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Abbott Laboratories

*Former Abbott Facility
Laurinburg, North Carolina*

*Monitored Natural Attenuation
Progress Report 4
Corrective Action Plan Implementation
Groundwater Incident No. 518280*

July 2008

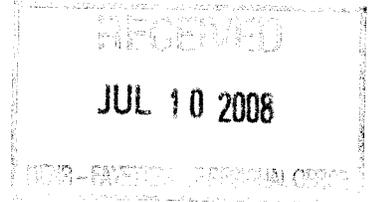
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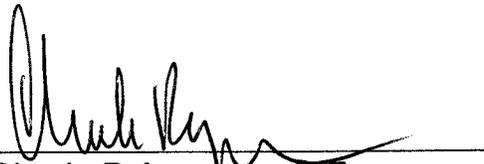
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*Former Abbott Facility
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***Monitored Natural Attenuation
Progress Report 4
Corrective Action Plan Implementation
Groundwater Incident No. 518280***

July 2008



**Charla Reinganum, P.E.
Phoenix Environmental Associates, Inc.
530 Audubon Place
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ENVIRONMENTAL**
ASSOCIATES, INCORPORATED

Former Abbott Facility
Laurinburg, North Carolina

*Monitored Natural Attenuation
Progress Report 4
Corrective Action Plan Implementation
Groundwater Incident No. 518280
July 2008*

Release Date: 30 January 2000
Quantity: 1,500 Gallons of No. 2 Fuel Oil
Source: Subsurface AST Piping
Latitude: 34.799605992
Longitude: -79.454220773

Responsible Party Representative:
Curtis Michols
Principal Specialist
Abbott Laboratories
200 Abbott Park Road
Abbott Park, Illinois 60064
(847)-937-0863

Property Owner:
QualPak
16000 Joy Street
Laurinburg, North Carolina 28352
(910)-610-1203

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May 2000 through April 2008

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INTRODUCTION

This *Monitored Natural Attenuation Progress Report No. 4, Groundwater Incident No. 518280 (Progress Report No. 4)* for the former Abbott facility located at 16000 Joy Street, Laurinburg, Scotland County, North Carolina is being submitted to the North Carolina Department of Environment and Natural Resources (NCDENR) to fulfill the annual reporting requirements presented in the approved Corrective Action Plan (CAP) for this incident. This progress report covers activities performed during the period July 2007 through June 2008, which covers the fourth annual reporting period for the Monitored Natural Attenuation (MNA) corrective action to address groundwater contamination that originated from a January 2000 No. 2 fuel oil release that occurred at the facility.

One Monitored Natural Attenuation groundwater monitoring event (the annual April 2008 event) was performed during this reporting period.

This progress report is being submitted, on behalf of Abbott Laboratories (Abbott), by Phoenix Environmental Associates, Inc. of Highland Park, Illinois, a North Carolina-licensed engineering corporation. Excel Environmental Associates (Excel), PLLC of Gastonia, North Carolina, which also is a North Carolina-licensed engineering company, provided field support of the reported activities. The Abbott Global Environment, Health and Safety (GEHS) laboratory, a North Carolina-certified analytical laboratory, provided the laboratory analytical services.

Unless otherwise noted, these activities were performed in accordance with the *Corrective Action Plan* (Matrix Environmental Southeast, Inc. 2004, the *MNA CAP*) for groundwater incident No. 518280 that was approved by the NCDENR on 21 June 2004.

This progress report is organized into the following two sections:

- Section 1.0 – Monitored Natural Attenuation Groundwater Monitoring
- Section 2.0 – Future Actions

The facility location is shown in Figure E-1 and the location of the fuel oil release area at the facility is shown in Figure E-2. Benzene is the sole contaminant impacting the groundwater that requires corrective action under the *MNA CAP*. Benzene has been detected in previous groundwater samples collected in the immediate vicinity of the fuel oil release in excess of the North Carolina Administrative Code subchapter 2L groundwater standard (the 2L standard, 15A NCAC 2L.0202) of 1 microgram per liter ($\mu\text{g/L}$). Detailed information on the facility history, groundwater release incident, initial response actions, and prior groundwater investigations were presented in the NCDENR-approved *Comprehensive Site Assessment Groundwater Incident No. 518280* (Matrix Environmental Southeast, Inc., June 2003) and the *MNA CAP*.

SECTION 1

MONITORED NATURAL ATTENUATION GROUNDWATER MONITORING

1.1 INTRODUCTION

This section presents the field activities performed and analytical data obtained from one annual MNA groundwater monitoring event performed in April 2008, which was performed in accordance with the procedures presented in Appendix G of the *MNA CAP*.

The purpose of the MNA Groundwater Monitoring Program is to demonstrate the effectiveness of the MNA corrective action in meeting the following two objectives:

- To reduce Benzene groundwater concentrations in the aquifer in the vicinity of the fuel oil release.
- To prevent offsite migration of the Benzene fuel oil release groundwater plume in exceedance of its 2L standard of 1 microgram per liter ($\mu\text{g/L}$).

The MNA Groundwater Monitoring Network consists of the 12 monitoring wells shown in Figure 1-1.

The monitoring objective for each well and well construction information are presented in Table 1-1. Analytical data were obtained from eight (8) of the monitoring wells in accordance with the *MNA CAP* requirements.

1.2 FIELD PROCEDURES

At each of the eight monitoring wells from which samples were collected, the static water level was measured prior to sampling. This information was used to determine groundwater elevation levels and to calculate the minimum purge volume needed prior to sample collection. The static water levels were measured using a combination interface probe/electronic water level meter (Heron H.01L Oil and Water Interface Probe).

Groundwater samples were collected using a low-flow sampling technique. Groundwater was withdrawn at each monitoring well using a Grundfos Redi Flo 2 submersible pump or a peristaltic pump (used for the ½-inch diameter wells) with an approximate flow rate of 0.5 liters per minute. The submersible pump (or dedicated tubing for the peristaltic pump) was placed at mid-water depth. Dedicated tubing was used at each monitoring location. Based on the water level data, one purge volume of water was withdrawn at each location prior to obtaining well stabilization data. An inflow sampling device, Horiba U22.23 multi-parameter water quality meter with flow thru cell, was used to measure the following field parameters: dissolved oxygen, redox potential, pH, temperature, specific conductivity and turbidity measurements. Each well was considered to be stabilized after one purge volume had been removed and the following criteria were met:

- ± 0.1 for pH
- ± 5% for specific conductivity
- ± 10% for turbidity

Dissolved oxygen field measurements were also obtained at the following four monitoring wells: FR-2; FR-4; FR-5; and FR-9d. These measurements were obtained using the field procedures described above. The well purging and field parameter data are presented in Tables 1-2. The well sampling forms are presented in Appendix A.

Immediately following stabilization, groundwater samples were collected from the outflow of the tubing for Benzene analysis. Each groundwater sample was collected directly into three (3) 40-milliliter glass vials containing hydrogen chloride as a preservative.

The collected groundwater samples were sent to the Abbott GEHS Laboratory in North Chicago, Illinois for analysis using United States Environmental Protection Agency Method 8260B.

Quality control samples also were collected. Extra sample volume for a laboratory matrix spike/matrix spike duplicate analysis was collected from monitoring well FR-6D and one field duplicate groundwater sample was collected from monitoring well FR-6D. One trip blank and

one field blank were collected and laboratory analyzed for Benzene to monitor for potential cross-contamination effects during each sampling event. The field blank was collected by pumping distilled water through the submersible pump after it has been decontaminated. The trip blank was laboratory-prepared and was kept with the sampling vials.

The Redi Flo2 submersible pump was decontaminated between wells by placing the pump into a 5-gallon bucket containing water and Alconox (a low-foaming phosphate-free detergent) and pumping for approximately three minutes followed by repeating this procedure in a 5-gallon bucket containing distilled water.

The purge water was collected in a 55-gallon drum for off-site management.

1.3 RESULTS

1.3.1 Field Data

The April 2008 static water-elevation level data are presented in Table 1-3.

The April 2008 and cumulative dissolved oxygen data are presented in Table 1-4. It is noted that most of the reported dissolved oxygen concentrations from the current monitoring event are significantly greater than observed in prior events. Therefore, these data should be interpreted cautiously since the reported values are more likely attributable to an equipment malfunction rather than large changes in aquifer conditions.

1.3.2 Analytical Data

The Benzene groundwater analytical results for this reporting period are presented in Table 1-5. The laboratory analytical reports for the data are presented in Appendix B.

Benzene was detected in groundwater samples in two monitoring wells (FR-3D and FR-6). The maximum benzene groundwater concentration during this sampling event was 54 µg/L observed

in monitoring well FR-6. No benzene was detected in the groundwater samples from the remaining six monitoring wells (FR-1; FR-3; FR-6D; FR-7D; FR-8D; and MW-20B) during this annual sampling event.

1.4 DATA EVALUATION

Benzene was observed to be present in excess of its 2L standard in groundwater samples collected from two monitoring wells (FR-3D and FR-6) during the current sampling event. The cumulative Benzene analytical data from May 2000 through the current reporting period are summarized in Table 1-6. The Benzene groundwater concentrations observed during the current reporting period are consistent with previously reported concentrations. These cumulative data indicate that the Benzene plume is stable with no relative increasing downgradient contaminant concentrations and the remaining impacted areas in close proximity to the source of the release, which is several hundred feet upgradient of the property line.

Figure 1-2 presents the location of a cross section along the longitudinal centerline of the Benzene groundwater plume and Figure 1-3 presents the cross sectional representation of the Benzene groundwater plume based on the April 2008 data. The lateral extent of the Benzene groundwater plume in the shallower and deeper portions of the aquifer based on the current reporting period is presented in Figure 1-4. As shown in Figures 1-3 and 1-4, the Benzene groundwater plume in the upper portion of the aquifer is remains close to the initial source of the release and the limits of the Benzene groundwater plume in excess of the Benzene 2L standard in the deeper portion of the aquifer extends slightly beyond monitoring well FR-3D. The Benzene plume limits remains more than 250 feet upgradient of the property line, which is located immediately south of monitoring well MW-20B as shown in Figure 1-4.

SECTION 2

FUTURE ACTIONS

Abbott is requesting permission from the NCDENR to modify both the scope and frequency of groundwater monitoring required under the *MNA CAP* based on the data obtained during the four-year MNA CAP implementation period (September 2004 through April 2008). These proposed modifications are not part of a request to terminate the corrective action.

2.1 PROPOSED MODIFICATIONS TO SCOPE

Abbott is requesting permission to suspend groundwater monitoring at the four monitoring well locations at which no exceedances of the benzene 2L standard have been observed throughout the four-year MNA CAP implementation monitoring period. Specifically, Abbott is requesting to suspend groundwater monitoring under the MNA CAP of the following monitoring wells: FR-1; FR-3; FR-7D; and FR-8D.

Additionally, Abbott intends to suspend optional field data collection from the following monitoring wells: FR-2; FR-4; FR-5; and FR-9D. Abbott had been collecting dissolved oxygen field data at these locations to provide baseline information for future evaluation of the MNA progress.

