LIMITED PRELIMINARY SITE ASSESSMENT

FOR

PARCEL 60-MID STATE PETROLEUM, INC.

(MARKET STREET POP SHOPPE)

WILIMINGTON, SR 1409 (MILITARY CUTTOFF ROAD) FROM
NORTH OF US 74 (EASTWOOD ROAD) TO US 17 (MARKET STREET)

6980 MARKET STREET

WILMINGTON, NEW HANOVER COUNTY, NORTH CAROLINA

NCDOT PROJECT NO. 8.2251001 (U-2734) FEDERAL PROJECT NO. NFH-1409(3)

CATLIN PROJECT NO. 202-093

PREPARED FOR:

NCDOT GEOTECHNICAL UNIT-GEOENVIRONMENTAL SECTION 1589 MSC
RALEIGH, NORTH CAROLINA 27699-1589

NOVEMBER 22, 2002

PREPARED BY:

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APPENDIX B	LABORATORY REPORTS/CHAIN OF CUSTODY RECORDS
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1.0 INTRODUCTION AND PROJECT DESCRIPTION

1.1 PURPOSE OF INVESTIGATION AND DESCRIPTION (Refer to Figure 1)

CATLIN Engineers and Scientists (CATLIN) was retained by the North Carolina Department of Transportation (NCDOT) Geotechnical Unit in August 2002 to provide a field investigation concluding with a Preliminary Site Assessment (PSA) for the above referenced property. In response to a Request for Technical and Cost Proposal (RFP) dated August 19, 2002, CATLIN submitted a proposal for conducting a PSA at the Mid State Petroleum, Inc. Parcel 60 property located at 6980 Market Street in Wilmington, North Carolina. The site currently operates as the Market Street Pop Shoppe providing convenience items and retail fuel sales. Figure 1 illustrates the site vicinity. CATLIN personnel conducted a field investigation at the Mid State Oil, Inc. property beginning on August 29, 2002 with fieldwork concluding on October 14, 2002. This PSA report documents activities and findings.

According to the RFP, six underground storage tanks (USTs) at the site are currently in operation. It is unknown whether any other USTs or associated piping may remain. A confirmed release occurred at the site while operating as the Market Street Sunoco (Groundwater Incident Number 10148). The groundwater and soil contamination plume associated with the site has not been fully delineated.

NCDOT has requested an investigation to determine if the contamination is present within the proposed roadway/drainage construction. The purpose of this investigation was to:

- Delineate the soil and groundwater contamination within 1.8 meters (6 feet) of ground level where the proposed drainage pipe will be installed, by advancing soil borings within the existing right-of-way (r-o-w) and/or proposed r-o-w (east side of SR 1409);
- Survey borings and provide groundwater elevations;
- Indicate area of impacted soil and groundwater on a site map;
- Determine the recharge rate and provide estimated quantity of contaminated water to be disposed of when de-watering activities occur during proposed drainage installation; and
- Prepare a report including field activities, findings, plotted borings on site map with concentrations, and recommendations.

1.2 FIELD METHODS

CATLIN personnel gathered subsurface soil data by Direct Push Technology boring advancement using an AMS PowerProbeTM 9600D (PowerProbe). When using the PowerProbe, the borings are advanced to depth by static force and a 90 pound hydraulic percussion hammer. Two and one-quarter inch diameter by four foot length steel is used as casing. Soil samples are continuously collected in one and one-half inch clear liners. Liners are removed from the casing and then cut in half longitudinally to allow for visual/manual classification utilizing the Unified Soil Classification System (USCS). Soil is removed using new disposable latex gloves and placed in sealable polyethylene bags for organic vapor headspace analysis. Samples were allowed approximately ten minutes to equilibrate prior to headspace screening. Vapors were screened using a Foxboro 128 Organic Vapor Analyzer (OVA). Vadose zone soil samples were collected concurrently and packed in appropriate glassware for laboratory analysis.

Well materials were installed in three borings in an attempt to determine accurate water table measurements. These included SB-16, SB-18, and SB-19 with respective depths of 1.84 meters (m) [6.05 feet (ft.)], 2.02 m (6.61 ft.), and 2.17 m (7.13 ft.) below land surface (BLS). The wells were constructed with 1.5 m (5ft) of 3.1-centimeter (1.25-inch) slotted polyvinyl chloride (PVC) well screen and PVC riser to the surface.

The depth to water (DTW) was measured in each well. The top of casing (TOC) elevation was surveyed using the monument BL40 for a known elevation temporary benchmark. One grab groundwater sample was collected from SB-18. The sample was collected utilizing a peristaltic pump and new polyethylene tubing.

New disposable latex gloves were worn during sampling activities. All samples

were placed into the appropriately labeled glassware and packed on ice in an insulated cooler for transportation to the laboratory. Sample integrity was maintained by following proper chain of custody procedures.

Boreholes were abandoned to the surface using one-centimeter (three-eighth inch) bentonite chips. Bentonite and water were poured into the borehole simultaneously to facilitate hydration.

1.3 LABORATORY TESTING

Samples were transported to Prism Laboratories, Inc. (Prism), located in Charlotte, North Carolina, (NC Certification # 402) by a Prism courier and via FedEx.

One vadose soil sample was collected from each boring location for laboratory analysis. In an attempt to provide information regarding petroleum impacts to soils and estimated volumes with reasonable analytical expense, soil samples were analyzed per Total Petroleum Hydrocarbons (TPH) by Environmental Protection Agency (EPA) Methods 5030 and 3550 with analysis by modified 8015. Any laboratory result in excess of 10 parts per million (ppm) was considered to be contaminated by petroleum. The North Carolina Department of Environment and Natural Resources (NCDENR) guidance documents propose analysis by risk based laboratory methods and site ranking by NCDENR to determine exceedances of guidelines action levels by petroleum.

In accordance with the NCDOT RFP workscope one groundwater sample was selected for laboratory analysis. The groundwater sample was analyzed per EPA Method 602.

2.0 FIELD ACTIVITIES

2.1 CURRENT SITE CONDITIONS AND FIELD OBSERVATIONS

As previously mentioned, the site currently operates as a convenience store with retail fuel sales. According to NCDOT there are four gasoline USTs and two diesel USTs in service.

2.2 SOIL SAMPLING

(Refer to Table 1, Figure 2, and Appendices A and B)

Soil borings were advanced along the proposed NCDOT drainage construction areas to approximately 1.8 m (6 ft.) BLS. Soil boring locations are shown on Figure 2. A total of 19 borings (SB-1 through SB-19) were advanced using the PowerProbe. Soil test boring records are included in Appendix A.

Soil samples were collected continuously to 1.2 m (4 ft) BLS and then from 1.2 m to boring termination. After retrieving the drive, the amount of recovered material was measured. Soil was visually/manually classified for USCS classification. Soil was then placed in an airtight polyethylene bag for headspace screening using an OVA. The OVA screening results are included on the boring logs in Appendix A and are summarized in Table 1. Concurrently, soil samples collected for laboratory analysis were packed in the appropriate glassware, labeled, and placed in a cooler on ice. A total of 19 soil samples were submitted to Prism, for analysis by EPA Methods 3550 and 5030 with analysis by modified 8015. Chain of Custody documentation is included in Appendix B.

2.3 GROUNDWATER SAMPLING

(Refer to Figure 2 and Appendix B)

Following retrieval of the soil sample from SB-18, a temporary well was installed in an attempt to collect a groundwater sample. After approximately 10 minutes the well was gauged for product and depth to water. No measurable free-phase floating product was encountered. The well location, along with temporary wells installed in SB-16 and SB-19 to confirm water table data, are illustrated on Figure 2.

A groundwater sample was collected from the temporary well at boring SB-18. Groundwater was pumped into the appropriate glassware, labeled, and placed in a cooler on ice. The groundwater sample was shipped to Prism via Fed Ex for analysis by EPA method 602. Chain of Custody documentation is included in Appendix B.

2.4 SURVEYING

The monument BL40 was located and surveyed, which established a known elevation reference. The TOC elevation at SB-16, SB-18, and SB-19 were surveyed based on the BL40 elevation. The wells were gauged for DTW on November 11, 2002 and then the water table elevation was calculated.

3.0 RESULTS

3.1 SOIL SAMPLE ANALYTICAL RESULTS

(Refer to Table 2, Figure 3, and Appendix B)

Soil sample analytical results are provided in Table 2 and illustrated on Figure 3.

The soil sample collected from boring SB-18, east of the dispenser island along the western side of Military Cuttoff Road, revealed concentrations of diesel range organics (DRO) at 600 mg/Kg and gasoline range organics (GRO)at 110 mg/Kg.

All other soil samples did not reveal DRO or GRO above the laboratory reporting limit. Complete laboratory reports are included in Appendix B.

3.2 GROUNDWATER SAMPLE ANALYTICAL RESULTS

(Refer to Table 3, Figure 4, and Appendix B)

Groundwater analytical results are provided in Table 3 and illustrated on Figure 4.

The groundwater samples collected from the temporary well SB-18 revealed the presence of the following compounds: benzene at 1,600 ug/L, ethylbenzene at 1,900 ug/L, toluene at 1,600, and total xylenes at 8,400 ug/L. Each of these results exceed the corresponding North Carolina Administrative Code Section 2L groundwater quality standard (2L Standard) but are below the corresponding Gross Contaminant Level (GCL).

All other analytical results were below the corresponding laboratory reporting limit. Complete laboratory reports are included in Appendix B.

3.3 GROUNDWATER TABLE ELEVATION

(Refer to Figure 4)

The measured depth to water below TOC was 1.39 meters (4.55 ft.) at SB-16, 1.89 meters (6.20 ft.) at SB-18 and 0.54 meters (1.80 ft.) at SB-19. It should be noted that SB-19 was installed on the edge of the drainage ditch somewhat below typical ground level. The water table elevation at SB-16 was 12.83 m (42.08 ft.), at SB-18, 12.29 meters (40.31 ft) and, 12.51 meters (41.03 ft.) at SB-19. Groundwater elevations are shown on Figure 4.

4.0 ESTIMATED EXTENT OF PETROLEUM IMPACT

(Refer to Figure 4)

Based on field observation and analytical results, soil contamination exceeding 10 mg/Kg TPH exists within the NCDOT r-o-w surrounding the SB-18 boring but does not extend across Military Cuttoff Road. Groundwater contamination was detected at the SB-18 boring location also, however, proposed construction depths do not intersect current contaminated groundwater table elevations. This includes the following assumptions:

- Depth to groundwater is 1.875 meters (6.2 ft) BLS.
- NCDOT roadway/drainage construction will not occur beyond 1.8 meters (6 ft) BLS.
- Soils exceeding a TPH concentration of 10 ppm are considered impacted.

5.0 ESTIMATED AQUIFER RECHARGE RATE AND DEWATERING FLUIDS (Appendix C)

The proposed excavation to 1.8 m (6 ft.) BLS will not intersect contaminated groundwater under current site conditions. However, based on historical water table measurements, the trench may require de-watering prior to pipe installation. Calculations for estimated aquifer recharge rates during proposed trenching activities in the area of known groundwater contamination are included in Appendix C.

