

**ANNUAL GROUNDWATER MONITORING REPORT
SITE M232-236
MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA
Revision 0**

Prepared for:

DEPARTMENT OF THE NAVY
Contract No. N62470-03-D-4000
Task Order No 0009



Atlantic Division
Naval Facilities Engineering Command
6506 Hampton Boulevard
Building C, Room 311
Norfolk, Virginia 23508

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6 May 2005

EEI PROJECT NO. LDO3-0011

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We hereby certify that the Report shown and marked in this submittal is proposed to be incorporated into Contract Number N62470-03-D-4000, is in compliance with the contract drawings and specifications, can be installed in the allocated spaces, and is submitted for Government approval.

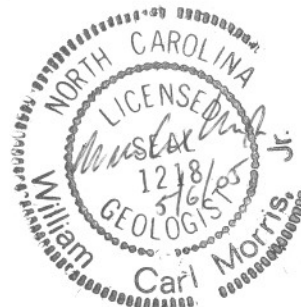


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6 May 2005



LIST OF ACRONYMS/ABBREVIATIONS

AVOC	Aromatic Volatile Organic Compound
bgs	below ground surface
DI	Deionized Water
DWM	Division of Waste Management
EEI	Engineering and Environment, Inc.
GCL	Gross Contamination Level
L	Liter
Law	Law Engineering and Environmental Services, Inc.
MADEP EPH	Massachusetts Department of Environmental Protection Extractable Petroleum Hydrocarbons
MADEP VPH	Massachusetts Department of Environmental Protection Volatile Petroleum Hydrocarbons
MCB	Marine Corps Base
mg/kg	milligrams per kilogram
msl	mean sea level
MW	Monitoring Well
NAVFACENGCOM	Navy Atlantic Division, Naval Facilities Engineering Command
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environment and Natural Resources
NCGS	North Carolina Geological Survey
NCGWQS	North Carolina Groundwater Quality Standard
ND	Not Detected
OBG	O'Brien & Gere Engineers, Inc.
QC	Quality Control
SVOC	Semi-Volatile Organic Compound
TIC	Tentatively Identified Compound
TPH	Total Petroleum Hydrocarbons
ug/L	micrograms per liter
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank

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EXECUTIVE SUMMARY

On behalf of the Department of the Navy, Atlantic Division, Naval Facilities Engineering Command, Engineering and Environment, Inc. has prepared this annual groundwater monitoring report for Site M232-236, Marine Corps Base Camp Lejeune, North Carolina. The report presents the findings of groundwater monitoring activities conducted from June 2004 through March 2005.

Buildings M232 through M236 are located in the Camp Johnson area of Camp Lejeune and are used as bachelors' quarters for military personnel. In May 1990, five heating oil Underground Storage Tanks (USTs) ranging in capacity from 530 gallons to 550 gallons were excavated and removed from the site. Soil samples collected at the time the USTs were removed indicated petroleum constituents were present in soil above State action levels in effect at that time.

Monitoring wells subsequently installed in 1991 indicated free product was not present, and petroleum constituents were not detected in groundwater at concentrations above North Carolina Groundwater Quality Standards (NCGWQS). Removal of petroleum-impacted soil in the immediate vicinity of the former USTs was recommended.

Additional site characterization activities were conducted in 1992. No petroleum constituents were detected in groundwater above NCGWQSs, although measurable free product was observed in one well (well MW-3, at a thickness of 0.12 foot). It was recommended to remove petroleum-impacted soil in the immediate vicinity of the former USTs, conduct free product removal from well MW-3, and monitor groundwater quality biannually.

Five additional monitoring wells were subsequently installed in the immediate vicinity of each of the former USTs. Gauging data indicated free product was present only in well MW-19, located near the former UST associated with Building M235; free product was not identified in well MW-3. Based on the presence of measurable free product at well MW-19, it was considered that the site warranted an Intermediate Risk classification.

Further groundwater monitoring activities were conducted in 2000 and 2001. Quarterly gauging data indicated free product was present at well MW-19 only, at thicknesses of 0.12 foot to 0.61 foot, and free product recovery was conducted. Few compounds were present in groundwater at concentrations above NCGWQSs with none above established GCLs, and concentrations of detected constituents generally were decreasing over time. However, the site was considered to remain an Intermediate Risk due to the minor thickness of free product at well MW-19. Continued recovery of free product from this well was recommended.

Gauging events were conducted in 2002 and 2003 at seven site wells, including well MW-19. The data indicated free product was no longer present at site wells. For some of the events, sorbent socks that had been removed from well MW-19 in advance of the gauging event had been reinstalled by an unknown party, and the gauging data for those events was compromised. However, the remaining 2003 gauging events that indicated measurable free product was not present were considered valid without qualification.

In June 2004, the current groundwater monitoring program was initiated. The program includes quarterly well gauging at 22 site wells and semi-annual groundwater sampling at wells MW-5, MW-7, MW-18, MW-20, MW-21, and MW-22. Semi-annual groundwater sampling was conducted in June and December 2004. Gauging events were conducted in June, September, and December 2004, and March 2005.

For the four gauging events conducted for the current monitoring program, free product was observed only in well MW-19, located in the immediate vicinity of the former UST associated with Building M235. Product thicknesses at this well ranged from 0.10 foot to 0.49 foot. Product recovery via hand bailing was conducted after each event. Analysis of groundwater samples from the two semi-annual groundwater sampling events indicated no aromatic volatile organic compounds or target analyte semi-volatile organic compounds were present at concentrations above NCGWQSs. The C₉-C₂₂ Aromatics were present at concentrations slightly above NCGWQSs in wells MW-18, MW-20, and/or MW-21. These wells are located in the immediate vicinity of the three former USTs associated with Buildings M236, M233, and M232. The potential for migration of dissolved-phase constituents away from the former USTs is limited given the groundwater flow conditions present at the site.

It is recommended to continue groundwater monitoring over the next year, to include quarterly gauging, semi-annual groundwater monitoring, and quarterly reporting. The site should be accessed in advanced of field events to remove any sorbent socks; the socks should be reinstalled as needed following the events.

SECTION 1 INTRODUCTION

On behalf of the Department of the Navy, Atlantic Division, Naval Facilities Engineering Command (NAVFACENGCOM), Engineering and Environment, Inc. (EEI) has prepared this annual groundwater monitoring report for Site M232-236, Marine Corps Base (MCB) Camp Lejeune. The report presents the findings of groundwater monitoring activities conducted from June 2004 through March 2005. This report and the methods used to acquire the data in support of this report have been prepared in accordance with the North Carolina Department of Environmental Resources (NCDENR), Division of Waste Management (DWM), Underground Storage Tank (UST) Section guidelines (NCDENR, 2001; NCDENR, 2003) and the site specific work prepared for this site by EEI (EEI, 2004a).

The site has not been assigned an incident number by NCDENR. Previous site investigations have indicated the site meets criteria associated with NCDENR's Intermediate Risk classification (Law, 2000b).

1.1 Site Description

The site is located on MCB Camp Lejeune in Onslow County, North Carolina (34°, 43', 13" N, 77°, 24', 52" W) (Figure 1-1). Within Camp Lejeune, the site is located along Hayes Street in the Camp Johnson area (Figure 1-2). Buildings M232 through M236 are used as bachelors' quarters for military personnel.

No permanent surface water bodies are present at the site. A shallow drainage ditch is present between the eastern wall of Buildings M232 through M236 and Hayes Street. The nearest mapped surface water bodies are the New River, located approximately 650 feet west of the site, and Northeast Creek, located approximately 850 feet southeast of the site. No potable water supply wells are located within 1200 feet of the site, and the potable water supply wells throughout Camp Lejeune draw water from the Castle Hayne aquifer at depths typically of at least 150 feet (OBG, 1993).

1.2 Site History

In May 1990, five USTs (one each associated with Buildings M232 through 236) were excavated and removed from the site (OBG, 1992). Four of the USTs had a capacity of 550-gallons and the fifth had a capacity of 530-gallons; all were used to store heating oil (Law2000a). The USTs had been in service from 1942 to the late 1980's (Law, 2000b). At the time the USTs were removed, soil samples were collected, analysis of the soil samples indicated Total Petroleum Hydrocarbons (TPH) were present at concentrations above State standards then in effect (OBG, 1992).

A site assessment was conducted in 1991 which included in part advancement of soil borings and installation of 14 surficial aquifer monitoring wells (seven with total depths of approximately 15 feet below ground surface [bgs], and seven with total depths of approximately 30 feet bgs, with the wells installed in pairs). Analysis of soil and groundwater samples collected during the investigation indicated petroleum constituents were not present at significant concentrations in

areas surrounding the former USTs, and no free product was observed in site monitoring wells. However, the assessment concluded that concentrations of petroleum constituents in soils in the immediate vicinity of the former USTs (as reported from the UST removal effort) could present a future exposure risk. The assessment recommended these soils be removed (OBG, 1992).

Further investigation was conducted in 1992. This investigation included in part installation of three surficial aquifer monitoring wells, each to total depths of approximately 15 feet bgs. No constituents were detected in groundwater samples collected from the three newly installed wells. However, free product was observed in well MW-3 at a thickness of 0.12 foot; measurable free product was not identified in any other site well. It was recommended to excavate petroleum-impacted soils in the immediate vicinity of the former USTs, conduct free product removal from well MW-3 using passive mechanisms, and monitor groundwater quality biannually.

Between July 1993 and November 1999, five monitoring wells were installed at locations adjacent to the former UST locations (Law, 2000a). EEI has been unable to locate well construction records for these wells, and well-specific data (e.g., top-of-casing elevations, screen parameters, etc.) are unavailable. (Additionally, at some point during this period, well identifications were changed, as follows: well MW-3 was re-identified as well MW-7; well MW-4 was re-identified as well MW-8; well MW-7 was re-identified as well MW4; and well MW-8 was re-identified as well MW-3. EEI is not aware of the reason for the well re-identification; the re-assignment of well identifications listed above is based on review of a site drawing presented in a Law Engineering and Environmental Services, Inc. (Law) work plan from 2000 [Law, 2000a] and comparison of well top-of-casing elevations presented in O'Brien and Gere Engineers, Inc. (OBG) reports from 1992/1993 [OBG, 1992; OBG, 1993] and Law reports from 2000/2001 [Law, 2000b; Law, 2001]. For this report and in EEI's work plan for this program [EEI, 2004a], well identifications follow that obtained from MCB Camp Lejeune's environmental database, which is consistent with the well identifications presented in the OBG reports [OBG, 1992; OBG, 1993]. All references to site data, including discussions in the report text, figures, and tables, consistently adhere to the database identifications. Footnotes are presented in tables as necessary.)

Based on citations in Law documents, natural attenuation monitoring was conducted at the site after July 1993 and prior to May 1998, and a risk characterization was conducted by Law in November 1999 (Law, 1999; Law, 2000b; Law, 2001). EEI was unable to locate these reports for review, although groundwater quality data apparently from the risk characterization assessment and summarized in later monitoring reports prepared by Law (Law, 2000b; Law, 2001) has been incorporated in this report. The risk characterization assessment reportedly indicated the site warranted classification as an Intermediate Risk based on the presence of measurable free product at well MW-19 (Law, 2000b; Law, 2001).

Further groundwater monitoring activities were conducted in 2000 and continued into 2001 (Law, 2000b, Law, 2001). The monitoring program included quarterly well gauging at all site wells and semi-annual groundwater sampling at wells MW-3 (identified as MW-7), MW-5, MW-18, MW-20, MW-21, and MW-22. The gauging data over this period identified the presence of measurable free product only in well MW-19, at thicknesses ranging from 0.12 foot to 0.61 foot,

and free product recovery was conducted. Groundwater sample data indicated few compounds were present at concentrations above NCGWQSs (none above established GCLs), and concentrations of detected constituents generally were decreasing over time. However, the site was considered to remain an Intermediate Risk due to the minor thickness of free product at well MW-19, and it was recommended to continue free product recovery from this well (Law, 2000b, Law, 2001).

A program of quarterly gauging of seven wells, including well MW-19, was initiated in October 2002 and was completed in August 2003 (EEI, 2003a, b, c, d). The program included accessing well MW-19 in advance of the gauging event to remove a previously installed sorbent (product recovery) sock. No measurable free product was observed during four quarters of gauging. However, on two occasions, when the well was re-accessed for gauging, the sorbent sock had been reinstalled into the well by an unknown party. The product thickness data for these two events was considered compromised. However, data for the remaining events indicating measurable free product was not present were considered valid without qualification.

In June 2004, the current groundwater monitoring program was initiated. The program included quarterly gauging at all 22 site wells and semi-annual groundwater sampling at wells MW-5, MW-7, MW-18, MW-20, MW-21, and MW-22. Additionally, free product recovery via hand bailing or installation of sorbent socks was conducted as needed (EEI, 2004a).

Data for the current monitoring program are discussed in the following sections. Section 2 describes field methods used at the site. Section 3 discusses hydrogeologic characteristics of the site. Laboratory analytical results and their significance are presented in Section 4. Section 5 provides conclusions and recommendations based on review of the data. References cited in the report are listed in Section 6. Figures and tables are organized after the text. Supporting documentation (field records and laboratory analytical reports) are contained in Appendices A and B.

SECTION 2 FIELD PROGRAM

Field methods employed during the groundwater monitoring program are discussed briefly below. Activities were conducted in accordance with NCDENR guidance (NCDENR, 2001 and 2003) and as per the work plan (EEI, 2004a) which details the field methods.

2.1 Well Gauging

Well gauging was conducted quarterly, on 15 June, 21 September, and 19 December 2004, and 4 March 2005. For each gauging event, 22 site monitoring wells (MW-1 through MW-22) were gauged. Well gauging was conducted using an electronic interface probe to measure the depth to water and depth to product (if present). Data were recorded to the nearest 0.01 foot and referenced to the surveyed top of casing.

During the gauging events, measurable free product was observed only at well MW-19, with a thickness of 0.49 foot, 0.10 foot, 0.39 foot, and 0.33 foot. Free product recovery via hand bailing subsequently was conducted, with approximately three ounces of product removed in June 2004, December 2004, and March 2005, and approximately one ounce removed in September 2004. All material was processed through the treatment plant located at Lot 203 on MCB Camp Lejeune.

2.2 Groundwater Sampling

Groundwater samples were collected on 16 and 17 June 2004 and on 19 December 2004 from monitoring wells MW-5, MW-7, MW-18, MW-20, MW-21, and MW-22. Additionally, for each event, one duplicate sample was collected, and one laboratory-prepared trip blank was included with the laboratory-supplied sample bottles. The trip blanks were stored with the samples once sampling activities began. Field data sampling sheets for both events are presented in Appendix A.

Monitoring well groundwater samples were collected using low-flow purging techniques. For the two-inch diameter wells (wells MW-5 and MW-7), a Grundfos Redi-Flo II stainless steel submersible pump discharging through polyethylene tubing was used to purge and sample the wells. The water level in a given well was periodically measured and recorded and, if necessary, the pumping rate was decreased to limit drawdown. Additionally, the pump intake height was adjusted as necessary. Water quality indicator parameters (pH, temperature, conductivity, oxidation-reduction potential, dissolved oxygen, and turbidity) were measured and recorded repeatedly during the purge. Purging was continued until water quality indicator parameters had stabilized or until a maximum of five well casing volumes had been purged. If a well purged to dryness, the well was allowed to recharge, and a sample then was collected. During the June 2004 event, neither of the two-inch wells purged dry; one two-inch well (MW-5) was purged dry during the December 2004 sampling event. Samples were collected immediately upon completion of the purge by filling the laboratory-prepared sample bottles directly from the discharge tubing. Samples were kept in an iced cooler from the time of collection until received by the laboratory.

At the one-inch diameter wells (wells MW-18 and MW-20 through MW-22), the submersible pump was too large to be placed into the wells. Therefore, purging and sampling was conducted using a peristaltic pump with polyethylene tubing lowered into the water column of the well. The polyethylene tubing was connected to a short length of silicone tubing that was threaded over the pump's rotor. Because of the small diameter of the wells, the interface probe could not be placed in the well while the polyethylene discharge tubing was in place. Therefore, water levels in these wells were not monitored during the purge. However, water quality indicator parameters as identified above were repeatedly measured and recorded while purging. Purging, sampling, and sample handling were conducted as described above. During the June 2004 event, none of the one-inch diameter wells were purged dry; during the December 2004 event, well MW-21 purged dry.

Groundwater samples collected during this event were analyzed for the following parameters:

- AVOCs, EPA Method 602 with xylenes (3x40 milliliter [ml] vials),
- Massachusetts Department of Environmental Protection (MADEP) - Volatile Petroleum Hydrocarbons (VPH) (3 x 40 ml vials)
- SVOCs, EPA Method 625 + 10 largest non-target peaks (i.e., Tentatively Identified Compounds [TICs]) (2 x 1 liter [L])
- MADEP - Extractable Petroleum Hydrocarbons (EPH) (2 x 1 L)

Samples were submitted under chain-of-custody to Paradigm Analytical Laboratories in Wilmington, North Carolina. Samples were delivered to the laboratory either via overnight commercial courier or were picked up by a laboratory courier.

2.3 Equipment Decontamination and Waste Handling Procedures

The submersible pump was decontaminated before first use and after each use by pumping a mixture of Alconox or Liquinox soap and potable water through the pump. The pump then was rinsed by pumping potable water through it, and final rinsed with deionized (DI) water. New polyethylene tubing was used at each well. For the peristaltic pump, the pump did not contact groundwater and decontamination of the pump was not required; new polyethylene and silicone tubing were used at each well.

Water quality meter flow-through cells and down-hole gauging equipment were decontaminated after each use by washing with an Alconox/DI water mixture, followed by a DI water rinse. The water quality probe was decontaminated with a DI rinse.

Well purge water and equipment decontamination water generated during the sampling event were contained in a portable holding tank. The water was processed through a groundwater treatment system located at Lot 203 on MCB Camp Lejeune. Used tubing and other miscellaneous material were collected and bagged as they were generated. This material was treated as normal solid waste and placed in EEI's refuse container at Lot 203.

2.4 Well Maintenance

During the sampling event, any brush, debris, and/or liter in the vicinity of the well heads were cleared. The well heads, casing risers, well pads, bollards, well caps, locks, etc. were inspected for damage or deterioration. All wells generally appeared to be undamaged and in serviceable condition, although rusting of the hinges on some of the well standards was observed.

SECTION 3 HYDROGEOLOGY

The hydrogeologic characteristics of the subsurface substantially control the movement of groundwater, which strongly influences contaminant movement. The regional geologic setting provides a framework for understanding and interpreting the site-specific hydrogeology. Knowledge of the latter allows for evaluating groundwater flow at a scale relevant to the monitoring program.

3.1 Regional Hydrogeology

The site is located in the eastern portion of the Coastal Plain Physiographic Province of North Carolina. The Coastal Plain consists of nearly flat to gently dipping sedimentary strata of varying composition that overlie a crystalline basement complex. Approximately 80 miles northwest of the site, the Coastal Plain pinches out where it contacts the Piedmont Physiographic Province along the Fall Line. East of the Fall Line, the sediments gradually thicken, reaching a maximum thickness of approximately 10,000 feet at Cape Hatteras, North Carolina. In the vicinity of the site, the sedimentary sequence is estimated to be approximately 2,000 feet thick (NCGS, 1988).

Surficial deposits of Quaternary age are present in and around the area of the site, typically at thicknesses ranging from about 25 to 80 feet. The uppermost mapped unit in the area of the site is identified as the River Bend Formation of Tertiary age, described as a calcareous limestone interlaced with indurated sandy, molluscan limestone (NCGS, 1985). The River Bend Formation overlies the Castle Hayne Formation, also of Tertiary age. The Castle Hayne Formation is described as gray to cream colored, fine grained to fossiliferous calcareous limestone with minor amounts of fine quartz, glauconite, and phosphate (NCGS, 1988). The thickness of the Castle Hayne Formation in the vicinity of the site is estimated at approximately 300 feet. The Castle Hayne aquifer is a primary source of potable water for the area.

3.2 Site Hydrogeology

The topography of the site is predominantly flat. A shallow drainage ditch is present between the Buildings M232 through M236 and Hayes Street. No permanent surface water bodies intersect the site. The nearest mapped surface water bodies are the New River, located approximately 650 feet west of the site, and Northeast Creek, located approximately 850 feet southeast of the site.

Shallow soil at the site includes a mixture of sands, silts, and clays. The uppermost nine feet of soils are described as silts and clays with variable amounts of very fine to medium sand. From approximately nine feet bgs to about 19 feet bgs, very fine sands coarsening downwards to very coarse sands are encountered. Below 19 feet bgs to 30 feet bgs (the maximum depth of borings advanced during previous site investigations), medium to very coarse sands are described (OBG, 1992; OBG, 1993). First saturated soils of the surficial aquifer typically were encountered at depths of nine to 11 feet bgs (OBG, 1992; OBG, 1993).

All of the monitoring wells installed at the site are screened in the surficial aquifer (Law, 1999). Ten of the wells (MW-1, MW-3, MW-5, MW-7, MW-9, MW-11, MW-13, MW-15, MW-16, and MW-17) are screened from about 5 feet bgs to 15 feet bgs, in the shallow silts/clays and the upper sands of the surficial aquifer. (These wells are designated in this report as surficial aquifer shallow wells.) Seven wells (MW-2, MW-4, MW-6, MW-8, MW-10, MW-12, and MW-14) are screened from approximately 20 feet bgs to 30 feet bgs in the medium to very coarse sands of the surficial aquifer (OBG, 1992; OBG, 1993). (These wells are designated in this report as surficial aquifer intermediate wells.) Each of the intermediate depth wells is paired with an odd numbered shallow depth well of next lowest number (e.g., intermediate well MW-2 is paired with shallow well MW-1). Construction records for wells MW-18 through MW-22 could not be located by EEI. Field measurements by EEI indicate these wells have total depths of approximately 14 to 15 feet bgs, and therefore are designated as shallow wells. Other information, such as screened intervals and filter pack intervals, are not known to EEI.

Using the top-of-casing elevation data and gauging data recorded during the quarterly events, groundwater elevations for the site monitoring wells were calculated. Table 3-1 presents the groundwater gauging data for the most recent (4 March 2005) event. Table 3-2 presents gauging data for all four quarterly gauging events conducted during the monitoring program. For wells exhibiting measurable free product, the groundwater elevation was corrected by adding 80 percent of the product thickness to the calculated groundwater elevation. (The product thickness was multiplied by 80 percent as the specific gravity of the product is assumed to be 0.8.)

From Tables 3-1 and 3-2, groundwater elevations calculated for the individual members of the shallow/intermediate depth well pairs are not identical. Variations in groundwater elevations at the well pairs are inconsistent across the site and over time, with lower elevations observed in shallow well MW-9 relative to the paired shallow well MW-10, higher elevations observed at shallow wells MW-1, MW-11, and MW-13 relative to their respective intermediate wells (wells MW-2, MW-12, and MW-14), and the remaining well pairs not exhibiting consistent elevation variations over time. The inconsistent lateral suggests the groundwater elevation differences arise from lateral heterogeneities in subsurface soils and are not indicative of restricted vertical hydraulic flow (i.e., an aquitard or aquiclude is not present between the screen zones of the wells, and all wells intercept the surficial aquifer). Temporal variations may be indicative of differences in recharge rates from precipitation events which could occur if the vertical permeability in the vadose zone and/or sediments of the surficial aquifer varied across the site.

The elevation data for the shallow and intermediate wells were used to construct surficial aquifer groundwater elevation maps for each gauging event, from which groundwater flow directions can be estimated. (In preparing the shallow well map for December 2004, data from well MW-20 was excluded, as the calculated groundwater elevation was much lower than that of surrounding wells, and the resultant map would suggest inflow to an area without any realistically apparent outlet; it is expected that the depth-to-water datum was recorded in error.) Figures 3-1 and 3-2 respectively present groundwater elevation maps for shallow and intermediate wells for June 2004; Figures 3-3 and 3-4, Figures 3-5 and 3-6, and Figures 3-7 and 3-8 similarly present the September 2004, December 2004, and March 2005 groundwater elevation maps. (Due to the limited relief expressed by the December 2004 groundwater elevation data, an elevation contour interval of 0.1 foot was selected to present interpreted

groundwater elevations for the shallow and intermediate maps; all other maps use a contour interval 1 foot.) Except for the figures prepared using data from the most recent (March 2005) gauging event, these maps were presented in previous quarterly monitoring reports (EEI 2004b, 2004c, and 2005). However, the shallow well map for June 2004 has been revised to incorporate groundwater elevations calculated for wells MW-18 through MW-22, which at the time could not be calculated as surveyed top-of-casing elevations were not available. (As per recommendations in the June 2004 quarterly monitoring report and noted in the September 2004 monitoring report, an elevation survey of these wells was conducted on 7 October 2004 by Charles F. Riggs and Associates, Inc., a surveying firm licensed in North Carolina [EEI, 2004b and 2004c].)

From a review of the shallow well maps, groundwater flow appears to be variable over time, although a south-southeasterly flow component across the central portion of the site is consistently present. For the March 2005 shallow well map, groundwater flows into the site from the southwest, northwest, north, and northeast, exiting the site to the south-southeast (Figure 3-7). For the December 2004 shallow well map, the south-southeasterly flow component is evident, but a westerly flow component in the vicinity well MW-5 is present that is not observed in the March 2005 data (Figure 3-5). The September 2004 shallow well map is similar to that observed for the March 2005 map, although depressed groundwater is evident in the central portion of the site at well MW-3; the westerly flow towards well MW-5 exhibited in the December 2004 map is absent (Figure 3-3). For the June 2004 shallow well map, the southern portion of the site again exhibits a south-southeasterly flow, but a radial flow pattern to the north, east, and west is present in the central portion of the site; this radial flow pattern is not observed in the other shallow well flow maps (Figure 3-1).

As with the shallow well groundwater flow maps, a review of the intermediate well groundwater elevation maps indicate flow directions vary over time. For the March 2005 map, groundwater flows northward across much of the site, although flow to the south-southwest is observed in the southwestern portion of the site (Figure 3-8). In December 2004, groundwater flow is generally to the southwest across most of the site. Along the western portion of the site, an area of relatively elevated groundwater is observed in the immediate vicinity of well MW-5, and groundwater flow in this portion of the site is to the northeast and southeast (Figure 3-6). The flow pattern in September 2004 indicates groundwater flows generally to the west-southwest (Figure 3-4). The June 2004 flow pattern is characterized by an area of relatively higher groundwater elevation present in the center of the site, with groundwater flowing radially away from this area. Groundwater flows away from the site primarily to the south-southeast, although flow components to the east, north, and west are present due to the high groundwater elevation observed in the site's center (Figure 3-2). The intermediate well groundwater elevation map for June 2004 is the only map which exhibits a flow pattern similar to that observed for the shallow wells during a given gauging event (Figures 3-1 and 3-2).

Previous investigations also have identified variable flow directions at the site (OBG, 1992; OBG, 1993; Law, 2000b, Law, 2001). Given the generally flat topography and absence of nearby significant surface water bodies, groundwater flow directions would be expected to be readily influenced by relatively minor changes in conditions at the site, such as seasonal

variations in the water table elevation (Law, 2000b) and transient local recharge associated with precipitation.

The horizontal gradient i is calculated using the standard equation $i = \Delta h / \Delta L$, where Δh is the change in head measured along the direction of groundwater flow, and ΔL is the straight-line distance between the measurement locations. For each of the quarterly gauging events, the horizontal gradient has been calculated using data from a well pair that is closely aligned with the groundwater flow direction for the gauging event, as summarized below:

<u>Event</u>	Shallow	Shallow	<u>Δh</u>	<u>ΔL</u>	<u>i</u>
	<u>Well/ GW Elev</u>	<u>Well / GW Elev</u>			
June 2004	MW-3 / 5.71	MW-18 / 2.50	3.21	206	0.016
September 2004	MW-13 / 7.58	MW-9 / 3.83	3.76	603	0.0062
December 2004	MW-16 / 2.26	MW-9 / 1.39	0.87	203	0.0043
March 2005	MW-3 / 2.48	MW-9 / 1.59	2.09	368	0.0024

<u>Event</u>	Intermediate	Intermediate	<u>Δh</u>	<u>ΔL</u>	<u>i</u>
	<u>Well/ GW Elev</u>	<u>Well / GW Elev</u>			
June 2004	MW-4 / 6.66	MW-8 / -1.02	7.68	280	0.027
September 2004	MW-4 / 6.62	MW-12 / 3.48	3.14	396	0.0079
December 2004	MW-10 / 2.50	MW-8 / 2.01	0.49	366	0.0013
March 2005	MW-6 / 5.48	MW-2 / 2.65	2.83	238	0.012

Notes:

GW Elev: Groundwater Elevation, expressed in feet above/below mean sea level

Δh : head differential, expressed in feet

ΔL : horizontal separation

i : horizontal gradient, dimensionless

From the above, horizontal gradients vary over time. Additionally, gradients calculated for shallow wells differ from those calculated for the intermediate wells.

The groundwater linear flow velocity V is calculated using the standard equation $V = (Ki) / n_e$, where i is the horizontal gradient (discussed above), K is the hydraulic conductivity, and n_e is the effective porosity. Previous investigations have provided estimates of K and n_e , respectively based on aquifer testing and examination of subsurface soil samples. The investigations identified a K of 1.47 feet/day and a n_e of 0.40 (dimensionless) for shallow wells (OBG, 1993). For intermediate wells, the investigations identified a K of 2.67 feet/day (OBG, 1993). Based on a review of the lithologic logs for the intermediate wells, the intermediate wells are screened in medium to very coarse sands (OBG, 1992; OBG, 1993); for this soil type, EEI estimates a n_e of 0.35 (dimensionless). Using these values and the horizontal gradients calculated above, linear flow velocities for each of the gauging events have been calculated, as summarized below:

<u>Event</u>	<u>i (Shallow)</u>	<u>V (Shallow)</u>
June 2004	0.016	21 feet/year
September 2004	0.0062	8.3 feet/year
December 2004	0.0043	5.8 feet/year
March 2005	0.0024	3.2 feet/year

<u>Event</u>	<u><i>i</i> (Intermediate)</u>	<u><i>V</i> (Intermediate)</u>
June 2004	0.027	75 feet/year
September 2004	0.0079	22 feet/year
December 2004	0.0013	3.6 feet/year
March 2005	0.012	33 feet/year

Notes:

i: horizontal gradient, dimensionless

V: linear flow velocity, feet per year

From the above, the groundwater linear flow velocities vary over time, due to the variation in gradient, as discussed above. The calculated velocities do not account for tortuosity (a parameter describing the deviation from a straight line flow path as groundwater moves around and between grains of soil). Consequently, at scales comparable to the size of the site, the linear velocity will overestimate the effective distance groundwater will travel for a given period of time. Lastly, given the variability in the direction of flow over time, the net movement of groundwater across the site over the course of the year will be further reduced.

SECTION 4 LABORATORY ANALYTICAL RESULTS

Groundwater samples were collected in June and December 2004 from site monitoring wells MW-5, MW-7, MW-18, MW-20, MW-21, and MW-22. One duplicate groundwater sample was collected from well MW-7 for both events. Groundwater samples were analyzed by Paradigm Analytical Laboratories for AVOCs (EPA Method 602), SVOCs (EPA Method 625), MADEP VPH, and MADEP EPH. Appendix B presents the laboratory analytical reports for both events.

4.1 Groundwater Analytical Results

Table 4-1 summarizes the laboratory data for the June and December 2004 sampling events. (For the SVOCs, only compounds detected at one or more locations during the current or previous sampling events and included in the current analytic suite are listed.) From a review of Table 4-1, no target analytes were detected in the sample collected from well MW-5. One TIC, identified only as “unknown,” was reported at an estimated concentration of 10 ug/L at this well for the June 2004 sampling event. (TICs are substances not on the target compound list, and not all TICs are identified and quantitated using individual standards. All TIC quantitations are estimated. Total TICs reported in Table 4-1 are the sum of all reported TICs, excluding those TICs identified as having been added by the laboratory.)

