STATE FILE

PHOENIX ENVIRONMENTAL
ASSOCIATES, INCORPORATED

Abbott

Former Abbott Facility
Laurinburg, North Carolina

FEB 21 2006

3rd and 4th QUARTERS 2005 PROGRESS REPORT
Solvent Release Remediation
Case# NO NCD 000 0040

February 2006

Prepared by:

Phoenix Environmental Associates, Inc.
530 Audubon Place
Highland Park, Illinois 60035

INTRODUCTION

This *3rd and 4th Quarters 2005 Progress Report* for the former Abbott facility located in Laurinburg, North Carolina, is submitted to the North Carolina Department of Environment and Natural Resources Inactive Hazardous Site Branch (NCDENR) in accordance with the Administrative Order on Consent (AOC) between Abbott and the State of North Carolina, effective 16 April 1991. The following field activities were performed during this reporting period and are described in this progress report:

- December 2005 Phase II *in situ* bioremediation groundwater performance monitoring.
- South Groundwater Interceptor/Remediation System Operation and Maintenance (O&M).
- September 2005 semi-annual Southern Boundary Capture Zone groundwater monitoring.
- December 2005 well abandonments.

This progress report is being submitted, on behalf of Abbott, by Phoenix Environmental Associates, Inc. (Phoenix) of Highland Park Illinois, a North Carolina licensed engineering corporation. The following two North Carolina licensed engineering companies provided technical and field support of the reported activities: Excel Environmental Associates (Excel), PLLC of Gastonia, North Carolina and Wampler Engineering (Wampler) of Laurinburg, North Carolina. Severn Trent Laboratories of Chicago, Illinois (STL-Chicago) (a North Carolina-certified analytical laboratory) provided the laboratory analytical services.

Unless otherwise noted, these activities were performed in accordance with the *Remedial Action Plan Amendment* (Matrix 2002, the *RAP Amendment*) that was approved by the NCDENR on 15 October 2002; the *Phase II In situ Bioremediation Preconstruction Letter Report* (Matrix SE 2004, the *Phase II Preconstruction Report*) that was approved by the NCDENR on 1 March 2004; and the *Well Abandonment Letter Request* (Phoenix 2005) that was approved by the NCDENR on 22 November 2005.

This progress report is organized into the following four sections:

Section 1.0 – Phase II *In Situ* Bioremediation Groundwater Performance Monitoring
Section 2.0 – South Groundwater Interceptor/Remediation System O&M
Section 3.0 – Semi-Annual Southern Boundary Capture Zone Groundwater Monitoring
Section 4.0 - Well Abandonments

The site location is shown in Figure E-1. Information on the site history, nature and extent of contamination, and prior remediation efforts are available in the *RAP Amendment* and previously submitted progress reports.

SECTION 1

PHASE II *IN SITU* BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING

1.1 INTRODUCTION

This section presents the field activities performed and analytical data obtained from the December 2005 Phase II *in situ* bioremediation groundwater performance monitoring event. Groundwater monitoring is being performed to track the progress and performance of the *in situ* bioremediation. These activities were performed following the procedures presented in Section 5 of the *Phase II Preconstruction Report*.

The amended remedial action approved by the NCDENR to address groundwater impacted by the disposal of solvents in a former onsite evaporation pit is *in situ* bioremediation using Hydrogen Release Compounds® (HRC) combined with downgradient plume containment and treatment. The HRC technology enhances the direct reductive dechlorination of chlorinated volatile organic compounds (VOCs), such as trichloroethene (TCE), which is the primary contaminant of concern at the Site. A total of 39,600 pounds (lbs) of HRC were injected into 133 borings in November 2002 under Phase I of the *in situ* bioremediation. The Phase II application of 31,290 lbs of Hydrogen Release Compound – Extended Release™ (HRC-X) into 123 injection borings was completed during May and June 2004. The Phase II injection locations are shown in Figure 1-1. The most heavily TCE-impacted portion of the Site is located north of the MW-102 well cluster.

The Phase II *in situ* bioremediation groundwater monitoring well network consists of the 13 MW-100 series wells shown in Figure 1-2. Well construction details for the MW-100 series monitoring wells are presented in Table 1-1.

The December 2005 groundwater performance monitoring event was performed on 19 and 20 December. All 13 MW-100 series wells were sampled during this groundwater monitoring event.

1.2 FIELD PROCEDURES

At each of the monitoring wells, the static water level was measured prior to groundwater 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. The submersible pump was placed at mid-screen depth and operated with a target flow rate of 0.5 liters per minute (L/min). The peristaltic pump tubing was placed at mid-screen depth and operated to achieve a target flow rate of 0.5 L/min. 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 U7 multi-parameter water quality meter, YSI 95 dissolved oxygen meter, Hanna HI 8733 conductivity meter and Hach 50230 OPR meter with flow thru cell were 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

The December 2005 well purging and field parameter data are presented in Table 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 analysis of the following parameters:

- volatile organic compounds (VOCs)
- total organic carbon (TOC)

In addition, a methane/ethane/ethene groundwater sample volume was collected at six locations (MW-100B; MW-101A; MW-101B; MW-102B; MW-103B; and MW-104B) to monitor for biodegradation endproducts.

The groundwater sample volumes were collected in the order presented and into the sample containers specified in Table 1-3.

The groundwater samples were sent to STL- Chicago for laboratory analysis by the analytical methods specified in Table 1-3. Tentatively identified compounds (TICs) analyses were included as part of the VOC analyses for groundwater samples collected from monitoring wells MW-100A; MW-100B; MW-101A; and MW-101B. The methane/ethane/ethene groundwater samples were transferred from STL-Chicago to STL of Austin, Texas for analysis.

Field duplicate groundwater samples were collected from monitoring wells MW-101B and MW-104B. One laboratory QC groundwater sample was collected from monitoring well MW-101B.

The Redi Flo2 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 managed and disposed of by discharging into, and treating through, the south groundwater treatment system.

1.3 RESULTS

The December 2005 Phase II *in situ* bioremediation groundwater performance monitoring event field and analytical results are presented in the following subsections.

1.3.1 Field Data

The December 2005 static water level data are presented in Table 1-4; groundwater contour maps were not prepared for this sampling event since site-wide water elevation data were not collected.

The field-measured Oxidation/Reduction Potential (ORP) value for each monitoring well purged was calculated based on the average of the final three ORP measurements, which represents stabilized groundwater conditions. A summary of the Phases I and II *in situ* bioremediation groundwater performance monitoring ORP data are presented in Table 1-5. Observed December 2005 ORP values in the MW 100 series wells ranged from –88 millivolts (MW-102C) to 213 millivolts (MW-104B).

1.3.2 Analytical Data

The VOC groundwater analytical results for the December 2005 *in situ* bioremediation groundwater performance monitoring event are presented in Table 1-6. The following 12 compounds were detected in at least one monitoring well groundwater sample: Dichlorodifluoromethane; Vinyl chloride; Trichlorotrifluoroethane (Freon 113); 1,1-Dichloroethene; Methylene chloride; *trans*-1,2-Dichloroethene; Methyl-tert-butyl-ether (MBTE); *cis*-1,2-Dichloroethene (*cis*-1,2-DCE); 2-Butanone (MEK); 1,1,1-Trichoroethane; TCE; and Toluene. The maximum value of TCE detected in the groundwater in December 2005 was 91,000 micrograms per liter (µg/L) at monitoring well MW-101A. The maximum value of *cis*-1,2-DCE detected in the groundwater in December 2005 was 77,000 µg/L at monitoring well MW-100A. One TIC, heptane, was detected at one monitoring well location (1,300 µg/L at monitoring well MW-101A).

The aquifer bioremediation indicator (ABI) parameter analytical results for the December 2005 *in situ* bioremediation groundwater performance monitoring event are presented in Table 1-7. The maximum value of TOC detected in the groundwater in December 2005 was 400 milligrams

per liter (mg/L) at monitoring well MW-100A. The maximum value of ethene detected in the groundwater during this sampling event was 130 μg/L at monitoring well MW-100B.

The laboratory analytical reports for the data are presented in Appendix. B.

The cumulative Phases I and II *in situ* bioremediation groundwater performance monitoring groundwater data are presented in Appendix C.

1.4 DATA EVALUATION

The field measurements and analytical results from the December 2005 groundwater monitoring event were compared to the data obtained during the previous Phases I and II *in situ* bioremediation groundwater performance monitoring events, which were performed between October 2002 and June 2005, to evaluate the progress of the enhanced *in situ* biodegradation of the chlorinated VOCs. Evidence of contaminant mass destruction is presented in subsection 1.4.3 below in fulfillment of the NCDENR requirement to provide an annual evaluation of the effectiveness of the remediation effort (4 March 2003 correspondence from K. Caulk, NCDENR, to C. Michols, Abbott).

Overall, the *in situ* bioremediation groundwater performance monitoring data collected to date demonstrate that the remediation is proceeding effectively. Aquifer redox conditions and the availability of organic acids to fuel the reductive dechlorination reactions remain favorable. Approximately 82% of the TCE contaminant mass in the most heavily impacted portions of the groundwater plume has been destroyed. In addition, the molar concentration data demonstrate that TCE is being completely degraded to ethene via the *in situ* bioremediation processes.

Details of the data evaluations are presented in the subsections below.

1.4.1 Redox Conditions

ORP data track if conditions within the aquifer are favorable to reductive dechlorination processes. Oxidation-reduction reactions in groundwater that contains organic compounds are

generally biologically mediated. The ORP depends on and influences biodegradation processes. To evaluate the ORP data, as presented in Table 1-5, the MW-100 series monitoring well data were grouped by depth within in the aquifer (shallow [20 feet bgs to 30 feet bgs], medium [35 feet bgs to 45 feet bgs], deep [55 feet bgs to 65 feet bgs]) and then an average ORP value at each depth interval was computed for each monitoring event. The MW-104 wells were not included in the calculation of the average depth ORP values since these wells are located significantly downgradient of the active treatment area and are not anticipated to be influenced directly by the treatment substrate application. These average depth ORP values are useful indicators of overall ORP response trends within the *in situ* bioremediation treatment area and are presented graphically for the period October 2002 through December 2005 in Figure 1-3.

As shown in Figure 1-3, the average December 2005 ORP values at each depth of the treated portion of the aquifer are negative values. These data indicate that the Phase II HRC-X treated portion of the aquifer is sustaining conditions conducive for anaerobic reductive dechlorination processes.

1.4.2 Availability of Organic Acids

TOC analysis is a surrogate method for tracking the availability of the organic acids that provide the food source for the *in situ* reductive dechlorination reactions. Following substrate application, TOC concentrations in the groundwater are expected to increase in areas influenced by the substrate application. The TOC concentration trends observed in the monitoring wells located in the primary treatment area (defined as monitoring well clusters MW-100; MW-101; and MW-102) are presented in Figure 1-4. In the MW-100 and MW-101 well clusters, the TOC concentrations remain above the pre-injection conditions, which indicate that the levels of organic acids remain increased and are favorable for reductive dechlorination to occur.

No significant changes in the baseline TOC levels have been observed in the more downgradient MW-103 and MW-104 well clusters, as shown in Figure 1-5. These results are consistent with these well clusters being located at greater distances from the Phase II injection locations.

1.4.3 Evidence of Trichloroethene Biodegradation

This subsection presents lines of evidence that TCE biodegradation has occurred in the *in situ* bioremediation treatment area. The following two evaluations were performed:

- Reduction of total TCE mass present in the most heavily impacted portion of the plume
- TCE and daughter compound molar concentrations trends

1.4.3.1 Total TCE Mass Reductions

The TCE groundwater concentrations observed during the Phases I and II *in situ* bioremediation groundwater performance monitoring events were interpolated along a two-dimensional cross-section of the groundwater plume using a krigging program (Surfer). The location of cross-section A-A' is shown in Figure 1-6. The interpolated TCE groundwater concentrations along cross-section A-A' for October 2002 and December 2005 are shown in Figure 1-7. This figure qualitatively illustrates that the TCE groundwater contaminant mass has reduced significantly over the 37-month *in situ* bioremediation treatment period.

The changes in total TCE mass were evaluated in the most heavily impacted portions of the plume (the "primary plume area"), which is defined as a 30-foot wide area beginning at the northern edge of the former source area and extending approximately 215 feet southward to the MW-102 well cluster. The total TCE mass present in the primary plume area is the sum of both the dissolved and sorbed TCE mass. Using the TCE concentration contours presented in Figure 1-7, the pre-remediation total TCE mass and December 2005 total TCE mass in the primary plume area were calculated. The formulae used to calculate the dissolved and sorbed TCE mass and the TCE mass calculations for these two time intervals are presented in the Table 1-8 notes. In addition, calculations of the estimated total TCE mass in the primary plume area at approximately six month intervals throughout the *in situ* bioremediation period are presented in Table 1-9. The percentage of total TCE mass remaining in the primary plume area over time is presented graphically in Figure 1-8.

The total TCE mass present in the primary treatment area has been reduced by approximately 82% over the 37-month *in situ* bioremediation period, as shown in Table 1-8 and illustrated in Figure 1-8.

The observed decrease in TCE mass in the heavily impacted portions of the plume is attributable to significant contaminant mass destruction via *in situ* bioremediation rather than downgradient contaminant migration. The decrease in observed TCE mass cannot be attributed to migration of the contaminant mass since (1) the observed TCE groundwater concentrations reported in samples collected from the MW-102 well cluster, which represents the downgradient edge of the most heavily impacted portion of the plume, have not increased over the treatment period and (2) the observed TCE groundwater concentrations reported in samples collected from the downgradient MW-103 well cluster remain approximately three orders of magnitude lower than the maximum observed TCE groundwater concentrations reported in the most heavily impacted portion of the plume. Therefore, the observed decrease in TCE mass in the heavily impacted portions of the plume demonstrates that significant contaminant mass is being destroyed by the implemented treatment technology.

Further reduction of the TCE mass also is occurring in the more downgradient portions of the groundwater plume. This is supported by evaluating the seepage velocity of the groundwater and the TCE concentrations observed in the MW102 and MW103 well clusters. The site-specific seepage velocity of the aquifer at depths greater than 25 feet bgs is estimated at 138 feet per year (See *Phase II Preconstruction Report*). The seepage velocity accounts for contaminant transport due to advection and sorption. Based on the site-specific seepage velocity, it is estimated conservatively that the contaminant time of travel between these well clusters is approximately 320 days. (The MW-103 well cluster is located approximately 120 feet downgradient of the MW-102 well cluster.) Therefore, in the absence of enhanced reductive dechlorination reactions, it would be expected that slightly lower TCE concentrations would appear at the MW-103 well cluster within one year of being observed in the MW-102 well cluster. As shown in the cumulative data presented in Appendix C and visually in Figures 1-11 and 1-12, the TCE concentrations in the MW-103 well cluster have remained over time dramatically lower than those observed in the MW-102 well cluster. The observed TCE

concentration differential is far greater than would be expected if only non-degradation attenuation processes are occurring (i.e. dispersion, dilution, sorption, and volatilization). Therefore the data supports concluding that TCE mass reduction via enhanced reductive dechlorination reactions is occurring between the MW-102 and MW-103 well clusters. This conclusion is additionally supported by the dominance of *cis*-1,2-DCE within the MW-103 well cluster since this is a degradation product of TCE.

December 2005 is the halfway point of the projected duration of the Phase II HRC-X application treatment period of 36 months. While there has been a significant decrease in the mass of TCE since the *in situ* bioremediation started, the total mass of TCE in the primary treatment area has decreased comparatively only modestly over the past six months, from an estimated 327 pounds to 320 pounds. To better assess the in situ treatment conditions, the following March 2006 limited sampling effort is recommended to supplement the next scheduled groundwater sampling event in June 2006:

- VOC and TIC analyses of groundwater samples from four monitoring wells (MW-100A; MW-100B; MW-101A; and MW-101B); and
- TOC and metabolic acids analyses of groundwater samples from eight monitoring wells (MW-100A; MW-100B; MW-101A; MW-101B; MW-102B; MW-103B; MW-104B; and MW-104C).

1.4.3.2 TCE and Daughter Compounds Molar Concentrations Trends

The biodegradation of TCE (and its parent compound Tetrachloroethene) proceeds on a one-to-one molar basis from TCE to *cis*-1,2-DCE to vinyl chloride to ethene. The molar concentrations for the groundwater constituents can be calculated from the reported groundwater analytical data by the following formula:

$$\text{Molar concentration } (\mu moles / liter) \equiv \frac{reportedconcentration(\mu grams / liter)}{molecularweight(\mu grams / \mu mole)}$$

The molar concentrations of TCE and its degradation products observed during the Phase I and Phase II *in situ* bioremediation groundwater monitoring events are presented in Table 1-10.

These data are presented graphically for each of the four well cluster in Figures 1-9 through 1-13.

The molar concentration data demonstrate that TCE is being completely degraded to ethene via *in situ* reductive dechlorination reactions by the following two lines of evidence.

- Significant reductions in the total molar concentrations of TCE and its degradation products have occurred within the most heavily impacted portion of the groundwater plume (monitoring well clusters MW-100, MW-101, and MW-102), as shown in Table 1-10 and illustrated in Figures 1-9, 1-10, and 1-11. This means that there is a net loss of TCE and its degradation products in this area.

- Observed ethene groundwater concentrations verify that degradation of *cis*-1,2-DCE to vinyl chloride and then ethene is occurring in both the most heavily impacted and downgradient portions of the solvent plume. The maximum reported molar ethene groundwater concentration (5 micromoles per liter) for the entire treatment period was observed in the groundwater sample from MW-100B collected in December 2005. The observed ethene molar concentration during this sampling event represents less than 1% of the total molar concentration of TCE and its degradation products at this location. Nonetheless, the observed presence of ethene at this location confirms that the complete destruction of TCE is occurring within the most heavily impacted portions of the groundwater plume.

  At downgradient monitoring well MW-103B, ethene comprised approximately 20% and vinyl chloride comprised approximately 4% of the total molar concentration of TCE and its degradation products observed in December 2005. These data demonstrate that a relatively large amount of the TCE present at this location has been completely degraded. The relatively large percentage of ethene observed in the groundwater sample from MW-103B suggests that the degradation from *cis*-1,2-DCE to vinyl chloride occurs more slowly than the degradation from vinyl chloride to ethene.

SECTION 2

SOUTH GROUNDWATER INTERCEPTOR/REMEDIATION SYSTEM O&M

2.1 SUMMARY

This section summarizes the O&M activities and system performance monitoring results for the South Groundwater Interceptor/Remediation System at the facility for the 3rd and 4th Quarters (July through December) 2005. (The North Groundwater Extraction and Treatment System was shutdown on 17 October 2002 and is not currently operating.)

The South Groundwater Interceptor/Remediation System operated smoothly and nearly continuously throughout this reporting period. A total of 1.9 million gallons (MG) of groundwater were extracted and 0.6 pounds of VOCs were removed during the current reporting period.

Section 2.2 of this progress report provides a description of the South Groundwater Interceptor/Remediation System. Section 2.3 summarizes system operation, maintenance, and performance monitoring results. The laboratory analytical reports are presented in Appendix B.

2.2 GROUNDWATER INTERCEPTOR/REMEDIATION SYSTEM DESCRIPTION

The South Groundwater Interceptor/Remediation System was installed in 1993 (and expanded in 1996) to intercept the VOC groundwater plume at the southern property boundary and control downgradient migration of the VOC plume. Figures 2-1 illustrates the location and configuration of the South Groundwater Interceptor/Remediation System.

The South Groundwater Interceptor/Remediation System currently consists of RW-7, a 4-inch diameter groundwater recovery well located along the southern property line, and a groundwater treatment system. RW-7 is approximately 75 feet deep and is screened between 35 feet bgs and 75 feet bgs. A submersible pump is used to extract approximately between seven (7) to ten (10) gallons per minute (gpm) from well RW-7. The pump conveys this flow to a groundwater

treatment system located in a groundwater treatment building near the southeast corner of the main plant building. The south treatment system consists of a bag filter, a low-profile air stripper, and a pH adjustment system. The treated groundwater is then discharged (with approval through letter of pretreatment authorization from the City of Laurinburg) into the Laurinburg publicly owned treatment works (POTW) through a discharge pipe located immediately north of the south groundwater treatment system, as shown in Figure 2-1.

2.3 OPERATION AND MAINTENANCE ACTIVITIES

O&M-related activities for the groundwater remediation system during the current reporting period were performed by Excel and Wampler. Excel provided technical and field support of O&M activities; and Wampler performed weekly inspection and maintenance activities and provided rapid troubleshooting response services.

During this reporting period, the following O&M activities were conducted:

- Routine weekly system maintenance.
- Monthly effluent monitoring and reporting to the City of Laurinburg.
- Performance monitoring.

The groundwater remediation system operated smoothly throughout the current reporting period. Details of the O&M activities performed are summarized in Table 2-1.

A summary of the groundwater extraction volumes for the current reporting period and cumulatively is presented in Table 2-2. For the current reporting period, a total of 1.9 MG of groundwater were extracted from the South Groundwater Interceptor/Remediation System.

The analytical results for the performance monitoring at extraction well RW-7 performed during the current reporting period are summarized in Table 2-3. The five constituents detected in the extraction well samples during the current reporting period, TCE, *cis*-1,2-DCE, Freon 113, Dichlorodifluoromethane, and *trans*-1,2-Dichloroethene, are VOCs present in the groundwater plume. The cumulative VOC performance monitoring data beginning in June 2002, are

presented in Appendix D. These data cover the performance monitoring period immediately prior to both the shutdown of the North Groundwater Extraction and Treatment System and the Phase I HRC® application through the current monitoring period.

The total estimated mass of VOCs removed during the 3rd and 4th Quarters 2005 is tabulated in Table 2-4. The cumulative VOC mass removal is summarized in Table 2-5. In addition, the cumulative quarterly mass removal for the South Groundwater Extraction System beginning in June 2002 is presented in Appendix D.

In sum, 0.6 pounds of VOCs (excluding chlorofluorocarbons) were removed during the current reporting period. Cumulatively, 737.1 pounds of VOCs have been removed by the groundwater extraction and treatment systems, to date.

SECTION 3

SEMI-ANNUAL SOUTHERN CAPTURE ZONE GROUNDWATER MONITORING

3.1 INTRODUCTION

This section presents the field activities performed and analytical data obtained during the September 2005 Southern Capture Zone groundwater monitoring event. In addition, the September 2005 data is compared to the historic semi-annual groundwater sampling data. Semi-annual groundwater sampling was initiated as part of the original *Remedial Action Plan* (approved November 1994), in part, to demonstrate plume capture along the southern property line. Based on changes to the groundwater remediation strategy being implemented as part of the *RAP Amendment*, modifications to the semi-annual groundwater sampling program were authorized by the NCDENR (letter dated 4 March 2003 to C. Michols, Abbott, from K. Caulk, NCDENR). Currently, VOC groundwater sampling is scheduled to be performed at four and ten monitoring wells during the Spring and Fall, respectively.

The purpose of the current Southern Capture Zone Groundwater Monitoring Program is to demonstrate VOC plume capture along the southern property line. Currently 19 monitoring wells are included in this program. A description of these monitoring well locations, their monitoring objectives and sampling frequency is presented in Table 3-1. As detailed below, the September 2005 semi-annual sampling event was, unless otherwise noted, performed according to the field procedures presented in the *Post-Remedial Groundwater Sampling Plan* (Radian, August 1994).

3.2 FIELD PROCEDURES

The September 2005 Southern Capture Zone groundwater sampling event was performed on 13 and 14 September with groundwater samples collected from the following ten monitoring wells: MW-10B; MW-10D; MW-16B; MW-16D; MW-18B; MW-18D; MW-19B; MW-19D; MW-20B; and MW-20D. The location of the wells monitored during this event are shown in Figure 3-1 and well construction details for these monitoring locations are presented in

Table 3-2. Prior to groundwater sampling, the static water level was measured using an electronic water-level meter in the 19 Southern Capture Zone Network monitoring wells and the 13 MW-100 series wells used to monitor the performance of the Phase II *in situ* bioremediation effort. This information was used to determine water elevation levels and to calculate the purge volume for wells scheduled for sampling.

