12	20.33	30'/50' (casing)	55 purged,	"	"	-

Notes:

Notice Sheen @ mw-2 after first bail.

Survey mws 1-4

Water levels up since last visit.

MONITOR WELL AND BAILER VOLUMES

2-inch wells:

To remove:	You need to remove (per foot of water in well): Disposable bailer	2-inch PVC bailer
1 volume	0.74 bailers	0.27 bailers
3 volumes	2.22 bailers	0.818 bailers
5 volumes	3.70 bailers	1.363 bailers

4-inch wells:

To remove:	You need to remove (per foot of water in well): Disposable bailer	4-inch PVC bailer
1 volume	2.96 bailers	0.593 bailers
3 volumes	8.89 bailers	1.778 bailers
5 volumes	14.82 bailers	2.964 bailers

Friendly Food Mart #6
1/21/99

Benchmark NW corner of building

Monitor Well Survey Data						
Station	BM Reading	Well Readings	Height Instru.[1]	Elevation[2]	GW Depth	GW Elevation
Benchmark	4.63	--	5.70	- [3]	-	-
MW-1	--	6.84	--	97.79	12.64	85.15
MW-2	--	8.03	--	96.60	13.41	83.19
MW-3	--	6.83	--	96.00	12.08	83.92
MW-4	--	5.80	--	98.83	12.14	86.69
MW-5	--		--			
MW-6	--		--			
MW-7	--		--			
MW-8	--		--			
MW-9	--		--			

Notes: [1]Add elevation to BM reading; [2]for MWs, subtract well readings from instrument height; [3]Elevation of site

OMEGA ENVIRONMENTAL SERVICES, INC. QA/QC PROGRAM

The QA/QC plan adopted by Omega Environmental Services, Inc. is in accordance with acceptable methodology and analytical procedures set forth by various regulatory agencies and private industry. The methods employ accepted USEPA (United States Environmental Protection Agency) sampling, decontamination, and analytical techniques (United States Environmental, Characterization of Hazardous Waste Sites, A Methods Manual, 1984).

SOIL SAMPLING SPECIFICATIONS

A Simco 2400 trailer-mounted drilling rig or a CME-75 truck-mounted drilling rig is used to collect soil samples at designated locations when desired sampling depths are greater than one foot (a hand operated split spoon sampler and stainless steel trowel are used where applicable). Soil samples are obtained from each bore hole using hollow stem augers and a split spoon sampler. Soil samples are collected by driving a two foot long decontaminated split spoon sampler ahead of the augers. Once the spoon has penetrated a minimum of two feet of sediment, it is brought to the surface for sample collection. The sample is examined and logged in the field by a qualified technician for physical characteristics including coloration, texture, odor, and signs of obvious contamination. It is then stored in a cooler at four degrees Celsius for later reference or laboratory analysis.

During drilling operations, a portable monitoring device such as a PID (photo-ionization detector), FID (flame ionization detector), or a CGI (combustible gas indicator) is used to perform head space organic vapor analysis on all samples collected during drilling to detect possible explosive conditions, and to assist in selecting samples for analysis. A soil sample to be analyzed for organic vapor is containerized immediately upon recovery by placement into a wide mouth glass jar (with head space) sealed with aluminum foil, and secured with a rubber band. The sample is shaken to allow vapor trapped within the pore space to occupy the head space of the jar. After being stored for a uniform period of time, a clean probe is injected through the foil to measure the organic vapor.

Samples designated for analysis of VOCs (volatile organic compounds) are placed in air-tight vials (with no head space). The rest of the sample (with head space) is placed in wide mouth jars for analyzing additional analytical parameters. All samples are labeled and refrigerated for transport to a laboratory. All soil samples for laboratory analysis are selected based on organic vapor analysis and/or specifically targeted depths. In instances where organic vapor analysis reveals no detectable levels, samples are selected based on visual examination of physical characteristics of the soil.

MONITOR WELL SPECIFICATIONS

Bore holes for monitor wells are drilled using hollow stem augers (6-5/8 inch I.D. for 4 inch wells and 4-1/4 inch I.D. for 2 inch wells). When drilling in rock, a 3' 7/8" down-hole air hammer is utilized. Monitor well specifications consist of either a 2" or 4" PVC flush joint casing, and slotted PVC screen. No glues or solvents are used during construction of monitor wells. A ten foot well screen is placed approximately seven feet below and three feet above the static water level (where applicable). The bore holes are backfilled with clean, #2 well-sorted sand to two feet above the well screen followed by two feet of bentonite pellets. The remaining annular space is filled with bentonite grout to approximately one foot below grade. The well heads are encased in access boxes and secured in place with concrete at grade. Locking well caps are installed at the completion of each well.

MONITOR WELL DEVELOPMENT

Ground water monitor wells are developed by removing five times the volume of the water in the well using either a disposable bailer or a decontaminated PVC bailer. Typically, a new disposable bailer is used for each well to prevent cross-contamination.

GROUND WATER LEVEL MEASUREMENTS

Prior to measuring ground water levels in the monitor wells, the well head elevation is determined by a site survey. Ground water depth measurements are obtained using a conductive water level probe with an audible signal. The field data is used to determine the local ground water flow direction. Water level measurements are taken prior to collection of ground water samples and approximately 72 hours after well completion.

GROUND WATER SAMPLING SPECIFICATIONS

Ground water monitor wells are sampled according to the following protocol:

1. Depth to ground water is determined in each monitor well prior to sampling.
2. The volume of water in the monitor well is calculated.
3. Wells are purged by removing five times the volume of water in each well using a disposable bailer.
4. Ground water samples are collected using nylon rope and single-use disposable bailers which are discarded after each use.
5. Ground water samples are placed in appropriate containers, labeled, and refrigerated.

Parameter	Laboratory Method	Container	Preservation	Maximum Holding Time
Chromium	218.1	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.
Lead	239.2	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.
Mercury	245.1	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	28 days
Selenium	270.3	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.
Silver	272.1	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.
Organo-chlorine Pesticides	608/8010	Glass teflon lined cap	Cool, 4°C.	7 days
PCB's	608/8080	Glass teflon lined cap	Cool, 4°C.	7 days
pHenoxy-acid Herbicides	615/8150	Poly., Glass	Cool, 4°C.	7 days
Organo-phosphorous pesticides	8140	Poly., Glass	Cool, 4°C.	7 days
TCLP Extractions Volatiles		Glass, teflon lined cap	Cool, 4°C.	7 days
TCLP Extraction Semi-volatiles		Glass, teflon lined cap	Cool, 4°C	7 days
TOC	415.1	Glass, teflon lined cap	Cool, 4°C, HCl to pH<2	28 days
TOX	450.0	Glass, teflon lined cap	Cool 4°C, 1 ml 0.1 M sodium sulfite	7 days
TPH	California Method	Glass, teflon lined cap	Cool, 4°C. No Headspace.	7 days (extract) 40 days (analyze)
TPH	418.1	Glass, teflon lined cap	Cool, 4°C. H_2SO_4 to pH<2	28 days

Chain-of-Custody measures are followed to allow for the tracing of possession and handling of individuals samples from the time of field collection through laboratory analysis.

DECONTAMINATION PROTOCOL

Reusable sampling equipment is decontaminated after each use as follows:

1. Non-phosphate detergent plus tap water wash.
2. Tap-water rinse.
3. Deionized water rinse.
4. 10 percent nitric acid rinse.*
5. Deionized water rinse.*
6. Acetone rinse.**
7. Air Dry.**
8. Deionized water rinse.**

* only if sample is analyzed for metal
** only if sample is analyzed for organic constituents

Drilling equipment, including hollow stem augers, drill rods, drill bits, etc., are pressure-cleaned prior to use at each boring followed by a non-phosphate detergent plus tap water wash.

LABORATORY ANALYSES

All samples are collected by qualified Omega personnel in accordance with established sampling and decontamination protocols.

Preservation techniques, holding times, containerization and laboratory methods for a variety of soil and aqueous samples are described in the Table below.

Halogenated and Aromatic Volatile Organic Compounds (includes BTEX)	601/602 624/625 8010/8020 8240/8270	Glass, teflon lined cap	Cool, 4°C.	7 days
Arsenic	206.3	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.
Barium	200.7	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.
Cadmium	213.2	Poly., Glass	HNO_3 to pH<2 or, in soil, Cool, 4°C.	6 mos.

The Chain of Custody program includes the following:

1. Sample labels
2. Sample seals
3. Field logbook
4. Chain-of-Custody Form
5. Sample analysis request sheets
6. Laboratory analysis logbook

UNDERGROUND LINE LOCATION

Underground line location is performed by visual inspection of above ground connections and surface features, marking by Miss Utility (in Virginia), inspection of public records, discussions with local residents, and by tracing with a magnetic line locator.

JOB TRAINING AND SAFETY PROCEDURES

Omega field personnel complete a 40-hour Health and Safety Training course that complies with OSHA 1910.120(e)(2). Field personnel attend an annual Health and Safety refresher course. Field supervisors complete and 8-hour supervisory training course to comply with OSHA 1910.120(e)(3).

Omega employees will be CPR (Cardiopulmonary Resuscitation) and First Aid certified.

Omega employees will wear appropriate safety equipment at all times.

Omega employees who are 40-hour health and safety trained will undergo periodic medical monitoring.

Omega employees will undergo random drug screening.

LIMITATIONS

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with customary principles and practices in the fields of geology and environmental science. This warranty is in lieu of all other warranties either expressed or implied. This company is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration and laboratory test data presented in this report.

The work performed in conjunction with this assessment and the data developed are intended as a description of available information at the dates and locations given. This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

NCDENR

JAMES B. HUNT JR.
GOVERNOR

WAYNE MCDEVITT
SECRETARY

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
WINSTON-SALEM REGIONAL OFFICE

DIVISION OF WASTE MANAGEMENT
UST SECTION

September 2, 1999

CERTIFIED MAIL P-536 306 719
RETURN RECEIPT REQUESTED

Mr. Chadd Wall
Dan River Oil Company
202 N. Dalton Street
Madison, NC 27025

Subject: Friendly Food Mart # 6, Route 2 Box 733, Walnut Cove, Stokes County, Incident Number 19490, Risk Classification Pending

Dear Mr. Wall:

The Division of Waste Management (DWM) Winston-Salem Regional Office is in the process of reviewing Limited Site Assessment Report, dated June 9, 1999, and Underground Storage Tank Closure Report, dated July 30, 1998 for the subject site. In order to complete this report the following information should be submitted to our office.

Closure Report Comments

1) Soil closure samples should be taken every 20 feet along the product line and analyzed using the appropriate analytical methods. Based on Figure 2, soil sample P1 is in the appropriate location. However, the sample was not analyzed. A soil sample should be taken in the P1 location and analyzed for the appropriate analytical methods.

Limited Site Assessment Comments

1) A map should be provided that clearly depicts properties within a 1,000 foot radius of the site and water supply wells. Water wells listed on the Water Supply Well Information Table should be able to be correlated with the water wells on the map. Tax maps are often times useful for this purpose. Surface water bodies, within 500 feet of the site, should also be depicted on the map.

2) A map should be provided that clearly depicts the site location as well as all schools, day care centers, hospitals, playgrounds, parks, recreation areas, churches, nursing homes, or other places of public assembly within a 1,000 foot radius of the site. Also, identify the zoning status of the area within the 1,000 foot radius.

3) In the Closure Report it states, on page 4, that the nearest surface water body is located about 400 feet to the north of the subject site. However, in the Limited Site Assessment Report, it is stated that the nearest surface water body is located about 900 feet to the north of the subject stie. This should be clearified.

4) A map should be provided that depicts all of the subsurface structures (sewers,utility lines, conduits, basements, septic tanks, leach fields, floor and storm drains, etc.).

5) A map should be provided that depicts the site, the adjacent properties, and all properties where the contamination is predicted to migrate. The properties, on the map, should be able to be correlated with the table of property owners.

6) Table 3a lists the total BTEX of soil samples. However, the standards do not use total BTEX. The standards use individual chemical constituents. In a table, for each soil sample provide the sampling depth, sample identification, date of sampling, sample analyses method, and analytical results of all chemicals detected above the method detection limit. Identify the samples that exceed the soil-to-groundwater maximum contaminant concentrations or the residential maximum contaminant concentration, whichever are lower.

7) Table 4a lists the total BTEX of groundwater samples. However, the standards do not use total BTEX. The standards use individual chemical constituents. In a table, list the monitoring well identification numbers, date of sampling, sample analyses method and analytical results of all chemicals detected above the method detection limit. Identify the chemicals that exceed the groundwater standards and the gross contaminant standards.

8) Groundwater needs to be sampled for 504.1.

9) It is noted, on page 7, that a door-to-door survey was done to gain water supply well information. However, it was not stated that every property owner was spoken to during this door-to-door survey. Often times property owners are not available at the time a door-to-door survey is done. Personal contact with every property owner, in addition to a visual survey, is required to verify whether there is a water well located at the properties within a 1,000 foot radius of the subject site and to determine the usage and construction of the water wells. It must not be assumed that a property dose not have a water well or that a water well is not used for drinking if the property has a water meter. If personal contact cannot be made with a property owner within the 1,000 foot radius, the names, addresses and telephone numbers of the property owners should be provided to the Department.

If personal contact was made with every property owner within a 1,000 foot radius of the site then it must be stated that personal contact was made with all property owners within a 1,000 foot radius of the site. The methods of personal contact must be described in detail.

If personal contact is made in the form of a letter, an explanation as to why well information is needed must be provided, in the letter, because property owners may be suspicious as to why this information is being requested. They should understand that it is in their best interest to report well information. Property owners must be informed that the presence of wells located within 1,000 feet of where the petroleum release occurred will determine the level to which the soil and groundwater will be cleaned up with higher cleanup standards being required in areas where water wells have the potential of becoming contaminated from the petroleum release. If this type of personal contact is made, then a

copy of the letter must be provided to the Department.

Please submit this information within 45 days from receipt of this letter. If you have any questions or comments please contact me at (336) 771-4600.

Sincerely,

Linda Estkowski

Linda Estkowski
Hydrogeologist II

cc: Winston-Salem Regional Office

omega
environmental
services

October 12, 1999
Omega Project Number R98-142

Linda Estkowski
NCDENR-UST Section
585 Waughtown Street
Winston-Salem, North Carolina 27107

Reference: LSA-Attachment
Friendly Food Mart # 6
Route 2, Box 733
Walnut Cove, North Carolina 27052

Dear Ms. Estkowski:

As requested in your letter dated September 2, 1999, Omega Environmental Services respectfully submits the following information to assist in your review of the Limited Site Assessment for the above referenced site. Please find enclosed a copy of the Attachment to be included in the Limited Site Assessment Report. If you have any questions regarding this information, or if we can be of further assistance, please feel free to contact the undersigned at (336) 286-3337.

Closure Report Comments

1) During the UST closure the soil sample collected from location P1 was analyzed using the appropriate methods. In Table 2 the results were inadvertently reported as not sampled(NS). The results for all parameters tested indicated BDL concentrations. Analytical results included in Appendix C of the report confirm this fact.

Limited Site Assessment Comments

1) As suggested in Groundwater Section Guidelines, all water wells located with in 1,000 feet of the site were indicated on a 7 ½ minute USGS topographic map. At your request a tax map of the area depicting all known water wells within 1,000 feet of the site is enclosed. No surface water bodies with in 500 feet were located during this investigation

2) As suggested in the Groundwater Section Guidelines, areas of public assembly were indicated on a 7 ½ minute USGS topographic map. At your request, a tax map of the area depicting all known areas of public assembly within 1,000 feet of the site is enclosed.

3) During closure of the UST system, a field estimated measurement of the distance from the site to Town Fork Creek was indicated in the closure report to be approximately 400 feet. Based upon USGS 7 ½ minute topographic map measurements, the distance appears to be approximately 900 feet. Omega suggests that 900 feet would be the most accurate measure.

4) All known underground water, sewer, septic and other conduits have been added to the enclosed site plan.

5) Because the site is situated on a corner lot adjacent properties are shown on the site plan as grassed areas or road ways. Please refer to tax map 2A for indication of property boundaries. To determine areas where contamination is expected to migrate would require completion of a slug test. At this time determination of plume migration would be speculative.

6) A table showing individual BTEX concentrations is included as Table 3.

7) Table 4a shown in the LSA did list individual BTEX concentrations in groundwater. Indication of samples exceeding groundwater standards and GCL's have been included as Tables 4a and 4B.

8) At your request per earlier telephone conversations, monitor wells MW-1, MW-2 and MW-5 were sampled and analyzed using method 504.1 for EDB. Analytical results will be submitted upon completion of analysis.

9) Following methods suggested in the Groundwater Section Guidelines a receptor survey was completed. Town officials were interviewed, a search for well houses and water meters was conducted and a door to door survey of every business or resident in the area within 1,000 feet of the site was completed. Table 2 indicates the name and address of each property owner or occupant within 1,000 feet of the site.

If you have any questions please contact me at (336) 286-3337.