At well MW-7, no target analytes were reported for the June 2004 event; an “unknown” TIC was reported at an estimated concentration of 20 ug/L and 13 ug/L, respectively for the primary and duplicate samples collected from this well. This “unknown” TIC was reported in the duplicate sample collected from this well at an estimated concentration of 13 ug/L. For the December 2004 event, with the exception of toluene, reported at an estimated concentration of 0.808 ug/L, and the C₉-C₂₂ Aliphatics, reported at a concentration of 600 ug/L, no analytes were detected; concentrations of both detected analytes were substantially below the NCGWQSs of 1000 ug/L and 42,000 ug/L, respectively. No analytes were detected in the December 2004 duplicate sample collected at well MW-7.

Various target analyte AVOCs and SVOCs were reported for the samples collected from wells MW-18, MW-20, MW-21, and MW-22 during both the June and December 2004 sampling events. Each of these wells is located in the immediate vicinity of USTs formerly present at the site (Figure 1-3). All of the detected AVOCs (ethylbenzene, toluene, and xylene isomers) and target analyte SVOCs (acenaphthene, diethylphthalate, fluorene, naphthalene, and phenanthrene) were reported at low (typically estimated) concentrations, and all were substantially below NCGWQSs and GCLs.

Some TICs were reported at wells MW-18, MW-20, MW-21, and/or MW-22 for both sampling events; most of the TICs were not identified as specific compounds. Those TICs that were reported as specific compounds included 1-methylnaphthalene, 2-methylnaphthalene, 2,3-dimethylnaphthalene, and biphenyl. Of these TICs, biphenyl was reported only during the December 2004 sampling event at well MW-18 at an estimated concentration of 9.82 ug/L. A NCGWQS has not been established for this compound, therefore the standard is set at the reporting limit, and the detection of the compound is by definition above the standard. A GCL

has not been established for this compound. 1-Methylnaphthalene, when detected, was reported at wells MW-18, MW-21, and MW-22 at estimated concentrations ranging from 4.6 ug/L to 50 ug/L for the two sampling events. A NCGWQS has not been established for 1-methylnaphthalene; therefore, as noted above, any detection of the compound is above the standard. A GCL has not been established for 1-methylnaphthalene. 2-Methylnaphthalene was reported in wells MW-21 and MW-22 during the June 2004 sampling event at estimated concentrations of 19 ug/L and 20 ug/L, respectively, slightly above the NCGWQS for 2-methylnaphthalene of 14 ug/L and substantially below the GCL of 12,500 ug/L. For December 2004, 2-methylnaphthalene was reported in these wells at concentrations of 10.7 ug/L and 6.6 ug/L, respectively, below the NCGWQS and GCL. For all of these reported TICs, given the uncertainties associated with TIC quantitation, a reduced level of confidence in the reported concentration is warranted, and the significance of the data is limited.

Various aliphatic and aromatic hydrocarbon fractions, quantitated by MADEP VPH and EPH, were detected in the June and December 2004 sampling events, primarily at wells MW-18, MW-21, and MW-22. Of the detected hydrocarbon fractions, only the C₉-C₂₂ Aromatic Hydrocarbon fraction concentrations were present above the NCGWQS of 210 ug/L; a GCL has not been established for the C₉-C₂₂ Aromatic Hydrocarbon fraction. (In Table 4-1, C₉-C₂₂ Aromatics are presented as the sum of the C₉-C₁₀ Aromatics, quantitated by MADEP VPH, and the C₁₁-C₂₂ Aromatics, quantitated by MADEP EPH.) Specifically, well MW-18 exhibited the C₉-C₂₂ Aromatics at concentrations of 570 ug/L and 310 ug/L for the June and December 2004 events, both above the NCGWQS. The C₉-C₂₂ Aromatics were reported at well MW-21 at concentrations of 360 ug/L (June) and 200 ug/L (December); the June concentration is slightly above the NCGWQS; the more recent December concentration is below the NCGWQS. At well MW-22, the C₉-C₂₂ Aromatics were not detected during the June event (reporting limit of 200 ug/L); in December, the C₉-C₂₂ Aromatics were reported at 240 ug/L, slightly above the NCGWQS.

Figures 4-1 and 4-2 present the surficial aquifer shallow well concentrations of the C₉-C₂₂ Aromatics for June and December 2004, respectively. The figures clearly illustrate the extent of the C₉-C₂₂ Aromatics above the NCGWQS is limited to the immediate vicinity of the former USTs associated with Building M232 (monitored by well MW-22), Building M233 (monitored by well MW-21), and/or Building M-236 (monitored by well MW-18).

Groundwater quality data from the current and previous sampling events are summarized in Table 4-2. From Table 4-2, few compounds have been detected at concentrations above NCGWQSs at any site wells. One compound, phenanthrene, was reported above GCLs at well MW-3 during the November 1991 sampling event. However, phenanthrene was not detected at this well in any subsequent sampling event, nor was this compound detected in any other site wells during the November 1991 event or during any other sampling event. No other compounds have been detected at concentrations above GCLs during any sampling event.

Wells that have exhibited groundwater concentrations above NCGWQSs are limited to MW-3, MW-12, MW-18, MW-21, and MW-22. At well MW-3, other than phenanthrene (discussed above), only the C₉-C₂₂ Aromatics have been detected at concentrations above NCGWQSs. In October 2000 and April 2001, the C₉-C₂₂ Aromatics were reported at concentrations of 440 ug/L

and 430 ug/L, respectively, somewhat above the NCGWQS of 210 ug/L. As indicated above, a GCL has not been established for the C₉-C₂₂ Aromatics. Well MW-3 is not designated for sampling for the current monitoring program.

Well MW-12 exhibited a chloroform concentration of 4.0 ug/l in November 1991, above the NCGWQS of 0.19 ug/L but substantially below the GCL of 190 ug/L. No other compounds were present above NCGWQSs at this well for that sampling event. Chloroform is not a constituent of petroleum fuels and often is present in potable water supplies that employ certain chlorine disinfection treatment processes. Consequently, the presence of chloroform at this low concentration is not considered significant. The well has not been sampled since the November 1991 event.

At well MW-18, 4-isopropyltoluene was reported at a concentration of 0.5 ug/L in April 2001. As a NCGWQS has not been established for this compound, the detection of the compound is considered above the standard; a GCL has not been established for this compound. 4-Isopropyltoluene is not included in the analytic suite for the current monitoring program. Bis(2-ethylhexyl)phthalate (DEHP) was reported at well MW-18 at a concentration of 159 ug/L in August 1999, above the NCGWQS of 3 ug/L but substantially below the GCL of 3000 ug/L. DEHP has not been detected at this well in subsequent sampling events (including the current event). DEHP is not a constituent of petroleum fuels but is a component of many plastics, and this compound frequently occurs as an artifact of the sampling and/or laboratory process due to incidental contact with plastics. Consequently, the reported former presence of DHEP at this well is not considered significant. The C₉-C₂₂ Aromatics were reported at well MW-18 in October 2000 and April 2001 at concentrations of 280 ug/L and 270 ug/L, respectively, similar to the concentrations reported for the current monitoring program (June and December 2004 concentrations of 570 ug/L and 310 ug/L, respectively). Each of these concentrations is slightly above the NCGWQS of 210 ug/L.

Well MW-21 exhibited concentrations of 4-isopropyltoluene of 2 ug/L and 3 ug/L in October 2000 and April 2001, respectively. As noted previously, a NCGWQS is not available for this compound so that the detection constitutes an exceedance of the standard. As indicated above, the compound is not included in the current analytic suite. DEHP was detected only once at this well (also in August 1999) at a concentration of 6 ug/L, above the NCGWQS of 3 ug/L and substantially below the GCL of 3000 ug/L. As discussed with respect to DHEP reported at well MW-18, the reported former presence of DHEP is not considered significant. The C₉-C₂₂ Aromatics were reported at well MW-21 in October 2000 and April 2001 at concentrations of 250 ug/L and 440 ug/L, respectively, and at a concentration of 360 ug/L in the previous (June 2004) sampling event; these concentrations are slightly above the NCGWQS of 210 ug/L. For the current event, the C₉-C₂₂ Aromatics concentration of 200 ug/L was below the NCGWQS.

At well MW-22, 4-isopropyltoluene concentrations of 2 ug/L and 0.8 ug/L were reported for the October 2000 and April 2001 sampling events, respectively, and, in the absence of an established NCGWQS, the detection of the compound constitutes an exceedance; the compound is not included in the current analytic suite. DEHP was reported only once at this well (again in August 1999, as with wells MW-18 and MW-21) at a concentration of 283 ug/L, above the NCGWQS of 3 ug/L and substantially below the GCL of 3000 ug/L. As discussed above, the

reported former presence of DHEP is not considered significant. The C₉-C₂₂ Aromatics were reported at well MW-21 in October 2000 and April 2001 at concentrations of 340 ug/L and 310 ug/L, respectively, slightly above the NCGWQS of 210 ug/L. The C₉-C₂₂ Aromatics were not detected during the previous (June 2004) sampling event, but were reported during the current event at a concentration of 240 ug/L, slightly above the NCGWQS.

Measurable free product was detected during the current monitoring program only at well MW-19, at a thickness of 0.39 foot for the most recent (March 2005) gauging event. Free product thicknesses of 0.49 foot, 0.10 foot, and 0.39 foot for the June, September, and December 2004 events, respectively, were previously measured and reported (EEI, 2004b, 2004c, and 2005). Figures 4-3 through 4-6 present the estimated extent of measurable free product for each of the quarterly gauging events conducted from June 2004 through March 2005. The maps illustrate the lateral extent of free product is restricted to the area in the immediate vicinity of well MW-19 and the former UST associated with the adjacent Building M235.

Gauging data collected from previous investigations also have identified measurable free product at well MW-19. Four gauging events conducted from July 2000 to April 2001 identified measurable free product at this well, ranging in thickness from 0.61 foot (January 2001) to 0.12 foot (July 2001) (Law, 2000b; Law, 2001). More recently, four gauging events conducted between October 2002 and August 2003 indicated measurable free product was not present at this well, although two events identified the presence of a sorbent sock in the well immediately prior to gauging, reducing the reliability of the gauging data at the well (EEI, 2003a; 2003b; 2003c; 2003d).

The only well other than MW-19 where measurable free product has been observed is well MW-3. Free product was reported at this well in December 1992 at a thickness of 0.12 foot (OBG, 1993). Measurable free product was not detected during gauging events conducted at this well in November 1991, July and October 2002, and January and April 2001 (OBG, 1992; Law, 2000b; Law, 2001). As indicated above, measurable free product was not observed at well MW-3 during the current monitoring program.

In summary, a review of site groundwater quality data indicate few AVOCs or SVOCs have been present at concentrations above NCGWQSs, and the current data indicate no AVOCs or target analyte SVOCs are present above NCGWQSs. The C₉-C₂₂ Aromatics have been reported at concentrations slightly above NCGWQSs at wells MW-3, MW-18, MW-21, and MW-22. The current monitoring program, which included sampling at wells MW-18, MW21, and MW-22 but not MW-3, indicated the C₉-C₂₂ Aromatics exceeded the NCGWQS only at well MW-18 during both semi-annual sampling events, with wells MW-21 and MW-22 exceeding the C₉-C₂₂ Aromatics NCGWQS for only one semi-annual event. Other than a single gauging event conducted in December 1992 that reported measurable free product in well MW-3, well MW-19 is the only well to exhibit measurable free product, and the free product measured in this well has not occurred consistently over time.

4.2 Quality Assurance/Quality Control and Data Verification

One quality control (QC) sample consisting of a field duplicate sample was collected from well MW-7 during the June and December 2004 events. The primary and QC samples were submitted to Paradigm Analytical Laboratories for the same analyses. Results for the two samples generally were consistent for each event. The June 2004 data indicated no detectable target analytes in either the primary or duplicate sample. A single TIC, identified as “unknown” with a retention time of 10.42, was reported at estimated concentrations of 20 ug/L and 13 ug/L for the primary and duplicate samples, respectively. In December 2004, no VPH hydrocarbons, target SVOCs, or TICs were detected in either sample. The primary sample exhibited toluene at an estimated concentration of 0.808 ug/L, whereas toluene was not detected in the duplicate sample, at a reporting limit of 1.00 ug/L. The EPH analyses indicated a concentration of 600 ug/L for the C₁₉-C₃₆ Aliphatics for the primary sample, whereas the C₁₉-C₃₆ Aliphatics were not detected in the duplicate sample, at a reporting limit of 100 ug/L. No other EPH hydrocarbons were detected in either sample.

Data verification was performed by EEI on the complete set of the primary investigative samples, and included a review of the following:

- Holding times
- Blanks
- Laboratory control spikes
- Surrogate recoveries
- Internal standards
- Calibrations

An assessment of the results indicated the data are usable for project purposes.

SECTION 5 CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations have been developed based on an evaluation of site data. Each is discussed below.

5.1 Conclusions

The following conclusions have been drawn based on site data:

- Surficial aquifer groundwater flow directions are variable over time, possibly in response to seasonal water table fluctuations and/or variable local recharge from precipitation; given the variable flow direction, net movement of groundwater across the site appears to be limited.
- No water supply wells have been identified within 1,200 feet of the site, and supply wells at the base do not draw water from the surficial aquifer but from the deeper Castle Hayne aquifer.
- There are no mapped surface water bodies present at the site. The closest mapped surface water bodies are more than 600 feet from the site.
- Previous investigations indicate petroleum-impacted soils exhibiting TPH concentrations above State standards in effect at the time of sampling are limited to the immediate vicinity of the former USTs.
- Gauging data suggest that a limited thickness of free product is present inconsistently at well MW-19, located near the former UST associated with Building M235.
- Historical groundwater quality data indicate few constituents have been present above NCGWQs, and, with the exception of phenanthrene detected once in 1991 at one well, all constituents have been substantially below GCLs.
- No AVOCs or target analyte SVOCs were present at concentrations above NCGWQs during the current monitoring program.
- Historical and current groundwater quality data indicate that the C₉-C₂₂ Aromatics are present at concentrations above slightly NCGWQs, primarily in wells located in the immediate vicinity of some of the former USTs; the potential for migration of dissolved-phase constituents is low given the groundwater flow conditions present at the site.

5.2 Recommendations

The following recommendations are made based on site data:

- Over the next year, conduct quarterly groundwater gauging and semi-annual groundwater sampling, to include wells identified for gauging and sampling in the current program.
- Conduct product recovery via hand bailing or installation of sorbent socks on a quarterly basis, as indicated by the gauging data.
- Remove any sorbent socks from site monitoring wells approximately two weeks prior to each scheduled gauging event, and reinstall socks as needed following the event.
- Report findings quarterly for each monitoring event, with an annual report prepared after completion of the fourth quarter monitoring event.

SECTION 6 REFERENCES

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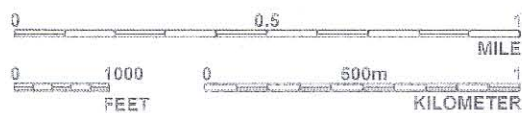
OBG, 1992 (O'Brien and Gere Engineers, Inc.). January 1992. Site Assessment, Tanks M232-M236, Camp Johnson, Marine Corps Base Camp Lejeune, North Carolina. Prepared for the Department of the Navy.

OBG, 1993 (O'Brien and Gere Engineers, Inc.). July 1993. Addendum Site Assessment, Tanks M232-M236, Camp Johnson, Marine Corps Base Camp Lejeune, North Carolina. Prepared for the Department of the Navy.

FIGURES



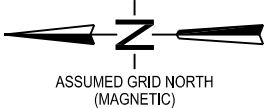
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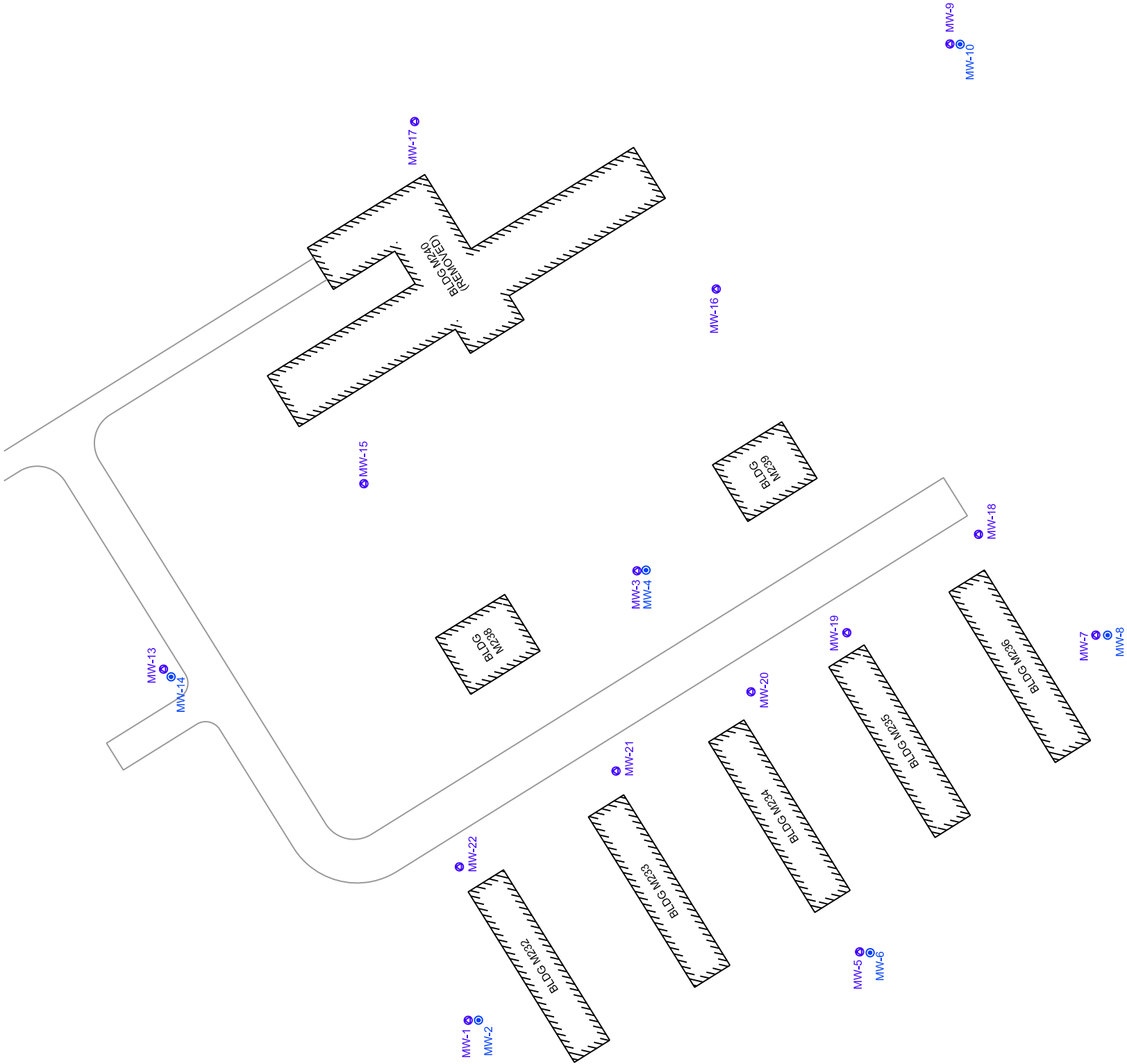
MAP LOCATION
IN NORTH CAROLINA

U.S.G.S TOPOGRAPHIC MAP:
JACKSONVILLE SOUTH, N.C.
1952
PHOTOINSPECTED 1988

	FIGURE	1-1	SITE LOCATION SITE M232-236 ANNUAL MONITORING REPORT MCB CAMP LEJEUNE, NC
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	REVISION	0	
	DRAWN BY	WCM	
	FILE	M232_TOPO	

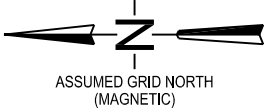


- LEGEND**
- SHALLOW MONITORING WELL
 - INTERMEDIATE MONITORING WELL

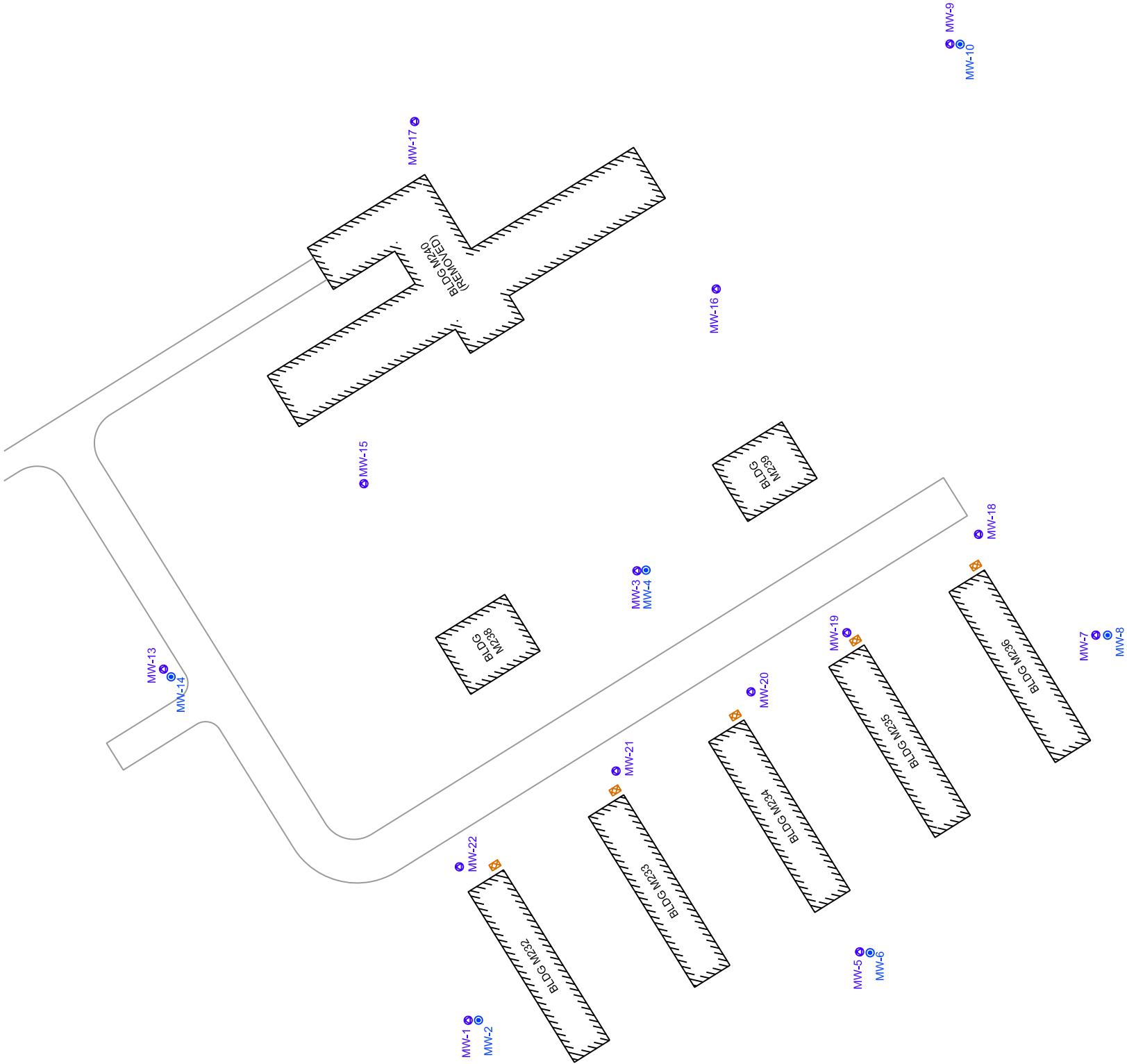


(Base map adapted from OBG, 1992; OBG, 1993, Law, 2000a)

	FIGURE	1-2	SITE LAYOUT AND WELL LOCATIONS
	DATE	04/13/05	SITE M232-236
	REVISION	0	ANNUAL MONITORING REPORT
	DRAWN BY	WGMAER	MCB CAMP LEJEUNE, NC
	FILE	M232_MAP	

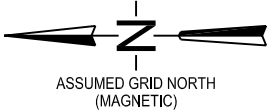


- LEGEND
- SHALLOW MONITORING WELL
 - INTERMEDIATE MONITORING WELL
 - FORMER UST



(Base map adapted from OBG, 1992; OBG, 1993, Law, 2000a)

	FIGURE	1-3	FORMER UST LOCATIONS
	DATE	04/13/05	
	REVISION	0	
	DRAWN BY	WGMAER	
	FILE	M232_MAP	
			SITE M232-236 ANNUAL MONITORING REPORT MCB CAMP LEJEUNE, NC



LEGEND

- SHALLOW MONITORING WELL
 - INTERMEDIATE MONITORING WELL
 - FORMER UST
 - SURFICIAL AQUIFER SHALLOW WELL GROUNDWATER ELEVATION
 - SURFICIAL AQUIFER SHALLOW WELL GROUNDWATER ELEVATION CONTOUR
- (GROUNDWATER ELEVATIONS EXPRESSED IN FEET ABOVE/BELOW MEAN SEA LEVEL)

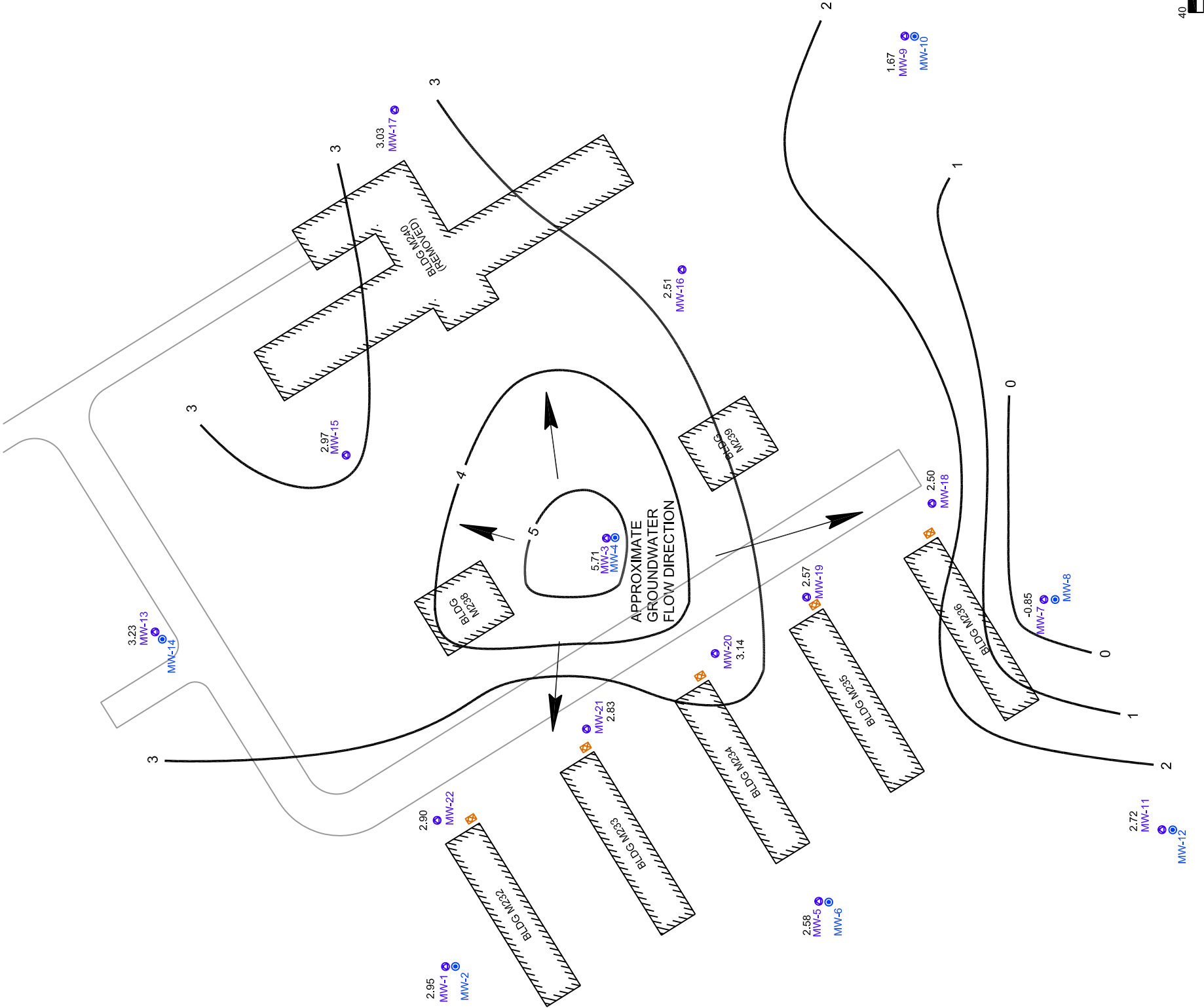
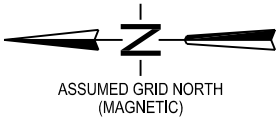


	FIGURE	3-1	SURFICIAL AQUIFER SHALLOW WELL GROUNDWATER ELEVATIONS
	DATE	7/17/04	FOR 15 JUNE 2004
	REVISION	0	SITE M232-236
	DRAWN BY	WCM	QUARTERLY MONITORING REPORT
	FILE	M232_MAP	MCB CAMP LEJEUNE, NC



LEGEND

- SHALLOW MONITORING WELL
 - INTERMEDIATE MONITORING WELL
 - FORMER UST
 - SURFICIAL AQUIFER INTERMEDIATE WELL GROUNDWATER ELEVATION
 - SURFICIAL AQUIFER INTERMEDIATE WELL GROUNDWATER ELEVATION CONTOUR
- (GROUNDWATER ELEVATIONS EXPRESSED IN FEET ABOVE/BELOW MEAN SEA LEVEL)

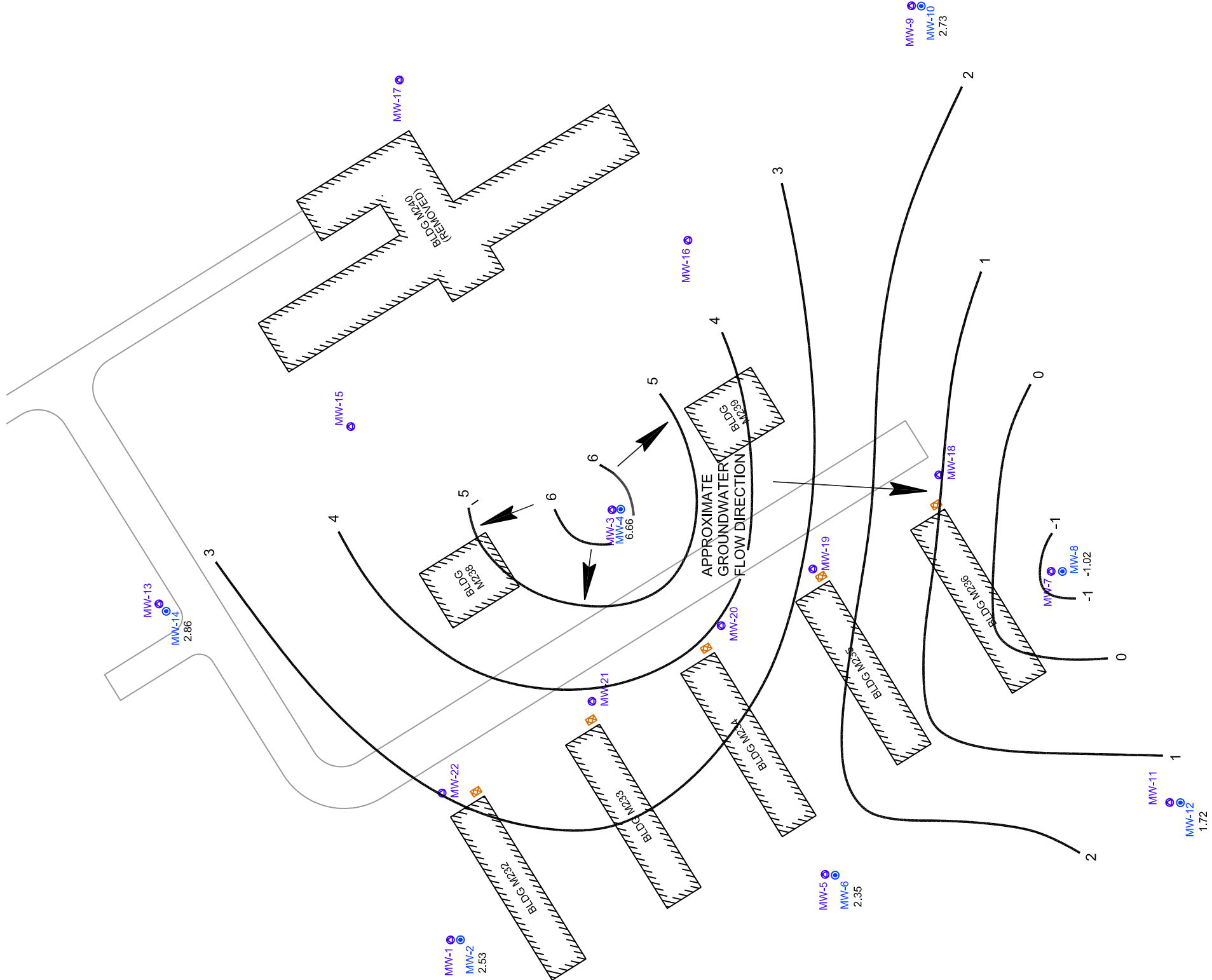


	FIGURE	3-2	SURFICIAL AQUIFER INTERMEDIATE WELL
	DATE	7/17/04	GROUNDWATER ELEVATIONS
	REVISION	0	FOR 15 JUNE 2004
	DRAWN BY	WCM	SITE M232-236
	FILE	M232_MAP	ANNUAL MONITORING REPORT
			MCB CAMP LEJEUNE, NC