The ten monitoring wells sampled during this event were purged prior to sample collection to ensure that a representative sample was obtained. Dedicated Waterra™ inertial pump systems, consisting of a foot valve and 0.625-inch high density polyethylene (HDPE) tubing, were used to purge the wells. During purging, the pH, specific conductance, and temperature measurements were recorded. Field parameter measurements were obtained using a portable pH meter and a temperature/conductivity meter. Purging continued until three well volumes were removed, the well was purged dry or until the relevant parameters stabilized for at least three consecutive readings. Field parameter readings had to fall within the following limits:

- ±1°C
- ± 5% microsiemens per centimeter (µS/cm) and
- ± 0.1 pH units.

The well purging data are presented in Table 3-3 and the Well Sampling Forms are provided in Appendix A.

After purging was completed, a sample was collected from each well using the dedicated inertial pump system. A ¼-inch VOC sample delivery tube was inserted into the HDPE tubing to minimize volatilization of VOCs from the groundwater sample. The groundwater sample was transferred directly into 40-milliliter volatile organic analysis (VOA) vials. All VOA vials were pre-preserved with hydrochloric acid (HCl). Upon sample collection, the VOC sample delivery tube was discarded and the HDPE tubing was folded over and inserted back into the well casing so that it could be used during future sampling events. Groundwater samples were shipped overnight to STL-Chicago where they were then analyzed by the laboratory for VOCs according to the US EPA SW-846 Method 8260. One field duplicate also was collected and submitted for VOC analysis.

All groundwater samples were collected using clean, dedicated equipment. Any non-dedicated equipment, such as the water-level, pH meter, and temperature/conductivity meter probes, were decontaminated prior to sample collection, between samples, and at the end of sampling. The instruments were wiped off with a Liquinox™ and water solution, then rinsed with distilled water.

3.3 RESULTS

3.3.1 Field Data

The September 2005 static water-level measurements for the 19 monitoring wells included in the Southern Capture Zone Groundwater Monitoring Program and the 13 monitoring wells included in the Phase II *in situ* bioremediation monitoring network are presented in Table 3-4. Groundwater contour maps based on the shallow and deeper well elevation measurements are presented in Figures 3-2 and 3-3, respectively. Groundwater flow overall was south/southwesterly in both the shallow portion and the deeper portion of the aquifer.

3.3.2 Analytical Data

The VOC analytical results for this sampling event and the current NCDENR Remediation Goals (RGs) are presented in Table 3-5. The laboratory data package is presented in Appendix B.

The following seven compounds were detected during this monitoring event in at least one groundwater sample: *cis*-1,2-DCE; TCE; 1,2-Dichlorobenzene; Freon 113; Dichlorodifluoromethane; Trichlorotrifluoroethane; and MTBE. The maximum TCE concentration reported (6.3 µg/L) was observed in the groundwater sample collected from the on-site monitoring well MW-19D and was the only observed RG exceedance.

The VOC analytical results for the semi-annual groundwater sampling for the period September 2002 (pre-*in situ* bioremediation treatment) through September 2005 are presented in Appendix E.

3.4 DATA EVALUATION

Contaminant concentration trends in downgradient monitoring wells and site-wide distribution of TCE and *cis*-1,2-DCE in the aquifer were evaluated. Overall the downgradient, offsite migration of impacted groundwater is being controlled effectively, as evidenced by the data trends present in the Southern Capture Zone monitoring wells. The footprints of the site-wide distribution of TCE and *cis*-1,2-DCE remain stable.

3.4.1 Downgradient Monitoring Well Concentration Trends

The TCE and *cis*-1,2-DCE groundwater concentration trends in the downgradient monitoring wells that are located near the inferred centerline of the plume were evaluated, as represented by monitoring wells MW-16B; MW-16D; MW-18B; and MW-18D. Figures 3-4 through 3-6 present these data for the groundwater monitoring periods from October 1998 through September 2005 in the following three monitoring wells: MW-16B; -16D; and -18D. (The concentration trends at monitoring well MW-18B are not graphically presented since TCE and *cis*-1,2-DCE have not been detected above the laboratory reporting limits consistently at this location.) These downgradient concentration trends are discussed below.

MW-16B and -16D (downgradient near extraction well RW-7)

In the shallow portion of the aquifer, the concentrations of both TCE and *cis*-1,2-DCE appear to be leveling off near their current concentration levels of nondetect at a reporting limit of 1 μg/L and 1.5 μg/L, respectively, as shown in Figure 3-4. The reported groundwater concentrations are well below their respective RGs of 2.8 μg/L and 70 μg/L.

In the deeper groundwater zone, TCE concentrations have remained below its RG during the past two years. The *cis*-1,2-DCE concentrations have fluctuated historically but are showing a decreasing concentration trend and have remained below its RG during the most recent six semi-annual sampling events, as shown in Figure 3-5.

MW-18B and -18D (most downgradient monitoring location included in Southern Capture Zone monitoring network)

No compounds were detected in the shallow southernmost monitoring well; offsite monitoring well MW-18B, which is consistent with earlier data at this location.

In the deep southernmost monitoring well, offsite monitoring well MW-18D, the TCE concentrations have been below its respective RG for the past four consecutive semi-annual sampling events, with an average value of 2.2 ± 0.4 μg/L, as shown in Figure 3-6. For the entire five year monitoring period under discussion, *cis*-1,2-DCE concentrations were significantly below the RG with some variation in the observed concentrations.

In sum, the data evaluation of the most downgradient wells located near the inferred solvent plume centerline shows that TCE and *cis*-1,2-DCE groundwater concentrations at the southern property line and immediately offsite have remained below their respective groundwater standards for the past two years.

3.4.2 Sitewide Extents of Contamination

The site-wide approximate lateral extent of TCE in the shallow and deeper groundwater zones are depicted in Figures 3-7 and 3-8, respectively, and the site-wide approximate lateral extent of *cis*-1,2-DCE in the shallow and deeper groundwater zones are depicted in Figures 3-9 and 3-10, respectively. These figures are based on the data from the September 2005 Southern Boundary Capture Zone groundwater monitoring event and the December 2005 Phase II *in situ* bioremediation performance groundwater monitoring event.

The downgradient footprint of the shallow TCE plume, as shown in Figure 3-7, has not changed from that reported for the Spring 2005 data. The inferred limit of the shallow TCE plume above the TCE RG remains onsite, between monitoring well clusters MW-103 and MW-104.

The downgradient footprint of the deep TCE plume, as shown in Figure 3-8, has not changed substantively from that reported for the Fall 2004 data, which is the last time monitoring well MW-19D was sampled. The inferred downgradient edge of the deep TCE plume remains on-site, between monitoring wells MW-10D and MW-16D.

The downgradient footprint of the shallow *cis*-1,2-DCE plume, as shown in Figure 3-9, has not changed from that reported for the Spring 2005 data. The inferred leading edge of the shallow *cis*-1,2-DCE plume remains on-site, located between monitoring wells MW-104A and MW-10B.

The downgradient footprint of the deep *cis*-1,2-DCE plume, as shown in Figure 3-10, has increased slightly from that reported for the Spring 2005 data. The inferred downgradient limit of the deep *cis*-1,2-DCE plume is on-site between the MW-104 well cluster and monitoring well MW-10D. (The Spring 2005 showed the plume limit between the MW-103 and MW-104 well clusters.) This observed increase in the *cis*-1,2-DCE plume may be due to upgradient bioremediation of TCE. These data will continue to be evaluated in future sampling events for data trends.

SECTION 4

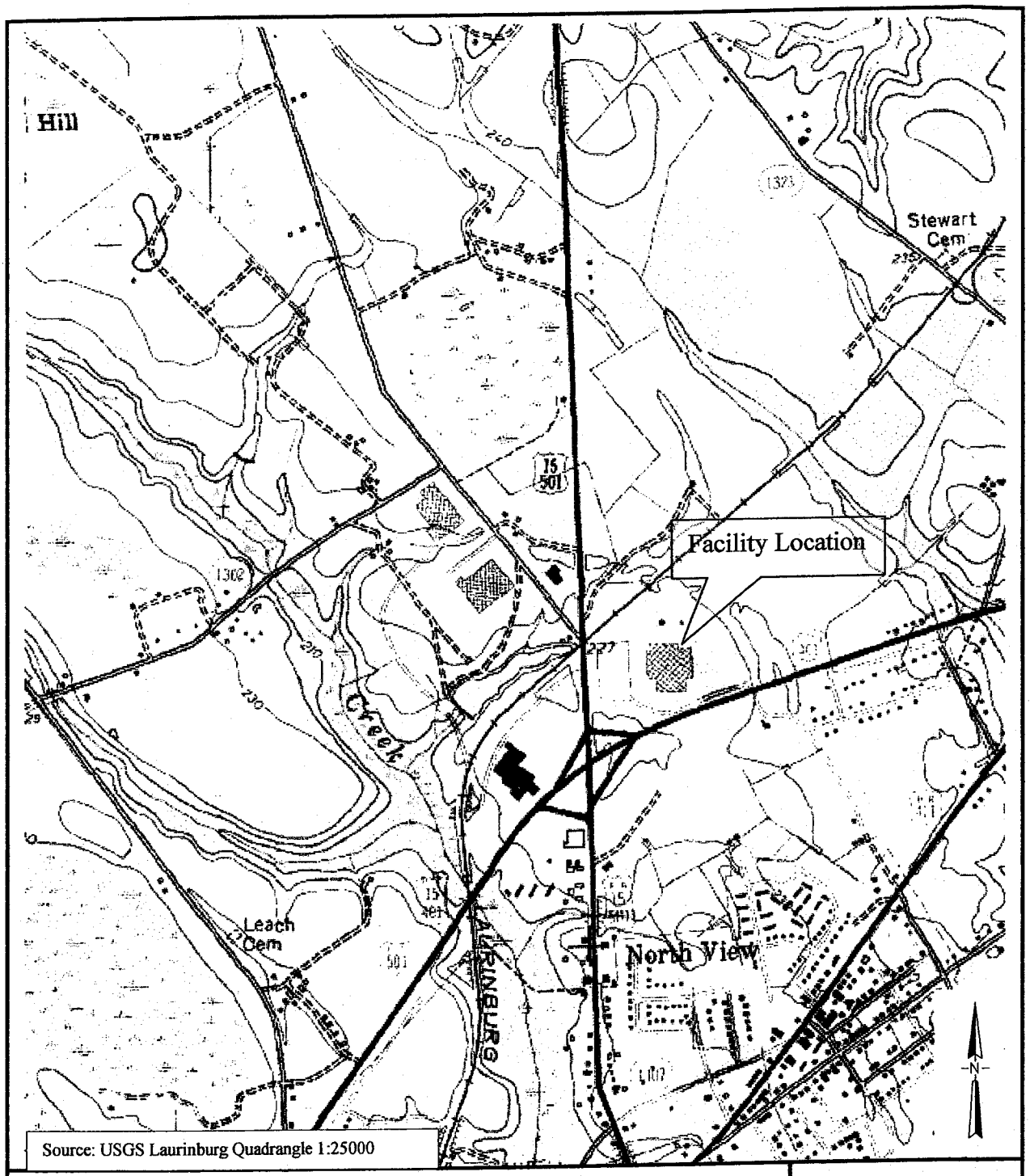
WELL ABANDONMENTS

3.1 INTRODUCTION

This section presents the field activities performed in December 2005 to abandon 44 wells that are not required to demonstrate plume remediation, plume capture or future compliance with North Carolina groundwater standards in areas impacted by the solvent release plume. Plans for the well abandonment were presented in the *Well Abandonment Letter Request* (Phoenix 2005) and were approved by the NCDENR (22 November 2005 email correspondence from S. Robbins, NCDENR, to C. Reinganum, Phoenix). A description of the 44 wells abandoned is presented in Table 4-1. The location of the 44 abandoned wells and the remaining 50 active wells are shown in Figure 4-1.

The well abandonments were performed on 26 and 27 December 2005 under the supervision of Mr. Michael Stanforth of Excel, a licensed North Carolina well contractor. At each well location, the well was disinfected with a hypochlorite solution. Following completion of the disinfection, each well was then filled with bentonite/cement grout to grade in accordance with the requirements of 15A NCAC 02.0113.

Completed originals of the well abandonment forms (GW-30) were submitted under separate cover to the Division of Water Quality and copies of these forms are presented in Appendix F.



Source: USGS Laurinburg Quadrangle 1:25000

miles 0 0.5 1.0

Figure E-1

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

SITE LOCATION MAP

Former Abbott Facility
Laurinburg, North Carolina

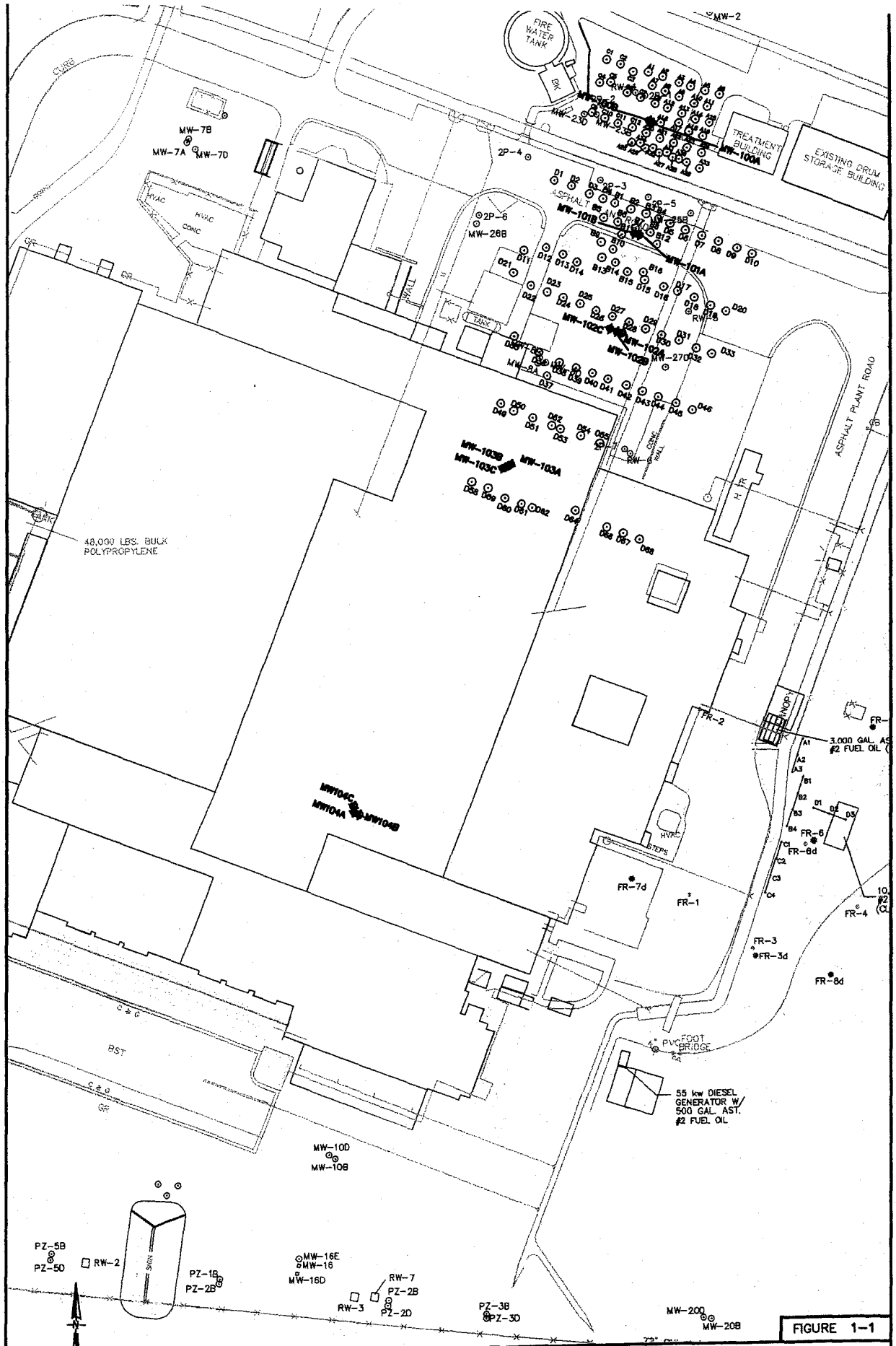

FIRE WATER TANK
TREATMENT BUILDING
EXISTING DRUM STORAGE BUILDING
ASPHALT PLANT ROAD
48,000 LBS. BULK POLYPROPYLENE
3,000 GAL. AS
#2 FUEL OIL
55 kw DIESEL GENERATOR W/ 500 GAL. AST. #2 FUEL OIL
PVC FOOT BRIDGE
BST
MW-2
MW-7B
MW-7A
MW-7D
2P-4
2P-6
MW-26B
MW-100A
MW-101B
MW-101A
MW-102C
MW-102A
MW-102B
MW-27
MW-103B
MW-103C
MW-103A
MW-104C
MW-104A
MW-104B
FR-2
FR-6
FR-6d
FR-7d
FR-1
FR-4
FR-3
FR-3d
FR-8d
MW-10D
MW-10B
PZ-5B
PZ-50
RW-2
PZ-1B
PZ-2B
MW-16E
MW-16
MW-16D
RW-7
PZ-2B
RW-3
PZ-2D
PZ-3B
PZ-3D
MW-20D
MW-20B
SCALE
0
60'
LEGEND
IN-SITU BIOREMEDIATION MONITORING WELL
COMPLETED PHASE II INJECTION LOCATION
PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED
PHASE II HRC-X INJECTION LOCATIONS
FORMER ABBOTT FACILITY
Laurinburg, North Carolina

FIGURE 1-1

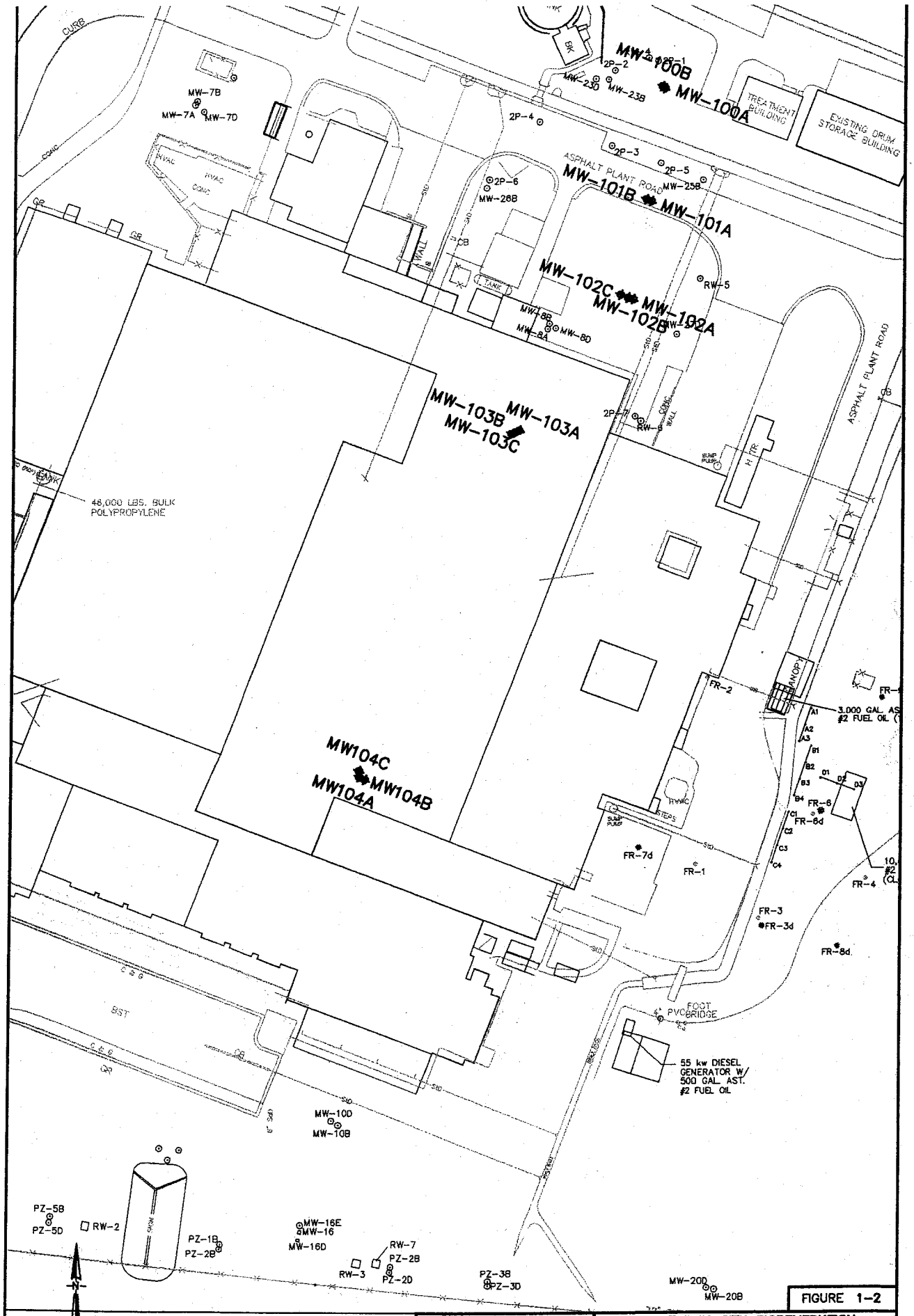

MW-100B
MW-100A
TREATMENT BUILDING
EXISTING DRUM STORAGE BUILDING
ASPHALT PLANT ROAD
MW-101B
MW-101A
MW-102C
MW-102B
MW-102A
MW-103B
MW-103A
MW-103C
MW104C
MW104B
MW104A
48,000 LBS. BULK POLYPROPYLENE
3,000 GAL AS
#2 FUEL OIL
55 kw DIESEL GENERATOR W/ 500 GAL. AST. #2 FUEL OIL
FOOT BRIDGE
BST
MW-7B
MW-7A
MW-7D
MW-23C
MW-23B
MW-25B
MW-26B
MW-8B
MW-8A
MW-8D
MW-10D
MW-10B
MW-16E
MW-16
MW-16D
MW-20D
MW-20B
PZ-5B
PZ-5D
RW-2
PZ-1B
PZ-2B
RW-3
RW-7
PZ-2D
PZ-3B
PZ-3D
FR-1
FR-2
FR-3
FR-3d
FR-4
FR-6
FR-6d
FR-7d
FR-8d
N
0
60'
SCALE
LEGEND
PHASE II MONITORING WELLS
PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED
PHASE II IN-SITU BIOREMEDIATION
GROUNDWATER MONITORING WELL NETWORK
FORMER ABBOTT FACILITY
Laurinburg, North Carolina