Aquifer recharge rate and necessary pumping rates to maintain a dry trench were estimated based on NFE Technologies calculated hydraulic conductivity. For estimating purposes the trench was assumed to be seven feet wide and six feet deep with depth to groundwater at five feet BLS. A pumping rate of approximately five gallons per minute would maintain a dry trench 75 feet long. A graph representing necessary pumping rates for other trench lengths is included in Appendix C.

6.0 SUMMARY AND CONCLUSIONS

Based on field observations and analytical results, soil contamination exceeding 10 mg/Kg TPH and groundwater contamination exceeding applicable standards exists within the NCDOT r-o-w along the east side of the Mid State Petroleum, Inc. property in at least one location. Soil contamination exceeding 10 mg/Kg TPH was not revealed in soil samples collected along the east side of Military Cuttoff within the proposed NCDOT roadway/drainage project area. The depth to groundwater at the site was determined to be greater than 1.8 m (6 ft.) BLS; therefore, at current water levels, contaminated groundwater will not impact the NCDOT roadway/drainage construction. The groundwater contamination detected during the Groundwater and Environmental Services, Inc. July 2002 monitoring event was confirmed by the analytical results from the SB-18 sample.

It should be noted that groundwater levels in this area might be currently depressed. Prior to construction activities it would be prudent to measure groundwater levels to reassess potential impacts to construction.

7.0 SIGNATURES

G. Richard Garrett, L.G.

Contract Manager

Benjamin J. Ashba Project Manager

Benjamin J. Ashlo

TABLES

TABLE 1 SUMMARY OF SOIL HEADSPACE SCREENING ANALYSIS

NCDOT MID STATE PETROLEUM NC DOT PROJECT 8.2251001 (U-2734) WILMINGTON, NORTH CAROLINA

BORING I.D.	Sample Depth Meters (Feet)	OVA READING (ppm)	Sample Selected for Laboratory Analysis
SB-1	0 - 1.2 (0 - 4)	0	no
	1.2 -1.8 (4 - 6)	0	Yes
SB-2	0 - 1.2 (0 - 4)	0	no
3D-2	1.2 -1.8 (4 - 6)	0	Yes
SB-3	0 - 1.2 (0 - 4)	0	no
3D-3	1.2 -1.8 (4 - 6)	0	Yes
SB-4	0 - 1.2 (0 - 4)	0.5	no
SD-4	1.2 -1.8 (4 - 6)	0	Yes
OD C	0 - 1.2 (0 - 4)	0	no
SB-5	1.2 -1.8 (4 - 6)	0	Yes
00.0	0 - 1.2 (0 - 4)	0.8	no
SB-6	1.2 -1.8 (4 - 6)	0	Yes
OD 7	0 - 1.2 (0 - 4)	0	no
SB-7	1.2 -1.8 (4 - 6)	0	Yes
00.0	0 - 1.2 (0 - 4)	0	no
SB-8	1.2 -1.8 (4 - 6)	0	Yes
00.0	0 - 1.2 (0 - 4)	0	no
SB-9	1.2 -1.8 (4 - 6)	0	Yes
OD 40	0 - 1.2 (0 - 4)	0	no
SB-10	1.2 -1.8 (4 - 6)	0	Yes
05.	0 - 1.2 (0 - 4)	0	no
SB-11	1.2 -1.8 (4 - 6)	0	Yes
	0 - 1.2 (0 - 4)	0	no
SB-12	1.2 -1.8 (4 - 6)	0	Yes
	0 - 1.2 (0 - 4)	0	no
SB-13	1.2 -1.8 (4 - 6)	0	Yes

TABLE 1 SUMMARY OF SOIL HEADSPACE SCREENING ANALYSIS

NCDOT MID STATE PETROLEUM NC DOT PROJECT 8.2251001 (U-2734) WILMINGTON, NORTH CAROLINA

BORING I.D.	Sample Depth Meters (Feet)	OVA READING (ppm)	Sample Selected for Laboratory Analysis
	0 - 1.2 (0 - 4)	0	no
SB-14	1.2 -1.8 (4 - 6)	0	Yes
OD 45	0 - 1.2 (0 - 4)	0	no
SB-15	1.2 -1.8 (4 - 6)	0	Yes
OD 10	0 - 1.2 (0 - 4)	0	no
SB-16	1.2 -1.8 (4 - 6)	8	Yes
OD 47	0 - 1.2 (0 - 4)	4.5	no
SB-17	1.2 -1.8 (4 - 6)	1	Yes
00.40	0 - 1.2 (0 - 4)	9.5	no
SB-18	1.2 -1.8 (4 - 6)	700	Yes
OD 40	0.6 - 1.2 (2 - 4)	5.2	Yes
SB-19	1.2 -1.8 (4 - 6)	95	no

TABLE 2

SUMMARY OF SOIL LABORATORY RESULTS PER EPA METHODS 3550 AND 5030 BY MODIFIED 8015

NCDOT MID STATE PETROLEUM NCDOT PROJECT 8.2251001(U-2734) WILMINGTON, NORTH CAROLINA

				
SAMPLE ID	DATE	DEPTH (FEET)	TPH - 3550 DIESEL (MG/KG)	TPH - 5030 GASOLINE (MG/KG)
SB-1	10/16/2002	4 - 6	<10	<1
SB-2	10/16/2002	4 - 6	<10	<1
SB-3	10/16/2002	4 - 6	<10	<1
SB-4	10/16/2002	4 - 6	<10	<1
SB-5	10/16/2002	4 - 6	<10	<1
SB-6	10/16/2002	4 - 6	<10	<1
SB-7	10/16/2002	4 - 6	<10	<1
SB-8	10/16/2002	4 - 6	<10	<1
SB-9	10/16/2002	4 - 6	<10	<1
SB-10	10/16/2002	4 - 6	<10	<1
SB-11	10/16/2002	4 - 6	<10	<1
SB-12	10/16/2002	4 - 6	<10	<1
SB-13	10/16/2002	4 - 6	<10	<1
SB-14	10/16/2002	4 - 6	<10	<1
SB-15	10/16/2002	4 - 6	<10	<1
SB-16	10/16/2002	4 - 6	<10	<1
SB-17	10/16/2002	4 - 6	<10	<1
SB-18	10/16/2002	4 - 6	600	110
SB-19	10/16/2002	2 - 4	<10	<1

Shaded concentrations exceed 10 mg/Kg

TABLE 3

SUMMARY OF GROUNDWATER LABORATORY RESULTS PER EPA METHOD 602

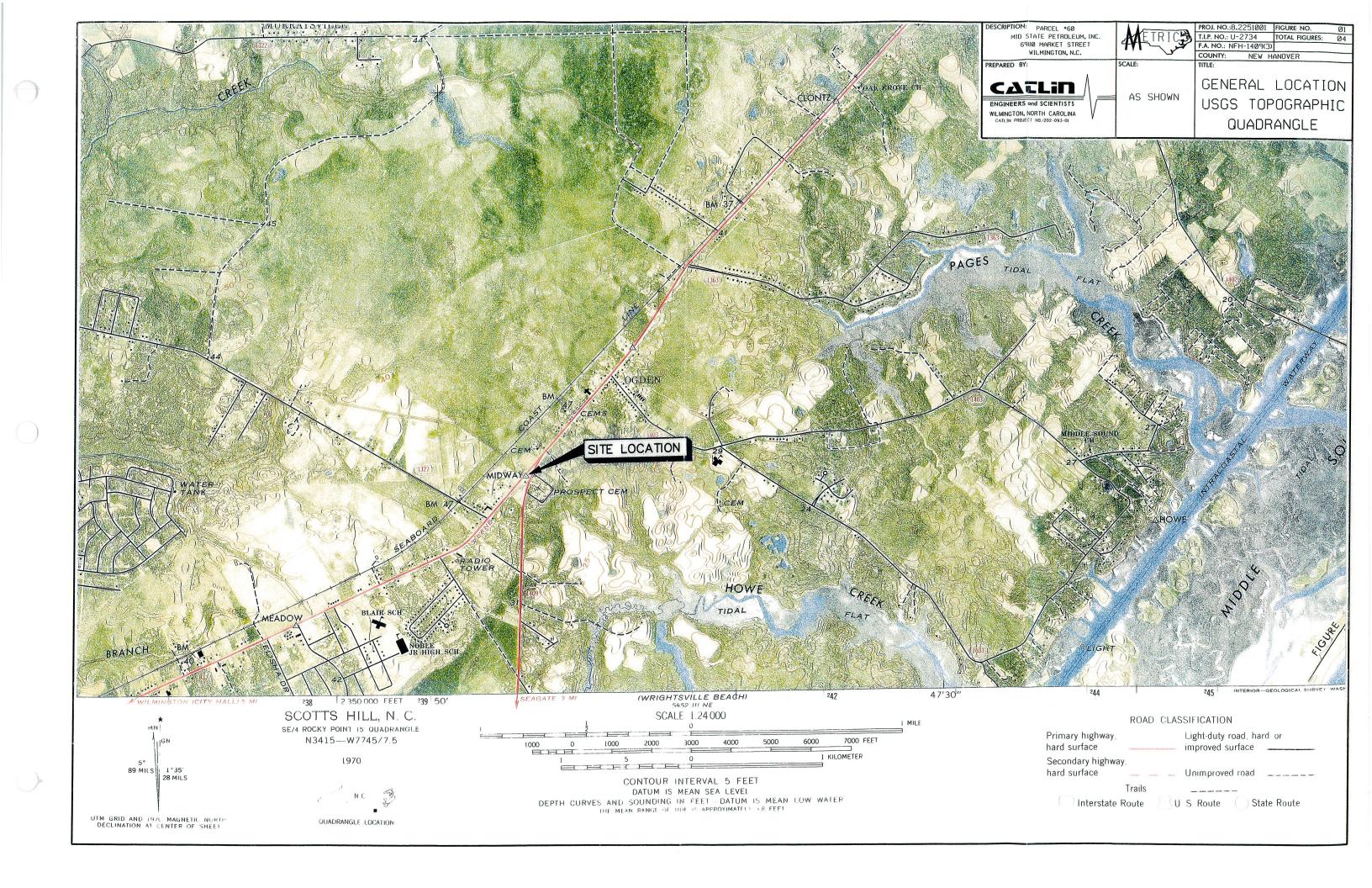
NCDOT MID STATE PETROLEUM NCDOT PROJECT 8.2251001 (U-2734) WILMINGTON, NORTH CAROLINA