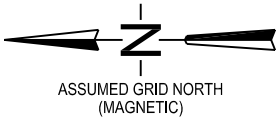
LEGEND

- SHALLOW MONITORING WELL
INTERMEDIATE MONITORING WELL
FORMER UST

(GROUNDWATER ELEVATIONS EXPRESSED IN FEET ABOVE/BELOW MEAN SEA LEVEL)



	FIGURE	3-3	SURFICIAL AQUIFER SHALLOW WELL GROUNDWATER ELEVATIONS FOR 21 SEPTEMBER 2004 SITE M232-236 ANNUAL MONITORING REPORT MCB CAMP LEJEUNE, NC
	DATE	10/12/04	
	REVISION	0	
	DRAWN BY	WCM	
	FILE	M232_MAP	



LEGEND

- SHALLOW MONITORING WELL
 - INTERMEDIATE MONITORING WELL
 - FORMER UST
 - SURFICIAL AQUIFER INTERMEDIATE WELL GROUNDWATER ELEVATION
 - SURFICIAL AQUIFER INTERMEDIATE WELL GROUNDWATER ELEVATION CONTOUR
- (GROUNDWATER ELEVATIONS EXPRESSED IN FEET ABOVE/BELOW MEAN SEA LEVEL)

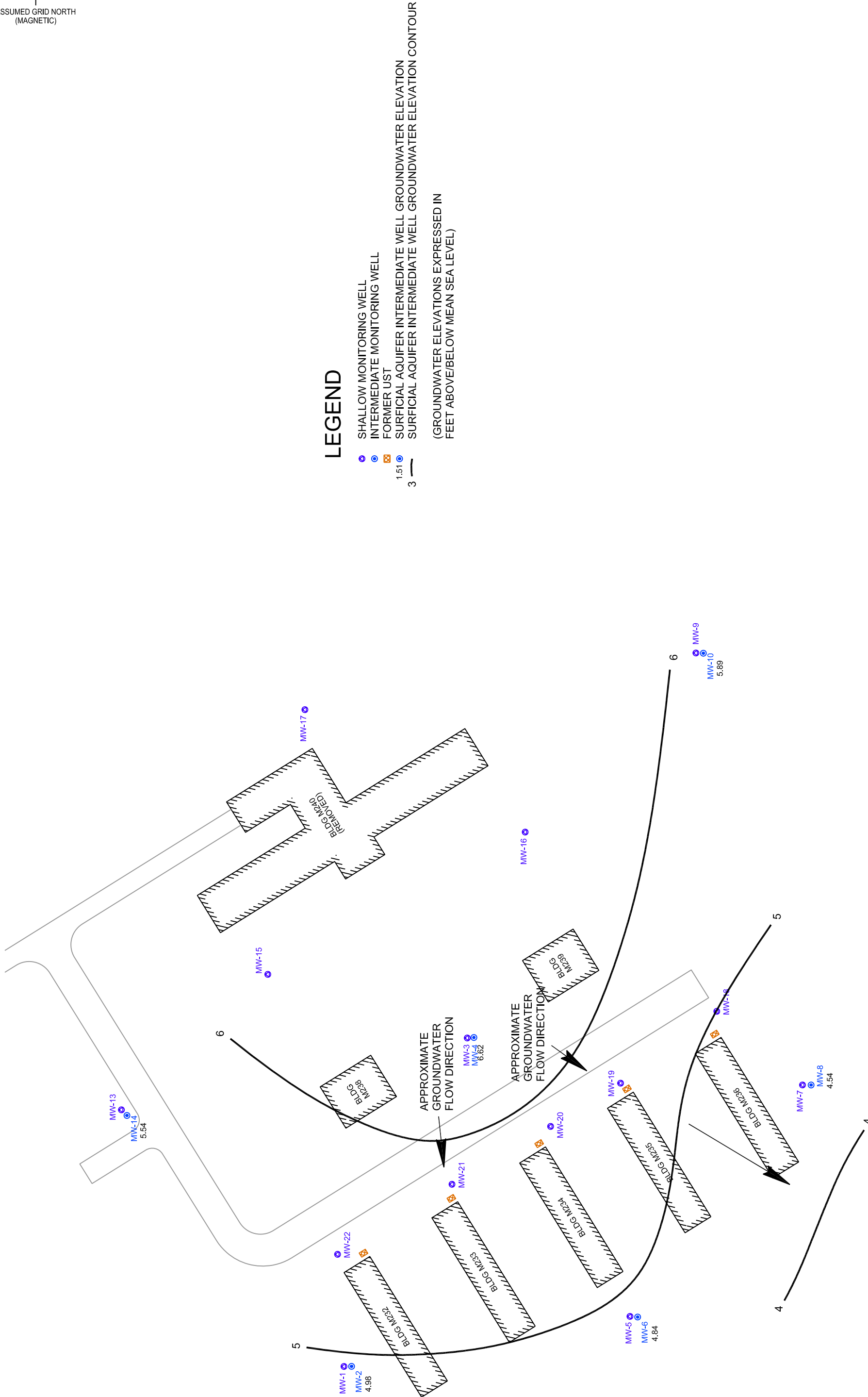
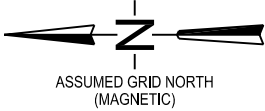
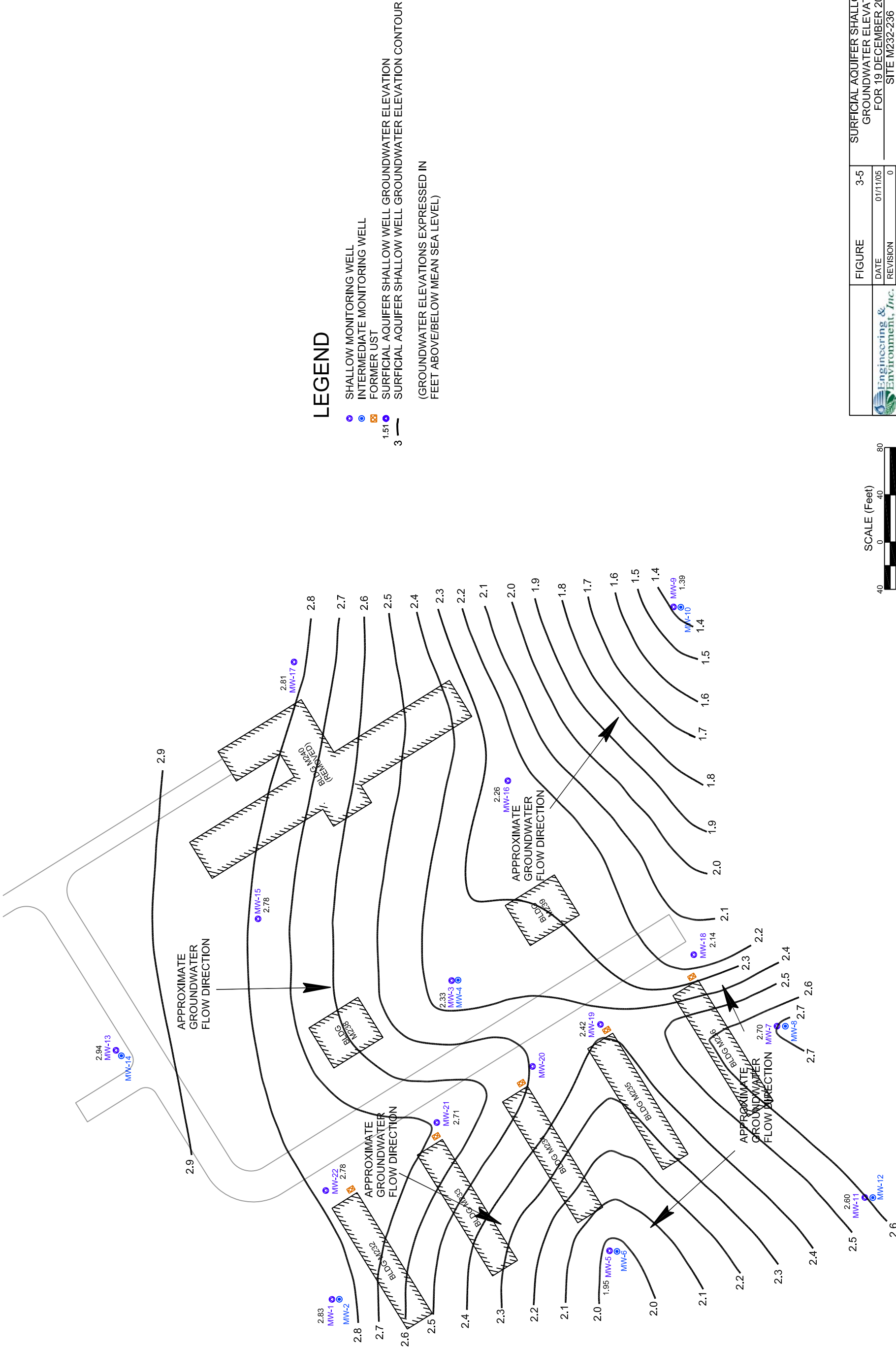


	FIGURE	3-4	SURFICIAL AQUIFER INTERMEDIATE WELL GROUNDWATER ELEVATIONS FOR 21 SEPTEMBER 2004 SITE M232-236 ANNUAL MONITORING REPORT MCB CAMP LEJEUNE, NC
	DATE	10/12/04	
	REVISION	0	
	DRAWN BY	WCM	
	FILE	M232_MAP	



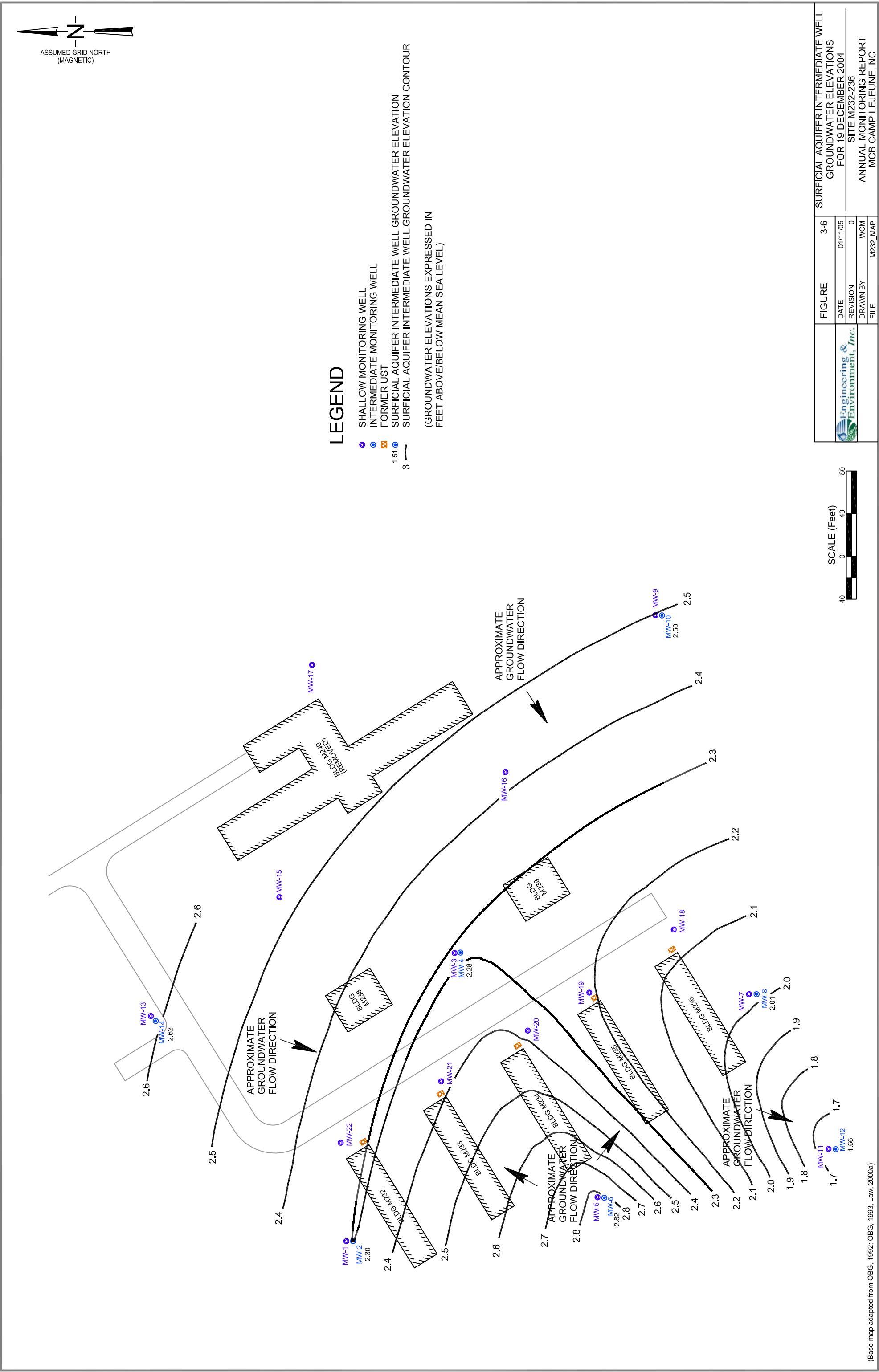
LEGEND

- SHALLOW MONITORING WELL
 - INTERMEDIATE MONITORING WELL
 - FORMER UST
 - SURFICIAL AQUIFER SHALLOW WELL GROUNDWATER ELEVATION
 - SURFICIAL AQUIFER SHALLOW WELL GROUNDWATER ELEVATION CONTOUR
- (GROUNDWATER ELEVATIONS EXPRESSED IN FEET ABOVE/BELOW MEAN SEA LEVEL)

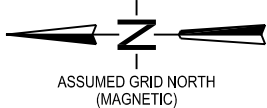


(Base map adapted from OBG, 1992; OBG, 1993, Law, 2000a)

	FIGURE	3-5	SURFICIAL AQUIFER SHALLOW WELL
	DATE	01/11/05	GROUNDWATER ELEVATIONS
	REVISION	0	FOR 19 DECEMBER 2004
	DRAWN BY	WCM	
	FILE	M232_MAP	ANNUAL MONITORING REPORT
			MCB CAMP LEJEUNE, NC

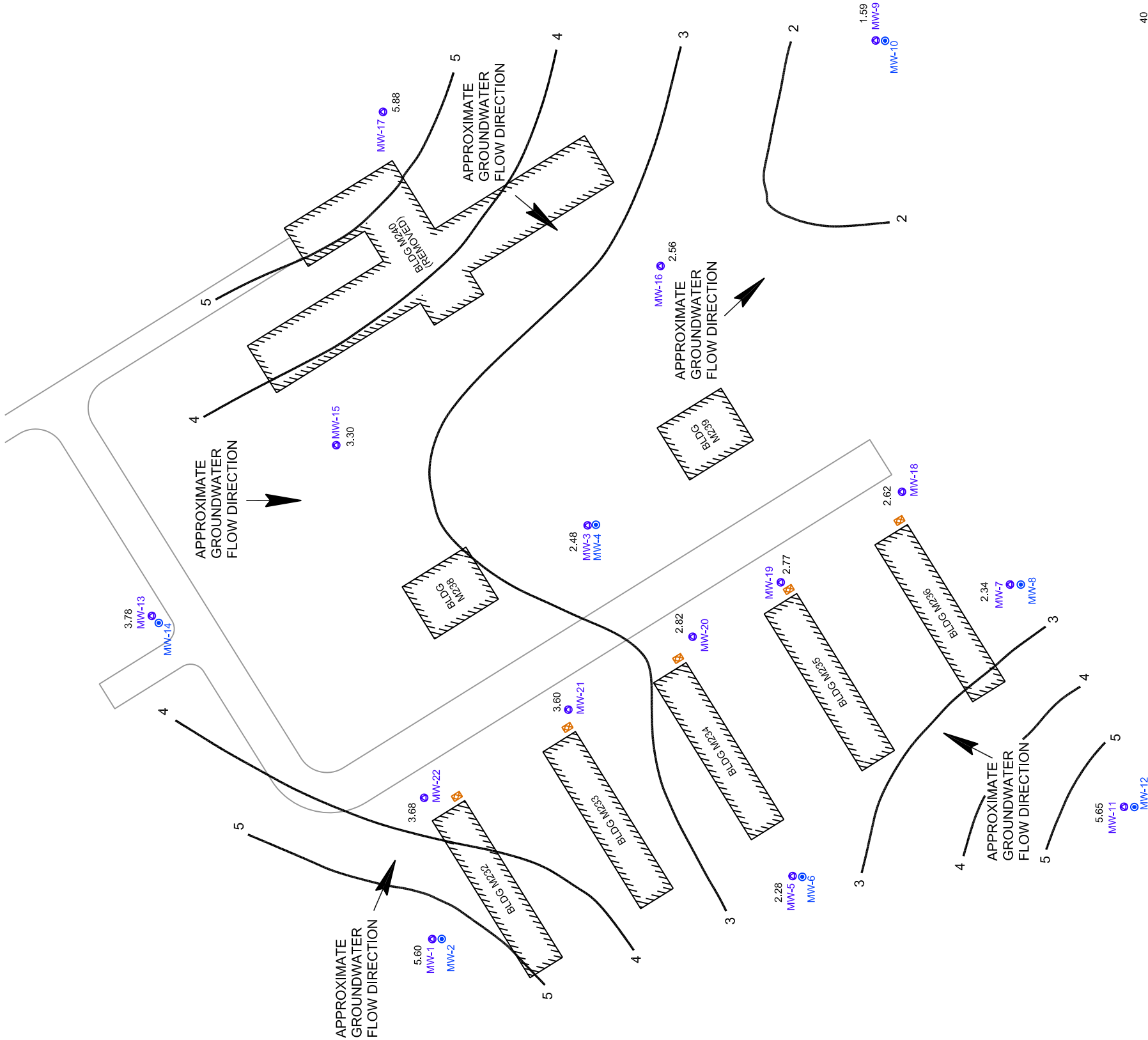


(Base map adapted from OBG, 1992; OBG, 1993, Law, 2000a)



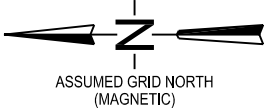
LEGEND

- SHALLOW MONITORING WELL
 - INTERMEDIATE MONITORING WELL
 - FORMER UST
 - SURFICIAL AQUIFER SHALLOW WELL GROUNDWATER ELEVATION
 - SURFICIAL AQUIFER SHALLOW WELL GROUNDWATER ELEVATION CONTOUR
- (GROUNDWATER ELEVATIONS EXPRESSED IN FEET ABOVE/BELOW MEAN SEA LEVEL)



(Base map adapted from OBG, 1992; OBG, 1993, Law, 2000a)

	FIGURE	3-7	SURFICIAL AQUIFER SHALLOW WELL GROUNDWATER ELEVATIONS FOR 4 MARCH 2005 ANNUAL MONITORING REPORT MCB CAMP LEJEUNE, NC
	DATE	04/13/05	
	REVISION	0	
	DRAWN BY	WGMA/ER	
	FILE	M232_MAP	



LEGEND

- SHALLOW MONITORING WELL
 - INTERMEDIATE MONITORING WELL
 - FORMER UST
 - SURFICIAL AQUIFER INTERMEDIATE WELL GROUNDWATER ELEVATION
 - SURFICIAL AQUIFER INTERMEDIATE WELL GROUNDWATER ELEVATION CONTOUR
- (GROUNDWATER ELEVATIONS EXPRESSED IN FEET ABOVE/BELOW MEAN SEA LEVEL)

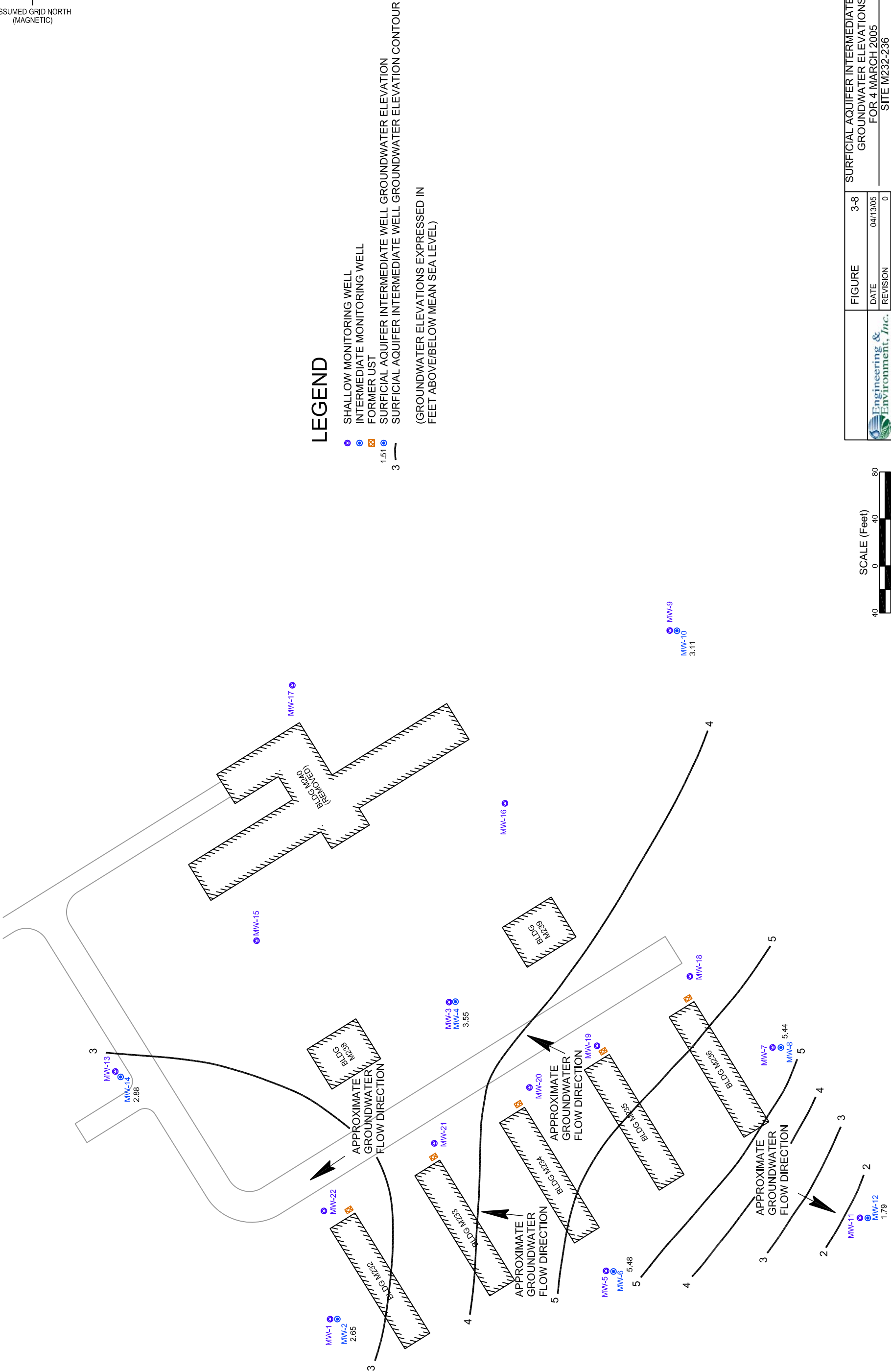
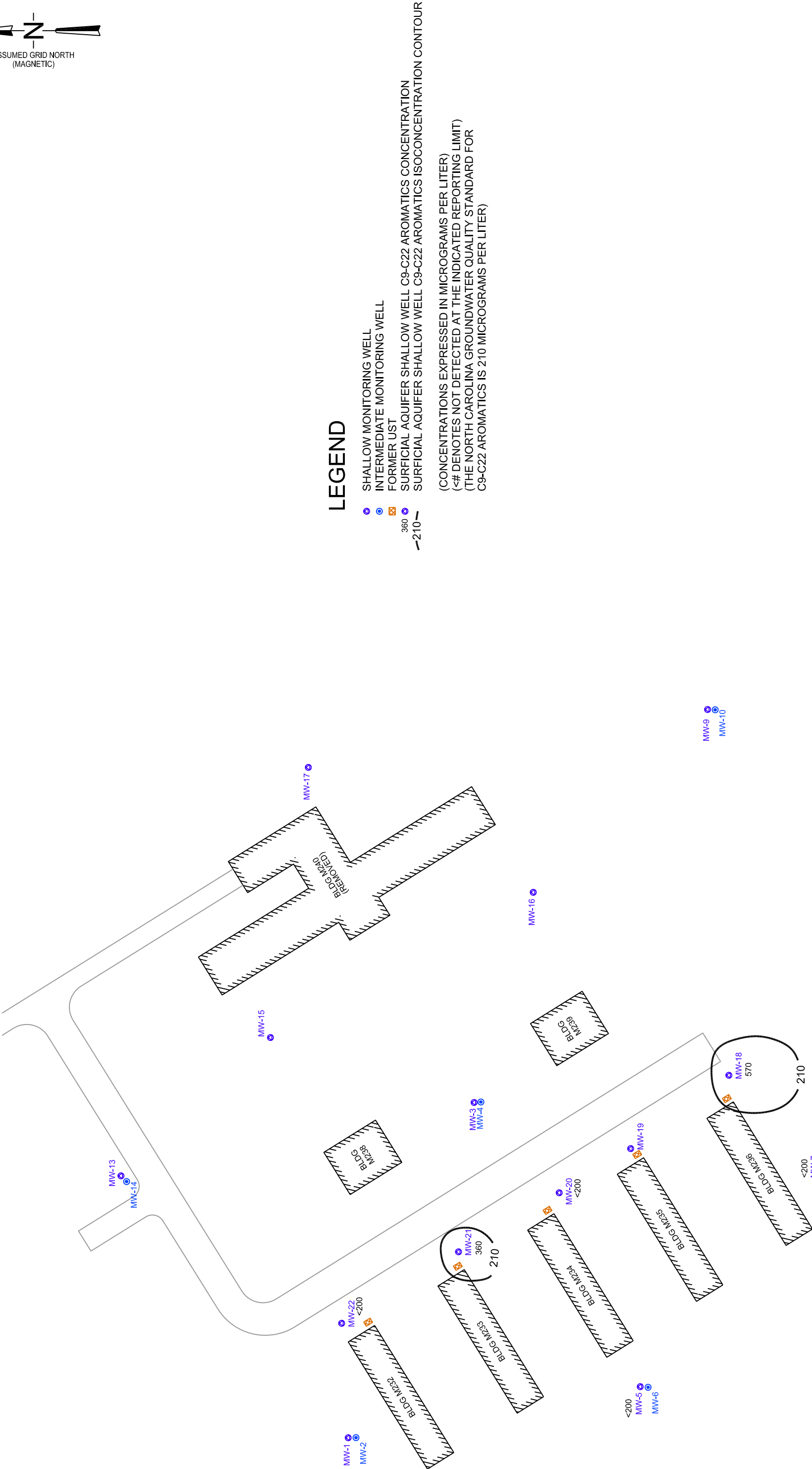
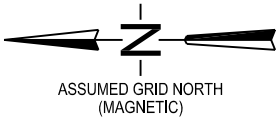


	FIGURE	3-8	SURFICIAL AQUIFER INTERMEDIATE WELL
	DATE	04/13/05	GROUNDWATER ELEVATIONS
	REVISION	0	FOR 4 MARCH 2005
	DRAWN BY	WGMA/ER	SITE M232-236
	FILE	M232_MAP	ANNUAL MONITORING REPORT
			MCB CAMP LEJEUNE, NC

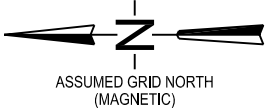


LEGEND

- SHALLOW MONITORING WELL
 - INTERMEDIATE MONITORING WELL
 - FORMER UST
 - SURFICIAL AQUIFER SHALLOW WELL C9-C22 AROMATICS CONCENTRATION
 - SURFICIAL AQUIFER SHALLOW WELL C9-C22 AROMATICS ISOCONCENTRATION CONTOUR
- (CONCENTRATIONS EXPRESSED IN MICROGRAMS PER LITER)
(<# DENOTES NOT DETECTED AT THE INDICATED REPORTING LIMIT)
(THE NORTH CAROLINA GROUNDWATER QUALITY STANDARD FOR C9-C22 AROMATICS IS 210 MICROGRAMS PER LITER)

	FIGURE	4-1	SURFICIAL AQUIFER SHALLOW WELL	
	DATE	7/17/04	C9-C22 AROMATICS CONCENTRATIONS	
	REVISION	0	FOR JUNE 2004	
	DRAWN BY	WCM	SITE M232-236	
	FILE	M232_MAP	ANNUAL MONITORING REPORT	
			MCB CAMP LEJEUNE, NC	





LEGEND

- SHALLOW MONITORING WELL
 - INTERMEDIATE MONITORING WELL
 - FORMER UST
 - SURFICIAL AQUIFER SHALLOW WELL C9-C22 AROMATICS CONCENTRATION 360
 - SURFICIAL AQUIFER SHALLOW WELL C9-C22 AROMATICS ISOCONCENTRATION CONTOUR 210
- (CONCENTRATIONS EXPRESSED IN MICROGRAMS PER LITER)
(<# DENOTES NOT DETECTED AT THE INDICATED REPORTING LIMIT)
(THE NORTH CAROLINA GROUNDWATER QUALITY STANDARD FOR C9-C22 AROMATICS IS 210 MICROGRAMS PER LITER)