Sincerely
OMEGA ENVIRONMENTAL SERVICES

Jason B. Johnson, CPG
Project Manager

cc: Chad Wall, President
Dan River Oil Company

Enclosures:

TABLE 3. Soil Chemical Analyses (BTEX)							
Location	Sample Depth (feet)	Sample date	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-Benzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)
LSA - June 1999							
MW-1	5'	11/4/98	BDL	BDL	BDL	0.5	0.5
MW-1	10'	11/4/98	0.3*	1.1	0.4*	3.2	5.0
MW-1	15'	11/4/98	BDL	0.6	0.8*	4.8	6.2
MW-1	20'	11/4/98	BDL	BDL	BDL	BDL	BDL
MW-1	25'	11/4/98	BDL	BDL	BDL	BDL	BDL
MW-1	30'	11/4/98	BDL	BDL	BDL	BDL	BDL
MW-2	10'	1/13/99	BDL	5.87	3.76*	20.2*	29.83
MW-3	10'	1/6/99	BDL	BDL	BDL	BDL	BDL
MW-4	15'	1/6/99	BDL	BDL	BDL	BDL	BDL
MW-5D	10'	1/6/99	BDL	0.017	0.038	0.320	0.375
MSCC			0.0056	7	0.24	5	na

Note: MSCC = Maximum Soil Contaminant Concentration-Soil to Groundwater Classification
BDL = Below Detection Limits
* = Exceeds MSCC
mg/kg = milligram per kilogram = parts per million

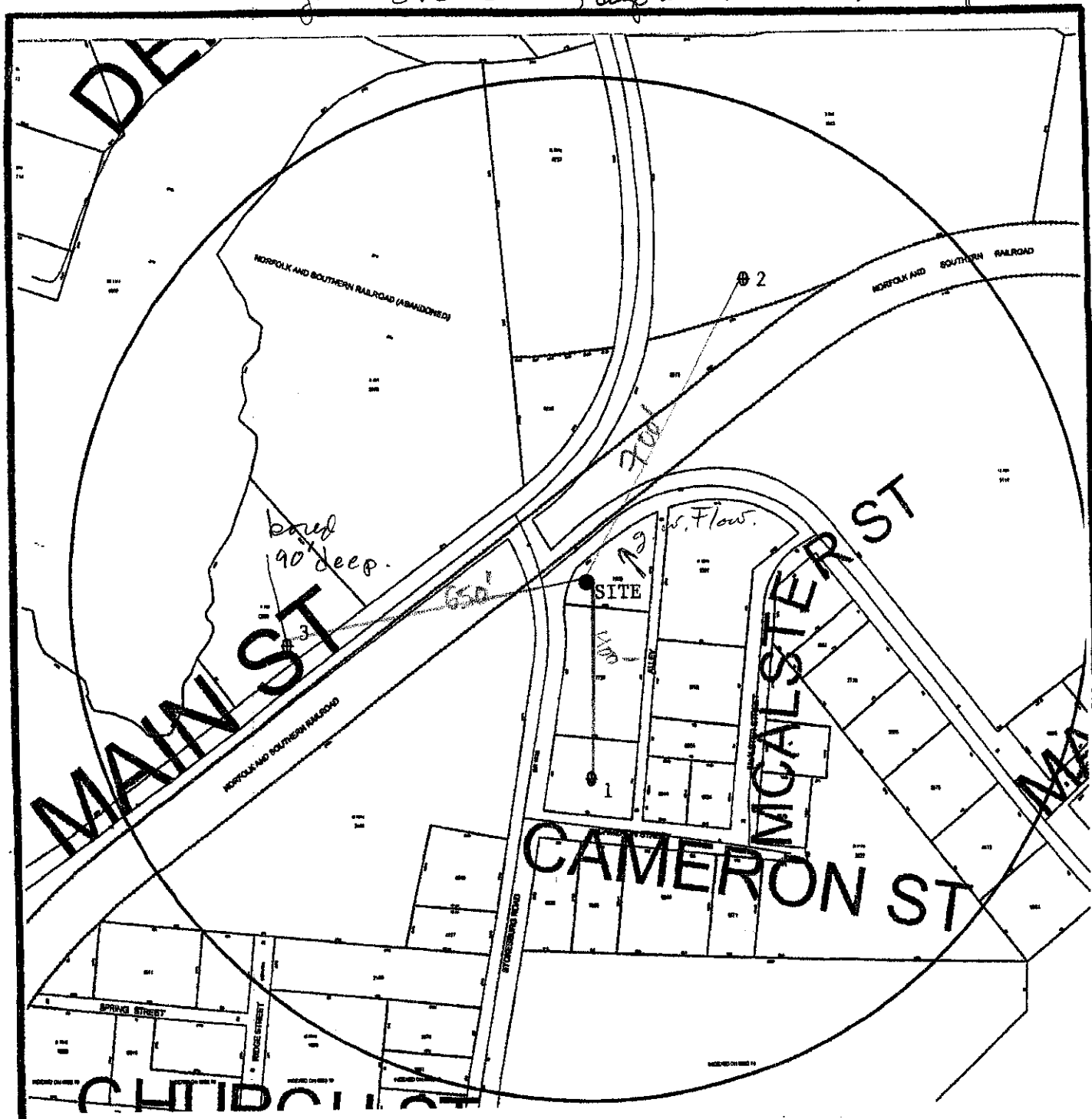
TABLE 4a. Groundwater Chemical Analyses (BTEX) Method 601/602						
Location	Sample Date	Benzene (ug/l)	Toluene (ug/l)	Ethly-benzene (ug/l)	Xylenes (ug/l)	Total BTEX (ug/l)
LSA - June 1999						
MW-1	11/9/98	440.0*	700.0	110.0*	1210.0*	2450.0
MW-2	1/21/99	6180.0**	11900.0*	2180.0*	14570.0*	34830.0
MW-3	1/21/99	150.0*	310.0	30.0*	380.0	870.0
MW-4	1/21/99	BDL	BDL	BDL	BDL	BDL
MW-5D	1/21/99	BDL	BDL	BDL	BDL	BDL
GCL's		5,000	257,500	29,000	87,500	--
NCGWS		1.0	1000.0	29.0	530.0	--

Note:
BDL = Below Detection Limits
NCGWS = Exceeds North Carolina Groundwater Standards
GCL's = Exceeds Gross Contaminant Levels
ug/l = microgram per liter = parts per billion

Table 4b. Groundwater Chemical Analyses (Other)							
Location	Sample Date	Lead (mg/l)	MTBE (ug/l)	Isopropyl Ether (ug/l)	C5-C8 Aliphatics (mg/l)	C9-C12 Aliphatics (mg/l)	C9-C10 Aromatics (mg/l)
LSA - June 1999							
MW-1	11/9/98	BDL	BDL	BDL	5.44	3.12	1.49
MW-2	1/21/99	BDL	9660.0*	BDL	42.1	49.3	19.4
MW-3	1/21/99	BDL	240.0*	BDL	3.06	1.91	0.825
MW-4	1/21/99	BDL	12.0	BDL	BDL	BDL	BDL
MW-5D	1/21/99	BDL	20.0	BDL	BDL	BDL	BDL
NCGWS		0.015	200.0	70.0	65.0	57.0	21.0

Note:
BDL = Below Detection Limits
mg/l = milligram per kilogram = parts per million
ug/l = microgram per liter = parts per billion
* = Exceeds North Carolina Groundwater Standard

g.w. ± 12' BGS.; deep well (MW-5D) 50' deep never hit bedrock



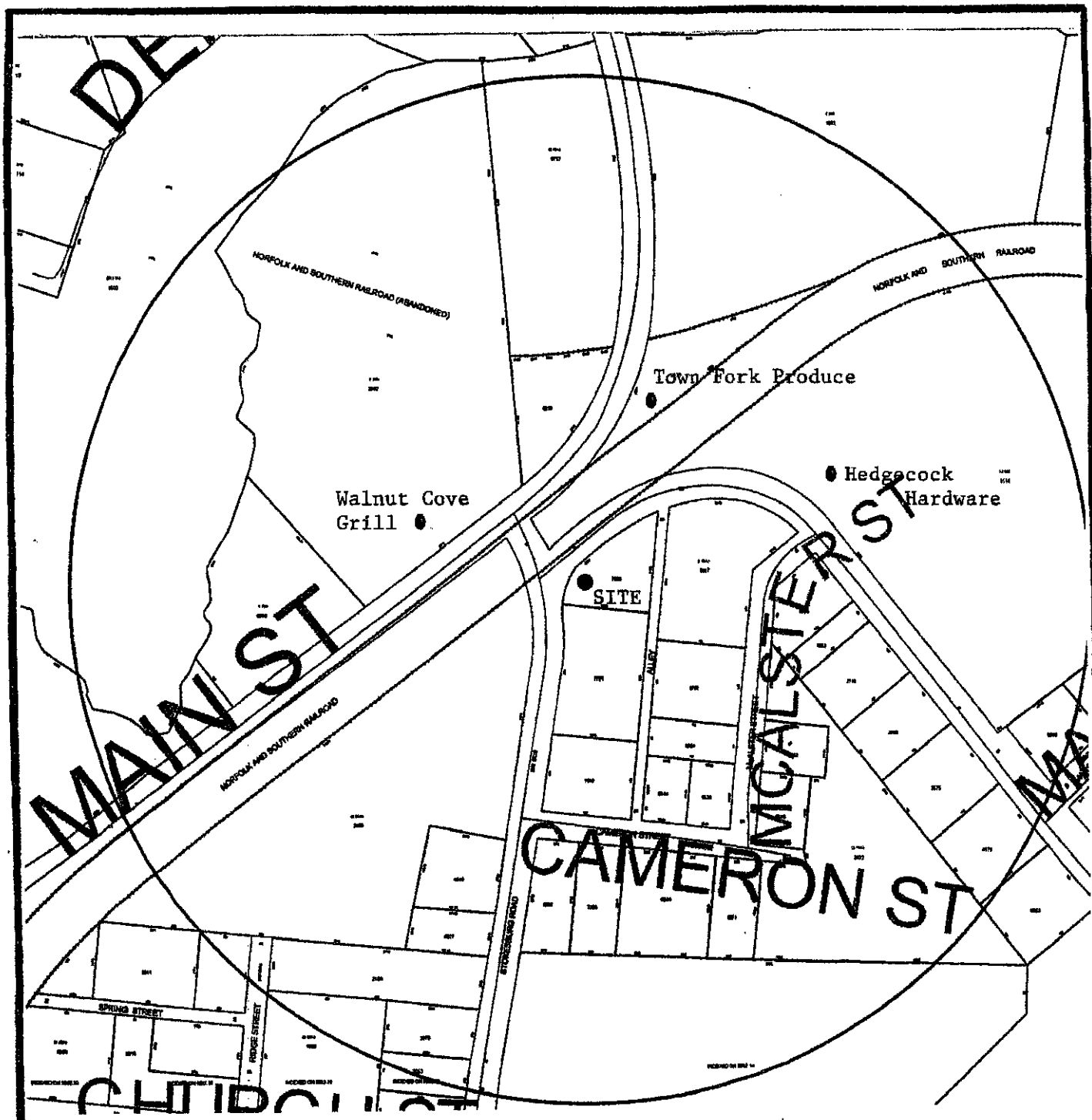
SCALE
1 inch = 0.05 mile
1 inch = 285 feet

N

SURVEY MAP OF WALNUT COVE, NC
Stokes County Department of Revenue Tax Map

1. Terry Meeks Well
2. Piedmont Concrete Well
3. Carwash Well Charlie Bowman

FIGURE NO.: FIGURE 1A	
FIGURE NAME: Site Vicinity Map Showing Supply Wells Within 1000 Feet	
CLIENT: DAN RIVER OIL	R98-142
SITE: Friendly Food Mart #6	DATE: 9/30/99



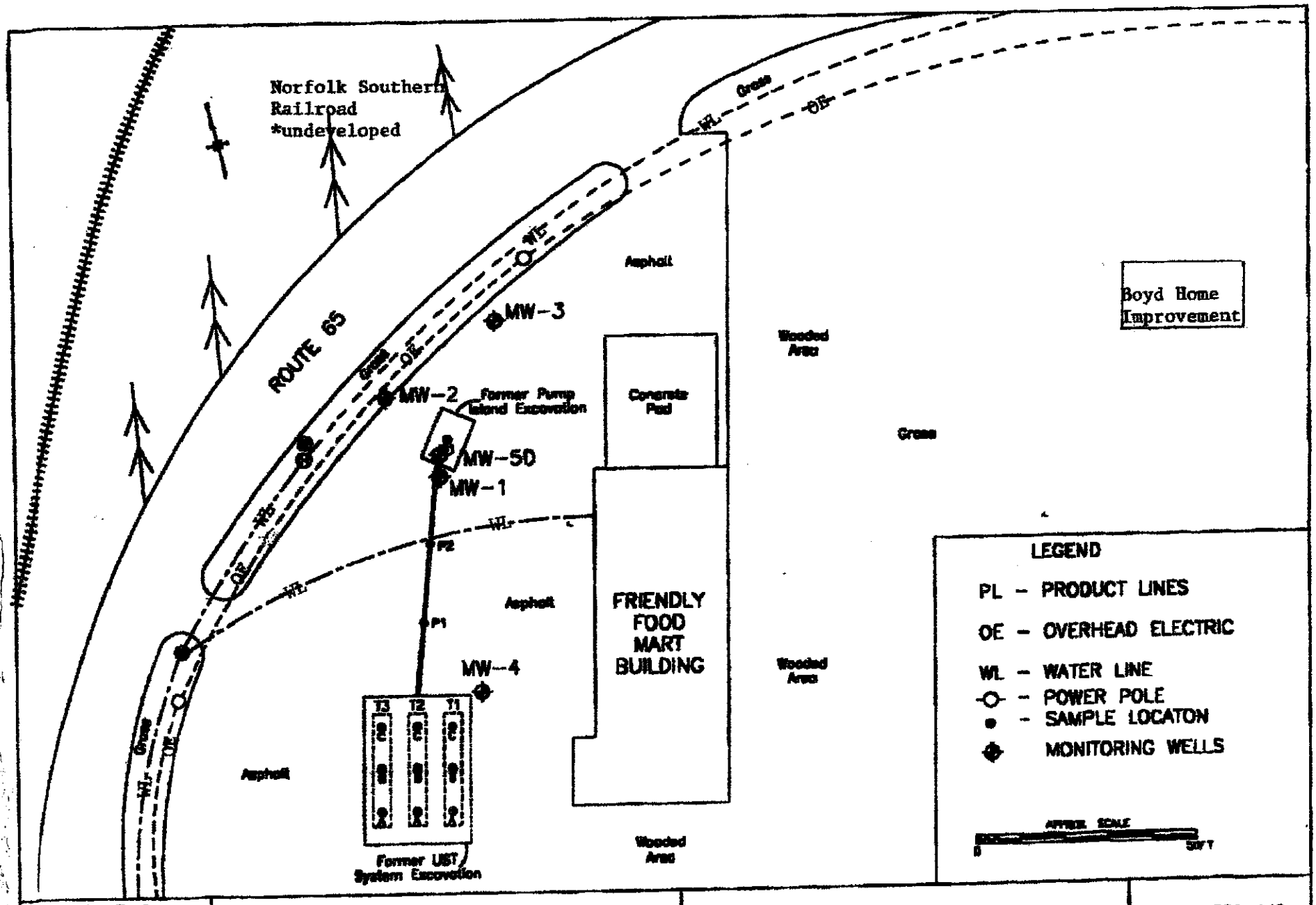
SCALE
1 inch = 0.05 miles
1 inch = 285 feet

N

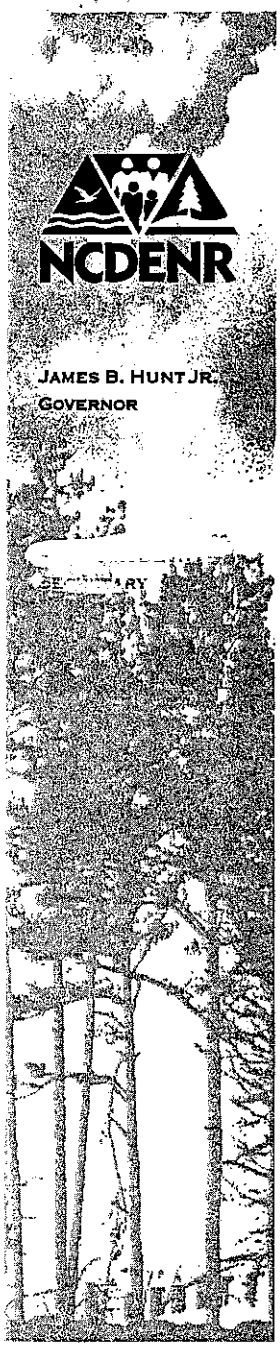
SURVEY MAP OF WALNUT COVE, NC

Stokes County Department of Revenue Tax Map

FIGURE NO.: FIGURE 2A	
FIGURE NAME: Areas of Public Assembly	
CLIENT: DAN RIVER OIL	R98-142
SITE: Friendly Food Mart #6	DATE: 9/30/99



OMEGA ENVIRONMENTAL SERVICES	FIGURE NO.: 3 FIGURE NAME: DETAILED SITE MAP	CLIENT: DAN RIVER OIL COMPANY SITE: FRIENDLY FOOD MART #6	JOB NO.: R98-142 DATE: 5/1/99



NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
WINSTON-SALEM REGIONAL OFFICE

DIVISION OF WASTE MANAGEMENT
UST SECTION

February 23, 2000

CERTIFIED MAIL P-536 307 768
RETURN RECEIPT REQUESTED

Mr. Chadd Wall
Dan River Oil Company
202 N. Dalton Street
Madison, NC 27025

Subject: Friendly Food Mart # 6, Route 2 Box 733, Walnut Cove, Stokes County, Incident Number 19490, Risk Classification Pending

Dear Mr. Wall:

The Division of Waste Management (DWM) Winston-Salem Regional Office has reviewed Limited Site Assessment Report (LSA), dated June 9, 1999, and the supplement to the LSA, dated October 15, 1999. The following comments are a result of this review.