These proposed modifications are summarized in Table 2-1.

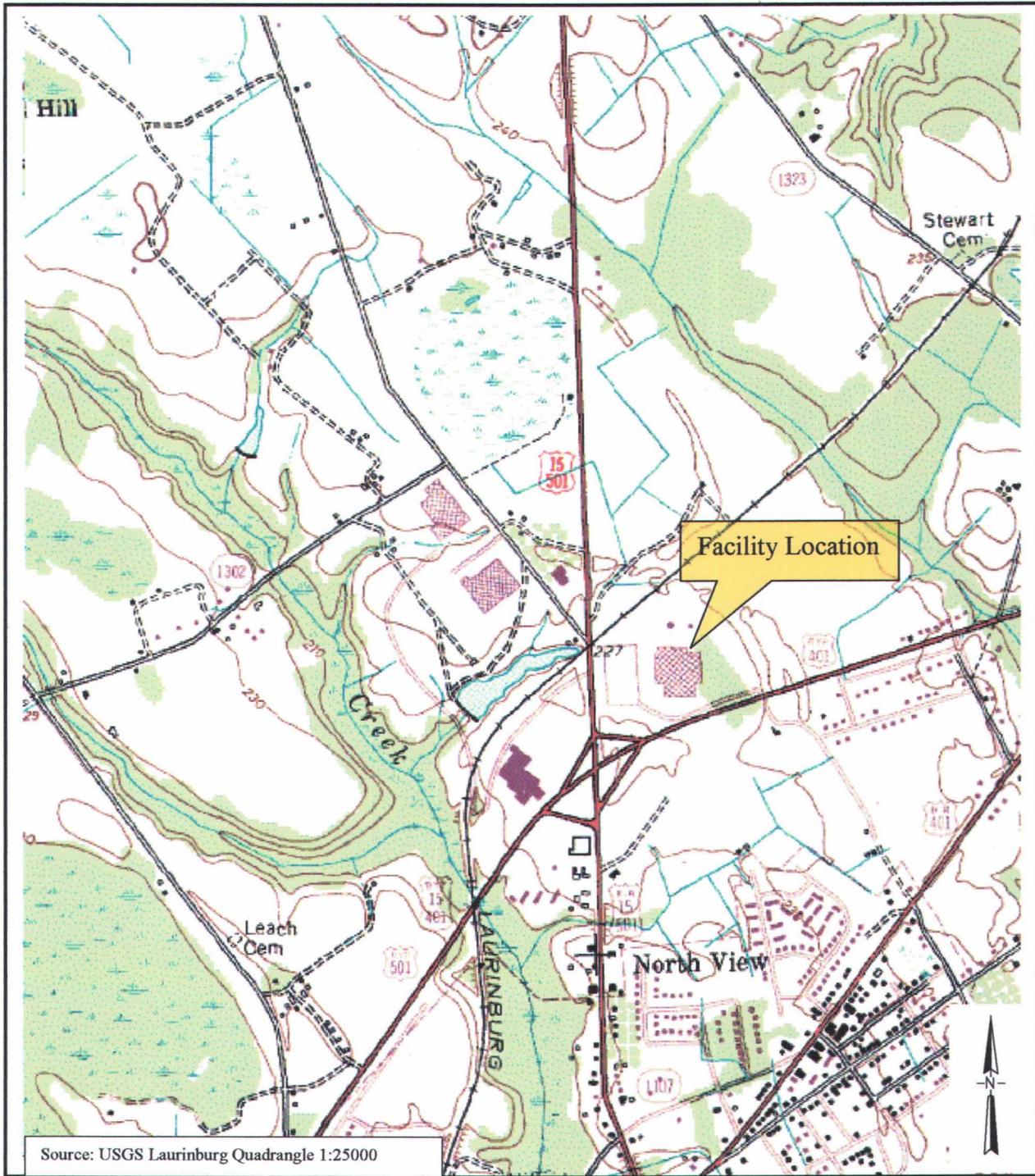
2.2 PROPOSED MODIFICATION TO MONITORING FREQUENCY

Abbott is requesting permission to perform groundwater monitoring once every three years rather than annually as required under the MNA CAP. As previously discussed, the Benzene plume has shown to be consistently stable with no relative increasing downgradient contaminant concentrations during the four years of monitoring; and, the remaining impacted areas are in close proximity to the source of the release, which is several hundred feet upgradient of the property line, and no reasonable receptors exist in the area.

The MNA corrective action is a long-term remedy and changes in the system occur at a slow rate. Ample baseline benzene groundwater data has been obtained during the four-year MNA CAP implementation period to confirm plume stability and no risk posed by the extent of remaining contamination. There is no technical justification for continuing annual groundwater monitoring since the stability of the Benzene plume is well established.

Abbott proposes to perform the next scheduled groundwater monitoring event in April 2011.

Abbott will continue to submit annual progress reports. Abbott will submit the fifth *MNA CAP* progress report to the NCDENR by 15 August 2009.



Source: USGS Laurinburg Quadrangle 1:25000

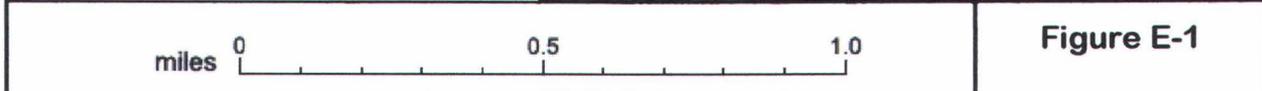


Figure E-1

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**FACILITY LOCATION MAP
MNA CAP IMPLEMENTATION
Former Abbott Facility
Laurinburg, North Carolina**

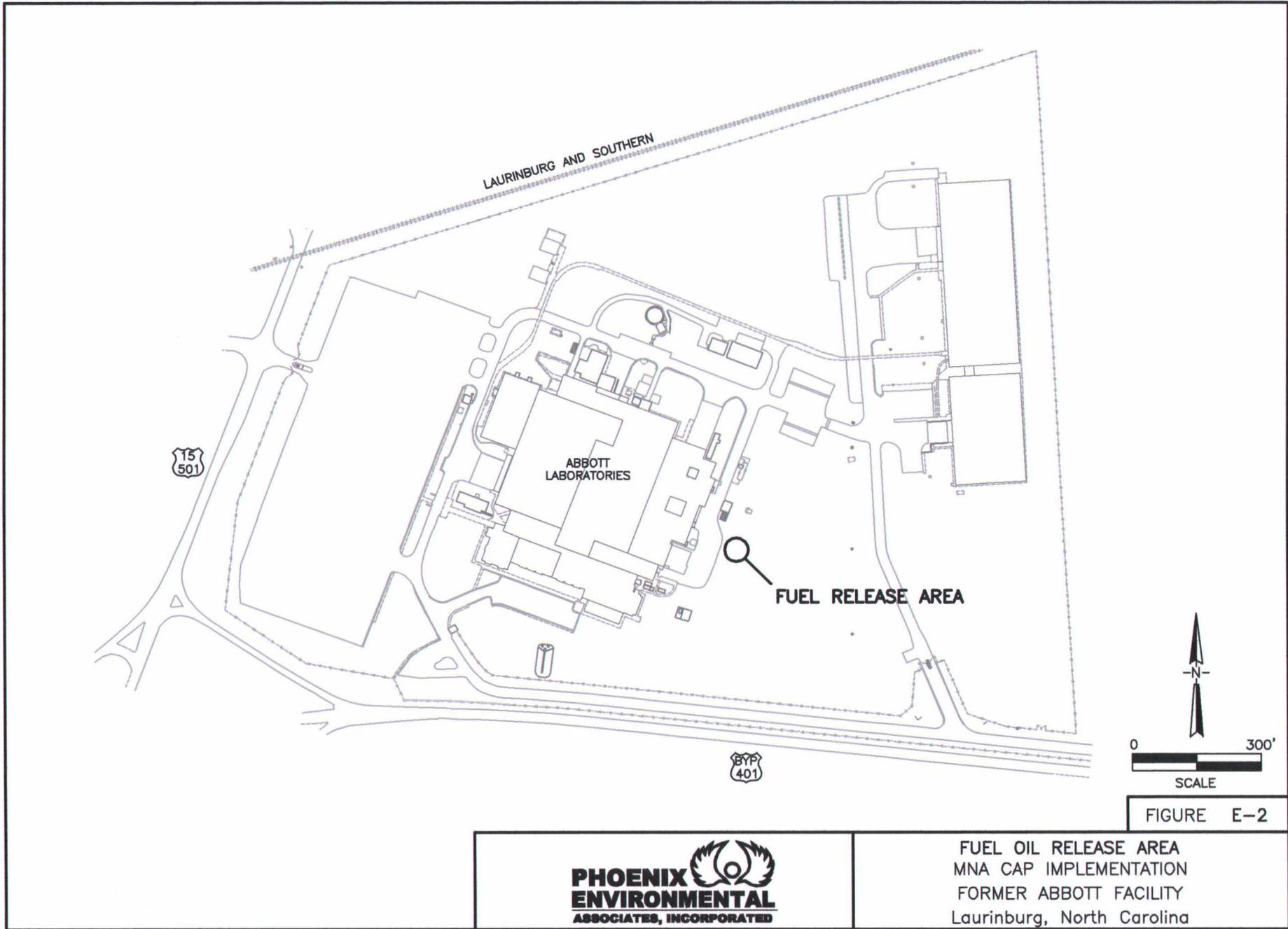


FIGURE E-2



FUEL OIL RELEASE AREA
MNA CAP IMPLEMENTATION
FORMER ABBOTT FACILITY
Laurinburg, North Carolina