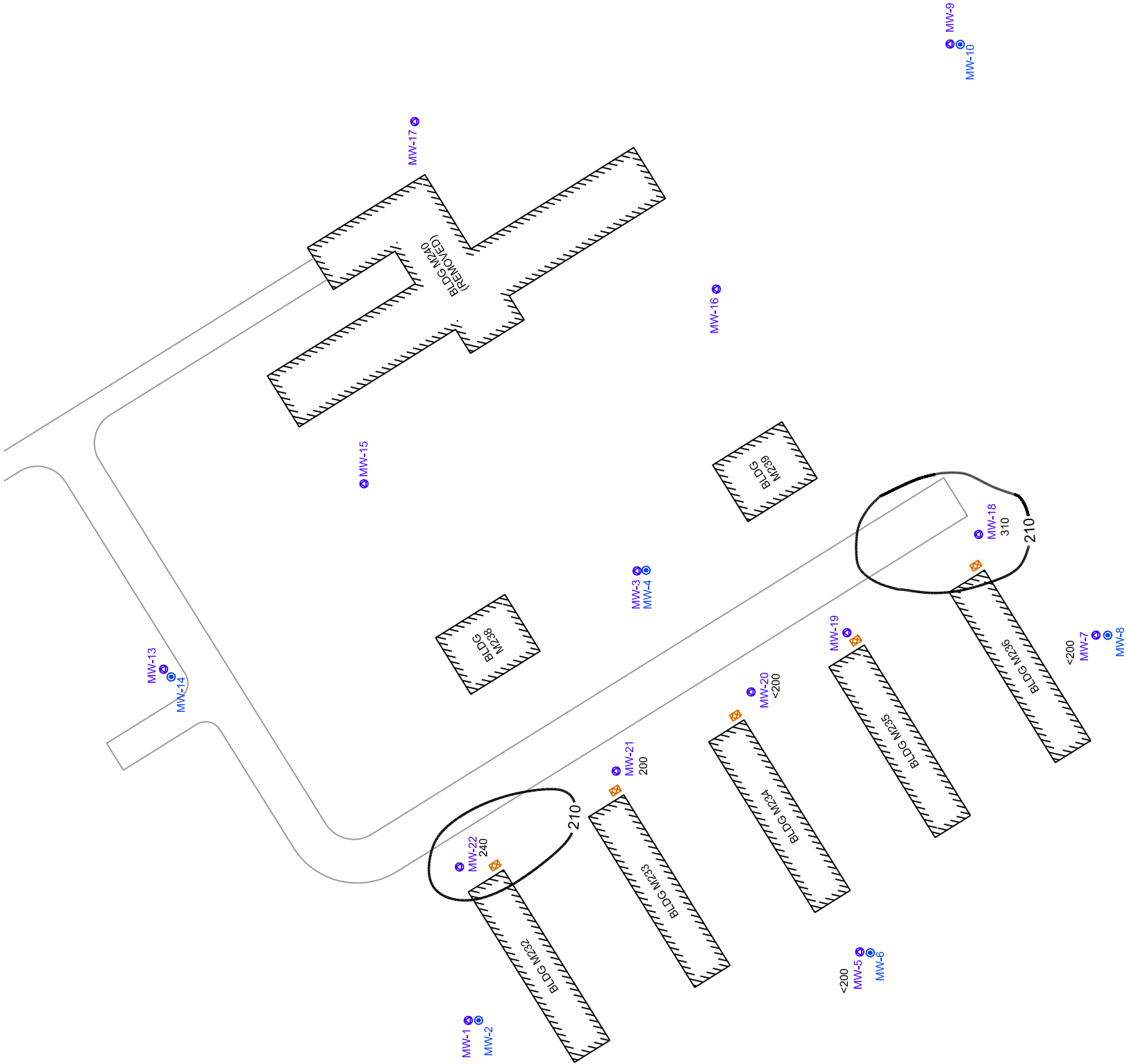
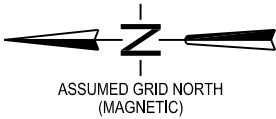
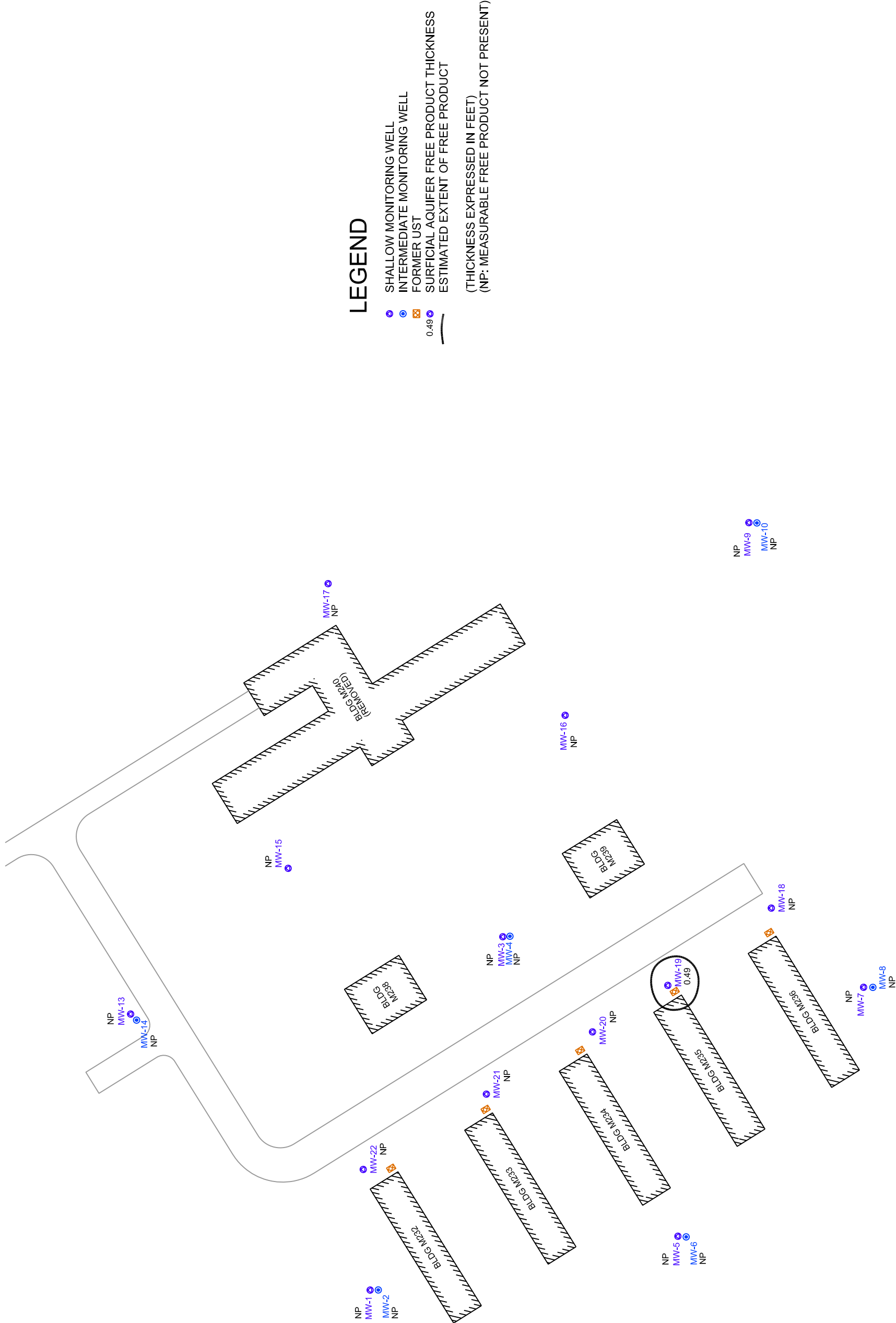


	FIGURE	4-2	SURFICIAL AQUIFER SHALLOW WELL C9-C22 AROMATICS CONCENTRATIONS FOR DECEMBER 2004 ANNUAL MONITORING REPORT MCB CAMP LEJEUNE, NC
	DATE	01/11/05	
	REVISION	0	
	DRAWN BY	WCM	
	FILE	M232_MAP	



LEGEND

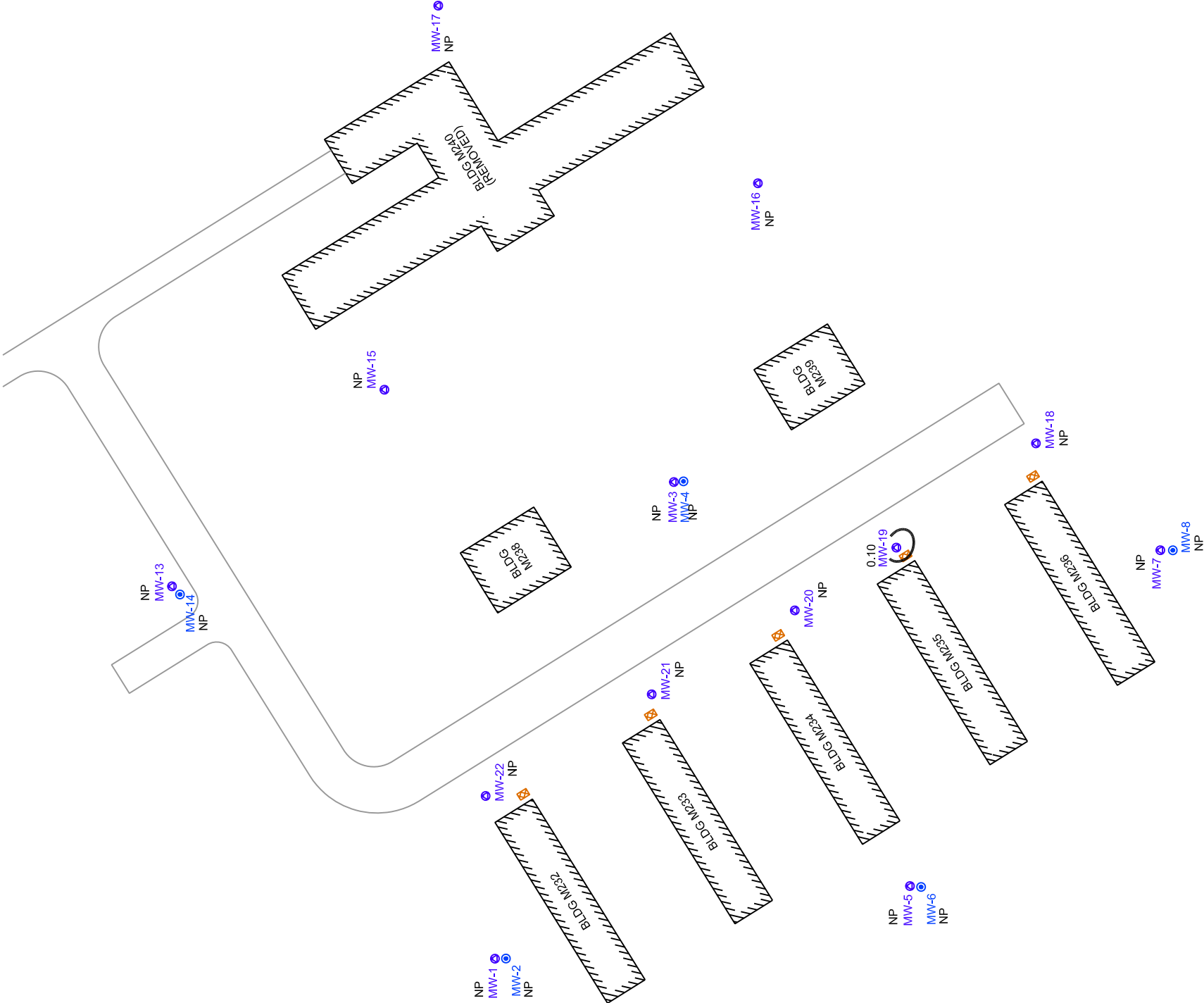
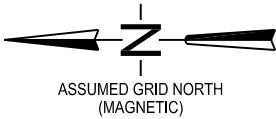
- SHALLOW MONITORING WELL
 - INTERMEDIATE MONITORING WELL
 - FORMER UST
 - SURFICIAL AQUIFER FREE PRODUCT THICKNESS
 - ESTIMATED EXTENT OF FREE PRODUCT
- (THICKNESS EXPRESSED IN FEET)
(NP: MEASURABLE FREE PRODUCT NOT PRESENT)



NP MW-11
MW-12
NP



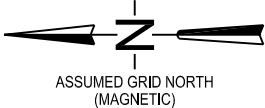
	FIGURE		4-3		ESTIMATED EXTENT OF FREE PRODUCT THICKNESS FOR JUNE 2004	
	DATE		7/17/04			
	REVISION		0			
	DRAWN BY		WCM		SITE M232-236	
	FILE		M232_MAP		ANNUAL MONITORING REPORT MCB CAMP LEJEUNE, NC	



NP
MW-11
NP
MW-12
NP



	FIGURE		4-4	ESTIMATED EXTENT OF FREE PRODUCT FOR SEPTEMBER 2004 SITE M232-236 ANNUAL MONITORING REPORT MCB CAMP LEJEUNE, NC
	DATE	10/12/04		
	REVISION	0		
	DRAWN BY	WCM		
	FILE	M232_MAP		



LEGEND

●

SHALLOW MONITORING WELL

●

INTERMEDIATE MONITORING WELL

●

FORMER UST

■

SURFICIAL AQUIFER FREE PRODUCT THICKNESS

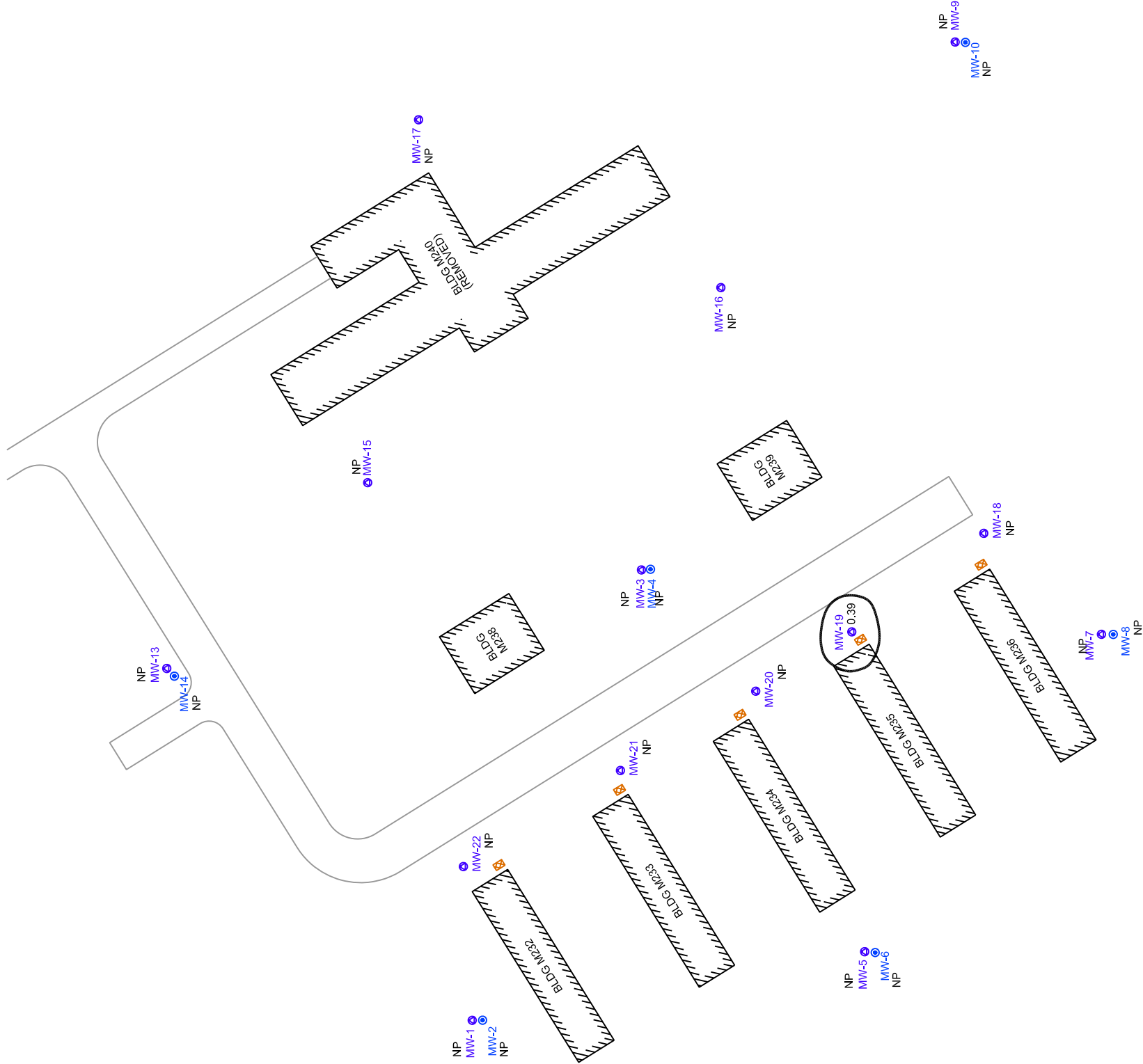
■

ESTIMATED EXTENT OF FREE PRODUCT

0.49

—

(THICKNESS EXPRESSED IN FEET)
(NP: MEASURABLE FREE PRODUCT NOT PRESENT)



(Base map adapted from OBG, 1992; OBG, 1993, Law, 2000a)

NP
MW-11
MW-12
NP

NP
MW-7
MW-8
NP

MW-18
NP

NP
MW-9
MW-10
NP

MW-16
NP

NP
MW-3
MW-4
NP

BLDG M238
BLDG M239

MW-19
0.39

MW-20
NP

BLDG M234
BLDG M235

NP
MW-5
MW-6
NP

BLDG M232
BLDG M233

MW-21
NP

NP
MW-1
MW-2
NP

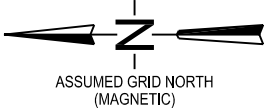
BLDG M230
BLDG M231

NP
MW-15

MW-17
NP

NP
MW-13
MW-14
NP

	FIGURE	4-5	ESTIMATED EXTENT OF FREE PRODUCT
	DATE	01/11/05	FOR DECEMBER 2004
	REVISION	0	SITE M232-236
	DRAWN BY	WCM	ANNUAL MONITORING REPORT
	FILE	M232_MAP	MCB CAMP LEJEUNE, NC



LEGEND

●

SHALLOW MONITORING WELL

●

INTERMEDIATE MONITORING WELL

●

FORMER UST

■

SURFICIAL AQUIFER FREE PRODUCT THICKNESS

■

ESTIMATED EXTENT OF FREE PRODUCT

0.49

(THICKNESS EXPRESSED IN FEET)

(NP: MEASURABLE FREE PRODUCT NOT PRESENT)

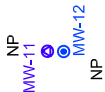
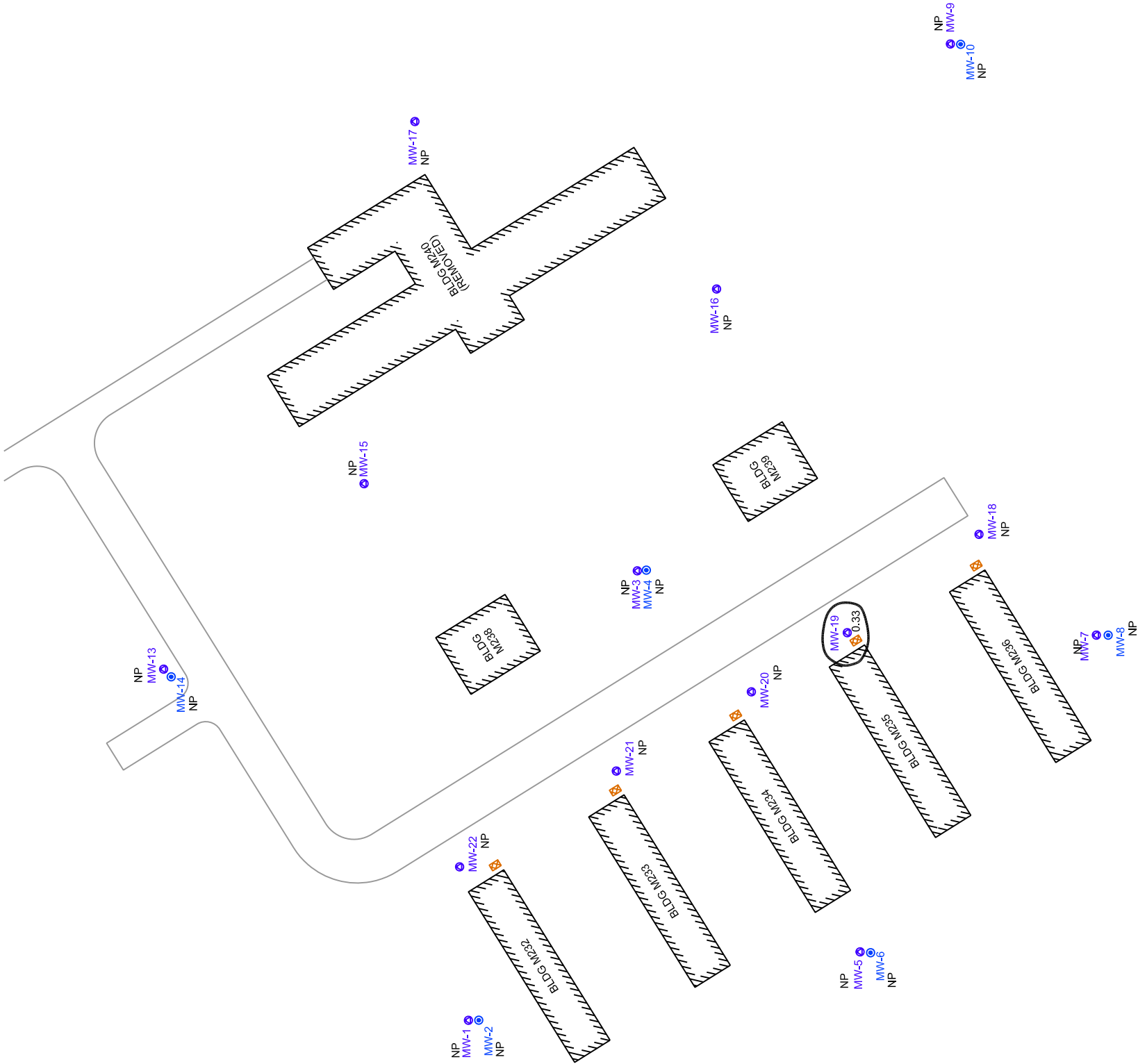


	FIGURE	4-6	ESTIMATED EXTENT OF FREE PRODUCT
	DATE	04/13/05	FOR MARCH 2005
	REVISION	0	SITE M232-236
	DRAWN BY	WGMA/ER	ANNUAL MONITORING REPORT
	FILE	M232_MAP	MCB CAMP LEJEUNE, NC

TABLES

Table 3-1
Gauging Data for 4 March 2005
Site M232-236

Well Identification	Top of Casing Elevation (feet msl)	Depth to Water (feet btoc)	Depth to Product (feet btoc)	Product Thickness (feet)	Uncorrected Groundwater Elevation (feet msl)	Corrected Groundwater Elevation ⁽¹⁾ (feet msl)
MW-1	14.20	8.60	NP	NP	5.60	5.60
<i>MW-2</i>	13.96	11.31	NP	NP	2.65	2.65
MW-3	16.33	13.85	NP	NP	2.48	2.48
<i>MW-4</i>	16.48	12.93	NP	NP	3.55	3.55
MW-5	12.80	10.52	NP	NP	2.28	2.28
<i>MW-6</i>	13.07	7.59	NP	NP	5.48	5.48
MW-7	12.90	10.56	NP	NP	2.34	2.34
<i>MW-8</i>	12.91	7.47	NP	NP	5.44	5.44
MW-9	13.88	12.29	NP	NP	1.59	1.59
<i>MW-10</i>	14.43	11.32	NP	NP	3.11	3.11
MW-11	10.87	5.22	NP	NP	5.65	5.65
<i>MW-12</i>	10.89	9.10	NP	NP	1.79	1.79
MW-13	16.10	12.32	NP	NP	3.78	3.78
<i>MW-14</i>	15.97	13.09	NP	NP	2.88	2.88
MW-15	15.28	11.98	NP	NP	3.30	3.30
MW-16	15.14	12.58	NP	NP	2.56	2.56
MW-17	14.52	8.64	NP	NP	5.88	5.88
MW-18	11.34	8.72	NP	NP	2.62	2.62
MW-19	11.45	8.94	8.61	0.33	2.51	2.77
MW-20	11.39	8.57	NP	NP	2.82	2.82
MW-21	11.75	8.15	NP	NP	3.60	3.60
MW-22	11.73	8.05	NP	NP	3.68	3.68

⁽¹⁾ Corrected Groundwater Elevation = Top of Casing Elevation - Depth to Water + 0.8 x Product Thickness

Well identifications shown in *italics* indicate wells screened from approximately 20 feet bgs to 30 feet bgs; all other wells screened at or above 15 feet bgs

feet msl - feet above/below mean sea level

feet btoc - feet below top of casing

NP - Not Present - no measurable product detected

Table 3-2
Quarterly Gauging Data from June 2004 to March 2005
Site M232-236

Location	Top of Casing Elevation (feet msl)	Depth to Water (feet btoc)				Depth To Product (feet btoc)			
		06/15/04	09/21/04	12/19/04	03/04/05	06/15/04	09/21/04	12/19/04	03/04/05
MW-1	14.20	11.25	6.31	11.37	8.60	NP	NP	NP	NP
MW-2	13.96	11.43	8.98	11.66	11.31	NP	NP	NP	NP
MW-3	16.33	10.62	11.38	14.00	13.85	NP	NP	NP	NP
MW-4	16.48	9.82	9.86	14.20	12.93	NP	NP	NP	NP
MW-5	12.80	10.22	5.50	10.85	10.52	NP	NP	NP	NP
MW-6	13.07	10.72	8.23	10.25	7.59	NP	NP	NP	NP
MW-7	12.90	13.75	4.92	10.20	10.56	NP	NP	NP	NP
MW-8	12.91	13.93	8.37	10.90	7.47	NP	NP	NP	NP
MW-9	13.88	12.21	10.05	12.49	12.29	NP	NP	NP	NP
MW-10	14.43	11.70	8.54	11.93	11.32	NP	NP	NP	NP
MW-11	10.87	8.15	2.99	8.27	5.22	NP	NP	NP	NP
MW-12	10.89	9.17	7.41	9.23	9.10	NP	NP	NP	NP
MW-13	16.10	12.87	8.52	13.16	12.32	NP	NP	NP	NP
MW-14	15.97	13.11	10.43	13.35	13.09	NP	NP	NP	NP
MW-15	15.28	12.31	9.14	12.50	11.98	NP	NP	NP	NP
MW-16	15.14	12.63	9.63	12.88	12.58	NP	NP	NP	NP
MW-17	14.52	11.49	9.21	11.71	8.64	NP	NP	NP	NP
MW-18	11.34	8.84	6.44	9.20	8.72	NP	NP	NP	NP
MW-19	11.45	9.27	6.43	9.34	8.94	8.78	6.33	8.95	8.61
MW-20	11.39	8.25	5.92	9.98	8.57	NP	NP	NP	NP
MW-21	11.75	8.92	5.41	9.04	8.15	NP	NP	NP	NP
MW-22	11.73	8.83	4.85	8.95	8.05	NP	NP	NP	NP
		Product Thickness (feet)				Corrected Groundwater Elevation ⁽¹⁾ (feet msl)			
		06/15/04	09/21/04	12/19/04	03/04/05	06/15/04	09/21/04	12/19/04	03/04/05
MW-1	14.20	NP	NP	NP	NP	2.95	7.89	2.83	5.60
MW-2	13.96	NP	NP	NP	NP	2.53	4.98	2.30	2.65
MW-3	16.33	NP	NP	NP	NP	5.71	4.95	2.33	2.48
MW-4	16.48	NP	NP	NP	NP	6.66	6.62	2.28	3.55
MW-5	12.80	NP	NP	NP	NP	2.58	7.30	1.95	2.28
MW-6	13.07	NP	NP	NP	NP	2.35	4.84	2.82	5.48
MW-7	12.90	NP	NP	NP	NP	-0.85	7.98	2.70	2.34
MW-8	12.91	NP	NP	NP	NP	-1.02	4.54	2.01	5.44
MW-9	13.88	NP	NP	NP	NP	1.67	3.83	1.39	1.59
MW-10	14.43	NP	NP	NP	NP	2.73	5.89	2.50	3.11
MW-11	10.87	NP	NP	NP	NP	2.72	7.88	2.60	5.65
MW-12	10.89	NP	NP	NP	NP	1.72	3.48	1.66	1.79
MW-13	16.10	NP	NP	NP	NP	3.23	7.58	2.94	3.78
MW-14	15.97	NP	NP	NP	NP	2.86	5.54	2.62	2.88
MW-15	15.28	NP	NP	NP	NP	2.97	6.14	2.78	3.30
MW-16	15.14	NP	NP	NP	NP	2.51	5.51	2.26	2.56
MW-17	14.52	NP	NP	NP	NP	3.03	5.31	2.81	5.88
MW-18	11.34	NP	NP	NP	NP	2.50	4.90	2.14	2.62
MW-19	11.45	0.49	0.10	0.39	0.33	2.57	5.10	2.42	2.77
MW-20	11.39	NP	NP	NP	NP	3.14	5.47	1.41	2.82
MW-21	11.75	NP	NP	NP	NP	2.83	6.34	2.71	3.60
MW-22	11.73	NP	NP	NP	NP	2.90	6.88	2.78	3.68

⁽¹⁾ Corrected Groundwater Elevation = Top of Casing Elevation - Depth to Water + 0.8 x Product Thickness

Well identifications shown in *italics* indicate wells screened from approximately

20 feet bgs to 30 feet bgs; all other wells screened at or above 15 feet bgs

feet msl - feet above/below mean sea level

feet btoc - feet below top of casing

NP - Not Present - no measurable product detected

Table 4-1
Summary of Groundwater Quality Analytical Data for June and December 2004
Site M232-236

EPA Method 602 (ug/L)	NCGWQS	GCL	MW-5		MW-7				MW-18		MW-20		MW-21		MW-22	
			06/16/04	12/19/04	06/16/04		12/19/04		06/17/04	12/19/04	06/17/04	12/19/04	06/17/04	12/19/04	06/17/04	12/19/04
					Primary	Duplicate	Primary	Duplicate								
Benzene	1	5000	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Diisopropyl ether	70	70,000	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Ethylbenzene	29	29,000	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	0.720 J	0.845 J	0.617 J	<1.00
Methyl-tert butyl ether	200	200,000	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Toluene	1000	257,500	<1.00	<1.00	<1.00	<1.00	0.808 J	<1.00	0.443 J	<1.00	0.497 J	0.498 J	0.655 J	0.869 J	<1.00	0.396 J
m,p-Xylene ⁽¹⁾			<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	0.660 J	0.826 J	<2.00	0.622 J	0.916 J	1.46 J	<2.00	0.638 J
o-Xylene ⁽¹⁾			<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	0.798 J	<2.00	<2.00	<2.00	0.598 J	0.904 J	<2.00	<2.00
Total Xylenes ⁽¹⁾	530	87,500	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	1.458 J	0.826 J	<4.00	0.622 J	1.514 J	2.364 J	<4.00	0.638 J
EPA Method 625 (ug/L)																
Acenaphthene	80	2120	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	6.50 J	2.80 J	1.80 J	<10.0	2.20 J	2.20 J	3.20 J	<10.0
Anthracene	2100	2100	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Bis(2-ethylhexyl)phthalate	3	3000	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Diethylphthalate	5000	NE	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	2.90 J	<10.0	15.5	<10.0	4.60 J
4,6-Dinitro-2-methylphenol	RL	NE	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Fluorene	280	950	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	9.40 J	4.70 J	2.10 J	1.30 J	3.40 J	3.50 J	4.50 J	1.60 J
Naphthalene	21	15,500	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	2.70 J	<10.0	<10.0	<10.0	4.60 J	3.10 J	7.80 J	2.30 J
Phenanthrene	210	410	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	8.80 J	4.90 J	<10.0	<10.0	2.60 J	3.10 J	3.30 J	<10.0
Pyrene	210	210	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
TICs (total)			10 J	NR	20 J	13 J	NR	NR	109.6 J	72.47 J	11 J	NR	100 J	116.69 J	117 J	32.8 J
1-Methylnaphthalene (TIC)	RL	NE	NR	NR	NR	NR	NR	NR	4.6 J	4.7 J	NR	NR	37 J	30.2 J	50 J	15.1 J
2-Methylnaphthalene (TIC)	14	12,500	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	19 J	10.7 J	20 J	6.6 J
2,3-Dimethylnaphthalene (TIC)	RL	NE	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	22 J	NR	NR	NR
Biphenyl (TIC)	RL	NE	NR	NR	NR	NR	NR	NR	NR	9.82 J	NR	NR	NR	NR	NR	NR
MADEP VPH (ug/L)																
C ₅ -C ₈ Aliphatics	420	NE	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C ₉ -C ₁₂ Aliphatics ⁽²⁾			<100	<100	<100	<100	<100	<100	200	<100	<100	<100	130	<100	120	<100
C ₉ -C ₁₀ Aromatics ⁽²⁾			<100	<100	<100	<100	<100	<100	<100	110	<100	<100	<100	<100	<100	<100
MADEP EPH (ug/L)																
C ₉ -C ₁₈ Aliphatics ⁽²⁾	42,000	NE	<100	<100	<100	<100	<100	<100	<100	210	<100	<100	<100	300	<100	<100
C ₁₉ -C ₃₆ Aliphatics			<100	<100	<100	<100	600	<100	<100	<100	<100	<100	<100	<100	<100	<100
C ₁₁ -C ₂₂ Aromatics ⁽²⁾			<100	<100	<100	<100	<100	<100	570	200	<100	<100	360	200	<100	240
MADEP VPH + EPH (ug/L)																
C ₉ -C ₁₂ + C ₉ -C ₁₈ Aliphatics ⁽²⁾	4200	NE	<200	<200	<200	<200	<200	<200	200	210	<200	<200	130	300	120	<200
C ₉ -C ₁₀ + C ₁₁ -C ₂₂ Aromatics ⁽²⁾	210	NE	<200	<200	<200	<200	<200	<200	570	310	<200	<200	360	200	<200	240

