

GEO TECHNICAL NOV 26 2002

LIMITED PRELIMINARY SITE ASSESSMENT

FOR

***PARCEL 60-MID STATE PETROLEUM, INC.
(MARKET STREET POP SHOPPE)***

**WILIMINGTON, SR 1409 (MILITARY CUTOFF 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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LIMITED PRELIMINARY SITE ASSESSMENT

FOR

*PARCEL 60 – MID STATE PETROLEUM, INC.
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**SR 1409 (MILITARY CUTOFF ROAD) FROM NORTH OF
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CATLIN PROJECT NO. 202-093

NOVEMBER 22, 2002

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 PowerProbe™ 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 Cutoff 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 Cutoff 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 Cutoff 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

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
	1.2 - 1.8 (4 - 6)	0	Yes
SB-3	0 - 1.2 (0 - 4)	0	no
	1.2 - 1.8 (4 - 6)	0	Yes
SB-4	0 - 1.2 (0 - 4)	0.5	no
	1.2 - 1.8 (4 - 6)	0	Yes
SB-5	0 - 1.2 (0 - 4)	0	no
	1.2 - 1.8 (4 - 6)	0	Yes
SB-6	0 - 1.2 (0 - 4)	0.8	no
	1.2 - 1.8 (4 - 6)	0	Yes
SB-7	0 - 1.2 (0 - 4)	0	no
	1.2 - 1.8 (4 - 6)	0	Yes
SB-8	0 - 1.2 (0 - 4)	0	no
	1.2 - 1.8 (4 - 6)	0	Yes
SB-9	0 - 1.2 (0 - 4)	0	no
	1.2 - 1.8 (4 - 6)	0	Yes
SB-10	0 - 1.2 (0 - 4)	0	no
	1.2 - 1.8 (4 - 6)	0	Yes
SB-11	0 - 1.2 (0 - 4)	0	no
	1.2 - 1.8 (4 - 6)	0	Yes
SB-12	0 - 1.2 (0 - 4)	0	no
	1.2 - 1.8 (4 - 6)	0	Yes
SB-13	0 - 1.2 (0 - 4)	0	no
	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
SB-14	0 - 1.2 (0 - 4)	0	no
	1.2 - 1.8 (4 - 6)	0	Yes
SB-15	0 - 1.2 (0 - 4)	0	no
	1.2 - 1.8 (4 - 6)	0	Yes
SB-16	0 - 1.2 (0 - 4)	0	no
	1.2 - 1.8 (4 - 6)	8	Yes
SB-17	0 - 1.2 (0 - 4)	4.5	no
	1.2 - 1.8 (4 - 6)	1	Yes
SB-18	0 - 1.2 (0 - 4)	9.5	no
	1.2 - 1.8 (4 - 6)	700	Yes
SB-19	0.6 - 1.2 (2 - 4)	5.2	Yes
	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
SB-18 11/1/02	BENZENE	1,600	1 / 5,000
	ETHYLBENZENE	1,900	29 / 29,000
	IPE	<500*	70 / 70,000
	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

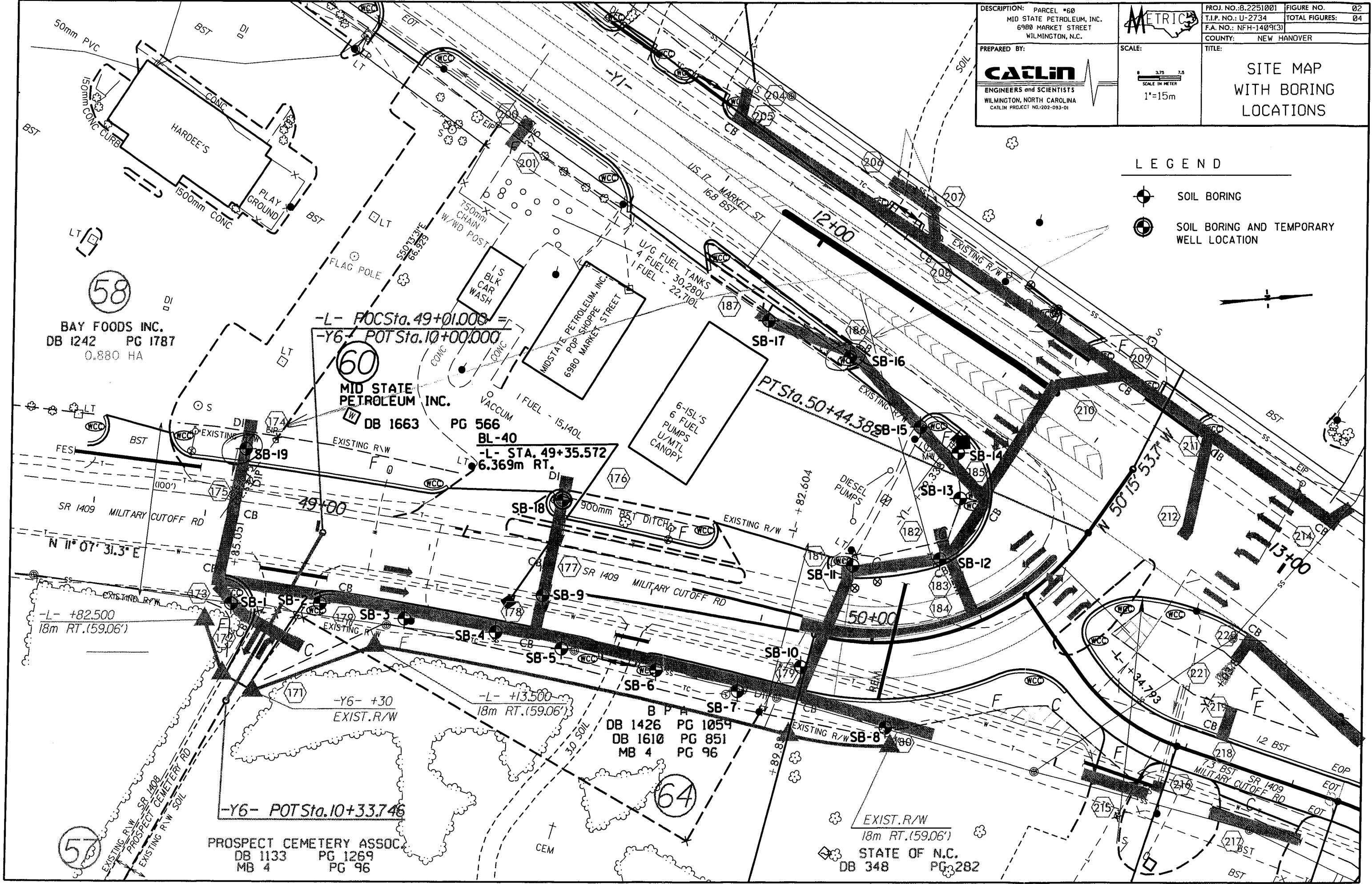
Shaded results exceed the corresponding NCAC 2L Standard.