1) Groundwater analyses for method 504.1 needs to be submitted.

2) It is stated in the October 12, 1999 supplement to the LSA report that "a door to door survey of every business or resident in the area within 1,000 feet of the site was completed". However, often times people are not at the property to speak to when door-to-door surveys are done. It needs to be stated specifically that an interview was conducted with the property owner or a representative of the property owner at every property within a 1,000 foot radius of the subject site to determine if there is a water well on the property. If this was not done, please see comment number 9 in the letter dated September 2, 1999 (Estkowski to Wall).

NOTE: The requested additional information must be signed and sealed by either a professional engineer or a licensed geologist.

Please submit this information within 30 days from receipt of this letter. If you have any questions or comments please contact me at (336) 771-4600.

Sincerely,

Linda Estkowski

Linda Estkowski
Hydrogeologist II

cc: Winston-Salem Regional Office

585 WAUGHTOWN STREET, WINSTON-SALEM, NORTH CAROLINA 27107
PHONE 336-771-4600 FAX 336-771-4632

50/4.

omega
environmental
services

March 22, 2000
Omega Project Number R98-142

Linda Estkowski
NCDENR-UST Section
585 Waughtown Street
Winston-Salem, North Carolina 27107

Reference: LSA-Attachment #2
Friendly Food Mart # 6,
Route 2, Box 733
Walnut Cove, North Carolina 27052
Incident # 19490

Dear Ms. Estkowski:

As requested in your letter dated February 23, 2000, Omega Environmental Services respectfully submits the following information to assist in your review of the Limited Site Assessment for the above referenced site. Please find enclosed a copy of the Attachment to be included in the Limited Site Assessment Report. If you have any questions regarding this information, or if we can be of further assistance, please feel free to contact the undersigned at (336) 286-3337.

Limited Site Assessment Comments

1) Groundwater analyses for method 504.1 are enclosed. Results indicate no detectable EBD concentrations.

2) An interview was conducted with the property owner or representative of every property within 1000 feet of the site to determine if there is a water well present on their property.

If you have any questions please contact me at (336) 286-3337.

Sincerely
OMEGA ENVIRONMENTAL SERVICES

NORTH CAROLINA LICENSED SEAL 1668 GEOLOGIST JASON B. JOHNSON

Jason B. Johnson, PG
Project Manager

cc: Chad Wall, President
Dan River Oil Company

AIR WATER & SOIL Laboratories, Inc.
2119A North Hamilton Street • Richmond, Virginia 23230 • Tel: (804)358-8295 Fax: (804)358-8297
North Carolina Certification #495

Certificate of Analysis

Client Name:	Omega Environmental Services	Date Received:	October 14, 1999
Client Project I.D.:	Friendly Food Mart #6/R98-142	Date Issued:	October 21, 1999
Submitted to:	Jason Johnson		

Reference Method: EPA method 504.1

Three water samples were analyzed for Ethylene Dibromide.

Sample I.D.	EDB (ug/L)
MW-1	< 0.02
MW-2	< 0.1
MW-50	BDL
Detection Limit	0.01

BDL - Below Detection Limit

Note: Matrix interference on above samples from gasoline range organics.

Carmela L. Tombes
Laboratory Director

99108958

CHAIN OF CUSTODY TRACKING FORM

Omega

PAGE 1 OF 1

LAB DESTINATION: AWS
SEND LAB RESULTS TO: Jason Johnson Greensboro NC OES
SEND BILLING TO: Lakeland FL OES
LEGAL CUSTODY: PRECLEANED CONTAINERS VERIFIED AND RELINQUISHED BY:

PROJECT NO.	PROJECT NAME	LOCATION
R48-142	Friendly Food Mart #6	Walnut Cove, NC

SAMPLED BY: Jason Johnson [signature]

SAMPLE NUMBER	LAB ID	COLLECTION DATE	COLLECTION TIME	SAMPLE MATERIAL	NUMBER OF CONTAINERS	FIELD READINGS pH	FIELD READINGS COND.	FIELD READINGS TEMP.	ANALYSES REQUESTED: 504.1 EDB	REMARKS
MW-1	-OEG100	10/13	10:00	GW	2				X	Normal TAT
MW-2	-" 101	"	11:30	"	2				X	
MW-50	-" 102	"	11:55	"	2				X	

SPECIAL INSTRUCTIONS: NC Trust Fund Job. DO# 41-3070

RELINQUISHED BY	DATE	TIME	RECEIVED BY
[signature]	10/13	9:00	Jennifer Walton
RELINQUISHED BY	DATE	TIME	RECEIVED BY COMMON CARRIER

RELINQUISHED BY	DATE	TIME	RECEIVED BY
	10/14/99	9:50	
RELINQUISHED BY	DATE	TIME	RECEIVED AT LAB BY

DWG: CHART32

North Carolina Department of Environment and Natural Resources

Pat McCrory, Governor

Division of Waste Management
UST Section

John E. Skvarla, III, Secretary
Dexter R. Matthews, Director

February 27, 2013

CERTIFIED MAIL 7011 1570 0001 8546 1074
RETURN RECEIPT REQUESTED

Mr. Chad Wall
Dan River Oil Company
202 N. Dalton Street,
Madison, NC 27025

Re: Notice of Regulatory Requirements
15A NCAC 2L .0407(I)
Risk-based Assessment and Corrective Action for
Petroleum Underground Storage Tanks

Friendly Food Mart #6
Route 2 Box 733
Stokes County
Incident Number: 19490
Risk Classification: Intermediate
Ranking: I144D

Dear Mr. Wall:

The subject incident has been determined by the Department, in response to North Carolina General Statute (NCGS) 143-215.94E(e4), to be of sufficiently high priority to allow funding by the State Trust Fund Program. Therefore, you are directed to proceed with assessment or remediation activities. Specifically, you are required to submit a monitoring report in accordance with the Underground Storage Tank guidelines within 30 days of receipt of this letter.

Effective October 1, 2004, the Department requires that all work following the submittal of the Limited Site Assessment Report (Title 15A NCAC 2L .0405) be preapproved if State Trust Fund reimbursement is anticipated. To comply with this requirement, a completed Preapproval/Claim Authorization Form, encompassing the required remedial activities, must be received in this office within 14 days of the date of this letter. Upon completion of the preapproved activities, you should submit your claim promptly. Reimbursement funds are budgeted based on completed preapprovals, but lengthy delays in reimbursement can occur if claims are not submitted immediately following work completion.

Please note that performing assessment and cleanup work that is not required under 15A NCAC 2L .0400 is not reimbursable from the Commercial or Noncommercial Leaking Petroleum Underground Storage Tank Cleanup Funds.

If you have any questions regarding the actions that must be taken or the rules mentioned in this letter, please contact me at the address or telephone number listed below. If you have any questions regarding trust fund eligibility or reimbursement, please contact the UST Section Trust Fund Branch at (919) 707-8171.

Sincerely,

Thomas Moore
Hydrogeologist
Winston-Salem Regional Office

cc: Stokes County Health Department

UST Regional Offices

Asheville (ARO) – 2090 US Highway 70, Swannanoa, NC 28778 **(828) 296-4500**

Fayetteville (FAY) – 225 Green Street, Suite 714, Systel Building, Fayetteville, NC 28301 **(910) 433-3300**

Mooresville (MOR) – 610 East Center Avenue, Suite 301, Mooresville, NC 28115 **(704) 663-1699**

Raleigh (RRO) – 1628 Mail Service Center, Raleigh, NC 27699 **(919) 791-4200**

Washington (WAS) – 943 Washington Square Mall, Washington, NC 27889 **(252) 946-6481**

Wilmington (WIL) – 127 Cardinal Drive Extension, Wilmington, NC 28405 **(910) 796-7215**

Winston-Salem (WS) – 585 Waughtown Street, Winston-Salem, NC 27107 **(336) 771-5000**

Guilford County Environmental Health, 400 West Market Street, Suite 300, Greensboro, NC 27401, **(336) 641-3771**

NCDENR
North Carolina Department of Environment and Natural Resources

Pat McCrory, Governor

Division of Waste Management
UST Section

John E. Skvarla, III, Secretary
Dexter R. Matthews, Director

May 30, 2013

Mr. Chard Wall
Dan River Oil Company
202 N. Dalton Street
Madison, NC 27025

Subject: Friendly Food Mart #6, 403 Stokesburg Road, Walnut Cove, Stokes County, Incident Number 19490, Risk Classification: Intermediate, Ranking: 144

Dear Mr. Wall,

Our office has reviewed the Groundwater Monitoring Report, dated May 22, 2013, for the above referenced site. Based on the review, it has been determined that the following needs to be conducted in order to complete the report:

1.) Unearth monitoring well MW-2 and sample the groundwater using the appropriate analytical methods.

Please **submit the above-requested information by July 10, 2013**. If you have questions, please contact me at the address or telephone number below.

Sincerely,

Linda Estkowski
Hydrogeologist
Winston-Salem Regional Office

cc: WSRO
Chris Hay
Kleinfelder
313 Gallimore Dairy Rd.
Greensboro, NC 27409

Fayetteville (FAY) – 225 Green Street, Suite 714, Systel Building, Fayetteville, NC 28301 **(910) 433-3300**

Mooresville (MOR) – 610 East Center Avenue, Suite 301, Mooresville, NC 28115 **(704) 663-1699**

Raleigh (RRO) – 1628 Mail Service Center, Raleigh, NC 27699 **(919) 791-4200**

Washington (WAS) – 943 Washington Square Mall, Washington, NC 27889 **(252) 946-6481**

Wilmington (WIL) – 127 Cardinal Drive Extension, Wilmington, NC 28405 **(910) 796-7215**

Winston-Salem (WS) – 585 Waughtown Street, Winston-Salem, NC 27107 **(336) 771-5000**

Guilford County Environmental Health, 400 West Market Street, Suite 300, Greensboro, NC 27401, **(336) 641-3771**

North Carolina Department of Environment and Natural Resources

Pat McCrory, Governor

Division of Waste Management
UST Section

John E. Skvarla, III, Secretary
Dexter R. Matthews, Director

November 1, 2013

To: Robert Davies, Corrective Action Branch Head, Raleigh Central Office, UST Section

From: Linda Estkowski, Winston-Salem Regional Office, UST Section LE

Subject: Friendly Food Mart #6, 403 Stokesburg Road, Walnut Cove, Stokes County, Incident Number 19490, Risk Classification: Intermediate, Ranking: 144, Request for State Lead

The responsible party, Dan River Oil Company, Inc., has indicated financial inability to conduct the necessary work at the above-referenced site. Could you please conduct a financial review in order to determine if the site is eligible for State Lead.

Please see the enclosed letter dated September 24, 2013 (Tucker and Wall to Estkowski). Please note that Bonnie's Grocery (incident #12787), also referenced in this letter, has already been submitted for State Lead.

LAW OFFICES
FOLGER, TUCKER & DALLAS, P.A.
117 E. Murphy Street
MADISON, NORTH CAROLINA 27025

A. D. Folger, Jr. (1922-2000)
Benjamin F. Tucker
D. Haynes Dallas, Jr.

Telephone:
336-548-2309
Facsimile:
336-548-1751

2013

September 24, 2013

Linda Estkowski
North Carolina Department
of Environment and Natural Resources
585 Waughtown Street
Winston-Salem, NC 27107

Re: Assessment and Corrective Action for Petroleum Underground Storage Tanks
Friendly Food Mart #6 and Bonnie's Grocery

Dear Ms. Estkowski:

I am writing to you on behalf of my client Dan River Oil Company (hereinafter Dan River) in connection with the above-captioned matters. Mr. Chadwick Wall, an officer of Dan River, tells me that under the current N.C. State guidelines, Dan River is required to pay for the initial corrective actions regarding underground storage tanks and that the State at some point thereafter reimburses Dan River for its expenses. Unfortunately, because of current economic conditions Dan River is unable to sustain sufficient cash flow to continue to operate its business and at the same time pay for the ongoing remedial activities. Such an expense will create a significant financial burden upon the Company and will adversely affect the Company's ongoing business activities.

On behalf of my client I would ask that you forward this letter to the appropriate N.C. State Agency official with our request that the State of North Carolina pay the corrective action costs directly rather than requiring Dan River to immediately pay such costs and receive reimbursement at a later date.

If I need to provide you with additional information, please contact me.

Sincerely,

FOLGER, TUCKER & DALLAS, P.A.

By: _____
Ben F. Tucker

BFT:mh

Dan River Oil Company

By: _____
Chad Wall

North Carolina Department of Environment and Natural Resources

Pat McCrory, Governor

Division of Waste Management
UST Section

John E. Skvarla, III, Secretary
Dexter R. Matthews, Director

August 8, 2013

Mr. Chard Wall
Dan River Oil Company
202 N. Dalton Street
Madison, NC 27025

Subject: Friendly Food Mart #6, 403 Stokesburg Road, Walnut Cove, Stokes County, Incident Number 19490, Risk Classification: Intermediate, Ranking: 144

Dear Mr. Wall,

Our office has reviewed the Groundwater Monitoring Report, dated May 22, 2013, and the supplemental information for that report, dated August 5, 2013. Based on the review, it has been determined that an mmpe event should be conducted on monitoring well MW-2.

Please **submit a mmpe report to our office by November 1, 2013**. If you have questions, please contact me at the address or telephone number below.

Sincerely,

Linda Estkowski
Hydrogeologist
Winston-Salem Regional Office

cc: WSRO
Chris Hay
Kleinfelder
313 Gallimore Dairy Rd.
Greensboro, NC 27409

UST Regional Offices

Asheville (ARO) – 2090 US Highway 70, Swannanoa, NC 28778 **(828) 296-4500**

Fayetteville (FAY) – 225 Green Street, Suite 714, Systel Building, Fayetteville, NC 28301 **(910) 433-3300**

Mooresville (MOR) – 610 East Center Avenue, Suite 301, Mooresville, NC 28115 **(704) 663-1699**

Raleigh (RRO) – 1628 Mail Service Center, Raleigh, NC 27699 **(919) 791-4200**

Washington (WAS) – 943 Washington Square Mall, Washington, NC 27889 **(252) 946-6481**

Wilmington (WIL) – 127 Cardinal Drive Extension, Wilmington, NC 28405 **(910) 796-7215**

Winston-Salem (WS) – 585 Waughtown Street, Winston-Salem, NC 27107 **(336) 771-5000**

Guilford County Environmental Health, 400 West Market Street, Suite 300, Greensboro, NC 27401, **(336) 641-3771**

Estkowski, Linda

From: Estkowski, Linda
Sent: Tuesday, May 13, 2014 7:05 PM
To: Davies, Robert
Cc: Estkowski, Linda
Subject: RE: financial review status request

An LSA was done in 1999, with 5 monitoring wells, and the groundwater plume is defined well enough. There is one monitoring well, with 4 inches of free product, which makes this an intermediate site. Free product needs to be eliminated (will try surfactants). The site may also need mmpe or natural attenuation if dissolved contaminants are above gross after using surfactants. In addition, a couple of soil samples need to be taken, in hot spots, to confirm soil is beneath industrial standards. Then, we can close with a nrp.

Linda

Linda Estkowski
NC DENR Winston-Salem Regional Office
Division of Waste Management, UST Section
585 Waughtown Street
Winston-Salem, NC 27107
Voice: (336) 771-5000
FAX: (336) 771-4632

Changes to the tables of approved methods for groundwater analysis in all UST Section Correctove Action Guidelines. Click on the link below for details: http://portal.ncdenr.org/web/wm/ust/whatsnew

-----Original Message-----
From: Davies, Robert
Sent: Wednesday, May 07, 2014 10:46 AM
To: Estkowski, Linda
Subject: RE: financial review status request

Linda,

I don't have any record of a financial referral for Friendly Food Mart. What do they need to do out there? I need a cost estimate of the required work. When you get me a cost estimate or let me know the required work e.g. perform a LSA then I'll talk to Leann since she already did a review of the RP and see if we can move this along faster than normal. Thanks.

Bob

Robert K. Davies, Head
Corrective Action Branch
NC DENR/DWM/UST Section
1637 Mail Service Center
Raleigh, NC 27699-1637

Tel: 919-707-8298
Fax: 919-715-1117

-----Original Message-----
From: Estkowski, Linda
Sent: Tuesday, May 06, 2014 6:44 PM
To: Davies, Robert
Cc: Estkowski, Linda
Subject: financial review status request

Hello Bob,

I hope all is well with you. I am writing to request the status of a financial review request for the Friendly Food Mart #6 (inc. # 19490) that was submitted on Nov. 1, 2013. Please see the attached.