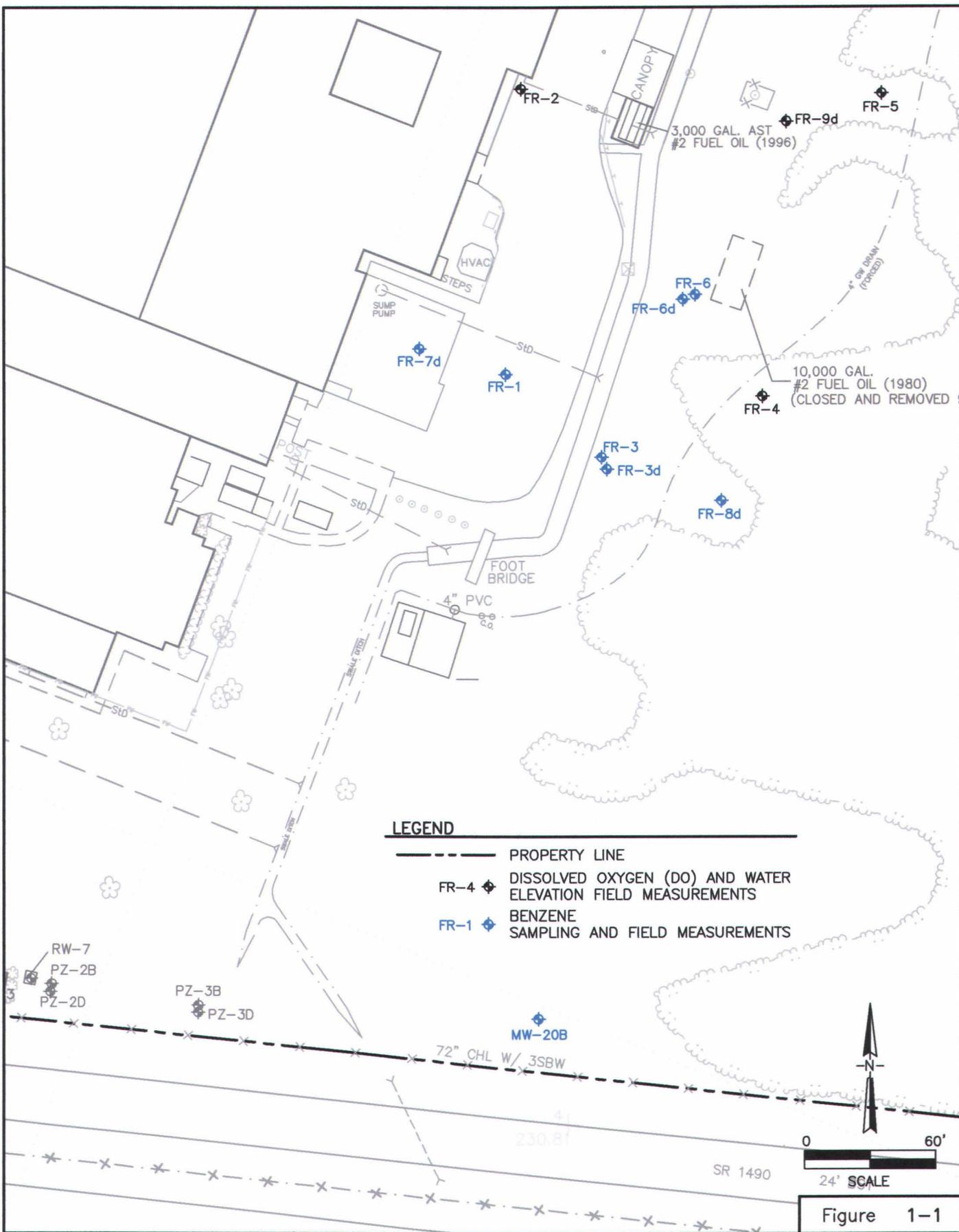
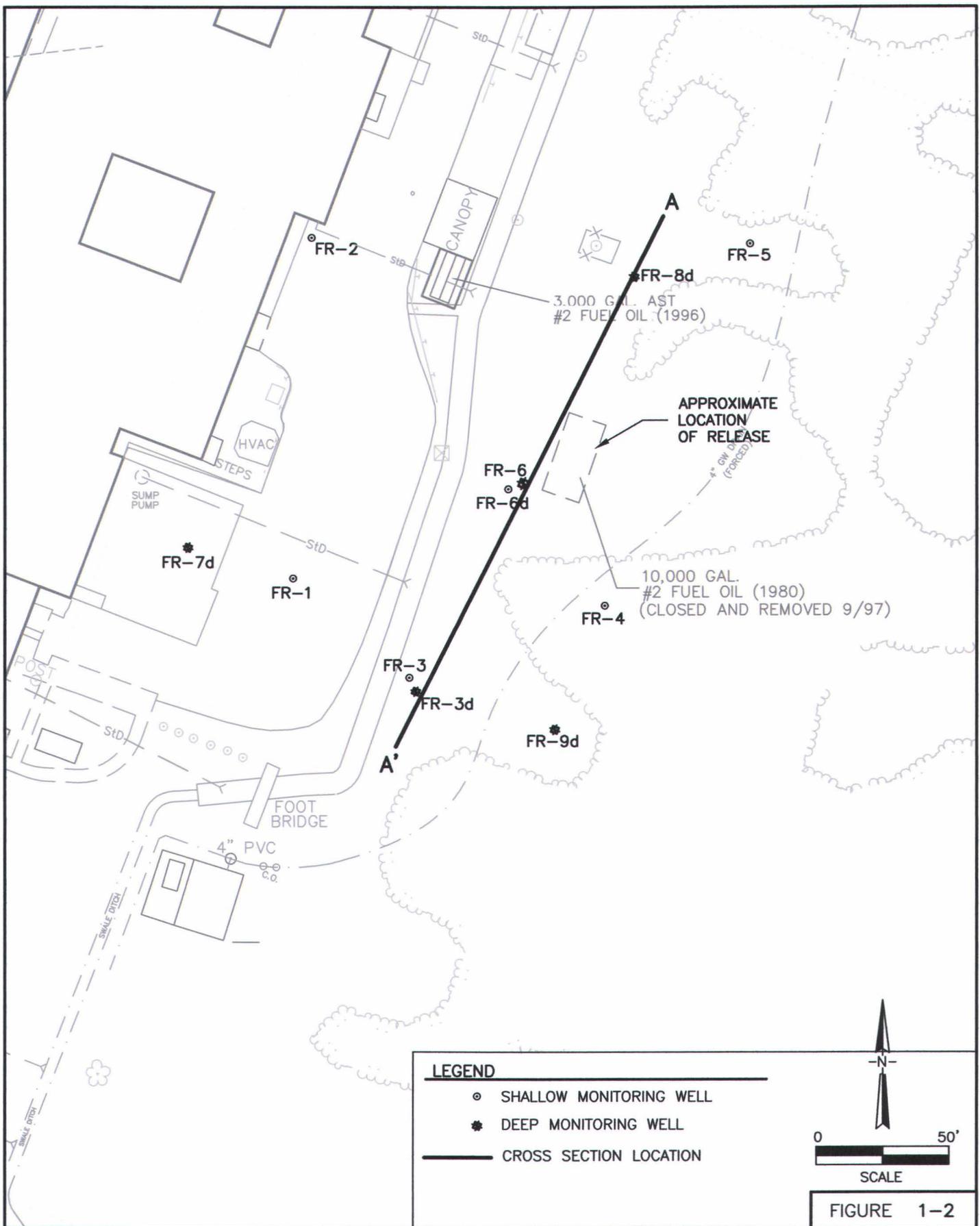
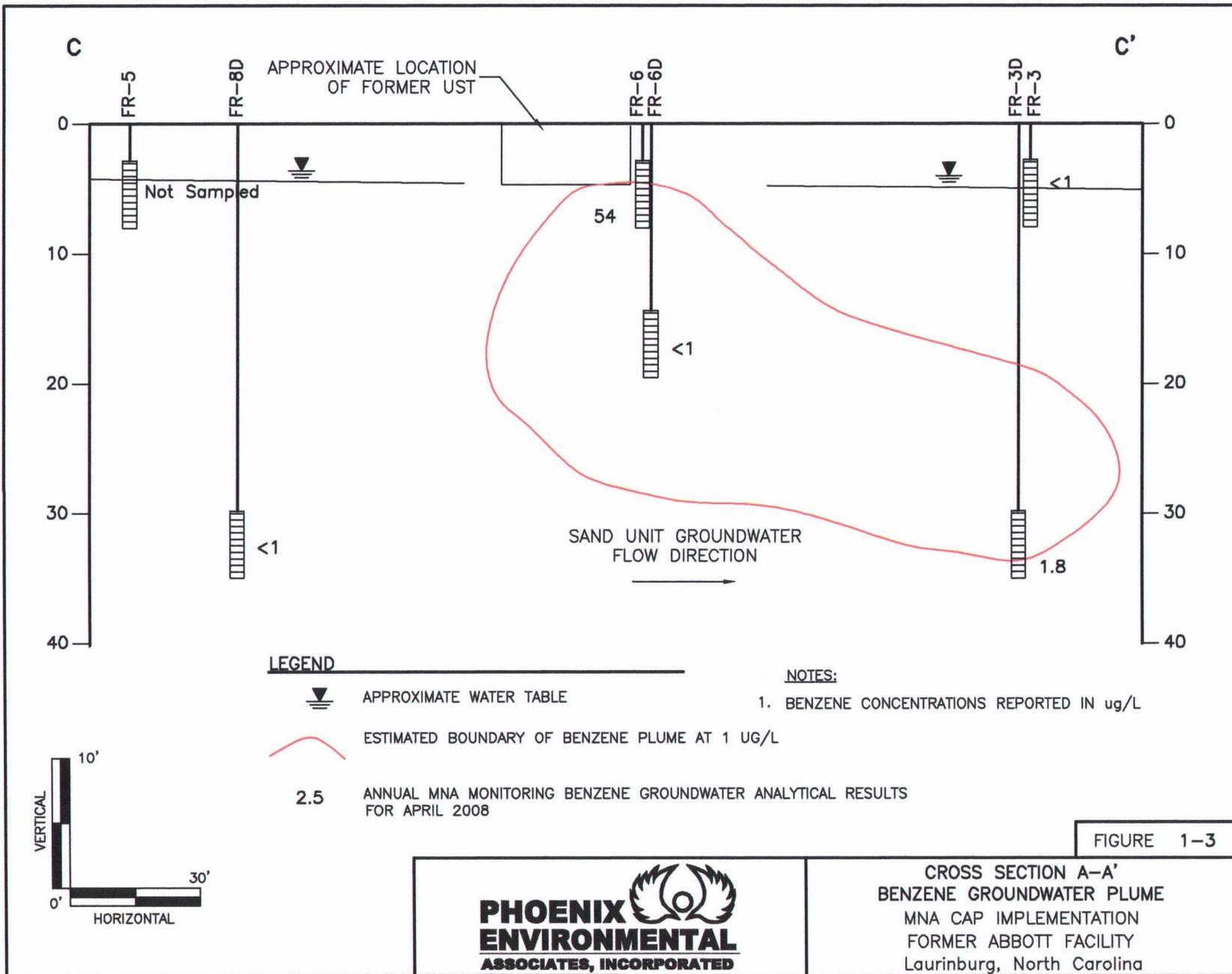