FIGURES

DESCRIPTION: PARCEL #60 MID STATE PETROLEUM, INC. 6980 MARKET STREET WILMINGTON, N.C.	PROJ. NO.: 8.2251001 T.I.P. NO.: U-2734 F.A. NO.: NFH-1409(3)	FIGURE NO. 02 TOTAL FIGURES: 04	
	PREPARED BY: CATLIN ENGINEERS and SCIENTISTS WILMINGTON, NORTH CAROLINA CATLIN PROJECT NO.: 202-093-01	SCALE: 	COUNTY: NEW HANOVER TITLE: <h2 style="text-align: center;">SITE MAP WITH BORING LOCATIONS</h2>

LEGEND

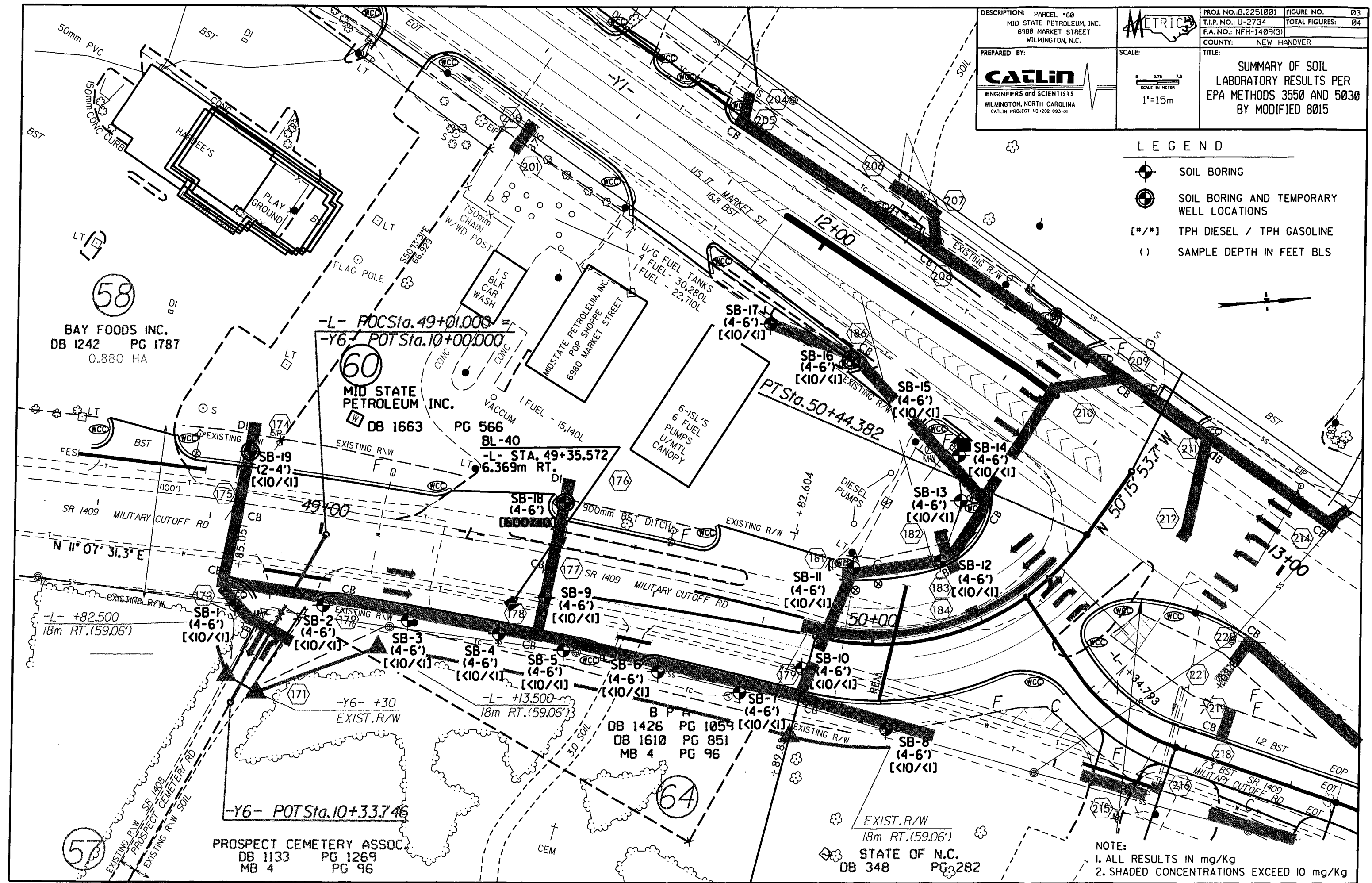
- SOIL BORING
- SOIL BORING AND TEMPORARY WELL LOCATION



DESCRIPTION: PARCEL #60 MID STATE PETROLEUM, INC. 6980 MARKET STREET WILMINGTON, N.C.		PROJ. NO.: B.2251001 FIGURE NO.: 03
		T.I.P. NO.: U-2734 TOTAL FIGURES: 04
PREPARED BY: 	SCALE: 	COUNTY: NEW HANOVER TITLE: SUMMARY OF SOIL LABORATORY RESULTS PER EPA METHODS 3550 AND 5030 BY MODIFIED 8015