FIGURE 1-2

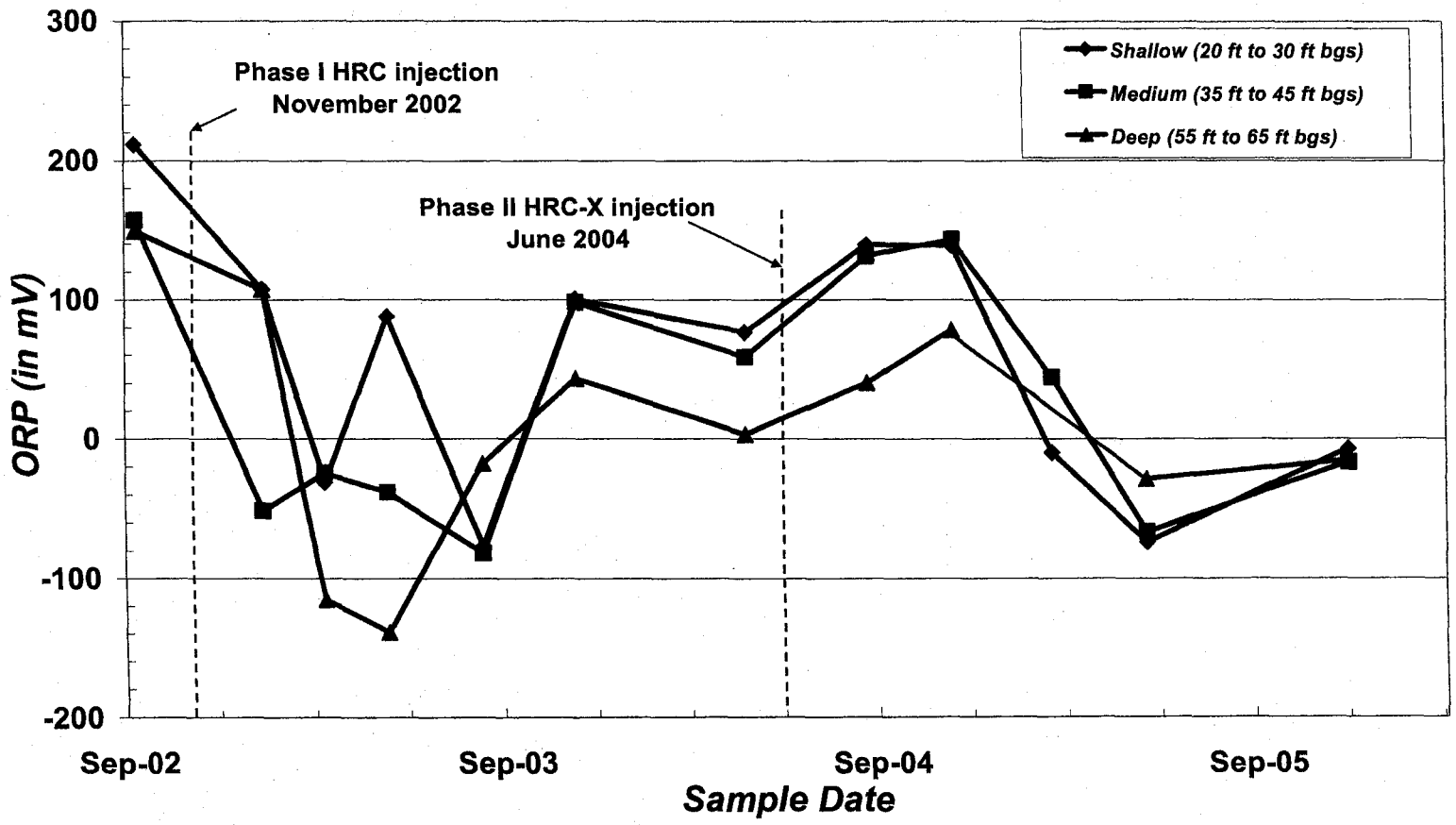


Figure 1-3

Notes:

1. MW-104 well cluster not included in well data.
2. March 2005 data only include MW-100 and MW-101 well clusters.

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

REDOX POTENTIAL DATA TRENDS

Former Abbott Facility
Laurinburg, North Carolina

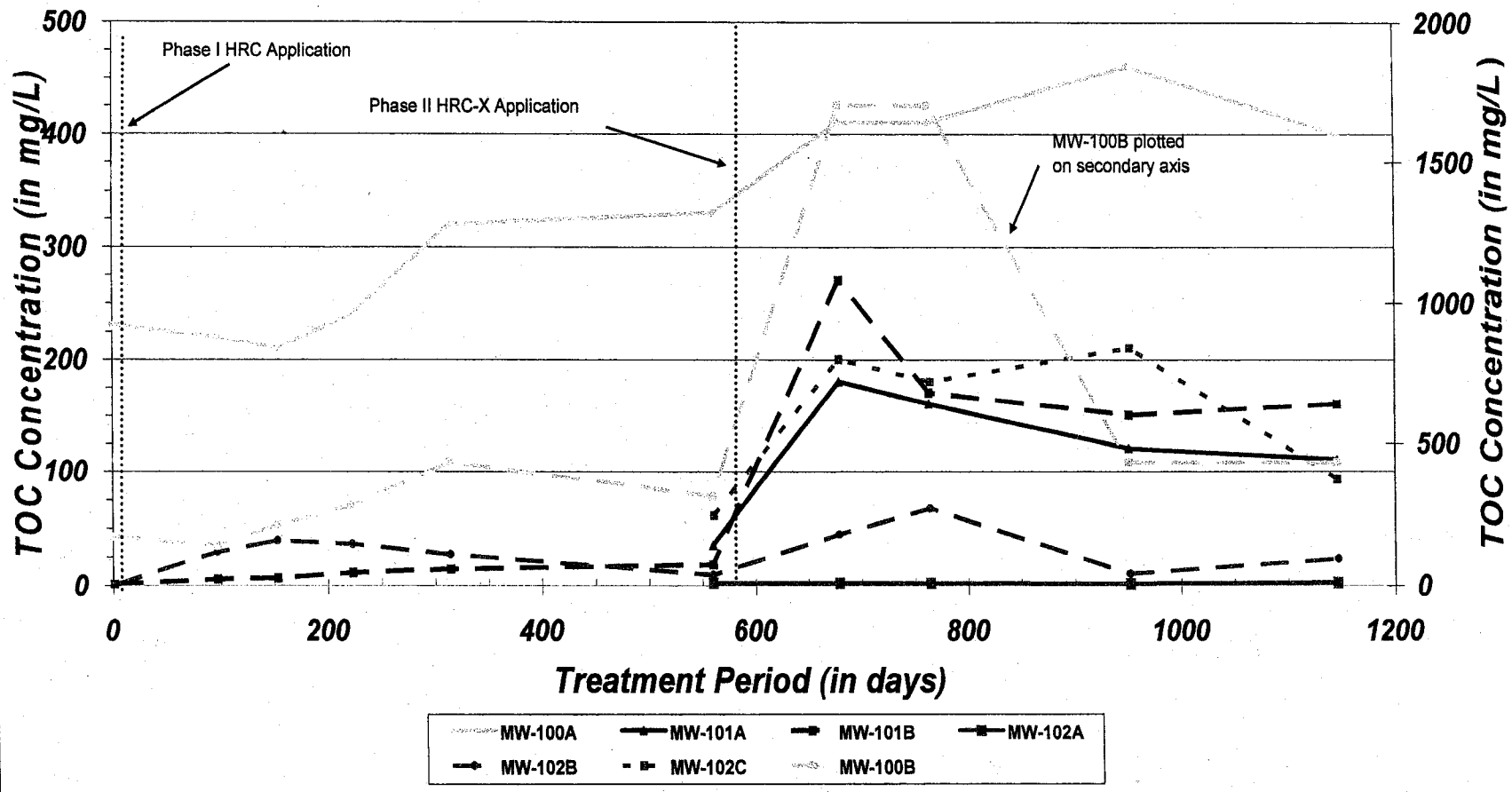


Figure 1-4

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

Total Organic Carbon Data Trends In Primary Treatment Area

Former Abbott Facility
Laurinburg, North Carolina

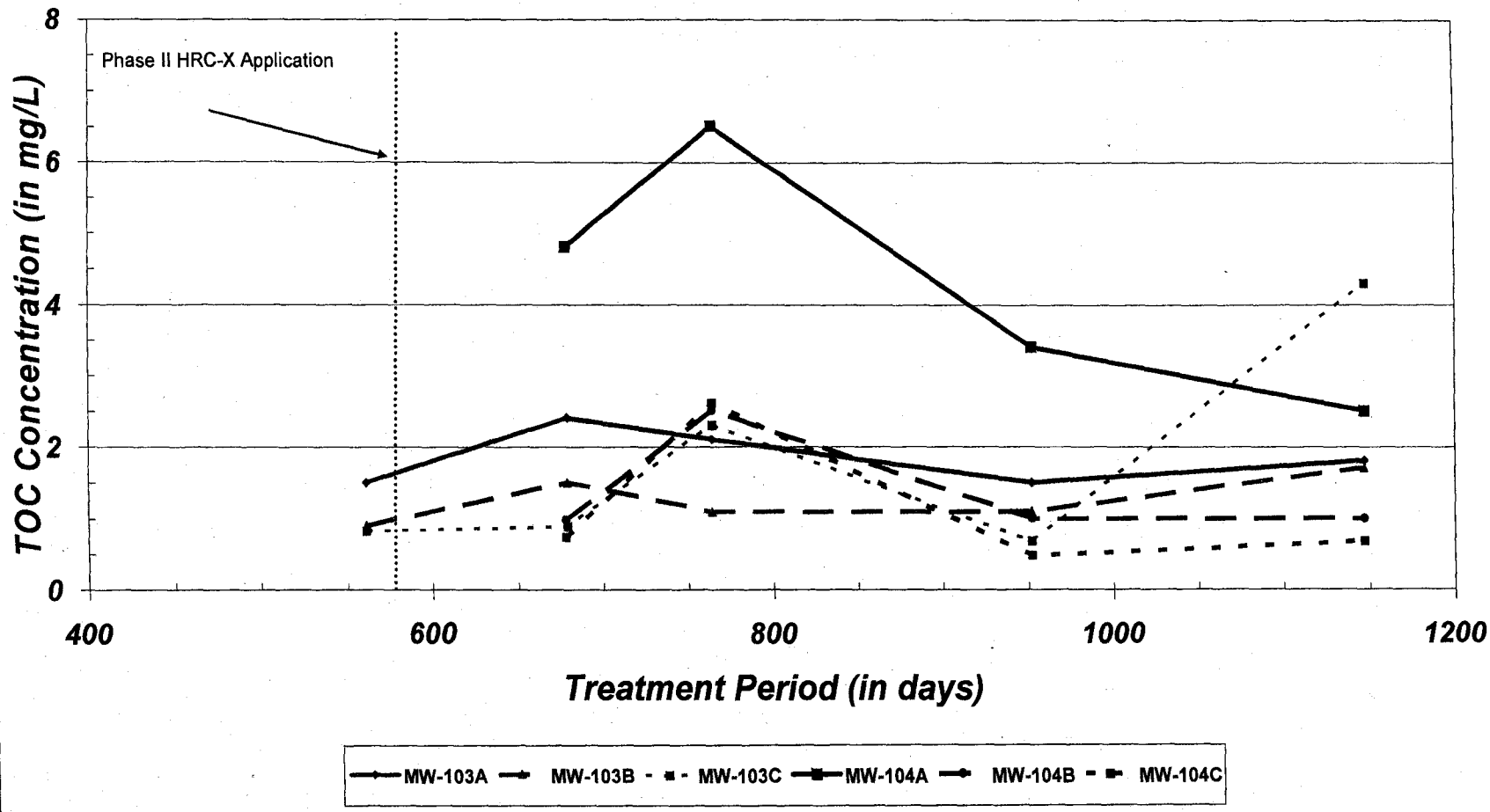


Figure 1-5

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

Total Organic Carbon Data Trends In Downgradient Areas

Former Abbott Facility
Laurinburg, North Carolina

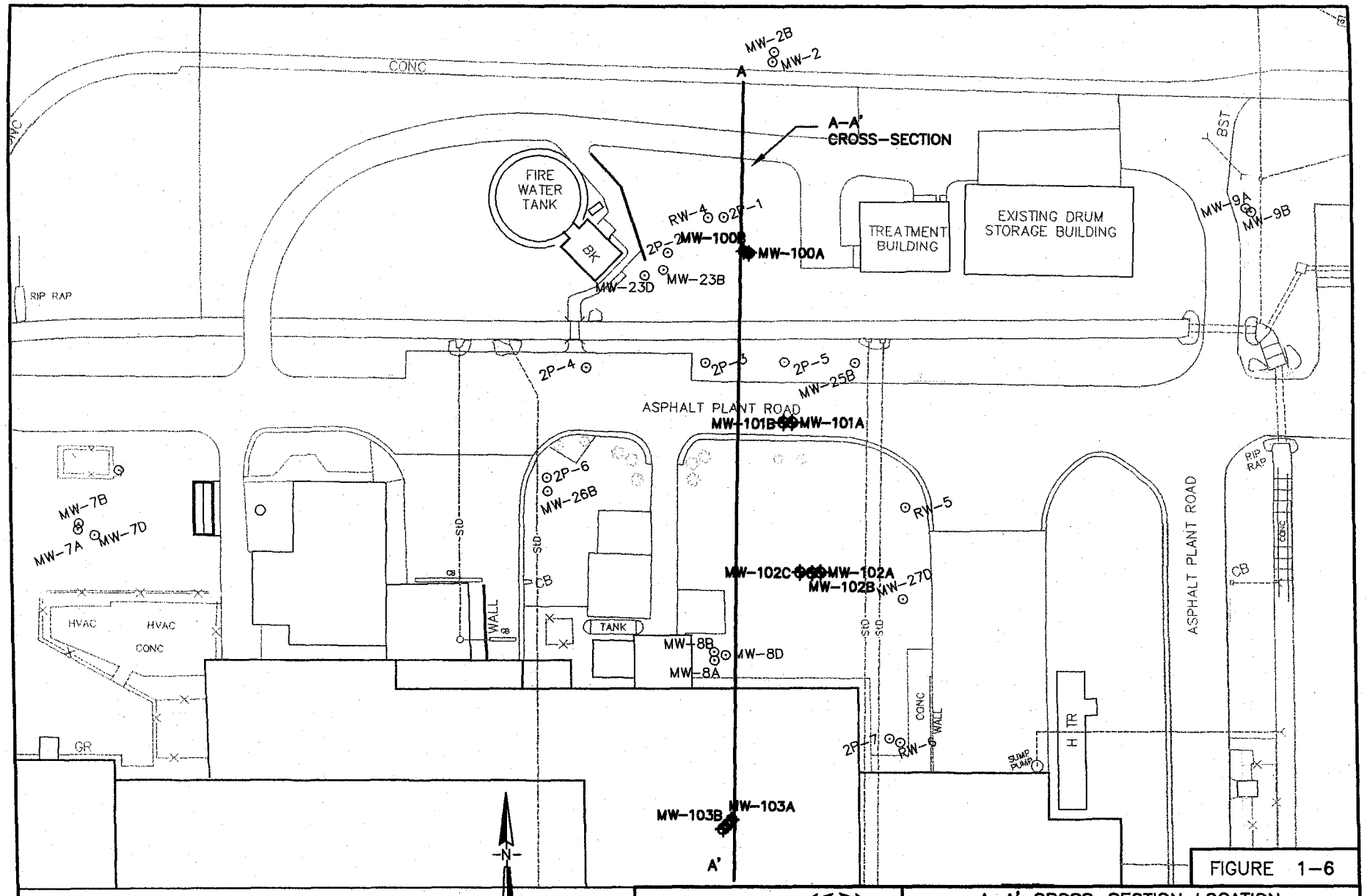


FIGURE 1-6

LEGEND

HRC MONITORING WELLS

NOTE:
HRC = HYDROGEN RELEASE COMPOUND

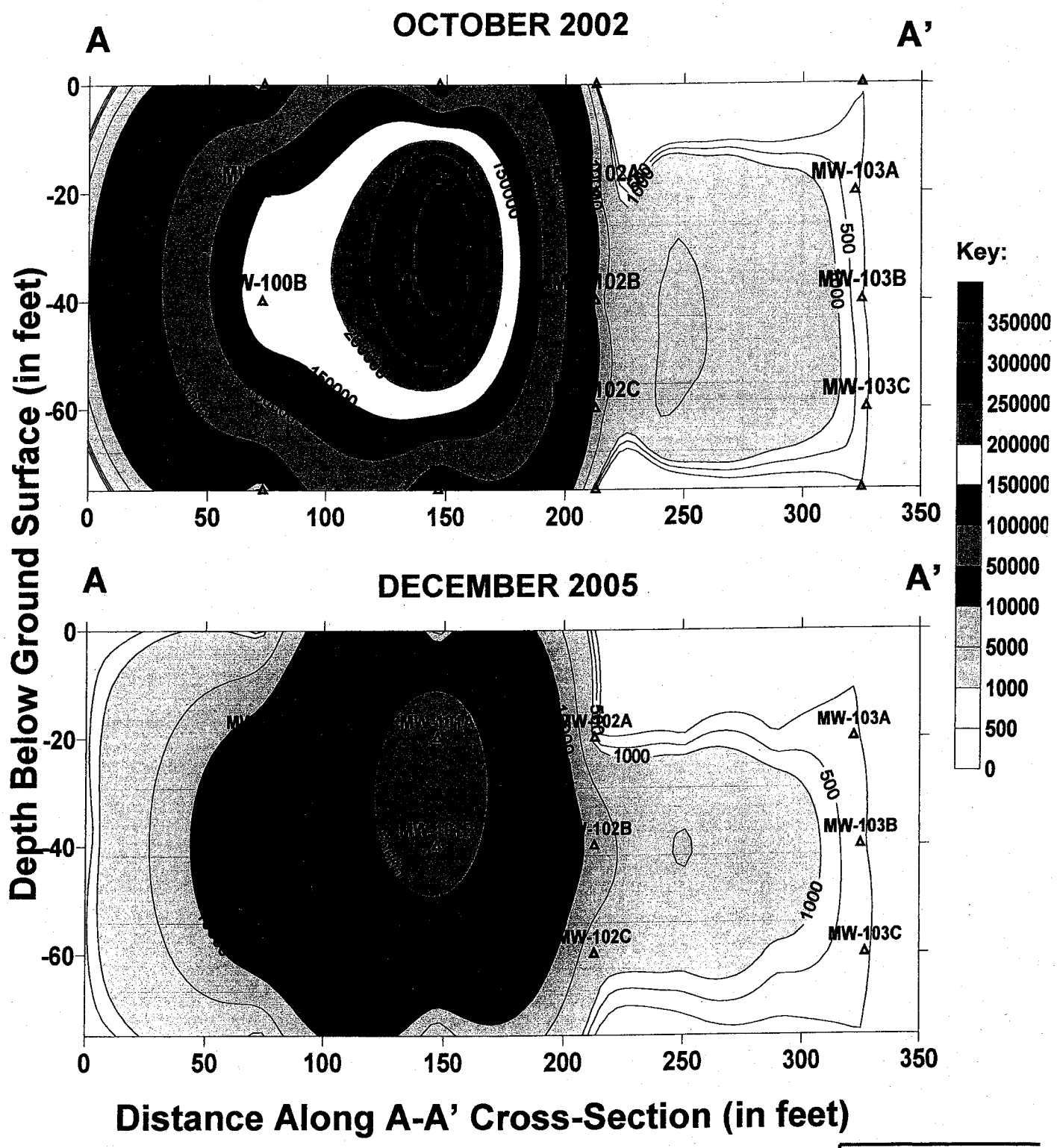
0 60'
SCALE

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

A-A' CROSS-SECTION LOCATION

FORMER ABBOTT FACILITY

Laurinburg, North Carolina



Note: Trichloroethene groundwater concentrations in µg/L

Figure 1-7

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

TRICHLOROETHENE CROSS-SECTION CONCENTRATION CONTOURS OCTOBER 2002 AND DECEMBER 2005

Former Abbott Facility
Laurinburg, North Carolina

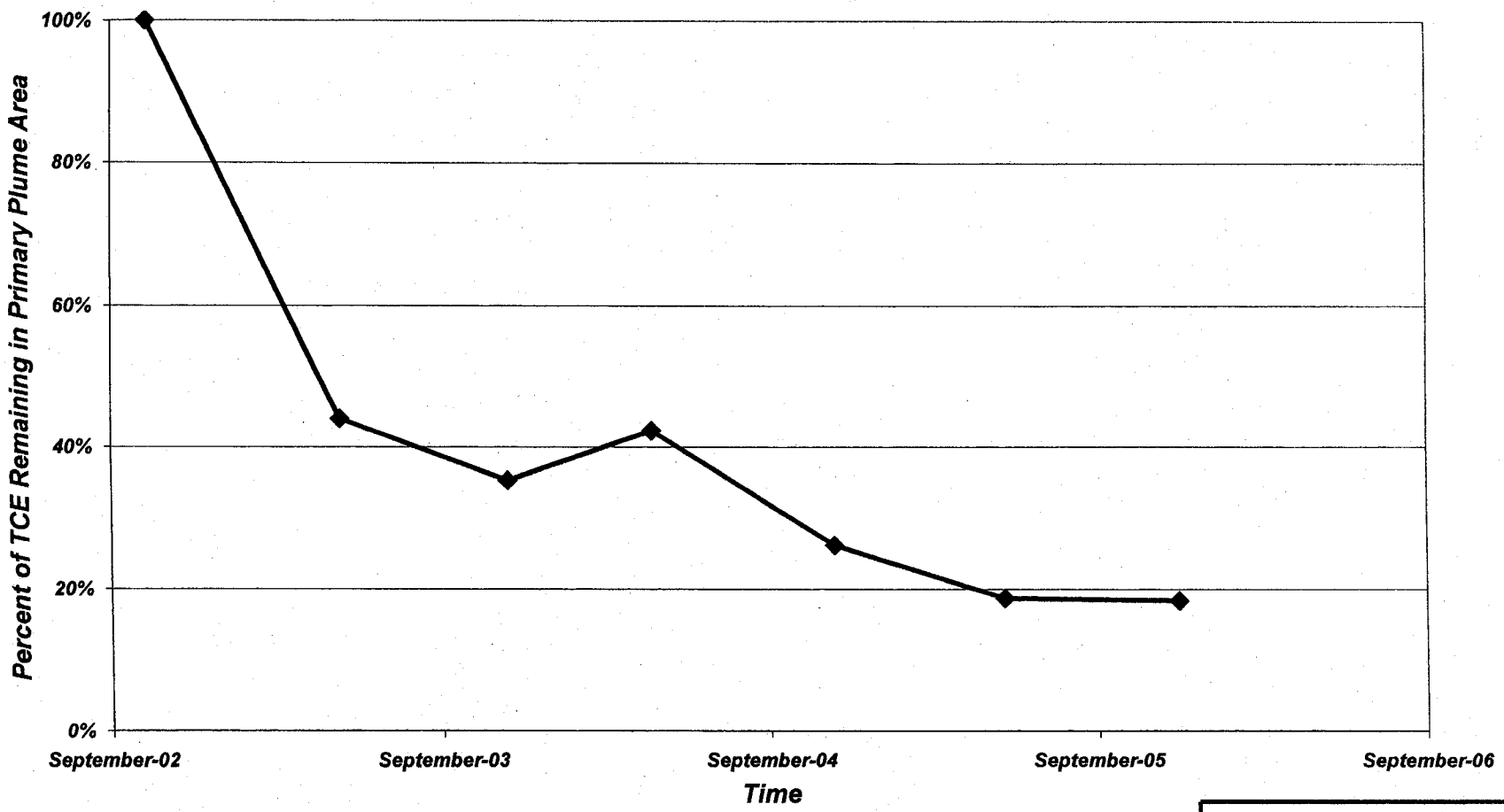
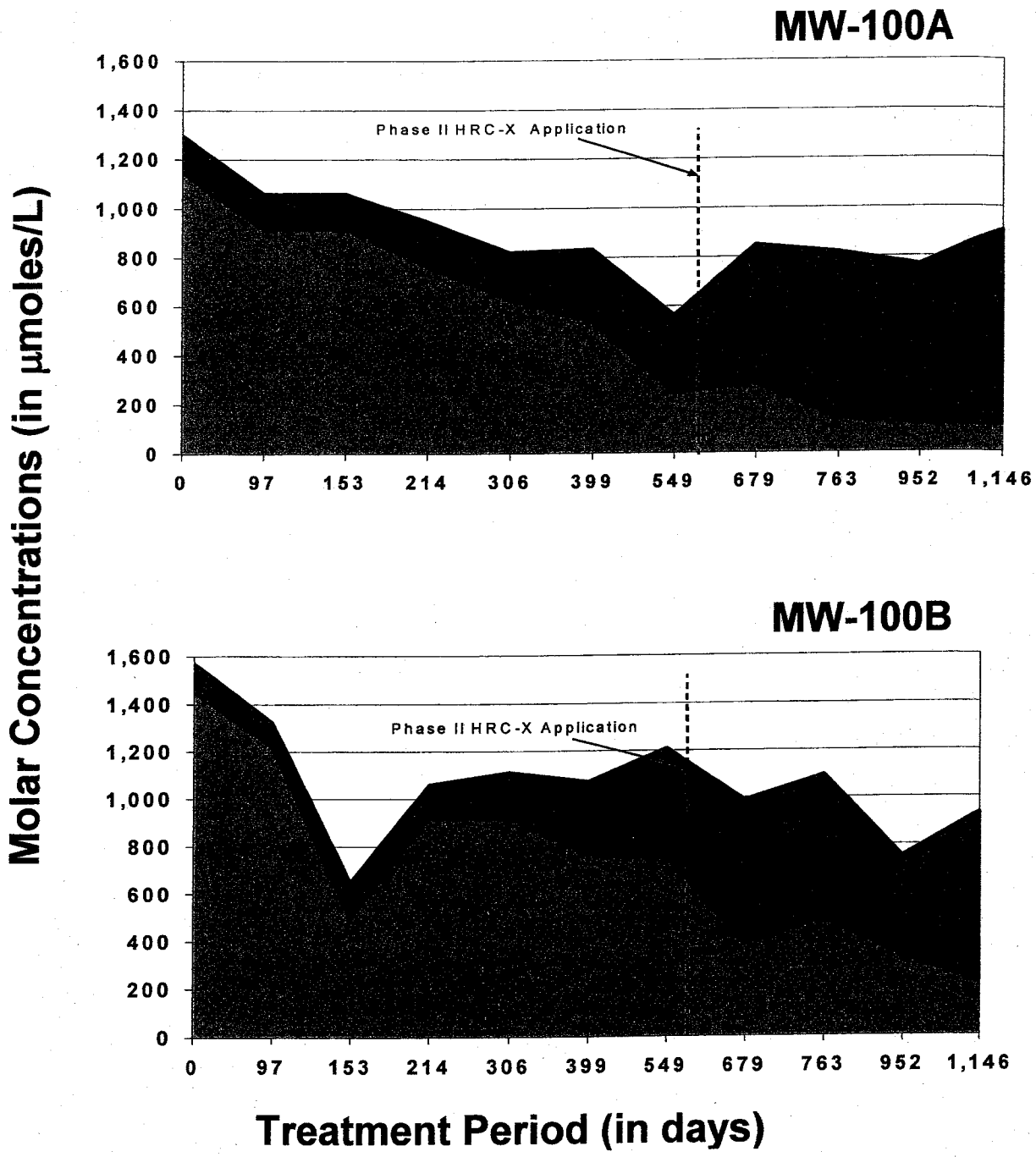