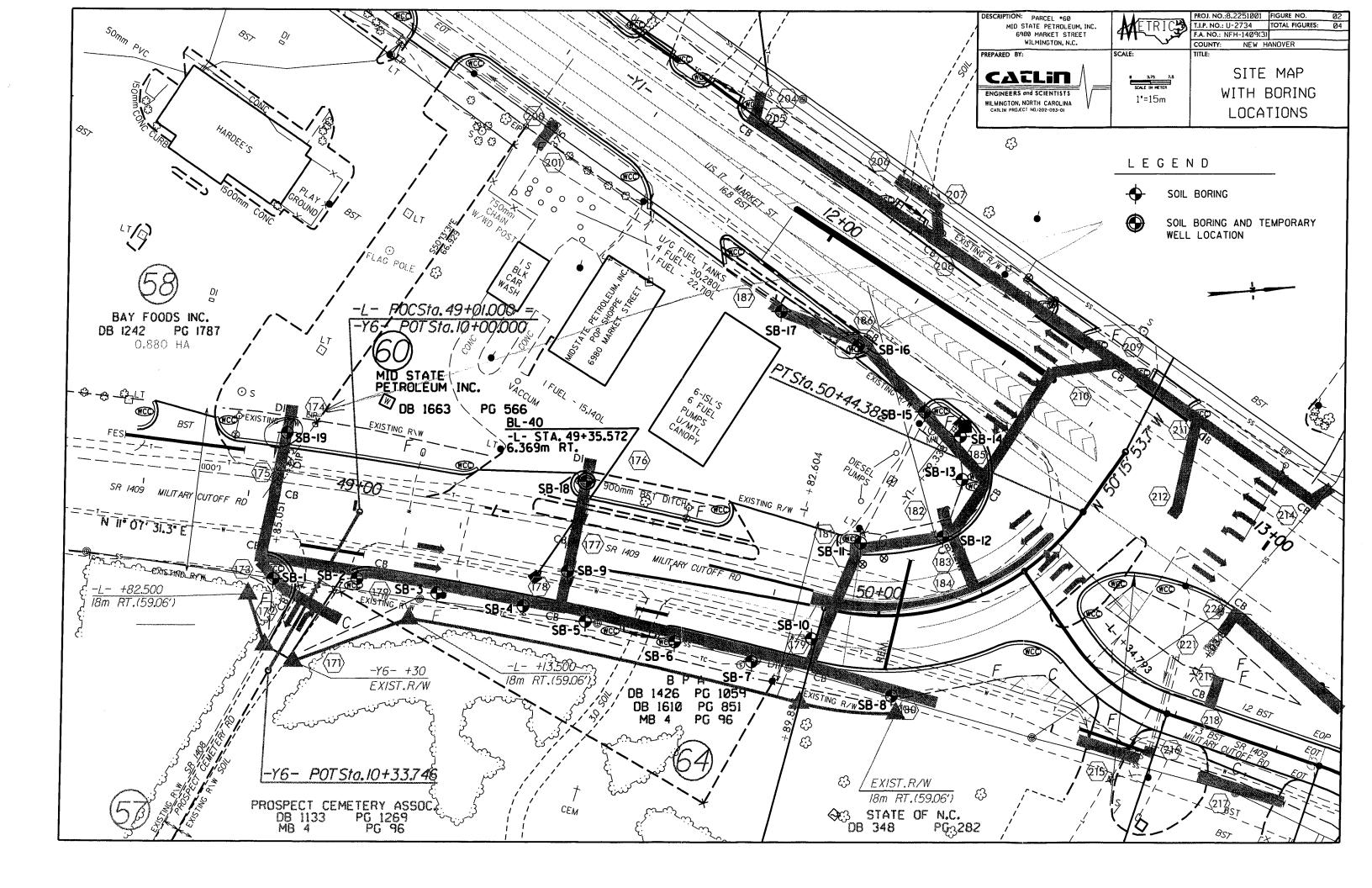
Sample ID and Date Sampled	Analyte	Result	NCAC 2L STANDARD / GCL
	BENZENE	1,600	1 / 5,000
	ETHYLBENZENE	1,900	29 / 29,000
SB-18	IPE	<500*	70 / 70,000
11/1/02	MTBE	<500*	200 / 200,000
	TOLUENE	1,600	1,000 / 257,500
	TOTAL XYLENES	8,400	530 / 87,500

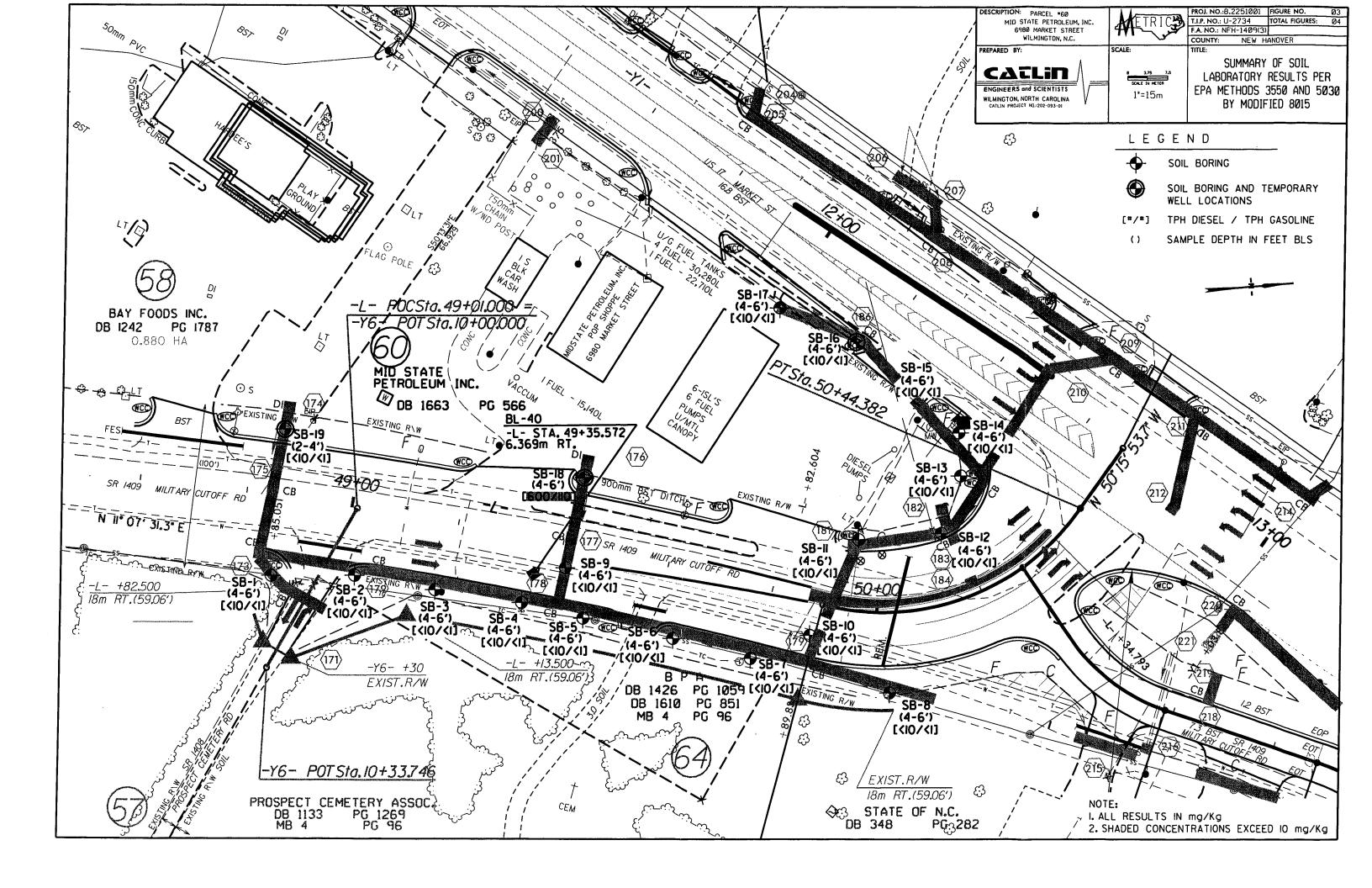
All results in ug/l.

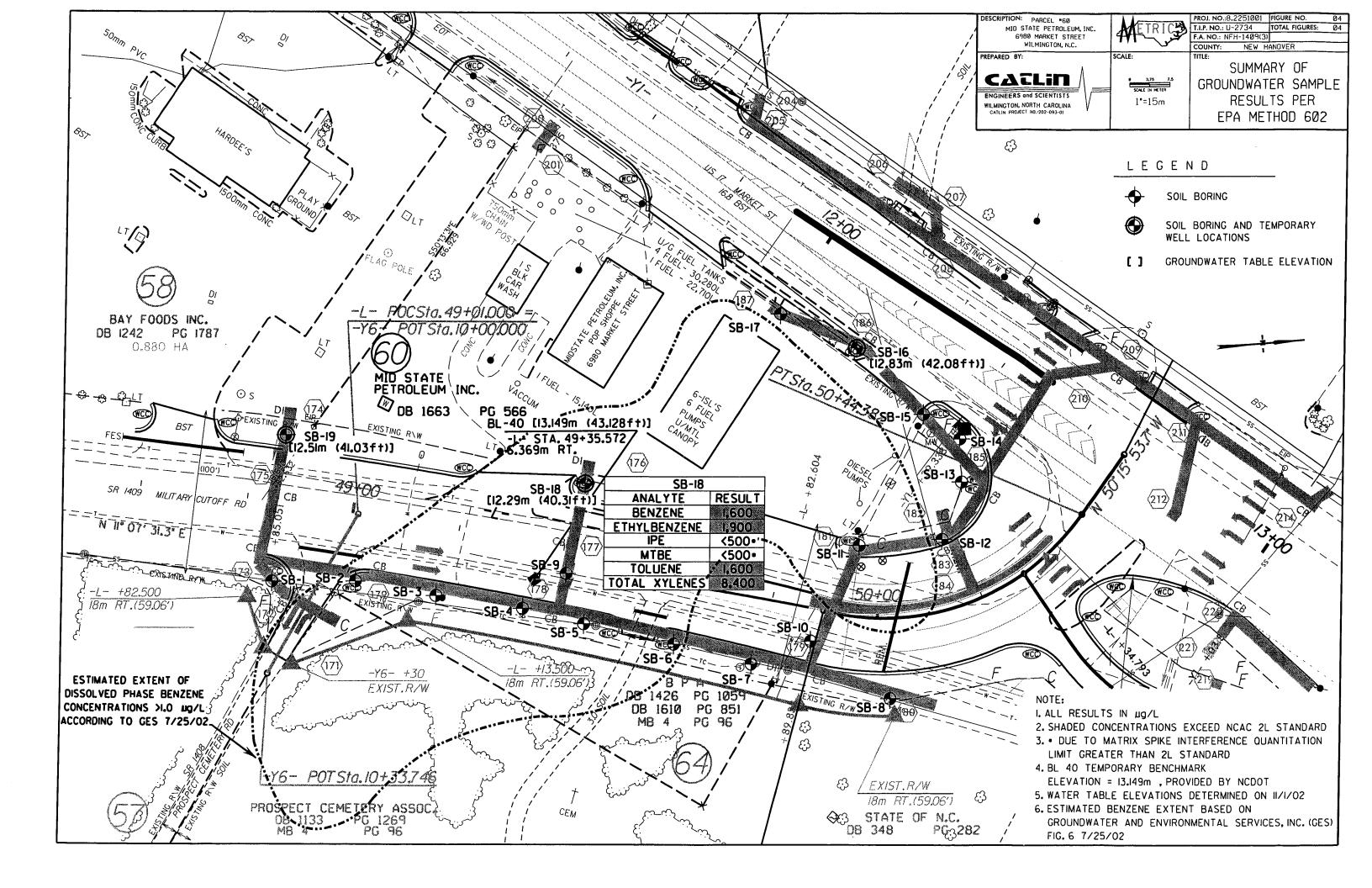
^{* =} Due to matrix spike interference quantitation limit is greater than 2L Standard Shaded results exceed the corresponding NCAC 2L Standard.