Notes presented on following page

Table 4-1 (Continued)
Summary of Groundwater Quality Analytical Data for June and December 2004
Site M232-236

Notes:

⁽¹⁾ Laboratory quantitation is performed on the m,p-xylene isomers and on the o-xylene isomer; the NCGWQS is based on the sum of the m-, p-, and o-xylene isomers and is presented as Total Xylenes

⁽²⁾ Laboratory quantitation is performed on each of the indicated hydrocarbon fractions; NCGWQSs are based on the sum of the indicated fractions; the sums for the indicated fractions are presented as MADEP VPH + EPH

J: Estimated concentration below reporting limits or estimated concentration for TIC quantitations

NR: None Reported; no TICs were identified in the sample

<#: Analyte not detected at the indicated detection limit

GCL: Gross Contamination Level

NE: Not Established; a GCL has not been established for the analyte

NCGWQS: North Carolina Groundwater Quality Standard

RL: Reporting Limit; a NCGWQS has not be established for the compound; therefore, the NCGWQS is set at the reporting limit

TICs: Tentatively Identified Compound; "total" indicates sum of all TICs; discrete compounds when identified are listed seperately; all TIC concentrations are estimated

ug/L: micrograms per liter

Bold type indicates analyte detection

Shaded area in bold indicates analyte detection at a concentration above the NCGWQS

Shaded area in bold italics indicates analyte detection at a concentration above the GCL

Table 4-2 (Page 1 of 2)
Groundwater Quality Analytical Data Over Time
Site M232-236

Volatile Organic Compounds (ug/L)	NCGWQS	GCL	MW-1	MW-2	MW-3		MW-4	MW-5					MW-6	MW-7				MW-8	MW-9	MW-10	MW-11	MW-12	MW-13		
			November 1991	November 1991	November 1991	October 2000 ⁽¹⁾	April 2001 ⁽¹⁾	November 1991	November 1991	October 2000	April 2001	June 2004	December 2004	November 1991	November 1991	June 2004 Primary	Dup	December 2004 Primary	Dup	November 1991	November 1991	November 1991	November 1991	November 1991	November 1991
			(8010/ 8020)	(8010/ 8020)	(8010/ 8020)	(6210D)	(6210D)	(8010/ 8020)	(8010/ 8020)	(6210D)	(6210D)	(602)	(602)	(8010/ 8020)	(8010/ 8020)	(602)	(602)	(602)	(602)	(8010/ 8020)	(8010/ 8020)	(8010/ 8020)	(8010/ 8020)	(8010/ 8020)	(8010/ 8020)
n-Butylbenzene	70	6900	na	na	na	ND	ND	na	na	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	na	
sec-Butylbenzene	70	8500	na	na	na	ND	ND	na	na	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	na	
tert-Butylbenzene	70	15,000	na	na	na	ND	ND	na	na	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	na	
Chloroform	0.19	190	ND	ND	ND	ND	ND	ND	ND	ND	ND	na	na	ND	ND	na	na	na	na	ND	ND	ND	ND	4.0	ND
Ethylbenzene	29	29,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1.00	<1.00	ND	ND	<1.00	<1.00	<1.00	<1.00	ND	ND	2.0	ND	ND	ND
Isopropylbenzene	70	25,000	na	na	na	ND	ND	na	na	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	na	na
4-Isopropyltoluene	RL	NE	na	na	na	ND	ND	na	na	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Naphthalene	21	15,500	na	na	na	ND	ND	na	na	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	na	na
n-Propyl benzene	70	30,000	na	na	na	ND	ND	na	na	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Tetrachloroethene	0.7	700	ND	ND	ND	ND	ND	ND	ND	ND	ND	na	na	ND	ND	na	na	na	na	ND	ND	ND	ND	ND	ND
Toluene	1000	257,500	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1.00	<1.00	1.0	ND	<1.00	<1.00	0.808 J	<1.00	ND	ND	8.0	2.0	6.0	ND
1,2,4-Trimethylbenzene	350	28,500	na	na	na	ND	ND	na	na	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,3,5-Trimethylbenzene	350	25,000	na	na	na	ND	ND	na	na	ND	ND	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Total Xylenes	530	87,500	ND	ND	ND	ND	ND	ND	ND	ND	ND	<4.00	<4.00	ND	ND	<4.00	<4.00	<4.00	<4.00	ND	ND	15.0	ND	ND	ND
Semi-Volatile Organic Compounds (ug/L)			(8100)	na	(8100)	(625)	(625)	na	(8100)	(625)	(625)	(625)	(625)	na	na	(625)	(625)	(625)	(625)	na	na	na	na	na	na
Acenaphthene	80	2120	ND	na	ND	ND	ND	na	ND	ND	ND	<10.0	<10.0	na	na	<10.0	<10.0	<10.0	<10.0	na	na	na	na	na	na
Bis(2-ethylhexyl)phthalate	3	3000	na	na	na	ND	ND	na	na	ND	ND	<10.0	<10.0	na	na	<10.0	<10.0	<10.0	<10.0	na	na	na	na	na	na
Diethylphthalate	5000	NE	na	na	na	na	ND	na	na	na	ND	<10.0	<10.0	na	na	<10.0	<10.0	<10.0	<10.0	na	na	na	na	na	na
Fluorene	280	950	ND	na	ND	ND	ND	na	ND	ND	ND	<10.0	<10.0	na	na	<10.0	<10.0	<10.0	<10.0	na	na	na	na	na	na
Naphthalene	21	15,500	ND	na	ND	ND	ND	na	ND	ND	ND	<10.0	<10.0	na	na	<10.0	<10.0	<10.0	<10.0	na	na	na	na	na	na
Phenanthrene	210	410	ND	na	2900	ND	ND	na	ND	ND	ND	<10.0	<10.0	na	na	<10.0	<10.0	<10.0	<10.0	na	na	na	na	na	na
TICs (total)			na	na	na	1024 J	585 J	na	na	ND	ND	10 J	NR	na	na	20 J	13 J	NR	NR	na	na	na	na	na	na
MADEP VPH + EPH (ug/L)																									
C ₉ -C ₁₈ Aliphatics	4200	NE	na	na	na	760	690	na	na	ND	ND	<200	<200	na	na	<200	<200	<200	<200	na	na	na	na	na	na
C ₁₉ -C ₃₆ Aliphatics	42,000	NE	na	na	na	200	140	na	na	ND	ND	<100	<100	na	na	<100	<100	600	<100	na	na	na	na	na	na
C ₉ -C ₂₂ Aromatics	210	NE	na	na	na	440	430	na	na	ND	ND	<200	<200	na	na	<200	<200	<200	<200	na	na	na	na	na	na

J: Estimated concentration below reporting limits or estimated concentration for TIC quantitations
na: Not Analyzed; compound not quantitated in the analytic suite specified for the sample
ND: Not Detected; compound quantitated and not detected; detection limit not specified in source document summary table
NR: None Reported; no TICs were identified in the sample
<#: Analyte not detected at the indicated detection limit

GCL:Gross Contamination Level
NE: Not Established; a GCL has not been established for the analyte
NCGWQS: North Carolina Groundwater Quality Standard
RL: Reporting Limit; a NCGWQS has not be established for the compound; therefore, the NCGWQS is set at the reporting limit
TICs (total): Tentatively Identified Compound; sum of all TICs; all TIC concentrations are estimated
ug/L: micrograms per liter

Bold type indicates analyte detection
Shaded area in bold indicates analyte detection at a concentration above the NCGWQS
Shaded area in bold italics indicates analyte detection at a concentration above the GCL

November 1991 data from OBG, 1992
December 1992 data from OBG, 1993
October 2000 data from Law, 2000b
April 2001 data from Law, 2001
June 2004 data from EEI, 2004b
December 2004 data presented in Appendix B

⁽¹⁾ Well identified as MW-7 in source document

Table 4-2 (Page 2 of 2)
Groundwater Quality Analytical Data Over Time
Site M232-236

Volatile Organic Compounds (ug/L)	NCGWQS	GCL	MW-14	MW-15	MW-16	MW-17	MW-18					MW-20					MW-21					MW-22				
			November	December	December	December	August	October	April	June	December	August	October	April	June	December	August	October	April	June	December	August	October	April	June	December
			1991 (8010/ 8020)	1992 (601/ 602)	1992 (601/ 602)	1992 (601/ 602)	1999 (602)	2000 (6210D)	2001 (6210D)	2004 (602)	2004 (602)	1999 (602)	2000 (6210D)	2001 (6210D)	2004 (602)	2004 (602)	1999 (602)	2000 (6210D)	2001 (6210D)	2004 (602)	2004 (602)	1999 (602)	2000 (6210D)	2001 (6210D)	2004 (602)	2004 (602)
n-Butylbenzene	70	6900	na	na	na	na	na	ND	10	na	na	na	2	2	na	na	na	4	4	na	na	na	ND	1	na	na
sec-Butylbenzene	70	8500	na	na	na	na	na	4	6	na	na	na	ND	ND	na	na	na	6	6	na	na	na	3	1	na	na
tert-Butylbenzene	70	15,000	na	na	na	na	na	0.7	0.7	na	na	na	ND	ND	na	na	na	ND	0.6	na	na	na	0.8	ND	na	na
Chloroform	0.19	190	ND	ND	ND	ND	na	ND	ND	na	na	na	ND	ND	na	na	na	ND	ND	na	na	na	ND	ND	na	na
Ethylbenzene	29	29,000	ND	ND	ND	ND	ND	ND	0.8	<1.00	<1.00	7	ND	ND	<1.00	<1.00	ND	0.7	1	0.720 J	0.845 J	ND	1	ND	0.617 J	<1.00
Isopropylbenzene	70	25,000	na	na	na	na	na	ND	2	na	na	na	ND	ND	na	na	na	2	3	na	na	na	3	1	na	na
4-Isopropyltoluene	RL	NE	na	na	na	na	na	ND	0.5	na	na	na	ND	ND	na	na	na	2	3	na	na	na	2	0.8	na	na
Naphthalene	21	15,500	na	na	na	na	na	3	5	na	na	na	1	1	na	na	na	8	7	na	na	na	24	11	na	na
n-Propyl benzene	70	30,000	na	na	na	na	na	ND	1	na	na	na	0.7	0.6	na	na	na	5	6	na	na	na	5	2	na	na
Tetrachloroethene	0.7	700	ND	ND	ND	ND	na	ND	ND	na	na	na	ND	ND	na	na	na	ND	0.6	na	na	na	ND	ND	na	na
Toluene	1000	257,500	ND	ND	ND	ND	ND	ND	ND	0.443 J	<1.00	ND	ND	ND	0.497 J	0.498 J	ND	ND	ND	0.655 J	0.869 J	ND	ND	ND	<1.00	0.396 J
1,2,4-Trimethylbenzene	350	28,500	na	na	na	na	na	ND	ND	na	na	na	ND	ND	na	na	na	11	14	na	na	na	22	9	na	na
1,3,5-Trimethylbenzene	350	25,000	na	na	na	na	na	0.5	ND	na	na	na	ND	ND	na	na	na	3	5	na	na	na	4	1	na	na
Total Xylenes	530	87,500	4.0	ND	ND	ND	ND	ND	ND	1.458 J	0.826 J	ND	ND	ND	<4.00	0.622 J	ND	ND	ND	1.514 J	2.364 J	ND	ND	ND	<4.00	0.638 J
Semi-Volatile Organic Compounds (ug/L)			na	na	na	na	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)	(625)
Acenaphthene	80	2120	na	na	na	na	ND	ND	ND	6.50 J	2.80 J	3	ND	ND	1.80 J	<10.0	ND	ND	ND	2.20 J	2.20 J	2	ND	ND	3.20 J	<10.0
BIs(2-ethylhexyl)phthalate	3	3000	na	na	na	na	159	ND	ND	<10.0	<10.0	ND	ND	ND	<10.0	<10.0	6	ND	ND	<10.0	<10.0	283	ND	ND	<10.0	<10.0
Diethylphthalate	5000	NE	na	na	na	na	na	na	ND	<10.0	<10.0	na	na	ND	<10.0	2.90 J	na	na	ND	<10.0	15.5	na	na	ND	<10.0	4.60 J
Fluorene	280	950	na	na	na	na	ND	12	12	9.40 J	4.70 J	4	ND	ND	2.10 J	1.30 J	2	ND	ND	3.40 J	3.50 J	3	ND	ND	4.50 J	1.60 J
Naphthalene	21	15,500	na	na	na	na	6	ND	ND	2.70 J	<10.0	ND	ND	ND	<10.0	<10.0	ND	ND	ND	4.60 J	3.10 J	8	14	13	7.80 J	2.30 J
Phenanthrene	210	410	na	na	na	na	ND	11	ND	8.80 J	4.90 J	5	ND	ND	<10.0	<10.0	2	ND	ND	2.60 J	3.10 J	1	ND	ND	3.30 J	<10.0
TICs (total)			na	na	na	na	19 J	222 J	203 J	109.6 J	72.47 J	92 J	5.4 J	3.8 J	11 J	NR	84 J	5170 J	430 J	100 J	116.69 J	118 J	380 J	369 J	117 J	32.8 J
MADEP VPH + EPH (ug/L)																										
C ₉ -C ₁₈ Aliphatics	4200	NE	na	na	na	na	21	630	430	200	210	260	120	ND	<200	<200	110	460	520	130	300	150	420	340	120	<200
C ₁₉ -C ₃₆ Aliphatics	42,000	NE	na	na	na	na	ND	ND	ND	<100	<100	ND	ND	ND	<100	<100	ND	ND	ND	<100	<100	ND	ND	ND	<100	<100
C ₉ -C ₂₂ Aromatics	210	NE	na	na	na	na	15	280	270	570	310	170	ND	ND	<200	<200	72	250	440	360	200	96	340	310	<200	240

J: Estimated concentration below reporting limits or estimated concentration for TIC quantitations

na: Not Analyzed, compound not quantitated in the analytic suite specified for the sample

ND: Not Detected; compound quantitated and not detected; detection limit not specified in source document summary table

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TICs (total): Tentatively Identified Compound; sum of all TICs; all TIC concentrations are estimated

ug/L: micrograms per liter

Bold type indicates analyte detection

Shaded area in bold indicates analyte detection at a concentration above the NCGWQS

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November 1991 data from OBG, 1992

December 1992 data from OBG, 1993

October 2000 data from Law, 2000b

April 2001 data from Law, 2001

June 2004 data from EEI, 2004b

December 2004 data presented in Appendix B

APPENDIX A
FIELD DATA SHEETS

June 2004



**ENGINEERING AND
ENVIRONMENT, INC.**

BLD. M232-236 Water Levels

Date: 6/16/2004

Well ID	MW01	Depth to Bottom		Depth to Product		Depth to Water	11.25
Well ID	MW02	Depth to Bottom		Depth to Product		Depth to Water	11.43
Well ID	MW03	Depth to Bottom		Depth to Product		Depth to Water	1.62
Well ID	MW04	Depth to Bottom		Depth to Product		Depth to Water	9.82
Well ID	MW05	Depth to Bottom		Depth to Product		Depth to Water	10.22
Well ID	MW06	Depth to Bottom		Depth to Product		Depth to Water	10.72
Well ID	MW07	Depth to Bottom		Depth to Product		Depth to Water	13.75
Well ID	MW08	Depth to Bottom		Depth to Product		Depth to Water	13.93
Well ID	MW09	Depth to Bottom		Depth to Product		Depth to Water	12.21
Well ID	MW10	Depth to Bottom		Depth to Product		Depth to Water	11.7
Well ID	MW11	Depth to Bottom		Depth to Product		Depth to Water	8.15
Well ID	MW12	Depth to Bottom		Depth to Product		Depth to Water	9.17
Well ID	MW13	Depth to Bottom		Depth to Product		Depth to Water	12.87
Well ID	MW14	Depth to Bottom		Depth to Product		Depth to Water	13.11
Well ID	MW15	Depth to Bottom		Depth to Product		Depth to Water	12.31
Well ID	MW16	Depth to Bottom		Depth to Product		Depth to Water	12.63
Well ID	MW17	Depth to Bottom		Depth to Product		Depth to Water	11.49
Well ID	MW18	Depth to Bottom		Depth to Product		Depth to Water	8.84
Well ID	MW19	Depth to Bottom		Depth to Product	8.78	Depth to Water	9.27
Well ID	MW20	Depth to Bottom		Depth to Product		Depth to Water	8.75
Well ID	MW21	Depth to Bottom		Depth to Product		Depth to Water	8.92
Well ID	MW22	Depth to Bottom		Depth to Product		Depth to Water	8.83



ENGINEERING AND ENVIRONMENT, INC.

M232-236 Field Data

Project #LD03-011

Date Time Weather

Sampler Well/Sample #

Depth To Bottom (ft) Depth To Water (ft) Water Depth (ft)

Well Vol. Purge Vol. Vol. Purged

Sampling Device (pump/Bailer)

	ONE	TWO	THREE	FOUR	FIVE	SIX	UNIT
Time	11:15	11:17	11:19	11:21	11:24		N/A
Temperature	18.58	18.43	18.41	18.46	18.41		°C
Spec. Conductivity	0.235	0.271	0.233	0.231	0.230		(m s/m)
Dissolved Oxygen	1.02	0.68	1.02	1.15	1.30		ms/L
PH	4.69	4.53	4.80	5.05	5.57		STD
ORP	30	30.6	16.2	4.3	-22.0		(G/L)
Turbidity	5.89	5.06	2.76	2.37	3.01		(NTU)
Analyte	Size	Preserv.					
VOC 602	3 X 40 ml	HCL					
625	2 X 1L	None					
VPH	40 ml x 2	HCL					
Comments:	probe will not fit in well with tubing						

2" well vol.=water depth X 0.1632 4" well vol.=water depth x 0.6528

Pid	0						
Time	11:13						
Pump adj.	1						
Pump Depth							



ENGINEERING AND ENVIRONMENT, INC.

M232-236 Field Data

Project #LD03-011

Date Time Weather

Sampler Well/Sample #

Depth To Bottom (ft) Depth To Water (ft) Water Depth (ft)

Well Vol. Purge Vol. Vol. Purged

Sampling Device (pump/Bailer)

	ONE	TWO	THREE	FOUR	FIVE	SIX	UNIT
Time	11.49	11:52	11:55	11:58	12:01		N/A
Temperature	20.85	20.16	20.02	20.02	19.92		°C
Spec. Conductivity	0.083	0.083	0.083	0.083	0.083		(m s/m)
Dissolved Oxygen	1.52	0.60	0.55	0.47	0.42		ms/L
PH	5.49	5.35	5.33	5.03	5.19		STD
ORP	51.3	47.2	42.0	55	40.6		(G/L)
Turbidity	37.1	18.5	12	12	8.24		(NTU)
Analyte	Size	Preserv.					
VOC 602	3 X 40 ml	HCL					
625	2 X 1L	None					
VPH	40 ml x 2	HCL					
Comments:	probe will not fit in well with tubing						

2" well vol.=water depth X 0.1632 4" well vol.=water depth x 0.6528

Pid	0						
Time	11:46						
Pump adj.	1						
Pump Depth							



ENGINEERING AND ENVIRONMENT, INC.

M232-236 Field Data

Project #LD03-011

Date Time Weather

Sampler Well/Sample #

Depth To Bottom (ft) Depth To Water (ft) Water Depth (ft)

Well Vol. Purge Vol. Vol. Purged

Sampling Device (pump/Bailer)

	ONE	TWO	THREE	FOUR	FIVE	SIX	UNIT
Time	12:17	12:20	12:24	12:28	12:32		N/A
Temperature	21.43	21.28	21.57	21.53	21.71		°C
Spec. Conductivity	0.115	0.105	0.111	0.110	0.110		(m s/m)
Dissolved Oxygen	1.20	2.82	4.69	5.80	5.71		ms/L
PH	5.77	5.62	5.67	5.70	5.72		STD
ORP	1.1	13.1	11.3	11.6	11.3		(G/L)
Turbidity	48.5	87.4	49.3	28.1	12.9		(NTU)
Analyte	Size	Preserv.					
6210D	3 X 40 ml	HCL					
625	1 X 1 L	None					
VPH	40 ml x 2	HCL					
Comments:	probe will not fit in well with tubing						

2" well vol.=water depth X 0.1632 4" well vol.=water depth x 0.6528

Pid	0						
Time	12:13						
Pump adj.	1						
Pump Depth							



ENGINEERING AND ENVIRONMENT, INC.

M232-236 Field Data

Project #LD03-011

Date Time Weather

Sampler Well/Sample #

Depth To Bottom (ft) Depth To Water (ft) Water Depth (ft)

Well Vol. Purge Vol. Vol. Purged

Sampling Device (pump/Bailer)

	ONE	TWO	THREE	FOUR	FIVE	SIX	UNIT
Time	13:00	13:03	13:06	13:09	13:12		N/A
Temperature	21.36	21.22	21.03	21.02	21.01		°C
Spec. Conductivity	0.311	0.265	0.244	0.223	0.221		(m s/m)
Dissolved Oxygen	0.88	0.61	0.55	0.79	1.01		ms/L
PH	6.17	6.08	6.03	6.00	5.98		STD
ORP	-46.4	-27.2	-18.2	-12	-9.04		(G/L)
Turbidity	85.2	61.7	36.6	57.2	86.1		(NTU)
Analyte	Size	Preserv.					
6210D	3 X 40 ml	HCL					
625	1 X 1 L	None					
VPH	40 ml x 2	HCL					
Comments:	probe will not fit in well with tubing						

2" well vol.=water depth X 0.1632 4" well vol.=water depth x 0.6528

Pid	0						
Time	12:57						
Pump adj.	1						
Pump Depth							



ENGINEERING AND ENVIRONMENT, INC.

M232-236 Field Data

Project #LD03-011

Date Time Weather

Sampler Well/Sample #

Depth To Bottem(ft) Depth To Water (ft) Water Depth (ft)

Well Vol. Purge Vol. Vol. Purged

Sampling Device (pump/Bailer)

	ONE	TWO	THREE	FOUR	FIVE	SIX	UNIT
Time	13:09	13:16	13:24				N/A
Temperature	19.32	20.59	22.38				°C
Spec. Conductivity	0.124	0.123	0.122				(m s/m)
Dissolved Oxygen	2.32	1.87	1.92				ms/L
PH	4.55	4.68	4.73				STD
ORP	275.9	256.3	240.5				(G/L)
Turbidity	O/L	O/L	O/L				(NTU)
Analyte	Size	Preserv.					
VOC 602	3 X 40 ml	HCL					
625	2 X 1L	None					
VPH	40 ml x 2	HCL					
Comments:	Dry at 13:29; waited ten minutes and took sample - Trub. 749						

2" well vol.=water depth X 0.1632 4" well vol.=water depth x 0.6528

PID	0						
Time		13:04	13:08	13:15	13:22		
SWL		10.22	12.1	12.39	12.75		
Pump adj.		2.5					
Pump Depth		13	13	13	14.5		



ENGINEERING AND ENVIRONMENT, INC.

M232-236 Field Data

Project #LD03-011

Date Time Weather

Sampler Well/Sample #

Depth To Bottom (ft) Depth To Water (ft) Water Depth (ft)

Well Vol. Purge Vol. Vol. Purged

Sampling Device (pump/Bailer)

	ONE	TWO	THREE	FOUR	FIVE	SIX	UNIT
Time	14:03	14:07	14:09	14:11	14:13		N/A
Temperature	17.41	17.40	17.34	17.26	17.21		°C
Spec. Conductivity	0.100	0.105	0.106	0.106	0.107		(m s/m)
Dissolved Oxygen	1.02	0.59	0.37	0.28	0.23		ms/L
PH	4.91	3.79	2.75	2.98	3.20		STD
ORP	149.9	245.8	297.6	283.6	271.2		(G/L)
Turbidity	245	96.2	23.4	11.3	7.02		(NTU)
Analyte	Size	Preserv.					
VOC 602	3 X 40 ml	HCL					
625	2 X 1L	None					
VPH	40 ml x 2	HCL					
Comments:	DUP						

2" well vol.=water depth X 0.1632 4" well vol.=water depth x 0.6528

Pid	1.2						
Time		14:01	14:04	14:08	14:13	14:15	
SWL		13.75	13.85	13.85	13.86	13.85	
Pump adj.		2 "					
Pump Depth		Bottom	Bottom	Bottom	Bottom	Bottom	

September 2004



**ENGINEERING AND
ENVIRONMENT, INC.**

BLD. M232-236 Water Levels

Date: 9/21/2004

Well ID	MW01	Depth to Bottom		Depth to Product		Depth to Water		6.31
Well ID	MW02	Depth to Bottom		Depth to Product		Depth to Water		8.98
Well ID	MW03	Depth to Bottom		Depth to Product		Depth to Water		11.38
Well ID	MW04	Depth to Bottom		Depth to Product		Depth to Water		9.86
Well ID	MW05	Depth to Bottom		Depth to Product		Depth to Water		5.5
Well ID	MW06	Depth to Bottom		Depth to Product		Depth to Water		8.23
Well ID	MW07	Depth to Bottom		Depth to Product		Depth to Water		4.92
Well ID	MW08	Depth to Bottom		Depth to Product		Depth to Water		8.37
Well ID	MW09	Depth to Bottom		Depth to Product		Depth to Water		10.05
Well ID	MW10	Depth to Bottom		Depth to Product		Depth to Water		8.54
Well ID	MW11	Depth to Bottom		Depth to Product		Depth to Water		2.99
Well ID	MW12	Depth to Bottom		Depth to Product		Depth to Water		7.41
Well ID	MW13	Depth to Bottom		Depth to Product		Depth to Water		8.52
Well ID	MW14	Depth to Bottom		Depth to Product		Depth to Water		10.43
Well ID	MW15	Depth to Bottom		Depth to Product		Depth to Water		9.14
Well ID	MW16	Depth to Bottom		Depth to Product		Depth to Water		9.63
Well ID	MW17	Depth to Bottom		Depth to Product		Depth to Water		9.21
Well ID	MW18	Depth to Bottom		Depth to Product		Depth to Water		6.44
Well ID	MW19	Depth to Bottom		Depth to Product	6.33	Depth to Water		6.43
Well ID	MW20	Depth to Bottom		Depth to Product		Depth to Water		5.92
Well ID	MW21	Depth to Bottom		Depth to Product		Depth to Water		5.41
Well ID	MW22	Depth to Bottom		Depth to Product		Depth to Water		4.85

*** BAILED OUT ABOUT 1 OZ. FROM MW19**

December 2004



**ENGINEERING AND
ENVIRONMENT, INC.**

BLD. M232-236 Water Levels

Date: 12/19/2004

Well ID	MW01	Depth to Bottom		Depth to Product		Depth to Water	11.37
Well ID	MW02	Depth to Bottom		Depth to Product		Depth to Water	11.66
Well ID	MW03	Depth to Bottom		Depth to Product		Depth to Water	14
Well ID	MW04	Depth to Bottom		Depth to Product		Depth to Water	14.2
Well ID	MW05	Depth to Bottom		Depth to Product		Depth to Water	10.85
Well ID	MW06	Depth to Bottom		Depth to Product		Depth to Water	10.25
Well ID	MW07	Depth to Bottom		Depth to Product		Depth to Water	10.2
Well ID	MW08	Depth to Bottom		Depth to Product		Depth to Water	10.9
Well ID	MW09	Depth to Bottom		Depth to Product		Depth to Water	12.49
Well ID	MW10	Depth to Bottom		Depth to Product		Depth to Water	11.93
Well ID	MW11	Depth to Bottom		Depth to Product		Depth to Water	8.27
Well ID	MW12	Depth to Bottom		Depth to Product		Depth to Water	9.23
Well ID	MW13	Depth to Bottom		Depth to Product		Depth to Water	13.16
Well ID	MW14	Depth to Bottom		Depth to Product		Depth to Water	13.35
Well ID	MW15	Depth to Bottom		Depth to Product		Depth to Water	12.5
Well ID	MW16	Depth to Bottom		Depth to Product		Depth to Water	12.88
Well ID	MW17	Depth to Bottom		Depth to Product		Depth to Water	11.71
Well ID	MW18	Depth to Bottom		Depth to Product		Depth to Water	9.2
Well ID	MW19	Depth to Bottom		Depth to Product	8.95	Depth to Water	9.34
Well ID	MW20	Depth to Bottom		Depth to Product		Depth to Water	9.98
Well ID	MW21	Depth to Bottom		Depth to Product		Depth to Water	9.04
Well ID	MW22	Depth to Bottom		Depth to Product		Depth to Water	8.95

Approximately 3 oz. of product was bailed out of MW19



ENGINEERING AND ENVIRONMENT, INC.

M232-236 Field Data

Project # LD03-011

Date Time Weather

Sampler Well/Sample #

Depth To Bottom (ft) Depth To Water (ft) Water Depth (ft)

Well Vol. Purge Vol. Vol. Purged

Sampling Device (pump/Bailer)

	ONE	TWO	THREE	FOUR	FIVE	SIX	UNIT
Time	12:13	12:17	12:20	12:23			N/A
Temperature	18.92	19.02	19.09	19.05			°C
Spec. Conductivity	0.23	0.228	0.223	0.214			(m s/m)
Dissolved Oxygen	0.9	0.87	0.63	1.24			ms/L
PH	6.23	6.27	6.27	6.21			STD
ORP	-81.9	-81.4	-84.3	-80.7			(G/L)
Turbidity	43.4	30.1	10.5	5.57			(NTU)
Analyte	Size	Preserv.					
6210D	3 X 40 ml	HCL					
625	1 X 1 L	None					
VPH	2 X 40 ml	HCL					
Comments:							

2" well vol.=water depth X 0.1632 4" well vol.=water depth x 0.6528

Pid							
Time							
SWL							
Pump Depth							



ENGINEERING AND ENVIRONMENT, INC.

M232-236 Field Data

Project # LD03-011

Date Time Weather

Sampler Well/Sample #

Depth To Bottom (ft) Depth To Water (ft) Water Depth (ft)

Well Vol. Purge Vol. Vol. Purged

Sampling Device (pump/Bailer)

	ONE	TWO	THREE	FOUR	FIVE	SIX	UNIT
Time	11:46	11:50	11:54				N/A
Temperature	20.26	20.64	20.69				°C
Spec. Conductivity	0.106	0.106	0.105				(m s/m)
Dissolved Oxygen	2.78	0.86	0.79				ms/L
PH	5.7	5.55	5.52				STD
ORP	24.9	25.4	24.7				(G/L)
Turbidity	872	33.9	9.87				(NTU)
Analyte	Size	Preserv.					
6210D	3 X 40 ml	HCL					
625	1 X 1 L	None					
VPH	2 X 40 ml	HCL					
Comments:							

2" well vol.=water depth X 0.1632 4" well vol.=water depth x 0.6528

Pid							
Time							
SWL							
Pump Depth							



ENGINEERING AND ENVIRONMENT, INC.

M232-236 Field Data

Project # LD03-011

Date Time Weather

Sampler Well/Sample #

Depth To Bottom (ft) Depth To Water (ft) Water Depth (ft)

Well Vol. Purge Vol. Vol. Purged

Sampling Device (pump/Bailer)

	ONE	TWO	THREE	FOUR	FIVE	SIX	UNIT
Time	11:13						N/A
Temperature	19.74						°C
Spec. Conductivity	1.73						(m s/m)
Dissolved Oxygen	6.26						ms/L
PH	6.24						STD
ORP	-55.6						(G/L)
Turbidity							(NTU)
Analyte	Size	Preserv.					
6210D	3 X 40 ml	HCL					
625	1 X 1 L	None					
VPH	2 X 40 ml	HCL					
Comments:	Dry at 1.2 vol.; waited ten minutes; took sample						

2" well vol.=water depth X 0.1632 4" well vol.=water depth x 0.6528

Pid	0						
Time							
SWL							
Pump Depth							



ENGINEERING AND ENVIRONMENT, INC.