Figure 1-8

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

REDUCTION OF TOTAL TCE MASS IN PRIMARY PLUME AREA

Former Abbott Facility
Laurinburg, North Carolina



Legend:

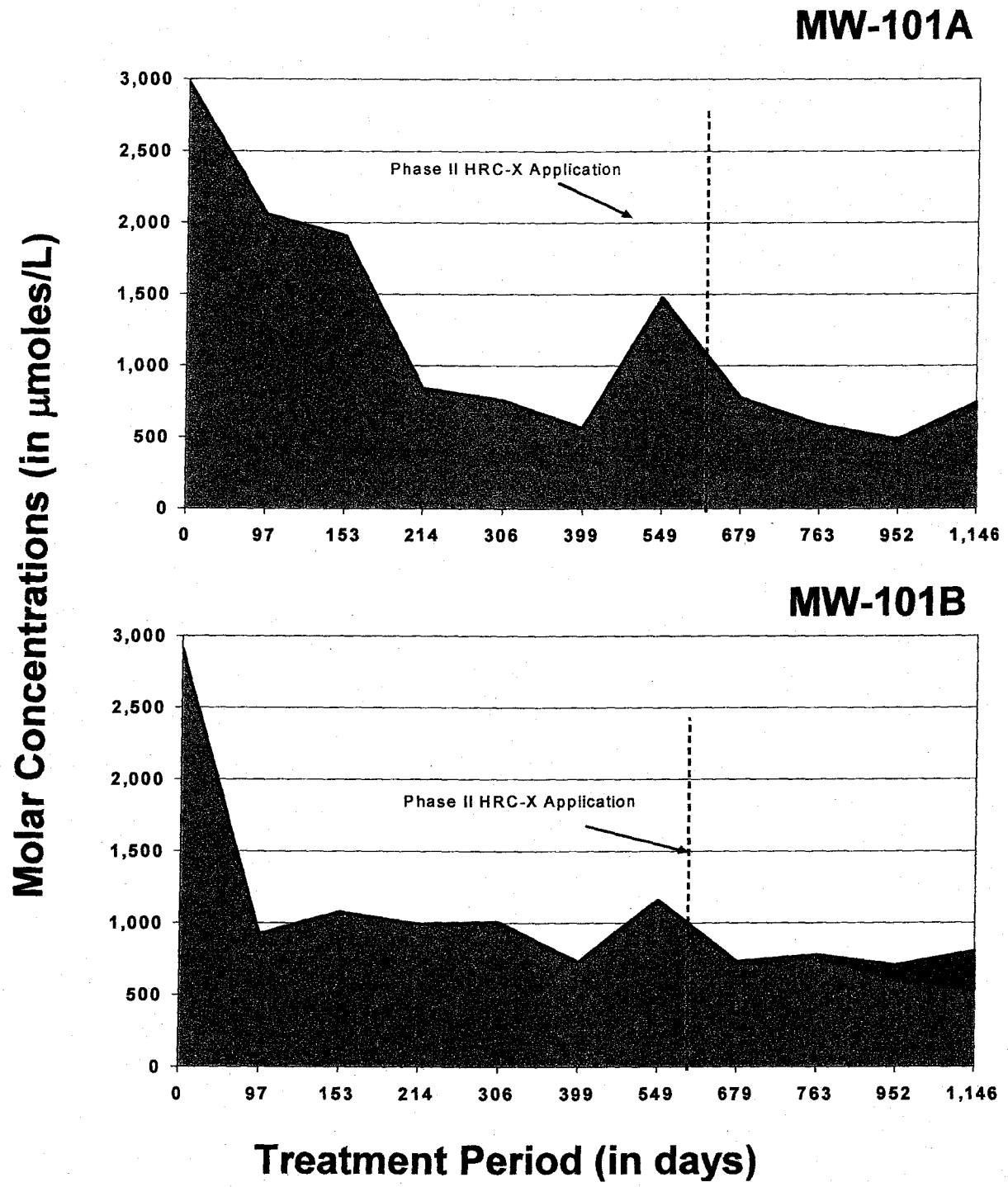
- Trichloroethene
- *cis*-1,2-Dichloroethene

Figure 1-9

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

CHANGES IN MOLAR CONCENTRATIONS OF TCE DEGRADATION PRODUCTS IN MW-100 WELL CLUSTER

Former Abbott Facility
Laurinburg, North Carolina



Legend:

- Trichloroethene
- *cis*-1,2-Dichloroethene

Figure 1-10

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

CHANGES IN MOLAR CONCENTRATIONS OF TCE DEGRADATION PRODUCTS IN MW-101 WELL CLUSTER

Former Abbott Facility
Laurinburg, North Carolina

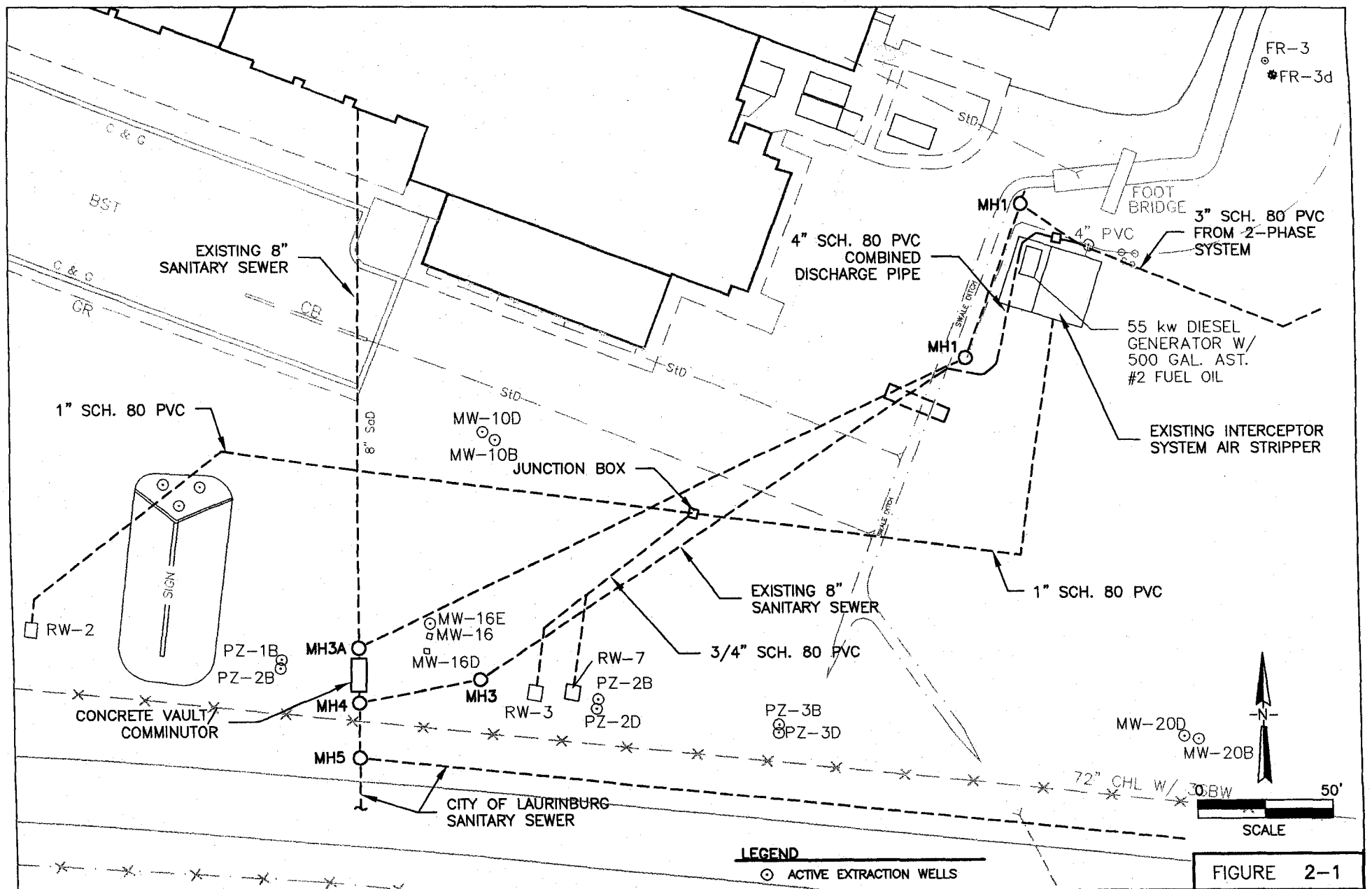


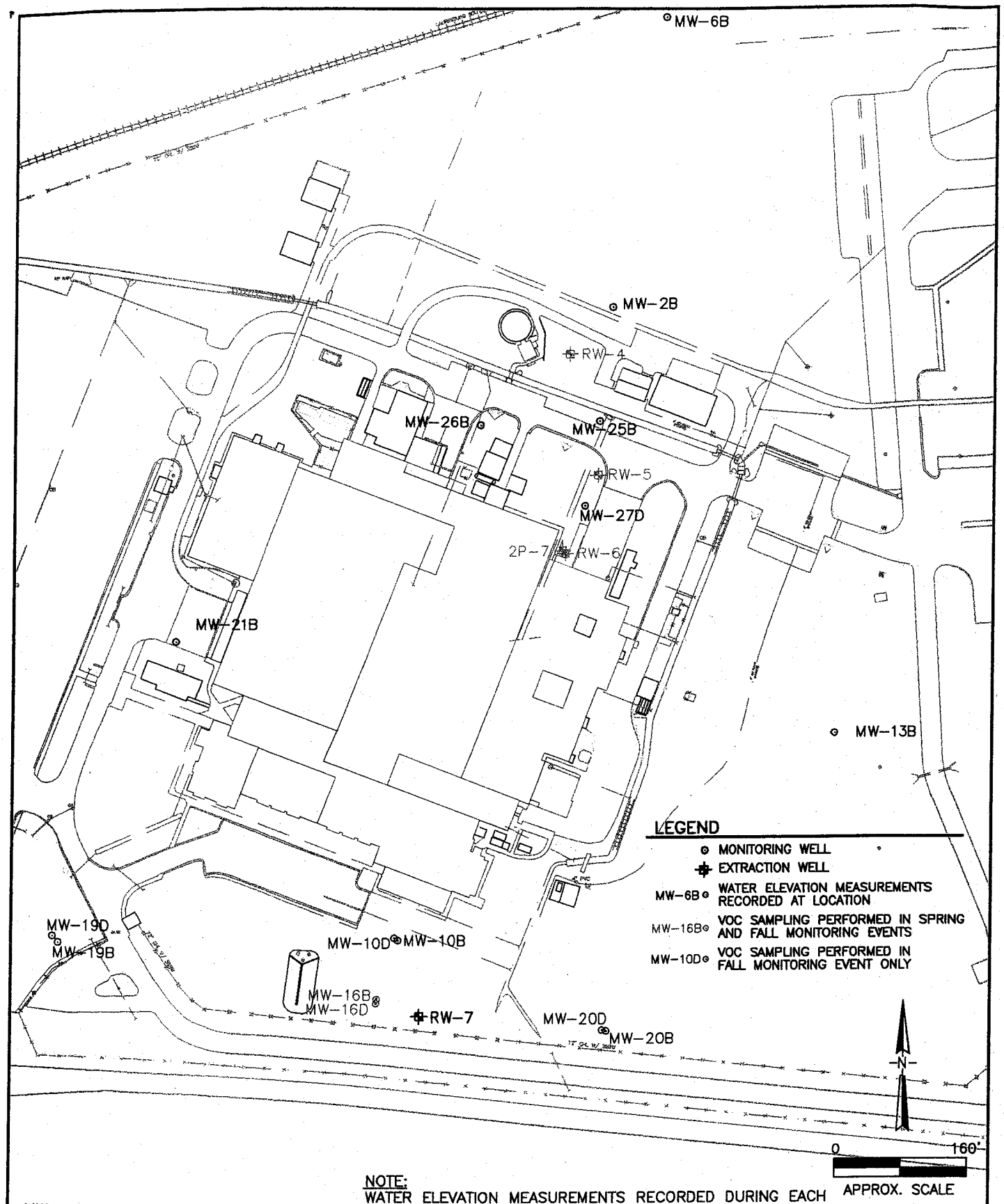
FIGURE 2-1

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

SOUTH GROUNDWATER INTERCEPTOR SYSTEM CONFIGURATION

FORMER ABBOTT FACILITY

Laurinburg, North Carolina



NOTE:
WATER ELEVATION MEASUREMENTS RECORDED DURING EACH MONITORING EVENT AT EACH MONITORING WELL SAMPLED DURING THE SPRING OR FALL MONITORING EVENTS.

FIGURE 3-1

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

SOUTHERN CAPTURE ZONE GROUNDWATER MONITORING WELL NETWORK

FORMER ABBOTT FACILITY

Laurinburg, North Carolina

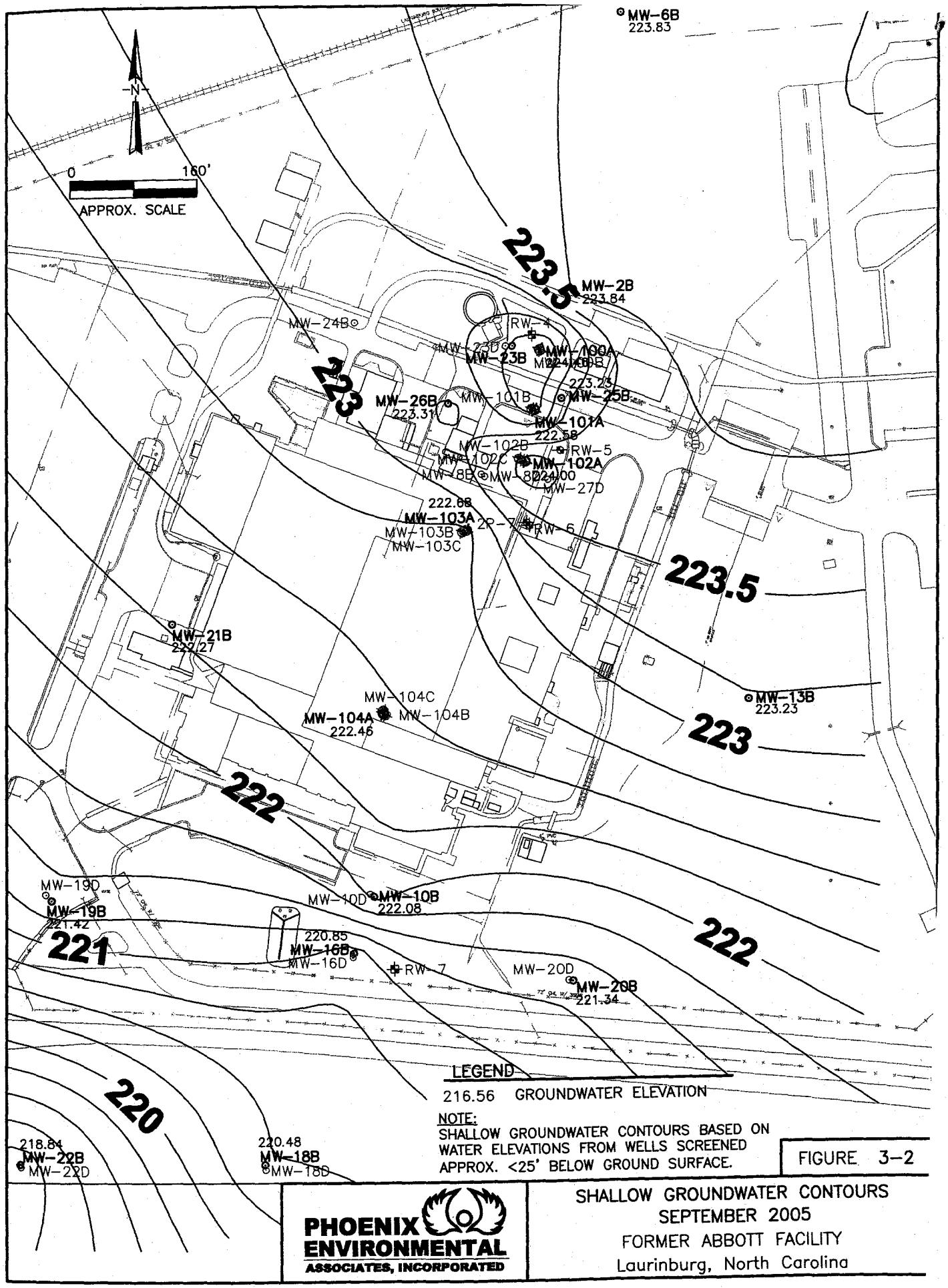


FIGURE 3-2

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

SHALLOW GROUNDWATER CONTOURS
SEPTEMBER 2005
FORMER ABBOTT FACILITY
Laurinburg, North Carolina

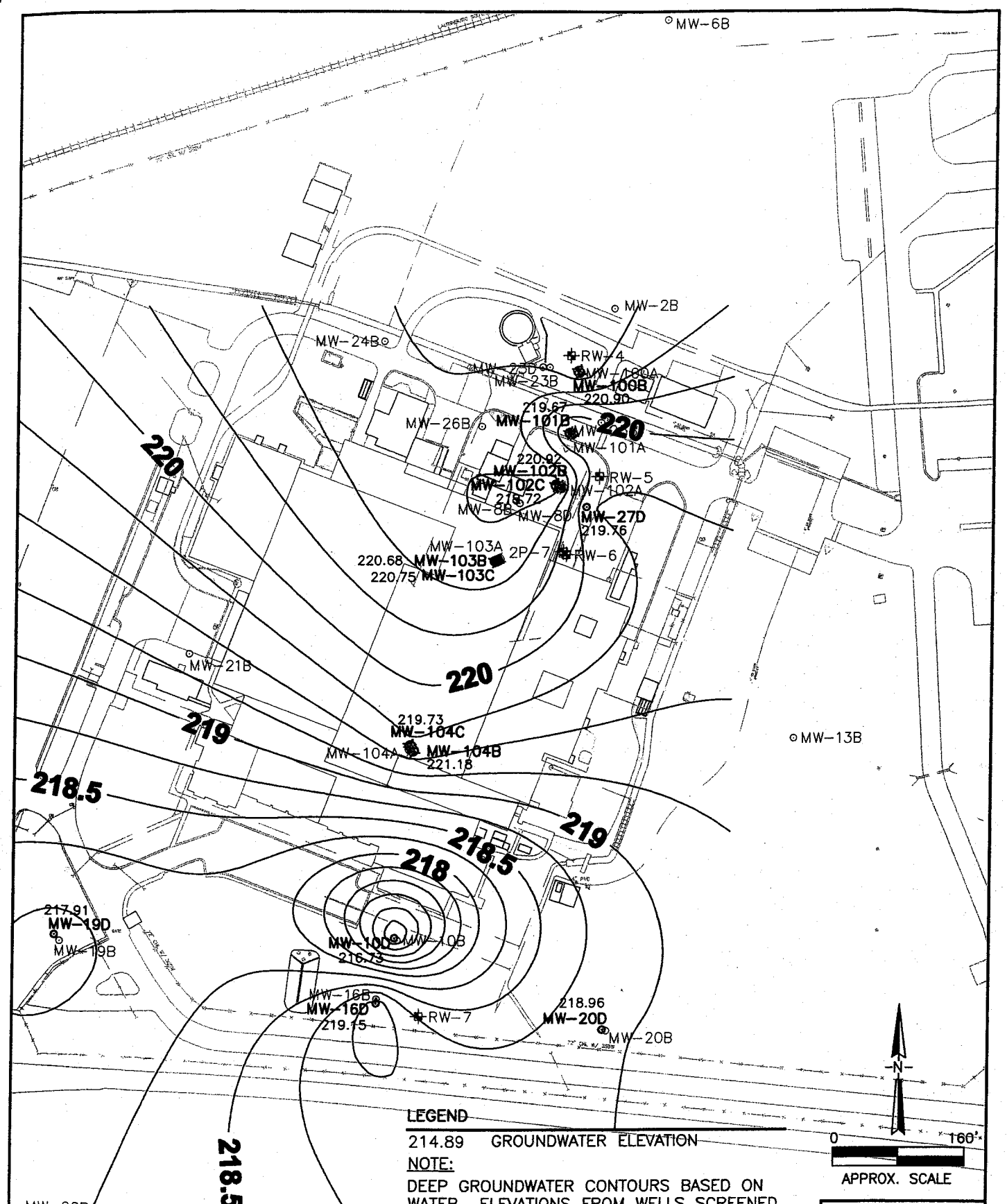


FIGURE 3-3

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

DEEP GROUNDWATER CONTOURS
SEPTEMBER 2005
FORMER ABBOTT FACILITY
Laurinburg, North Carolina