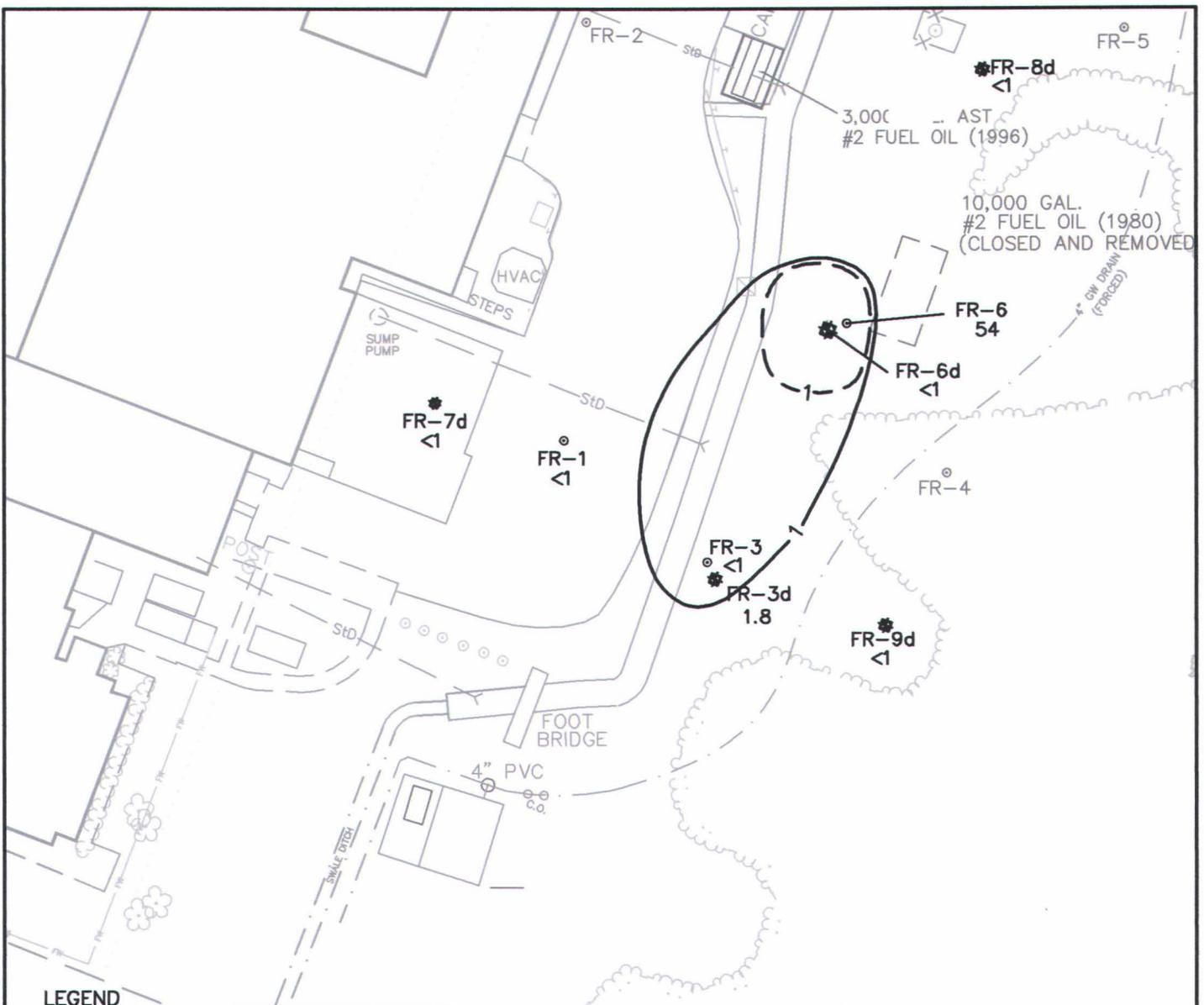
Figure 1-1



MNA CAP GROUNDWATER MONITORING NETWORK
 MNA CAP IMPLEMENTATION
 FORMER ABBOTT FACILITY
 Laurinburg, North Carolina







LEGEND

- SHALLOW MONITORING WELL (8 FT BGS)
- ✱ DEEP MONITORING WELL (15 TO 35 FT BGS)

2.4 OBSERVED BENZENE CONCENTRATIONS

- - - SHALLOWER PORTION OF BENZENE PLUME EXCEEDING 2L STANDARD
- DEEPER PORTION OF BENZENE PLUME EXCEEDING 2L STANDARD

NOTES:

1. DATA OBTAINED FROM APRIL 2008 ANNUAL SAMPLING EVENT.
2. BENZENE CONCENTRATIONS IN ug/L.
3. 2L BENZENE STANDARD IS 1 ug/L.
4. MONITORING WELL FR-6D IS SCREENED TO A DEPTH OF 15 FEET BGS, ALL OTHER DEEPER WELLS ARE SCREENED AT A BOTTOM DEPTH OF 35 FEET BGS.

MW-20D
 ○ MW-20B
 <1
 2" CHL W/ 3SBW

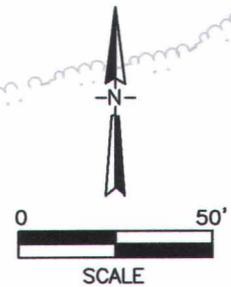


FIGURE 1-4



**BENZENE GROUNDWATER PLUME
 FUEL OIL RELEASE
 FORMER ABBOTT FACILITY
 Laurinburg, North Carolina**

**TABLE 1-1
MNA GROUNDWATER MONITORING NETWORK
WELL SPECIFICATIONS**

**GROUNDWATER INCIDENT NO. 518280
MNA CAP IMPLEMENTATION
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA**

Well ID	Description of Sampling Location	Monitoring Objective	Ground Elevation (MSL)	TOC Elevation (MSL)	Screening Interval (in ft bgs)	Casing Diameter (in inches)
FR-1	Shallow Down- and Side-gradient	Plume Delineation	227.02	227.02	3 - 8	2
FR-2	Shallow Upgradient	Dissolved Oxygen	227.01	227.01	3 - 8	2
FR-3	Shallow Downgradient	Plume Delineation	228.17	230.17	1 - 6	2
FR-4	Shallow sidegradient	Dissolved Oxygen	228.15	230.15	1 - 6	2
FR-5	Shallow Upgradient	Dissolved Oxygen	228.69	230.69	1 - 6	2
FR-6	Shallow Source Area	Plume Delineation	228.66	230.66	1 - 6	2
FR-6d	Deep Source Area	Plume Delineation	228.62	230.62	12.5 - 17.5	2
FR-3d	Deep Downgradient	Plume Delineation	227.17	229.67	29 - 35	0.5
FR-7d	Deep Down-and Side-Gradient	Plume Delineation	226.45	226.45	29 - 35	0.5
FR-8d	Deep Down-and Side-Gradient	Plume Delineation	228.32	230.82	29 - 35	0.5
FR-9d	Deep Upgradient	Dissolved Oxygen	228.31	230.81	29 - 35	0.5
MW-20B	Deep Downgradient Property Line	Plume Delineation	228.87	228.62	17 - 27	2

Key:

ft = feet
bgs = below ground surface
MSL = Mean Sea Level

TABLE 1-2
APRIL 2008
MONITORING WELL PURGE AND FIELD DATA
(Page 1 of 2)

GROUNDWATER INCIDENT NO. 518280
MNA CAP IMPLEMENTATION
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Monitoring Well Location	Time	Cumulative Purge Volume (in gallons)	Stabilization			Other Field Parameters		
			pH (Standard Units)	Conductivity (in mmhos/cm)	Turbidity (NTU)	Dissolved Oxygen (in mg/L)	ORP (in mV)	Temperature (in °C)
FR-1	1000	0	5.23	0.109	96.8	15.39	289	19.7
	1007	NR	5.30	0.115	77.1	13.42	288	19.8
	1010	NR	5.43	0.113	47.2	12.71	289	19.8
	1013	NR	5.46	0.088	45.8	12.55	290	19.7
	1016	-	5.46	0.088	45.3	12.53	290	19.7
FR-3	1038	0	4.32	0.027	33.7	9.66	317	15.7
	1042	NR	4.11	0.027	45.1	10.53	324	15.7
	1045	NR	4.06	0.028	44.3	10.33	329	15.7
	1048	NR	4.05	0.028	44.3	10.32	329	15.7
	1051	-	4.06	0.028	44.3	10.32	329	15.7
FR-3D	1050	0	4.05	0.043	55.4	9.17	334	16.6
	1051	NR	4.07	0.045	85.8	10.77	328	17.2
	1054	NR	4.11	0.045	93.0	10.82	326	17.4
	1057	NR	4.11	0.044	94.0	10.73	318	17.8
	1100	-	4.11	0.043	95.0	10.63	318	18.0
FR-6	1114	0	5.56	0.483	51.7	9.62	31	15.3
	1119	NR	5.63	0.482	44.8	8.96	18	15.3
	1122	NR	5.66	0.481	54.2	8.36	8	15.3
	1125	NR	5.69	0.483	56.3	7.96	1	15.3
	1128	-	5.69	0.483	56.0	7.90	1	15.3
FR-6D	1050	0	4.76	0.046	45.2	7.12	291	16.4
	1104	NR	4.70	0.046	33.8	5.88	286	16.3
	1107	NR	4.75	0.046	29.7	5.26	287	16.3
	1110	NR	4.75	0.047	28.5	5.19	280	16.3
	1113	-	4.75	0.047	28.0	5.19	280	16.3
FR-7D	115	0	4.42	0.049	42.5	11.01	230	20.1
	1016	NR	4.03	0.044	23.3	9.81	311	20.3
	1019	NR	4.27	0.043	21.7	9.56	314	20.3
	1022	NR	4.26	0.043	21.8	9.56	314	20.3
	1025	-	4.26	0.044	21.4	9.54	315	20.3

TABLE 1-2
APRIL 2008
MONITORING WELL PURGE AND FIELD DATA
(Page 2 of 2)

GROUNDWATER INCIDENT NO. 518280
MNA CAP IMPLEMENTATION
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Monitoring Well Location	Time	Cumulative Purge Volume (in gallons)	Stabilization			Other Field Parameters		
			pH (Standard Units)	Conductivity (in mmhos/cm)	Turbidity (NTU)	Dissolved Oxygen (in mg/L)	ORP (in mV)	Temperature (in °C)
FR-8D	1022	0	4.52	0.042	174	8.50	315	16.2
	1023	NR	4.43	0.041	220	7.69	315	16.2
	1026	NR	4.41	0.041	207	7.51	315	16.2
	1029	NR	4.40	0.041	208	7.45	315	16.2
	1032	-	4.40	0.041	208	7.45	315	16.2
MW-20B	750	0	4.52	0.062	40.3	6.61	271	18.2
	819	NR	4.08	0.062	27.0	4.23	293	18.8
	822	NR	4.08	0.062	28.7	5.15	294	18.7
	825	NR	4.10	0.062	29.2	4.06	293	19.0
	828	-	4.11	0.062	30.0	4.01	297	19.1
FR-2	0000	-	5.07	0.078	82.3	10.82	82	18.5
	0007	NR	5.36	0.08	57.9	7.91	78	18.5
	0010	NR	5.43	0.079	35.9	7.36	75	18.7
	0013	-	5.47	0.076	34.7	7.25	74	18.7
	0016	NR	5.47	0.074	34.5	7.32	74	18.7
FR-4	0000	0	4.76	0.033	29.7	7.92	47	14.6
	0006	NR	4.61	0.03	27.8	9.10	63	14.6
	0009	NR	4.48	0.029	25.9	9.47	75	14.6
	0012	NR	4.35	0.028	26.9	9.40	78	14.5
	0015	-	4.27	0.028	25.1	8.99	87	14.5
FR-5	0000	0	5.49	0.087	96.3	5.56	18	15.0
	0007	NR	5.37	0.084	77.3	3.00	18	14.9
	0010	NR	5.36	0.083	81.7	2.29	20	14.9
	0013	NR	5.33	0.080	80	2.23	20	14.9
	0016	-	5.31	0.080	77.8	2.21	21	15.0
FR-9D	0000	0	5.57	0.001	156	11.25	15	17.7
	001	NR	5.57	0.001	156	11.14	16	17.7
	0004	NR	5.56	0.001	157	10.89	15	17.7
	0007	NR	5.47	0.001	156	10.88	16	17.7
	0010	-	5.47	0.001	157	10.87	17	17.7