LEGEND

- SOIL BORING
- SOIL BORING AND TEMPORARY WELL LOCATIONS
- [*/*] TPH DIESEL / TPH GASOLINE
- () SAMPLE DEPTH IN FEET BLS

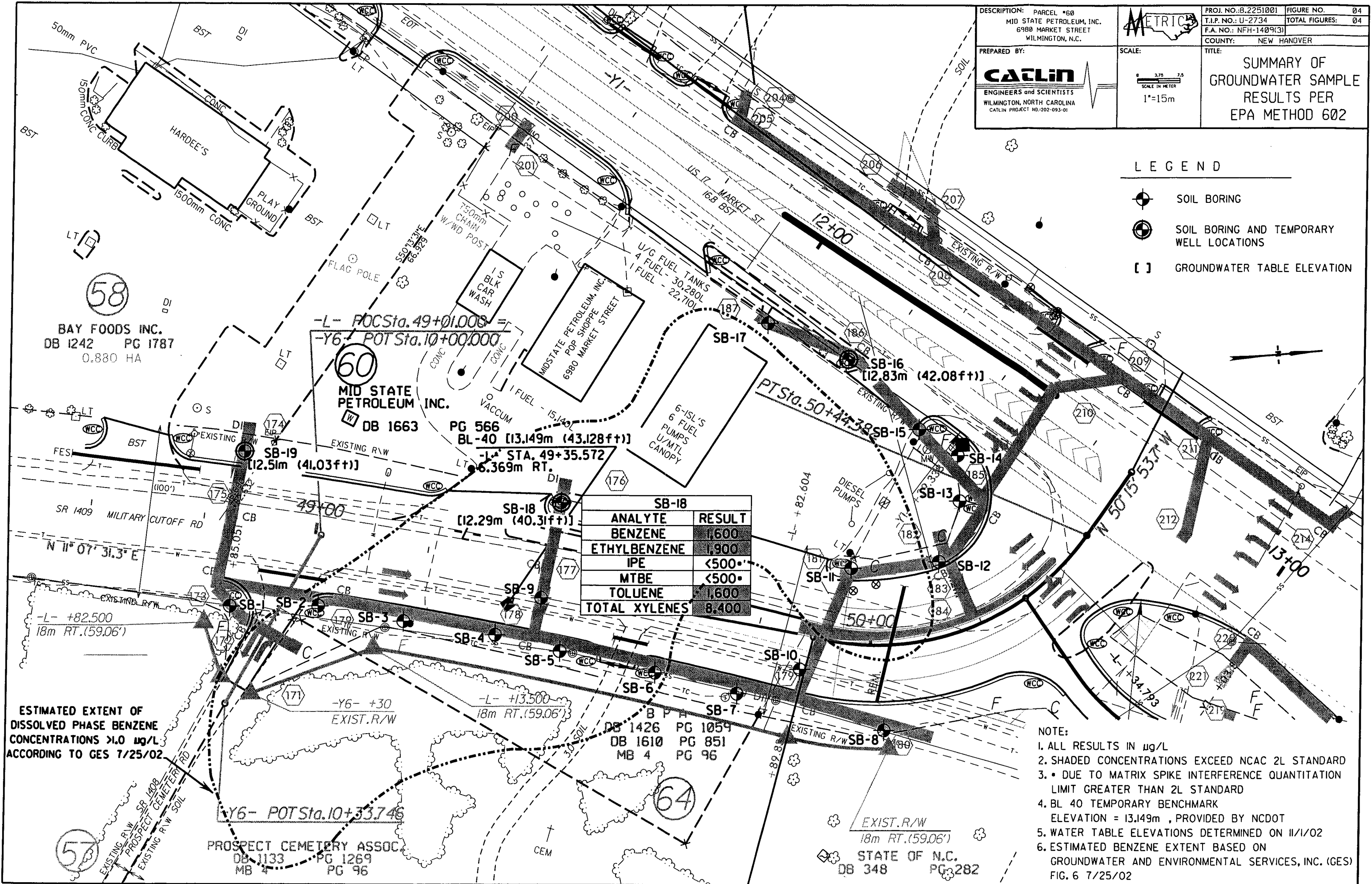


NOTE:
 1. ALL RESULTS IN mg/Kg
 2. SHADED CONCENTRATIONS EXCEED 10 mg/Kg

DESCRIPTION: PARCEL #68 MID STATE PETROLEUM, INC. 6980 MARKET STREET WILMINGTON, N.C.	METRIC	PROJ. NO.: 8.2251001	FIGURE NO. 04
		T.I.P. NO.: U-2734	TOTAL FIGURES: 04
PREPARED BY: CATLIN ENGINEERS and SCIENTISTS WILMINGTON, NORTH CAROLINA CATLIN PROJECT NO. 202-093-01	SCALE: 1"=15m	COUNTY: NEW HANOVER	
		TITLE: SUMMARY OF GROUNDWATER SAMPLE RESULTS PER EPA METHOD 602	

LEGEND

- SOIL BORING
- SOIL BORING AND TEMPORARY WELL LOCATIONS
- GROUNDWATER TABLE ELEVATION



SB-18	
ANALYTE	RESULT
BENZENE	1,600
ETHYLBENZENE	1,900
IPE	<500
MTBE	<500
TOLUENE	1,600
TOTAL XYLENES	8,400

NOTE:

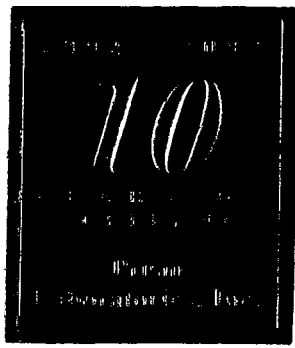
- ALL RESULTS IN µg/L
- SHADED CONCENTRATIONS EXCEED NCAC 2L STANDARD
- DUE TO MATRIX SPIKE INTERFERENCE QUANTITATION LIMIT GREATER THAN 2L STANDARD
- BL 40 TEMPORARY BENCHMARK ELEVATION = 13.149m, PROVIDED BY NCDOT
- WATER TABLE ELEVATIONS DETERMINED ON 11/1/02
- ESTIMATED BENZENE EXTENT BASED ON GROUNDWATER AND ENVIRONMENTAL SERVICES, INC. (GES) FIG. 6 7/25/02