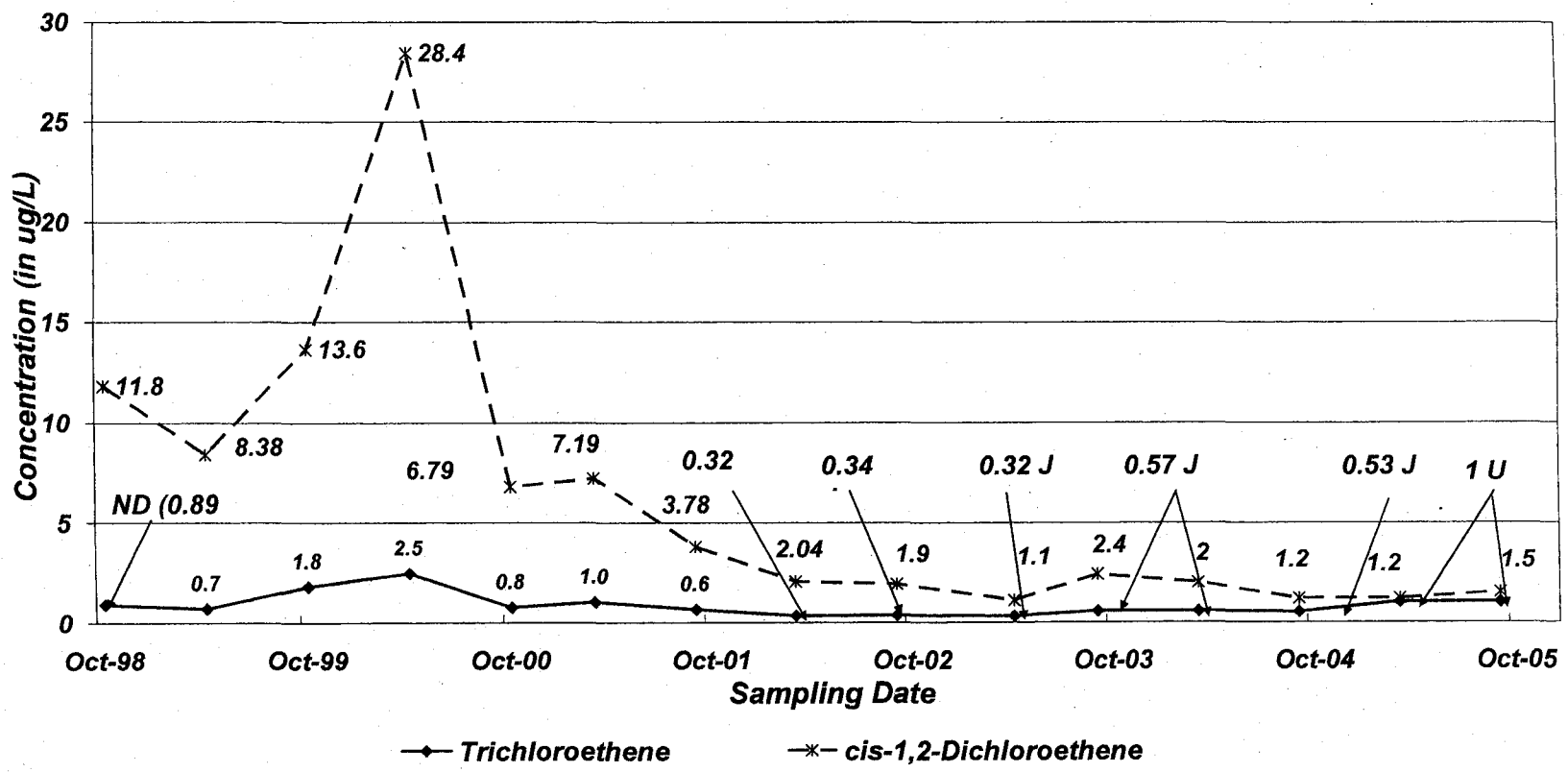


Figure 3-4

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

Monitoring Well MW-16B
Concentration Trends

Former Abbott Facility
Laurinburg, North Carolina

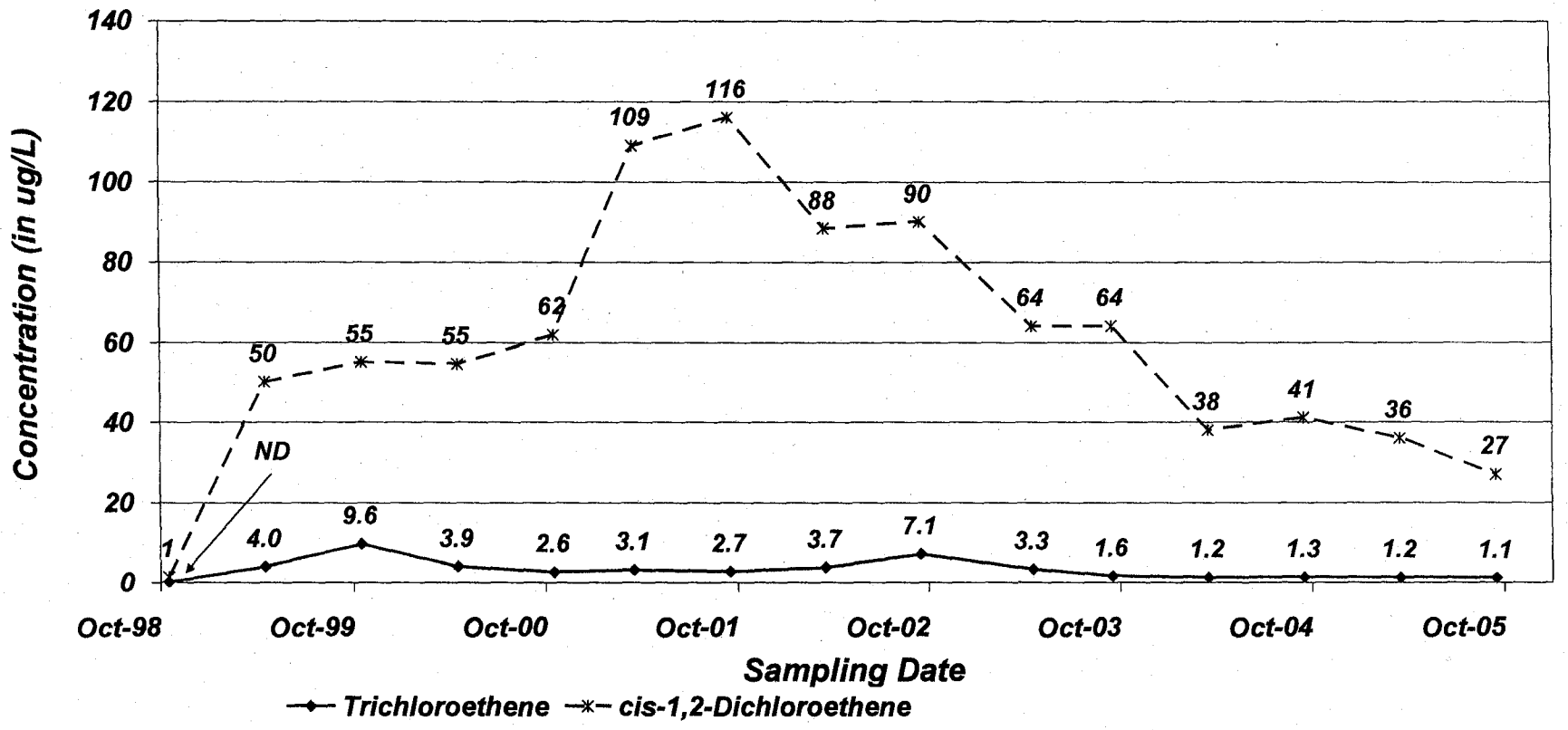


Figure 3-5

PHOENIX ENVIRONMENTAL
ASSOCIATES, INCORPORATED

Monitoring Well MW-16D
Concentration Trends

Former Abbott Facility
Laurinburg, North Carolina

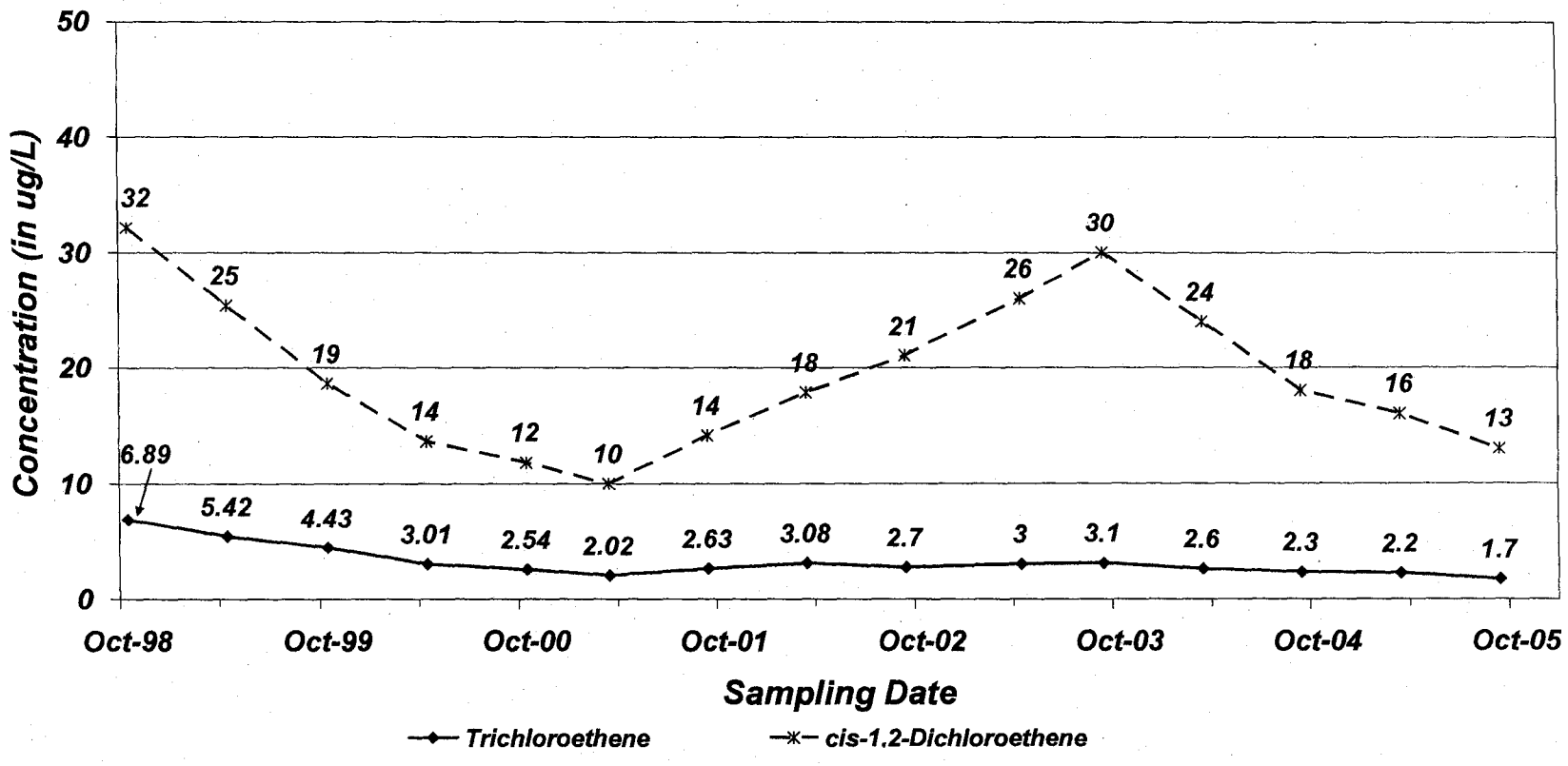
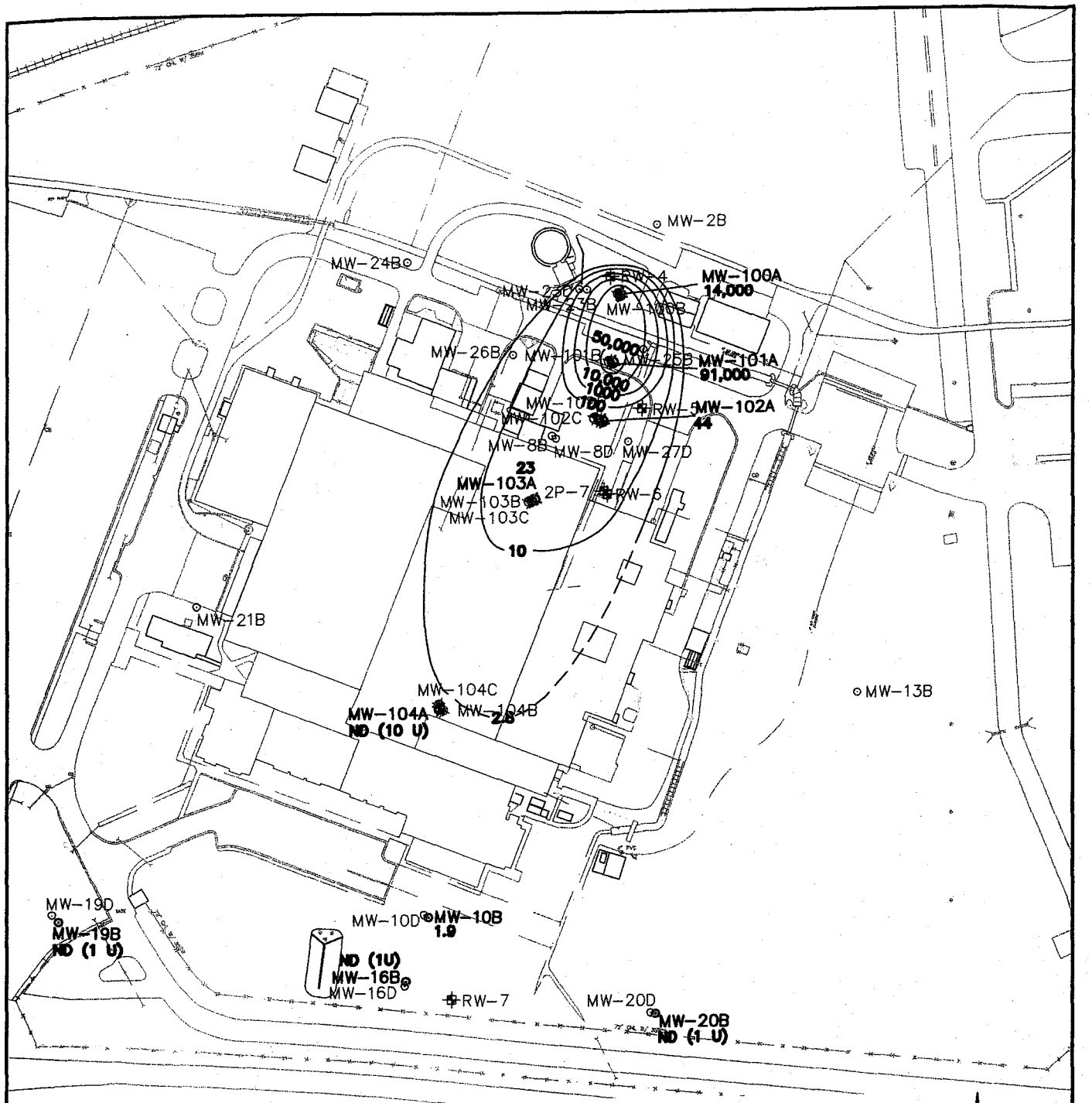


Figure 3-6

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

Monitoring Well MW-18D
Concentration Trends

Former Abbott Facility
Laurinburg, North Carolina



LEGEND

25 TRICHLOROETHENE CONCENTRATION IN GROUNDWATER IN ug/L

ND (1 U) NOT DETECTED ABOVE LISTED IN PARENTHESIS

——— INFERRED CONCENTRATION CONTOUR

NOTES:

1. ISOCONTOURS BASED ON WELLS SCREENED AT <25' BELOW GROUND SURFACE.
2. BASED ON SEPTEMBER AND DECEMBER 2005 SAMPLING DATA.
3. TRICHLOROETHENE 2L STANDARD IS 2.8 ug/L.

-N-

0 160'

APPROX. SCALE

FIGURE 3-7

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

APPROXIMATE EXTENT OF TCE IN THE SHALLOW PORTION OF THE AQUIFER

FORMER ABBOTT FACILITY

Laurinburg, North Carolina

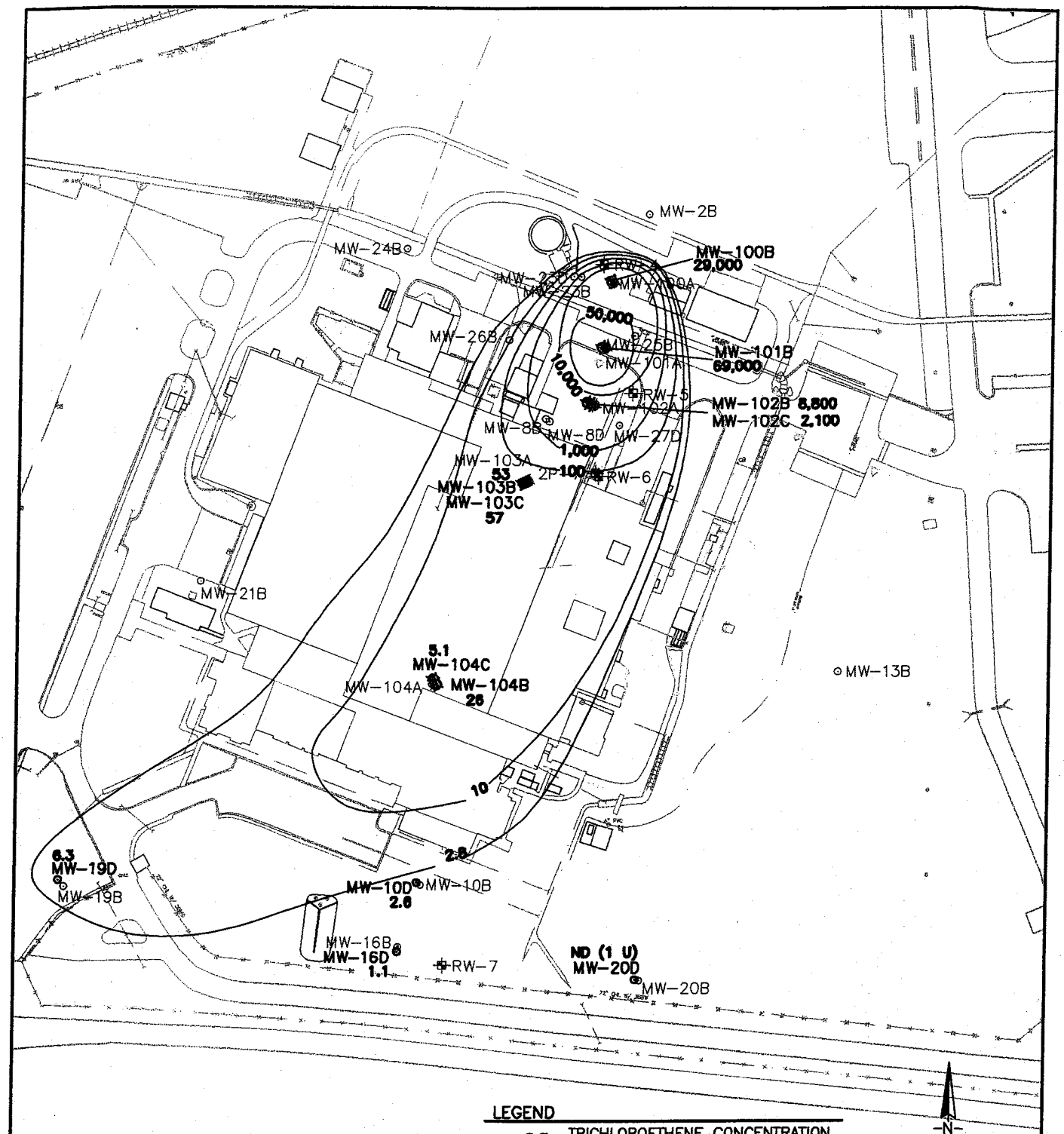
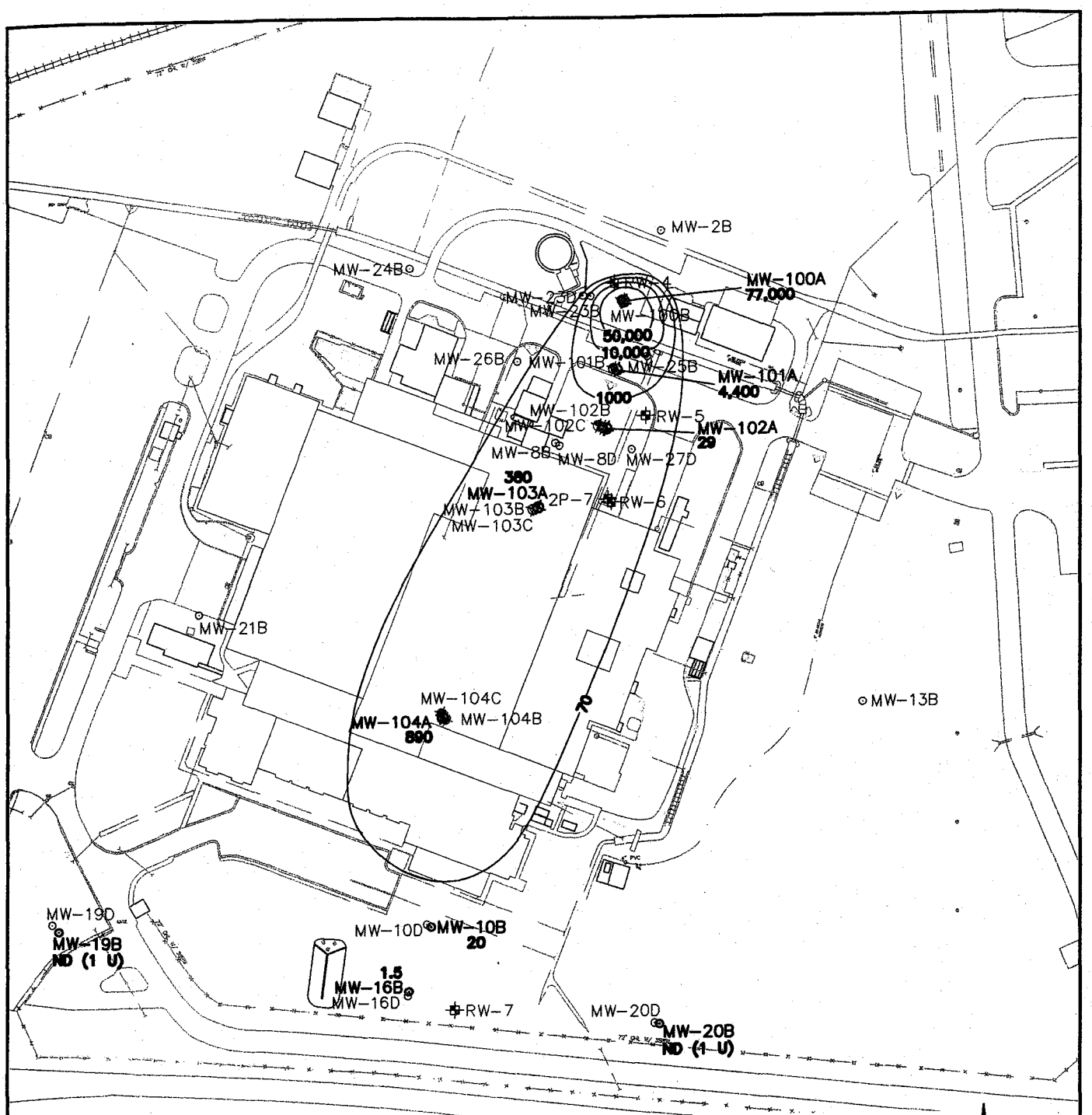


FIGURE 3-8

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

APPROXIMATE EXTENT OF TCE IN THE DEEPER PORTION OF THE AQUIFER
FORMER ABBOTT FACILITY
Laurinburg, North Carolina



LEGEND

470 CIS-1,2-DICHLOROETHENE CONCENTRATION IN GROUNDWATER IN ug/L

ND (0.21 U) NOT DETECTED ABOVE LISTED IN PARENTHESIS

——— INFERRED CONCENTRATION CONTOUR

NOTES:

1. ISOCONTOURS BASED ON WELLS SCREENED AT <25' BELOW GROUND SURFACE.
2. BASED ON SEPTEMBER AND DECEMBER 2005 SAMPLING DATA.
3. CIS-1,2-DICHLOROETHENE 2L STANDARD IS 70 ug/L.