FIGURES









APPENDIX B LABORATORY REPORTS/CHAIN OF CUSTODY RECORDS



FILE COPY



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10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

Customer Project ID: Midstate Oil

Customer Sample ID: SB-1

Prism Sample ID: AC61331

Login Group: AOO25K19

Sample Collection Date/Time: 10/16/02 11:10

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 08:25	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/22/02 06:55	JMV
CALCULATIONS BASED ON DRY WT.	93	% DRY WT.	0.01	SM 2540 G	10/22/02 11:15	cwc
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:

Angela D. Overcash, V.P. Laboratory Services

Phone: 704 / 529-6364 ▲ Toll Free Number: 1-800 / 529-6364 ▲ Fax: 704 / 525-0409



10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

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Customer Project ID: Midstate Oil

Customer Sample ID: SB-2

Prism Sample ID: AC61332

Login Group: AOO25K19

Sample Collection Date/Time: 10/16/02 11:30

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 09:10	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/22/02 13:54	JMV
CALCULATIONS BASED ON DRY WT.	89	% DRY WT.	0.01	SM 2540 G	10/22/02 11:15	CWC
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:

Angela D. Overcash, V.P. Laboratory Services

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10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

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Customer Project ID: Midstate Oil

Customer Sample ID: SB-3

Prism Sample ID: AC61333 Login Group: AOO25K19

Login Group. ACC251(15

Sample Collection Date/Time: 10/16/02 12:50

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 09:56	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/22/02 08:11	JMV
CALCULATIONS BASED ON DRY WT.	90	% DRY WT.	0.01	SM 2540 G	10/22/02 11:15	CWC
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:



10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

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Customer Project ID: Midstate Oil

Customer Sample ID: SB-4

Prism Sample ID: AC61334

Login Group: AOO25K19

Sample Collection Date/Time: 10/16/02 13:10

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 10:41	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/22/02 08:48	JMV
CALCULATIONS BASED ON DRY WT.	90	% DRY WT.	0.01	SM 2540 G	10/22/02 11:15	cwc
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:

Angela D. Overcash, V.P. Laboratory Services

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



10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

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Customer Project ID: Midstate Oil

Customer Sample ID: SB-5

Prism Sample ID: AC61335

Login Group: AOO25K19

Sample Collection Date/Time: 10/16/02 13:25

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 11:26	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/22/02 19:05	JMV
CALCULATIONS BASED ON DRY WT.	90	% DRY WT.	0.01	SM 2540 G	10/22/02 11:15	CWC
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:

Angela D. Overcash, V.P. Laboratory Services

Phone: 704 / 529-6364 ▲ Toll Free Number: 1-800 / 529-6364 ▲ Fax: 704 / 525-0409



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10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

Customer Project ID: Midstate Oil

Customer Sample ID: SB-6

Prism Sample ID: AC61336

Login Group: AOO25K19

Sample Collection Date/Time: 10/16/02 14:05

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 12:12	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/22/02 19:42	JMV
CALCULATIONS BASED ON DRY WT.	89	% DRY WT.	0.01	SM 2540 G	10/22/02 11:15	cwc
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:

Angela D. Overcash, V.P. Laboratory Services

Phone: 704 / 529-6364 ▲ Toll Free Number: 1-800 / 529-6364 ▲ Fax: 704 / 525-0409



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14:20

10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

Customer Project ID: Midstate Oil

Customer Sample ID: SB-7

Prism Sample ID: AC61337

Login Group: AOO25K19

Sample Collection Date/Time: 10/16/02

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 12:58	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/22/02 20:20	JMV
CALCULATIONS BASED ON DRY WT.	88	% DRY WT.	0.01	SM 2540 G	10/22/02 11:15	CWC
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:



10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

Page 8 of 19

Customer Project ID: Midstate Oil

Customer Sample ID: SB-8

Prism Sample ID: AC61338

Login Group: AOO25K19

Sample Collection Date/Time: 10/16/02 15:30

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 19:48	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/23/02 10:12	JMV
CALCULATIONS BASED ON DRY WT.	91	% DRY WT.	0.01	SM 2540 G	10/22/02 11:15	cwc
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:



Full Service Analytical & Environmental Solutions

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13:50

10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

Customer Project ID: Midstate Oil

Customer Sample ID: SB-9

Prism Sample ID: AC61339

Login Group: AOO25K19

Sample Collection Date/Time: 10/16/02

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 20:34	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/22/02 22:51	JMV
CALCULATIONS BASED ON DRY WT.	96	% DRY WT.	0.01	SM 2540 G	10/22/02 11:15	CWC
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:



10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

Page 10 of 19

Customer Project ID: Midstate Oil

Customer Sample ID: SB-10

Prism Sample ID: AC61340

Login Group: AOO25K19

Sample Collection Date/Time: 10/16/02 15:00

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 21:19	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/22/02 23:29	JMV
CALCULATIONS BASED ON DRY WT.	86	% DRY WT.	0.01	SM 2540 G	10/22/02 11:15	cwc
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:



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09:20

10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

Customer Project ID: Midstate Oil

Customer Sample ID: SB-11

Prism Sample ID: AC61341

Login Group: AOO25K19

Sample Collection Date/Time: 10/17/02

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 07:40	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/23/02 00:07	JMV
CALCULATIONS BASED ON DRY WT.	96	% DRY WT.	0.01	SM 2540 G	10/23/02 11:00	CWC
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:



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10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

Customer Project ID: Midstate Oil

Customer Sample ID: SB-12
Prism Sample ID: AC61342

Login Group: AOO25K19

Sample Collection Date/Time: 10/17/02 09:35

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 15:59	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/23/02 00:45	JMV
CALCULATIONS BASED ON DRY WT.	90	% DRY WT.	0.01	SM 2540 G	10/23/02 11:00	CWC
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:



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09:45

10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

Customer Project ID: Midstate Oil

Customer Sample ID: SB-13

Prism Sample ID: AC61343

Login Group: AOO25K19

Sample Collection Date/Time: 10/17/02

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 16:45	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/23/02 11:11	JMV
CALCULATIONS BASED ON DRY WT.	90	% DRY WT.	0.01	SM 2540 G	10/23/02 11:00	cwc
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:



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10/28/02

Customer Project ID: Midstate Oil

Catlin Engineers & Scientists

Customer Sample ID: SB-14

Attn: Rick Garrett

Prism Sample ID: AC61344

PO Box 10279

Wilmington, NC 28404-0279

Login Group: AOO25K19

Sample Collection Date/Time: 10/17/02 Lab Submittal Date/Time: 10/18/02

10:05 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 13:43	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/23/02 02:01	JMV
CALCULATIONS BASED ON DRY WT.	91	% DRY WT.	0.01	SM 2540 G	10/23/02 11:00	CWC
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:



10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

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Customer Project ID: Midstate Oil

Customer Sample ID: SB-15
Prism Sample ID: AC61345

Login Group: AOO25K19

Sample Collection Date/Time: 10/17/02 10:45

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 17:32	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/23/02 11:48	JMV
CALCULATIONS BASED ON DRY WT.	92	% DRY WT.	0.01	SM 2540 G	10/23/02 11:00	CWC
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:



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10/28/02

Attn: Rick Garrett

PO Box 10279

Catlin Engineers & Scientists

Wilmington, NC 28404-0279

Customer Project ID: Midstate Oil

Customer Sample ID: SB-16

Prism Sample ID: AC61346

Login Group: AOO25K19

Sample Collection Date/Time: 10/17/02 11:05

Lab Submittal Date/Time: 10/18/02

09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 18:17	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/23/02 12:26	JMV
CALCULATIONS BASED ON DRY WT.	93	% DRY WT.	0.01	SM 2540 G	10/23/02 11:00	CWC
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:



10/28/02

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Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

Customer Project ID: Midstate Oil

Customer Sample ID: SB-17

Prism Sample ID: AC61347

Login Group: AOO25K19

Sample Collection Date/Time: 10/17/02 11:35

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 19:03	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/23/02 03:54	JMV
CALCULATIONS BASED ON DRY WT.	87	% DRY WT.	0.01	SM 2540 G	10/23/02 11:00	cwc
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:

Angela D. Overcash, V.P. Laboratory Services



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10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

Customer Project ID: Midstate Oil

Customer Sample ID: SB-18

Prism Sample ID: AC61348

Login Group: AOO25K19

Sample Collection Date/Time: 10/17/02 12:05

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	600	mg/kg	100	8015MOD/3550	10/27/02 11:15	GRR
TPH-GASOLINE RANGE / PREP. 5030	110	mg/kg	10	8015MOD/5030	10/23/02 13:41	JMV
CALCULATIONS BASED ON DRY WT.	96	% DRY WT.	0.01	SM 2540 G	10/23/02 11:00	CWC
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:

Angela D. Overcash, V.P. Laboratory Services

Phone: 704 / 529-6364 ▲ Toll Free Number: 1-800 / 529-6364 ▲ Fax: 704 / 525-0409



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12:45

10/28/02

Catlin Engineers & Scientists

Attn: Rick Garrett PO Box 10279

Wilmington, NC 28404-0279

Customer Project ID: Midstate Oil

Customer Sample ID: SB-19

Prism Sample ID: AC61349

Login Group: AOO25K19

Sample Collection Date/Time: 10/17/02

Lab Submittal Date/Time: 10/18/02 09:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME STARTED	ANALYST
TPH - DIESEL RANGE	Less than	mg/kg	10	8015MOD/3550	10/26/02 22:50	GRR
TPH-GASOLINE RANGE / PREP. 5030	Less than	mg/kg	1.0	8015MOD/5030	10/23/02 13:04	JMV
CALCULATIONS BASED ON DRY WT.	81	% DRY WT.	0.01	SM 2540 G	10/23/02 11:00	cwc
PREP. METHOD 3550	Completed			SW846-3550	10/25/02 06:30	JDP

Sample Comments:

Angela D. Overcash, V.P. Laboratory Services



449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543 Full Service Analytical & Environmental Solutions

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VOLATILES 18CID WIGHT HEADSPACE? PROPER PRESERVATIVES Indicated? Received WITHIN HOLDING TIMES? PROPER CONTAINERS used? Received ON WET ICE? Temp Samples INTACT upon arrival? CUSTODY SEALS INTACT?

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LAB USE ONLY

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□ 6–9 Days □ Standard 10 days

Purchase Order No./Billing Reference BJ/M_{ℓ} Do au

Address:_

Requested Due Date □ 1 Day

.	TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL
	Certification: NELAC USACE FL NC
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*CONTAINER TYPE CODES: A = Amber C = Clear G = Glass P = Plastic; TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (Zero Head Space) ONC OSC L'ANDFILL: | OTHER: ONC OSC ONC OSC CERCLA: RCRA: SOLID WASTE: D NC D SC DRINKING WATER: ONC OSC

Annorda

NOTE: ALL SAMPLE COOLERS SHOULD BE TAPED SHUT WITH CUSTOOY SEALS FOR TRANSPORTATION TO THE LABORATORY. SAMPLES ARE NOT ACCEPTED AND VERIFIED AGAINST COC UNTIL RECEIVED AT THE LABORATORY.