M232-236 Field Data

Project # LD03-011

Date Time Weather

Sampler Well/Sample #

Depth To Bottom (ft) Depth To Water (ft) Water Depth (ft)

Well Vol. Purge Vol. Vol. Purged

Sampling Device (pump/Bailer)

	ONE	TWO	THREE	FOUR	FIVE	SIX	UNIT
Time	10:39	10:43	10:45	10:48	10:51		N/A
Temperature	20.15	20.12	20.14	20.17	20.12		°C
Spec. Conductivity	0.154	0.127	0.122	0.114	0.113		(m s/m)
Dissolved Oxygen	3.3	3.17	3.11	3.04	3.05		mg/L
PH	6.48	6.11	6.01	5.9	5.85		STD
ORP	-60	-36.4	-29.8	-20.7	-16.9		(G/L)
Turbidity	135	52.6	41	43.1	30.9		(NTU)
Analyte	Size	Preserv.					
6210D	3 X 40 ml	HCL					
625	1 X 1 L	None					
VPH	2 X 40 ml	HCL					
Comments:							

2" well vol.=water depth X 0.1632 4" well vol.=water depth x 0.6528

Pid	0						
Time							
SWL	N/A						
Pump Depth							



ENGINEERING AND ENVIRONMENT, INC.

M232-236 Field Data

Project # LD03-011

Date Time Weather

Sampler Well/Sample #

Depth To Bottom (ft) Depth To Water (ft) Water Depth (ft)

Well Vol. Purge Vol. Vol. Purged

Sampling Device (pump/Bailer)

	ONE	TWO	THREE	FOUR	FIVE	SIX	UNIT
Time	13:38	13:45	13:52	13:57	14:03		N/A
Temperature	18.52	18.58	18.62	18.66	18.71		°C
Spec. Conductivity	0.06	0.06	0.059	0.059	0.059		(m s/m)
Dissolved Oxygen	3.01	1.19	0.91	0.93	0.87		ms/L
PH	4.85	4.79	4.72	4.69	4.61		STD
ORP	208.5	227.1	236.4	251.7	262.2		(G/L)
Turbidity	O/L	404	171	55	32.6		(NTU)
Analyte	Size	Preserv.					
6210D	3 X 40 ml	HCL					
625	1 X 1 L	None					
VPH	2 X 40 ml	HCL					
Comments:							

2" well vol.=water depth X 0.1632 4" well vol.=water depth x 0.6528

Pid	0						
Time	13:31	13:35	13:40	13:46			
SWL	10.85	11.15	11.15	11.15			
Pump Depth	30	30	30	30			



ENGINEERING AND ENVIRONMENT, INC.

M232-236 Field Data

Project # LD03-011

Date Time Weather

Sampler Well/Sample #

Depth To Bottom (ft) Depth To Water (ft) Water Depth (ft)

Well Vol. Purge Vol. Vol. Purged

Sampling Device (pump/Bailer)

	ONE	TWO	THREE	FOUR	FIVE	SIX	UNIT
Time	12:46	10:49	12:53	12:57	13:01		N/A
Temperature	18.49	18.63	18.68	18.68	18.71		°C
Spec. Conductivity	0.099	0.099	0.097	0.097	0.095		(m s/m)
Dissolved Oxygen	0.73	0.6	0.44	0.4	0.39		ms/L
PH	5.37	5.34	5.29	5.25	5.25		STD
ORP	165.5	178.5	196.9	202.5	204		(G/L)
Turbidity	47.1	23.6	8.07	2.69			(NTU)
Analyte	Size	Preserv.					
6210D	3 X 40 ml	HCL					
625	1 X 1 L	None					
VPH	2 X 40 ml	HCL					
Comments:	DUP						

2" well vol.=water depth X 0.1632 4" well vol.=water depth x 0.6528							
Pid	0						
Time	12:41	12:48	12:51	12:55			
SWL	10.2	10.52	10.61	10.62			
Pump Depth	16.5	16.5	16.5	16.5			

March 2005



**ENGINEERING AND
ENVIRONMENT, INC.**

BLD. M232-236 Water Levels

Date: 3/4/2005

Well ID	MW01	Depth to Bottom		Depth to Product		Depth to Water	8.6
Well ID	MW02	Depth to Bottom		Depth to Product		Depth to Water	11.31
Well ID	MW03	Depth to Bottom		Depth to Product		Depth to Water	13.85
Well ID	MW04	Depth to Bottom		Depth to Product		Depth to Water	12.93
Well ID	MW05	Depth to Bottom		Depth to Product		Depth to Water	10.52
Well ID	MW06	Depth to Bottom		Depth to Product		Depth to Water	7.59
Well ID	MW07	Depth to Bottom		Depth to Product		Depth to Water	10.56
Well ID	MW08	Depth to Bottom		Depth to Product		Depth to Water	7.47
Well ID	MW09	Depth to Bottom		Depth to Product		Depth to Water	12.29
Well ID	MW10	Depth to Bottom		Depth to Product		Depth to Water	11.32
Well ID	MW11	Depth to Bottom		Depth to Product		Depth to Water	5.22
Well ID	MW12	Depth to Bottom		Depth to Product		Depth to Water	9.1
Well ID	MW13	Depth to Bottom		Depth to Product		Depth to Water	12.32
Well ID	MW14	Depth to Bottom		Depth to Product		Depth to Water	13.09
Well ID	MW15	Depth to Bottom		Depth to Product		Depth to Water	11.98
Well ID	MW16	Depth to Bottom		Depth to Product		Depth to Water	12.58
Well ID	MW17	Depth to Bottom		Depth to Product		Depth to Water	8.64
Well ID	MW18	Depth to Bottom		Depth to Product		Depth to Water	8.72
Well ID	MW19	Depth to Bottom		Depth to Product	8.61	Depth to Water	8.94
Well ID	MW20	Depth to Bottom		Depth to Product		Depth to Water	8.57
Well ID	MW21	Depth to Bottom		Depth to Product		Depth to Water	8.15
Well ID	MW22	Depth to Bottom		Depth to Product		Depth to Water	8.05

APPENDIX B

LABORATORY ANALYTICAL REPORTS

June 2004

Mr. Fred Kozminski
Engineering & Environment, Inc.
195 South Rosemont Rd.
Suite 118
Virginia Beach VA 23452-4353
Report Number: G546-10
Client Project: M232-236

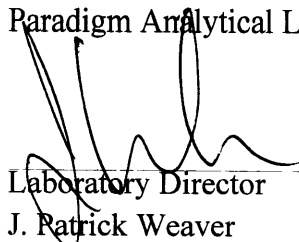
Dear Mr. Kozminski:

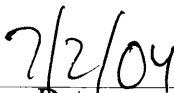
Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
Paradigm Analytical Laboratories, Inc.


Laboratory Director
J. Patrick Weaver


Date

Results for Volatiles

by GC 602

Client Sample ID: USTM232-MW22

Analyzed By: DCS

Client Project ID: M232-236

Date Collected: 06/17/2004 13:15

Lab Sample ID: G546-10-1B

Date Received: 6/18/04

Lab Project ID: G546-10

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	06/25/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	06/25/2004	
Ethylbenzene	0.617	1.00	0.299	1	06/25/2004	J
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	06/25/2004	
Toluene	BQL	1.00	0.302	1	06/25/2004	
m/p-Xylene	BQL	2.00	0.608	1	06/25/2004	
o-Xylene	BQL	2.00	0.596	1	06/25/2004	

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	39.4	98.6

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Results for Volatiles

by GC 602

Client Sample ID: USTM232-MW21

Analyzed By: DCS

Client Project ID: M232-236

Date Collected: 06/17/2004 12:35

Lab Sample ID: G546-10-2B

Date Received: 6/18/04

Lab Project ID: G546-10

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	06/25/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	06/25/2004	
Ethylbenzene	0.720	1.00	0.299	1	06/25/2004	J
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	06/25/2004	
Toluene	0.655	1.00	0.302	1	06/25/2004	J
m/p-Xylene	0.916	2.00	0.608	1	06/25/2004	J
o-Xylene	0.598	2.00	0.596	1	06/25/2004	J

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	39.1	97.8

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Results for Volatiles

by GC 602

Client Sample ID: USTM232-MW18

Analyzed By: DCS

Client Project ID: M232-236

Date Collected: 06/17/2004 11:25

Lab Sample ID: G546-10-3B

Date Received: 6/18/04

Lab Project ID: G546-10

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	06/25/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	06/25/2004	
Ethylbenzene	BQL	1.00	0.299	1	06/25/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	06/25/2004	
Toluene	0.443	1.00	0.302	1	06/25/2004	J
m/p-Xylene	0.660	2.00	0.608	1	06/25/2004	J
o-Xylene	0.798	2.00	0.596	1	06/25/2004	J

Surrogate Spike Recoveries**Spike
Added****Spike
Result****Percent
Recovery**

Trifluorotoluene

40

39.1

97.6

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Results for Volatiles

by GC 602

Client Sample ID: USTM232-MW07

Analyzed By: DCS

Client Project ID: M232-236

Date Collected: 06/16/2004 14:20

Lab Sample ID: G546-10-4B

Date Received: 6/18/04

Lab Project ID: G546-10

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	06/25/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	06/25/2004	
Ethylbenzene	BQL	1.00	0.299	1	06/25/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	06/25/2004	
Toluene	BQL	1.00	0.302	1	06/25/2004	
m/p-Xylene	BQL	2.00	0.608	1	06/25/2004	
o-Xylene	BQL	2.00	0.596	1	06/25/2004	

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	39.0	97.5

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Results for Volatiles

by GC 602

Client Sample ID: USTM232-MW05

Analyzed By: DCS

Client Project ID: M232-236

Date Collected: 06/16/2004 13:39

Lab Sample ID: G546-10-5B

Date Received: 6/18/04

Lab Project ID: G546-10

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	06/25/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	06/25/2004	
Ethylbenzene	BQL	1.00	0.299	1	06/25/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	06/25/2004	
Toluene	BQL	1.00	0.302	1	06/25/2004	
m/p-Xylene	BQL	2.00	0.608	1	06/25/2004	
o-Xylene	BQL	2.00	0.596	1	06/25/2004	

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	39.1	97.7

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Results for Volatiles

by GC 602

Client Sample ID: USTM232-MW20

Analyzed By: DCS

Client Project ID: M232-236

Date Collected: 06/17/2004 12:05

Lab Sample ID: G546-10-6B

Date Received: 6/18/04

Lab Project ID: G546-10

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	06/25/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	06/25/2004	
Ethylbenzene	BQL	1.00	0.299	1	06/25/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	06/25/2004	
Toluene	0.497	1.00	0.302	1	06/25/2004	J
m/p-Xylene	BQL	2.00	0.608	1	06/25/2004	
o-Xylene	BQL	2.00	0.596	1	06/25/2004	

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	39.1	97.6

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Results for Volatiles

by GC 602

Client Sample ID: USTM232-DUP

Analyzed By: DCS

Client Project ID: M232-236

Date Collected: 06/16/2004 00:00

Lab Sample ID: G546-10-7B

Date Received: 6/18/04

Lab Project ID: G546-10

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	06/25/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	06/25/2004	
Ethylbenzene	BQL	1.00	0.299	1	06/25/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	06/25/2004	
Toluene	BQL	1.00	0.302	1	06/25/2004	
m/p-Xylene	BQL	2.00	0.608	1	06/25/2004	
o-Xylene	BQL	2.00	0.596	1	06/25/2004	

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	39.1	97.7

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW22
Client Project ID: M232-236
Lab Sample ID: G546-10-1H
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/17/2004 13:15
Date Received: 06/18/2004
Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	3.20	10.0	1.22	1	06/26/2004	J
Acenaphthylene	BQL	10.0	1.12	1	06/26/2004	
Anthracene	BQL	10.0	1.75	1	06/26/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	06/26/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	06/26/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	06/26/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	06/26/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	06/26/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	06/26/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	06/26/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	06/26/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	06/26/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	06/26/2004	
2-Chlorophenol	BQL	10.0	4.22	1	06/26/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	06/26/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	06/26/2004	
Chrysene	BQL	10.0	1.11	1	06/26/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	06/26/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	06/26/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	06/26/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	06/26/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	06/26/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	06/26/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	06/26/2004	
Diethylphthalate	BQL	10.0	1.48	1	06/26/2004	
Dimethylphthalate	BQL	10.0	1.04	1	06/26/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	06/26/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	06/26/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	06/26/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	06/26/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	06/26/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	06/26/2004	
Fluoranthene	BQL	10.0	1.41	1	06/26/2004	
Fluorene	4.50	10.0	1.22	1	06/26/2004	J
Hexachlorobenzene	BQL	10.0	1.22	1	06/26/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	06/26/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	06/26/2004	
Hexachloroethane	BQL	10.0	1.58	1	06/26/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	06/26/2004	
Isophorone	BQL	10.0	1.27	1	06/26/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW22
Client Project ID: M232-236
Lab Sample ID: G546-10-1H
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/17/2004 13:15
Date Received: 06/18/2004
Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	7.80	10.0	1.08	1	06/26/2004	J
Nitrobenzene	BQL	10.0	1.32	1	06/26/2004	
2-Nitrophenol	BQL	10.0	3.52	1	06/26/2004	
4-Nitrophenol	BQL	50.0	3.17	1	06/26/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	06/26/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	06/26/2004	
Pentachlorophenol	BQL	50.0	2.83	1	06/26/2004	
Phenanthrene	3.30	10.0	1.38	1	06/26/2004	J
Phenol	BQL	10.0	3.38	1	06/26/2004	
Pyrene	BQL	10.0	2.08	1	06/26/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	06/26/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	06/26/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.1	91
2-Fluorophenol	10	8.9	89
Nitrobenzene-d5	10	9	90
Phenol-d6	10	8.1	81
2,4,6-Tribromophenol	10	9.2	92
4-Terphenyl-d14	10	9.2	92

Comments:**Flags:**

BQL = Below Quantitation Limits.

Reviewed By: ELU

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTM232-MW22
Client Project ID: M232-236
Lab Sample ID: G546-10-1H
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/17/2004 13:15
Date Received: 06/18/2004
Matrix: Water

Dilution: 1

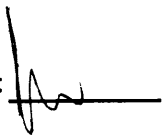
Date Analyzed: 06-26-2004

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	1-Methylnaphthalene	10.15	000090-12-0	97	50
2	Dimethylnaphthalene, Isomer of	11.13			26
3	Unknown	10.42			21
4	2-Methylnaphthalene	9.99	000091-57-6	99	20
5					
6					
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW21
Client Project ID: M232-236
Lab Sample ID: G546-10-2H
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/17/2004 12:35
Date Received: 06/18/2004
Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	2.20	10.0	1.22	1	06/26/2004	J
Acenaphthylene	BQL	10.0	1.12	1	06/26/2004	
Anthracene	BQL	10.0	1.75	1	06/26/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	06/26/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	06/26/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	06/26/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	06/26/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	06/26/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	06/26/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	06/26/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	06/26/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	06/26/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	06/26/2004	
2-Chlorophenol	BQL	10.0	4.22	1	06/26/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	06/26/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	06/26/2004	
Chrysene	BQL	10.0	1.11	1	06/26/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	06/26/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	06/26/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	06/26/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	06/26/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	06/26/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	06/26/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	06/26/2004	
Diethylphthalate	BQL	10.0	1.48	1	06/26/2004	
Dimethylphthalate	BQL	10.0	1.04	1	06/26/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	06/26/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	06/26/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	06/26/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	06/26/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	06/26/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	06/26/2004	
Fluoranthene	BQL	10.0	1.41	1	06/26/2004	
Fluorene	3.40	10.0	1.22	1	06/26/2004	J
Hexachlorobenzene	BQL	10.0	1.22	1	06/26/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	06/26/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	06/26/2004	
Hexachloroethane	BQL	10.0	1.58	1	06/26/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	06/26/2004	
Isophorone	BQL	10.0	1.27	1	06/26/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW21
Client Project ID: M232-236
Lab Sample ID: G546-10-2H
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/17/2004 12:35
Date Received: 06/18/2004
Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	4.60	10.0	1.08	1	06/26/2004	J
Nitrobenzene	BQL	10.0	1.32	1	06/26/2004	
2-Nitrophenol	BQL	10.0	3.52	1	06/26/2004	
4-Nitrophenol	BQL	50.0	3.17	1	06/26/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	06/26/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	06/26/2004	
Pentachlorophenol	BQL	50.0	2.83	1	06/26/2004	
Phenanthrene	2.60	10.0	1.38	1	06/26/2004	J
Phenol	BQL	10.0	3.38	1	06/26/2004	
Pyrene	BQL	10.0	2.08	1	06/26/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	06/26/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	06/26/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.3	93
2-Fluorophenol	10	9	90
Nitrobenzene-d5	10	9.1	91
Phenol-d6	10	8.1	81
2,4,6-Tribromophenol	10	9.2	92
4-Terphenyl-d14	10	9.6	96

Comments:

Flags:

BQL = Below Quantitation Limits.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTM232-MW21
Client Project ID: M232-236
Lab Sample ID: G546-10-2H
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/17/2004 12:35
Date Received: 06/18/2004
Matrix: Water

Dilution: 1

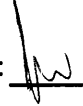
Date Analyzed: 06-26-2004

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	1-Methylnaphthalene	10.15	000090-12-0	99	37
2	Naphthalene, 2,3-dimethyl-	11.12	000581-40-8	96	22
3	Unknown	10.42			22
4	2-Methylnaphthalene	10.00	000091-57-6	96	19
5					
6					
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW18
Client Project ID: M232-236
Lab Sample ID: G546-10-3H
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/17/2004 11:25
Date Received: 06/18/2004
Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	6.50	10.0	1.22	1	06/26/2004	J
Acenaphthylene	BQL	10.0	1.12	1	06/26/2004	
Anthracene	BQL	10.0	1.75	1	06/26/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	06/26/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	06/26/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	06/26/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	06/26/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	06/26/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	06/26/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	06/26/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	06/26/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	06/26/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	06/26/2004	
2-Chlorophenol	BQL	10.0	4.22	1	06/26/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	06/26/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	06/26/2004	
Chrysene	BQL	10.0	1.11	1	06/26/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	06/26/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	06/26/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	06/26/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	06/26/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	06/26/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	06/26/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	06/26/2004	
Diethylphthalate	BQL	10.0	1.48	1	06/26/2004	
Dimethylphthalate	BQL	10.0	1.04	1	06/26/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	06/26/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	06/26/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	06/26/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	06/26/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	06/26/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	06/26/2004	
Fluoranthene	BQL	10.0	1.41	1	06/26/2004	
Fluorene	9.40	10.0	1.22	1	06/26/2004	J
Hexachlorobenzene	BQL	10.0	1.22	1	06/26/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	06/26/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	06/26/2004	
Hexachloroethane	BQL	10.0	1.58	1	06/26/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	06/26/2004	
Isophorone	BQL	10.0	1.27	1	06/26/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW18
Client Project ID: M232-236
Lab Sample ID: G546-10-3H
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/17/2004 11:25
Date Received: 06/18/2004
Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	2.70	10.0	1.08	1	06/26/2004	J
Nitrobenzene	BQL	10.0	1.32	1	06/26/2004	
2-Nitrophenol	BQL	10.0	3.52	1	06/26/2004	
4-Nitrophenol	BQL	50.0	3.17	1	06/26/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	06/26/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	06/26/2004	
Pentachlorophenol	BQL	50.0	2.83	1	06/26/2004	
Phenanthrene	8.80	10.0	1.38	1	06/26/2004	J
Phenol	BQL	10.0	3.38	1	06/26/2004	
Pyrene	BQL	10.0	2.08	1	06/26/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	06/26/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	06/26/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.6	86
2-Fluorophenol	10	8.7	87
Nitrobenzene-d5	10	8.9	89
Phenol-d6	10	8.2	82
2,4,6-Tribromophenol	10	8.8	88
4-Terphenyl-d14	10	8.4	84

Comments:

Flags:

BQL = Below Quantitation Limits.

Reviewed By: ELM

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTM232-MW18
Client Project ID: M232-236
Lab Sample ID: G546-10-3H
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/17/2004 11:25
Date Received: 06/18/2004
Matrix: Water

Dilution: 1

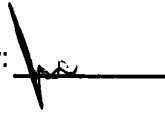
Date Analyzed: 06-26-2004

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	Aromatic, Unknown	7.21	000496-11-7	83	35
2	Methylpropenylbenzene, Isomer of	8.48	000768-49-0	91	26
3	Tetrahydromethylnaphthalene, Isomer of	9.93	001680-51-9	93	16
4	Aromatic, Unknown	8.97	017059-48-2	87	14
5	Unknown	10.42			14
6	1-Methylnaphthalene	10.15	000090-12-0	98	4.6
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW07

Client Project ID: M232-236

Lab Sample ID: G546-10-4H

Lab Project ID: G546-10

Analyzed By: MRC

Date Collected: 06/16/2004 14:20

Date Received: 06/18/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	06/26/2004	
Acenaphthylene	BQL	10.0	1.12	1	06/26/2004	
Anthracene	BQL	10.0	1.75	1	06/26/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	06/26/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	06/26/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	06/26/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	06/26/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	06/26/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	06/26/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	06/26/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	06/26/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	06/26/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	06/26/2004	
2-Chlorophenol	BQL	10.0	4.22	1	06/26/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	06/26/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	06/26/2004	
Chrysene	BQL	10.0	1.11	1	06/26/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	06/26/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	06/26/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	06/26/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	06/26/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	06/26/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	06/26/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	06/26/2004	
Diethylphthalate	BQL	10.0	1.48	1	06/26/2004	
Dimethylphthalate	BQL	10.0	1.04	1	06/26/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	06/26/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	06/26/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	06/26/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	06/26/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	06/26/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	06/26/2004	
Fluoranthene	BQL	10.0	1.41	1	06/26/2004	
Fluorene	BQL	10.0	1.22	1	06/26/2004	
Hexachlorobenzene	BQL	10.0	1.22	1	06/26/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	06/26/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	06/26/2004	
Hexachloroethane	BQL	10.0	1.58	1	06/26/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	06/26/2004	
Isophorone	BQL	10.0	1.27	1	06/26/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW07
 Client Project ID: M232-236
 Lab Sample ID: G546-10-4H
 Lab Project ID: G546-10

Analyzed By: MRC
 Date Collected: 06/16/2004 14:20
 Date Received: 06/18/2004
 Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	BQL	10.0	1.08	1	06/26/2004	
Nitrobenzene	BQL	10.0	1.32	1	06/26/2004	
2-Nitrophenol	BQL	10.0	3.52	1	06/26/2004	
4-Nitrophenol	BQL	50.0	3.17	1	06/26/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	06/26/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	06/26/2004	
Pentachlorophenol	BQL	50.0	2.83	1	06/26/2004	
Phenanthrene	BQL	10.0	1.38	1	06/26/2004	
Phenol	BQL	10.0	3.38	1	06/26/2004	
Pyrene	BQL	10.0	2.08	1	06/26/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	06/26/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	06/26/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.9	89
2-Fluorophenol	10	9	90
Nitrobenzene-d5	10	8.9	89
Phenol-d6	10	8.2	82
2,4,6-Tribromophenol	10	8.2	82
4-Terphenyl-d14	10	9.5	95

Comments:

Flags:

BQL = Below Quantitation Limits.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTM232-MW07
Client Project ID: M232-236
Lab Sample ID: G546-10-4H
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/16/2004 14:20
Date Received: 06/18/2004
Matrix: Water

Dilution: 1

Date Analyzed: 06-26-2004

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	Unknown	10.42			20
2					
3					
4					
5					
6					
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW05
Client Project ID: M232-236
Lab Sample ID: G546-10-5I
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/16/2004 13:39
Date Received: 06/18/2004
Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	06/26/2004	
Acenaphthylene	BQL	10.0	1.12	1	06/26/2004	
Anthracene	BQL	10.0	1.75	1	06/26/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	06/26/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	06/26/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	06/26/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	06/26/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	06/26/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	06/26/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	06/26/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	06/26/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	06/26/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	06/26/2004	
2-Chlorophenol	BQL	10.0	4.22	1	06/26/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	06/26/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	06/26/2004	
Chrysene	BQL	10.0	1.11	1	06/26/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	06/26/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	06/26/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	06/26/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	06/26/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	06/26/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	06/26/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	06/26/2004	
Diethylphthalate	BQL	10.0	1.48	1	06/26/2004	
Dimethylphthalate	BQL	10.0	1.04	1	06/26/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	06/26/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	06/26/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	06/26/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	06/26/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	06/26/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	06/26/2004	
Fluoranthene	BQL	10.0	1.41	1	06/26/2004	
Fluorene	BQL	10.0	1.22	1	06/26/2004	
Hexachlorobenzene	BQL	10.0	1.22	1	06/26/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	06/26/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	06/26/2004	
Hexachloroethane	BQL	10.0	1.58	1	06/26/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	06/26/2004	
Isophorone	BQL	10.0	1.27	1	06/26/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW05

Client Project ID: M232-236

Lab Sample ID: G546-10-5I

Lab Project ID: G546-10

Analyzed By: MRC

Date Collected: 06/16/2004 13:39

Date Received: 06/18/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	BQL	10.0	1.08	1	06/26/2004	
Nitrobenzene	BQL	10.0	1.32	1	06/26/2004	
2-Nitrophenol	BQL	10.0	3.52	1	06/26/2004	
4-Nitrophenol	BQL	50.0	3.17	1	06/26/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	06/26/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	06/26/2004	
Pentachlorophenol	BQL	50.0	2.83	1	06/26/2004	
Phenanthrene	BQL	10.0	1.38	1	06/26/2004	
Phenol	BQL	10.0	3.38	1	06/26/2004	
Pyrene	BQL	10.0	2.08	1	06/26/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	06/26/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	06/26/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.5	85
2-Fluorophenol	10	7.9	79
Nitrobenzene-d5	10	8	80
Phenol-d6	10	7.2	72
2,4,6-Tribromophenol	10	7.6	76
4-Terphenyl-d14	10	9.2	92

Comments:**Flags:**

BQL = Below Quantitation Limits.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTM232-MW05
Client Project ID: M232-236
Lab Sample ID: G546-10-5I
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/16/2004 13:39
Date Received: 06/18/2004
Matrix: Water

Dilution: 1

Date Analyzed: 06-26-2004

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	Unknown	10.42			10
2					
3					
4					
5					
6					
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW20

Client Project ID: M232-236

Lab Sample ID: G546-10-6K

Lab Project ID: G546-10

Analyzed By: MRC

Date Collected: 06/17/2004 12:05

Date Received: 06/18/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	1.80	10.0	1.22	1	06/26/2004	J
Acenaphthylene	BQL	10.0	1.12	1	06/26/2004	
Anthracene	BQL	10.0	1.75	1	06/26/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	06/26/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	06/26/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	06/26/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	06/26/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	06/26/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	06/26/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	06/26/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	06/26/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	06/26/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	06/26/2004	
2-Chlorophenol	BQL	10.0	4.22	1	06/26/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	06/26/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	06/26/2004	
Chrysene	BQL	10.0	1.11	1	06/26/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	06/26/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	06/26/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	06/26/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	06/26/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	06/26/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	06/26/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	06/26/2004	
Diethylphthalate	BQL	10.0	1.48	1	06/26/2004	
Dimethylphthalate	BQL	10.0	1.04	1	06/26/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	06/26/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	06/26/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	06/26/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	06/26/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	06/26/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	06/26/2004	
Fluoranthene	BQL	10.0	1.41	1	06/26/2004	
Fluorene	2.10	10.0	1.22	1	06/26/2004	J
Hexachlorobenzene	BQL	10.0	1.22	1	06/26/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	06/26/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	06/26/2004	
Hexachloroethane	BQL	10.0	1.58	1	06/26/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	06/26/2004	
Isophorone	BQL	10.0	1.27	1	06/26/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW20

Client Project ID: M232-236

Lab Sample ID: G546-10-6K

Lab Project ID: G546-10

Analyzed By: MRC

Date Collected: 06/17/2004 12:05

Date Received: 06/18/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	BQL	10.0	1.08	1	06/26/2004	
Nitrobenzene	BQL	10.0	1.32	1	06/26/2004	
2-Nitrophenol	BQL	10.0	3.52	1	06/26/2004	
4-Nitrophenol	BQL	50.0	3.17	1	06/26/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	06/26/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	06/26/2004	
Pentachlorophenol	BQL	50.0	2.83	1	06/26/2004	
Phenanthrene	BQL	10.0	1.38	1	06/26/2004	
Phenol	BQL	10.0	3.38	1	06/26/2004	
Pyrene	BQL	10.0	2.08	1	06/26/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	06/26/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	06/26/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.5	85
2-Fluorophenol	10	7.8	78
Nitrobenzene-d5	10	8.4	84
Phenol-d6	10	7.3	73
2,4,6-Tribromophenol	10	8.1	81
4-Terphenyl-d14	10	9.3	93

Comments:**Flags:**

BQL = Below Quantitation Limits.

Reviewed By: 

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTM232-MW20
Client Project ID: M232-236
Lab Sample ID: G546-10-6K
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/17/2004 12:05
Date Received: 06/18/2004
Matrix: Water

Dilution: 1

Date Analyzed: 06-26-2004

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	Unknown	10.42			11
2					
3					
4					
5					
6					
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-DUP

Client Project ID: M232-236

Lab Sample ID: G546-10-7I

Lab Project ID: G546-10

Analyzed By: MRC

Date Collected: 06/16/2004 00:00

Date Received: 06/18/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	06/26/2004	
Acenaphthylene	BQL	10.0	1.12	1	06/26/2004	
Anthracene	BQL	10.0	1.75	1	06/26/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	06/26/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	06/26/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	06/26/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	06/26/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	06/26/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	06/26/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	06/26/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	06/26/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	06/26/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	06/26/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	06/26/2004	
2-Chlorophenol	BQL	10.0	4.22	1	06/26/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	06/26/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	06/26/2004	
Chrysene	BQL	10.0	1.11	1	06/26/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	06/26/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	06/26/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	06/26/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	06/26/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	06/26/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	06/26/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	06/26/2004	
Diethylphthalate	BQL	10.0	1.48	1	06/26/2004	
Dimethylphthalate	BQL	10.0	1.04	1	06/26/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	06/26/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	06/26/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	06/26/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	06/26/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	06/26/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	06/26/2004	
Fluoranthene	BQL	10.0	1.41	1	06/26/2004	
Fluorene	BQL	10.0	1.22	1	06/26/2004	
Hexachlorobenzene	BQL	10.0	1.22	1	06/26/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	06/26/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	06/26/2004	
Hexachloroethane	BQL	10.0	1.58	1	06/26/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	06/26/2004	
Isophorone	BQL	10.0	1.27	1	06/26/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-DUP
Client Project ID: M232-236
Lab Sample ID: G546-10-7I
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/16/2004 00:00
Date Received: 06/18/2004
Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	BQL	10.0	1.08	1	06/26/2004	
Nitrobenzene	BQL	10.0	1.32	1	06/26/2004	
2-Nitrophenol	BQL	10.0	3.52	1	06/26/2004	
4-Nitrophenol	BQL	50.0	3.17	1	06/26/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	06/26/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	06/26/2004	
Pentachlorophenol	BQL	50.0	2.83	1	06/26/2004	
Phenanthrene	BQL	10.0	1.38	1	06/26/2004	
Phenol	BQL	10.0	3.38	1	06/26/2004	
Pyrene	BQL	10.0	2.08	1	06/26/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	06/26/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	06/26/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8	80
2-Fluorophenol	10	7.9	79
Nitrobenzene-d5	10	8	80
Phenol-d6	10	7.3	73
2,4,6-Tribromophenol	10	7.6	76
4-Terphenyl-d14	10	10.3	103

Comments:**Flags:**

BQL = Below Quantitation Limits.