ESTIMATED EXTENT OF DISSOLVED PHASE BENZENE CONCENTRATIONS >1.0 µg/L ACCORDING TO GES 7/25/02

APPENDIX B

LABORATORY REPORTS/CHAIN OF CUSTODY RECORDS

Lab Report



FILE COPY



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-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

Lab Report

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-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

Lab Report

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-3
Prism Sample ID: AC61333
Login Group: AOO25K19
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:



Angela D. Overcash, V.P. Laboratory Services

Lab Report

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-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

Lab Report

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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-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

Lab Report

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: ACO25K19
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

Lab Report

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 14:20
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:



Angela D. Overcash, V.P. Laboratory Services

Lab Report

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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-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:



Angela D. Overcash, V.P. Laboratory Services

Lab Report



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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-9
Prism Sample ID: AC61339
Login Group: AOO25K19
Sample Collection Date/Time: 10/16/02 13:50
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 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:

Angela D. Overcash, V.P. Laboratory Services

NC Certification No. 402 - SC Certification No. 99012 - NC Drinking Water Cert. No. 37735 - FL Certification No. E87519

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

Lab Report

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-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:



Angela D. Overcash, V.P. Laboratory Services

Lab Report



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-11
Prism Sample ID: AC61341
Login Group: AOO25K19
Sample Collection Date/Time: 10/17/02 09:20
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:

Angela D. Overcash, V.P. Laboratory Services

Lab Report

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-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:



Angela D. Overcash, V.P. Laboratory Services

Lab Report

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-13
Prism Sample ID: AC61343
Login Group: AOO25K19
Sample Collection Date/Time: 10/17/02 09:45
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 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:



Angela D. Overcash, V.P. Laboratory Services

Lab Report



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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-14
Prism Sample ID: AC61344
Login Group: AOO25K19
Sample Collection Date/Time: 10/17/02 10:05
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 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:

Angela D. Overcash, V.P. Laboratory Services

Lab Report

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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-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:



Angela D. Overcash, V.P. Laboratory Services

Lab Report



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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-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:

Angela D. Overcash, V.P. Laboratory Services

Lab Report



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

Lab Report

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-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

Lab Report



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 12:45
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 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

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING:

Project Name: Prism Lab, 121 Longleaf Drive #10

Short Hold Analysis: (Yes) (No) UST Project: (Yes) (No)

*Please ATTACH any project specific reporting provisions and/or QC Requirements

Invoice To: AKDOT Geotechnical Engineering

Address:

Purchase Order No./Billing Reference Bill AKDOT

Requested Due Date 1 Day 2 Days 3 Days 4 Days 5 Days

6-9 Days 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)

LAB USE ONLY

Samples INTACT upon arrival? YES NO N/A
 Received ON WET ICE? Temp 49
 PROPER PRESERVATIVES indicated?
 Received WITHIN HOLDING TIMES?
 CUSTODY SEALS INTACT?
 VOLATILES rec'd W/OBT HEADSPACE?
 PROPER CONTAINERS used?

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL

Certification: NELAC _____ USACE _____ FL _____ NC

SC _____ OTHER _____ N/A _____

Water Chlorinated: YES _____ NO _____

Sample Iced Upon Collection: YES _____ NO _____

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER			PRESERVATIVES	ANALYSES REQUESTED	REMARKS	SUB LAB CERT. ID NO.	PRISM LAB ID NO.
				*TYPE SEE BELOW	NO.	SIZE					
SB-1	10/16/02	11:10	Soil	2	4/8oz	None		AKDOT Project 8225/000832		61333	
SB-2		12:50								61332	
SB-3		13:10								61334	
SB-4		13:25								61337	
SB-5		14:05								61337	
SB-6		14:20								61337	
SB-7		15:30								61337	
SB-8		13:50								61337	
SB-9		15:00								61337	
SB-10		9:20								61337	
SB-11	10/17/02	9:35								61341	
SB-12		9:45								61342	
SB-13		10:05								61343	
SB-14		10:45								61344	
SB-15		11:05								61345	
SB-16		11:35								61346	
SB-17		12:05								61347	
SB-18										61348	
SB-19		12:45								61349	

PRESS DOWN FIRMLY - 3 COPIES

Sampler's Signature: MR Garrett Sampled By (Print Name): Rick Garrett Affiliation: CAITLIN

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.

Relinquished By: (Signature) MR Garrett Received By: (Signature) MR Garrett

Relinquished By: (Signature) MR Garrett Received By: (Signature) MR Garrett

Relinquished By: (Signature) MR Garrett Received For Prism Laboratories By: MR Garrett

Method of Shipment: Fed Ex UPS Hand-delivered Prism Field Service Other

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

*CONTAINER TYPE CODES: A = Amber C = Clear G = Glass P = Plastic; TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (Zero Head Space)

PRISM USE ONLY

Site Arrival Time: _____

Site Departure Time: _____

Field Tech Fee: _____

Mileage: _____

Additional Comments:

Date: 10/17/02 Military/Hours: 14.30

Date: 10/18/02 Military/Hours: 0930

Date: 10/18/02 Military/Hours: 0930

SEE REVERSE FOR TERMS & CONDITIONS

FINAL REPORT COPY



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

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING:
Project Name: ALC DOT Project
Short Hold Analysis: (Yes) (No) UST Project: (Yes) (No)
*Please ATTACH any project specific reporting provisions and/or QC Requirements
Invoice To: ALC DOT
Address: ALC DOT

LAB USE ONLY

Samples INTACT upon arrival? YES NO
Received ON WET ICE? Temp 4.9
PROPER PRESERVATIVES indicated?
Received WITHIN HOLDING TIMES?
CUSTODY SEALS INTACT?
VOLATILES rec'd W/OUT HEADSPACE?
PROPER CONTAINERS used?