Thanks,
Linda

Linda Estkowski
NC DENR Winston-Salem Regional Office
Division of Waste Management, UST Section
585 Waughtown Street
Winston-Salem, NC 27107
Voice: (336) 771-5000
FAX: (336) 771-4632

Changes to the tables of approved methods for groundwater analysis in all UST Section Correctove Action Guidelines. Click on the link below for details: http://portal.ncdenr.org/web/wm/ust/whatsnew

-----Original Message-----
From: NC DENR Winston-Salem [mailto:DoNotReply@NCDENR.gov]
Sent: Tuesday, May 06, 2014 6:41 PM
To: Estkowski, Linda
Subject: Send data from TOSHIBAUST 2014/05/06 18:41

Scanned from TOSHIBAUST

Date: 2014/05/06 18:41
Pages: 3
Resolution: 200x200 DPI

Scanned at NC DENR Winston-Salem Regional Office

Waste Management
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

LINDA CULPEPPER
Director

December 4, 2015

MEMORANDUM

TO: Robert Davies, Corrective Action Branch Head, Raleigh Regional Office, UST Section

FROM: Linda Estkowski, Winston-Salem Regional Office, UST Section

SUBJECT: Friendly Food Mart #6, 403 Stokesburg Rd., Walnut Cove, Stokes County, Incident # 19490, Risk Classification: Intermediate 144, Request for State Lead

This site is being submitted to the State Lead Program because the responsible party, Dan River Oil Company, Inc., has indicated financial inability to conduct the necessary work at the above-referenced site (see attached letter dated September 24, 2013).

This site received Trust Fund eligibility on October 15, 2013 with a deductible of $20,000. Since that time, one claim package, from Dan River Oil Company, was received for $2,952 which was applied to the deductible (see attached e-mail from Christina Schroeter dated Dec. 2, 2015). Therefore $17,048 of the deductible has not been met.

A LSA was done in 1999, with 5 monitoring wells, and the groundwater plume is defined well enough. The site was ranked intermediate. There is one monitoring well, with 4 inches of free product. Free product needs to be eliminated. In addition, a couple of soil samples need to be taken, in hot spots, to confirm soil is beneath industrial standards. Then, we can close with a nrp.

Chronology

5/18/97 UST-3 received

9/4/97 2N NOV for failure to comply with permanent closure requirements was sent.

6/4/98 24-Hour report received.

7/30/98 Closure report received. Three 4,000 gallon gas tanks removed. Soil contamination found under the lines and pump island.

8/10/98 UST-2 received.

1/27/99 2L .0115(c) NORR sent requiring a LSA.

6/3/99 LSA received.

10/15/99 LSA supplement I received.

3/24/00 LSA supplement II received.

12/21/00 Site was ranked intermediate.

10/17/03 NORR sent requiring Trust Fund reimbursable work to stop.

2/27/13 Site ranked I 144 D.

2/27/13 Fund resume NORR sent.

5/22/13 Monitoring report received. Four inches of free product in MW-2. Dissolved groundwater high was 2,100 ppb benzene and 5,600 ppb MTBE.

10/1/13 Received letter, from Dan River Oil Company, requesting the site be submitted to the State Lead Program.

RECOMMENDATION OF SITE FOR STATE LEAD CLEANUP

Incident Name: Friendly Food Mart #6 **Site Priority Risk/Rank** I/44
Incident #: 19490 **County:** Stokes **City:** Walnut Cove
Site Address: 403 Stokesburg Rd.
Current Landowner _____ **Address** _____
Recommended by: L. Estkowski **Regional Office:** WS
Date of Last Site Visit 11.20.2015

Step 1:

Private/public water supply well within 1000'	☐ yes	☑ no
Has a water supply been contaminated?	☐ yes	☑ no
Has alternate water been provided?	☐ yes	☐ no

Step 2: **This incident is recommended for State Lead Cleanup because (check All that apply)**

- ☐ The RO has not been able to positively identify the source(s) of contamination
- ☐ The RO has not been able to positively identify the RP
- ☐ The RO has positively identified the source(s) but RP cannot be located, or is deceased
- ☐ The RP has been identified but refuses to comply with investigative requirements
- ☑ The RP has been identified but claims financial hardship or bankruptcy
- ☐ The RO is continuing its investigation of sources and RPs, but **immediate action** is necessary to protect human health and the environment. See comments.

Step 3: ✓ **Attach a statement documenting or supporting the site risk determination (RRA Form) based upon a confirmed UST release of petroleum to soil and/or groundwater.**

Step 4: ✓ **Attach a cover memo with a complete summary of site history and chronology of events, including RO actions taken to date.**

Step 5: **Attach the entire original Regional Office file, and be sure it includes:**

- ☑ 24-Hour Release and UST Leak Reporting Form (Form 61) and ranking forms
- ☑ Topographic map with site location clearly identified
- ☑ NORRs, NOVs, and any other correspondence issued and received
- ☐ Alternate water requests and any information on available water sources
- ☑ Telephone logs, any supplemental information

Step 6: **Check all that apply for any UST located at the site:**

- ☐ UST is a heating oil tank 1100 gallons or less
- ☐ UST is a heating oil tank greater than 1100 gallons for four or fewer households
- ☐ UST is farm or residential, 1100 gallons or less of motor fuel for non-commercial purposes
- ☑ The UST is a non-regulated, commercial UST
- ☐ The UST is a regulated UST

Comments: Three 4,000 gallon gas tanks removed in 1998.

Regional Supervisor _____ Signature _____ Date _____

Attachment: Incident File ☐

(revision 5/1/06)

Estkowski, Linda

From: Schroeter, Christina
Sent: Wednesday, December 02, 2015 11:12 AM
To: Estkowski, Linda
Subject: Re: Eligibility question

Hi,

Yes, this site received eligibility on 10/15/13 with a deductible of $20,000. On 2/3/14 we received one claim package from Dan River Oil Company. The requested and approved amount was $2,952 which was applied to the deductible. Another claim has not yet been received. Just let me know if I can help further.

Thanks!
Christina

Christina Schroeter
Hydrogeologist I
North Carolina Department of Environmental Quality

919 707-8260 office
christina.schroeter@ncdenr.gov

217 West Jones Street, Raleigh NC 27603
1646 Mail Service Center, Raleigh NC 27699-1646

Nothing Compares

From: Estkowski, Linda
Sent: Wednesday, December 2, 2015 10:43 AM
To: Schroeter, Christina
Cc: Estkowski, Linda
Subject: Eligibility question

Hello Christina,

Could you please tell me if the Friendly Food Mart #6 (incident # 19490): 1.) has been determined to be eligible for trust fund, 2.) what their deductible is, and 3.) how much of their deductible has been met.

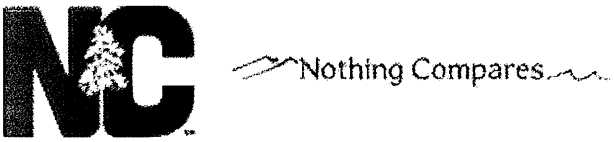
Thanks,
Linda

Linda Estkowski

Hydrogeologist
Division of Waste Management, UST Section
Department of Environmental Quality

336 776 9680 office
Linda.Estkowski@ncdenr.gov

450 West Hanes Mill Rd.
Suite 300
Winston-Salem, NC 27105



RECOMMENDATION OF SITE FOR STATE LEAD CLEANUP

Incident Name: Friendly Food Mart #6 **Site Priority Risk/Rank** I 144
Incident #: 19490 **County:** Stokes **City:** Walnut Cove
Site Address: 403 Stokesburg Rd.
Current Landowner _____ **Address** _____
Recommended by: L. Estkowski **Regional Office:** WS
Date of Last Site Visit 11·20·2015

Step 1:

Private/public water supply well within 1000'	☐ yes	☑ no
Has a water supply been contaminated?	☐ yes	☑ no
Has alternate water been provided?	☐ yes	☐ no

Step 2: **This incident is recommended for State Lead Cleanup because (check All that apply)**

- ☐ The RO has not been able to positively identify the source(s) of contamination
- ☐ The RO has not been able to positively identify the RP
- ☐ The RO has positively identified the source(s) but RP cannot be located, or is deceased
- ☐ The RP has been identified but refuses to comply with investigative requirements
- ☑ The RP has been identified but claims financial hardship or bankruptcy
- ☐ The RO is continuing its investigation of sources and RPs, but **immediate action** is necessary to protect human health and the environment. See comments.

Step 3: ✓ **Attach a statement documenting or supporting the site risk determination (RRA Form) based upon a confirmed UST release of petroleum to soil and/or groundwater.**

Step 4: ✓ **Attach a cover memo with a complete summary of site history and chronology of events, including RO actions taken to date.**

Step 5: **Attach the entire original Regional Office file, and be sure it includes:**

- ☑ 24-Hour Release and UST Leak Reporting Form (Form 61) and ranking forms
- ☑ Topographic map with site location clearly identified
- ☑ NORRs, NOVs, and any other correspondence issued and received
- ☐ Alternate water requests and any information on available water sources
- ☑ Telephone logs, any supplemental information

Step 6: **Check all that apply for any UST located at the site:**

- ☐ UST is a heating oil tank 1100 gallons or less
- ☐ UST is a heating oil tank greater than 1100 gallons for four or fewer households
- ☐ UST is farm or residential, 1100 gallons or less of motor fuel for non-commercial purposes
- ☑ The UST is a non-regulated, commercial UST
- ☐ The UST is a regulated UST

Comments: Three 4,000 gallon gas tanks removed in 1998.

Carin Lee Kromm — CARIN Kromm — 1/8/2016
Regional Supervisor — Signature — Date

Attachment: Incident File ☐

APPENDIX C

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2019-074)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 8
NCDOT PROJECT R-5768 (44670.1.1)

403 STOKESBURG ROAD, WALNUT COVE, NC

APRIL 10, 2019

Report prepared for: **Craig Haden**
NCDOT Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

Prepared by: _____
Eric C. Cross, P.G.
NC License #2181

Reviewed by: _____
Douglas A. Canavello, P.G.
NC License #1066

503 INDUSTRIAL AVENUE, WALNUT COVE, NC 27406
P: 336.335.3174 F: 336.691.0648
C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 8 – 403 Stokesburg Road
Walnut Cove, Stokes County, North Carolina

Table of Contents

Figures

Appendices

LIST OF ACRONYMS

CADD .....Computer Assisted Drafting and Design
DF .....Dual Frequency
EM.....Electromagnetic
GPR.....Ground Penetrating Radar
GPS .....Global Positioning System
NCDOT.....North Carolina Department of Transportation
ROW .....Right-of-Way
UST .....Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT) at Parcel 8, located at 403 Stokesburg Road, in Walnut Cove, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project R-5768). This property was understood to be a total take, and the survey was designed to include all accessible portions of the property. Conducted on April 3, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of ten EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR was performed across EM anomalies associated with the building, a trailer, and suspected buried metallic debris to verify that the metallic interference associated with these features did not obscure any potential USTs. GPR did not record any evidence of significant buried structures. EM and GPR evidence also show suspected utilities in areas where known buried utility lines are located. Collectively, the geophysical data did not record any evidence of metallic USTs within the geophysical survey area at Parcel 8.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT) at Parcel 8, located at 403 Stokesburg Road, in Walnut Cove, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project R-5768). This property was understood to be a total take, and the survey was designed to include all accessible portions of the property. Conducted on April 3, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a vacant building surrounded by concrete, asphalt, and grass. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending, generally parallel survey lines, spaced five feet apart. The data were downloaded to a

computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on April 3, 2019, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Hydrant/Sign	
2	Suspected Buried Metallic Debris	☑
3	Utility/Sign	
4	Suspected Utility	☑
5	Fence	
6	Sign	
7	Building/Air Conditioner	☑
8	Utilities	☑
9	Monitoring Well	
10	Trailer	☑

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including a hydrant, signs, a fence, a building, an air conditioner, utilities, a monitoring well, and a trailer. EM Anomaly 2 was a small, low-amplitude anomaly and was further investigated with GPR to confirm that the anomaly was a result of buried metallic debris. EM Anomalies 4 and 8 were located in areas of known utilities and were further investigated with GPR to confirm that these anomalies were the result of the buried utility lines. EM Anomalies 7 and 10 were investigated with GPR to confirm that these surface features did not obscure any potential USTs.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property, as well as select transect images. All of the transect images are included in **Appendix A**. A total of eight formal GPR transects were performed at the site. GPR Transects 1, 2, and 7 were performed across EM Anomalies 7 and 10. No evidence of any significant buried structures such as USTs was observed.

GPR Transects 3-6 were performed across EM Anomalies 4 and 8. These transects recorded medium-amplitude hyperbolic reflectors consistent with buried utility.

GPR Transect 8 was performed across EM Anomaly 2 and recorded isolated high-amplitude lateral reflectors and an increase in signal penetration consistent with buried metallic debris. Collectively, the geophysical data did not record any evidence of metallic USTs within the survey area at Parcel 8. **Figure 4** provides an overlay of the geophysical metal detection results onto the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 8 in Walnut Cove, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface.
- GPR was performed across EM anomalies associated with the building, a trailer, and suspected buried metallic debris to verify that the metallic interference associated with these features did not obscure any potential USTs. GPR did not record any evidence of significant buried structures.
- EM and GPR also show evidence of suspected utilities in areas where known buried utility lines are located.
- Collectively, the geophysical data did not record any evidence of metallic USTs within the geophysical survey area at Parcel 8.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for the NCDOT in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report.

Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA

View of Survey Area
(Facing Approximately East)

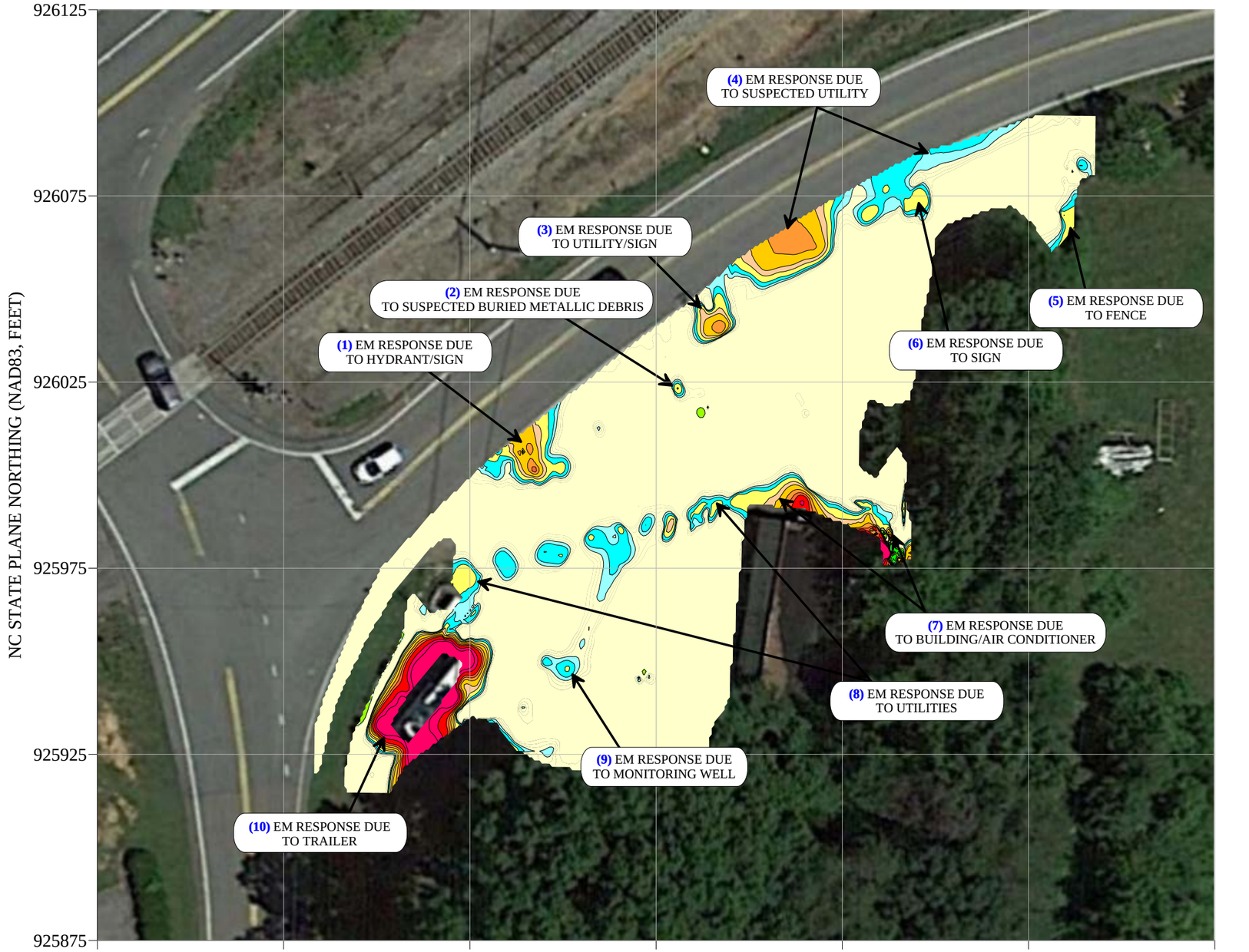
View of Survey Area
(Facing Approximately South)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 8 WALNUT COVE, NORTH CAROLINA NCDOT PROJECT R-5768	TITLE	PARCEL 8 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE 4/4/2019 PYRAMID PROJECT #: 2019-074
				CLIENT NCDOT **FIGURE 1**

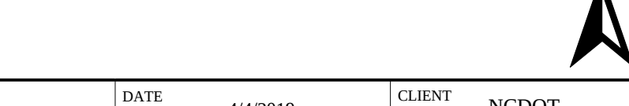
EM61 METAL DETECTION RESULTS



NO EVIDENCE OF METALLIC USTs WAS OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM61 data were collected on April 3, using a Geonics EM61 instrument. Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency 300/800 MHz antenna on April 3, 2019.

