

**FINAL
2009 ANNUAL MONITORING REPORT
JUNE 2009 – SEPTEMBER 2009**

**BUILDING AS-4141
MARINE CORPS BASE CAMP LEJEUNE
ONslow COUNTY, NORTH CAROLINA**

**CONTRACT NO. N40085-08-D-1409
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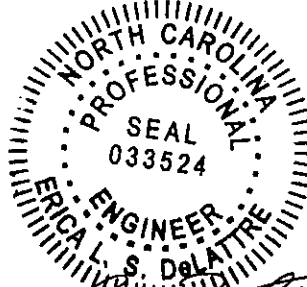
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ACRONYMS AND ABBREVIATIONS

AFVR	Aggressive Fluid Vapor Recovery
AMR	Annual Monitoring Report
bls	Below Land Surface
BQL	Below Quantitation Limit
CAP	Corrective Action Plan
CATLIN	CATLIN Engineers and Scientists
DPE	Dual Phase Extraction
DWM	Division of Waste Management
EEI	Engineering and Environment, Inc.
EPA	Environmental Protection Agency
GWQS	Groundwater Quality Standards
J.A. Jones	J.A. Jones Environmental Services Company
MCAS	Marine Corps Air Station
NAVFAC	Naval Facilities Engineering Command
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environmental and Natural Resources
NGVD	National Geodetic Vertical Datum
OBG	O'Brian & Gere Engineers
O&M	Operations and Maintenance
Osage	Osage of Virginia
PAH	Poly Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
RAO	Remedial Action Objectives
RCAP	Revised Corrective Action Plan

Radian Rhēa	Radian International Rhēa Engineers and Consultants, Inc.
Shaw SVOCs TPH	Shaw Environmental, Inc. Semi-Volatile Organic Compounds Total Petroleum Hydrocarbons
μg/L USEPA UST	Micrograms per Liter United States Environmental Protection Agency Underground Storage Tank
VOCs	Volatile Organic Compounds
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

Rhēa Engineers and Consultants, Inc. (Rhēa) has been tasked by the Department of the Navy, Naval Facilities Engineering Command (NAVFAC), Mid-Atlantic under Contract Number N40085-08-D-1409, Task Order 0008 to prepare this Annual Monitoring Report (AMR) for the Building AS-4141 (JP-5 Line Area) site located at the Marine Corps Air Station (MCAS), New River, Onslow County, North Carolina. The purpose of this report is to present the findings and recommendations associated with the groundwater monitoring activities performed from June 2009 through September 2009. 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 and Natural Resources (NCDENR), Division of Waste Management (DWM), Underground Storage Tank (UST) Section guidelines.

1.1 MCB CAMP LEJEUNE LOCATION AND DESCRIPTION

Located in Onslow County, North Carolina, MCB Camp Lejeune is a training base for the United States Marine Corps. The base covers approximately 236 square miles (153,000 acres) and includes 14 miles of coastline. MCB Camp Lejeune is bound to the southeast by the Atlantic Ocean and to the northeast by State Route 24. Wooded areas are located north, east, and west of the base. Jacksonville, North Carolina is located north of MCB Camp Lejeune (Figure 1).

1.2 AS-4141 SITE DESCRIPTION

Building AS-4141 is located at the MCAS New River, North Carolina (Figure 2). The site is directly west of the airfield and is divided by White Street and consists of several parking lots and a helicopter hanger. Building AS-4141 is located at the west central portion of the site. An underground fuel transfer pipeline transects the subject site. The purpose of the fuel transfer pipeline at MCAS New River is to transfer JP-5 fuel from the Campbell Street Bulk Fuel Farm to four USTs at the Rapid Jet Systems A & B and C & D. JP-5 fuel is transferred to the C & D Rapid Jet Systems via approximately 4,000 feet of single-wall fiberglass, underground piping. Its general routing is along White Street and then under the aircraft parking ramp MAT-7. Six valve pits with new block and bleed valves are located along the fiberglass portion of this piping system. The transfer pipeline transitions to 8 inch stainless steel just prior to entering valve box #6 and approximately 1,000 feet of 8 inch stainless steel transfer line continues to the A & B Rapid Jet UST Systems.