-N-

0 160'

APPROX. SCALE

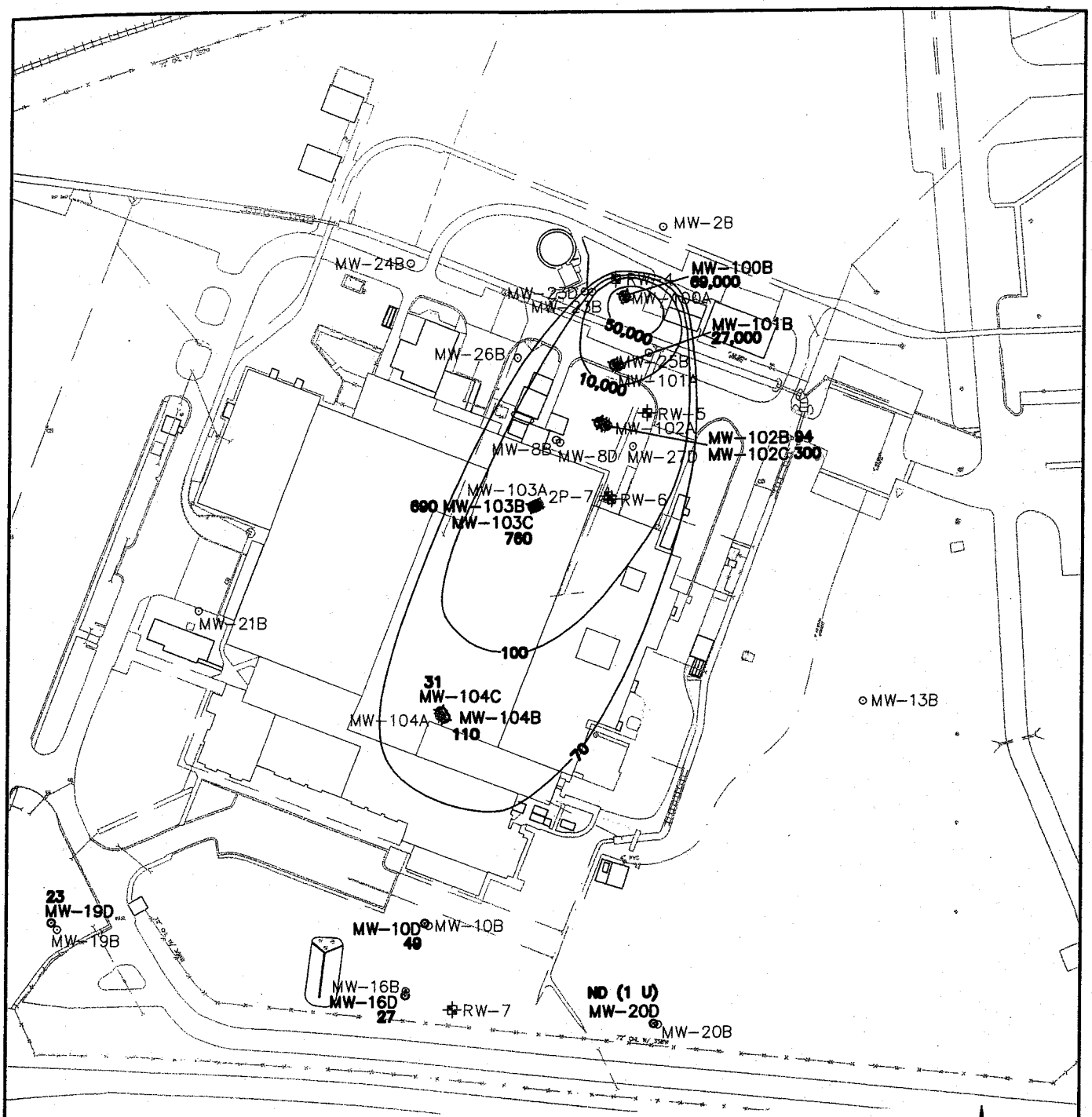
FIGURE 3-9

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

APPROXIMATE EXTENT OF CIS-1,2-DCE IN THE SHALLOW PORTION OF THE AQUIFER

FORMER ABBOTT FACILITY

Laurinburg, North Carolina



LEGEND

26 CIS-1,2-DICHLOROETHENE CONCENTRATION IN GROUNDWATER IN ug/L

ND (1 U) NOT DETECTED ABOVE LISTED IN PARENTHESIS

——— INFERRED CONCENTRATION CONTOUR

NOTES:

1. ISOCONTOURS BASED ON WELLS SCREENED AT >25' BELOW GROUND SURFACE.
2. BASED ON SEPTEMBER AND DECEMBER 2005 SAMPLING DATA.
3. CIS-1,2-DICHLOROETHENE 2L STANDARD IS 70 ug/L.

-N-

0 160'

APPROX. SCALE

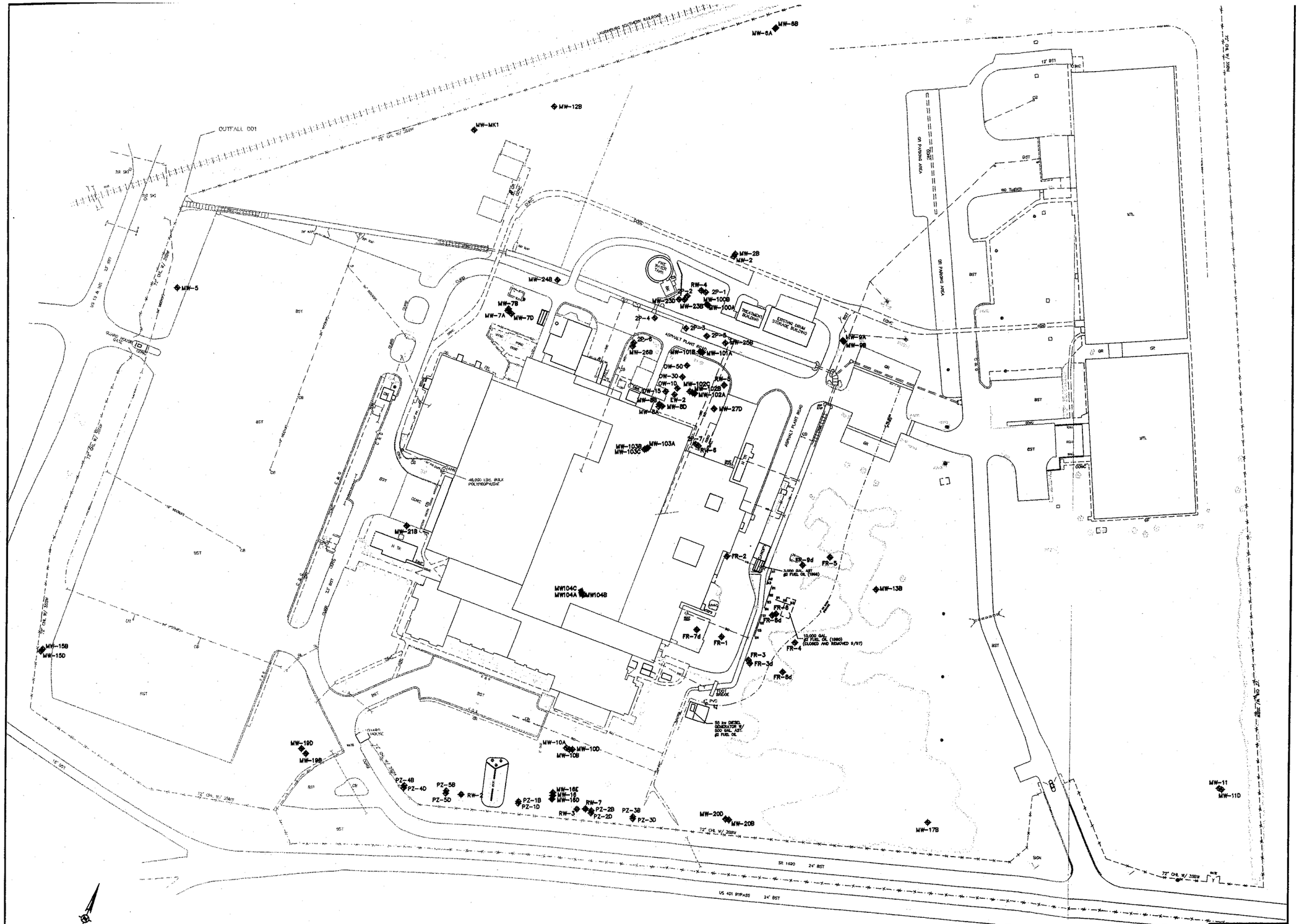
FIGURE 3-10

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

APPROXIMATE EXTENT OF CIS-1,2-DCE IN THE DEEPER PORTION OF THE AQUIFER

FORMER ABBOTT FACILITY

Laurinburg, North Carolina



LEGEND

- ABANDONED WELLS
- ACTIVE WELLS

PHOENIX ENVIRONMENTAL ASSOCIATES, INCORPORATED

FIGURE 4-1

2005 WELL ABANDONMENT LOCATIONS
FORMER ABBOTT FACILITY
Laurinburg, North Carolina

TABLE 1-1

WELL CONSTRUCTION DATA
MW-100 SERIES MONITORING WELLS

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Well ID	Date Installed	Ground Elevation (MSL)	TOC Elevation (MSL)	Screening Interval From Surface (in ft)			Total Well Depth From Surface (in ft)	Casing Diameter (in inches)
MW-100A	8-Oct-2002	229.36	228.86	20	-	30	30	2
MW-100B	7-Oct-2002	229.42	228.92	35	-	45	45	2
MW-101A	11-Oct-2002	228.68	228.18	20	-	30	30	2
MW-101B	11-Oct-2002	228.67	228.17	35	-	45	45	2
MW-102A	11-Oct-2002	230.06	229.56	20	-	30	30	2
MW-102B	10-Oct-2002	229.97	229.47	35	-	45	45	2
MW-102C	10-Oct-2002	230.04	229.54	55	-	65	65	2
MW-103A	9-Oct-2002	231.08	230.58	20	-	30	30	2
MW-103B	8-Oct-2002	231.08	230.58	35	-	45	45	2
MW-103C	9-Oct-2002	231.10	230.60	55	-	65	65	2
MW-104A	5-Jun-2004	231.08	230.58	2	-	12	12	2
MW-104B	5-Jun-2004	231.09	230.59	35	-	45	45	2
MW-104C	5-Jun-2004	231.06	230.56	63.5	-	73.5	74	2

Key:
ft = feet
MSL = Mean Sea Level
TOC = Top of casing

TABLE 1-2

DECEMBER 2005 MONITORING WELL PURGING AND FIELD PARAMETER DATA
(Page 1 of 2)

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NC

Monitoring Well Location	Time	Cumulative Purge Volume (in gallons)	Stabilization Measurements: pH (Standard Units)	Stabilization Measurements: Conductivity (in mmhos/cm)	Stabilization Measurements: Turbidity (in NTU)	ABI Measurements: Dissolved Oxygen (in mg/L)	ABI Measurements: Oxidation Reduction Potential (in mV)	Additional Parameters: Temperature (in °C)
MW-100A	1426	--	5.75	0.995	98.0	4.13	-36	22.6
	1458	4.2	5.79	1.11	72.8	4.92	-30	22.7
	1500	4.3	5.74	1.13	64.1	4.57	-30	22.0
	1502	4.4	5.75	1.15	67.4	4.53	-29	21.7
	Final	4.5	5.72	1.16	65.2	4.57	-29	21.8
MW-100B	1343	--	5.64	0.983	999+	5.17	-28	22.0
	1430	6.4	5.63	0.962	71.6	2.11	-75	24.3
	1432	6.5	5.63	0.974	51	1.95	-75	23.8
	1434	6.6	5.63	0.981	90.7	1.85	-75	23.6
	1436	6.8	5.62	0.979	92.1	1.80	-76	23.6
	Final	6.9	5.61	0.983	96.3	1.82	-77	23.6
MW-101A	1300	--	5.71	0.329	401	1.83	-20	22.0
	1312	3.7	5.75	0.333	408	1.81	-25	22.2
	1315	3.8	5.75	0.330	539	1.80	-24	22.1
	1317	3.9	5.75	0.321	533	1.79	-25	22.0
	1319	4.1	5.78	0.313	46	1.77	-26	22.1
	Final	4.5	5.78	0.318	59	1.73	-28	22.2
MW-101B	1144	--	5.14	0.230	999+	2.38	83	22.8
	1233	6.0	4.67	0.240	999+	5.02	89	23.8
	1235	6.2	4.65	0.247	999+	4.46	104	23.7
	1237	6.3	4.59	0.249	999+	4.16	100	23.7
	1239	6.4	4.58	0.245	999+	2.97	101	23.8
	1242	6.5	4.57	0.244	999+	2.36	102	23.6
	Final	NM	4.54	0.246	999+	2.21	108	23.8
MW-102A	1540	--	5.06	0.049	25.6	8.08	93	22.0
	1612	3.9	5.10	0.050	25.8	7.97	90	21.3
	16614	4.1	5.10	0.050	24.7	7.95	89	21.2
	1616	4.2	5.10	0.050	25.7	7.93	90	21.0
	1618	4.4	5.10	0.049	24.2	7.91	89	21.0
	Final	4.5	5.09	0.050	22.5	7.91	90	21.0
MW-102B	1400	--	5.93	0.146	60.5	2.08	-1	21.3
	1410	5.8	5.93	0.148	50.3	1.87	-18	20.5
	1412	5.9	5.93	0.149	49.9	1.88	-20	20.4
	1414	6	5.94	0.150	49.4	2.05	-22	20.4
	Final	6.2	5.94	0.151	48.4	2.47	-24	20.3
MW-102C	1525	--	5.81	0.184	23.5	7.50	-17	21.6
	1637	9.3	6.15	0.295	22.9	1.55	-81	22.4
	1639	9.4	6.15	0.297	22.7	1.57	-85	22.4
	1641	9.5	6.15	0.300	22.9	1.55	-87	22.4
	1643	9.7	6.15	0.300	22.4	1.53	-89	22.4
	Final	10.0	6.14	0.302	20.3	1.53	-88	22.4

TABLE 1-2

DECEMBER 2005 MONITORING WELL PURGING AND FIELD PARAMETER DATA
(Page 2 of 2)

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NC

Monitoring Well Location	Time	Cumulative Purge Volume (in gallons)	Stabilization Measurements: pH (Standard Units)	Stabilization Measurements: Conductivity (in mmhos/cm)	Stabilization Measurements: Turbidity (in NTU)	ABI Measurements: Dissolved Oxygen (in mg/L)	ABI Measurements: Oxidation Reduction Potential (in mV)	Additional Parameters: Temperature (in °C)
MW-103A	830	--	6.50	0.188	135	8.21	-49	23.5
	840	3.2	6.54	0.196	101	8.29	-61	23.6
	842	3.6	6.55	0.158	94	8.17	-62	23.2
	844	3.8	6.56	0.199	106	8.13	-64	23.1
	846	4.1	6.55	0.149	94	8.14	-63	23.0
	848	NM	6.55	0.148	93	8.09	-64	23.0
MW-103B	925	--	6.45	0.211	135	4.47	-69	23.9
	940	6.2	6.49	0.216	85	4.10	-73	23.8
	942	6.3	6.50	0.221	82.3	3.77	-74	22.7
	944	6.4	6.50	0.224	78.7	3.64	-74	22.4
	Final	6.5	6.51	0.223	73.4	3.60	-74	22.3
MW-103C	0800	--	6.14	0.100	85.4	2.81	25	25.1
	0912	9.3	5.86	0.104	82	4.16	54	24.6
	0914	9.4	5.83	0.103	82.5	4.3	57	24.6
	0916	9.5	5.83	0.104	79.9	4.38	56	24.6
	Final	9.7	5.84	0.105	78.8	4.42	56	24.5
MW-104A	1010	--	5.80	0.196	56	4.06	68	24.3
	1017	1	6.05	0.227	45	4.31	37	23.7
	1019	1.1	6.11	0.224	103	3.6	26	23.3
	1021	1.3	6.17	0.234	47	350.00	16	23.2
	Final	1.5	6.26	0.290	43	3.58	-2	23.1
MW-104B	1030	--	4.93	0.072	89	2.99	208	22.9
	1116	6	4.91	0.072	108	3.31	210	22.8
	1118	6.2	4.91	0.072	94	3.47	212	22.8
	1120	6.4	4.91	0.073	86	3.55	213	22.8
	Final	6.7	4.90	0.073	79	3.60	213	22.7
MW-104C	955	--	5.42	0.042	148	4.34	93	25.4
	1113	11.0	4.12	0.039	61	4.11	189	26.2
	1115	11.2	5.13	0.039	62	3.77	190	25.4
	1117	11.4	5.13	0.040	61	3.69	191	25.3
	Final	11.6	5.15	0.040	60.4	3.64	191	25.2

Key:

mmhos/cm = millisiemens per cemtimeter
NTU = nephelometric turbidity units
mg/L = milligrams per liter
mV = millivolts
°C = degrees Centigrade
ABI = Aquifer bioremediation indicator

TABLE 1-3

GROUNDWATER SAMPLE ANALYTICAL PARAMETERS, METHODS, SAMPLE CONTAINERS, AND PRESERVATION REQUIREMENTS

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NC

Sample Collection Order	*Parameter*	*Analytical Method*	*Number of Sample Containers*	*Sample Container Type*	*Sample Preservation*
1	Volatile Organic Compounds	SW-846 8260B [1]	3	40 ml glass	HCl [2]
2	Methane/ethane/ethene	EPA RSK-175	3	40 ml glass	HCl [2]
3	Total Organic Carbon	415.1 [3]		1 L HPDE	H_2SO_4 [2]

Key:

ml = milliliters

HCl = hydrogen chloride

H_2SO_4 = sulfuric acid

NaOH = sodium hydroxide

Notes:

[1] *Test Methods for Evaluating Solid Waste*, Third Edition, U.S. EPA; 13 June 1997 (62 FR 32452)

[2] pH of samples will be field tested prior to shipment by testing pH of sample collected in a separate preserved sample container that is not sent for shipment. If needed, the pH of the sample will be field adjusted by adding additional preservative prior to collection of the laboratory sample.

[3] *Methods for Determination of Inorganic Substances In Environmental Samples*; U.S. EPA; August 1993 (600/R-93/100)

TABLE 1-4

DECEMBER 2005 WATER LEVEL ELEVATIONS

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Monitoring Well Identification	Top of Casing Elevation (ft MSL)	Depth to Water from TOC (ft)	Water Level Elevation (ft MSL)
MW-100A	228.86	5.10	223.76
MW-100B	228.92	6.72	222.20
MW-101A	228.18	6.98	221.20
MW-101B	228.17	7.95	220.22
MW-102A	229.56	5.62	223.94
MW-102B	229.47	7.85	221.62
MW-102C	229.54	8.50	221.04
MW-103A	230.58	6.25	224.33
MW-103B	230.58	8.48	222.10
MW-103C	230.6	9.41	221.19
MW-104A	230.58	6.40	224.18
MW-104B	230.59	7.82	222.77
MW-104C	230.56	9.70	220.86

Key:
ft = feet
MSL = Mean Sea Level
TOC = Top of casing
NR = not recorded

TABLE 1-5

SUMMARY OF PHASES I AND II OXIDATION/REDUCTION POTENTIAL GROUNDWATER DATA

PHASE I AND II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING FORMER ABBOTT FACILITY LAURINBURG, NORTH CAROLINA

Monitoring Well Location	ORP (in millivolts)											
	Oct-02	Feb-03	Apr-03	Jun-03	Sep-03	Dec-03	May-04	Sep-04	Dec-04	Mar-05	Jun-05	Dec-05
MW-100A	115	-177	-135	-17	-220	64	69	92	102	-88	-56	-29
MW-100B	173	-176	-114	-48	-192	106	88	199	180	-61	-30	-76
MW-101A	274	246	69	240	-117	118	97	173	169	66	-42	-26
MW-101B	278	102	39	28	-127	118	100	171	169	149	-76	104
MW-102A	343	185	24	225	-157	124	100	124	119	NM	-42	90
MW-102B	105	-173	44	-26	-209	118	100	108	91	NM	-43	-22
MW-102C	120	134	-156	-182	-223	83	17	107	108	NM	-32	-88
MW-103A	121	160	-83	-97	186	86	5	84	166	NM	-158	-64
MW-103B	70	39	-70	-108	200	60	18	79	133	NM	-119	-74
MW-103C	177	81	-76	-97	187	67	21	120	48	NM	-27	56
MW-104A	NM	NM	NM	NM	NM	NM	NM	-4	324	NM	-107	13
MW-104B	NM	NM	NM	NM	NM	NM	NM	147	139	NM	-124	213
MW-104C	NM	NM	NM	NM	NM	NM	NM	211	65	NM	-80	191

Key:
ORP = Oxidation Reduction Potential
NM = Not measured

Notes:
ORP readings based on average of final three field measurements, which represent stabilized groundwater conditions.
Monitoring wells MW-104A, B, C were installed in June 2004.

TABLE 1-6

DECEMBER 2005 MW-100 SERIES WELL VOLATILE ORGANIC COMPOUND ANALYTICAL RESULTS
(Page 1 of 2)

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NC

Parameter (in µg/L)	Remediation Goal [1]	MW-100A 12/19/2005	MW-100B 12/19/2005	MW-101A 12/19/2005	MW-101B 12/19/2005	MW-101BDP 12/19/2005	MW-102A 12/19/2005	MW-102B 12/20/2005	MW-102C 12/19/2005	MW-103A 12/20/2005	MW-103B 12/20/2005	MW-103C 12/20/2005	MW-104A 12/20/2005	MW-104B 12/20/2005	MW-104BDP 12/20/2005	MW-104C 12/20/2005	TRIP BLANK 12/19/2005
Dichlorodifluoromethane	1,400	500 U	500 U	500 U	500 U	500 U	1.6	50 U	5.8	5 U	38	37	99	16	16	2	1 U
Chloromethane	2.6	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Vinyl chloride	0.015	380 J	500 U	500 U	500 U	500 U	1 U	50 U	5 U	8.7	27	16	10 U	10 U	10 U	1 U	1 U
Bromomethane	NE	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Chloroethane	2800	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Trichlorofluoromethane	2,100	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,1-Dichloroethene	7	500 U	1,500	500	1,000	1,300	2.2	170	46	6.4	41	25	15	10 U	10 U	1 U	1 U
Trichlorotrifluoroethane	210,000	23,000 J	39,000	37,000	31,000	35,000	580	9,500	1,000	1,900	12,000	7,600	3,400	1,900	1,800	220	1 U
Carbon disulfide	700	2500 U	2500 U	2500 U	2500 U	2500 U	5 U	250 U	25 U	25 U	25 U	50 U	50 U	50 U	50 U	5 U	5 U
Acetone	700	2500 U	2500 U	2500 U	2500 U	2500 U	5 U	250 U	25 U	25 U	25 U	50 U	50 U	50 U	50 U	5 U	5 U
Methylene chloride	4.6	4,700	27,000	1,500	3,700	4,500	1.6	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
trans-1,2-Dichloroethene	100	1,800	1,200	500 U	500 U	500 U	1 U	50 U	5 U	5.7	6.7	10 U	10 U	10 U	10 U	1 U	1 U
Methyl-tert-butyl-ether (MTBE)	200	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	14	13	1.3	1 U
1,1-Dichloroethane	70	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
2,2-Dichloropropane	NE	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
cis-1,2-Dichloroethene	70	77,000	69,000	4,400	23,000	27,000	29	94	300	380	690	760	890	110	100	31	1 U
2-Butanone (MEK)	4,200	6,000	2500 U	2500 U	2500 U	2500 U	8.2	250 U	25 U	25 U	25 U	50 U	50 U	50 U	50 U	5 U	5 U
Bromochloromethane	NE	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Chloroform	70	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,1,1-Trichloroethane	200	4,300 J	3,300 J	8,200	5,300	6,200	2.8	200	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,1-Dichloropropene	NE	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Carbon tetrachloride	0.269	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Benzene	1	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,2-Dichloroethane	0.38	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Trichloroethene	2.8	14,000	29,000	91,000	69,000	64,000	44	8,800	2,100	23	53	57	10 U	26	23	5.1	1 U
1,2-Dichloropropane	0.51	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Dibromomethane	NE	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Bromodichloromethane	0.56	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
cis-1,3-Dichloropropene	0.19	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
4-Methyl-2-pentanone (MIBK)	NE	2500 U	2500 U	2500 U	2500 U	2500 U	5 U	250 U	25 U	25 U	25 U	50 U	50 U	50 U	50 U	5 U	5 U
Toluene	1000	5,400	5,300	4,100	3,400	3,900	4.4	150 J	8.3 J	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
trans-1,3-Dichloropropene	0.19	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,1,2-Trichloroethane	5	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Tetrachloroethene	0.7	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,3-Dichloropropane	NE	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
2-Hexanone	280	2500 U	2500 U	2500 U	2500 U	2500 U	5 U	250 U	25 U	25 U	25 U	50 U	50 U	50 U	50 U	5 U	5 U
Dibromochloromethane	0.41	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,2-Dibromoethane (EDB)	0.0004	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Chlorobenzene	50	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,1,1,2-Tetrachloroethane	NE	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Ethylbenzene	550	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U

TABLE 1-6

DECEMBER 2005 MW-100 SERIES WELL VOLATILE ORGANIC COMPOUND ANALYTICAL RESULTS
(Page 2 of 2)

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NC

Parameter (in µg/L)	Remediation Goal [1]	MW-100A 12/19/2005	MW-100B 12/19/2005	MW-101A 12/19/2005	MW-101B 12/19/2005	MW-101BDP 12/19/2005	MW-102A 12/19/2005	MW-102B 12/20/2005	MW-102C 12/19/2005	MW-103A 12/20/2005	MW-103B 12/20/2005	MW-103C 12/20/2005	MW-104A 12/20/2005	MW-104B 12/20/2005	MW-104BDP 12/20/2005	MW-104C 12/20/2005	TRIP BLANK 12/19/2005
m&p-Xylenes	530	1000 U	1000 U	1000 U	1000 U	1000 U	2 U	100 U	10 U	10 U	10 U	20 U	20 U	20 U	20 U	2 U	2 U
o-Xylene	530	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Styrene	100	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Bromoform	4.43	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Isopropylbenzene	70	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Bromobenzene	NE	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,1,2,2-Tetrachloroethane	0.17	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,2,3-Trichloropropane	0.005	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
n-Propylbenzene	70	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
2-Chlorotoluene	140	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,3,5-Trimethylbenzene	350	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
4-Chlorotoluene	NE	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
tert-Butylbenzene	70	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,2,4-Trimethylbenzene	350	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
sec-Butylbenzene	70	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,3-Dichlorobenzene	170	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
p-Isopropyltoluene	NE	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,4-Dichlorobenzene	1.4	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
n-Butylbenzene	70	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,2-Dichlorobenzene	24	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,2-Dibromo-3-chloropropane	0.2	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,2,4-Trichlorobenzene	70	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Hexachlorobutadiene	0.44	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Naphthalene	21	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
1,2,3-Trichlorobenzene	NE	500 U	500 U	500 U	500 U	500 U	1 U	50 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	1 U	1 U
Vinyl acetate	NE	2500 U	2500 U	2500 U	2500 U	2500 U	5 U	250 U	25 U	25 U	25 U	50 U	50 U	50 U	50 U	5 U	5 U
Tentatively Identified Compounds [2]							NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Heptane	2,100			1,300													

Key:
ug/L = micrograms per liter
NE = Not Established
NA = Not analyzed
U = Constituent not detected at a concentration above the reported value
J = Estimated concentration
UJ = Constituent not detected at a concentration above the estimated reported value
[redacted] = Indicates that the detected concentration exceeds the Remediation Goal

Notes:
[1] Remediation goals development procedures are presented in the *Remedial Action Plan Amendment*, approved by the North Carolina Department of Environment and Natural Resources on 15 October 2002. Remediation goals updated to reflect April 2005 revisions to 15A NCAC 2L. Remediation goals have not been developed for the constituents that are listed as "NE".
[2] Only detected Tentatively Identified Compounds are reported.