EM61 Metal Detection Response (millivolts)

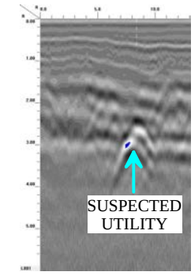


N

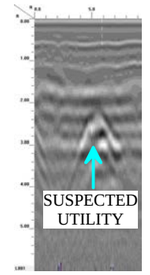
PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 8 WALNUT COVE, NORTH CAROLINA NCDOT PROJECT R-5768	TITLE	PARCEL 8 - EM61 METAL DETECTION CONTOUR MAP	DATE 4/4/2019 PYRAMID PROJECT #: 2019-074
CLIENT	NCDOT			**FIGURE 2**

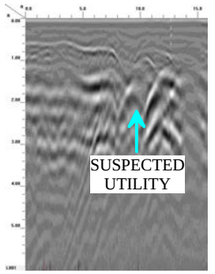
GPR TRANSECT LOCATIONS



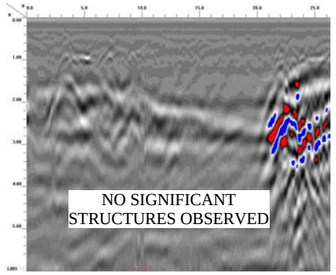
GPR TRANSECT 3 (T3)



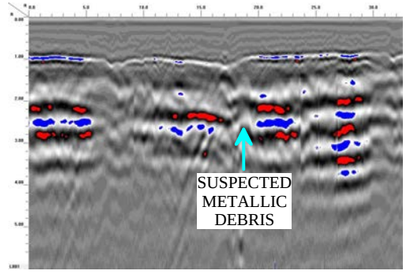
GPR TRANSECT 4 (T4)



GPR TRANSECT 5 (T5)



GPR TRANSECT 7 (T7)



GPR TRANSECT 8 (T8)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 8 WALNUT COVE, NORTH CAROLINA NCDOT PROJECT U-5768	TITLE	PARCEL 8 - GPR TRANSECT LOCATIONS AND SELECT IMAGES
DATE	4/4/2019	CLIENT	NCDOT
PYRAMID PROJECT #:	2019-074		**FIGURE 3**

EM61 METAL DETECTION CONTOURS
(SEE FIGURE 2 FOR ANOMALY LABELS)

LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED PERMANENT UTILITY EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE

MILLIVOLTS (mV)

1000 750 500 400 300 200 150 100 75 60 50 40 30 -90 -100 -200 -400 -5000

0 25 50
FEET

N

TITLE
OVERLAY OF METAL DETECTION RESULTS
ON NCDOT ENGINEERING PLANS

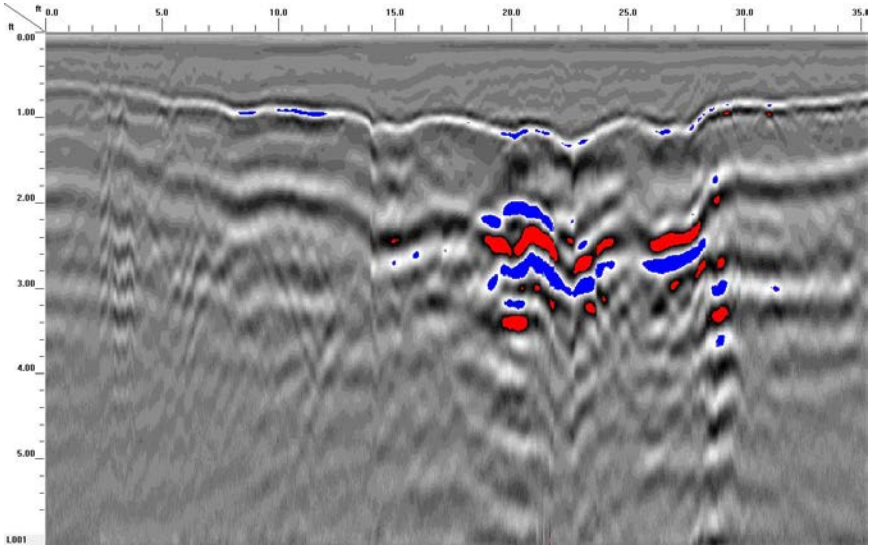
PROJECT
PARCEL 8
WALNUT COVE, NORTH CAROLINA
NCDOT PROJECT R-5768

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
License # C1251 Eng. / #C257 Geology

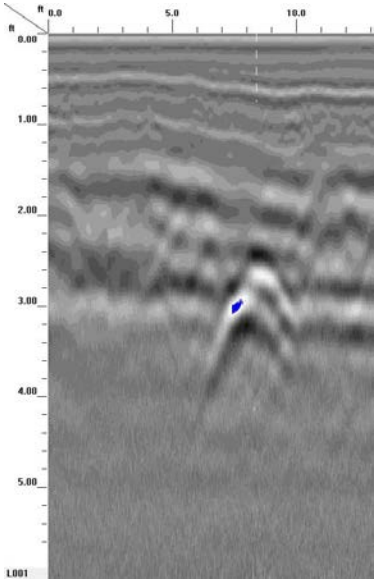
DATE: 04-03-2019 | REVISION NO. 0

PYRAMID PROJECT NO. 2019-074 | FIGURE NO. 4

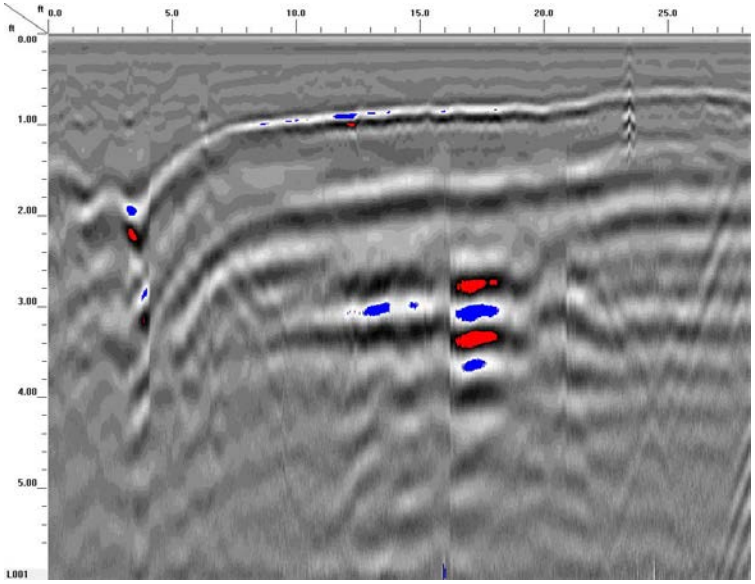
Appendix A – GPR Transect Images



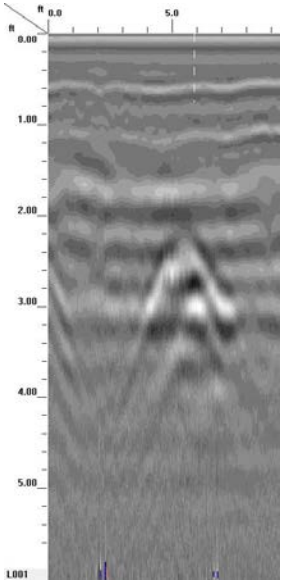
Transect 1



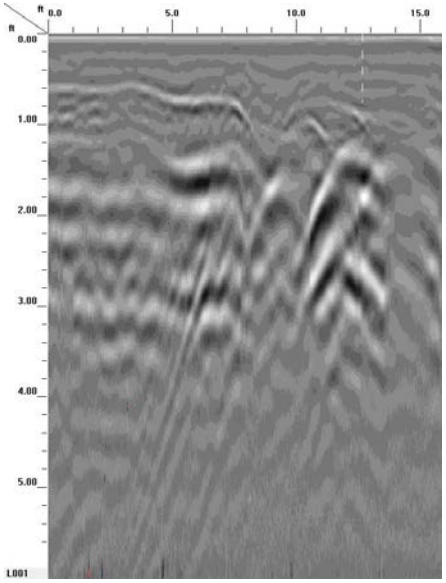
Transect 3



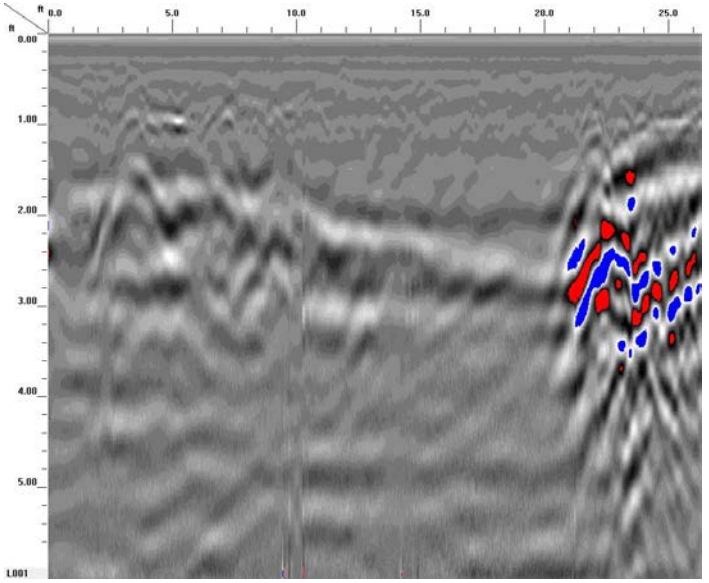
Transect 2



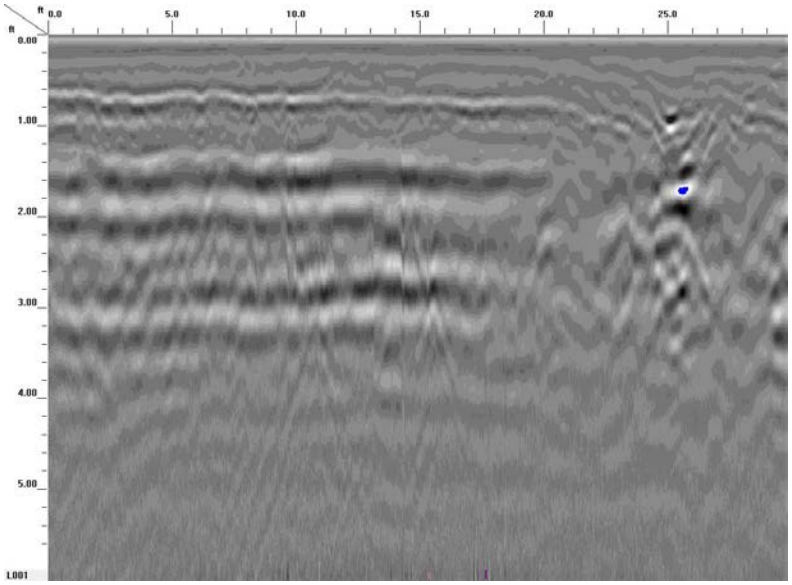
Transect 4



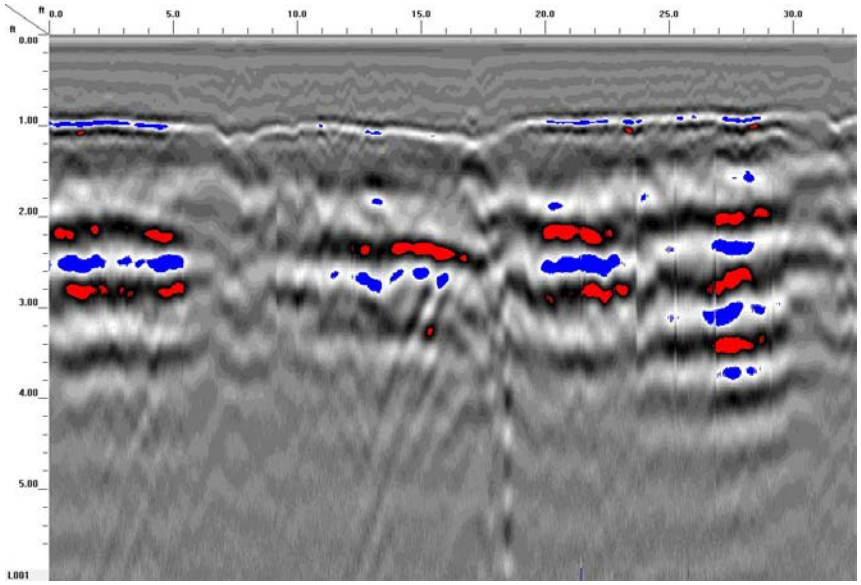
Transect 5



Transect 7



Transect 6



Transect 8

APPENDIX D

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 008, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	8-1
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 008, East portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Surface - Asphalt	Core Sample Depths
0-2	Reddish brown, silty-clay (CL), firm, moist, no odor	PID= 1.5 PPM
2-4	Reddish brown, silty-clay (CL), firm, moist, no odor	PID= 2.2 PPM
4-6	Reddish brown, silty-clay (CL), firm, moist, no odor	PID= 3.9 PPM
6-8	Reddish brown, silty-clay (CL), firm, moist, no odor	PID= 3.3 PPM
	Geoprobe refusal at 8 feet.	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0___.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 008, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	8-2
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 008, NE portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	10 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Surface - Asphalt	Core Sample Depths
0-2	Light brown, sandy-clayey-silt (ML), moist no odor	PID= 2.0 PPM
2-4	Light brown, sandy-clayey-silt (ML), moist no odor	PID= 1.8 PPM
4-6	Light brown, sandy-clayey-silt (ML), moist, no odor	PID= 3.5 PPM
6-8	Light brown to tan, clayey-silty-sand (SM), moist, no odor	PID= 2.8 PPM
8-10	Light brown to tan, clayey-silty-sand (SM), moist, no odor	PID= 3.0 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0___.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 008, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	8-3
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 008, North portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	10 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Surface - Asphalt	Core Sample Depths
0-2	Light brown, sandy-clayey-silt (ML), moist no odor	PID= 1.2 PPM
2-4	Light brown, sandy-clayey-silt (ML), moist no odor	PID= 1.6 PPM
4-6	Light brown, clayey-silty-sand (SM), moist, gasoline petroleum odor	PID= 1.3 PPM
6-8	Light brown, clayey-silty-sand (SM), moist, gasoline petroleum odor	PID= 120 PPM
8-10	Light brown, clayey-silty-sand (SM), moist, gasoline petroleum odor	PID= 4000 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0___.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 008, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	8-4
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 008, East portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	10 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Surface - Asphalt	Core Sample Depths
0-2	Dark reddish brown, sandy-silty-clay (CL), firm to hard, moist, no odor	PID= 2.5 PPM
2-4	Dark reddish brown, sandy-silty-clay (CL), firm to hard, moist, no odor	PID= 1.9 PPM
4-6	Dark reddish brown, sandy-silty-clay (CL), firm to hard, moist, no odor	PID= 1.1 PPM
6-10	Dark reddish brown, sandy-silty-clay (CL), firm to hard, moist, strong	PID= 65 PPM
	gasoline petroleum odor	PID= 103 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0___.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 008, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	8-5
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 008, Center portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	7.5 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Surface - Asphalt	Core Sample Depths
0-2	Dark brown, sandy-clayey-silt (ML), firm, moist, gasoline petroleum odor	PID= 275 PPM
2-4	Dark brown, sandy-clayey-silt (ML), firm, moist, gasoline petroleum odor	PID= 3700 PPM
4-7.5	Dark brown to brown, sandy-silty-clay to silty clay (CL), firm to hard,	PID= 3600 PPM
	moist, gasoline petroleum odor	PID= 1000 PPM
	Geoprobe refusal at 7.5 feet	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 008, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	8-6
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 008, West portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	10 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
	Surface - Asphalt	Core Sample Depths
0-2	Brown, silty-sand-clay (CL), moist, no odor	PID= 0.8 PPM
2-4	Brown to tan, clayey-silty-sand (SC), moist, no odor	PID= 0.9 PPM
4-6	Brown to tan, clayey-silty-sand (SC), moist, no odor	PID= 1.0 PPM
6-8	Brown to tan, clayey-silty-sand (SC), moist, no odor	PID= 0.9 PPM
8-10	Tan, saprolite, silty-sand (SM), saturated water in spoon, no odor	PID= 0.9 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-5768, Parcel 008, Walnut Cove, NC (2019-074)	**BORING/WELL NO:**	8-7
SITE LOCATION:	Stokes County, NC	**BORING/WELL LOCATION:**	Parcel 008, South portion
START DATE:	04/24/19	**COMPLETED:**	04/24/19
GEOLOGIST:	T. Leatherman	**DRILLER:**	Draper Aden
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	10 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Surface - Asphalt	Core Sample Depths
0-2	Brown, sandy-clayey-silt (ML), soft, moist, no odor	PID= 2.9 PPM
2-4	Brown, sandy-clayey-silt (ML), soft, moist, no odor	PID= 1.6 PPM
4-6	Brown, sandy-clayey-silt (ML), soft, moist, no odor	PID= 1.0 PPM
6-8	Light brown to tan, sandy-clayey-silt (ML), moist to very moist, no odor	PID= 2.8 PPM
8-10	Light brown to tan, sandy-clayey-silt (ML), moist to very moist, no odor	PID= 2.6 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0___.