The nearest surface water body is a pond located approximately 800 feet northeast of the site. No active drinking water supply wells are within 1,500 feet of the site. The nearest drinking water supply well, AS-4150, is located approximately 2,200 feet southwest of the site and has been taken offline and shut down.

The objective of the AMR is to document the system performance, groundwater gauging events, and to evaluate the extent of dissolved phase contamination at the site from the annual sampling event conducted in September 2009. The report also provides a brief environmental history of the site, summarizes the Corrective Action Plan (CAP), and describes the installation and operation of the recommended remedial alternative. The report provides a discussion of monitoring results and the status of groundwater quality.

2.0 CONTAMINATION INVESTIGATION HISTORY

In the early 1980s several environmental investigations were completed at the site that identified leaks in the JP-5 fuel line. Upon discovery of the leak the pipeline was shut down and fuel was transported from the fuel farm to day tanks at the flight line. During the summer of 1984 the pipeline was replaced. Results of these investigations identified both dissolved phase contamination and free phase product in the vicinity of the JP-5 fuel line.

In May of 1986 a site assessment was conducted by ATEC Associates, Inc. to identify the extent of JP-5 fuel contamination in the JP-5 Line Area. Monitoring wells MW02, MW07, MW08, MW10, and MW13 were installed as part of this investigation. An interim remedial system to remove free phase product from the area was installed in October 1986. Operation of the interim system was terminated in 1987 due to hangar construction activities. A total of 4,043 gallons of JP-5 fuel was recovered by the interim system.

In September 1989 O'Brian & Gere Engineers (OBG) installed monitoring wells OBG01 through OBG06 to assist with further delineation of the groundwater contamination which was later used to develop a CAP dated June 1991 (OBG, 1991). Based upon the recommendations of the CAP, a free phase product recovery system and a groundwater extraction and treatment system were installed in February of 1994. A long-term monitoring program was also recommended in the CAP.

The following three remedial goals were developed for the site:

- Remove free phase product from the subsurface to the extent practicable;
- Prevent further migration of contaminated groundwater; and
- Rehabilitate the groundwater by removing any dissolved petroleum constituents in concentrations exceeding North Carolina's groundwater quality standards.

From February 1998 through April 2002, J.A. Jones Environmental Services Company (J.A. Jones) implemented the selected approach as outlined in the CAP for the JP-5 Line Area. Starting in August 1999, AFVR (Aggressive Fluid Vapor Recovery) activities were conducted at the recovery wells to enhance the removal of free phase product. AFVR events were completed if free phase product thickness was equal to or greater than 0.1 feet in a recovery well. The recovery wells RW01 and RW02 were gauged weekly for free phase product thickness. The monitoring requirements of the JP-5 Line Area included monthly monitoring of free phase product levels in 11 wells and quarterly groundwater sampling and analysis from five wells. Between April 1999 and December 2002, approximately 51,450 gallons of groundwater from monitoring well development and AFVR events had been transported and disposed.

The CAP-designed recovery system at the JP-5 Line Area was in operation from February 1994 to July 2000. The remediation system was designed to recover free phase product and to remediate contaminated groundwater. The free phase product recovery system consisted of two recovery wells (RW01 and RW02) located within the contaminant plume. The recovery wells were designed to prevent the migration of contamination, recover free phase product, and extract contaminated groundwater. Free phase product was recovered from the recovery wells through the use of pneumatic pumps. A controller that established pumping rates and optimized free product recovery set the operation cycle of the pumps. Groundwater was recovered from the two wells, treated using an oil/water separator, air stripping, followed by carbon adsorption and discharged to the MCAS wastewater treatment plant (WWTP). On July 19, 2000, J.A. Jones shut down the treatment system based on recommendations provided by Radian International under the JP-5 Treatment System Optimization Study (Radian, 2000).