TABLE 1-7

DECEMBER 2005 AQUIFER BIOREMEDIATION INDICATOR PARAMETER ANALYTICAL RESULTS
(Page 1 of 2)

PHASE II IN SITU BIOREMEDIATION GROUNDWATER MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Parameter	Units	Monitoring Locations							
		MW-100A	MW-100B	MW-101A	MW-101B	MW-101BDP	MW-102A	MW-102B	MW-102C
Total Organic Carbon	mg/L	400	430	110	160	150	2.3	23	93
Methane	ug/L	NA	130 J	150 J	41 J	NA	NA	83 J	NA
Ethane	ug/L	NA	33	0.5 U	0.5 U	NA	NA	1.1	NA
Ethene	ug/L	NA	130	1.8	2.4	NA	NA	0.5 U	NA

Key:
ug/L = micrograms per liter
mg/L = millgrams per liter
J = Estimated value
U = Constituent not detected at a concentration above the reported value
NA = Not Analyzed

TABLE 1-7

DECEMBER 2005 AQUIFER BIOREMEDIATION INDICATOR PARAMETER ANALYTICAL RESULTS
(Page 2 of 2)

PHASE II IN SITU BIOREMEDIATION GROUNDWATER MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Parameter	Units	Monitoring Locations						
		MW-103A	MW-103B	MW-103C	MW-104A	MW-104B	MW-104BDP	MW-104C
Total Organic Carbon	mg/L	1.8	1.7	4.3	2.5	1 J	0.94 J	0.68 J
Methane	ug/L	NA	910 J	NA	NA	43 J	NA	NA
Ethane	ug/L	NA	6.6	NA	NA	0.5 U	NA	NA
Ethene	ug/L	NA	43	NA	NA	0.5 U	NA	NA

Key:
ug/L = micrograms per liter
mg/L = millgrams per liter
J = Estimated value
U = Constituent not detected at a concentration above the reported value
NA = Not Analyzed

TABLE 1-8

ESTIMATED TRICHLOROETHENE TOTAL MASS IN PRIMARY PLUME AREA

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

October 2002						June 2005					
Concentration Range [1] (µg/L)		Average Concentration (µg/L)	Cross Sectional Area [1] (feet^2)	Dissolved Mass [2] (lb)	Sorbed Mass [3] (lb)	Concentration Range [1] (µg/L)		Average Concentration (µg/L)	Cross Sectional Area [1] (lb)	Dissolved Mass [2] (lb)	Sorbed Mass [3] (lb)
350,000	400,000	375,000	325	68	43	75,000	100,000	87,500	218	11	7
300,000	350,000	325,000	462	84	53	50,000	75,000	62,500	1,222	43	27
250,000	300,000	275,000	676	104	66	25,000	50,000	37,500	3,839	81	51
200,000	250,000	225,000	1,091	138	87	10,000	25,000	17,500	4,871	48	30
150,000	200,000	175,000	2,360	232	146	7,500	10,000	8,750	1,050	5	3
100,000	150,000	125,000	2,573	181	113	5,000	7,500	6,250	989	3	2
50,000	100,000	75,000	4,894	206	129	2,500	5,000	3,750	1,545	3	2
10,000	50,000	30,000	3,589	61	38	1,000	2,500	1,750	1,439	1	1
5,000	10,000	7,500	0	0	0	750	1,000	875	209	0.1	0.1
1,000	5,000	3,000	0	0	0	500	7,500	4,000	306	1	0.4
500	1,000	750	0	0	0	250	500	375	287	0.1	0.04
				1,075	675					197	123

Summary Statistics:	Oct 2002	Dec 2005
Total Tricholoroethene Mass in Primary Plume Area (in lb):	1,750	320
Net Trichloroethene Mass Loss in Primary Plume Area (in lb):	-	1,430
Percentage Mass Reduction of Trichloroethene in Primary Plume Area:	-	82%

Key:
µg/L =micrograms per liter
feet^2 = square feet
lb =pounds

Notes:

[1] Concentration ranges and Cross-sectional areas calculated using Surfer krigging program.

[2] Dissolved mass for each area was calculated based on the following formula:

Dissolved Mass (lb) = [Trichloroethene] (µg/L) X Cross-Sectional Area (ft^2) X Plume Width (ft) X Porosity X 28.32 L/ft^3 *.002205 lbm/g * 10^{-6} gm/µg

with the following parameters:

Plume Width (ft)	= 30
Soil Matrix Porosity	=0.3

[3] Sorbed mass for each area was calculate based on the following formula:

Sorbed Mass (lb) = [Trichloroethene] (µg/L) X Cross-Sectional Area (ft^2) X Plume Width (ft) XKoc X foc X Soil Bulk Density (gm/cm^3) X 10-9 kg/µg X 0.002205 lbm/gm X 28313cm^3/ft^3

with the following parameters:

Trichloroethene Soil Organic Carbon/Water Partitioning Coefficient (Koc)	=107
Soil Bulk Density (gm/cm^3)	=1.76
Soil Matrix Fraction Organic Content (foc)	=0.001
Plume Width (ft)	= 30

TABLE 1-9

CUMULATIVE ESTIMATED TRICHLOROETHENE TOTAL MASS IN PRIMARY PLUME AREA

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Concentration Range [1] (µg/L)		Average Concentration (µg/L)	October-02			June-03			December-03			May-04			December-04		
			Cross Sectional Area [1] (feet²)	Dissolved Mass [2] (lb)	Sorbed Mass [3] (lb)	Cross Sectional Area [1] (feet²)	Dissolved Mass [2] (lb)	Sorbed Mass [3] (lb)	Cross Sectional Area [1] (feet²)	Dissolved Mass [2] (lb)	Sorbed Mass [3] (lb)	Cross Sectional Area [1] (feet²)	Dissolved Mass [2] (lb)	Sorbed Mass [3] (lb)	Cross Sectional Area [1] (feet²)	Dissolved Mass [2] (feet²)	Sorbed Mass [3] (feet²)
350,000	400,000	375,000	325	68	43	0	0	0	0	0	0	0	0	0	0	0	0
300,000	350,000	325,000	462	84	53	0	0	0	0	0	0	0	0	0	0	0	0
250,000	300,000	275,000	676	104	66	0	0	0	0	0	0	0	0	0	0	0	0
200,000	250,000	225,000	1,091	138	87	0	0	0	0	0	0	0	0	0	0	0	0
150,000	200,000	175,000	2,360	232	146	0	0	0	0	0	0	359	35	22	0	0	0
100,000	150,000	125,000	2,573	181	113	1,202	84	53	0	0	0	1,402	98	62	0	0	0
50,000	100,000	75,000	4,894	206	129	5,878	248	155	4,877	206	129	4,649	196	123	2,383	100	63
10,000	50,000	30,000	3,589	61	38	8,217	139	87	10,052	169	106	7,005	118	74	9,954	168	105
5,000	10,000	7,500	0	0	0	379	2	1	623	3	2	1,087	5	3	2,313	10	6
1,000	5,000	3,000	0	0	0	299	0.5	0.3	418	1	0.4	1,381	2	1	1,320	2	1
500	1,000	750	0	0	0		0	0	0	0	0	87	0.04	0.02	0	0	0
				1,075	675		473	297		378	237		455	285		280	176
TOTAL TCE MASS IN PRIMARY PLUME AREA (in lbs):					1,750			770			616			740			456

Concentration Range [1] (µg/L)		Average Concentration (µg/L)	June-05			December-05		
			Cross Sectional Area [1] (feet²)	Dissolved Mass [2] (feet²)	Sorbed Mass [3] (feet²)	Cross Sectional Area [1] (feet²)	Dissolved Mass [2] (feet²)	Sorbed Mass [3] (feet²)
75,000	100,000	87,500	25	1	1	218	11	7
50,000	75,000	62,500	1,172	41	26	1,222	43	27
25,000	50,000	37,500	4,464	94	59	3,839	81	51
10,000	25,000	17,500	5,064	50	31	4,871	48	30
7,500	10,000	8,750	1,167	6	4	1,050	5	3
5,000	7,500	6,250	1,357	5	3	989	3	2
2,500	5,000	3,750	1,374	3	2	1,545	3	2
1,000	2,500	1,750	703	1	0.4	1,439	1	0.9
750	1,000	875	649	0.3	0.2	209	0.1	0.1
500	7,500	4,000	0	0	0	306	1	0.4
250	500	375	0	0	0	287	0.1	0.04
				201	126		197	123
					327			320

Key:
µg/L =micrograms per liter
feet² = square feet

Notes:
[1] Concentration ranges and Cross-sectional areas calculated using Surfer krigging program.
[2] Dissolved mass for each area was calculated based on the following formula:

Dissolved Mass (lb) = [Trichloroethene] (µg/L) X Cross-Sectional Area (ft²) X Plume Width (ft) X Porosity X 28.32 L/ft³ *.002205 lbm/g * 10^{-6} gm/µg

with the following parameters:
Plume Width (ft) = 30
Soil Matrix Porosity =0.3

[3] Sorbed mass for each area was calculate based on the following formula:

Sorbed Mass (lb) = [Trichloroethene] (µg/L) X Cross-Sectional Area (ft²) X Plume Width (ft) XKoc X foc X Soil Bulk Density (gm/cm³) X 10-9 kg/µg X 0.002205 lbm/gm X 28313cm³/ft³

with the following parameters:
Trichloroethene Soil Organic Carbon/Water Partitioning Coefficient (Koc) =107
Soil Bulk Density (gm/cm³) =1.76
Soil Matrix Fraction Organic Content (foc) =0.001
Plume Width (ft) = 30

TABLE 1-10

CUMULATIVE TCE AND DAUGHTER COMPOUND MOLAR CONCENTRATIONS
(Page 1 of 5)

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Parameter	Molecular Weight (in µgrams/µmole)	Molar Concentrations (in µmole/L) MW-100A										
		Oct-02	Feb-03	Apr-03	Jun-03	Sep-03	Dec-03	May-04	Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	0	0	0	0	0	0	0.3	0	0.4	0	0
Trichloroethene	131	1,145	916	916	763	626	534	244	282	137	115	107
cis-1,2-Dichloroethene	97	155	144	144	186	196	299	320	567	680	649	794
Vinyl chloride	63	0	0	0	0	0	0	0	0	2	2	6
Ethene	26	0.7	1.8	0.8	NA	1.5	2.0	0	NA	NA	NA	NA
Total Molar Concentration of Constituents & End Products		1,300	1,062	1,061	949	823	835	564	849	820	767	907

Parameter	Molecular Weight (in µgrams/µmole)	Molar Concentrations (in µmole/L) MW-100B										
		Oct-02	Feb-03	Apr-03	Jun-03	Sep-03	Dec-03	May-04	Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	0	0	0	0	0	0	1.2	0	0.0	0	0
Trichloroethene	131	1,450	1,221	496	916	916	763	748	382	489	328	221
cis-1,2-Dichloroethene	97	124	103	155	144	196	309	464	608	608	423	711
Vinyl chloride	63	0	0	0	0	0	0	0	0	0	0	0
Ethene	26	0.4	1.0	0.3	NA	0.8	1.2	1	1	1	1	5
Total Molar Concentration of Constituents & End Products		1,574	1,325	651	1,060	1,113	1,074	1,215	991	1,098	752	938

Parameter	Molecular Weight (in µgrams/µmole)
Tetrachloroethene	166
Trichloroethene	131
cis-1,2-Dichloroethene	97
Vinyl chloride	63
Ethene	26
Total Molar Concentration of Constituents & End Products	

Key:
NA = Not analyzed
µgrams/µmole = micrograms per micromole
µmole/L =micromoles per liter

Notes:
1 Values not detected above the reporting limit of the constituent are listed as "0" moles/liter.

TABLE 1-10

CUMULATIVE TCE AND DAUGHTER COMPOUND MOLAR CONCENTRATIONS
(Page 2 of 5)

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Parameter	Molecular Weight (in µgrams/µmole)	Molar Concentrations (in µmole/L) MW-101A										
		Oct-02	Feb-03	Apr-03	Jun-03	Sep-03	Dec-03	May-04	Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	3	0	4	0	0	0	0.0	0	0.0	1	0
Trichloroethene	131	2,977	2,061	1,908	840	756	557	1,450	763	580	473	695
cis-1,2-Dichloroethene	97	8	0	0	4	5	6	27	12	8	10	45
Vinyl chloride	63	0	0	0	0	0	0	0	0	0	0	0
Ethene	26	NA	NA	NA	NA	NA	NA	NA	0	0	0	0
Total Molar Concentration of Constituents & End Products		2,988	2,061	1,912	843	761	563	1,477	776	588	485	740

Parameter	Molecular Weight (in µgrams/µmole)	Molar Concentrations (in µmole/L) MW-101B										
		Oct-02	Feb-03	Apr-03	Jun-03	Sep-03	Dec-03	May-04	Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	2	0	0	0	0	0	0.0	0	0.9	0	0
Trichloroethene	131	2,901	916	1,069	992	992	718	1,145	710	756	603	527
cis-1,2-Dichloroethene	97	10	7	9	0	12	12	13	22	24	103	278
Vinyl chloride	63	0	0	0	0	0	0	0	0	0	0	0
Ethene	26	0.0	0.0	0.0	0	0.0	0.0	0	0	0	0	0
Total Molar Concentration of Constituents & End Products		2,913	923	1,078	992	1,005	730	1,158	732	780	706	805

Parameter	Molecular Weight (in µgrams/µmole)
Tetrachloroethene	166
Trichloroethene	131
cis-1,2-Dichloroethene	97
Vinyl chloride	63
Ethene	26
Total Molar Concentration of Constituents & End Products	

Key:
NA = Not analyzed
µgrams/µmole = micrograms per micromole
µmole/L =micromoles per liter

Notes:
1 Values not detected above the reporting limit of the constituent are listed as "0" moles/liter.

TABLE 1-10

CUMULATIVE TCE AND DAUGHTER COMPOUND MOLAR CONCENTRATIONS
(Page 3 of 5)

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Parameter	Molecular Weight (in μgrams/μmole)	Molar Concentrations (in μmole/L) MW-102A										
		Oct-02	Feb-03	Apr-03	Jun-03	Sep-03	Dec-03	May-04	Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	0	0	0	0	0	0	0	0	0	0	0
Trichloroethene	131	47	27	9.2	5.8	13	0.2	0.3	0.2	0.2	0.1	0.3
cis-1,2-Dichloroethene	97	1	1	0	0.1	1	0	0	0	0	0.1	0.3
Vinyl chloride	63	0	0	0	0	0	0	0	0	0	0	0
Ethene	26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Molar Concentration of Constituents & End Products		48	28	9	6	14	0.2	0.3	0.2	0.2	0.2	1

Parameter	Molecular Weight (in μgrams/μmole)	Molar Concentrations (in μmole/L) MW-102B										
		Oct-02	Feb-03	Apr-03	Jun-03	Sep-03	Dec-03	May-04	Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	0	0	0	0	0	0	0	0	0	0	0
Trichloroethene	131	56	237	84	130	107	69	84	76	76	42	67
cis-1,2-Dichloroethene	97	1	0	0	0	0.8	0.6	0	0.5	0.6	0.3	1.0
Vinyl chloride	63	0	0	0	0	0	0	0	0	0	0	0
Ethene	26	0	0	0	NA	0	0	0	0	0	0	0
Total Molar Concentration of Constituents & End Products		57	237	84	130	108	70	84	77	77	42	68

Parameter	Molecular Weight (in μgrams/μmole)	Molar Concentrations (in μmole/L) MW-102C										
		Oct-02	Feb-03	Apr-03	Jun-03	Sep-03	Dec-03	May-04	Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	0	0	0.04	0	0	0	0	0	0	0	0
Trichloroethene	131	61	32	16	7.0	20	18	21	27	28	30	16
cis-1,2-Dichloroethene	97	0.9	4	3.9	1.3	1	2	2	2.2	2.3	2	3
Vinyl chloride	63	0	0	0	0	0	0	0	0	0	0	0
Ethene	26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Molar Concentration of Constituents & End Products		62	36	20	8	21	20	23	29	31	32	19

Key:
NA = Not analyzed
μgrams/μmole = micrograms per micromole
μmole/L =micromoles per liter

Notes:
1 Values not detected above the reporting limit of the constituent are listed as "0" moles/liter.

TABLE 1-10

CUMULATIVE TCE AND DAUGHTER COMPOUND MOLAR CONCENTRATIONS
(Page 4 of 5)

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Parameter	Molecular Weight (in µgrams/µmole)	Molar Concentrations (in µmole/L) MW-103A										
		Oct-02	Feb-03	Apr-03	Jun-03	Sep-03	Dec-03	May-04	Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	0.004	0	0	0	0	0	0	0	0	0	0
Trichloroethene	131	0.3	0	0	1	2	1	0	0.2	0.8	0.3	0.2
cis-1,2-Dichloroethene	97	0.9	3	6	7	10	11	19	40	18	7.4	3.9
Vinyl chloride	63	0	0	0	0	1	1	1	0.6	0	0.3	0.1
Ethene	26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Molar Concentration of Constituents & End Products		1	3	6	8	13	13	20	41	18	8.0	4.2

Parameter	Molecular Weight (in µgrams/µmole)	Molar Concentrations (in µmole/L) MW-103B										
		Oct-02	Feb-03	Apr-03	Jun-03	Sep-03	Dec-03	May-04	Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	0	0	0	0	0	0	0	0	0	0	0
Trichloroethene	131	0	1	10	0.5	1	1	1	0	0.6	0.5	0.4
cis-1,2-Dichloroethene	97	1	2	2	6	8	6	10	22	10	7	7
Vinyl chloride	63	0	0	0	0	0	0	0	0	0	0.4	0.4
Ethene	26	NA	NA	NA	NA	NA	NA	NA	0	0.2	0	2
Total Molar Concentration of Constituents & End Products		1	2	12	7	9	7	11	22	11	8	10

Parameter	Molecular Weight (in µgrams/µmole)	Molar Concentrations (in µmole/L) MW-103C										
		Oct-02	Feb-03	Apr-03	Jun-03	Sep-03	Dec-03	May-04	Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	0.003	0	0	0	0	0	0	0	0	0	0
Trichloroethene	131	0.3	2.1	3.8	1.1	4.2	0.5	0.6	0.5	0.5	0.4	0.4
cis-1,2-Dichloroethene	97	3.1	3.0	5.2	5.3	5.4	5.2	6.7	10	10.3	7.1	7.8
Vinyl chloride	63	0	0	0	0	0	0	0	0	0.4	0.3	0.3
Ethene	26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Molar Concentration of Constituents & End Products		3	5	9	6	10	6	7	10	11	8	9

Key:
NA = Not analyzed
µgrams/µmole = micrograms per micromole
µmole/L =micromoles per liter

Notes:
1 Values not detected above the reporting limit of the constituent are listed as "0" moles/liter.

TABLE 1-10

CUMULATIVE TCE AND DAUGHTER COMPOUND MOLAR CONCENTRATIONS
(Page 5 of 5)

PHASE II IN SITU BIOREMEDIATION GROUNDWATER PERFORMANCE MONITORING
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Parameter	Molecular Weight (in μgrams/μmole)	Molar Concentrations (in μmole/L) MW-104A			
		Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	0	0	0	0
Trichloroethene	131	0	0	0.02	0
cis-1,2-Dichloroethene	97	5	5	5	9
Vinyl chloride	63	0	0	0.05	0
Ethene	26	NA	NA	NA	NA
Total Molar Concentration of Constituents & End Products		4.8	5.1	4.7	9.2

Parameter	Molecular Weight (in μgrams/μmole)	Molar Concentrations (in μmole/L) MW-104B			
		Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	0	0	0	0
Trichloroethene	131	0.1	0.1	0.1	0.2
cis-1,2-Dichloroethene	97	0.8	0.8	0.6	1.1
Vinyl chloride	63	0	0	0	0
Ethene	26	0	0	0	0
Total Molar Concentration of Constituents & End Products		0.9	0.9	0.7	1.3

Parameter	Molecular Weight (in μgrams/μmole)	Molar Concentrations (in μmole/L) MW-104C			
		Sep-04	Dec-04	Jun-05	Dec-05
Tetrachloroethene	166	0	0	0	0
Trichloroethene	131	0.04	0.09	0.03	0.04
cis-1,2-Dichloroethene	97	0.5	0.2	0.38	0.32
Vinyl chloride	63	0	0	0	0
Ethene	26	NA	NA	NA	NA
Total Molar Concentration of Constituents & End Products		0.5	0.3	0.4	0.4

Key:

NA = Not analyzed

μgrams/μmole = micrograms per micromole

μmole/L =micromoles per liter

Notes:

1 Values not detected above the reporting limit of th

TABLE 2-1

SUMMARY OF 3rd and 4th QUARTERS 2005 O and M AND MONITORING ACTIVITIES

SOUTH GROUNDWATER INTERCEPTOR SYSTEM
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

	Date	Event	Comment
Operation	July-05	South groundwater intercept system uptime was 100%.	None.
	August-05	South groundwater intercept system uptime was 100%.	None.
	September-05	South groundwater intercept system uptime was 100%.	RW-7 pump controls required adjustments to reduce flow to 7 gpm due to low water table.
	October-05	South groundwater intercept system uptime was 100%.	None.
	November-05	South groundwater intercept system uptime was 100%.	None.
	December-05	South groundwater intercept system uptime was 100%.	None.
Maintenance	7/25/05	Filter bag replaced.	Flow increased from 7 gallons per minute (gpm) to 8 gpm.
	9/8/05	Filter bag replaced.	Adjusted flow to 7 gpm.
	11/21/05	Filter bag replaced.	None.
Monitoring	7/11/05-8/10/05	Monthly sampling and reporting for July IDMR.	Remediation system was in compliance with all permit discharge limits during this reporting period.
	8/11/05-9/10/05	Monthly sampling and reporting for August IDMR.	Remediation system was in compliance with all permit discharge limits during this reporting period.
	9/11/05-10/10/05	Monthly sampling and reporting for September IDMR.	Remediation system was in compliance with all permit discharge limits during this reporting period.
	10/11/04-11/10/04	Monthly sampling and reporting for October IDMR.	Remediation system was in compliance with all permit discharge limits during this reporting period.
	11/11/05-12/10/05	Monthly sampling and reporting for November IDMR.	Remediation system was in compliance with all permit discharge limits during this reporting period.
	12/11/05-1/10/06	Monthly sampling and reporting for December IDMR.	Remediation system was in compliance with all permit discharge limits during this reporting period.
	8/2/05	1st & 2nd Quarter 2005 Progresss Report.	Submitted to NCDENR.
	9/13/05	3rd Quarter 2005 Performance Monitoring sampling.	Sample was collected from recovery well RW-7 and analyzed for VOCs.
	12/20/05	4th Quarter 2005 Performance Monitoring sampling.	Sample was collected from recovery well RW-7 and analyzed for VOCs.