☐ Hand-delivered ☐ Prism Field Service ☐ Other

GROUNDWATER:

D NC D SC

ONC OSC

OS O ON O NPDES:

UST:

Received For Prism Laboratories By:

Relinquished By: (Signature)

Method of Shipment: OF FED EX TOYUPS

Relinquished By: (Signature)

Received By: (Signature)

FINAL REPORT COPY SEE REVERSE FOR TERMS & CONDITIONS

Site Departure Time:

Field Tech Fee:

Mileage:



449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543 Full Service Analytical & Environmental Solutions

د جرير ... Fax (Yes) (No): المربيرة ع Site Location Name: And Control Site Location Physical Address: Client Company Name: Report To/Contact Name: 🔀 Reporting Address: _ Phone: And Just

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PAGE OF QUOTE # TO ENSURE PROPER BILLING:	1. 1. 1. 1. 1. C. J. C. J. C.	No) UST Project:	ecific reporting	ments .	Invoice To:	
OF QUOTE # T	t Name: 27 / / / /	Short Hold Analysis: (Yes) (No)	*Please ATTACH any project specific reporting	provisions and/or QC Requirements	e To:	SS:
PAGE	Proje	Short	*Pleas	provi	Invoic	Address:

	TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL	ays Q5 Days Certification: NELAC USACE FL NC 1	SC OTHER N/A	Water Clorinated: YES	ND FEES) Sample Iced Upon Collection: YES NO
Audiess.	Purchase Order No./Billing Reference 87/ 21/ 1907	∠, ? Requested Due Date □1 Day □2 Days □3 Days □4 Days Q5 Days	コート・ローク ロ G-9 Days ロ Standard 10 days	Samples received after 15:00 will be processed next business day. Turnaround time is based on business days, excluding weekends and holidays.	- (SEE REVERSE SIDE FOR RUSH TURNAROUND FEES)

CLIENT	DATE	COLLECTED	MATRIX	SAMPL	SAMPLE CONTAINER	NER	PRESERVA.	₹ <u>₹</u>	ANALYSES R.	EQUESTED		SUB -	PRISM	
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CUSTOMER COPY

***CONTAINER TVPF CONFS. A = Amher C = Clear G = Glass P = Plastic; TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (Zero Head Space)

SEE REVERSE FOR TERMS & CONDITIONS

L'ANDFILL: OTHER:

RCRA: CERCLA:

SOLID WASTE:

DRINKING WATER:

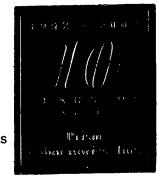
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GROUNDWATER:

D NC D SC

NPDES: \ | UST:

'⊈ Fed Ex 'Q'UPS ☐ Hand-delivered ☐ Prism Field Service ☐ Other_





Full Service Analytical & Environmental Solutions

Page 1 of 1

11/12/02

Catlin Engineers & Scientists

Attn: Ben Ashba PO Box 10279

Wilmington, NC 28404-0279

Customer Project ID: DOT Market Street

Customer Sample ID: SB-18

Prism Sample ID: AC63673

Login Group: 4122K1

Sample Collection Date/Time: 11/1/02 11:30 Lab Submittal Date/Time: 11/8/02 10:20

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

TEST	TEST		REPORTING	METHOD	DATE/TIME	
PARAMETER	RESULT	UNITS	LIMIT	REFERENCE	STARTED	ANALYST
BENZENE	1600	ug/L	100	EPA 602	11/8/02 10:51	KTE
ETHYLBENZENE	1900	ug/L	100	EPA 602	11/8/02 10:51	KTE
IPE	Not detected	ug/L	500	EPA 602	11/8/02 10:51	KTE
MTBE ·	Not detected	ug/L	500	EPA 602	11/8/02 10:51	KTE
TOLUENE	1600	ug/L	100	EPA 602	11/8/02 10:51	KTE
XYLENES	8400	ug/L	300	EPA 602	11/8/02 10:51	KTE

Sample Comments:

Angela D. Overcash, V.P. Laboratory Services

Phone: 704 / 529-6364 ▲ Toll Free Number: 1-800 / 529-6364 ▲ Fax: 704 / 525-0409



	•
Full Service Analytical & Environmental Sotutions	Short Hold Analy
449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543	*Please ATTACH
	provisions and/o
Client Company Name:	Invoice To:
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Full Service Analytical & Environmental Solutions 449 Springbrook Road • P.O. Roy 246843, President	Full Service Analytical & Environmental Solutions	nental Solutions		Short Hold Analysis:	alysis:	(Yes) (No)	USTP	:: :	(Ves) (No)	PROPER PR	PROPER PRESERVATIVES Indicated?	ated?	4.4,	 	
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ite Location Physical Address:	ddress:		10V 1657 S	samples receive urnaround time	الے 6–ڑ d after 15:0 is based or	Uays USI 0 will be pro	☐ b−9 Days ☐ Standard 10 days Samples received after 15:00 will be processed next business day. Turnaround time is based on histores days excluding workpade and heliders.	ess day.		SC SC Water Clorinated:	VES	THER YOUNG	N/A	 	Ի
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Upon relinquishing, the stilbmitted in writing to	Is Chain of Cu	ustody is your	authorizatio	Sampled By (Print Name) uthorization for Prism to	o proceed	with the	to proceed with the analyses as requested above. Any changes must be	Affiliation puested abo	ive. Any chang	anges must	pe		NO ESTI MSIGG	10 201	
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The state of the s	Project Name: DUT MANIET CAUSE	Received ON WET ICE? Te
Full Service Analytical & Environmental Solutions	Short Hold Analysis: (Yes) (No) UST Project: (Yes) (No)	PROPER PRESERVATIVE
449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543	c repoi	Received WITHIN HOLDIN
	provisions and/or QC Requirements	CUSTODY SEALS INTACT
Client Company Name:	Invoice To:	VOLATILES rec'd W/OUT H
Report To/Contact Name: 구도시 사기 3시	Address:	PROPER CONTAINERS US
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	ABORA	LABORATORES, INC.	ā Ó.	PAGE OF QUOTE # TO EP Project Name: DIST NAM !	QUOTE # TO ENSURE PROPER BILLING:	Samples INTACT upon arrival? Received ON WET ICE? Temp # //	NO N/A	
ull Service Anal	'ull Service Analytical & Environmental Solutions	nental Solutions	S.	Short Hold Analysis: (Yes) (No)	UST Project: (Yes) (No)			
ook Road • P.C). Box 240543 •	Charlotte, NC 28	224-0543 *P	ook Road • P.O. Box 240543 • Charlotte, NC 28224-0543 *Please ATTACH any project specific reporting provisions and/or QC Requirements	ic reporting	Received WITHIN HOLDING TIMES? CUSTODY SEALS INTACT?		
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nquishing, the in writing to	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.	ustody is your oject Manager	authorization. There will t	on for Prism to	o proceed r any chan	with the al ges after a	nalyses as requinalyses have t	ested abov	e. Any change	es must be		PRIS	PRISM USE ONLY	NLY
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ipment: NOTE:	Method of Shipment: NOTE: ALL SAMPLE COOLERS SHOULD BETAPED SHUT WITH CUSTODY SEALS FOR TRANSPORTATION TO THE LABORATORY. SAMPLES ARE NOT ACCEPTED AND VERBIERD ACAINST CONTINUED BEFORED AT THE 1 ADDITION OF THE LABORATORY.	LERS SHOULD BE	E TAPED SHUT W	ITH CUSTODY &	EALS FOR TRA	ANSPORTATIO	IN TO THE LABORA	_	1 8-02 10 Log-in Group No.		<i>),</i>	Mileage:		·
W Fed Ex O UPS O Hand	☐ Hand-delivered ☐ Prism Field Service ☐ Other_	m Field Service	1 Other						1772117					
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NER TYPE C	*CONTAINER TYPE CODES: A = Amber C = Clear G = Glass P = Plastic: TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (7 per Head Spane)	nber C = Clea	r G = Glass	P = Plastic: 1	'L = Teflon-l	Lined Can	VOA = Volatile (raanics Ana	lvsis (7arn Ha	ad Snace)) 	! !	

APPENDIX A SOIL TEST BORING RECORDS

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PROJECT: 8.2251001 TIP: U-2734

ENGINEERS and SCIENTISTS

PROJEC	OT NO . 2	202-09	OS STATI	E: NC COI	UNTY:		Jew	Hano	ver LO	CATION:	Wilmington	-
				9 from north				BY:		Garrett	BORING ID:	
111002	71 14∧111⊏. 4 4		74 to l	JS 17	0, 00		LLEF		William		CB 01	
NORTH	NG:		EASTI	ING:			EW:				SB-01	
SYSTEM				BORING LOCA	TION: S	S. enc	on	E. side	of Military Cuto	off	LAND ELEV.:	
DRILL N	ACHINE:	Powe	er Probe	METHOD:	Dire	ect P	<u>ush</u>		0 HOUR DTW:	N.E.	BORING DEPTH:	1.8
START		10/1	6/02	FINISH DATE:	 	10/16	3/02	· -	24 HOUR DTW	:	ROCK DEPTH:	
DEPTH	BLOW COUNT	SAMP. TYPE	1	RESULTS opm)	LAB.	USCS	L O G	DEPTH		OIL AND RO	ON	/ATION
			0 200 400	600 800 100	o		177.1	0.0	LAN	ND SURF	ACE	
	DIRECT PUSH		4 0.0·			SM			rk brown, v.f. s rting. Friable.	SAND w/	SILT. Mod.	- -
1.2 -	DIRECT PUSH		△ 0.0······		SB-01			1.8			Ab. 4. O. so.	- - -
1.0								Un	ring Terminate iform compact iire sampled in	tion assu	nt 1.8 m med through	-
NOTE	S: N.E. =	· Not I	Encountere	ed	I		, 				METRIC UNITS	

PROJECT: 8.2251001 TIP: U-2734 **BORING LOG** SHEET 1 OF 1 Wilmington, North Carolina New Hanover Wilmington PROJECT NO.: 202-093 STATE: NC COUNTY: LOCATION: PROJECT NAME: Wilmington, SR 1409 from north of US Rick Garrett **BORING ID:** LOGGED BY: 74 to US 17 William Miller DRILLER: **SB-02 EASTING:** CREW: **NORTHING:** LAND ELEV.: BORING LOCATION: 49' N. of SB-01 SYSTEM: Power Probe Direct Push 0 HOUR DTW: N.E. **BORING DEPTH:** 1.8 METHOD: **DRILL MACHINE:** 10/16/02 10/16/02 24 HOUR DTW: **ROCK DEPTH:** FINISH DATE: START DATE: USCS **BLOW** SOIL AND ROCK SAMP **OVA RESULTS** LAB. Ö COUNT .15m;15m;15m;15m **DEPTH DESCRIPTION TYPE** (ppm) DEPTH **ELEVATION** 0 200 400 600 800 1000 LAND SURFACE 0.0 Med. brown, f. to v.f. SANDY GRAVEL. GW DIRECT PUSH •0.0 Med. brown, f. to v.f. SAND w/SILT. SM Friable. 1.2 DIRECT PUSH SB-02 •0.0· 1.8 Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