On August 7, 2000, a passive product skimmer was installed in recovery well RW01 to assist with free phase product recovery. On October 17, 2000, J.A. Jones completed the closure of the abandoned fuel line and a closure report was completed February 13, 2001.

Shaw prepared an AMR dated January 2004 that documented J.A. Jones' activities between 1998 and April 2002 (Shaw, 2004). Shaw operated, monitored and maintained the subject site from May 2002 to January 2003. Engineering and Environment, Inc. (EEI) took over these operations from February 2003 until March 2005. EEI documented their activities in a report entitled Annual Groundwater Monitoring Report 2004-2005, dated July 29, 2005 (Shaw, 2006).

In December 2004, CATLIN Engineers and Scientists (CATLIN) completed a Revised Corrective Action Plan (RCAP) with Remedial Action Objectives (RAO) for the site, which recommended additional investigations to effectively evaluate the AFVR remedial approach (CATLIN, 2004). Based on CATLIN's RAO & RCAP, the extent of free phase product needed to be delineated, and the horizontal and vertical extent of groundwater contamination needed to be defined.

In April 2005, Shaw resumed operations for the site which included free phase product recovery using AFVR events, monitoring the free phase product thicknesses, and sampling of the monitoring wells at the subject site. In October 2005, Shaw installed one Type III monitoring well (MW14) and two Type II monitoring wells (MW15 and OBG03R) to evaluate the extent of dissolved phase contamination. In addition, Shaw installed five piezometers (TPZ01 through TPZ05) to delineate the free phase product at the site. In December 2005, Shaw completed one groundwater sample collection and analysis event from select monitoring wells to track free phase product and dissolved hydrocarbon contamination occurrence. Shaw prepared a 2005 AMR, dated June 2006, that documented these activities (Shaw, 2006).

In December 2005, CATLIN conducted soil sampling with 13 hand augered borings in areas of previously referenced total petroleum hydrocarbons (TPH) contamination. All soil sample results were below Residential and Industrial/Commercial maximum soil contaminant concentrations. In February and March 2006, CATLIN installed four Type II monitoring wells (MW16 through MW19) to evaluate the extent of dissolved phase contamination. These new wells were gauged and monitoring wells MW16 and MW17 detected 0.30 feet and 0.20 feet of free phase product, respectively.

CATLIN prepared a revision for the RAO & RCAP in June 2006 and included the 2005 activities they performed (CATLIN, 2006). CATLIN believed the AFVR events had not been effectively removing free phase product from the Building AS-4141 site, hence CATLIN evaluated five alternative technologies for removal of free phase product from the Building AS4141 site. These included a Skimmer System, Excavation and

Treatment, a Groundwater Depression System, a Dual Phase Extraction System (DPE), and the continued use of AFVR events. CATLIN recommended the Dual Phase Extraction System to effectively remove free phase product from the site.

In August 2006, CATLIN installed two Type II monitoring wells (MW20 and MW21) to evaluate the extent of free phase product recovery efforts. Pilot tests were conducted in December 2006 and January 2007. These pilot tests were used to aid in evaluating the feasibility of the DPE technology recommended for the remediation of free phase product from the Building AS-4141 site. CATLIN prepared a Summary of Aggressive Fluid Vapor Recovery Pilot Test for Building AS-4141 Report, dated March 14, 2007, that documented these activities (CATLIN, 2007).

In October 2007 and March 2008, Shaw completed two groundwater sample collection and analysis events from select monitoring wells to track free phase product and dissolved hydrocarbon contamination occurrence. Shaw prepared a 2007-2008 AMR, dated May 2008, that documented the October 2007 and March 2008 gauging of 19 monitoring wells and sampling of nine selected monitoring wells and the monthly removal of free phase product from the five piezometers (USTAS4141-TPZ01 through USTAS4141-TPZ05) using a peristaltic pump (Shaw, 2008).