Key:

μmhoms/cm = microsiemens per centimeter
mg/L = milligrams per liter
NTU = nephelometric turbidity units
mV = millivolts
NR = not recorded
°C = degrees Centigrade

**TABLE 1-3
WATER ELEVATION DATA**

**GROUNDWATER INCIDENT NO. 518280
MNA CAP IMPLEMENTATION
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA**

Monitoring Well Identification	Top of Casing Elevation (ft MSL)	April 2008	
		Depth to Water (ft)	Water-Level Elevation (ft MSL)
FR-1	227.02	2.3	224.72
FR-3	230.17	4.66	225.51
FR-3d	229.67	32.66	197.01
FR-6	230.66	4.5	226.16
FR-6d	230.62	6.01	224.61
FR-7d	226.45	29.22	197.23
FR-8d	230.82	32.77	198.05
MW-20B	227.94	3.8	224.14
FR-2	227.01	2.05	224.96
FR-4	230.15	5.78	224.37
FR-5	230.69	5.59	225.1
FR-9d	230.81	32.65	198.16

Key:
ft = feet
MSL = Mean Sea Level

**TABLE 1-4
CUMULATIVE DISSOLVED OXYGEN FIELD DATA**

**GROUNDWATER INCIDENT NO. 518280
MNA CAP IMPLEMENTATION
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA**

Well Screening Interval ¹	Well ID	Dissolved Oxygen							
		(in mg/L)							
		Sep 2004	Mar 2005	Sep 2005	Dec 2005	Mar 2006	Jun 2006	Apr 2007	Apr 2008
Shallow	FR-1	2.81	2.33	3.89	8.06	4.62	1.94	1.51	12.54
	FR-2	NM	6.09	NM	5.80	2.08	5.44	0.92	7.31
	FR-3	4.50	1.00	2.76	6.25	0.32	5.84	0.40	10.32
	FR-4	NM	5.36	NM	5.26	2.84	7.24	2.39	9.29
	FR-5	NM	6.30	NM	6.18	0.13	5.72	2.47	2.47
	FR-6	1.80	3.19	1.64	6.02	2.97	0.03	0.52	8.07
Deep	FR-3d	2.57	1.71	0.00	2.79	1.65	1.18	0.25	10.73
	FR-6d	2.30	3.02	4.75	1.44	0.23	0.00	2.30	5.21
	FR-7d	4.10	2.60	3.02	1.77	2.99	0.15	0.28	9.55
	FR-8d	4.13	3.29	3.51	3.59	0.34	1.65	1.45	5.81
	FR-9d	NM	2.99	NM	4.18	0.06	1.14	1.23	10.88
	MW-20B	2.23	1.77	3.10	4.72	0.44	0.00	4.72	4.41

Key:
mg/L = milligram per liter
NM = not measured

Note:

¹ The following definitions are used to describe the well screening interval:

Shallow = Screened at a depth less than 8 ft bgs

Deep = Screened at a depth greater than 12 ft bgs

² Dissolved Oxygen value represents the average of final three field measurements.

TABLE 1-5

**APRIL 2008
BENZENE ANALYTICAL RESULTS**

**GROUNDWATER INCIDENT NO. 518280
MNA CAP IMPLEMENTATION
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA**

<i>Benzene Concentrations (in $\mu\text{g/L}$)</i>										
<i>FR-1</i>	<i>FR-3</i>	<i>FR-3D</i>	<i>FR-6</i>	<i>FR-6D</i>	<i>FR-6DFD</i>	<i>FR-7D</i>	<i>FR-8D</i>	<i>MW-20B</i>	<i>FIELD BLANK</i>	<i>TRIP BLANK</i>
1 U	1 U	1.8	54	1 U	1 U	1 U	1 U	1 U	1 U	1 U

Key:

ug/L = microgram per liter

U = Constituent not detected at a concentration above the reported value

25 = Indicates that the detected concentration exceeds the benzene 2L standard of 1 $\mu\text{g/L}$

Notes:

¹ North Carolina 2L standards taken from 15A NCAC 2L .0202 effective 1 April 2005

TABLE 1-6

CUMULATIVE BENZENE ANALYTICAL DATA
 (Page 1 of 3)

GROUNDWATER INCIDENT NO. 518280
MNA CAP IMPLEMENTATION
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Well Location	Sampling Date	Benzene Concentration ¹ (in ug/L)
FR-1	May-00	1 U
	May-01	0.1 U
	Sep-01	0.1 U
	Mar-02	1 U
	Sep-02	NS
	Apr-03	1 U
	Sep-04	1 U
	Mar-05	1 U
	Sep-05	1 U
	Dec-05	1 U
	Mar-06	1 U
	Jun-06	1 U
	Apr-07	1 UJ
	Apr-08	1 U
FR-3	May-00	1 U
	May-01	0.1 U
	Sep-01	0.1 U
	Mar-02	1 U
	Sep-02	NS
	Apr-03	1 U
	Sep-04	1 U
	Mar-05	1 U
	Sep-05	1 U
	Dec-05	1 U
	Mar-06	1 U
	Jun-06	1 U
	Apr-07	1 U
	Apr-08	1 U
FR-3D	Dec-00	2
	May-01	0.1 U
	Sep-01	1.6
	Mar-02	2.5
	Sep-02	0.53 J
	Apr-03	1.4
	Sep-04	1.5
	Mar-05	1.6
	Sep-05	1
	Dec-05	2.1
	Mar-06	2.4
	Jun-06	2
	Apr-07	2.3
Apr-08	1.8	

TABLE 1-6

CUMULATIVE BENZENE ANALYTICAL DATA
 (Page 2 of 3)

GROUNDWATER INCIDENT NO. 518280
MNA CAP IMPLEMENTATION
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Well Location	Sampling Date	Benzene Concentration ¹ (in ug/L)
FR-6	Apr-03	47
	Sep-04	60
	Mar-05	68
	Sep-05	36
	Dec-05	53
	Mar-06	65
	Jun-06	56
	Apr-07	58
Apr-08	54	
FR-6D	May-00	21
	Dec-00	17
	May-01	3.7
	Sep-01	17
	Mar-02	4.2
	Sep-02	26
	Apr-03 ²	3.1
	Sep-04 ²	7.1
	Mar-05 ²	1 U
	Sep-05 ²	1.7
	Dec-05 ²	2.1
	Mar-06 ²	2
	Jun-06 ²	1.2
	Apr-07 ²	3.3
Apr-08 ²	1 U	
FR-7D	Dec-00	1 U
	May-01	0.36 J
	Sep-01	0.42 J
	Mar-02	0.40 J
	Sep-02	1.6
	Apr-03	1 U
	Sep-04	0.68 J
	Mar-05	1 U
	Sep-05	1 U
	Dec-05	5 U
	Mar-06	1 U
	Jun-06	1 U
	Apr-07	1 U
Apr-08	1 U	

TABLE 1-6

**CUMULATIVE BENZENE ANALYTICAL DATA
(Page 3 of 3)**

**GROUNDWATER INCIDENT NO. 518280
MNA CAP IMPLEMENTATION
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA**

Well Location	Sampling Date	Benzene Concentration ¹ (in ug/L)
FR-8D	Dec-00	1 U
	May-01	0.1 U
	Sep-01	0.1 U
	Mar-02	1 U
	Sep-02	0.21 U
	Apr-03	1 U
	Sep-04	1 U
	Mar-05	1 U
	Sep-05	1 U
	Dec-05	1 U
	Mar-06	1 U
	Jun-06	1 U
	Apr-07	1 U
	Apr-08	1 U
MW-20B	May-01	0.1 U
	Sep-01	0.0465 U
	Mar-02	1 U
	Sep-02	0.2 U
	Apr-03	1 U
	Sep-04	1 U
	Mar-05	1 U
	Sep-05	1 U
	Dec-05	1 U
	Mar-06	1 U
	Jun-06	1 U
	Apr-07	1 U
	Apr-08	1 U

Key:

ug/L = microgram per liter

U = Constituent not detected at a concentration above the reported value

J = Reported value is estimated

NS = Not sampled due to well being dry

25 = Indicates that the detected concentration exceeds the 2L standard

Notes:

¹ North Carolina 2L standard for Benzene is 1 ug/L.

² Reported concentration is the maximum detected concentration or the minimum detection limit of the sample and its duplicate.

**TABLE 2-1
PROPOSED MODIFICATIONS TO MNA GROUNDWATER MONITORING PROGRAM**

**GROUNDWATER INCIDENT NO. 518280
MNA CAP IMPLEMENTATION
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA**

<i>Well ID</i>	<i>Description of Sampling Location</i>	<i>Current Monitoring Purpose</i>	<i>Proposed Future Monitoring</i>	<i>Modification Basis</i>
FR-1	Shallow Down- and Side-gradient	Plume Delineation	Suspend	Benzene not detected
FR-2	Shallow Upgradient	Dissolved Oxygen	Suspend	Baseline dissolved oxygen conditions established
FR-3	Shallow Downgradient	Plume Delineation	Suspend	Benzene not detected
FR-4	Shallow sidegradient	Dissolved Oxygen	Suspend	Baseline dissolved oxygen conditions established
FR-5	Shallow Upgradient	Dissolved Oxygen	Suspend	Baseline dissolved oxygen conditions established
FR-6	Shallow Source Area	Plume Delineation	Plume Delineation	-
FR-6d	Deep Source Area	Plume Delineation	Plume Delineation	-
FR-3d	Deep Downgradient	Plume Delineation	Plume Delineation	-
FR-7d	Deep Down-and Side-Gradient	Plume Delineation	Suspend	Benzene not detected
FR-8d	Deep Down-and Side-Gradient	Plume Delineation	Suspend	Benzene not detected
FR-9d	Deep Upgradient	Dissolved Oxygen	Suspend	Baseline dissolved oxygen conditions established
MW-20B	Deep Downgradient Property Line	Plume Delineation	Plume Delineation	-

ABBOTT LAURINBURG Ground Water Sampling Form

Consultant Company: Phoenix Environmental
 Project: Fuel Oil Wells - 4.08 Sampling Round
 Facility: Abbott Laboratories Laurinburg