APPENDIX E

QED REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS QROS

Hydrocarbon Analysis Results

Client: PYRAMID ENVIRONMENTAL
Address: 503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406

Samples taken Wednesday, April 24, 2019
Samples extracted Wednesday, April 24, 2019
Samples analysed Friday, April 26, 2019

Contact: TIM LEATHERMAN

Operator CAROLINE STEVENS

Project: NCDOT STOKES PARCEL 8 / 2019-074

F03640

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	8-1-4-6	296.0	<7.4	<7.4	170.6	170.6	142.5	5.2	<0.3	0	77.1	22.9	Deg Fuel 89.5%,(FCM)
s	8-2-0-2	27.6	<0.69	<0.69	2.1	2.1	1.7	<0.22	<0.028	0	75.6	24.4	Deg Fuel 91.1%,(FCM)
s	8-2-4-6	26.9	<0.67	<0.67	10	10	9.5	0.37	<0.027	0	78.5	21.5	Deg Fuel 76.7%,(FCM)
s	8-3-2-4	27.6	<0.69	<0.69	1.4	1.4	0.64	<0.22	<0.028	0	74.1	25.9	Deg Fuel 88.9%,(FCM)
s	8-3-6-8	29.4	<0.73	<0.73	13	13	10.6	3.3	<0.029	0	75.9	24.1	Light Coal Tar 86.8%,(FCM)
s	8-3-8-10	27.4	>198.3	>802.7	>6627	>7430	>156.6	>5.9	<0.027	99.7	0.3	0	Deg.Light PHC 91.4%,(FCM)
s	8-4-6-8	25.4	<1.3	36.8	181.5	218.3	7	0.26	<0.025	99.7	0.3	0	Deg.Light PHC 87.8%,(FCM)
s	8-4-8-10	403.0	<10.1	27.6	85	112.6	82.4	<3.2	<0.4	51.3	36.9	11.8	Deg Fuel 92.3%,(FCM)
s	8-5-2-4	25.8	<0.65	157.4	775.9	933.3	80.6	3	<0.026	96.3	3	0.7	Deg.Fuel 85.7%,(FCM)
s	8-6-4-6	24.4	<0.61	<0.61	29	29	22.3	0.79	<0.024	0	79.4	20.6	Deg Fuel 89.2%,(FCM)

Initial Calibrator QC check OK Final FCM QC Check OK 107.8 %

Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

(SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

QED

REDLAB
RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: PYRAMID ENVIRONMENTAL
Address: 503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406

Contact: TIM LEATHERMAN

Project: NCDOT STOKES PARCEL 8 / 2019-074

Samples taken Wednesday, April 24, 2019
Samples extracted Wednesday, April 24, 2019
Samples analysed Friday, April 26, 2019

Operator CAROLINE STEVENS

F03640

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	8-7-0-2	27.6	<0.69	<0.69	3.2	3.2	3	<0.22	<0.028	0	76.9	23.1	Deg Fuel 77.6%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 107.4 %

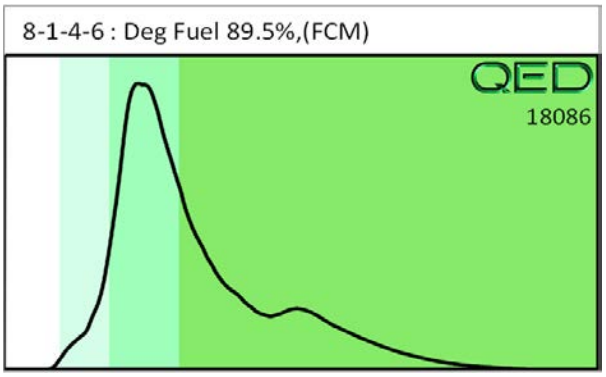
Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

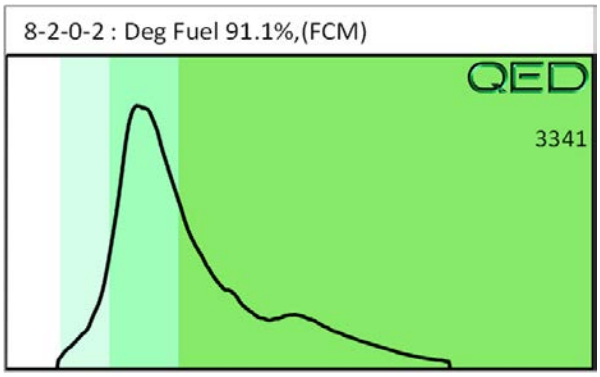
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

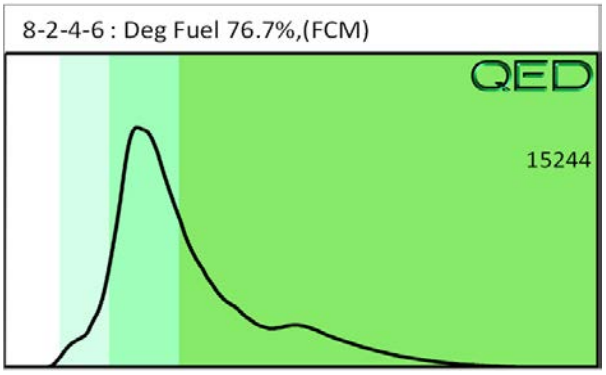
(SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

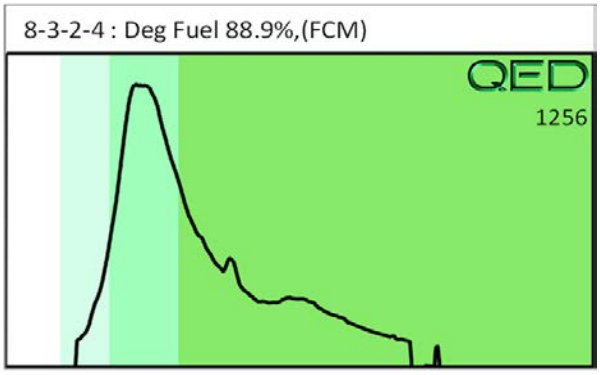
QED Hydrocarbon Fingerprints

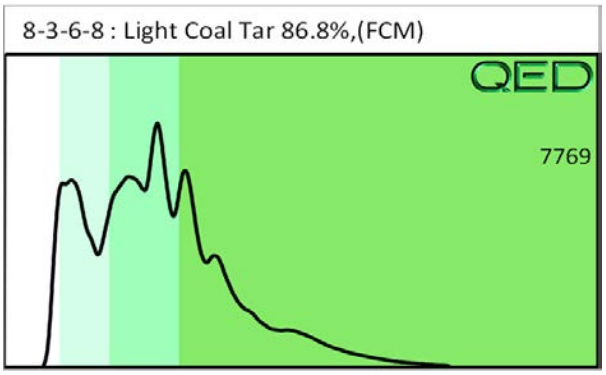
Project: NCDOT STOKES PARCEL 8 / 2019-074 Friday, April 26, 2019

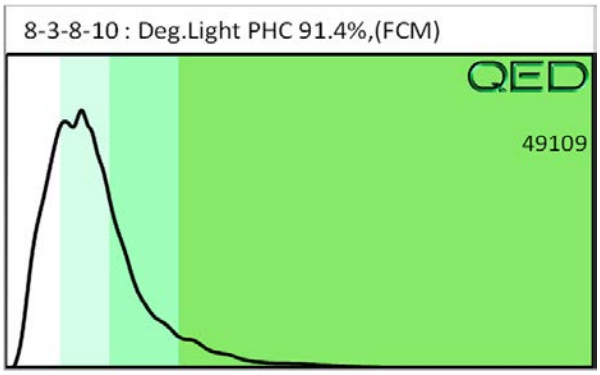


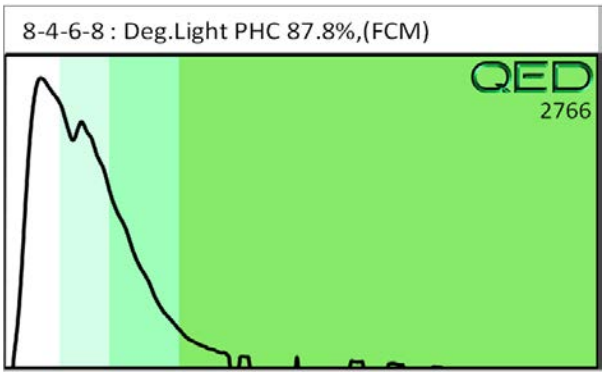


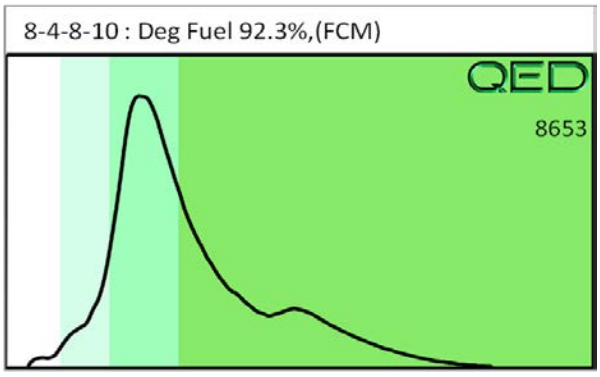


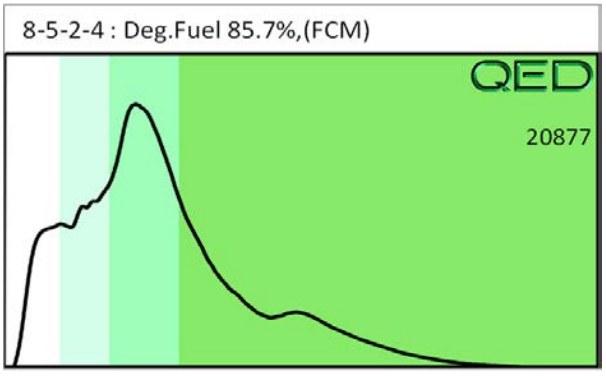


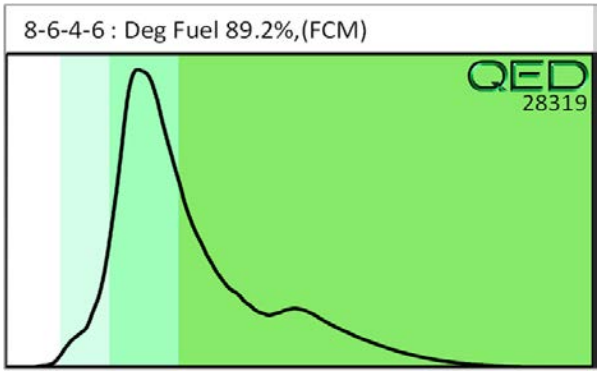






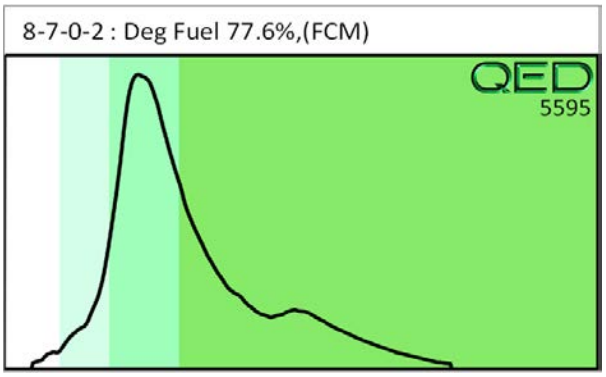






QED Hydrocarbon Fingerprints

Project: NCDOT STOKES PARCEL 8 / 2019-074 Friday, April 26, 2019



APPENDIX F

PRISM LABORATORIES, INC.
Full-Service Analytical & Environmental Solutions

NC Certification No. 402
NC Drinking Water Cert No. 37735
SC Certification No. 99012

Case Narrative

4/24/19 13:41

Pyramid Environmental, Inc
Tim Leatherman
PO Box 16265
Greensboro, NC 27416-0265

Project: NCDOT Parcel 18 (Friendly Mart #6)

Lab Submittal Date: 04/12/2019
Prism Work Order: 9040223

This data package contains the analytical results for the project identified above and includes a Case Narrative, Sample Results and Chain of Custody. Unless otherwise noted, all samples were received in acceptable condition and processed according to the referenced methods.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative.

Please call if you have any questions relating to this analytical report.

Respectfully,

PRISM LABORATORIES, INC.

Angela D. Overcash

VP Laboratory Services

Reviewed By Terri W. Cole For Angela D. Overcash

Project Manager

Data Qualifiers Key Reference:

D	RPD value outside of the control limits.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
BRL	Below Reporting Limit
MDL	Method Detection Limit
RPD	Relative Percent Difference
*	Results reported to the reporting limit. All other results are reported to the MDL with values between MDL and reporting limit indicated with a J.

PRISM LABORATORIES, INC. | Full-Service Analytical & Environmental Solutions

Sample Receipt Summary

04/24/2019

Prism Work Order: 9040223

Client Sample ID	Lab Sample ID	Matrix	Date/Time Sampled	Date/Time Received
MW-2	9040223-01	Water	04/11/19 11:00	04/12/19 14:00

Samples were received in good condition at 2.4 degrees C unless otherwise noted.

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543
Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

Summary of Detections

04/24/2019

Prism Work Order: 9040223

Prism ID	Client ID	Parameter	Method	Result		Units
9040223-01	MW-2	1,2,4-Trimethylbenzene	SM6200 B	3100		ug/L
9040223-01	MW-2	1,3,5-Trimethylbenzene	SM6200 B	910		ug/L
9040223-01	MW-2	Benzene	SM6200 B	9500		ug/L
9040223-01	MW-2	Ethylbenzene	SM6200 B	1800		ug/L
9040223-01	MW-2	Isopropylbenzene (Cumene)	SM6200 B	95		ug/L
9040223-01	MW-2	m,p-Xylenes	SM6200 B	9100		ug/L
9040223-01	MW-2	Methyl Butyl Ketone (2-Hexanone)	SM6200 B	76	J	ug/L
9040223-01	MW-2	Methyl-tert-Butyl Ether	SM6200 B	1700		ug/L
9040223-01	MW-2	Naphthalene	SM6200 B	780		ug/L
9040223-01	MW-2	n-Propylbenzene	SM6200 B	210		ug/L
9040223-01	MW-2	o-Xylene	SM6200 B	5100		ug/L
9040223-01	MW-2	sec-Butylbenzene	SM6200 B	130		ug/L
9040223-01	MW-2	Toluene	SM6200 B	25000		ug/L
9040223-01	MW-2	Xylenes, total	SM6200 B	14000		ug/L

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543
Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

Pyramid Environmental, Inc
Attn: Tim Leatherman
PO Box 16265
Greensboro, NC 27416-0265

Project: NCDOT Parcel 18 (Friendly Mart #6)

Sample Matrix: Water

Client Sample ID: MW-2
Prism Sample ID: 9040223-01
Prism Work Order: 9040223
Time Collected: 04/11/19 11:00
Time Submitted: 04/12/19 14:00

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Volatile Organic Compounds by GC/MS									
1,1,1,2-Tetrachloroethane	BRL	ug/L	50	11	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,1,1-Trichloroethane	BRL	ug/L	50	6.1	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,1,2,2-Tetrachloroethane	BRL	ug/L	50	3.6	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,1,2-Trichloroethane	BRL	ug/L	50	6.6	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,1-Dichloroethane	BRL	ug/L	50	8.3	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,1-Dichloroethylene	BRL	ug/L	50	8.3	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,1-Dichloropropylene	BRL	ug/L	50	5.1	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,2,3-Trichlorobenzene	BRL	ug/L	50	40	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,2,3-Trichloropropane	BRL	ug/L	50	14	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,2,4-Trichlorobenzene	BRL	ug/L	50	13	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,2,4-Trimethylbenzene	**3100**	**ug/L**	**50**	**5.4**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**
1,2-Dibromo-3-chloropropane	BRL	ug/L	200	17	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,2-Dibromoethane	BRL	ug/L	50	5.1	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,2-Dichlorobenzene	BRL	ug/L	50	7.6	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,2-Dichloroethane	BRL	ug/L	50	6.6	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,2-Dichloropropane	BRL	ug/L	50	11	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,3,5-Trimethylbenzene	**910**	**ug/L**	**50**	**7.6**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**
1,3-Dichlorobenzene	BRL	ug/L	50	5.4	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,3-Dichloropropane	BRL	ug/L	50	4.3	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
1,4-Dichlorobenzene	BRL	ug/L	50	5.0	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
2,2-Dichloropropane	BRL	ug/L	200	11	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
2-Chlorotoluene	BRL	ug/L	50	6.6	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
4-Chlorotoluene	BRL	ug/L	50	5.0	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
4-Isopropyltoluene	BRL	ug/L	50	8.9	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Acetone	BRL	ug/L	1000	31	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Benzene	**9500**	**ug/L**	**50**	**4.8**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**
Bromobenzene	BRL	ug/L	50	5.7	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Bromochloromethane	BRL	ug/L	50	14	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Bromodichloromethane	BRL	ug/L	50	6.2	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Bromoform	BRL	ug/L	50	4.0	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Bromomethane	BRL	ug/L	100	18	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Carbon Tetrachloride	BRL	ug/L	50	11	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Chlorobenzene	BRL	ug/L	50	6.2	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Chloroethane	BRL	ug/L	50	22	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Chloroform	BRL	ug/L	50	7.6	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Chloromethane	BRL	ug/L	50	7.9	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
cis-1,2-Dichloroethylene	BRL	ug/L	50	5.6	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
cis-1,3-Dichloropropylene	BRL	ug/L	50	7.9	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Dibromochloromethane	BRL	ug/L	50	8.1	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Dibromomethane	BRL	ug/L	50	6.5	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Dichlorodifluoromethane	BRL	ug/L	100	11	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Ethanol	BRL	ug/L	20000	2700	100	SM6200 B	4/23/19 1:45	KDM	P9D0374