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL
Certification: NELAC USACE FL NC
SC OTHER N/A
Water Chlorinated: YES NO
Sample Iced Upon Collection: YES NO

Purchase Order No./Billing Reference BUYALC DOT
Requested Due Date 1 Day 2 Days 3 Days 4 Days 5 Days
 6-9 Days 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 Company Name: CATLIN
Report To/Contact Name: Rick Garrett
Reporting Address: 2700 Old Dairy Rd
Phone: 704-552-2563 Fax (Yes) (No): 704-552-2563
Site Location Name: ALC DOT
Site Location Physical Address: ALC DOT

CLIENT DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER		PRESERVATIVES	ANALYSES REQUESTED	REMARKS	SUB LAB CERT. ID NO.	PRISM LAB ID NO.
				*TYPE SEE BELOW	NO. SIZE					
SB-1	10/16/02	11:10	SOIL	2	4/8.2	None	7115030	ALC DOT Project	6133	6133
SB-2		12:50							6225	6225
SB-3		13:10							6222	6222
SB-4		13:25							6224	6224
SB-5		14:05							6224	6224
SB-6		14:20							6224	6224
SB-7		15:30							6224	6224
SB-8		15:40							6224	6224
SB-9		15:50							6224	6224
SB-10		16:00							6224	6224
SB-11		17:20							6224	6224
SB-12		17:35							6224	6224
SB-13		18:45							6224	6224
SB-14		19:45							6224	6224
SB-15		10:45							6224	6224
SB-16		11:05							6224	6224
SB-17		11:35							6224	6224
SB-18		12:05							6224	6224
SB-19		12:45							6224	6224

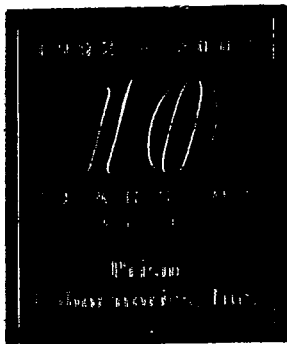
PRESS DOWN FIRMLY - 3 COPIES

PRISM USE ONLY
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

Sampled By (Print Name) Rick Garrett Affiliation CATLIN
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.
Relinquished By: (Signature) MR Garrett Received By: (Signature)
Relinquished By: (Signature) MR Garrett Received By: (Signature)
Relinquished By: (Signature) Received By: (Signature)
Date 10/17/02 Military/Hours 14:30
Date 10/17/02 Military/Hours 14:30
Date 10/17/02 Military/Hours 14:30
Log In Group No. 6990
Additional Comments:

Method of Shipment: Fed Ex UPS Hand-delivered Prism Field Service Other
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.
NPDES: NC SC NC SC NC SC NC SC
GROUNDWATER: NC SC NC SC NC SC
DRINKING WATER: NC SC NC SC NC SC
SOLID WASTE: NC SC NC SC NC SC
RCRA: NC SC NC SC NC SC
CERCLA: NC SC NC SC NC SC
LANDFILL: NC SC NC SC NC SC
OTHER: NC SC NC SC
*CONTAINER TYPE CODES: A = Amherst C = Clear G = Glass P = Plastic; TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (Zero Head Space)

Lab Report



FILE COPY



11/12/02

Page 1 of 1

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 PARAMETER	TEST RESULT	UNITS	REPORTING LIMIT	METHOD REFERENCE	DATE/TIME 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

APPENDIX A
SOIL TEST BORING RECORDS

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS
Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-02
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: 49' N. of SB-01		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/16/02	FINISH DATE: 10/16/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT <small>.15m .15m .15m .15m</small>	SAMP. TYPE	OVA RESULTS (ppm) 0 200 400 600 800 1000	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
					GW		0.4	Med. brown, f. to v.f. SANDY GRAVEL.
	DIRECT PUSH		▲0.0					
					SM			Med. brown, f. to v.f. SAND w/SILT. Friable.
1.2								
	DIRECT PUSH		▲0.0	SB-02				
1.8							1.8	Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

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

NOTES: N.E. = Not Encountered

**METRIC
UNITS**

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS
Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-03
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: 49' N. of SB-02		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/16/02	FINISH DATE: 10/16/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT <small>.15m 15m 15m 15m</small>	SAMP. TYPE	OVA RESULTS (ppm) 0 200 400 600 800 1000	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
	DIRECT PUSH		▲0.0					
					SM			Med. dark grading to dark brown, v.f. to f. SAND w/SILT. Mod. sorted and friable.
1.2								
	DIRECT PUSH		▲0.0	SB-03				
1.8							1.8	Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

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

NOTES: N.E. = Not Encountered

METRIC
UNITS

BORING LOG

CATLIN
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Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-04
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: 49' N. of SB-03		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/16/02	FINISH DATE: 10/16/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT <small>.15m 15m 15m 15m</small>	SAMP. TYPE	OVA RESULTS (ppm)	LAB.	U S C S	L O G	SOIL AND ROCK		
							DEPTH	DESCRIPTION	ELEVATION
0.0			0 200 400 600 800 1000				0.0	LAND SURFACE	
					SM		0.5	Dark brown, v.f. to f. SAND w/SILT. Mod. sorted and friable.	
	DIRECT PUSH		▲0.5		SP		0.7	Light brown, mod. well sorted f. SAND. Friable.	
					ML			Med. brown, SILT w/some v.f. SAND and CLAY. Firm.	
1.2							1.5		
	DIRECT PUSH		▲0.0	SB-04	ML			Dark brown, SILT w/v.f. SAND. Firm.	
1.8							1.8	Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.	

NOTES: N.E. = Not Encountered

**METRIC
UNITS**

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

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS
Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-05
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: 49' N. of SB-04		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/16/02	FINISH DATE: 10/16/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT <small>.15m .15m .15m .15m</small>	SAMP. TYPE	OVA RESULTS (ppm) 0 200 400 600 800 1000	LAB.	USCS	LOG	SOIL AND ROCK		
							DEPTH	DESCRIPTION	ELEVATION
0.0							0.0	LAND SURFACE	
					SP		0.2	Med. brown, v.f. SAND.	
					SP			Light brown-gray, well sorted v.f. SAND. Friable.	
	DIRECT PUSH	▲0.0					1.0		
1.2					SM			Dark brown, v.f. to f. SAND w/SILT. Firm.	
							1.4		
	DIRECT PUSH	▲0.0		SB-05	SP			Med. brown-gray, well sorted v.f. SAND. Friable.	
1.8							1.8	Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.	