NOTES: N.E. = Not Encountered

METRIC UNITS

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ENGINEERS and SCIENTISTS

PROJECT: 8.2251001 TIP: U-2734

Wilmington, North Carolina SHEET 1 OF 1

PROJE	CT NO.: 2	202-09	93 STA	TE: NC	COUNTY	<u>': </u>	Ne	w H	anover	LOCA	TION:	Wilmington	
PROJE	CT NAME: W	/ilming	ton, SR 14	409 from r	orth of L	ıs L	LOGG	ED B	Y:	Rick Ga	ırrett	BORING ID:	
			74 to	US 17			DRILL	ER:		William N	<u>/liller</u>	SB-03	
NORTH	ING:		EAS	TING:			CREW	:				3D-00	
SYSTEM			1	BORING	LOCATION	: 49'	N. of	SB-	02			LAND ELEV.:	
	MACHINE:	Powe	er Probe	METHOD	: D	rect	Pus	h	0 HO	UR DTW:	N.E.	BORING DEPTH:	1.8
START		10/1		FINISH D			/16/0		24 HC	OUR DTW:		ROCK DEPTH:	
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PROJECT: 8.2251001 TIP: U-2734

Wilmington, North Carolina

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NORTHI	NG:			EASTI	NG:			CRI	EW:				35-04	
SYSTEM				L	BORING I	LOCAT	ION: 4	9' N.	of S	B-03			LAND ELEV.:	····
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	BLOW/			OVA F	RESULTS		LAB.	U	L			SOIL AND R	OCK	
DEPTH	COUNT .15m;15m;15m;15m	TYPE		-	pm)		LAD.	S C S	Ö G	DEPTH		DESCRIPTI	ON ELEV	ATION
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PROJECT: 8.2251001 TIP: U-2734

ENGINEERS and SCIENTISTS

Wilmington, North Carolina

PROJEC	T NO.: 2	02-09	3	STATE	: NC	COL	JNTY:	1	Vew	Hano	ver	LOCAT	ION:	Wilming	gton	
	T NAME: W	ilming	ton, S	R 140	9 from	north	of US	LO	GGE	BY:	Ric	ck Gar	rrett	BORING ID:		
			-	74 to L	JS 17				LLEF	<u>}: </u>	Will	<u>iam M</u>	iller	SB-	.05	١ .
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SYSTEM					BORIN	G LOCA	TION: 4	9' N <u>.</u>	of S	B-04				LAND ELEV.	<u>:</u>	
DRILL M	IACHINE:	Powe	r Pro	be	METHO	DD:	Dire	ect P	ush	<u> </u>	0 HOUR D	TW:	N.E.	BORING DEF	PTH:	1.8
START	DATE:	10/16	6/02	_	FINISH	DATE:	•	10/1	5/02		24 HOUR	DTW:		ROCK DEPT	H:	
	BLOW COUNT .15m;15m;15m;15m	SAMP. TYPE		-	RESULTS	S	LAB.	U S C S	L O G	DEPTH			AND RO	ON	ELEV	AOITA
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0.0								SP		M6 0.2	ed. brown,	v.f. SA	ND.			-
-	DIRECT PUSH		▲ 0.0·					SP			ght brown- iable.	gray, w	ell so	rted v.f. SAN	ID.	_
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ENGINEERS and SCIENTISTS

PROJECT: 8.2251001 TIP: U-2734

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									Wilmington, Non	th Carolina	TOTILLI I O	<u>'</u>
PROJEC	T NO.: 2	02-09	93 STATE	: NC c	OUNTY:	1	Vew	Hanov		ATION:	Wilmington	
PROJEC	T NAME: W	ilming	iton, SR 140	9 from nort	h of US	LO	GGE	BY:	Rick G		BORING ID:	
		_	74 to L	JS 17			ILLEF	₹:	William I	Miller	SB-06	
NORTHI	NG:		EASTI	NG:		CR	EW:				05 00	
SYSTEM	l:			BORING LOC	CATION: 4	9' N.	of S	B-05	r		LAND ELEV.:	
DRILL N	ACHINE:	Powe	er Probe	METHOD:	Dire	ct P	<u>ush</u>		0 HOUR DTW:	N.E.	BORING DEPTH:	1.8
START I	DATE:	10/1	6/02	FINISH DATE	:	10/16	<u> 6/02</u>		24 HOUR DTW:		ROCK DEPTH:	
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PROJECT: 8.2251001 TIP: U-2734

Wilmington North Carolina

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_														
-	DIRECT PUSH		▲ 0.0·											_
_	, 33													
-							sw			ed. brown, able.	mod. s	orted '	v.f. to f. SAN	D
1.2 -														_
-													4	-
_	DIRECT PUSH	,	▲ 0.0· · · · ·			SB-07								-
1.8									1.8	ring Town:	notod -	t Don	th 1 0 m	
_									Un	ring Termir iform comp tire sample	paction	assur	n 1.8 m ned through	-
														-
														_
NOTES	S: N.E. =	Not E	ncounte	red									METI	RIC
													UNI	

CATLIN

Wilmington, North Carolina

PROJECT: 8.2251001 TIP: U-2734

PROJEC		02-09			: NC	COU			<u>lew</u>	Han		CATION:	Wilmington	
PROJEC	T NAME: W	ilming	ton, S	R 140	9 from no	orth c	of US	LO	GGE	BY:		Garrett	BORING ID:	
			7	74 to L	JS 17			DRI	LLEF	₹:	William	Miller	SB-08	e
NORTHI	NG:			EASTI	NG:			CRI	EW:				OB 00	
SYSTEM			_		BORING L	OCAT	ION: 4	9' N.	of S	B-07			LAND ELEV.:	
		Powe	r Pro	be	METHOD:		Dire	ct P	ush		0 HOUR DTW:	<u>N.E.</u>	BORING DEPTH:	1.8
START I		10/16			FINISH DA	ATE:	1	0/16	3/02)	24 HOUR DTW	:	ROCK DEPTH:	
	BLOW	SAMP.		OVA E	RESULTS		LAD	U	L		SC	OIL AND RO	OCK	
DEPTH	COUNT .15m _{.15m_{.15m}_{.15m}}				pm)		LAB.	SCS	G	DEPT	r _H D	ESCRIPTI	ON ELEV	ATION
	15m:15m:15m		0 20		600 800	1000						ID SURF		
0.0			1 1		11.				hin	0.0	C) II	10 00111	· · · · · -	
0.0														
_								014			Med. brown, v.f.	SAND w	/some SILT.	-
							ĺ	SM			Friable.			
														_
										0.4				
-								SP			Light gray, v.f. to	I SAND) Friable	
								SF		'	Light glay, v.i. to	I. OAND	, madio.	
-	DIRECT PUSH		▲ 0.0··							0.7				_
										"				
-							i							-
			,										CAND Edable	-
								SP			Buff yellow brow	n, v.t. to	f. SAND. Friable	•
-														
										1.2				
1.2 -										1.2				
-														_
											_		(011 *** 1.4	
_	DIRECT PUSH		▲ 0.0· ·				SB-08	SM		[Dark brown, v.f. well sorted.	to f. SAN	ID w/SILT. Mod.	-
	PUSH	well softed.												
													_	
1														
										1.8				
1.8			···	· -					_ائلـتىر	ı	Boring Terminate	ed at Dep	oth 1.8 m	
										l	Uniform compac	tion assu	imed through	
4										•	entire sampled ir	ne vai.		-
														-
														-
7														
										<u> </u>				
NOTE	S: N.E. =	: Not	Encol	untere	ed								METRI	$C \mid$
													UNITS	
													1. <u>0.41.1 C</u>	

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PROJECT: 8.2251001 TIP: U-2734

ENGINEERS and SOLEMISTS

					_	_			Wilmington, North Carolina	TOTILET TOT
PROJEC	T NO.: 2	02-09	3 STAT	E: NC CO	UNTY:		lew	Hanover	LOCATION	: Wilmington
		'ilming	ton, SR 140	9 from north	of US	LO	GGE	BY:	Rick Garret	
		Ţ	74 to l	US 17			LLEF	} :	William Mille	SB-09
NORTHI	NG:		EAST				EW:			
SYSTEM	1:		··	BORING LOCA					-05 - closer to Mi	
DRILL N	ACHINE:		r Probe	METHOD:		ect P			HOUR DTW: N.E	
START		10/16	5/02	FINISH DATE:	·	10/16	3/02	24	HOUR DTW:	ROCK DEPTH:
DEPTH	BLOW COUNT	SAMP. TYPE		RESULTS ppm)	LAB.	U S C S	L O G	DEPTH	SOIL AND DESCRIF	
			0 200 400	600 800 100	0			0.0	LAND SU	RFACE
0.0						SM			dark brown, v.f. to	of. SAND w/SILT.
1.2	DIRECT PUSH		4 0.0·······			SP		Light t	orown-gray to ligh ID. Friable.	t gray, well sorted
-	DIRECT PUSH		•0.0•••••		SB-09			1.6		
_						SM		5.5-6.0	0.	/SILT. Roots from
1.8							11.412	Boring Unifor	Terminated at D m compaction as sampled interval.	sumed through
NOTE	S. NE -	Not E	Encountere		<u> </u>					METRIC
NOIE	J. IN.⊏. =	- INUL E	_11600111818	Ju						
										UNITS

PROJECT: 8.2251001 TIP: U-2734

													Wilmington, Nort	h Carolina	ISHEELLO				
PROJECT NO.: 202-093 STATE: NC COUNTY									1	Vew	<u>Hano</u>	over Location:			Wilmington				
PROJEC	T NAME: W	ilmina	ton, SF	7 140	9 fro	m nor	th of	US	LO	GGEI	DBY:		Rick G	arrett_	BORING ID:				
			7	4 to l	JS 1	7			DR	ILLEI	₹:	V	Villiam I	Miller	CD 40				
NORTHI	MG.			EAST	ING:					EW:					SB-10				
SYSTEM				LACI		ING LO	CATIO	N· R			SB-07 &	SB-08	16' from	FOP.	LAND ELEV.:				
		Powe	r Prob			HOD:			ct P			1	R DTW:	N.E.		1.8			
				<u> </u>	 				0/16					14.6.	ROCK DEPTH:				
START	BLOW	10/16	0/02		<u> </u>	SH DAT	E;		IJ	Τ.	<u> </u>								
DEPTH	COLINIT	SAMP.			RESUL	_TS	L	₋AB.	Š	0		SOIL AND ROCK							
	.15m;15m;15m;15m	TYPE	S G DEPTH DESCRIPTION ELE								ON ELEV	<u>/ATIOI</u>							
			0 200	400	600	800	1000			1	0.0		LANE	SURF	ACE				
0.0																			
-								İ								•			
								İ											
-																-			
İ										11714									
																-			
7																			
	DIDEAT																		
_	DIRECT PUSH		▲ 0.0· · ·													_			
											Μe	ed. brov	vn. v.f. to	f. SAN	ID w/SILT. Mod.				
4							• •		SM			rted. F				-			
j												oortour Fridator							
_													-						
İ							1	İ											
1																			
1.2																			
								1											
4										批						-			
											4.5								
	DIRECT PUSH		•0.0				· · SB	3-10		1111	1.5								
	PUSH		-0.0																
									SP		Lig	ght to da	ark browi	n, mod.	well sorted f.				
1									٥,		SA	ND. F	riable.						
											4.0								
1.8											1.8 Bo	rina Te	rminated	at Den	oth 1.8 m				
1											Un	niform c	ompactic	n assu	med through				
		İ									ent	tire san	npled inte	erval.		-			
1																			
ł																			
1																			
4																-			
NOTE	S A1 =	A1 : 5			_1										METDI	$\overline{}$			
NOTES	S: N.E. =	NOT E	ncou	ntere	ea										METRIC				
															UNITS	,			