Location: Laurinburg, NC
 Date: 4/16/2008
 Sampler(s): TG & LM

Sample Information

Sample ID: FR-1 MNA8FR1

Screen/Depth: 3' - 8' Collection Date: 4/16/2008 Collection Time(24:00): 1016

QA/QC Sample Collected: YES NO Type: _____ QA/QC ID: _____

Sampling Data

Sample collection based on: Purge Volume Parameter Stabilization other: _____

Sampling Method: Low Flow

Field Parameters

Time	Purge Volume (gallons)	Stabilization			Other Parameters		
		pH (pH units)	Conductivity (µmhos/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Temp (Cent)
1000		5.23	0.109	96.8	15.39	289	19.7
1007		5.30	0.115	77.1	13.42	288	19.8
1010		5.43	0.113	47.2	12.71	289	19.8
1013		5.46	0.088	45.8	12.55	290	19.7
1016		5.46	0.088	45.3	12.53	290	19.7

Purge Volume Calculations

Total Well Depth: 8 ft
 Water Level: 2.3 ft
 Water Column = 5.7 ft
 Gallons per ft: x 0.163 gal
 Well Volume = 0.93 gal

Well Volumes
 To be Removed: 1 x 0.93 = 0.93 gallons to be purged prior to sampling 3.52 LITERS

Well Casing Volumes (gallons per foot)		
1.0" = 0.041	2.0" = 0.163	3.0" = 0.367
1.5" = 0.092	2.5" = 0.255	4" = 0.653

Stabilization Requirements:	
pH:	± 0.1 unit
Conductivity:	± 5%
Turbidity:	± 10%

Remarks: Total Run Time = 7-MIN @ 0.5-L / MIN
Peristaltic pump used due to length of water column

Sample Description

Sample Color: _____ Sheen: _____
 Odor: _____ NAPL present: _____
 Comments: _____

ABBOTT LAURINBURG Ground Water Sampling Form

Consultant Company: Phoenix Environmental
 Project: Fuel Oil Wells - 4.08 Sampling Round
 Facility: Abbott Laboratories Laurinburg

Location Laurinburg, NC
 Date 4/16/2008
 Sampler(s) TG & LM

Sample Information

Sample ID: FR-3 MNA8FR3

Screen/Depth: 3' - 8' Collection Date: 4/16/2008 Collection Time(24:00): 1051

QA/QC Sample Collected: YES NO Type: _____ QA/QC ID: _____

Sampling Data

Sample collection based on: Purge Volume Parameter Stabilization other: _____

Sampling Method: _____ Low Flow

Field Parameters

Time	Purge Volume (gallons)	Stabilization			Other Parameters		
		pH (pH units)	Conductivity (µmhos/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Temp (Cent)
1038		4.32	0.027	33.7	9.66	317	15.7
1042		4.11	0.027	45.1	10.53	324	15.7
1045		4.06	0.028	44.3	10.33	329	15.7
1048		4.05	0.028	44.3	10.32	329	15.7
1051		4.06	0.028	44.3	10.32	329	15.7

Purge Volume Calculations

Total Well Depth: 8 ft
 Water Level: 4.66 ft
 Water Column = 3.34 ft
 Gallons per ft: x 0.163 gal
 Well Volume = 0.54 gal

Well Volumes

To be Removed: 1 x 0.54 = 0.54 gallons to be purged prior to sampling 2.06 LITERS

Well Casing Volumes (gallons per foot)		
1.0" = 0.041	2.0" = 0.163	3.0" = 0.367
1.5" = 0.092	2.5" = 0.255	4" = 0.653

Stabilization Requirements:	
pH:	± 0.1 unit
Conductivity:	± 5%
Turbidity:	± 10%

Remarks: Total Run Time = 4-MIN @ 0.5-L / MIN

Peristaltic pump used due to length of water column

Sample Description

Sample Color: _____ Sheen: _____

Odor: _____ NAPL present: _____

Comments: _____

ABBOTT LAURINBURG Ground Water Sampling Form

Consultant Company: Phoenix Environmental
 Project: Fuel Oil Wells - 4.08 Sampling Round
 Facility: Abbott Laboratories Laurinburg

Location: Laurinburg, NC
 Date: 4/16/2008
 Sampler(s): TG & LM

Sample Information

Sample ID: FR-3D

MNA8FR3D

Screen/Depth: 29' - 35'

Collection Date: 4/16/2008

Collection Time(24:00): 1100

QA/QC Sample Collected: YES NO

Type: _____

QA/QC ID: _____

Sampling Data

Sample collection based on: Purge Volume Parameter Stabilization other: _____

Sampling Method: _____ Low Flow

Field Parameters

Time	Purge Volume (gallons)	Stabilization			Other Parameters		
		pH (pH units)	Conductivity (µmhos/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Temp (Cent)
1050		4.05	0.043	55.4	9.17	334	16.6
1051		4.07	0.045	85.8	10.77	328	17.2
1054		4.11	0.045	93.0	10.82	326	17.4
1057		4.11	0.044	94.0	10.73	318	17.8
1100		4.11	0.043	95.0	10.63	318	18.0

Purge Volume Calculations

Total Well Depth: 35 ft
 Water Level: 32.66 ft
 Water Column = 2.34 ft
 Gallons per ft: x 0.0102 gal
 Well Volume = 0.02 gal

Well Volumes

To be Removed: 1 x 0.02 = 0.02 gallons to be purged prior to sampling 0.09 LITERS

Well Casing Volumes (gallons per foot)		
1.0" = 0.041	2.0" = 0.163	3.0" = 0.367
1.5" = 0.092	2.5" = 0.255	4" = 0.653

Stabilization Requirements:	
pH:	± 0.1 unit
Conductivity:	± 5%
Turbidity:	± 10%

Remarks: Total Run Time = 1-MIN @ 0.5-L / MIN
Peristaltic pump used due to the diameter of well

Sample Description

Sample Color: _____

Sheen: _____

Odor: _____

NAPL present: _____

Comments: _____

ABBOTT LAURINBURG Ground Water Sampling Form

Consultant Company: Phoenix Environmental
 Project: Fuel Oil Wells - 4.08 Sampling Round
 Facility: Abbott Laboratories Laurinburg

Location Laurinburg, NC
 Date 4/16/2008
 Sampler(s) TG & LM

Sample Information

Sample ID: FR-6 MNA8FR6

Screen/Depth: 3' - 8' Collection Date: 4/16/2008 Collection Time(24:00): 1128

QA/QC Sample Collected: YES NO Type: _____ QA/QC ID: _____

Sampling Data

Sample collection based on: Purge Volume Parameter Stabilization other: _____

Sampling Method: Low Flow

Field Parameters

Time	Purge Volume (gallons)	Stabilization			Other Parameters		
		pH (pH units)	Conductivity (µmhos/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Temp (Cent)
1114		5.56	0.483	51.7	9.62	31	15.3
1119		5.63	0.482	44.8	8.96	18	15.3
1122		5.66	0.481	54.2	8.38	8	15.3
1125		5.69	0.483	56.3	7.96	1	15.3
1128		5.69	0.483	56.0	7.90	1	15.3

Purge Volume Calculations

Total Well Depth 8 ft
 Water Level: 4.5 ft
 Water Column = 3.5 ft
 Gallons per ft: x 0.163 gal
 Well Volume = 0.57 gal

Well Volumes
 To be Removed: 1 x 0.57 = 0.57 gallons to be purged prior to sampling **2.16 LITERS**

Well Casing Volumes (gallons per foot)

1.0" = 0.041	2.0" = 0.163	3.0" = 0.367
1.5" = 0.092	2.5" = 0.255	4" = 0.653

Stabilization Requirements:

pH: ± 0.1 unit
Conductivity: ± 5%
Turbidity: ± 10%

Remarks: Total Run Time = 5-MIN @ 0.5-L / MIN
Peristaltic pump used due to length of water column

Sample Description

Sample Color: _____ Sheen: _____
 Odor: _____ NAPL present: _____
 Comments: _____

ABBOTT LAURINBURG Ground Water Sampling Form

Consultant Company: Phoenix Environmental
 Project: Fuel Oil Wells - 4.08 Sampling Round
 Facility: Abbott Laboratories Laurinburg

Location: Laurinburg, NC
 Date: 4/16/2008
 Sampler(s): TG & LM

Sample Information

Sample ID: FR-6D

MNA8FR6D & MNA8FR6DFD

Screen/Depth: 12.5' - 17.5'

Collection Date: 4/16/2008

Collection Time(24:00): 1113

FD @ 1115

QA/QC Sample Collected: YES / NO

Type: Field Duplicate QA/QC ID: FR6DFD

Sampling Data

Sample collection based on: Purge Volume Parameter Stabilization other: _____

Sampling Method: Low Flow

Field Parameters

Time	Purge Volume (gallons)	Stabilization			Other Parameters		
		pH (pH units)	Conductivity (µmhos/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Temp (Cent)
1050		4.76	0.046	45.2	7.12	291	16.4
1104		4.70	0.046	33.8	5.88	286	16.3
1107		4.75	0.046	29.7	5.26	287	16.3
1110		4.75	0.047	28.5	5.19	280	16.3
1113		4.75	0.047	28.0	5.19	280	16.3

Purge Volume Calculations

Total Well Depth: 17.5 ft
 Water Level: 6.01 ft
 Water Column = 11.49 ft
 Gallons per ft: x 0.163 gal
 Well Volume = 1.87 gal

Well Volumes

To be Removed: 1 x 1.87 = 1.87 gallons to be purged prior to sampling 7.09 LITERS

Well Casing Volumes (gallons per foot)		
1.0" = 0.041	2.0" = 0.163	3.0" = 0.367
1.5" = 0.092	2.5" = 0.255	4" = 0.653

Stabilization Requirements:	
pH:	± 0.1 unit
Conductivity:	± 5%
Turbidity:	± 10%

Remarks: Total Run Time = 14-MIN @ 0.5-L / MIN

Redi-flo pump used

Sample Description

Sample Color: _____
 Odor: _____

Sheen: _____
 NAPL present: _____

Comments: _____

ABBOTT LAURINBURG Ground Water Sampling Form

Consultant Company: Phoenix Environmental
 Project: Fuel Oil Wells - 4.08 Sampling Round
 Facility: Abbott Laboratories Laurinburg

Location: Laurinburg, NC
 Date: 4/16/2008
 Sampler(s): TG & LM

Sample Information

Sample ID: FR-7D MNA8FR7D

Screen/Depth: 29' - 35' Collection Date: 4/16/2008 Collection Time(24:00): 1025

QA/QC Sample Collected: YES NO Type: _____ QA/QC ID: _____

Sampling Data

Sample collection based on: Purge Volume Parameter Stabilization other: _____

Sampling Method: _____ Low Flow

Field Parameters

Time	Purge Volume (gallons)	Stabilization			Other Parameters		
		pH (pH units)	Conductivity (umhos/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Temp (Cent)
1015		4.42	0.049	42.5	11.01	230	20.1
1016		4.03	0.044	23.3	9.81	311	20.3
1019		4.27	0.043	21.7	9.56	314	20.3
1022		4.26	0.043	21.8	9.56	314	20.3
1025		4.26	0.044	21.4	9.54	315	20.3