TABLE 2-2

SUMMARY OF 3rd and 4th QUARTERS 2005 GROUNDWATER EXTRACTION VOLUMES

SOUTH GROUNDWATER INTERCEPTOR SYSTEM FORMER ABBOTT FACILITY LAURINBURG, NORTH CAROLINA

Monitoring Period	Volume of Groundwater Extracted (in Gallons)		
	South Intercept System RW-7	North Extraction System [1,2]	Combined North Extraction and South Intercept Systems
July-05	348,250	NA	NA
August-05	353,650	NA	NA
September-05	315,200	NA	NA
October-05	321,260	NA	NA
November-05	304,240	NA	NA
December-05	327,090	NA	NA
Summary Statistics			
Volume Extracted 3rd Quarter 2005 (gal)	1,017,100	NA	NA
Average Groundwater Extraction Rate for 3rd QTR 2005 (gpm)	7.7	NA	NA
Volume Extracted 4th QTR 2005 (gal)	952,590	NA	NA
Average Groundwater Extraction Rate for 4th QTR 2005 (gpm)	7.2	NA	NA
Volume Extracted from August 1996 - June 2005 (gal)	36,831,800	30,391,344	67,223,144
Total Volume Extracted through December 2005 (gal)	38,801,490	30,391,344	69,192,834

Key:
NA = Not Applicable
gal = gallon
gpm = gallons per minute

Notes:
[1] Includes volumes extracted from 2-Phase wells, RW-4, RW-5, RW-6, and 2P-7.
In addition, includes volumes extracted from RW-2 and RW-3, which operated only in 1996.
[2] Abbott Laboratories shut the 2-Phase well system in 1999.
Under North Carolina Department of Environment and Natural Resources approval, Abbott Laboratories shut down the remaining components of the North Extraction System on 17 October 2002.

TABLE 2-3

PERFORMANCE MONITORING ANALYTICAL RESULTS
3rd AND 4th QUARTERS 2005
(Page 1 of 2)

SOUTH GROUNDWATER INTERCEPTOR SYSTEM
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Parameter	Remediation Goal [1] (ug/L)	RW-7	
		9/13/2005 (ug/L)	12/20/2005 (ug/L)
Dichlorodifluoromethane	1,400	5.2	3.1
Chloromethane	2.6	1 U	1 U
Vinyl chloride	0.015	1 U	1 U
Bromomethane	NE	1 U	1 U
Chloroethane	2800	1 U	1 U
Trichlorofluoromethane	2,100	1 U	1 U
1,1-Dichloroethene	7	1	1 U
Trichlorotrifluoroethane (Freon 113)	210,000	310	300
Carbon disulfide	700	5 U	5 U
Acetone	700	5 U	5 U
Methylene chloride	4.6	1 U	1 U
trans-1,2-Dichloroethene	100	1 U	1 U
Methyl-tert-butyl-ether (MTBE)	200	1 U	1 U
1,1-Dichloroethane	70	1 U	1 U
2,2-Dichloropropane	NE	1 U	1 U
cis-1,2-Dichloroethene	70	30	36
2-Butanone (MEK)	4,200	5 U	5 U
Bromochloromethane	NE	1 U	1 U
Chloroform	70	1 U	1 U
1,1,1-Trichloroethane	200	1 U	1 U
1,1-Dichloropropene	NE	1 U	1 U
Carbon tetrachloride	0.269	1 U	1 U
Benzene	1	1 U	1 U
1,2-Dichloroethane	0.38	1 U	1 U
Trichloroethene	2.8	1.4	1.6
1,2-Dichloropropane	0.51	1 U	1 U
Dibromomethane	NE	1 U	1 U
Bromodichloromethane	0.56	1 U	1 U
cis-1,3-Dichloropropene	0.19	1 U	1 U
4-Methyl-2-pentanone (MIBK)	NE	5 U	5 U
Toluene	1000	1 U	1 U
trans-1,3-Dichloropropene	0.19	1 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U
Tetrachloroethene	0.7	1 U	1 U
1,3-Dichloropropane	NE	1 U	1 U
2-Hexanone	280	5 U	5 U
Dibromochloromethane	0.41	1 U	1 U
1,2-Dibromoethane (EDB)	0.0004	1 U	1 U

TABLE 2-3

PERFORMANCE MONITORING ANALYTICAL RESULTS
3rd AND 4th QUARTERS 2005
(Page 2 of 2)

SOUTH GROUNDWATER INTERCEPTOR SYSTEM
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Parameter	Remediation Goal [1] (ug/L)	RW-7	
		9/13/2005 (ug/L)	12/20/2005 (ug/L)
Chlorobenzene	50	1 U	1 U
1,1,1,2-Tetrachloroethane	NE	1 U	1 U
Ethylbenzene	550	1 U	1 U
m&p-Xylenes	530	2 U	2 U
o-Xylene	530	1 U	1 U
Styrene	100	1 U	1 U
Bromoform	4.43	1 U	1 U
Isopropylbenzene	70	1 U	1 U
Bromobenzene	NE	1 U	1 U
1,1,2,2-Tetrachloroethane	0.17	1 U	1 U
1,2,3-Trichloropropane	0.005	1 U	1 U
n-Propylbenzene	70	1 U	1 U
2-Chlorotoluene	140	1 U	1 U
1,3,5-Trimethylbenzene	350	1 U	1 U
4-Chlorotoluene	NE	1 U	1 U
tert-Butylbenzene	70	1 U	1 U
1,2,4-Trimethylbenzene	350	1 U	1 U
sec-Butylbenzene	70	1 U	1 U
1,3-Dichlorobenzene	170	1 U	1 U
p-Isopropyltoluene	NE	1 U	1 U
1,4-Dichlorobenzene	1.4	1 U	1 U
n-Butylbenzene	70	1 U	1 U
1,2-Dichlorobenzene	24	1 U	1 U
1,2-Dibromo-3-chloropropane	0.2	1 U	1 U
1,2,4-Trichlorobenzene	70	1 U	1 U
Hexachlorobutadiene	0.44	1 U	1 U
Naphthalene	21	1 U	1 U
1,2,3-Trichlorobenzene	NE	1 U	1 U
Vinyl acetate	NE	5 U	5 U

Key:
ug/L = micrograms per liter
NE =Not Established
U = Constituent not detected above reported value
J = Reported value is estimated
UJ = Constituent not detected above estimated reported value

Notes:
[1] Remediation goals development procedures are presented in the *Remedial Action Plan Amendment*, approved by the North Carolina Department of Environment and Natural Resources on 15 October 2002. Remediation goals updated to reflect April 2005 revisions to 15A NCAC 2L. Remediation goals have not been developed for the constituents that are listed as "NE".

TABLE 2-4

VOC MASS REMOVAL - 3rd and 4th QUARTERS 2005

SOUTH GROUNDWATER INTERCEPTOR SYSTEM
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

	3rd Quarter 2005	4th Quarter 2005
Volume of Groundwater Treated (in gallons)	1,017,100	952,590
VOC Mass Recovery [1,2] (in pounds)		
cis-1,2-Dichloroethene	0.255	0.286
trans-1,2-Dichloroethene	0	0
Trichloroethene	0.012	0.013
Methylene chloride	0	0
2-Butanone	0	0
Acetone	0	0
Toluene	0	0
Chloroform	0	0
1,1,1-Trichloroethane	0	0
1,1-Dichloroethene	0.008	0
1,2-Dichloroethane	0	0
Vinyl Chloride	0	0
Total VOC Mass Removal (In pounds)	0.275	0.299

Key:
VOC = Volatile organic compounds

Notes:
[1] VOC mass removal calculated based on the following formula:
VOC mass removed (in pounds) = Volume Extracted (in gallons) X VOC concentration (in ug/L) X 8.3454E-9 (lbs*L/gallon*ug)
[2] VOC mass recovery calculation does not include chlorofluorocarbon mass removal (Freon compounds).

TABLE 2-5

CUMULATIVE VOC MASS RECOVERY FROM GROUNDWATER EXTRACTION SYSTEMS

SOUTH GROUNDWATER INTERCEPTOR SYSTEM
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

	VOC Mass Recovery (in pounds) [1,2]		
Parameter	**Prior (8/96 - 6/05)**	**Current (7/05 - 12/05)**	**Cumulative (8/96 - 12/05)**
cis-1,2-Dichloroethene	117.1 [3]	0.54	117.6
trans-1,2-Dichloroethene	0.013	0.00	0.01
Trichloroethene	240.5	0.02	240.5
Methylene chloride	305.6	0.0	305.6
2-Butanone	52.1	0.0	52.1
Acetone	9.2	0.0	9.2
Toluene	5.3	0.0	5.3
Chloroform	1.4	0.0	1.4
1,1,1-Trichloroethane	1.3	0.0	1.3
1,1-Dichloroethene	2.8	0.01	2.8
1,2-Dichloroethane	1.3	0.0	1.3
Vinyl Chloride	0.04 [4]	0.0	0.04
Totals	736.5	0.6	737.1

Key:
VOC = Volatile organic compounds

Notes:

[1] VOC mass removal calculated based on the following formula:

VOC mass removed (in pounds) = Volume Extracted (in gallons) X VOC concentration (in ug/L) X 8.3454E-9 (lbs*L/gallon*ug)

[2] VOC mass recovery calculation does not include chlorofluorocarbon mass removal (Freon compounds).

[3] Reported as sum of *cis-* and *trans*-1,2-dichloroethene.

[4] Vinyl Chloride mass recover not tracked prior to September 2002.

TABLE 3-1

WELL LOCATIONS AND OBJECTIVES
SOUTHERN BOUNDARY CAPTURE ZONE

FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Well ID	Downgradient Distance from Source Area (in feet)	Description of Sampling Location	Monitoring Purpose	Sample Collection Frequency
Shallow Wells				
MW-2B	NA	Upgradient of Source Area	Groundwater contour mapping	None
MW-6B	NA	Upgradient of Source Area	Groundwater contour mapping	None
MW-25B	<50	Sidegradient location	Groundwater contour mapping	None
MW-26B	<100	Sidegradient location	Groundwater contour mapping	None
MW-21B	380	Westernmost mid location	Groundwater contour mapping	None
MW-13B	400	Easternmost mid location	Groundwater contour mapping	None
MW-10B	650	Centerline downgradient location	Downgradient impacts of discontinuing North Extraction System	Fall
MW-19B	650	Westernmost downgradient location	Effectiveness of Southern capture zone	Fall
MW-16B	720	Southern property line; centerline	Effectiveness of Southern capture zone	Spring and Fall
MW-18B	950	Furthest downgradient centerline location	Effectiveness of Southern capture zone	Spring and Fall
MW-20B	720	Easternmost downgradient location	Effectiveness of Southern capture zone	Fall
MW-22B	1,050	Offsite water level elevation control location	Groundwater contour mapping	None
Deep Wells				
MW-27D	150	Near centerline downgradient location	Groundwater contour mapping	None
MW-10D	650	Centerline downgradient location	Downgradient impacts of discontinuing North Extraction System	Fall
MW-19D	650	Westernmost downgradient location	Effectiveness of Southern capture zone	Fall
MW-16D	720	Southern property line; centerline	Effectiveness of Southern capture zone	Spring and Fall
MW-20D	720	Easternmost downgradient location	Effectiveness of Southern capture zone	Fall
MW-18D	950	Furthest downgradient centerline location	Effectiveness of Southern capture zone	Spring and Fall
MW-22D	1050	Offsite water level elevation control location	Groundwater contour mapping	None

Key:
NA = Not Applicable

TABLE 3-2

WELL CONSTRUCTION DATA
SOUTHERN BOUNDARY CAPTURE ZONE

FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Monitoring Well Identification	Installation Date	TOC Elevation (ft above msl)	Total Depth (ft bgs)	Screen Interval (ft bgs)	Casing Diameter (inches)
MW-02B	7/26/1990	231.56	24	18.7 – 23.7	2
MW-06B	7/25/1990	230.27	19	14.0 – 19.0	2
MW-10B	7/24/1990	229.06	26.7	16.5 – 26.5	2
MW-10D	1/17/1996	228.65	40	30.0 – 40.0	2
MW-13B	7/18/1991	230.28	19.5	9.3 – 18.3	2
MW-16B	7/17/1991	227.85	25.25	15.25 – 24.25	2
MW-16D	7/18/1991	228.9	72.5	62.5 – 71.5	2
MW-18B	2/5/1992	228.68	15.4	5.5 – 14.5	2
MW-18D	2/7/1992	228.69	58	48.1 – 57.1	2
MW-19B	4/24/1992	228.67	26	15.0 – 25.0	2
MW-19D	4/27/1992	228.66	74	63.8 – 73.8	2
MW-20B	4/28/1992	227.94	27.5	17.0 – 27.0	2
MW-20D	4/27/1992	228.06	78.5	68.0 – 78.0	2
MW-21B	1996 [1]	227.02	25	15.0 – 25.0[1]	2
MW-22B	1994 [1]	235.04	25	15.0 – 25.0[1]	2
MW-22D	1994 [1]	235.08	50	45.0 – 50.0[1]	2
MW-25B	1/11/1996	229.63	20	10 - 20	2
MW-26B	1/11/1996	231.16	20	10 - 20	2
MW-27D	1/11/1996	231.06	40	30 - 40	2

Key:

ft = feet

MSL = Mean Sea Level

Notes:

[1] Well construction logs are not available. Screen interval are estimates

TABLE 3-3

SEPTEMBER 2005 MONITORING WELL PURGING AND FIELD PARAMETER DATA
(Page 1 of 2)

SOUTHERN BOUNDARY CAPTURE ZONE
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Monitoring Well Location	Time	Cumulative Purge Volume (in gallons)	Stabilization Measurements		
			pH (Standard Units)	Conductivity (in mmhos/cm)	Temperature (in °C)
MW-10B	-	0	5.33	0.077	24.1
	1450	9.5	4.91	0.072	24.0
	1455	10.0	4.91	0.072	24.0
	1500	10.5	4.91	0.072	24.0
	Final	-	4.86	0.070	24.0
MW-10D	-	0	5.05	0.073	23.6
	1520	14.4	4.65	0.086	23.7
	1525	15.0	4.65	0.088	23.7
	1530	15.5	4.65	0.090	23.7
	Final	-	4.61	0.080	23.7
MW-16B	-	0	5.68	0.106	24.5
	1300	8.5	5.43	0.038	24.9
	1310	9.0	5.43	0.038	24.9
	1315	11.0	5.43	0.038	24.9
	Final	-	5.02	0.033	24.9
MW-16D	-	0	5.34	0.036	24.7
	1350	30	5.10	0.061	25.5
	1355	31	5.10	0.061	25.5
	1400	32	5.10	0.061	25.5
	Final	-	4.62	0.04	25.5
MW-18B	Initial	0	5.07	0.104	23.5
	850	3.00	4.91	0.061	23.5
	855	4.00	4.90	0.061	23.5
	900	5.00	4.90	0.061	23.5
	Final	--	4.89	0.060	23.5
MW-18D	-	0	5.00	0.074	21.7
	910	23	4.92	0.066	21.0
	915	24	4.90	0.064	21.0
	920	25	4.90	0.061	21.0
	Final	-	4.85	0.058	21.0

TABLE 3-3

SEPTEMBER 2005 MONITORING WELL PURGING AND FIELD PARAMETER DATA
(Page 2 of 2)

SOUTHERN BOUNDARY CAPTURE ZONE
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Monitoring Well Location	Time	Cumulative Purge Volume (in gallons)	Stabilization Measurements		
			pH (Standard Units)	Conductivity (in mmhos/cm)	Temperature (in °C)
MW-19B	Initial	0	5.21	0.056	22.3
	750	9.0	5.10	0.051	22.3
	755	10	5.10	0.051	22.3
	800	11	5.10	0.051	22.3
	Final	-	5.01	0.050	22.3
MW-19D	Initial	0	5.81	0.044	21.8
	810	31	5.22	0.040	23.1
	815	32	5.22	0.040	23.1
	820	33	5.22	0.040	23.1
	Final	-	5.19	0.036	23.1
MW-20B	Initial	0	4.66	0.053	22.6
	1220	10	4.59	0.043	22.5
	1225	11	4.59	0.043	22.5
	1230	12	4.59	0.046	22.5
	Final	-	4.25	0.036	22.5
MW-20D	Initial	0	5.18	0.046	21.7
	1230	33	5.00	0.043	21.5
	1235	34	4.99	0.046	21.5
	1240	35	5.01	0.044	21.5
	Final	-	3.88	0.032	21.5

Key:
mmhos/cm = millisiemens per cemtimeter
°C = degrees Centigrade
mg/L = milligrams per liter
NTU = nephelometric turbidity units

TABLE 3-4

SEPTEMBER 2005 SITEWIDE WATER LEVEL ELEVATIONS

SOUTHERN BOUNDARY CAPTURE ZONE
FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Monitoring Well Identification	Top of Casing Elevation (ft MSL)	Depth to Water from TOC (ft)	Water Level Elevation (ft MSL)
MW-02B	231.56	7.72	223.84
MW-06B	230.93	7.10	223.83
MW-10B	229.06	6.98	222.08
MW-10D	228.65	11.92	216.73
MW-13B	230.28	7.05	223.23
MW-16B	227.85	7.00	220.85
MW-16D	228.9	9.75	219.15
MW-18B	228.68	8.20	220.48
MW-18D	228.69	10.10	218.59
MW-19B	228.67	7.25	221.42
MW-19D	228.66	10.75	217.91
MW-20B	227.94	6.60	221.34
MW-20D	228.06	9.10	218.96
MW-21B	227.02	4.75	222.27
MW-22B	235.04	16.20	218.84
MW-22D	235.08	16.90	218.18
MW-25B	229.63	6.40	223.23
MW-26B	231.16	7.85	223.31
MW-27D	231.06	11.30	219.76
MW-100A	228.86	6.40	222.46
MW-100B	228.92	8.02	220.9
MW-101A	228.18	5.60	222.58
MW-101B	228.17	8.50	219.67
MW-102A	229.56	5.56	224.00
MW-102B	229.47	8.55	220.92
MW-102C	229.54	9.82	219.72
MW-103A	230.58	7.90	222.68
MW-103B	230.58	9.90	220.68
MW-103C	230.6	9.85	220.75
MW-104A	230.58	8.12	222.46
MW-104B	230.59	9.41	221.18
MW-104C	230.56	10.83	219.73

Key:
ft = feet
MSL = Mean Sea Level
TOC = Top of casing

TABLE 3-5

SEPTEMBER 2005 VOLATILE ORGANIC COMPOUND ANALYTICAL RESULTS
SOUTHERN BOUNDARY CAPTURE ZONE
(Page 1 of 2)

FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Parameter (in µg/L)	Remediation Goals [1]	MW-10B 13-Sep-05	MW-10D 13-Sep-05	MW-16B 13-Sep-05	MW-16D 13-Sep-05	MW-16D DUP 13-Sep-05	MW-18B 14-Sep-05	MW-18D 14-Sep-05	MW-19B 14-Sep-05	MW-19D 14-Sep-05	MW-20B 13-Sep-05	MW-20D 13-Sep-05
Dichlorodifluoromethane	1,400	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.8	1 U	1 U
Chloromethane	2.6	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl chloride	0.015	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	NE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	2800	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.9	1 U	1 U
1,1-Dichloroethene	7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorotrifluoroethane	210,000	470	1,200	20	12	11	1 U	78	1 U	370	1 U	1 U
Carbon disulfide	700	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	700	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylene chloride	4.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl-tert-butyl-ether (MTBE)	200	2.6 J	2.5 J	1.3 J	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	NE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	20	49	1.5	27	27	1 U	13	1 U	23	1 U	1 U
2-Butanone (MEK)	4,200	5 UJ	5 UJ	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromochloromethane	NE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	200	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	NE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	0.269	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Benzene	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.38	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	2.8	1.9	2.6	1 U	1 U	1.1	1 U	1.7	1 U	6.3	1 U	1 U
1,2-Dichloropropane	0.51	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane	NE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	0.56	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	0.19	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Methyl-2-pentanone (MIBK)	NE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	1000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	0.19	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	NE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Hexanone	280	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	0.41	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane (EDB)	0.0004	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1,2-Tetrachloroethane	NE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	550	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE 4-1

WELL ABANDONMENT LOCATIONS

FORMER ABBOTT FACILITY
LAURINBURG, NORTH CAROLINA

Well ID	*Total Depth (in feet)*	*Most Recent Use*
2P-1	20	Inactive 2-Phase Extraction
2P-2	20	Inactive 2-Phase Extraction
2P-3	20	Inactive 2-Phase Extraction
2P-4	20	Inactive 2-Phase Extraction
2P-5	20	Inactive 2-Phase Extraction
2P-6	20	Inactive 2-Phase Extraction
2P-7	20	Inactive 2-Phase Extraction
EW-2	15	2-Phase Design Study
MW-2	14.6	Early site characterization
MW-2B	23.7	Early site characterization
MW-5	33	Early site characterization
MW-6A	10	Early site characterization
MW-7A	10.4	Early site characterization
MW-8A	8.8	Early site characterization
MW-9A	10.6	Early site characterization
MW-10A	10.8	Early site characterization
MW-11	33	Early site characterization
MW-11D	80.1	Early site characterization
MW-12B	14.6	Early site characterization
MW-15B	38.6	Early site characterization
MW-15D	77.5	Early site characterization
MW-17B	34.5	Early site characterization
MW-24B	20	Early site characterization
OW-10	15	2-Phase Design Study
OW-15	15	2-Phase Design Study
OW-30	15	2-Phase Design Study
OW-50	15	2-Phase Design Study
MK-1	15	3rd Party TCE Notification
RW-2	71	Inactive Southern Interception System
RW-3	71	Inactive Southern Interception System
MW-22B	20	SCZM EL
MW-22D	90	SCZM EL
MW-25B	20	SCZM EL
MW-26B	20	SCZM EL
PZ-1B	27.5	Groundwater Intercept Pump Test
PZ-1D	61.5	Groundwater Intercept Pump Test
PZ-2B	26.5	Groundwater Intercept Pump Test
PZ-2D	60.5	Groundwater Intercept Pump Test
PZ-3B	26.5	Groundwater Intercept Pump Test
PZ-3D	63.5	Groundwater Intercept Pump Test
PZ-4B	26.5	Groundwater Intercept Pump Test
PZ-4D	60.5	Groundwater Intercept Pump Test
PZ-5B	27.5	Groundwater Intercept Pump Test
PZ-5D	61.5	Groundwater Intercept Pump Test

Key:
SCZM EL = Southern Capture Zone Groundwater Monitoring - water elevations only