Reviewed By: ELC

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTM232-DUP
Client Project ID: M232-236
Lab Sample ID: G546-10-71
Lab Project ID: G546-10

Analyzed By: MRC
Date Collected: 06/16/2004 00:00
Date Received: 06/18/2004
Matrix: Water

Dilution: 1

Date Analyzed: 06-26-2004

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	Unknown	10.42			13
2					
3					
4					
5					
6					
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

VPH (Aliphatics/Aromatics) Laboratory Reporting FormClient Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-MW22
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	06/17/04
Date Received	06/18/04
Date Extracted	06/24/04
Date Analyzed	06/24/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	120 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	100

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Comments: Sample reported on a wet weight basis.

Lab Info: g546-10-1a

Reviewed By: 

VPH (Aliphatics/Aromatics) Laboratory Reporting FormClient Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-MW21
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	06/17/04
Date Received	06/18/04
Date Extracted	06/24/04
Date Analyzed	06/24/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	130 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	100

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Comments: Sample reported on a wet weight basis.

Lab Info: g546-10-2a

Reviewed By: EICM

VPH (Aliphatics/Aromatics) Laboratory Reporting FormClient Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-MW18
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	06/17/04
Date Received	06/18/04
Date Extracted	06/24/04
Date Analyzed	06/24/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	200 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	120

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Comments: Sample reported on a wet weight basis.

Lab Info: g546-10-3a

Reviewed By: *EJN*

VPH (Aliphatics/Aromatics) Laboratory Reporting FormClient Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-MW07
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	06/16/04
Date Received	06/18/04
Date Extracted	06/24/04
Date Analyzed	06/24/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Comments: Sample reported on a wet weight basis.

Lab Info: g546-10-4a

Reviewed By: 

VPH (Aliphatics/Aromatics) Laboratory Reporting FormClient Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-MW05
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	06/16/04
Date Received	06/18/04
Date Extracted	06/24/04
Date Analyzed	06/24/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	95
Surrogate % Recovery - FID	100

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Comments: Sample reported on a wet weight basis.

Lab Info: g546-10-5a

Reviewed By: ELM

VPH (Aliphatics/Aromatics) Laboratory Reporting FormClient Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-MW20
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	06/17/04
Date Received	06/18/04
Date Extracted	06/24/04
Date Analyzed	06/24/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	97
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Comments: Sample reported on a wet weight basis.

Lab Info: g546-10-6a

Reviewed By: 

VPH (Aliphatics/Aromatics) Laboratory Reporting FormClient Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-DUP
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	06/16/04
Date Received	06/18/04
Date Extracted	06/24/04
Date Analyzed	06/24/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	93
Surrogate % Recovery - FID	100

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Comments: Sample reported on a wet weight basis.

Lab Info: g546-10-7a

Reviewed By: ELW

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-MW22
Sample Matrix	Water
Date Collected	06/17/04
Date Received	06/18/04
Date Extracted	06/22/04
Date Analyzed	06/23/04
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	110
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G546-10-11

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-MW21
Sample Matrix	Water
Date Collected	06/17/04
Date Received	06/18/04
Date Extracted	06/22/04
Date Analyzed	06/29/04
Dry Weight	
Dilution Factor	1:1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	360 (µg/L)
Aliphatic Surrogate % Recovery	57
Aromatic Surrogate % Recovery	81
Fractionation Surrogate 1 % Recovery	53

Comments:

* = Excludes any surrogates or internal standards.

Lab info: G546-10-21

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-MW18
Sample Matrix	Water
Date Collected	06/17/04
Date Received	06/18/04
Date Extracted	06/22/04
Date Analyzed	06/29/04
Dry Weight	
Dilution Factor	1:1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	570 (µg/L)
Aliphatic Surrogate % Recovery	82
Aromatic Surrogate % Recovery	93
Fractionation Surrogate 1 % Recovery	55

Comments:

* = Excludes any surrogates or internal standards.

Lab info: G546-10-3I

Reviewed By: ECH

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-MW07
Sample Matrix	Water
Date Collected	06/16/04
Date Received	06/18/04
Date Extracted	06/22/04
Date Analyzed	06/23/04
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	100
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G546-10-4J

Reviewed By: ELW

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-MW05
Sample Matrix	Water
Date Collected	06/16/04
Date Received	06/18/04
Date Extracted	06/22/04
Date Analyzed	06/23/04
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	68
Aromatic Surrogate % Recovery	93

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G546-10-5H

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-MW20
Sample Matrix	Water
Date Collected	06/17/04
Date Received	06/18/04
Date Extracted	06/22/04
Date Analyzed	06/23/04
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	100
Aromatic Surrogate % Recovery	100

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G546-10-6H

Reviewed By: EUCM

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232-236

Sample Information and Analytical Results	
Sample Identification	USTM232-DUP
Sample Matrix	Water
Date Collected	06/16/04
Date Received	06/18/04
Date Extracted	06/22/04
Date Analyzed	06/23/04
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	82
Aromatic Surrogate % Recovery	84

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G546-10-7H

Reviewed By: ELCH

List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit

DF = Dilution Factor

Dup = Duplicate

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL = Reporting Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% solids = Percent Solids

Special Notes:

1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.

2) Uncertainty for all reported data is less than or equal to 30 percent.

PARADIGM ANALYTICAL LABORATORIES, INC.

5500 Business Drive, Wilmington, NC 28405

Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 44319

Client: Engineering Environment Project ID: M232-236

Date: 9-18-04

Report To: Fred Kynah

Address: 824 Gumbrecht Rd Suite 5 Contact: Bill Morris

Turnaround: Standard

Virginia Beach

Address: Jacksonville, NC 29540 Phone: 910-949-3214

Job Number: _____

Invoice To: Mike Skelton

Quote #: _____

Fax: 910-949-3341

P.O. Number: _____

PARADIGM ANALYTICAL LABORATORIES, INC.

Sample ID	Date	Time	Matrix	Preservatives		Analyses				Comments: Please specify any special reporting requirements
				ICE	HCI	602	825-10105	VPH	EPH	
ASTM232-MW22	6-17-04	13:15	GW	X	X	3	1	2	1	
ASTM232-MW21	6-17-04	12:35	GW	X	X	3	1	2	1	
ASTM232-MW18	6-17-04	11:25	GW	X	X	3	1	2	1	
ASTM232-MW07	6-16-04	14:20	GW	X	X	3	1	2	1	
ASTM232-MW05	6-16-04	13:39	GW	X	X	3	1	2	1	
ASTM232-MW20	6-17-04	12:05	GW	X	X	3	1	2	1	
ASTM232-B4P	6-16-04		GW	X	X	3	1	2	1	
Relinquished By	Date	Time	Received By	Date	Time	Temperature	State Certification Requested			
Bob Sullivan	6-18-04	8:00					NC SC Other			
							SEE REVERSE FOR TERMS AND CONDITIONS			

G546-10

December 2004

Mr. Fred Kozminski
Engineering & Environment, Inc.
195 South Rosemont Rd.
Suite 118
Virginia Beach VA 23452-4353
Report Number: G546-20
Client Project: M232

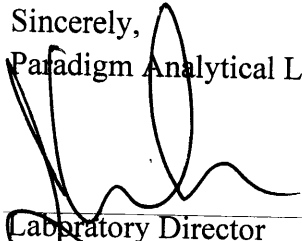
Dear Mr. Kozminski:

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
Paradigm Analytical Laboratories, Inc.


Laboratory Director
J. Patrick Weaver


Date

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Engineering & Environment, Inc.

Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-MW22
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/30/04
Date Analyzed	12/30/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	89

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: g546-20-1e

Reviewed By: me

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Engineering & Environment, Inc.

Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-MW21
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/30/04
Date Analyzed	12/30/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	87

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.
 ** = Excludes any surrogates or internal standards.

Lab Info: g546-20-2e

Reviewed By: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Engineering & Environment, Inc.

Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-MW20
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/30/04
Date Analyzed	12/30/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	92

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: g546-20-3e

Reviewed By: mc

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Engineering & Environment, Inc.

Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-MW18
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/30/04
Date Analyzed	12/30/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	110 (µg/L)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	90

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: g546-20-4e

Reviewed By: 

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Engineering & Environment, Inc.Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-MW07
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/30/04
Date Analyzed	12/30/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	96
Surrogate % Recovery - FID	96

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: g546-20-5eReviewed By: *me*

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Engineering & Environment, Inc.

Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-MW05
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/30/04
Date Analyzed	12/30/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	97
Surrogate % Recovery - FID	97

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: g546-20-6e

Reviewed By: my

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Engineering & Environment, Inc.

Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-Dup
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/30/04
Date Analyzed	12/30/04
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	96
Surrogate % Recovery - FID	96

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: g546-20-7e

Reviewed By: 

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 12/17/04PID Initial Calibration Date: 12/17/04

Calibration Ranges and Limits

Range	MDL (07/15/2004) (µg/L)	ML (µg/L)	RL (µg/L)	RL (mg/Kg)
C ₅ -C ₈ Aliphatics	4.4	14	100	10
C ₉ -C ₁₂ Aliphatics	3.4	11	100	10
C ₉ -C ₁₀ Aromatics	0.13	0.41	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	%RSD or CCC	Method of Quantitation
C ₅ -C ₈ Aliphatics	40	4.8	Calibration Factor
	1000		
	2000		
	3000		
	4000		
C ₉ -C ₁₂ Aliphatics	10	0.993	Linear Regression
	250		
	500		
	750		
	1000		
C ₉ -C ₁₀ Aromatics	10	6.8	Calibration Factor
	250		
	500		
	750		
	1000		

Calibration Check Date: 12/30/04

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	RPD
C ₅ -C ₈ Aliphatics	2000	200	-1.9
C ₉ -C ₁₂ Aliphatics	500	50	1.9
C ₉ -C ₁₀ Aromatics	500	50	-6.4

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-MW22
Sample Matrix	Water
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/22/04
Date Analyzed	01/03/05
Dry Weight	
Dilution Factor	1:1
C ₉ -C ₁₈ Aliphatics*	< 100 (ug/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (ug/L)
C ₁₁ -C ₂₂ Aromatics*	240 (ug/L)
Aliphatic Surrogate % Recovery	86
Aromatic Surrogate % Recovery	84
Fractionation Surrogate 1 % Recovery	120

Comments:

* = Excludes any surrogates or internal standards.

Lab info: G546-20-1J

Reviewed By: me

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-MW21
Sample Matrix	Water
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/22/04
Date Analyzed	01/07/05
Dry Weight	
Dilution Factor	1:1
C ₉ -C ₁₈ Aliphatics*	300 (ug/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (ug/L)
C ₁₁ -C ₂₂ Aromatics*	200 (ug/L)
Aliphatic Surrogate % Recovery	89
Aromatic Surrogate % Recovery	83
Fractionation Surrogate 1 % Recovery	98

Comments:

* = Excludes any surrogates or internal standards.

Lab info: G546-20-2J

Reviewed By: ml

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-MW20
Sample Matrix	Water
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/22/04
Date Analyzed	12/27/04
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (ug/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (ug/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (ug/L)
Aliphatic Surrogate % Recovery	82
Aromatic Surrogate % Recovery	89

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G546-20-3J

Reviewed By: mw

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-MW18
Sample Matrix	Water
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/22/04
Date Analyzed	01/03/05
Dry Weight	
Dilution Factor	1:1
C ₉ -C ₁₈ Aliphatics*	210 (ug/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (ug/L)
C ₁₁ -C ₂₂ Aromatics*	200 (ug/L)
Aliphatic Surrogate % Recovery	70
Aromatic Surrogate % Recovery	75
Fractionation Surrogate 1 % Recovery	92

Comments:

* = Excludes any surrogates or internal standards.

Lab info: G546-20-4J

Reviewed By: hwl

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-MW07
Sample Matrix	Water
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/22/04
Date Analyzed	01/03/05
Dry Weight	
Dilution Factor	1:1
C ₉ -C ₁₈ Aliphatics*	< 100 (ug/L)
C ₁₉ -C ₃₆ Aliphatics*	600 (ug/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (ug/L)
Aliphatic Surrogate % Recovery	98
Aromatic Surrogate % Recovery	77
Fractionation Surrogate 1 % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.

Lab info: G546-20-5K

Reviewed By: me

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-MW05
Sample Matrix	Water
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/22/04
Date Analyzed	01/03/05
Dry Weight	
Dilution Factor	1:1
C ₉ -C ₁₈ Aliphatics*	< 100 (ug/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (ug/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (ug/L)
Aliphatic Surrogate % Recovery	69
Aromatic Surrogate % Recovery	76
Fractionation Surrogate 1 % Recovery	66

Comments:

* = Excludes any surrogates or internal standards.

Note: Low surrogates confirmed by duplicate analysis.

Lab info: G546-20-6J

Reviewed By: 

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Engineering & Environment, Inc.Project Name: M232

Sample Information and Analytical Results	
Sample Identification	USTM232-Dup
Sample Matrix	Water
Date Collected	12/19/04
Date Received	12/21/04
Date Extracted	12/22/04
Date Analyzed	12/27/04
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 100 (ug/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (ug/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (ug/L)
Aliphatic Surrogate % Recovery	75
Aromatic Surrogate % Recovery	89

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G546-20-7J

Reviewed By: WMC

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 12/15/04

Calibration Ranges and Limits

Range	MDL (2/2004) (µg/L)	ML (µg/L)	RL (µg/L) (mg/Kg)	
C ₉ -C ₁₈ Aliphatics	3.84	12.2	100	10
C ₁₉ -C ₃₆ Aliphatics	0.57	1.8	100	10
C ₁₁ -C ₂₂ Aromatics	4.54	14.4	100	10

Calibration Concentration Levels

Range	Levels (µg/mL)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	6	4.80	Calibration Factor
	30		
	60		
	120		
	240		
C ₁₉ -C ₃₆ Aliphatics	8	8.3	Calibration Factor
	40		
	80		
	160		
	320		
C ₁₁ -C ₂₂ Aromatics	17	5.4	Calibration Factor
	85		
	170		
	340		
	680		

Calibration Check Date: 12/27/04

Calibration Check

Range	Levels (µg/mL)	RPD
C ₉ -C ₁₈ Aliphatics	120	0.6
C ₁₉ -C ₃₆ Aliphatics	160	-17.7
C ₁₁ -C ₂₂ Aromatics	340	4.9

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 12/30/04

Calibration Ranges and Limits

Range	MDL (2/2004) (µg/L)	ML (µg/L)	RL (µg/L) (mg/Kg)	
C ₉ -C ₁₈ Aliphatics	3.84	12.2	100	10
C ₁₉ -C ₃₆ Aliphatics	0.57	1.8	100	10
C ₁₁ -C ₂₂ Aromatics	4.54	14.4	100	10

Calibration Concentration Levels

Range	Levels (µg/mL)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	6	9.00	Calibration Factor
	30		
	60		
	120		
	240		
C ₁₉ -C ₃₆ Aliphatics	8	6.1	Calibration Factor
	40		
	80		
	160		
	320		
C ₁₁ -C ₂₂ Aromatics	17	5.4	Calibration Factor
	85		
	170		
	340		
	680		

Calibration Check Date: 01/03/05

Calibration Check

Range	Levels (µg/mL)	RPD
C ₉ -C ₁₈ Aliphatics	120	-3.5
C ₁₉ -C ₃₆ Aliphatics	160	-10.0
C ₁₁ -C ₂₂ Aromatics	340	16.8

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 12/30/04

Calibration Ranges and Limits

Range	MDL (2/2004) (µg/L)	ML (µg/L)	RL (µg/L) (mg/Kg)	
C ₉ -C ₁₈ Aliphatics	3.84	12.2	100	10
C ₁₉ -C ₃₆ Aliphatics	0.57	1.8	100	10
C ₁₁ -C ₂₂ Aromatics	4.54	14.4	100	10

Calibration Concentration Levels

Range	Levels (µg/mL)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	6	9.00	Calibration Factor
	30		
	60		
	120		
	240		
C ₁₉ -C ₃₆ Aliphatics	8	6.1	Calibration Factor
	40		
	80		
	160		
	320		
C ₁₁ -C ₂₂ Aromatics	17	5.4	Calibration Factor
	85		
	170		
	340		
	680		

Calibration Check Date: 01/07/05

Calibration Check

Range	Levels (µg/mL)	RPD
C ₉ -C ₁₈ Aliphatics	120	-6.2
C ₁₉ -C ₃₆ Aliphatics	160	-5.2
C ₁₁ -C ₂₂ Aromatics	340	8.5

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Results for Volatiles

by GC 602

Client Sample ID: USTM232-MW22

Analyzed By: JTF

Client Project ID: M232

Date Collected: 12/19/2004 10:55

Lab Sample ID: G546-20-1A

Date Received: 12/21/04

Lab Project ID: G546-20

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	12/28/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	12/28/2004	
Ethylbenzene	BQL	1.00	0.299	1	12/28/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	12/28/2004	
Toluene	0.396	1.00	0.302	1	12/28/2004	J
m/p-Xylene	0.638	2.00	0.608	1	12/28/2004	J
o-Xylene	BQL	2.00	0.596	1	12/28/2004	

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	35.3	88.2

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

Results for Volatiles

by GC 602

Client Sample ID: USTM232-MW21

Analyzed By: JTF

Client Project ID: M232

Date Collected: 12/19/2004 11:25

Lab Sample ID: G546-20-2A

Date Received: 12/21/04

Lab Project ID: G546-20

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	12/28/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	12/28/2004	
Ethylbenzene	0.845	1.00	0.299	1	12/28/2004	J
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	12/28/2004	
Toluene	0.869	1.00	0.302	1	12/28/2004	J
m/p-Xylene	1.46	2.00	0.608	1	12/28/2004	J
o-Xylene	0.904	2.00	0.596	1	12/28/2004	J

Surrogate Spike Recoveries**Spike**
Added**Spike**
Result**Percent**
Recovery

Trifluorotoluene

40

35.5

88.8

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: ml

Results for Volatiles

by GC 602

Client Sample ID: USTM232-MW20

Analyzed By: JTF

Client Project ID: M232

Date Collected: 12/19/2004 11:58

Lab Sample ID: G546-20-3A

Date Received: 12/21/04

Lab Project ID: G546-20

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	12/28/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	12/28/2004	
Ethylbenzene	BQL	1.00	0.299	1	12/28/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	12/28/2004	
Toluene	0.498	1.00	0.302	1	12/28/2004	J
m/p-Xylene	0.622	2.00	0.608	1	12/28/2004	J
o-Xylene	BQL	2.00	0.596	1	12/28/2004	

Surrogate Spike Recoveries**Spike
Added****Spike
Result****Percent
Recovery**

Trifluorotoluene

40

35.3

88.3

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: ml

Results for Volatiles

by GC 602

Client Sample ID: USTM232-MW18

Analyzed By: JTF

Client Project ID: M232

Date Collected: 12/19/2004 12:25

Lab Sample ID: G546-20-4A

Date Received: 12/21/04

Lab Project ID: G546-20

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	12/29/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	12/29/2004	
Ethylbenzene	BQL	1.00	0.299	1	12/29/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	12/29/2004	
Toluene	BQL	1.00	0.302	1	12/29/2004	
m/p-Xylene	0.826	2.00	0.608	1	12/29/2004	J
o-Xylene	BQL	2.00	0.596	1	12/29/2004	

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	35.4	88.5

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

Results for Volatiles

by GC 602

Client Sample ID: USTM232-MW07

Analyzed By: JTF

Client Project ID: M232

Date Collected: 12/19/2004 13:05

Lab Sample ID: G546-20-5A

Date Received: 12/21/04

Lab Project ID: G546-20

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	12/29/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	12/29/2004	
Ethylbenzene	BQL	1.00	0.299	1	12/29/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	12/29/2004	
Toluene	0.808	1.00	0.302	1	12/29/2004	J
m/p-Xylene	BQL	2.00	0.608	1	12/29/2004	
o-Xylene	BQL	2.00	0.596	1	12/29/2004	
Surrogate Spike Recoveries		Spike Added		Spike Result	Percent Recovery	

Trifluorotoluene

40

35.1

87.8

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By:

Results for Volatiles

by GC 602

Client Sample ID: USTM232-MW05

Analyzed By: DCS

Client Project ID: M232

Date Collected: 12/19/2004 14:05

Lab Sample ID: G546-20-6A

Date Received: 12/21/04

Lab Project ID: G546-20

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	12/30/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	12/30/2004	
Ethylbenzene	BQL	1.00	0.299	1	12/30/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	12/30/2004	
Toluene	BQL	1.00	0.302	1	12/30/2004	
m/p-Xylene	BQL	2.00	0.608	1	12/30/2004	
o-Xylene	BQL	2.00	0.596	1	12/30/2004	

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	36.2	90.4

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

Results for Volatiles

by GC 602

Client Sample ID: USTM232-Dup

Analyzed By: DCS

Client Project ID: M232

Date Collected: 12/19/2004 00:00

Lab Sample ID: G546-20-7A

Date Received: 12/21/04

Lab Project ID: G546-20

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	12/30/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	12/30/2004	
Ethylbenzene	BQL	1.00	0.299	1	12/30/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	12/30/2004	
Toluene	BQL	1.00	0.302	1	12/30/2004	
m/p-Xylene	BQL	2.00	0.608	1	12/30/2004	
o-Xylene	BQL	2.00	0.596	1	12/30/2004	

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	36.0	89.9

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

Results for Volatiles

by GC 602

Client Sample ID: Trip Blank

Analyzed By: DCS

Client Project ID: M232

Date Collected: 12/20/2004 00:00

Lab Sample ID: G546-20-8A

Date Received: 12/21/04

Lab Project ID: G546-20

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	12/30/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	12/30/2004	
Ethylbenzene	BQL	1.00	0.299	1	12/30/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	12/30/2004	
Toluene	BQL	1.00	0.302	1	12/30/2004	
m/p-Xylene	BQL	2.00	0.608	1	12/30/2004	
o-Xylene	BQL	2.00	0.596	1	12/30/2004	

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	35.9	89.7

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

Results for Volatiles

by GC 602

Client Sample ID: Method Blank

Analyzed By: JTF

Client Project ID:

Date Collected:

Lab Sample ID: VBLK122804D

Date Received:

Lab Project ID:

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	12/28/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	12/28/2004	
Ethylbenzene	BQL	1.00	0.299	1	12/28/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	12/28/2004	
Toluene	BQL	1.00	0.302	1	12/28/2004	
m/p-Xylene	BQL	2.00	0.608	1	12/28/2004	
o-Xylene	BQL	2.00	0.596	1	12/28/2004	
Surrogate Spike Recoveries		Spike Added		Spike Result	Percent Recovery	

Trifluorotoluene

40

35.5

88.7

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: me

Results for Volatiles

by GC 602

Client Sample ID: Method Blank

Analyzed By: DCS

Client Project ID:

Date Collected:

Lab Sample ID: VBLK3123004B

Date Received:

Lab Project ID:

Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.316	1	12/30/2004	
Diisopropyl ether (DIPE)	BQL	1.00	0.294	1	12/30/2004	
Ethylbenzene	BQL	1.00	0.299	1	12/30/2004	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.588	1	12/30/2004	
Toluene	BQL	1.00	0.302	1	12/30/2004	
m/p-Xylene	BQL	2.00	0.608	1	12/30/2004	
o-Xylene	BQL	2.00	0.596	1	12/30/2004	

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	35.8	89.6

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

Control Limits for QC Check / Laboratory Control Spike

Method: 602 Spike[ppb] : 10
 Instrument : gc3
 Filename : 122804\021r0101.txt

Compound	ppb	Q(%)	QC Limits		P _s (%)	LCS Limits	
			Lower	Upper		Lower	Upper
Benzene	10.2	102.4	77.0	123.0	102	39	150
Chlorobenzene	10.3	103.3	80.5	119.5	103	55	135
1,2-Dichlorobenzene	10.8	107.9	68.0	132.0	108	37	154
1,3-Dichlorobenzene	10.4	104.2	72.5	127.5	104	50	141
1,4-Dichlorobenzene	10.6	106.1	69.5	130.5	106	42	143
• Diisopropyl ether	9.6	96.3	43.1	156.9	96	30	170
Ethylbenzene	10.8	108.0	63.0	137.0	108	32	160
• MTBE	10.0	100.4	46.8	153.2	100	35	165
Toluene	10.4	103.7	77.5	127.0	104	46	148
• m,p-Xylene	21.5	107.4	11.2	188.8	107	D	239
• o-Xylene	10.7	106.9	47.6	152.4	107	36	164

Flags :

- + = out of QC limits.
- = lab generated limits.
- D = Detected

Reviewed by: mc

Control Limits for MS-MSD

Method: **602** Spike[ppb]: **10**
 Instrument : gc3
 Sample : 122804\024r0101.txt
 MS : 122804\034r0101.txt
 MSD : 122804\035r0101.txt

Compound	µg/L			P(%)		P Limits	
	Sam.	MS	MSD	MS	MSD	Lower	Upper
Benzene	ND	10.3	10.4	103	104	39	150
Chlorobenzene	ND	10.4	10.5	104	105	55	135
1,2-Dichlorobenzene	ND	11.2	11.2	109	110	37	154
1,3-Dichlorobenzene	ND	10.7	10.8	105	105	50	141
1,4-Dichlorobenzene	ND	10.8	10.8	108	108	42	143
• Diisopropyl ether	ND	9.7	9.9	97	99	30	170
Ethylbenzene	ND	11.0	11.0	110	110	32	160
• MTBE	ND	10.0	10.2	100	102	35	165
Toluene	ND	10.6	10.6	105	106	46	148
• m,p-Xylene	ND	22.0	22.0	110	110	D	239
• o-Xylene	ND	10.9	10.7	109	107	36	164

Flags :

+ = out of QC limits.
 ♦ = lab generated limits.
 D = Detected
 ND = None Detected

Reviewed by: MC

Control Limits for QC Check / Laboratory Control Spike

Method: 602 Spike[ppb]: 10
 Instrument : gc3
 Filename : 123004\010r0101.txt

Compound	ppb	Q(%)	QC Limits		P _s (%)	LCS Limits	
			Lower	Upper		Lower	Upper
Benzene	10.0	100.2	77.0	123.0	100	39	150
Chlorobenzene	10.0	100.4	80.5	119.5	100	55	135
1,2-Dichlorobenzene	9.9	99.1	68.0	132.0	99	37	154
1,3-Dichlorobenzene	9.8	98.3	72.5	127.5	98	50	141
1,4-Dichlorobenzene	10.1	100.5	69.5	130.5	101	42	143
• Diisopropyl ether	9.5	94.8	43.1	156.9	95	30	170
Ethylbenzene	10.4	103.6	63.0	137.0	104	32	160
• MTBE	9.7	96.6	46.8	153.2	97	35	165
Toluene	10.1	100.8	77.5	127.0	101	46	148
• m,p-Xylene	20.5	102.4	11.2	188.8	102	D	239
• o-Xylene	10.2	101.8	47.6	152.4	102	36	164

Flags :

- + = out of QC limits.
- ♦ = lab generated limits.
- D = Detected

Reviewed by: 

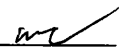
Control Limits for MS-MSD

Method: **602** Spike[ppb] : **10**
 Instrument : gc3
 Sample : 123004\025r0101.txt
 MS : 123004\028r0101.txt
 MSD : 123004\029r0101.txt

Compound	µg/L			P(%)		P Limits	
	Sam.	MS	MSD	MS	MSD	Lower	Upper
Benzene	ND	10.0	10.1	100	101	39	150
Chlorobenzene	ND	10.4	10.3	104	103	55	135
1,2-Dichlorobenzene	ND	10.8	10.8	108	108	37	154
1,3-Dichlorobenzene	ND	10.4	10.4	104	104	50	141
1,4-Dichlorobenzene	ND	10.6	10.6	106	106	42	143
• Diisopropyl ether	ND	9.3	9.4	93	94	30	170
Ethylbenzene	ND	10.8	10.7	108	107	32	160
• MTBE	ND	9.6	9.6	96	96	35	165
Toluene	ND	10.4	10.2	104	102	46	148
• m,p-Xylene	ND	21.5	21.2	107	106	D	239
• o-Xylene	ND	10.6	10.5	106	105	36	164

Flags :

+ = out of QC limits.
 ♦ = lab generated limits.
 D = Detected
 ND = None Detected

 Reviewed by: 

Results for Semivolatiles by GCMS 625

Client Sample ID: USTM232-MW22

Client Project ID: M232

Lab Sample ID: G546-20-11

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 10:55

Date Received: 12/21/2004

Date Extracted: 12/21/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	12/28/2004	
Acenaphthylene	BQL	10.0	1.12	1	12/28/2004	
Anthracene	BQL	10.0	1.75	1	12/28/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	12/28/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	12/28/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	12/28/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	12/28/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	12/28/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	12/28/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	12/28/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	12/28/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	12/28/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	12/28/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	12/28/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	12/28/2004	
2-Chlorophenol	BQL	10.0	4.22	1	12/28/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	12/28/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	12/28/2004	
Chrysene	BQL	10.0	1.11	1	12/28/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	12/28/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	12/28/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	12/28/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	12/28/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	12/28/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	12/28/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	12/28/2004	
Diethylphthalate	4.60	10.0	1.48	1	12/28/2004	J
Dimethylphthalate	BQL	10.0	1.04	1	12/28/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	12/28/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	12/28/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	12/28/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	12/28/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	12/28/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	12/28/2004	
Fluoranthene	BQL	10.0	1.41	1	12/28/2004	
Fluorene	1.60	10.0	1.22	1	12/28/2004	J
Hexachlorobenzene	BQL	10.0	1.22	1	12/28/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	12/28/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	12/28/2004	
Hexachloroethane	BQL	10.0	1.58	1	12/28/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	12/28/2004	
Isophorone	BQL	10.0	1.27	1	12/28/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW22

Client Project ID: M232

Lab Sample ID: G546-20-11

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 10:55

Date Received: 12/21/2004

Date Extracted: 12/21/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	2.30	10.0	1.08	1	12/28/2004	J
Nitrobenzene	BQL	10.0	1.32	1	12/28/2004	
2-Nitrophenol	BQL	10.0	3.52	1	12/28/2004	
4-Nitrophenol	BQL	50.0	3.17	1	12/28/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	12/28/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	12/28/2004	
Pentachlorophenol	BQL	50.0	2.83	1	12/28/2004	
Phenanthrene	BQL	10.0	1.38	1	12/28/2004	
Phenol	BQL	10.0	3.38	1	12/28/2004	
Pyrene	BQL	10.0	2.08	1	12/28/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	12/28/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	12/28/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.1	81
2-Fluorophenol	10	8.8	88
Nitrobenzene-d5	10	7.9	79
Phenol-d6	10	8.5	85
2,4,6-Tribromophenol	5	3.5	71
4-Terphenyl-d14	10	12.9	129

Comments:**Flags:**

BQL = Below Quantitation Limits.