Purge Volume Calculations

Total Well Depth 35 ft
 Water Level: 29.22 ft
 Water Column = 5.78 ft
 Gallons per ft: x 0.0102 gal
 Well Volume = 0.06 gal

Well Volumes

To be Removed: 1 x 0.06 = 0.06 gallons to be purged prior to sampling 0.22 LITERS

Well Casing Volumes (gallons per foot)

1.0" = 0.041 2.0" = 0.163 3.0" = 0.367
 1.5" = 0.092 2.5" = 0.255 4" = 0.653

Stabilization Requirements:

pH: ± 0.1 unit
 Conductivity: $\pm 5\%$
 Turbidity: $\pm 10\%$

Remarks: Total Run Time = 1-MIN @ 0.5-L / MIN

Peristaltic pump used due to well diameter

Sample Description

Sample Color: _____ Sheen: _____
 Odor: _____ NAPL present: _____

Comments: _____

ABBOTT LAURINBURG Ground Water Sampling Form

Consultant Company: Phoenix Environmental
 Project: Fuel Oil Wells - 4.08 Sampling Round
 Facility: Abbott Laboratories Laurinburg

Location Laurinburg, NC
 Date 4/16/2008
 Sampler(s) TG & LM

Sample Information

Sample ID: FR-8D MNA8FR8D
 Screen/Depth: 29' - 35' Collection Date: 4/16/2008 Collection Time(24:00): 1032

QA/QC Sample Collected: YES NO Type: _____ QA/QC ID: _____

Sampling Data

Sample collection based on: Purge Volume Parameter Stabilization other: _____
 Sampling Method: Low Flow

Field Parameters

Time	Purge Volume (gallons)	Stabilization			Other Parameters		
		pH (pH units)	Conductivity (µmhos/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Temp (Cent)
1022		4.52	0.042	174.0	8.59	315	16.2
1023		4.43	0.041	220.0	7.69	315	16.2
1026		4.41	0.041	207.0	7.51	315	16.2
1029		4.40	0.041	208.0	7.45	315	16.2
1032		4.40	0.041	208.0	7.45	315	16.2

Purge Volume Calculations
 Total Well Depth 35 ft
 Water Level: 32.77 ft
 Water Column = 2.23 ft
 Gallons per ft: x 0.0102 gal
 Well Volume = 0.02 gal

Well Volumes
 To be Removed: 1 x 0.02 = 0.02 gallons to be purged prior to sampling 0.09 LITERS

Well Casing Volumes (gallons per foot)

1.0" = 0.041	2.0" = 0.163	3.0" = 0.367
1.5" = 0.092	2.5" = 0.255	4" = 0.653

Stabilization Requirements:

pH: ± 0.1 unit
Conductivity: ± 5%
Turbidity: ± 10%

Remarks: Total Run Time = 1-MIN @ 0.5-L / MIN
Peristaltic pump used due to well diameter

Sample Description

Sample Color: _____ Sheen: _____
 Odor: _____ NAPL present: _____
 Comments: _____

ABBOTT LAURINBURG Ground Water Sampling Form

Consultant Company: Phoenix Environmental
 Project: Fuel Oil Wells - 4.08 Sampling Round
 Facility: Abbott Laboratories Laurinburg

Location Laurinburg, NC
 Date 4/16/2008
 Sampler(s) LM

Sample Information

Sample ID: FR-2

Screen/Depth: 3' - 8' Collection Date: 4/16/2008 Collection Time(24:00):

QA/QC Sample Collected: YES NO Type: QA/QC ID:

Sampling Data

Sample collection based on: Purge Volume Parameter Stabilization other:

Sampling Method: Low Flow

Field Parameters

Time	Purge Volume (gallons)	Stabilization			Other Parameters		
		pH (pH units)	Conductivity (umhos/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Temp (Cent)
0000		5.07	0.078	82.3	10.82	82	18.5
0007		5.36	0.080	57.9	7.91	78	18.5
0010		5.43	0.079	35.9	7.36	75	18.7
0013		5.47	0.076	34.7	7.25	74	18.7
0016		5.47	0.074	34.5	7.32	74	18.7

Purge Volume Calculations

Total Well Depth 8 ft
 Water Level: 2.05 ft
 Water Column = 5.95 ft
 Gallons per ft: x 0.163 gal
 Well Volume = 0.97 gal

Well Volumes

To be Removed: 1 x 0.97 = 0.97 gallons to be purged prior to sampling 3.67 LITERS

Well Casing Volumes (gallons per foot)		
1.0" = 0.041	2.0" = 0.163	3.0" = 0.367
1.5" = 0.092	2.5" = 0.255	4" = 0.653

Stabilization Requirements:	
pH:	± 0.1 unit
Conductivity:	± 5%
Turbidity:	± 10%

Remarks: Total Run Time = 7-MIN @ 0.5-L / MIN
Peristaltic pump used due to length of water column

Sample Description

Sample Color: Sheen:
 Odor: NAPL present:
 Comments:

ABBOTT LAURINBURG Ground Water Sampling Form

Consultant Company: Phoenix Environmental
 Project: Fuel Oil Wells - 4.08 Sampling Round
 Facility: Abbott Laboratories Laurinburg

Location Laurinburg, NC
 Date 4/16/2008
 Sampler(s) LM

Sample Information

Sample ID: FR-4

Screen/Depth: 3' - 8'

Collection Date: 4/16/2008

Collection Time(24:00):

QA/QC Sample Collected: YES NO

Type: _____

QA/QC ID: _____

Sampling Data

Sample collection based on: Purge Volume **Parameter Stabilization** other: _____

Sampling Method: _____ Low Flow

Field Parameters

Time	Purge Volume (gallons)	Stabilization			Other Parameters		
		pH (pH units)	Conductivity (µmhos/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Temp (Cent)
0000		4.76	0.033	29.7	7.92	47	14.6
0006		4.61	0.030	27.8	9.10	63	14.6
0009		4.48	0.029	25.9	9.47	75	14.6
0012		4.35	0.028	26.9	9.40	78	14.5
0015		4.27	0.028	25.1	8.99	87	14.5

Purge Volume Calculations

Total Well Depth: 8 ft
 Water Level: 5.78 ft
 Water Column = 2.22 ft
 Gallons per ft: x 0.163 gal
 Well Volume = 0.36 gal

Well Volumes
 To be Removed: 1 x 0.36 = 0.36 gallons to be purged prior to sampling 1.37 LITERS

Well Casing Volumes (gallons per foot)		
1.0" = 0.041	2.0" = 0.163	3.0" = 0.367
1.5" = 0.092	2.5" = 0.255	4" = 0.653

Stabilization Requirements:	
pH:	± 0.1 unit
Conductivity:	± 5%
Turbidity:	± 10%

Remarks: Total Run Time = 3-MIN @ 0.5-L / MIN
Peristaltic pump used due to length of water column

Sample Description

Sample Color: _____ Sheen: _____
 Odor: _____ NAPL present: _____

Comments: _____

ABBOTT LAURINBURG Ground Water Sampling Form

Consultant Company: Phoenix Environmental
 Project: Fuel Oil Wells - 4.08 Sampling Round
 Facility: Abbott Laboratories Laurinburg

Location Laurinburg, NC
 Date 4/16/2008
 Sampler(s) LM

Sample Information

Sample ID: FR-5

Screen/Depth: 3' - 8'

Collection Date: 4/16/2008

Collection Time(24:00): _____

QA/QC Sample Collected: YES NO

Type: _____

QA/QC ID: _____

Sampling Data

Sample collection based on: Purge Volume Parameter Stabilization other: _____

Sampling Method: _____ Low Flow

Field Parameters

Time	Purge Volume (gallons)	Stabilization			Other Parameters		
		pH (pH units)	Conductivity (µmhos/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Temp (Cent)
0000		5.49	0.087	96.3	5.56	18	15.0
0007		5.37	0.084	77.3	3.00	18	14.9
0010		5.36	0.083	81.7	2.29	20	14.9
0013		5.33	0.080	80.0	2.23	20	14.9
0016		5.31	0.080	77.8	2.21	21	15.0

Purge Volume Calculations

Total Well Depth: 8 ft
 Water Level: 5.59 ft
 Water Column = 5.75 ft
 Gallons per ft: x 0.163 gal
 Well Volume = 0.94 gal

Well Volumes

To be Removed: 1 x 0.94 = 0.94 gallons to be purged prior to sampling 3.55 LITERS

Well Casing Volumes (gallons per foot)		
1.0" = 0.041	2.0" = 0.163	3.0" = 0.367
1.5" = 0.092	2.5" = 0.255	4" = 0.653

Stabilization Requirements:	
pH:	± 0.1 unit
Conductivity:	± 5%
Turbidity:	± 10%

Remarks: Total Run Time = 7-MIN @ 0.5-L / MIN
Peristaltic pump used due to length of water column

Sample Description

Sample Color: _____

Sheen: _____

Odor: _____

NAPL present: _____

Comments: _____

ABBOTT LAURINBURG Ground Water Sampling Form

Consultant Company: Phoenix Environmental
 Project: Fuel Oil Wells - 4.08 Sampling Round
 Facility: Abbott Laboratories Laurinburg

Location: Laurinburg, NC
 Date: 4/16/2008
 Sampler(s): LM

Sample Information

Sample ID: FR-9D
 Screen/Depth: 29' - 35' Collection Date: 4/16/2008 Collection Time(24:00):

QA/QC Sample Collected: YES NO Type: QA/QC ID:

Sampling Data

Sample collection based on: Purge Volume Parameter Stabilization other:

Sampling Method: Low Flow

Field Parameters

Time	Purge Volume (gallons)	Stabilization			Other Parameters		
		pH (pH units)	Conductivity (µmhos/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Temp (Cent)
0000		5.57	0.001	156.0	11.25	15	17.7
0001		5.57	0.001	156.0	11.14	16	17.7
0004		5.56	0.001	157.0	10.89	15	17.7
0007		5.47	0.001	156.0	10.88	16	17.7
0010		5.47	0.001	157.0	10.87	17	17.7

Purge Volume Calculations

Total Well Depth 35 ft
 Water Level: 32.65 ft
 Water Column = 2.35 ft
 Gallons per ft: x 0.0102 gal
 Well Volume = 0.02 gal

Well Volumes

To be Removed: 1 x 0.02 = 0.02 gallons to be purged prior to sampling 0.09 LITERS

Well Casing Volumes (gallons per foot)		
1.0" = 0.041	2.0" = 0.163	3.0" = 0.367
1.5" = 0.092	2.5" = 0.255	4" = 0.653

Stabilization Requirements:	
pH:	± 0.1 unit
Conductivity:	± 5%
Turbidity:	± 10%

Remarks: Total Run Time = 1-MIN @ 0.5-L / MIN
Peristaltic pump used due to the diameter of well

Sample Description

Sample Color: Sheen:
 Odor: NAPL present:
 Comments:

ABBOTT LAURINBURG Ground Water Sampling Form

Consultant Company: Phoenix Environmental
 Project: 4.08 Sampling Round
 Facility: Abbott Laboratories Laurinburg