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ENGINEERS and SCIENTISTS

PROJECT: 8.2251001 TIP: U-2734

Wilmington, North Carolina

SHEET 1 OF 1

New Hanover LOCATION: Wilmington PROJECT NO.: 202-093 STATE: NC | COUNTY: Rick Garrett **BORING ID:** PROJECT NAME: Wilmington, SR 1409 from north of US LOGGED BY: 74 to US 17 William Miller DRILLER: **SB-11 EASTING: CREW: NORTHING:** BORING LOCATION: On N.E. side of Midstate Property LAND ELEV.: SYSTEM: N.E. BORING DEPTH: 1.8 Direct Push 0 HOUR DTW: Power Probe METHOD: **DRILL MACHINE:** 10/17/02 **ROCK DEPTH:** 10/17/02 24 HOUR DTW: START DATE: **FINISH DATE: BLOW** SOIL AND ROCK **OVA RESULTS** SAMP. LAB. SCS **DEPTH** COUNT .15m;15m;15m;15m **DESCRIPTION TYPE** (ppm) DEPTH **ELEVATION** 200 400 600 800 1000 LAND SURFACE 0.0 Med. brown, v.f. to f. SAND w/SILT. SM Friable. CH Yellow brown, high plasticity CLAY. DIRECT PUSH Light gray grading to yellow brown, mod. SP well sorted f. SAND. Friable. 1.2 DIRECT SB-11 **.**0.0 Med. dark brown, v.f. to f. SAND w/SILT. SM 1.8 Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval. NOTES: N.E. = Not Encountered

CATLIN ENVIRO. LOG. 202-093.GPJ. CATLIN.GDT. 11/14/02

ENGINEERS and SCIENTISTS

PROJECT: 8.2251001 TIP: U-2734

SHEET 1 OF 1

UNITS

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PROJECT NO.: 202-093 STATE: NC COUN PROJECT NAME: Wilmington, SR 1409 from north of							_		Hanov								
PROJEC	T NAME: W	ilmington,	SR 140	9 from n	orth of	US			BY:	Rick Garrett BORING ID:							
			74 to l					LLEF	<u>}:</u>	William Mille	SB-12						
NORTHI	NG:		EAST				CRI				LAND ELEV.						
SYSTEM				BORING I					B-11	0 HOUR DTW: N.E	LAND ELEV.:	1.8					
		Power Pr		METHOD:			ct P				E. BORING DEPTH: ROCK DEPTH:	1.0					
START		10/17/02		FINISH D	ATE:		0/17	702		24 HOUR DTW: ROCK DEPTH:							
DEPTH	BLOW COUNT	SAMP. TYPE	(1	RESULTS opm)		LAB.	USCS	O G	DEPTH	PTH DESCRIPTION ELEVA							
		0	200 400	600 800	0 1000			177.7	0.0	LAND SUI	RFACE						
0.0							SM			ed. brown, v.f. to f. S. able.	AND w/SILT.	_					
_	DIRECT PUSH	40.0										_					
							SP		Lig sor	Light gray to yellow brown, mod. well sorted f. SAND. Friable.							
1.2	DIRECT PUSH	▲0.0				SB-12	SM		1.2	ed. to dark brown, SA ssibly wet @ 4' bls.	AND w/SILT.	1					
-									1.8			-					
1.8									Bo Un	ring Terminated at D iform compaction as ire sampled interval	sumed through						
NO==		N1-4 -									METRIC	\leftarrow					
NOIE		Not Enco			ale.						INITS	,					

PROJECT: 8.2251001 **BORING LOG** TIP: U-2734 **ENGINEERS and SCIENTISTS** SHEET 1 OF 1 Wilmington, North Carolina 202-093 New Hanover LOCATION: Wilmington **COUNTY:** STATE: NC PROJECT NO.: Rick Garrett **BORING ID:** PROJECT NAME: Wilmington, SR 1409 from north of US LOGGED BY: 74 to US 17 William Miller DRILLER: **SB-13 EASTING:** CREW: **NORTHING:** LAND ELEV.: BORING LOCATION: 49' N. of SB-12 SYSTEM: N.E. **BORING DEPTH:** 1.8 0 HOUR DTW: **Direct Push Power Probe** METHOD: DRILL MACHINE: 10/17/02 24 HOUR DTW: **ROCK DEPTH:** 10/17/02 **FINISH DATE:** START DATE: **BLOW** SOIL AND ROCK SAMP. **OVA RESULTS** COUNT .15m,15m,15m,15m LAB. S C S Ö DEPTH DESCRIPTION **TYPE** (ppm) **DEPTH ELEVATION** 400 600 800 1000 200 LAND SURFACE 0.0 Dark brown, v.f. SAND w/SILT. Friable. SM 0.2 Buff yellow brown, mod. well sorted f. SP SAND. Friable. DIRECT PUSH **4**0.0 8.0 1.2 Dark brown-black grading to dark brown, SM v.f. to f. SAND w/ SILT. DIRECT PUSH SB-13 -0.01.8 Boring Terminated at Depth 1.8 m Uniform compaction assumed through

NOTES: N.E. = Not Encountered

METRIC UNITS

entire sampled interval.

CATLIN

PROJECT: 8.2251001 TIP: U-2734

ENGINEERS and SCIENTISTS

				STATE: NC COUNTY:					lew	На	nove	r Loc	CATION:	Wilmington				
PROJEC	T NAME: W	/ilmingt	on, S	R 140	9 from n		GGE		:	Rick Garrett BORING ID:								
			7	74 to U	· · · · · · · · · · · · · · · · · · ·				LLEF	₹:		William	Miller	SB-14				
NORTHI				EASTI					EW:			Military Outoff LAND FLEW						
SYSTEM												n Military C	utoti N.E.	LAND ELEV.:	1.8			
	IACHINE:	Powe		oe	METHOD:			ct P				HOUR DTW:		BORING DEPTH:	1.0			
START		10/17	702		FINISH DA	AIE:	l	0/17	//02		24	4 HOUR DTW		ROCK DEPTH:				
DEPTH	BLOW COUNT .15m;15m;15m;15m	SAMP. TYPE		(p	RESULTS pm)		LAB.	U S C S	O G	DEF	PTH		OIL AND RO	ON	/ATIO			
			0 200	0 400	600 800	0 1000				0.0		ACE						
0.0								SM		0.2	Dark brown, v.f. to f. SAND w/SILT.							
-																		
_	DIRECT PUSH		0.0								14	augu gugalin	o to volle		_			
_								SP			Med. gray grading to yellow brown, mod. well sorted f. SAND.							
															-			
1.2										1.2					_			
	DIRECT PUSH		0.0				SB-14	SP			Med.	brown, mod	d. sorted	f. SAND.	_			
										1.8					-			
1.8										,,,,	Unifo	g Terminate rm compact sampled in	ion assu	th 1.8 m med through	_			
-															-			
								ı										
_						į									-			
NOTE	S: N.E. =	Not E	ncou	intere	d				<u> </u>					METRI				
														UNITS				

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PROJECT: 8.2251001 TIP: U-2734

Wilmington, North Carolina

PROJECT NO.: 202-093 STATE: NC COUNTY: New Hand							Hano	ver L	OCATION:	Wilmington								
	T NAME: W	ilming	ton, S	R 140	9 from no	orth c	of US	LO	GGE	BY:	Rick Garrett BORING ID:							
		J	7	74 to L	JS 17			DRI	LLEF	₹:	Willia	m Miller_	SB-15					
NORTHI	NG:			EASTI	NG:			CRI	EW:									
SYSTEM]:				BORING L	OCAT	ION: N	1. side	e of	N.W. d <u>r</u>	iveway		LAND ELEV.:					
DRILL M	ACHINE:	Powe	r Pro	be	METHOD:			ct P			0 HOUR DTV	<u>v: N.E.</u>	BORING DEPTH:	1.8				
START [DATE:	10/17	7/02		FINISH DA	TE:		0/17	7/02	<u> </u>	24 HOUR DT	W:	ROCK DEPTH:					
	BLOW COUNT .15m,15m,15m,15m				RESULTS		LAB.	U S C S	L O G	DEPTH		OCK ON ELEY	VATION					
			0 20	0 400	600 800	1000				0.0	L/	ACE						
0.0								SM			Dark brown, v.f. to f. SAND w/SILT.							
								СН		Υe	ellow brown,	CLAY. Ha	rd.					
-	DIRECT PUSH		•0.0·					SP		0.4 Light gray, mod. well sorted f. SAND.								
-								SF		6.9 Fr	Friable.							
1.2 -														_				
_	DIRECT PUSH						SB-15	SM		Me SA	ed. brown gra AND w/SILT.	ading to da Friable.	ırk brown, v.f. to	f				
_	PUSH									1.8				_				
1.8										Bo Ur	oring Termina niform compa tire sampled	action assu	oth 1.8 m med through	_				
NOTES	S: N.E. =	Not E	Encol	ıntere	ed								METRI					
													UNITS	>				