NOTES: N.E. = Not Encountered

**METRIC
UNITS**

CATLIN ENVIRO. LOG 202-093.GE1.CATLIN.GDT 11/14/02

BORING LOG

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Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-06
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: 49' N. of SB-05		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/16/02	FINISH DATE: 10/16/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT 15m 15m 15m 15m	SAMP. TYPE	OVA RESULTS (ppm) 0 200 400 600 800 1000	LAB.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
					SP		0.6	Med. brown, mod. well sorted v. SAND. Friable.
	DIRECT PUSH	▲0.8			SW		1.2	Dark brown, mod. sorted v.f. to f. SAND. Friable.
1.2								
	DIRECT PUSH	▲0.0		SB-06	SM		1.8	Med. red brown to dark brown, v.f. SAND w/SILT. Firm.
1.8								Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

CATLIN ENVIRONMENTAL LOG 202-093.GPJ_CATLIN.GDT 11/14/02

NOTES: N.E. = Not Encountered

**METRIC
UNITS**

BORING LOG

CATLIN
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Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-08
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: 49' N. of SB-07		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/16/02	FINISH DATE: 10/16/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT <small>.15m 15m 15m 15m</small>	SAMP. TYPE	OVA RESULTS (ppm) 0 200 400 600 800 1000	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
					SM			Med. brown, v.f. SAND w/some SILT. Friable.
					SP		0.4	Light gray, v.f. to f. SAND. Friable.
	DIRECT PUSH		▲0.0		SP		0.7	Buff yellow brown, v.f. to f. SAND. Friable.
1.2							1.2	
	DIRECT PUSH		▲0.0	SB-08	SM			Dark brown, v.f. to f. SAND w/SILT. Mod. well sorted.
1.8							1.8	Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

NOTES: N.E. = Not Encountered

METRIC UNITS

CATLIN ENVIRO. LOG_202-093.GE1_CATLIN.GDT_11/14/02

BORING LOG

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Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-09
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: Between SB-04 & SB-05 - closer to Military Ave		LAND ELEV.: ---
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/16/02	FINISH DATE: 10/16/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT <small>.15m .15m .15m .15m</small>	SAMP. TYPE	OVA RESULTS (ppm) 0 200 400 600 800 1000	LAB.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
					SM			Med. dark brown, v.f. to f. SAND w/SILT. Friable.
	DIRECT PUSH	▲0.0					0.5	
					SP			Light brown-gray to light gray, well sorted f. SAND. Friable.
1.2								
	DIRECT PUSH	▲0.0		SB-09			1.6	
					SM			Dark brown, f. SAND w/SILT. Roots from 5.5-6.0.
1.8							1.8	Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

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

NOTES: N.E. = Not Encountered **METRIC UNITS**

BORING LOG

CATLIN
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Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-10
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: Between SB-07 & SB-08 16' from EOP.		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/16/02	FINISH DATE: 10/16/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT <small>.15m .15m .15m .15m</small>	SAMP. TYPE	OVA RESULTS (ppm) 0 200 400 600 800 1000	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
					SM			Med. brown, v.f. to f. SAND w/SILT. Mod. sorted. Friable.
1.2								
				SB-10	SP		1.5	Light to dark brown, mod. well sorted f. SAND. Friable.
1.8							1.8	Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

NOTES: N.E. = Not Encountered

**METRIC
UNITS**

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

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS
Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-11
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: On N.E. side of Midstate Property		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/17/02	FINISH DATE: 10/17/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT <small>.15m .15m .15m .15m</small>	SAMP. TYPE	OVA RESULTS (ppm) <small>0 200 400 600 800 1000</small>	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
					SM		0.3	Med. brown, v.f. to f. SAND w/SILT. Friable.
					CH		0.4	Yellow brown, high plasticity CLAY.
	DIRECT PUSH		▲0.0		SP			Light gray grading to yellow brown, mod. well sorted f. SAND. Friable.
1.2								
	DIRECT PUSH		▲0.0	SB-11	SM		1.5	Med. dark brown, v.f. to f. SAND w/SILT.
1.8							1.8	Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

NOTES: N.E. = Not Encountered

**METRIC
UNITS**

CATLIN ENVIRO. LOG_202-093.GE1_CATLIN.GDI_11/14/02

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS

Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-12
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: 49' N. of SB-11		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/17/02	FINISH DATE: 10/17/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT <small>.15m, .15m, .15m, .15m</small>	SAMP. TYPE	OVA RESULTS (ppm) 0 200 400 600 800 1000	LAB.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
0.0					SM		0.3	Med. brown, v.f. to f. SAND w/SILT. Friable.
	DIRECT PUSH		▲0.0		SP		1.2	Light gray to yellow brown, mod. well sorted f. SAND. Friable.
1.2								
	DIRECT PUSH		▲0.0	SB-12	SM		1.8	Med. to dark brown, SAND w/SILT. Possibly wet @ 4' bls.
1.8								Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

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

NOTES: N.E. = Not Encountered
Boring located in drainage swale.

**METRIC
UNITS**

BORING LOG

CATLIN

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Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-13
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: 49' N. of SB-12		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/17/02	FINISH DATE: 10/17/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT .15m .15m .15m .15m	SAMP. TYPE	OVA RESULTS (ppm) 0 200 400 600 800 1000	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
0.0					SM		0.2	Dark brown, v.f. SAND w/SILT. Friable.
					SP		0.8	Buff yellow brown, mod. well sorted f. SAND. Friable.
1.2	DIRECT PUSH	▲0.0			SM		1.8	Dark brown-black grading to dark brown, v.f. to f. SAND w/ SILT.
1.8	DIRECT PUSH	▲0.0		SB-13			1.8	Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

NOTES: N.E. = Not Encountered

METRIC UNITS

CATLIN\INFO.LOG_202-093.GPJ_CATLIN.GDT_11/14/02

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS
Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-14
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: N. side of Midstate on Military Cutoff		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/17/02	FINISH DATE: 10/17/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT .15m .15m .15m .15m	SAMP. TYPE	OVA RESULTS (ppm)					LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION	
			0	200	400	600	800				1000	DEPTH
0.0										0.0	LAND SURFACE	
								SM		0.2	Dark brown, v.f. to f. SAND w/SILT.	
	DIRECT PUSH		▲0.0					SP		1.2	Med. gray grading to yellow brown, mod. well sorted f. SAND.	
1.2												
	DIRECT PUSH		▲0.0				SB-14	SP		1.8	Med. brown, mod. sorted f. SAND.	
1.8											Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.	