Pyramid Environmental, Inc
Attn: Tim Leatherman
PO Box 16265
Greensboro, NC 27416-0265

Project: NCDOT Parcel 18 (Friendly Mart #6)

Sample Matrix: Water

Client Sample ID: MW-2
Prism Sample ID: 9040223-01
Prism Work Order: 9040223
Time Collected: 04/11/19 11:00
Time Submitted: 04/12/19 14:00

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Ethylbenzene	**1800**	**ug/L**	**50**	**6.1**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**
Hexachlorobutadiene	BRL	ug/L	200	16	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Isopropyl Ether	BRL	ug/L	50	5.0	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Isopropylbenzene (Cumene)	**95**	**ug/L**	**50**	**5.4**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**
m,p-Xylenes	**9100**	**ug/L**	**100**	**12**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**
Methyl Butyl Ketone (2-Hexanone)	**76 J**	**ug/L**	**100**	**6.5**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**
Methyl Ethyl Ketone (2-Butanone)	BRL	ug/L	500	24	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Methyl Isobutyl Ketone	BRL	ug/L	100	7.8	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Methylene Chloride	BRL	ug/L	200	8.3	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Methyl-tert-Butyl Ether	**1700**	**ug/L**	**100**	**4.2**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**
Naphthalene	**780**	**ug/L**	**100**	**19**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**
n-Butylbenzene	BRL	ug/L	50	7.6	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
n-Propylbenzene	**210**	**ug/L**	**50**	**8.7**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**
o-Xylene	**5100**	**ug/L**	**50**	**4.4**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**
sec-Butylbenzene	**130**	**ug/L**	**50**	**7.6**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**
Styrene	BRL	ug/L	50	4.7	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
tert-Butylbenzene	BRL	ug/L	50	8.8	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Tetrachloroethylene	BRL	ug/L	50	9.8	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Toluene	**25000**	**ug/L**	**500**	**44**	**1000**	**SM6200 B**	**4/23/19 2:11**	**KDM**	**P9D0374**
trans-1,2-Dichloroethylene	BRL	ug/L	50	7.0	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
trans-1,3-Dichloropropylene	BRL	ug/L	50	12	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Trichloroethylene	BRL	ug/L	50	7.8	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Trichlorofluoromethane	BRL	ug/L	50	6.2	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Vinyl acetate	BRL	ug/L	500	6.0	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Vinyl chloride	BRL	ug/L	50	9.7	100	SM6200 B	4/23/19 1:45	KDM	P9D0374
Xylenes, total	**14000**	**ug/L**	**150**	**15**	**100**	**SM6200 B**	**4/23/19 1:45**	**KDM**	**P9D0374**

Surrogate	Recovery	Control Limits
4-Bromofluorobenzene	*102 %*	*70-130*
Dibromofluoromethane	*94 %*	*70-130*
Toluene-d8	*97 %*	*70-130*

Pyramid Environmental, Inc
Attn: Tim Leatherman
PO Box 16265
Greensboro, NC 27416-0265

Project: NCDOT Parcel 18 (Friendly Mart #6)

Prism Work Order: 9040223
Time Submitted: 4/12/2019 2:00:00PM

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9D0374 - SM6200 B										
Blank (P9D0374-BLK1)				Prepared & Analyzed: 04/22/19						
1,1,1,2-Tetrachloroethane	BRL	0.50	ug/L							
1,1,1-Trichloroethane	BRL	0.50	ug/L							
1,1,2,2-Tetrachloroethane	BRL	0.50	ug/L							
1,1,2-Trichloroethane	BRL	0.50	ug/L							
1,1-Dichloroethane	BRL	0.50	ug/L							
1,1-Dichloroethylene	BRL	0.50	ug/L							
1,1-Dichloropropylene	BRL	0.50	ug/L							
1,2,3-Trichlorobenzene	BRL	0.50	ug/L							
1,2,3-Trichloropropane	BRL	0.50	ug/L							
1,2,4-Trichlorobenzene	BRL	0.50	ug/L							
1,2,4-Trimethylbenzene	BRL	0.50	ug/L							
1,2-Dibromo-3-chloropropane	BRL	2.0	ug/L							
1,2-Dibromoethane	BRL	0.50	ug/L							
1,2-Dichlorobenzene	BRL	0.50	ug/L							
1,2-Dichloroethane	BRL	0.50	ug/L							
1,2-Dichloropropane	BRL	0.50	ug/L							
1,3,5-Trimethylbenzene	BRL	0.50	ug/L							
1,3-Dichlorobenzene	BRL	0.50	ug/L							
1,3-Dichloropropane	BRL	0.50	ug/L							
1,4-Dichlorobenzene	BRL	0.50	ug/L							
2,2-Dichloropropane	BRL	2.0	ug/L							
2-Chlorotoluene	BRL	0.50	ug/L							
4-Chlorotoluene	BRL	0.50	ug/L							
4-Isopropyltoluene	BRL	0.50	ug/L							
Acetone	BRL	10	ug/L							
Benzene	BRL	0.50	ug/L							
Bromobenzene	BRL	0.50	ug/L							
Bromochloromethane	BRL	0.50	ug/L							
Bromodichloromethane	BRL	0.50	ug/L							
Bromoform	BRL	0.50	ug/L							
Bromomethane	BRL	1.0	ug/L							
Carbon Tetrachloride	BRL	0.50	ug/L							
Chlorobenzene	BRL	0.50	ug/L							
Chloroethane	BRL	0.50	ug/L							
Chloroform	BRL	0.50	ug/L							
Chloromethane	BRL	0.50	ug/L							
cis-1,2-Dichloroethylene	BRL	0.50	ug/L							
cis-1,3-Dichloropropylene	BRL	0.50	ug/L							
Dibromochloromethane	BRL	0.50	ug/L							
Dibromomethane	BRL	0.50	ug/L							
Dichlorodifluoromethane	BRL	1.0	ug/L							
Ethanol	BRL	200	ug/L							
Ethylbenzene	BRL	0.50	ug/L							
Hexachlorobutadiene	BRL	2.0	ug/L							
Isopropyl Ether	BRL	0.50	ug/L							
Isopropylbenzene (Cumene)	BRL	0.50	ug/L							

Pyramid Environmental, Inc
Attn: Tim Leatherman
PO Box 16265
Greensboro, NC 27416-0265

Project: NCDOT Parcel 18 (Friendly Mart #6)

Prism Work Order: 9040223
Time Submitted: 4/12/2019 2:00:00PM

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9D0374 - SM6200 B										
Blank (P9D0374-BLK1)				Prepared & Analyzed: 04/22/19						
m,p-Xylenes	BRL	1.0	ug/L							
Methyl Butyl Ketone (2-Hexanone)	BRL	1.0	ug/L							
Methyl Ethyl Ketone (2-Butanone)	BRL	5.0	ug/L							
Methyl Isobutyl Ketone	BRL	1.0	ug/L							
Methylene Chloride	BRL	2.0	ug/L							
Methyl-tert-Butyl Ether	BRL	1.0	ug/L							
Naphthalene	BRL	1.0	ug/L							
n-Butylbenzene	BRL	0.50	ug/L							
n-Propylbenzene	BRL	0.50	ug/L							
o-Xylene	BRL	0.50	ug/L							
sec-Butylbenzene	BRL	0.50	ug/L							
Styrene	BRL	0.50	ug/L							
tert-Butylbenzene	BRL	0.50	ug/L							
Tetrachloroethylene	BRL	0.50	ug/L							
Toluene	BRL	0.50	ug/L							
trans-1,2-Dichloroethylene	BRL	0.50	ug/L							
trans-1,3-Dichloropropylene	BRL	0.50	ug/L							
Trichloroethylene	BRL	0.50	ug/L							
Trichlorofluoromethane	BRL	0.50	ug/L							
Vinyl acetate	BRL	5.0	ug/L							
Vinyl chloride	BRL	0.50	ug/L							
Xylenes, total	BRL	1.5	ug/L							
Surrogate: 4-Bromofluorobenzene	*50.1*		*ug/L*	*50.00*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*47.4*		*ug/L*	*50.00*		*95*	*70-130*			
Surrogate: Toluene-d8	*48.7*		*ug/L*	*50.00*		*97*	*70-130*			
LCS (P9D0374-BS1)				Prepared & Analyzed: 04/22/19						
1,1,1,2-Tetrachloroethane	18.8	0.50	ug/L	20.00		94	70-130			
1,1,1-Trichloroethane	19.7	0.50	ug/L	20.00		99	70-130			
1,1,2,2-Tetrachloroethane	20.1	0.50	ug/L	20.00		100	70-130			
1,1,2-Trichloroethane	20.4	0.50	ug/L	20.00		102	70-130			
1,1-Dichloroethane	21.2	0.50	ug/L	20.00		106	70-130			
1,1-Dichloroethylene	18.5	0.50	ug/L	20.00		92	70-130			
1,1-Dichloropropylene	19.0	0.50	ug/L	20.00		95	70-130			
1,2,3-Trichlorobenzene	20.5	0.50	ug/L	20.00		102	70-130			
1,2,3-Trichloropropane	18.4	0.50	ug/L	20.00		92	70-130			
1,2,4-Trichlorobenzene	21.2	0.50	ug/L	20.00		106	70-130			
1,2,4-Trimethylbenzene	18.8	0.50	ug/L	20.00		94	70-130			
1,2-Dibromo-3-chloropropane	18.7	2.0	ug/L	20.00		93	70-130			
1,2-Dibromoethane	20.0	0.50	ug/L	20.00		100	70-130			
1,2-Dichlorobenzene	19.9	0.50	ug/L	20.00		99	70-130			
1,2-Dichloroethane	21.7	0.50	ug/L	20.00		108	70-130			
1,2-Dichloropropane	21.1	0.50	ug/L	20.00		106	70-130			
1,3,5-Trimethylbenzene	18.1	0.50	ug/L	20.00		91	70-130			
1,3-Dichlorobenzene	20.0	0.50	ug/L	20.00		100	70-130			
1,3-Dichloropropane	20.9	0.50	ug/L	20.00		105	70-130			
1,4-Dichlorobenzene	19.7	0.50	ug/L	20.00		99	70-130			

Pyramid Environmental, Inc
Attn: Tim Leatherman
PO Box 16265
Greensboro, NC 27416-0265

Project: NCDOT Parcel 18 (Friendly Mart #6)

Prism Work Order: 9040223
Time Submitted: 4/12/2019 2:00:00PM

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9D0374 - SM6200 B										
LCS (P9D0374-BS1)				Prepared & Analyzed: 04/22/19						
2,2-Dichloropropane	20.0	2.0	ug/L	20.00		100	70-130			
2-Chlorotoluene	20.6	0.50	ug/L	20.00		103	70-130			
4-Chlorotoluene	20.5	0.50	ug/L	20.00		103	70-130			
4-Isopropyltoluene	18.5	0.50	ug/L	20.00		93	70-130			
Acetone	58.2	10	ug/L	40.00		146	40-160			
Benzene	20.8	0.50	ug/L	20.00		104	70-130			
Bromobenzene	20.2	0.50	ug/L	20.00		101	70-130			
Bromochloromethane	19.9	0.50	ug/L	20.00		100	70-130			
Bromodichloromethane	22.1	0.50	ug/L	20.00		111	70-130			
Bromoform	18.2	0.50	ug/L	20.00		91	70-130			
Bromomethane	18.4	1.0	ug/L	20.00		92	60-140			
Carbon Tetrachloride	20.0	0.50	ug/L	20.00		100	70-130			
Chlorobenzene	19.0	0.50	ug/L	20.00		95	70-130			
Chloroethane	25.0	0.50	ug/L	20.00		125	60-140			
Chloroform	21.0	0.50	ug/L	20.00		105	70-130			
Chloromethane	16.2	0.50	ug/L	20.00		81	60-140			
cis-1,2-Dichloroethylene	21.2	0.50	ug/L	20.00		106	70-130			
cis-1,3-Dichloropropylene	19.7	0.50	ug/L	20.00		98	70-130			
Dibromochloromethane	18.0	0.50	ug/L	20.00		90	70-130			
Dibromomethane	20.6	0.50	ug/L	20.00		103	70-130			
Dichlorodifluoromethane	17.7	1.0	ug/L	20.00		89	60-140			
Ethanol	478	200	ug/L	500.0		96	60-140			
Ethylbenzene	19.6	0.50	ug/L	20.00		98	70-130			
Hexachlorobutadiene	20.2	2.0	ug/L	20.00		101	70-130			
Isopropyl Ether	22.5	0.50	ug/L	20.00		113	70-130			
Isopropylbenzene (Cumene)	22.1	0.50	ug/L	20.00		111	70-130			
m,p-Xylenes	35.2	1.0	ug/L	40.00		88	70-130			
Methyl Butyl Ketone (2-Hexanone)	19.7	1.0	ug/L	20.00		98	60-140			
Methyl Ethyl Ketone (2-Butanone)	19.2	5.0	ug/L	20.00		96	60-140			
Methyl Isobutyl Ketone	19.9	1.0	ug/L	20.00		100	60-140			
Methylene Chloride	20.6	2.0	ug/L	20.00		103	70-130			
Methyl-tert-Butyl Ether	19.8	1.0	ug/L	20.00		99	70-130			
Naphthalene	18.5	1.0	ug/L	20.00		93	70-130			
n-Butylbenzene	21.0	0.50	ug/L	20.00		105	70-130			
n-Propylbenzene	20.9	0.50	ug/L	20.00		104	70-130			
o-Xylene	20.0	0.50	ug/L	20.00		100	70-130			
sec-Butylbenzene	18.9	0.50	ug/L	20.00		94	70-130			
Styrene	18.1	0.50	ug/L	20.00		91	70-130			
tert-Butylbenzene	19.3	0.50	ug/L	20.00		97	70-130			
Tetrachloroethylene	19.3	0.50	ug/L	20.00		96	70-130			
Toluene	20.7	0.50	ug/L	20.00		104	70-130			
trans-1,2-Dichloroethylene	21.6	0.50	ug/L	20.00		108	70-130			
trans-1,3-Dichloropropylene	19.3	0.50	ug/L	20.00		97	70-130			
Trichloroethylene	20.9	0.50	ug/L	20.00		104	70-130			
Trichlorofluoromethane	16.6	0.50	ug/L	20.00		83	60-140			
Vinyl acetate	19.2	5.0	ug/L	20.00		96	60-140			

Pyramid Environmental, Inc
Attn: Tim Leatherman
PO Box 16265
Greensboro, NC 27416-0265

Project: NCDOT Parcel 18 (Friendly Mart #6)