PROJECT: 8.2251001 TIP: U-2734

1				. –	_				-			Wilmington, North	n Carolina	I SHEEL I U	<u> </u>
PROJEC	CT NO.: 2	02-09	93	STAT	E: N	IC cou	JNTY:	1	Vew	На	nover	LOCA	TION:	Wilmington	
	T NAME: W	ilming	ton, S	R 140	9 fro	m north	of US	LO	GGEI	BY:		Rick Ga	arrett	BORING ID:	
İ		J	7	'4 to l	JS 17	7			ILLEF	₹:		William N	<i>Miller</i>	SB-16	
NORTH	NG:			EAST	ING:			CR	EW:			·····		3D-10	
SYSTEM		_			BOR	ING LOCA	TION: S	S. sid	e of l	N.W.	drivewa	ay		LAND ELEV.:	
DRILL N	ACHINE:	Powe	r Prol	ре	MET	HOD:	Dire	ect P	ush		0 HC	OUR DTW:	1.8	BORING DEPTH:	1.8
START	DATE:	10/1	7/02		FINIS	SH DATE:		10/1	7/02) 	24 H	OUR DTW:	1.4	ROCK DEPTH:	
DEPTH	BLOW COUNT	SAMP. TYPE			RESUL ppm)	LOD							ON	/ATION	
	.15m _{:15m} : _{15m} : _{15m}		0 200			800 100	q	5		 		LAND	SURF		ATION
0.0	· · · · · · · · · · · · · · · · · · ·		1			1			139	0.0					
SW Dark brown, v.f. to f. SAND w/SILT and some GRAVEL. 0.2										-					
_								СН		0.4	Yellow	brown, high	n plastic	city CLAY.	_
_	DIRECT PUSH		▲0. 0					SP					ell sort	ed f. SAND.	_
-											Friable.				-
_									Ш	1.0					_
_								SM		1.1	Dark br	own, v.f. to	t. SAN	D w/SIL1.	
1.2 -								SP			Light gr	ay, mod. w	ell sort	ed f. SAND.	_
-	DIRECT	ļ					SB-16	SM		1.4	Dark bro	own, v.f. SA	AND w/	/SILT.	
	DIRECT PUSH		≜8. 0· ·				28-10	SM			Med. brosorting.	own, v.f. to	f. SAN	ID w/SILT. Mod.	-
1.8 -										1.8	Uniform	Terminated compactio	n assu	oth 1.8 m med through	
-						;					entire sa	ampled inte	erval.		-
-															
						į									
NOTES	S: N.E. =													METRIC	$\overline{\mathcal{I}}$
	Temporary Piezometer installed to 6.1' bls w/5' of screen. UNITS														

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PROJECT: 8.2251001 TIP: U-2734

SHEET 1 OF 1 Wilmington, North Carolina STATE: NC COUNTY: **New Hanover** LOCATION: Wilmington **PROJECT NO.:** 202-093 Rick Garrett **BORING ID:** PROJECT NAME: Wilmington, SR 1409 from north of US LOGGED BY: William Miller 74 to US 17 DRILLER: **SB-17 EASTING: CREW: NORTHING:** LAND ELEV.: BORING LOCATION: 49' S. of SB-16 SYSTEM: 1.8 BORING DEPTH: 1.8 0 HOUR DTW: Power Probe **Direct Push** METHOD: **DRILL MACHINE: ROCK DEPTH:** 10/17/02 24 HOUR DTW: 10/17/02 **FINISH DATE:** START DATE: SOIL AND ROCK **BLOW OVA RESULTS** SAMP. LAB. S Ö DEPTH COUNT .15m;15m;15m;15m **DESCRIPTION TYPE** (ppm) DEPTH **ELEVATION** 400 600 200 800 1000 0 LAND SURFACE 0.0 0.0 Med. brown, v.f. to f. SAND w/SILT. SM 0.2 Light gray to brown, SAND w/GRAVEL. SW 0.5 Light gray, mod. well sorted f. SAND. SP Friable. DIRECT PUSH Dark brown, v.f. SAND w/SILT. SM 0.8 Light gray, mod. well sorted f. SAND. SP Friable. 1.2 Dark brown, v.f. to f. SAND w/SILT. SM Friable. Moist. DIRECT PUSH SB-17 **▲1.0**· Med. dark brown, v.f. to f. SAND w/some SM SILT. Friable. Light med. gray, mod. well sorted f. SAND. SP Friable. 1.8 Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval. NOTES: N.E. = Not Encountered

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PROJECT: 8.2251001 TIP: U-2734

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PROJECT NO.: 202-093 STATE: NC COUNTY: New Hanover LOCATION: Wilming											Wilmington					
			ton, SR 140									BORING ID:				
			74 to l	JS 17				LLEF	} :	William N	/liller	SB-18	,			
NORTHI	NG:		EASTI	~ ~~~~~~			CRI									
SYSTEM	1:			BORING	LOCAT							LAND ELEV.:				
DRILL M	ACHINE:		r Probe	METHOD			ct P			0 HOUR DTW:	N.E.	BORING DEPTH:	2.0			
START		10/17	7/02	FINISH D	ATE:		0/17	7/02		24 HOUR DTW:		ROCK DEPTH:				
DEPTH	BLOW COUNT .15m;15m;15m;15m	SAMP. TYPE		RESULTS opm)		LAB.	U S C S	L O G	DEPTH	SOIL DES	0.1	/ATION				
	.10111		0 200 400	600 80	0 1000				0.0	LAND	SURF	ACE				
SW Med. brown-gray, SAND w/GRAVEL.										-						
	DIRECT PUSH		••••95 • • • • • • • • • • • • • • • • •				SP		Med. gray w/black mottled staining, f. SAND. HCO.							
1.8	DIRECT PUSH				0	SB-18	SP		2.0 Bo	Light gray, mod. well sorted f. SAND. Strong HCO (diesel)						
_									Uı	niform compaction	n assu	med through	_			
NOTE	S: N.E. =	= Not I	Encountere	ed r install	ad ta	6 6'	hle 14	ı/ 5 '	of sor	een		METRI				
	Temporary Piezometer installed to 6.6' bls w/5' of screen.															

PROJECT: 8.2251001 TIP: U-2734

Wilmington, North Carolina

SHEET 1 OF 1

UNITS

PROJECT NO.: 202-093 STATE: NC COUNTY: New Hanover LOCATION:								Wilmington							
	T NAME: W			L			of US						k Garrett BORING ID:		
		0	7	'4 to L	JS 17				LLEF	₹:	Wil	liam M	liller	SB-19	
NORTHI	NG:			EASTI				CR					-		
SYSTEM	l:				BORIN	IG LOCA					driveway			LAND ELEV.:	
DRILL M	ACHINE:	Powe		oe	METH			ect P			0 HOUR			BORING DEPTH:	2.2
START		10/17	7/02		FINISH	DATE:		10/17	7/02	<u>'</u>	24 HOUR			ROCK DEPTH:	
DEPTH	BLOW COUNT .15m _{15m_{15m}15m}	SAMP. TYPE			RESULT ppm)		LAB.	SCS	L O G	DEP	тн		AND RO	ON	ATION
			0 200	0 400	600	800 1000	9			0.0		LAND	SURF	ACE	
0.0								sw			Med. brown SILT. Friab		sorted	f. SAND w/trace	
-								ML			Dark brown SAND. Firr		v/CLA`	Y and some	_
0.6	DIRECT PUSH		▲ 5.2					SP		0.7	Med. gray, I Friable.	mod. we	ell sort	ed f. SAND.	_
1							SB-19	SM			Dark brown w/SILT. Wet @ +/- 3		sorted	v.f. SAND	-
1.2								SP			Med. brown Friable.	, mod. v	well so	orted f. SAND.	
-	DIRECT PUSH		▲ 9.5					CNA			Dody brown	wf CA	NID w/	/SILT. Firm.	_
1.8								SM		2.2	Dark brown	, v.i. <i>o</i>	IND W	SIET. TIIII.	1
-									1111		Boring Tern Uniform cor entire samp	npactio	n assu	oth 2.2 m med through	
NOTE	S: N.E. =	 - Not F	-ncou	interc	ed .		<u> </u>		ıl	· · · · ·				METRI	C
INOIL	Temp	orary	Piezo	mete	r insta	alled to	7.1'	bls v	v/5'	of so	creen.			UNITS	

APPENDIX C DEWATERING CALCULATIONS

JOB: DOT MIDSTATE COMPUTED BY: 11-22-02

DESCRIPTION: 202-093 CHECKED BY: GRG DATE: 11/22/02

105

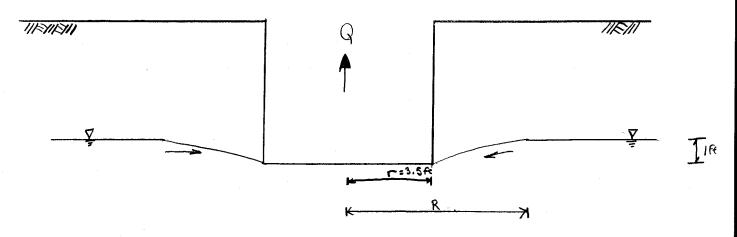
TRENCH DEWATERING CALCULATIONS

ASSUMPTIONS: - TRENCH IS 6 FEET DEEP & 7 FEET WIDE

- ONE FOOT OF WATER IN TRENCH

- HYDRAULIC CONDUCTIVITY RANGE: 3.46 Fldg - 3.51 Fldg

- EFFECTIVE POROSTY = 0.3



USING DARRY'S LAW:

RECHARGE FROM

SIDE WALLS

$$A = (1fe)(L)(2) + (1fe)(7fe)(2)$$
 $A = (1fe)(L)(2) + (1fe)(7fe)(2)$

LENGTH OF TRENCH

* HYDRAULIC CONDUCTIVITY AS CALCULATED BY NFE TECHNOLOGIES ON MW-10



JOB: DOT MIDSTATE COMPUTED BY: WJW DATE: 11-22-02

DESCRIPTION: 202 -093 CHECKED BY: GRG DATE: 11/22/02

2or

TRENCH DEWATERING CALCULATIONS (CONTINUED)

ASSUME TRENCH LENGTH = 75 m
$$\left(\frac{3.201 \, \text{Fe}}{\text{m}}\right) = 246.1 \, \text{fe}$$

$$\therefore A = (1\text{Fe})(246.1 \, \text{fe})(2) + (1\text{Fe})(7\text{Fe})(2)$$

R	Q (fe3/day)	Q (gpm)
(4 R	3 5 3 3	18.4
5A	1178	6.12
ANTICIPATED) GE	706.7	3.67
RANGE OF The	504.8	2.62
) 8fe	392.6	2.04
9 %	321.2	1.67
10/€	271.8	1.41
nfe	235. 6	1.22
12 F	207.8	1.08
BÆ	186.0	0.97
iy k	168.3	0.87
15 FE	153.6	0.80
16F	141,3	0.73
178-	130,9	0.68
18Fe	121.8	0.63
19 %	114.0	0.59
20 fe	107.1	0.56

^{*} ESTIMATED LENGTH OF TRENCH INTERSECTING GROUND WATER CONTAMINANT PLUME
ACCORDING TO GES 7-25-02 SAMPLING EVENT



JOB:	A-marile.	COMPUTED BY:	DATE:
DESCRIPTION:	202-093	CHECKED BY: GRG	_ DATE: 11/22/02

3 of

TRENCH DEWATERING CALCULATIONS CONTINUED

$$Q_{AVG} = \frac{\sum_{n=1}^{10} Q_n}{7}$$

WHERE QR = CALCULATED FLOW RATE AT R = n

NOTE: FLOW RATE CALCULATION ASSUMES THAT ONLY THE PORTION OF TRENCH INTERSECTING THE GROUNDWATER CONTAMINANT PLUME IS BEING DE NATERED. IF DEWATERING IS REQUIRED FOR AUDITIONAL LENGTHS OF SIMILIARLY SHARED TRENCHES, THE GRAPH ON THE FOLLOWING PAGE CAN BE USED TO ESTIMATE REQUIRED PUMPING RATES.



Dewatering Pumping Rate