NOTES: N.E. = Not Encountered

**METRIC
UNITS**

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

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS
Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-15
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: N. side of N.W. driveway		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 1.8
START DATE: 10/17/02	FINISH DATE: 10/17/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT 15m 15m 15m 15m	SAMP. TYPE	OVA RESULTS (ppm)	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0			0 200 400 600 800 1000				0.0	LAND SURFACE
					SM		0.3	Dark brown, v.f. to f. SAND w/SILT.
					CH		0.4	Yellow brown, CLAY. Hard.
	DIRECT PUSH		▲0.0		SP		0.9	Light gray, mod. well sorted f. SAND. Friable.
1.2					SM			Med. brown grading to dark brown, v.f. to f. SAND w/SILT. Friable.
	DIRECT PUSH		▲0.0	SB-15				
1.8							1.8	Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

NOTES: N.E. = Not Encountered

**METRIC
UNITS**

CATLIN ENVIRONMENTAL LOG_202-093.GPJ_CATLIN.GDT_11/14/02

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS
Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-16
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: S. side of N.W. driveway		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: 1.8	BORING DEPTH: 1.8
START DATE: 10/17/02	FINISH DATE: 10/17/02	24 HOUR DTW: 1.4	ROCK DEPTH: ---

DEPTH	BLOW COUNT 15m 15m 15m 15m	SAMP. TYPE	OVA RESULTS (ppm) 0 200 400 600 800 1000	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
					SW	[Dotted Pattern]	0.2	Dark brown, v.f. to f. SAND w/SILT and some GRAVEL.
					CH	[Diagonal Hatching]	0.4	Yellow brown, high plasticity CLAY.
	DIRECT PUSH		▲0.0		SP	[Dotted Pattern]	1.0	Light gray, mod. well sorted f. SAND. Friable.
					SM	[Vertical Lines]	1.1	Dark brown, v.f. to f. SAND w/SILT.
1.2					SP	[Dotted Pattern]	1.4	Light gray, mod. well sorted f. SAND.
	DIRECT PUSH		▲8.0	SB-16	SM	[Vertical Lines]	1.5	Dark brown, v.f. SAND w/SILT.
					SM	[Vertical Lines]	1.8	Med. brown, v.f. to f. SAND w/SILT. Mod. sorting.
1.8								Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

NOTES: N.E. = Not Encountered
Temporary Piezometer installed to 6.1' bls w/5' of screen.

**METRIC
UNITS**

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

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS
Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-17
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: 49' S. of SB-16		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: 1.8	BORING DEPTH: 1.8
START DATE: 10/17/02	FINISH DATE: 10/17/02	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT <small>.15m .15m .15m .15m</small>	SAMP. TYPE	OVA RESULTS (ppm) <small>0 200 400 600 800 1000</small>	LAB.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
					SM		0.2	Med. brown, v.f. to f. SAND w/SILT.
					SW		0.5	Light gray to brown, SAND w/GRAVEL.
					SP		0.6	Light gray, mod. well sorted f. SAND. Friable.
	DIRECT PUSH	▲4.5			SM		0.8	Dark brown, v.f. SAND w/SILT.
					SP		1.2	Light gray, mod. well sorted f. SAND. Friable.
1.2					SM		1.5	Dark brown, v.f. to f. SAND w/SILT. Friable. Moist.
	DIRECT PUSH	▲1.0		SB-17	SM		1.7	Med. dark brown, v.f. to f. SAND w/some SILT. Friable.
					SP		1.8	Light med. gray, mod. well sorted f. SAND. Friable.
1.8								Boring Terminated at Depth 1.8 m Uniform compaction assumed through entire sampled interval.

NOTES: N.E. = Not Encountered

METRIC UNITS

CATLIN\ENVIRO.LOG_202-093.GPJ_CATLIN.GDT_11/14/02

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS
Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-18
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: N. side of S.E. driveway		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: N.E.	BORING DEPTH: 2.0
START DATE: 10/17/02	FINISH DATE: 10/17/02	24 HOUR DTW: 1.9	ROCK DEPTH: ---

DEPTH	BLOW COUNT <small>.15m .15m .15m .15m</small>	SAMP. TYPE	OVA RESULTS (ppm) <small>0 200 400 600 800 1000</small>	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
					SW	LOG	0.5	Med. brown-gray, SAND w/GRAVEL.
	DIRECT PUSH		▲95		SP		1.2	Med. gray w/black mottled staining, f. SAND. HCO.
1.2							1.2	
	DIRECT PUSH		▲700	SB-18	SP		2.0	Light gray, mod. well sorted f. SAND. Strong HCO (diesel)
1.8							2.0	Boring Terminated at Depth 2.0 m Uniform compaction assumed through entire sampled interval.

NOTES: N.E. = Not Encountered
Temporary Piezometer installed to 6.6' bls w/5' of screen.