Location Laurinburg, NC
 Date 4/16/2008
 Sampler(s) TG & LM

Sample Information

Sample ID: MW-20B

ALL2MW20B11

Screen/Depth: 17' - 27'

Collection Date: 4/16/2008

Collection Time(24:00): 828

QA/QC Sample Collected: YES NO

Type: _____

QA/QC ID: _____

Sampling Data

Sample collection based on: Purge Volume Parameter Stabilization other: _____

Sampling Method: _____ Low Flow

Field Parameters

Time	Purge Volume (gallons)	Stabilization			Other Parameters		
		pH (pH units)	Conductivity (umhos/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Temp (Cent)
750		4.52	0.062	40.3	6.61	271	18.2
819		4.08	0.062	27.0	4.23	293	18.8
822		4.08	0.062	28.7	4.15	294	18.7
825		4.10	0.062	29.2	4.06	293	19.0
828		4.11	0.062	30.0	4.01	297	19.1

Purge Volume Calculations

Total Well Depth: 27 ft
 Water Level: 3.8 ft
 Water Column = 23.2 ft
 Gallons per ft: x 0.163 gal
 Well Volume = 3.78 gal

Well Volumes
 To be Removed: 1 x 3.78 = 3.78 gallons to be purged prior to sampling 14.31 LITERS

Well Casing Volumes (gallons per foot)		
1.0" = 0.041	2.0" = 0.163	3.0" = 0.367
1.5" = 0.092	2.5" = 0.255	4" = 0.653

Stabilization Requirements:	
pH:	± 0.1 unit
Conductivity:	± 5%
Turbidity:	± 10%

Remarks: Total Run Time = 29-MIN @ 0.5-L / MIN
Redi-flo pump used

Sample Description

Sample Color: _____ Sheen: _____
 Odor: _____ NAPL present: _____
 Comments: _____



Global Environmental, Health and Safety Laboratory

CURTIS MICHOLS
 Company Name: ABBOTT
 Sampling Division: 0539 Environmental Services
 Sampling Site: OTHER
 Sampling Dept.:



Report Date: 25-Apr-08
 Lab Project Number: 301108
 Sample Group Number: E301431

Enclosed is the analytical report for the following samples submitted to Abbott Global Environmental, Health and Safety Laboratories of North Chicago for analysis.

Project Description: Laurinburg

Field Sample No.	Sample Description	Date/Time Taken	Date/Time Received
310110	Trip Blank	24-Mar-08 9:00 AM	18-Apr-08 8:40 AM
310111	Field Blank	16-Apr-08 9:45 AM	18-Apr-08 8:40 AM
310112	MNA8FR1	16-Apr-08 10:16 AM	18-Apr-08 8:40 AM
310113	MNA8FR7D	16-Apr-08 10:25 AM	18-Apr-08 8:40 AM
310114	MNA8FR8D	16-Apr-08 10:32 AM	18-Apr-08 8:40 AM
310115	MNA8FR3	16-Apr-08 10:51 AM	18-Apr-08 8:40 AM
310116	MNA8FR3D	16-Apr-08 11:00 AM	18-Apr-08 8:40 AM
310117	MNA8FR6D	16-Apr-08 11:13 AM	18-Apr-08 8:40 AM
310118	MNA8FR6DMS	16-Apr-08 11:13 AM	18-Apr-08 8:40 AM
310119	MNA8FR6DMSD	16-Apr-08 11:13 AM	18-Apr-08 8:40 AM
310120	MNA8FR6DFD	16-Apr-08 11:15 AM	18-Apr-08 8:40 AM
310121	MNA8FR6	16-Apr-08 11:28 AM	18-Apr-08 8:40 AM

Case Narrative

Sample Receipt - Samples were received on ice at a temperature of 0.1 degrees celsius.

Sample Analysis in support of the project referenced above has been completed and results are presented on the following pages. These results apply only to the samples analyzed. Reproduction of this report only in whole is permitted. Procedures used follow Abbott Laboratories Standard Operating Procedures which reference the methods listed in your report.



Global Environmental, Health and Safety Laboratory

Page 2 of 5

CURTIS MICHOLS
Company Name: ABBOTT
Sampling Division: 0539 Environmental Services
Sampling Site: OTHER
Sampling Dept.:



Report Date: 25-Apr-08
Lab Project Number: 301108
Sample Group Number: E301431

Approved by:
BRIAN WANNER
MANAGER II
Date: 25-Apr-08

Abbott
200 Abbott Park Rd. D-051H, AP52
Abbott Park, IL 60064
Phone: (847) 935-6337

Environmental Lab Report



Global Environmental, Health and Safety Laboratory

CURTIS MICHOLS
 Company Name: ABBOTT
 Sampling Division: 0539 Environmental Services
 Sampling Site: OTHER
 Sampling Dept.:



Report Date: 25-Apr-08
 Lab Project Number: 301108
 Sample Group Number: E301431

Field Sample No.	Sample Description	Parameter	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Additional Info
310112	MNA8FR1	BENZENE	< 0.001		MG/L	0.001	21-Apr-08	BW	
		4-BROMOFLUOROBENZENE (SURR)	93		%	86-115	21-Apr-08	BW	
		DIBROMOFLUOROMETHANE (SURR)	100		%	86-118	21-Apr-08	BW	
		TOLUENE-D8 (SURR)	99		%	88-110	21-Apr-08	BW	
Method: EPA 8260B									
310115	MNA8FR3	BENZENE	< 0.001		MG/L	0.001	21-Apr-08	BW	
		4-BROMOFLUOROBENZENE (SURR)	96		%	86-115	21-Apr-08	BW	
		DIBROMOFLUOROMETHANE (SURR)	99		%	86-118	21-Apr-08	BW	
		TOLUENE-D8 (SURR)	97		%	88-110	21-Apr-08	BW	
Method: EPA 8260B									
310121	MNA8FR6	BENZENE	0.054		MG/L	0.001	21-Apr-08	BW	
		4-BROMOFLUOROBENZENE (SURR)	108		%	86-115	21-Apr-08	BW	
		DIBROMOFLUOROMETHANE (SURR)	98		%	86-118	21-Apr-08	BW	
		TOLUENE-D8 (SURR)	101		%	88-110	21-Apr-08	BW	
Method: EPA 8260B									
310116	MNA8FR3D	BENZENE	0.0018		MG/L	0.001	21-Apr-08	BW	
		4-BROMOFLUOROBENZENE (SURR)	96		%	86-115	21-Apr-08	BW	
		DIBROMOFLUOROMETHANE (SURR)	98		%	86-118	21-Apr-08	BW	
		TOLUENE-D8 (SURR)	96		%	88-110	21-Apr-08	BW	
Method: EPA 8260B									
310117	MNA8FR6D	BENZENE	< 0.001		MG/L	0.001	22-Apr-08	BW	

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Global Environmental, Health and Safety Laboratory

CURTIS MICHOLS
Company Name: ABBOTT
Sampling Division: 0539 Environmental Services
Sampling Site: OTHER
Sampling Dept.:



Report Date: 25-Apr-08
Lab Project Number: 301108
Sample Group Number: E301431

Field Sample No.	Sample Description	Parameter	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Additional Info
310117	MNA8FR6D	4-BROMOFLUOROBENZENE (SURR)	97		%	86-115	22-Apr-08	BW	
		DIBROMOFLUOROMETHANE (SURR)	99		%	86-118	22-Apr-08	BW	
		TOLUENE-D8 (SURR)	99		%	88-110	22-Apr-08	BW	
Method: EPA 8260B									
310120	MNA8FR6DFD	BENZENE	< 0.001		MG/L	0.001	22-Apr-08	BW	
		4-BROMOFLUOROBENZENE (SURR)	98		%	86-115	22-Apr-08	BW	
		DIBROMOFLUOROMETHANE (SURR)	98		%	86-118	22-Apr-08	BW	
		TOLUENE-D8 (SURR)	98		%	88-110	22-Apr-08	BW	
Method: EPA 8260B									
310113	MNA8FR7D	BENZENE	< 0.001		MG/L	0.001	21-Apr-08	BW	
		4-BROMOFLUOROBENZENE (SURR)	94		%	86-115	21-Apr-08	BW	
		DIBROMOFLUOROMETHANE (SURR)	101		%	86-118	21-Apr-08	BW	
		TOLUENE-D8 (SURR)	97		%	88-110	21-Apr-08	BW	
Method: EPA 8260B									
310114	MNA8FR8D	BENZENE	< 0.001		MG/L	0.001	21-Apr-08	BW	
		4-BROMOFLUOROBENZENE (SURR)	95		%	86-115	21-Apr-08	BW	
		DIBROMOFLUOROMETHANE (SURR)	100		%	86-118	21-Apr-08	BW	
		TOLUENE-D8 (SURR)	99		%	88-110	21-Apr-08	BW	
Method: EPA 8260B									
310111	Field Blank	BENZENE	< 0.001		MG/L	0.001	21-Apr-08	BW	
		4-BROMOFLUOROBENZENE (SURR)	94		%	86-115	21-Apr-08	BW	

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Global Environmental, Health and Safety Laboratory

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Company Name: ABBOTT
Sampling Division: 0539 Environmental Services
Sampling Site: OTHER
Sampling Dept.:



Report Date: 25-Apr-08
Lab Project Number: 301108
Sample Group Number: E301431

Field Sample No.	Sample Description	Parameter	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Additional Info
310111	Field Blank	DIBROMOFLUOROMETHANE (SURR)	102		%	86-118	21-Apr-08	BW	
		TOLUENE-D8 (SURR)	97		%	88-110	21-Apr-08	BW	
Method: EPA 8260B									
310110	Trip Blank	BENZENE	< 0.001		MG/L	0.001	21-Apr-08	BW	
		4-BROMOFLUOROBENZENE (SURR)	93		%	86-115	21-Apr-08	BW	
		DIBROMOFLUOROMETHANE (SURR)	101		%	86-118	21-Apr-08	BW	
		TOLUENE-D8 (SURR)	97		%	88-110	21-Apr-08	BW	
Method: EPA 8260B									
310118	MNA8FR6DMS	BENZENE	95		%	0.001	22-Apr-08	BW	
		4-BROMOFLUOROBENZENE (SURR)	102		%	86-115	22-Apr-08	BW	
		DIBROMOFLUOROMETHANE (SURR)	97		%	86-118	22-Apr-08	BW	
		TOLUENE-D8 (SURR)	99		%	88-110	22-Apr-08	BW	
Method: EPA 8260B									
310119	MNA8FR6DMSD	BENZENE	96		%	0.001	22-Apr-08	BW	
		4-BROMOFLUOROBENZENE (SURR)	102		%	86-115	22-Apr-08	BW	
		DIBROMOFLUOROMETHANE (SURR)	99		%	86-118	22-Apr-08	BW	
		TOLUENE-D8 (SURR)	100		%	88-110	22-Apr-08	BW	
Method: EPA 8260B									

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