Prism Work Order: 9040223
Time Submitted: 4/12/2019 2:00:00PM

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9D0374 - SM6200 B										
LCS (P9D0374-BS1)				Prepared & Analyzed: 04/22/19						
Vinyl chloride	20.7	0.50	ug/L	20.00		104	60-140			
Xylenes, total	55.3	1.5	ug/L	60.00		92	70-130			
Surrogate: 4-Bromofluorobenzene	*53.2*		*ug/L*	*50.00*		*106*	*70-130*			
Surrogate: Dibromofluoromethane	*48.0*		*ug/L*	*50.00*		*96*	*70-130*			
Surrogate: Toluene-d8	*46.8*		*ug/L*	*50.00*		*94*	*70-130*			
LCS Dup (P9D0374-BSD1)				Prepared & Analyzed: 04/22/19						
1,1,1,2-Tetrachloroethane	18.4	0.50	ug/L	20.00		92	70-130	3	20	
1,1,1-Trichloroethane	19.5	0.50	ug/L	20.00		98	70-130	1	20	
1,1,2,2-Tetrachloroethane	18.2	0.50	ug/L	20.00		91	70-130	10	20	
1,1,2-Trichloroethane	19.6	0.50	ug/L	20.00		98	70-130	4	20	
1,1-Dichloroethane	20.5	0.50	ug/L	20.00		102	70-130	3	20	
1,1-Dichloroethylene	18.1	0.50	ug/L	20.00		90	70-130	2	20	
1,1-Dichloropropylene	19.3	0.50	ug/L	20.00		96	70-130	1	20	
1,2,3-Trichlorobenzene	19.9	0.50	ug/L	20.00		100	70-130	3	20	
1,2,3-Trichloropropane	17.6	0.50	ug/L	20.00		88	70-130	5	20	
1,2,4-Trichlorobenzene	19.8	0.50	ug/L	20.00		99	70-130	7	20	
1,2,4-Trimethylbenzene	17.6	0.50	ug/L	20.00		88	70-130	6	20	
1,2-Dibromo-3-chloropropane	18.4	2.0	ug/L	20.00		92	70-130	1	20	
1,2-Dibromoethane	19.9	0.50	ug/L	20.00		99	70-130	0.8	20	
1,2-Dichlorobenzene	19.0	0.50	ug/L	20.00		95	70-130	4	20	
1,2-Dichloroethane	20.5	0.50	ug/L	20.00		103	70-130	5	20	
1,2-Dichloropropane	20.6	0.50	ug/L	20.00		103	70-130	2	20	
1,3,5-Trimethylbenzene	17.4	0.50	ug/L	20.00		87	70-130	4	20	
1,3-Dichlorobenzene	18.9	0.50	ug/L	20.00		94	70-130	6	20	
1,3-Dichloropropane	20.7	0.50	ug/L	20.00		104	70-130	1	20	
1,4-Dichlorobenzene	18.8	0.50	ug/L	20.00		94	70-130	5	20	
2,2-Dichloropropane	20.4	2.0	ug/L	20.00		102	70-130	2	20	
2-Chlorotoluene	19.6	0.50	ug/L	20.00		98	70-130	5	20	
4-Chlorotoluene	19.3	0.50	ug/L	20.00		96	70-130	6	20	
4-Isopropyltoluene	17.9	0.50	ug/L	20.00		89	70-130	4	20	
Acetone	41.0	10	ug/L	40.00		102	40-160	35	20	D
Benzene	19.9	0.50	ug/L	20.00		99	70-130	5	20	
Bromobenzene	19.3	0.50	ug/L	20.00		97	70-130	4	20	
Bromochloromethane	20.3	0.50	ug/L	20.00		102	70-130	2	20	
Bromodichloromethane	21.3	0.50	ug/L	20.00		106	70-130	4	20	
Bromoform	18.2	0.50	ug/L	20.00		91	70-130	0.2	20	
Bromomethane	17.9	1.0	ug/L	20.00		89	60-140	3	20	
Carbon Tetrachloride	18.9	0.50	ug/L	20.00		94	70-130	6	20	
Chlorobenzene	18.4	0.50	ug/L	20.00		92	70-130	4	20	
Chloroethane	23.2	0.50	ug/L	20.00		116	60-140	7	20	
Chloroform	20.7	0.50	ug/L	20.00		104	70-130	1	20	
Chloromethane	13.5	0.50	ug/L	20.00		68	60-140	18	20	
cis-1,2-Dichloroethylene	20.9	0.50	ug/L	20.00		104	70-130	2	20	
cis-1,3-Dichloropropylene	18.8	0.50	ug/L	20.00		94	70-130	5	20	
Dibromochloromethane	18.0	0.50	ug/L	20.00		90	70-130	0.1	20	
Dibromomethane	19.9	0.50	ug/L	20.00		99	70-130	4	20	

Pyramid Environmental, Inc
Attn: Tim Leatherman
PO Box 16265
Greensboro, NC 27416-0265

Project: NCDOT Parcel 18 (Friendly Mart #6)

Prism Work Order: 9040223
Time Submitted: 4/12/2019 2:00:00PM

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9D0374 - SM6200 B										
LCS Dup (P9D0374-BSD1)				Prepared & Analyzed: 04/22/19						
Dichlorodifluoromethane	16.2	1.0	ug/L	20.00		81	60-140	9	20	
Ethanol	473	200	ug/L	500.0		95	60-140	1	20	
Ethylbenzene	18.9	0.50	ug/L	20.00		95	70-130	3	20	
Hexachlorobutadiene	18.9	2.0	ug/L	20.00		94	70-130	7	20	
Isopropyl Ether	21.5	0.50	ug/L	20.00		108	70-130	5	20	
Isopropylbenzene (Cumene)	21.1	0.50	ug/L	20.00		105	70-130	5	20	
m,p-Xylenes	33.6	1.0	ug/L	40.00		84	70-130	5	20	
Methyl Butyl Ketone (2-Hexanone)	18.3	1.0	ug/L	20.00		92	60-140	7	20	
Methyl Ethyl Ketone (2-Butanone)	17.8	5.0	ug/L	20.00		89	60-140	8	20	
Methyl Isobutyl Ketone	19.9	1.0	ug/L	20.00		100	60-140	0.1	20	
Methylene Chloride	20.0	2.0	ug/L	20.00		100	70-130	3	20	
Methyl-tert-Butyl Ether	18.9	1.0	ug/L	20.00		95	70-130	5	20	
Naphthalene	17.6	1.0	ug/L	20.00		88	70-130	5	20	
n-Butylbenzene	20.2	0.50	ug/L	20.00		101	70-130	4	20	
n-Propylbenzene	19.8	0.50	ug/L	20.00		99	70-130	5	20	
o-Xylene	19.5	0.50	ug/L	20.00		97	70-130	3	20	
sec-Butylbenzene	17.6	0.50	ug/L	20.00		88	70-130	7	20	
Styrene	17.3	0.50	ug/L	20.00		87	70-130	5	20	
tert-Butylbenzene	18.9	0.50	ug/L	20.00		95	70-130	2	20	
Tetrachloroethylene	18.9	0.50	ug/L	20.00		95	70-130	2	20	
Toluene	20.5	0.50	ug/L	20.00		102	70-130	1	20	
trans-1,2-Dichloroethylene	21.2	0.50	ug/L	20.00		106	70-130	2	20	
trans-1,3-Dichloropropylene	18.7	0.50	ug/L	20.00		93	70-130	4	20	
Trichloroethylene	19.6	0.50	ug/L	20.00		98	70-130	6	20	
Trichlorofluoromethane	15.8	0.50	ug/L	20.00		79	60-140	5	20	
Vinyl acetate	19.1	5.0	ug/L	20.00		95	60-140	0.8	20	
Vinyl chloride	20.6	0.50	ug/L	20.00		103	60-140	0.7	20	
Xylenes, total	53.1	1.5	ug/L	60.00		89	70-130	4	20	
Surrogate: 4-Bromofluorobenzene	*53.6*		*ug/L*	*50.00*		*107*	*70-130*			
Surrogate: Dibromofluoromethane	*47.8*		*ug/L*	*50.00*		*96*	*70-130*			
Surrogate: Toluene-d8	*47.9*		*ug/L*	*50.00*		*96*	*70-130*			

Sample Extraction Data

Prep Method: SM6200 B

Lab Number	Batch	Initial	Final	Date/Time
9040223-01	P9D0374	10 mL	10 mL	04/22/19 7:54
9040223-01	P9D0374	10 mL	10 mL	04/22/19 7:54

CHAIN OF CUSTODY RECORD

PRISM LABORATORIES, INC. — Full-Service Analytical & Environmental Solutions

449 Springbrook Road • Charlotte, NC 28217
Phone 704/529-6364 • Fax: 704/525-0409

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: 2019-074

Project Name: NCDOT - Parcel 8 (Friendly Mart #6)
Short Hold Analysis: (Yes) (No) UST Project: (Yes) (NO)
*Please ATTACH any project specific reporting (QC LEVEL I II III IV) provisions and/or QC Requirements
Invoice To: Pyramid
Address:

Client Company Name: Pyramid Environmental
Report To/Contact Name: Tim Leatherman
Reporting Address: 503 Industrial Ave.
Greensboro NC 27406
Phone: 336 335-3174 Fax (Yes) (No):
Email Address: Tim@pyramidenvironmental.com
EDD Type: PDF ✓ Excel ___ Other ___
Site Location Name: Walnut Cove, NC
Site Location Physical Address:

Purchase Order No./Billing Reference 2019-074
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☐ 5 Days
"Working Days" ☒ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 14:00 will be processed next business day.
Turnaround time is based on business days, excluding weekends and holidays.
(SEE REVERSE FOR TERMS & CONDITIONS REGARDING SERVICES RENDERED BY PRISM LABORATORIES, INC. TO CLIENT)

LAB USE ONLY

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE?	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?	✓		
PROPER CONTAINERS used?	✓		

TEMP: Therm ID: IR#3 Observed: 2.3 °C / Corr 2.4 °C

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL
Certification: NELAC___ DoD___ FL___ NC X
SC___ OTHER___ N/A___
Water Chlorinated: YES___ NO X
Sample Iced Upon Collection: YES X NO___

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	ANALYSIS REQUESTED 624.1	REMARKS	PRISM LAB ID NO.
MW-2	4-11-19	11:00	Water	VOA	4	40ml	HCl	X	HOT!!!	01

Sampler's Signature: Timothy D. Leatherman
Sampled By (Print Name): Timothy D. Leatherman
Affiliation: Pyramid

PRESS DOWN FIRMLY - 3 COPIES

Upon relinquishing, this Chain of Custody is your authorization for Prism to proceed with the analyses as requested above. Any changes must be submitted in writing to the Prism Project Manager. There will be charges for any changes after analyses have been initialized.

		Date	Military/Hours
Relinquished By: (Signature) Timothy D. Leatherman	Received By: (Signature)	4-12-19	1055
Relinquished By: (Signature)	Received By: (Signature)	Date	
Relinquished By: (Signature) 4-12-19 1400	Received For Prism Laboratories By:	Date 4/12/19	14:00

Method of Shipment: NOTE: ALL SAMPLE COOLERS SHOULD BE TAPED SHUT WITH CUSTODY SEALS FOR TRANSPORTATION TO THE LABORATORY. SAMPLES ARE NOT ACCEPTED AND VERIFIED AGAINST COC UNTIL RECEIVED AT THE LABORATORY.

☐ Fed Ex ☐ UPS ☐ Hand-delivered ☐ Prism Field Service ☐ Other

COC Group No. 9040223

Additional Comments:

PRISM USE ONLY
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC	☒ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC
☐ ___	☐ ___	☐ ___	☐ ___	☐ ___	☐ ___	☐ ___	☐ ___	☐ ___

*CONTAINER TYPE CODES: A = Amber C = Clear G= Glass P = Plastic; TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (Zero Head Space)

SEE REVERSE FOR TERMS & CONDITIONS

ORIGINAL

APPENDIX G

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT R-5768 Phase II **PROJECT NO.:** 2019-074

Name: Leatherman, Heenan **Dates:** 4/3/19 & 4/4/19

TASKS PERFORMED: Site reconnaissance, geophysical surveys, utility locating

T. Leatherman, J. Heenan
Mobilize to site. Site, recon, geophysics, utility locating.
Average daily time: ~8:00 AM - 5:00PM

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT R-5768 Phase II **PROJECT NO.:** 2019-074

Name: Leatherman **Dates:** 4/23/19 & 4/24/19

TASKS PERFORMED: Soil Sampling

T. Leatherman
Mobilize to site. soil sampling supervision, collection and analysis prep
Average daily time: ~8:00 AM - 5:00PM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

May 15, 2017

MEMORANDUM TO: Brett Abernathy, PE, PLS
Division 9 Project Development Team Lead

FROM: Dennis G Li, Ph.D., LG
GeoEnvironmental Project Engineer
GeoEnvironmental Section
Geotechnical Engineering Unit

DocuSigned by:
Dennis Li
3288528EC798426...
5/16/2017

TIP NO: R-5768
WBS: 44670.1.1
COUNTY: Stokes
DIVISION 9
DESCRIPTION: US 311/NC 65/SR 1928 (Stokesburg Rd.) in Walnut Cove. Upgrade existing intersection and improve Norfolk Southern Railroad Crossing. Includes realignment of NC 65.

SUBJECT: **GeoEnvironmental Planning Report**

The GeoEnvironmental Section of the Geotechnical Engineering Unit performed a Phase I field investigation on May 10, 2017 for the above referenced project to identify geoenvironmental sites of concern. The purpose of this report is to document sites of concern within the project study area that are or may be contaminated. These sites of concern should be included in the environmental planning document in an effort to assist the project stakeholders in reducing or avoiding impacts to these sites. Sites of concern may include, but are not limited to, underground storage tank (UST) sites, dry cleaning facilities, hazardous waste sites, regulated landfills and unregulated dumpsites.

Findings

Five (5) sites of concern were identified within the proposed study area. We anticipate low monetary and scheduling impacts resulting from these sites. See the following table and figure for details.

Please note that discovery of additional sites not recorded by regulatory agencies and not reasonably discernible during the project reconnaissance may occur. The GeoEnvironmental Section should be notified immediately after discovery of such sites so their potential impact(s) may be assessed.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

Telephone: 919-707-6850
Fax: 919-250-4237
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

If there are questions regarding the geoenvironmental issues, please contact me, at 919-707-6857.

cc:
John Pilipchuk, LG, PE, State Geotechnical Engineer
Matthew (Matt) S. Lauffer, PE, Assistant State Hydraulics Engineer
Brian Hanks, PE, State Structures Engineer
Dale Burton, PE, PLS, Assistant State Locations and Surveys Engineer
Carl Barclay, PE, State Utilities Manager
Wright R. Archer, III, PE, Division 9 Construction Engineer
Rodney K Hatton, Division 9 Right of Way Agent
Eric Williams, PE, Western Regional Geotechnical Design Engineer
Kevin B Miller, L.G., Regional Geological Engineer
Steve Grimes, ROW Unit, Negotiations, State Negotiator
row-notify@ncdot.gov
roadwaydesign@ncdot.gov
File

Sites of Concern

1) **Property Name:**
Walnut Cove Food Mart (Former EXPREZIT 835)

634 S MAIN ST
WALNUT COVE NC 27052

Facility ID #: 00-0-0000035733
Incident #: N/A

Property Owner:
AS & S INC; NASIR, MUHAMMAD RAMZAN; KAUSAR, ROBINA

117 TRAIL COURT
THOMASVILLE NC 27360

UST Owner:
MGS ENTERPRISES INC
634 S MAIN STREET
WALNUT NC 27502

This is an active Mobil Gas Station. Based on NCDEQ's database, there are 4 USTs currently active on site. No monitoring wells are observed to be present at the time of this site visit. **This site is anticipated to present low geoenvironmental impacts to the project.**

2) **Property Name:**
The Cove Grill

407 S MAIN ST711 SOUTH MAIN STREET (Former
WALNUT COVE NC 27052

Facility ID #: N/A
Incident #: N/A

Property Owner
SUTPHIN, DUANE.

1015 BEAVER ISLAND TRAIL
WALNUT COVE NC 27052

UST Owner:
N/A

This is a large lot with a restaurant (the Cover Grill) and some storage business currently in operations. There are evidence of USTs and associated features on site. This was an old country store, USTs are probably still in the property. There are no record can be located from NCDEQ database. No monitoring wells are observed to be present on site. **This site is anticipated to present medium geoenvironmental impacts to the project**.

3) **Property Name:**
Vacant (Former FRIENDLY FOOD MART #6)

403 NC HWY 65 @ STOKESBURG RD
WALNUT COVE NC 27052

Facility ID #: 00-0-0000008364
Incident #: 19490

Property Owner
DEHART DR, V L

PO BOX 398
WALNUT COVE NC 27052

UST Owner:
DAN RIVER OIL CO
202 NOTH DALTON ST.
MADISON, NC 27025

This is the vacant building, the Former FRIENDLY FOOD MART #6 convenience Store was located at the corner of NC 65 and STOKESBURG RD. Based on NCDEQ's database, there were three 4000 gallons tanks installed in 1975 reportedly removed in 1998. Four (4) monitoring wells were observed to be present on site. The tank closure report could not be located in DEQ's files. **This site is anticipated to present medium geoenvironmental impacts to the project.**

4) **Property Name:**
Pork Produce Mart (Former GENE MILLER)

711 S Main Street
Walnut Cove, NC 27052

Facility ID #: 00-0-0000024859
Incident #: N/A

Property Owner
WEBSTER, THOMAS E; WEBSTER, SUE K

2113 LINDSAY BRIDGE RD
MADISON NC 27025

UST Owner:
Barrow Oil Co.
8900 ELLISBORO ROAD
STOKESDALE, NC 27357

This is the former GENE MILLER convenience store later converted to a multi business center. Based on NCDEQ's database, there were four tanks on the property, one was installed in 1986, and the others in 1964. No new USTs were installed since 2005. There are evidence of sewer line installed in the area of former USTs. No monitoring wells were observed to be present at the time of this site visit. Reportedly, one 3000 gallon UST associated with the former operations was removed and was replaced with the same sized UST in 1986. All USTs were removed in 2005 and no groundwater incident number was assigned. **This site is anticipated to present medium geoenvironmental impacts to the project.**

5) **Property Name:**
Vacant Building (Possible Former Convenience Store)

0 US 311 HWY/ 715 S Main Street
Walnut Cove, NC 27052

Facility ID #: N/A
Incident #: N/A

Property Owner
KNIGHT JR, JIMMY L.; KNIGHT, DEBBIE R.

PO BOX 531
WALNUT COVE NC 27052

UST Owner:
N/A

This is a vacant building. Based on the location and the style of the structure, the site is probably a former convenience store. However, USTs and associated features are not observed to be present at the time of this site visit. No monitoring wells are observed to be present on site. No record was located from NCDEQ's database. **This site is anticipated to present medium geoenvironmental impacts to the project.**

Appendix A
Location of GeoEnvironmental Sites of Concern