**METRIC
UNITS**

CATLIN ENVIRO. LOG_202-093.GPJ_CATLIN.GDT_11/14/02

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS

Wilmington, North Carolina

PROJECT: 8.2251001
TIP: U-2734

SHEET 1 OF 1

PROJECT NO.: 202-093	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: Wilmington, SR 1409 from north of US 74 to US 17		LOGGED BY: Rick Garrett	BORING ID: SB-19
		DRILLER: William Miller	
NORTHING:	EASTING:	CREW:	
SYSTEM:	BORING LOCATION: 125' S. of S.E. driveway		LAND ELEV.:
DRILL MACHINE: Power Probe	METHOD: Direct Push	0 HOUR DTW: 1.8	BORING DEPTH: 2.2
START DATE: 10/17/02	FINISH DATE: 10/17/02	24 HOUR DTW: 0.5	ROCK DEPTH: ---

DEPTH	BLOW COUNT <small>.15m 15m 15m 15m</small>	SAMP. TYPE	OVA RESULTS (ppm) 0 200 400 600 800 1000	LAB.	USCS	LOG	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
0.0					SW		0.3	Med. brown, mod. sorted f. SAND w/trace SILT. Friable.
0.6	DIRECT PUSH		▲5.2		ML		0.5	Dark brown, SILT w/CLAY and some SAND. Firm.
0.6					SP		0.7	Med. gray, mod. well sorted f. SAND. Friable.
1.2				SB-19	SM		1.2	Dark brown, mod. sorted v.f. SAND w/SILT. Wet @ +/- 3'
1.2					SP		1.4	Med. brown, mod. well sorted f. SAND. Friable.
1.8	DIRECT PUSH		▲9.5		SM		2.2	Dark brown, v.f. SAND w/SILT. Firm.
								Boring Terminated at Depth 2.2 m Uniform compaction assumed through entire sampled interval.

NOTES: N.E. = Not Encountered
Temporary Piezometer installed to 7.1' bls w/5' of screen.

**METRIC
UNITS**

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

APPENDIX C
DEWATERING CALCULATIONS

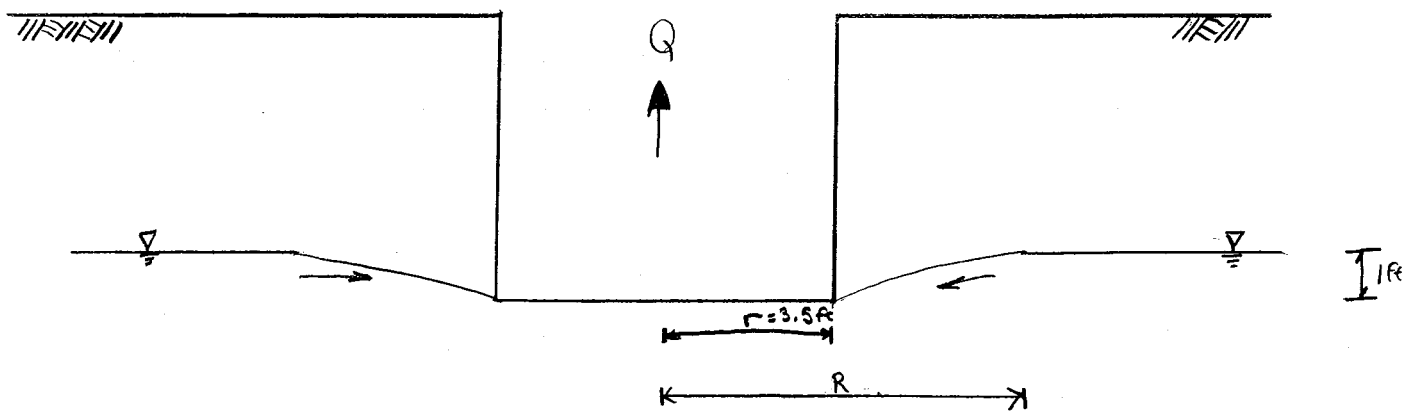
JOB: DOT MIDSTATE COMPUTED BY: IVJIV DATE: 11-22-02

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

1 OF

TRENCH DEWATERING CALCULATIONS

- ASSUMPTIONS:
- TRENCH IS 6 FEET DEEP & 7 FEET WIDE
 - ONE FOOT OF WATER IN TRENCH
 - HYDRAULIC CONDUCTIVITY RANGE: 3.46 ft/day - 3.51 ft/day*
 - EFFECTIVE POROSITY = 0.3



USING DARCY'S LAW:

$$Q = kiA$$

WHERE: $k = \frac{3.46 \text{ ft/day} + 3.51 \text{ ft/day}}{2} = 3.49 \text{ ft/day}$

$$i = \frac{1 \text{ ft}}{R - 3.5R}$$

RECHARGE FROM
SIDE WALLS

$$A = (1 \text{ ft})(L)(2) + (1 \text{ ft})(7 \text{ ft})(2)$$

RECHARGE FROM
END WALLS

↑ TWO SIDES OF TRENCH
↑ LENGTH OF TRENCH

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

TRENCH DEWATERING CALCULATIONS (CONTINUED)

ASSUME TRENCH LENGTH = 75 m $\left(\frac{3.281 \text{ ft}}{\text{m}} \right) = 246.1 \text{ ft}$

$\therefore A = (1 \text{ ft})(246.1 \text{ ft})(2) + (1 \text{ ft})(7 \text{ ft})(2)$
 $A = 506.2 \text{ ft}^2$

$Q = (3.49 \text{ ft/day}) \left(\frac{1 \text{ ft}}{R - 3.5 \text{ ft}} \right) (506.2 \text{ ft}^2)$

	<u>R</u>	<u>Q (ft³/day)</u>	<u>Q (gpm)</u>
ANTICIPATED RANGE OF R	4 ft	3533	18.4
	5 ft	1178	6.12
	6 ft	706.7	3.67
	7 ft	504.8	2.62
	8 ft	392.6	2.04
	9 ft	321.2	1.67
	10 ft	271.8	1.41
	11 ft	235.6	1.22
	12 ft	207.8	1.08
	13 ft	186.0	0.97
	14 ft	168.3	0.87
	15 ft	153.6	0.80
	16 ft	141.3	0.73
	17 ft	130.9	0.68
	18 ft	121.8	0.63
	19 ft	114.0	0.59
	20 ft	107.1	0.56

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

JOB: _____ COMPUTED BY: _____ DATE: _____

DESCRIPTION: 202-093 CHECKED BY: G.R.G DATE: 11/22/02

3 of

TRENCH DEWATERING CALCULATIONS (CONTINUED)

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

WHERE Q_R = CALCULATED FLOW RATE AT $R = n$

$Q_{AVG} = 5.13 \text{ gpm}$

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

Dewatering Pumping Rate