J = Detected below the quantitation limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds

by GCMS

Client Sample ID: USTM232-MW22

Client Project ID: M232

Lab Sample ID: G546-20-11

Lab Project ID: G546-20

Sample Wt/Vol: 500 ML

Dilution: 1

Analyzed By: MRC

Date Collected: 12/19/2004 10:55

Date Received: 12/21/2004

Date Analyzed: 12/28/2004

Date Extracted: 12/21/2004

Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	Know solvent peak (added by lab)	3.84			1460
2	Know compound peak (added by lab)	11.85			117
3	1-Methylnaphthalene	10.19	000090-12-0	99	15.1
4	Dimethylnaphthalene, Isomer of	11.16			11.1
5	2-Methylnaphthalene	10.03	000091-57-6	97	6.6
6					
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW21

Client Project ID: M232

Lab Sample ID: G546-20-2I

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 11:25

Date Received: 12/21/2004

Date Extracted: 12/21/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	2.20	10.0	1.22	1	12/28/2004	J
Acenaphthylene	BQL	10.0	1.12	1	12/28/2004	
Anthracene	BQL	10.0	1.75	1	12/28/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	12/28/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	12/28/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	12/28/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	12/28/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	12/28/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	12/28/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	12/28/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	12/28/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	12/28/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	12/28/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	12/28/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	12/28/2004	
2-Chlorophenol	BQL	10.0	4.22	1	12/28/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	12/28/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	12/28/2004	
Chrysene	BQL	10.0	1.11	1	12/28/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	12/28/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	12/28/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	12/28/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	12/28/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	12/28/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	12/28/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	12/28/2004	
Diethylphthalate	15.5	10.0	1.48	1	12/28/2004	
Dimethylphthalate	BQL	10.0	1.04	1	12/28/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	12/28/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	12/28/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	12/28/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	12/28/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	12/28/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	12/28/2004	
Fluoranthene	BQL	10.0	1.41	1	12/28/2004	
Fluorene	3.50	10.0	1.22	1	12/28/2004	J
Hexachlorobenzene	BQL	10.0	1.22	1	12/28/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	12/28/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	12/28/2004	
Hexachloroethane	BQL	10.0	1.58	1	12/28/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	12/28/2004	
Isophorone	BQL	10.0	1.27	1	12/28/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW21

Client Project ID: M232

Lab Sample ID: G546-20-2I

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 11:25

Date Received: 12/21/2004

Date Extracted: 12/21/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	3.10	10.0	1.08	1	12/28/2004	J
Nitrobenzene	BQL	10.0	1.32	1	12/28/2004	
2-Nitrophenol	BQL	10.0	3.52	1	12/28/2004	
4-Nitrophenol	BQL	50.0	3.17	1	12/28/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	12/28/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	12/28/2004	
Pentachlorophenol	BQL	50.0	2.83	1	12/28/2004	
Phenanthrene	3.10	10.0	1.38	1	12/28/2004	J
Phenol	BQL	10.0	3.38	1	12/28/2004	
Pyrene	BQL	10.0	2.08	1	12/28/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	12/28/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	12/28/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7	70
2-Fluorophenol	10	7.3	73
Nitrobenzene-d5	10	6.6	66
Phenol-d6	10	7.4	74
2,4,6-Tribromophenol	5	3.5	69
4-Terphenyl-d14	10	12.3	123

Comments:**Flags:**

BQL = Below Quantitation Limits.

J = Detected below the quantitation limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds

by GCMS

Client Sample ID: USTM232-MW21
 Client Project ID: M232
 Lab Sample ID: G546-20-2I
 Lab Project ID: G546-20
 Sample Wt/Vol: 500 ML
 Dilution: 1

Analyzed By: MRC
 Date Collected: 12/19/2004 11:25
 Date Received: 12/21/2004
 Date Analyzed: 12/28/2004
 Date Extracted: 12/21/2004
 Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	Know solvent peak (added by lab)	3.84			1530
2	Know compound peak (added by lab)	11.85			113
3	Dimethylnaphthalene, Isomer of	11.16			30.9
4	1-Methylnaphthalene	10.19	000090-12-0	98	30.2
5	Dimethylnaphthalene, Isomer of	11.03			12.4
6	Dimethylnaphthalene, Isomer of	11.34			11.6
7	Ethyl dimethylbenzene, Isomer of	8.50			10.9
8	2-Methylnaphthalene	10.03	000091-57-6	98	10.7
9	Dimethylnaphthalene, Isomer of	11.20			9.99
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW20

Client Project ID: M232

Lab Sample ID: G546-20-3I

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 11:58

Date Received: 12/21/2004

Date Extracted: 12/21/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	12/29/2004	
Acenaphthylene	BQL	10.0	1.12	1	12/29/2004	
Anthracene	BQL	10.0	1.75	1	12/29/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	12/29/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	12/29/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	12/29/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	12/29/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	12/29/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	12/29/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	12/29/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	12/29/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	12/29/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	12/29/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	12/29/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	12/29/2004	
2-Chlorophenol	BQL	10.0	4.22	1	12/29/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	12/29/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	12/29/2004	
Chrysene	BQL	10.0	1.11	1	12/29/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	12/29/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	12/29/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	12/29/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	12/29/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	12/29/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	12/29/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	12/29/2004	
Diethylphthalate	2.90	10.0	1.48	1	12/29/2004	J
Dimethylphthalate	BQL	10.0	1.04	1	12/29/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	12/29/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	12/29/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	12/29/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	12/29/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	12/29/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	12/29/2004	
Fluoranthene	BQL	10.0	1.41	1	12/29/2004	
Fluorene	1.30	10.0	1.22	1	12/29/2004	J
Hexachlorobenzene	BQL	10.0	1.22	1	12/29/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	12/29/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	12/29/2004	
Hexachloroethane	BQL	10.0	1.58	1	12/29/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	12/29/2004	
Isophorone	BQL	10.0	1.27	1	12/29/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW20

Client Project ID: M232

Lab Sample ID: G546-20-3I

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 11:58

Date Received: 12/21/2004

Date Extracted: 12/21/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	BQL	10.0	1.08	1	12/29/2004	
Nitrobenzene	BQL	10.0	1.32	1	12/29/2004	
2-Nitrophenol	BQL	10.0	3.52	1	12/29/2004	
4-Nitrophenol	BQL	50.0	3.17	1	12/29/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	12/29/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	12/29/2004	
Pentachlorophenol	BQL	50.0	2.83	1	12/29/2004	
Phenanthrene	BQL	10.0	1.38	1	12/29/2004	
Phenol	BQL	10.0	3.38	1	12/29/2004	
Pyrene	BQL	10.0	2.08	1	12/29/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	12/29/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	12/29/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.8	78
2-Fluorophenol	10	8.7	87
Nitrobenzene-d5	10	7.8	78
Phenol-d6	10	8.4	84
2,4,6-Tribromophenol	5	3.6	71
4-Terphenyl-d14	10	12.5	125

Comments:**Flags:**

BQL = Below Quantitation Limits.

J = Detected below the quantitation limit.

Reviewed By: MC

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTM232-MW20

Client Project ID: M232

Lab Sample ID: G546-20-3I

Lab Project ID: G546-20

Sample Wt/Vol: 500 ML

Dilution: 1

Analyzed By: MRC

Date Collected: 12/19/2004 11:58

Date Received: 12/21/2004

Date Analyzed: 12/29/2004

Date Extracted: 12/21/2004

Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	Know solvent peak (added by lab)	3.85			1400
2	Know compound peak (added by lab)	11.85			130
3					
4					
5					
6					
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW18

Client Project ID: M232

Lab Sample ID: G546-20-4I

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 12:25

Date Received: 12/21/2004

Date Extracted: 12/21/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	2.80	10.0	1.22	1	12/29/2004	J
Acenaphthylene	BQL	10.0	1.12	1	12/29/2004	
Anthracene	BQL	10.0	1.75	1	12/29/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	12/29/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	12/29/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	12/29/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	12/29/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	12/29/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	12/29/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	12/29/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	12/29/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	12/29/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	12/29/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	12/29/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	12/29/2004	
2-Chlorophenol	BQL	10.0	4.22	1	12/29/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	12/29/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	12/29/2004	
Chrysene	BQL	10.0	1.11	1	12/29/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	12/29/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	12/29/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	12/29/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	12/29/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	12/29/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	12/29/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	12/29/2004	
Diethylphthalate	BQL	10.0	1.48	1	12/29/2004	
Dimethylphthalate	BQL	10.0	1.04	1	12/29/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	12/29/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	12/29/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	12/29/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	12/29/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	12/29/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	12/29/2004	
Fluoranthene	BQL	10.0	1.41	1	12/29/2004	
Fluorene	4.70	10.0	1.22	1	12/29/2004	J
Hexachlorobenzene	BQL	10.0	1.22	1	12/29/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	12/29/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	12/29/2004	
Hexachloroethane	BQL	10.0	1.58	1	12/29/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	12/29/2004	
Isophorone	BQL	10.0	1.27	1	12/29/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW18

Client Project ID: M232

Lab Sample ID: G546-20-4I

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 12:25

Date Received: 12/21/2004

Date Extracted: 12/21/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	BQL	10.0	1.08	1	12/29/2004	
Nitrobenzene	BQL	10.0	1.32	1	12/29/2004	
2-Nitrophenol	BQL	10.0	3.52	1	12/29/2004	
4-Nitrophenol	BQL	50.0	3.17	1	12/29/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	12/29/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	12/29/2004	
Pentachlorophenol	BQL	50.0	2.83	1	12/29/2004	
Phenanthrene	4.90	10.0	1.38	1	12/29/2004	J
Phenol	BQL	10.0	3.38	1	12/29/2004	
Pyrene	BQL	10.0	2.08	1	12/29/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	12/29/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	12/29/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.2	73
2-Fluorophenol	10	7.6	76
Nitrobenzene-d5	10	7.2	72
Phenol-d6	10	7.8	78
2,4,6-Tribromophenol	5	3.4	68
4-Terphenyl-d14	10	12.2	122

Comments:**Flags:**

BQL = Below Quantitation Limits.

J = Detected below the quantitation limit.

Reviewed By: ml

Results of Library Search for Semivolatile Compounds

by GCMS

Client Sample ID: USTM232-MW18

Client Project ID: M232

Lab Sample ID: G546-20-41

Lab Project ID: G546-20

Sample Wt/Vol: 500 ML

Dilution: 1

Analyzed By: MRC

Date Collected: 12/19/2004 12:25

Date Received: 12/21/2004

Date Analyzed: 12/29/2004

Date Extracted: 12/21/2004

Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	Know solvent peak (added by lab)	3.84			1570
2	Know compound peak (added by lab)	11.85			119
3	Propenylbenzene, Isomer of	7.23			29.3
4	Aromatic, Unknown	8.50			19.2
5	Biphenyl	10.79	000092-52-4	93	9.82
6	Tetrahydromethylnaphthalene, Isomer of	9.95			9.45
7	1-Methylnaphthalene	10.19	000090-12-0	99	4.7
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW07

Client Project ID: M232

Lab Sample ID: G546-20-5I

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 13:05

Date Received: 12/21/2004

Date Extracted: 12/21/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	12/29/2004	
Acenaphthylene	BQL	10.0	1.12	1	12/29/2004	
Anthracene	BQL	10.0	1.75	1	12/29/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	12/29/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	12/29/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	12/29/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	12/29/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	12/29/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	12/29/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	12/29/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	12/29/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	12/29/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	12/29/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	12/29/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	12/29/2004	
2-Chlorophenol	BQL	10.0	4.22	1	12/29/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	12/29/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	12/29/2004	
Chrysene	BQL	10.0	1.11	1	12/29/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	12/29/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	12/29/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	12/29/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	12/29/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	12/29/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	12/29/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	12/29/2004	
Diethylphthalate	BQL	10.0	1.48	1	12/29/2004	
Dimethylphthalate	BQL	10.0	1.04	1	12/29/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	12/29/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	12/29/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	12/29/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	12/29/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	12/29/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	12/29/2004	
Fluoranthene	BQL	10.0	1.41	1	12/29/2004	
Fluorene	BQL	10.0	1.22	1	12/29/2004	
Hexachlorobenzene	BQL	10.0	1.22	1	12/29/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	12/29/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	12/29/2004	
Hexachloroethane	BQL	10.0	1.58	1	12/29/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	12/29/2004	
Isophorone	BQL	10.0	1.27	1	12/29/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW07

Client Project ID: M232

Lab Sample ID: G546-20-5I

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 13:05

Date Received: 12/21/2004

Date Extracted: 12/21/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	BQL	10.0	1.08	1	12/29/2004	
Nitrobenzene	BQL	10.0	1.32	1	12/29/2004	
2-Nitrophenol	BQL	10.0	3.52	1	12/29/2004	
4-Nitrophenol	BQL	50.0	3.17	1	12/29/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	12/29/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	12/29/2004	
Pentachlorophenol	BQL	50.0	2.83	1	12/29/2004	
Phenanthrene	BQL	10.0	1.38	1	12/29/2004	
Phenol	BQL	10.0	3.38	1	12/29/2004	
Pyrene	BQL	10.0	2.08	1	12/29/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	12/29/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	12/29/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.6	76
2-Fluorophenol	10	8.4	84
Nitrobenzene-d5	10	7.6	76
Phenol-d6	10	8.3	83
2,4,6-Tribromophenol	5	3.1	62
4-Terphenyl-d14	10	12.8	128

Comments:**Flags:**

BQL = Below Quantitation Limits.

J = Detected below the quantitation limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds

by GCMS

Client Sample ID: USTM232-MW07

Client Project ID: M232

Lab Sample ID: G546-20-5I

Lab Project ID: G546-20

Sample Wt/Vol: 500 ML

Dilution: 1

Analyzed By: MRC

Date Collected: 12/19/2004 13:05

Date Received: 12/21/2004

Date Analyzed: 12/29/2004

Date Extracted: 12/21/2004

Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	Know solvent peak (added by lab)	3.84			1490
2	Know compound peak (added by lab)	11.85			119
3					
4					
5					
6					
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: MC

Results for Semivolatiles by GCMS 625

Client Sample ID: USTM232-MW05

Client Project ID: M232

Lab Sample ID: G546-20-6I

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 14:05

Date Received: 12/21/2004

Date Extracted: 12/22/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	12/29/2004	
Acenaphthylene	BQL	10.0	1.12	1	12/29/2004	
Anthracene	BQL	10.0	1.75	1	12/29/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	12/29/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	12/29/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	12/29/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	12/29/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	12/29/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	12/29/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	12/29/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	12/29/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	12/29/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	12/29/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	12/29/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	12/29/2004	
2-Chlorophenol	BQL	10.0	4.22	1	12/29/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	12/29/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	12/29/2004	
Chrysene	BQL	10.0	1.11	1	12/29/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	12/29/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	12/29/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	12/29/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	12/29/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	12/29/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	12/29/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	12/29/2004	
Diethylphthalate	BQL	10.0	1.48	1	12/29/2004	
Dimethylphthalate	BQL	10.0	1.04	1	12/29/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	12/29/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	12/29/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	12/29/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	12/29/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	12/29/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	12/29/2004	
Fluoranthene	BQL	10.0	1.41	1	12/29/2004	
Fluorene	BQL	10.0	1.22	1	12/29/2004	
Hexachlorobenzene	BQL	10.0	1.22	1	12/29/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	12/29/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	12/29/2004	
Hexachloroethane	BQL	10.0	1.58	1	12/29/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	12/29/2004	
Isophorone	BQL	10.0	1.27	1	12/29/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-MW05

Client Project ID: M232

Lab Sample ID: G546-20-6I

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 14:05

Date Received: 12/21/2004

Date Extracted: 12/22/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	BQL	10.0	1.08	1	12/29/2004	
Nitrobenzene	BQL	10.0	1.32	1	12/29/2004	
2-Nitrophenol	BQL	10.0	3.52	1	12/29/2004	
4-Nitrophenol	BQL	50.0	3.17	1	12/29/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	12/29/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	12/29/2004	
Pentachlorophenol	BQL	50.0	2.83	1	12/29/2004	
Phenanthrene	BQL	10.0	1.38	1	12/29/2004	
Phenol	BQL	10.0	3.38	1	12/29/2004	
Pyrene	BQL	10.0	2.08	1	12/29/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	12/29/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	12/29/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	5.5	55
2-Fluorophenol	10	5.7	57
Nitrobenzene-d5	10	5.3	53
Phenol-d6	10	6.1	61
2,4,6-Tribromophenol	5	2.8	55
4-Terphenyl-d14	10	12.4	124

Comments:**Flags:**

BQL = Below Quantitation Limits.

J = Detected below the quantitation limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds

by GCMS

Client Sample ID: USTM232-MW05

Client Project ID: M232

Lab Sample ID: G546-20-6I

Lab Project ID: G546-20

Sample Wt/Vol: 500 ML

Dilution: 1

Analyzed By: MRC

Date Collected: 12/19/2004 14:05

Date Received: 12/21/2004

Date Analyzed: 12/29/2004

Date Extracted: 12/22/2004

Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	Know solvent peak (added by lab)	3.84			1280
2	Know compound peak (added by lab)	11.85			125
3					
4					
5					
6					
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-Dup

Client Project ID: M232

Lab Sample ID: G546-20-71

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 00:00

Date Received: 12/21/2004

Date Extracted: 12/22/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	12/29/2004	
Acenaphthylene	BQL	10.0	1.12	1	12/29/2004	
Anthracene	BQL	10.0	1.75	1	12/29/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	12/29/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	12/29/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	12/29/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	12/29/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	12/29/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	12/29/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	12/29/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	12/29/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	12/29/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	12/29/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	12/29/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	12/29/2004	
2-Chlorophenol	BQL	10.0	4.22	1	12/29/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	12/29/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	12/29/2004	
Chrysene	BQL	10.0	1.11	1	12/29/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	12/29/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	12/29/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	12/29/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	12/29/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	12/29/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	12/29/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	12/29/2004	
Diethylphthalate	BQL	10.0	1.48	1	12/29/2004	
Dimethylphthalate	BQL	10.0	1.04	1	12/29/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	12/29/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	12/29/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	12/29/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	12/29/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	12/29/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	12/29/2004	
Fluoranthene	BQL	10.0	1.41	1	12/29/2004	
Fluorene	BQL	10.0	1.22	1	12/29/2004	
Hexachlorobenzene	BQL	10.0	1.22	1	12/29/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	12/29/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	12/29/2004	
Hexachloroethane	BQL	10.0	1.58	1	12/29/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	12/29/2004	
Isophorone	BQL	10.0	1.27	1	12/29/2004	

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: USTM232-Dup

Client Project ID: M232

Lab Sample ID: G546-20-71

Lab Project ID: G546-20

Analyzed By: MRC

Date Collected: 12/19/2004 00:00

Date Received: 12/21/2004

Date Extracted: 12/22/2004

Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	BQL	10.0	1.08	1	12/29/2004	
Nitrobenzene	BQL	10.0	1.32	1	12/29/2004	
2-Nitrophenol	BQL	10.0	3.52	1	12/29/2004	
4-Nitrophenol	BQL	50.0	3.17	1	12/29/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	12/29/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	12/29/2004	
Pentachlorophenol	BQL	50.0	2.83	1	12/29/2004	
Phenanthrene	BQL	10.0	1.38	1	12/29/2004	
Phenol	BQL	10.0	3.38	1	12/29/2004	
Pyrene	BQL	10.0	2.08	1	12/29/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	12/29/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	12/29/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7	70
2-Fluorophenol	10	7.8	78
Nitrobenzene-d5	10	7.1	71
Phenol-d6	10	7.9	79
2,4,6-Tribromophenol	5	3	60
4-Terphenyl-d14	10	12.9	129

Comments:**Flags:**

BQL = Below Quantitation Limits.

J = Detected below the quantitation limit.

Reviewed By: 

Results of Library Search for Semivolatile Compounds*by GCMS*

Client Sample ID: USTM232-Dup

Client Project ID: M232

Lab Sample ID: G546-20-7I

Lab Project ID: G546-20

Sample Wt/Vol: 500 ML

Dilution: 1

Analyzed By: MRC

Date Collected: 12/19/2004 00:00

Date Received: 12/21/2004

Date Analyzed: 12/29/2004

Date Extracted: 12/22/2004

Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	Know solvent peak (added by lab)	3.84			1160
2	Know compound peak (added by lab)	11.85			130
3					
4					
5					
6					
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: Method Blank

Client Project ID:

Lab Sample ID: PB2163

Lab Project ID:

Analyzed By: MRC

Date Collected:

Date Received:

Date Extracted: 12/21/2004

Matrix: WATER

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	12/28/2004	
Acenaphthylene	BQL	10.0	1.12	1	12/28/2004	
Anthracene	BQL	10.0	1.75	1	12/28/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	12/28/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	12/28/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	12/28/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	12/28/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	12/28/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	12/28/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	12/28/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	12/28/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	12/28/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	12/28/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	12/28/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	12/28/2004	
2-Chlorophenol	BQL	10.0	4.22	1	12/28/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	12/28/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	12/28/2004	
Chrysene	BQL	10.0	1.11	1	12/28/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	12/28/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	12/28/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	12/28/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	12/28/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	12/28/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	12/28/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	12/28/2004	
Diethylphthalate	BQL	10.0	1.48	1	12/28/2004	
Dimethylphthalate	BQL	10.0	1.04	1	12/28/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	12/28/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	12/28/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	12/28/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	12/28/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	12/28/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	12/28/2004	
Fluoranthene	BQL	10.0	1.41	1	12/28/2004	
Fluorene	BQL	10.0	1.22	1	12/28/2004	
Hexachlorobenzene	BQL	10.0	1.22	1	12/28/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	12/28/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	12/28/2004	
Hexachloroethane	BQL	10.0	1.58	1	12/28/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	12/28/2004	
Isophorone	BQL	10.0	1.27	1	12/28/2004	

Results for Semivolatiles by GCMS 625

Client Sample ID: Method Blank

Client Project ID:

Lab Sample ID: PB2163

Lab Project ID:

Analyzed By: MRC

Date Collected:

Date Received:

Date Extracted: 12/21/2004

Matrix: WATER

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	BQL	10.0	1.08	1	12/28/2004	
Nitrobenzene	BQL	10.0	1.32	1	12/28/2004	
2-Nitrophenol	BQL	10.0	3.52	1	12/28/2004	
4-Nitrophenol	BQL	50.0	3.17	1	12/28/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	12/28/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	12/28/2004	
Pentachlorophenol	BQL	50.0	2.83	1	12/28/2004	
Phenanthrene	BQL	10.0	1.38	1	12/28/2004	
Phenol	BQL	10.0	3.38	1	12/28/2004	
Pyrene	BQL	10.0	2.08	1	12/28/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	12/28/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	12/28/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.9	79
2-Fluorophenol	10	8.5	85
Nitrobenzene-d5	10	7.9	79
Phenol-d6	10	8.3	83
2,4,6-Tribromophenol	5	3.3	66
4-Terphenyl-d14	10	12	120

Comments:**Flags:**

BQL = Below Quantitation Limits.

J = Detected below the quantitation limit.

Reviewed By: 

**Results for Semivolatiles
by GCMS 625**

Client Sample ID: Method Blank

Client Project ID:

Lab Sample ID: PB2168

Lab Project ID:

Analyzed By: MRC

Date Collected:

Date Received:

Date Extracted: 12/22/2004

Matrix: WATER

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	12/28/2004	
Acenaphthylene	BQL	10.0	1.12	1	12/28/2004	
Anthracene	BQL	10.0	1.75	1	12/28/2004	
Benzo[a]anthracene	BQL	10.0	1.36	1	12/28/2004	
Benzo[a]pyrene	BQL	10.0	1.27	1	12/28/2004	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	12/28/2004	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	12/28/2004	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	12/28/2004	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	12/28/2004	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	12/28/2004	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	12/28/2004	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	12/28/2004	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	12/28/2004	
Butylbenzylphthalate	BQL	10.0	1.53	1	12/28/2004	
2-Chloronaphthalene	BQL	10.0	1.25	1	12/28/2004	
2-Chlorophenol	BQL	10.0	4.22	1	12/28/2004	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	12/28/2004	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	12/28/2004	
Chrysene	BQL	10.0	1.11	1	12/28/2004	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	12/28/2004	
Di-n-Butylphthalate	BQL	10.0	1.65	1	12/28/2004	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	12/28/2004	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	12/28/2004	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	12/28/2004	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	12/28/2004	
2,4-Dichlorophenol	BQL	10.0	3.75	1	12/28/2004	
Diethylphthalate	BQL	10.0	1.48	1	12/28/2004	
Dimethylphthalate	BQL	10.0	1.04	1	12/28/2004	
2,4-Dimethylphenol	BQL	10.0	9.25	1	12/28/2004	
Di-n-octylphthalate	BQL	10.0	1.16	1	12/28/2004	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	12/28/2004	
2,4-Dinitrophenol	BQL	50.0	4.20	1	12/28/2004	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	12/28/2004	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	12/28/2004	
Fluoranthene	BQL	10.0	1.41	1	12/28/2004	
Fluorene	BQL	10.0	1.22	1	12/28/2004	
Hexachlorobenzene	BQL	10.0	1.22	1	12/28/2004	
Hexachlorobutadiene	BQL	10.0	1.58	1	12/28/2004	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	12/28/2004	
Hexachloroethane	BQL	10.0	1.58	1	12/28/2004	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	12/28/2004	
Isophorone	BQL	10.0	1.27	1	12/28/2004	

Results for Semivolatiles by GCMS 625

Client Sample ID: Method Blank

Client Project ID:

Lab Sample ID: PB2168

Lab Project ID:

Analyzed By: MRC

Date Collected:

Date Received:

Date Extracted: 12/22/2004

Matrix: WATER

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Naphthalene	BQL	10.0	1.08	1	12/28/2004	
Nitrobenzene	BQL	10.0	1.32	1	12/28/2004	
2-Nitrophenol	BQL	10.0	3.52	1	12/28/2004	
4-Nitrophenol	BQL	50.0	3.17	1	12/28/2004	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	12/28/2004	
N-Nitrosodiphenylamine	BQL	10.0	1.53	1	12/28/2004	
Pentachlorophenol	BQL	50.0	2.83	1	12/28/2004	
Phenanthrene	BQL	10.0	1.38	1	12/28/2004	
Phenol	BQL	10.0	3.38	1	12/28/2004	
Pyrene	BQL	10.0	2.08	1	12/28/2004	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	12/28/2004	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	12/28/2004	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	5.9	59
2-Fluorophenol	10	6.5	65
Nitrobenzene-d5	10	6.1	61
Phenol-d6	10	6.7	67
2,4,6-Tribromophenol	5	2.8	56
4-Terphenyl-d14	10	12	120

Comments:**Flags:**

BQL = Below Quantitation Limits.

J = Detected below the quantitation limit.

Reviewed By: 

Results For Water Laboratory Control Standard (LCS)
by GCMS

Client Sample ID: Batch QC
 Client Project ID:
 Lab Sample ID: W-LCS-2163
 Lab Project ID:
 Matrix: Water

Date Collected:
 Date Received:
 Date Analyzed: 12/28/04
 Analyzed By: MRC

	Spiked ng	LCS ng	LCS % Rec.	LIMITS	
				LOWER	UPPER
Acenaphthylene	10	8.65	86	84	114
4-Chloro-3-methylphenol	10	8.00	80	63	110
2-Chlorophenol	10	7.53	75	64	94
1,4-Dichlorobenzene	10	5.72	57	27	78
2,4-Dinitrotoluene	10	7.59	76	73	103
N-Nitrosodi-n-propylamine	10	9.08	91	73	100
4-Nitrophenol	10	7.66	77	45	127
Pentachlorophenol	10	7.48	75	54	99
Phenol	10	7.84	78	64	94
Pyrene	10	7.74	77	58	114
1,2,4-Trichlorobenzene	10	6.93	69	51	96

Comments:

Concentrations are on column amounts.

Flags:

* = Out of limits.

NA = Not applicable.

Reviewed By: 

Results For Water Matrix Spike / Matrix Spike Duplicate (MS/MSD)
by GCMS

Client Sample ID: Batch QC
 Client Project ID:
 Lab Sample ID: W-MS-2163
 Lab Project ID:
 Matrix: Water

Date Collected:
 Date Received:
 Date Analyzed: 12/28/04
 Analyzed By: MRC
 Dilution: 1

	Sample ng	Spiked ng	MS %	MSD %	Limits		RPD %	Limit
					Lower %	Upper %		Max. %
Acenaphthylene	BQL	10	93	91	79	118	2.5	30
4-Chloro-3-methylphenol	BQL	10	85	82	63	112	3.7	30
2-Chlorophenol	BQL	10	84	78	57	102	7.5	30
1,4-Dichlorobenzene	BQL	10	58	55	40	89	4.8	30
2,4-Dinitrotoluene	BQL	10	81	80	70	108	0.7	30
N-Nitrosodi-n-propylamine	BQL	10	96	93	66	109	3.3	30
4-Nitrophenol	BQL	10	80	75	50	130	7.0	30
Pentachlorophenol	BQL	10	82	77	52	110	6.1	30
Phenol	BQL	10	88	82	59	100	6.3	30
Pyrene	BQL	10	79	77	58	112	2.3	30
1,2,4-Trichlorobenzene	BQL	10	75	71	46	103	6.1	30

Comments:

Concentrations are on column amounts.

Flags:

* = Out of limits.

NA = Not applicable.

Reviewed By: 

Results For Water Laboratory Control Standard (LCS)
by GCMS

Client Sample ID: Batch QC
 Client Project ID:
 Lab Sample ID: W-LCS-2168
 Lab Project ID:
 Matrix: Water

Date Collected:
 Date Received:
 Date Analyzed: 12/28/04
 Analyzed By: MRC

	Spiked ng	LCS ng	LCS % Rec.	LIMITS	
				LOWER	UPPER
Acenaphthylene	10	9.38	94	84	114
4-Chloro-3-methylphenol	10	8.27	83	63	110
2-Chlorophenol	10	6.68	67	64	94
1,4-Dichlorobenzene	10	4.46	45	27	78
2,4-Dinitrotoluene	10	8.09	81	73	103
N-Nitrosodi-n-propylamine	10	9.12	91	73	100
4-Nitrophenol	10	7.60	76	45	127
Pentachlorophenol	10	7.61	76	54	99
Phenol	10	7.51	75	64	94
Pyrene	10	8.12	81	58	114
1,2,4-Trichlorobenzene	10	6.18	62	51	96

Comments:

Concentrations are on column amounts.

Flags:

* = Out of limits.

NA = Not applicable.

Reviewed By: 

Results For Water Matrix Spike / Matrix Spike Duplicate (MS/MSD)
by GCMS

Client Sample ID: Batch QC
Client Project ID:
Lab Sample ID: W-MS-2168
Lab Project ID:
Matrix: Water

Date Collected:
Date Received:
Date Analyzed: 12/28/04
Analyzed By: MRC
Dilution: 1

	Sample ng	Spiked ng	MS %	MSD %	Limits		RPD %	Limit Max. %
					Lower %	Upper %		
Acenaphthylene	BQL	10	64 *	73 *	79	118	12.5	30
4-Chloro-3-methylphenol	BQL	10	67	81	63	112	18.1	30
2-Chlorophenol	BQL	10	50 *	71	57	102	35.0 *	30
1,4-Dichlorobenzene	BQL	10	33 *	48	40	89	37.9 *	30
2,4-Dinitrotoluene	BQL	10	63 *	71	70	108	12.7	30
N-Nitrosodi-n-propylamine	BQL	10	67	86	66	109	24.2	30
4-Nitrophenol	BQL	10	63	75	50	130	16.6	30
Pentachlorophenol	BQL	10	66	71	52	110	7.4	30
Phenol	BQL	10	55 *	74	59	100	28.5	30
Pyrene	BQL	10	60	67	58	112	11.0	30
1,2,4-Trichlorobenzene	BQL	10	42 *	56	46	103	27.0	30

Comments:

Concentrations are on column amounts.

Flags:

* = Out of limits.

NA = Not applicable.

Reviewed By: 

List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit

DF = Dilution Factor

Dup = Duplicate

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL = Reporting Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% solids = Percent Solids

Special Notes:

- 1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.
- 2) Uncertainty for all reported data is less than or equal to 30 percent.

PARADIGM ANALYTICAL LABORATORIES, INC.

5500 Business Drive, Wilmington, NC 28405

Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 43618

Page 1 of 1

Client: Engineering + Environment

Project ID: M232

Date: 12-20-04

Report To: Bill Morris

Address: 6846 Bonbranch rd suite 5

Contact: Bill Morris

Turnaround: Standard

Address: Jacksonville NC 28546

Phone: 910-989-3214

Job Number: 6003-011

Quote #: _____

Fax: 910-989-3341

P.O. Number: _____

Invoice To: _____

Sample ID	Date	Time	Matrix	Preservatives			Analyses					Comments: Please specify any special reporting requirements
				HCT	None	VPH	EPH	602 w/xy/leas	625 + 10 Tics			
ASTM232-MW22	12-19-04	10:55	GW	X		X	3	1	3	1		G546-20
ASTM232-MW21	12-19-04	11:25	GW	X		X	3	1	3	1		
ASTM232-MW20	12-19-04	11:54	GW	X		X	3	1	3	1		
ASTM232-MW18	12-19-04	12:25	GW	X		X	3	1	3	1		
ASTM232-MW07	12-19-04	13:06	GW	X		X	3	1	3	1		
ASTM232-MW05	12-19-04	14:05	GW	X		X	3	1	3	1		
ASTM232-MW00	12-19-04	-	GW	X		X	3	1	3	1		
Trig Block	12-20-04	11:00										
Relinquished By	Date	Time	Received By	Date	Time	Temperature	State Certification Requested					
Bob Sellers	12-20-04	11:15	Bob Sellers	12/20/04	1155	274 634	NC SC Other					

ORIGINAL