On October 31, 2008, Shaw completed the installation and started up the DPE system. The system consists of the following components: transfer pumps, vapor-liquid separator, oil/water separator, liquid ring vacuum pump, product storage tank, surge tank, air stripper, sump tank, bag filters, and carbon adsorption drums. The DPE system is used for the recovery of free-phase product and groundwater from an existing recovery well (USTAS4141-RW01) and three new recovery wells (USTAS4141RW03 through USTAS4141-RW05), at Building AS-4141.

From October 2008 through May 2009 Shaw operated the DPE system with associated system monitoring and weekly gauging of select monitoring wells. Results of their operations, maintenance, and monitoring activities are reported in their 2008-2009 AMR dated June 2009 (Shaw, 2009).

From June 2009 to present, Rhēa operated the DPE system. This 2009 AMR documents the results of our operations and maintenance of the existing DPE system as well as the September 2009 sampling and gauging of selected monitoring wells and monthly gauging of monitoring wells. The DPE system performance summary is presented in Table 1. The maximum concentrations of the chemicals of concern for 2006, 2007, 2008, 2009 and the revised site rehabilitation goals for detected chemicals of concern are presented in Table 2. A layout of the Building AS-4141 site in the JP-5 Line Area is presented in Figure 3. Free phase product thickness for September 2009 is depicted in Figure 4.

3.0 GROUNDWATER AND FREE PHASE PRODUCT MONITORING

3.1 GROUNDWATER MONITORING SUMMARY

Groundwater elevations and free phase product thicknesses were measured monthly from June 2009 to September 2009 (Table 4). The groundwater elevation and free phase product thickness historical data for November 2005 to May 2009 are presented in Appendix A. The groundwater sample collection field logs for the annual groundwater gauging and sampling event performed in September 2009 are provided in Appendix B.

3.2 SEPTEMBER 2009 GAUGING EVENT

In September 2009, the depth to groundwater from top of casing was gauged in 27 monitoring wells:

USTAS4141-MW02	USTAS4141-MW07	USTAS4141-MW08	USTAS4141-MW10
USTAS4141-MW13	USTAS4141-MW14	USTAS4141-MW15	USTAS4141-MW16
USTAS4141-MW17	USTAS4141-MW18	USTAS4141-MW19	USTAS4141-MW20
USTAS4141-MW21	USTAS4141-OBG02	USTAS4141-OBG03R	USTAS4141-OBG04
USTAS4141-OBG05	USTAS4141-OBG06	USTAS4141-RW01	USTAS4141-RW03
USTAS4141-RW04	USTAS4141-RW05	USTAS4141-TPZ01	USTAS4141-TPZ02
USTAS4141-TPZ03	USTAS4141-TPZ04	USTAS4141-TPZ05	

The depth to groundwater ranged from top of casing in recovery wells USTAS4141-RW03 and RW05 to 11.22 feet below land surface (bls) in monitoring well USTAS4141-MW08. Groundwater elevations ranged from 13.88 feet National Geodetic Vertical Datum (NGVD) in monitoring well USTAS4141-TPZ03 to 18.74 feet NGVD in monitoring well USTAS4141-OBG02. September 2009 gauging data is depicted in Table 3.

The shallow groundwater flows from the west to the east at a horizontal hydraulic gradient of approximately 0.057 ft/ft from USTAS4141-MW10 to USTAS4141-OBG03R (Figure 3). Detectable thickness of free phase product was observed in monitoring wells USTAS4141-MW20, USTAS4141-MW21, USTAS4141-TPZ01, USTAS4141-TPZ02, USTAS4141-TPZ03, USTAS4141-TPZ04 and USTAS4141-TPZ05 (Figure 4). Free phase product thicknesses ranged from 0.11 feet in USTAS4141-TPZ02 to 2.66 feet in USTAS4141-TPZ03.

3.3 FREE PHASE PRODUCT THICKNESS AND RECOVERY SUMMARY

3.3.1 Free Phase Product History

An interim remedial system to remove free product from the area was installed in October 1986. Operation of the interim system was terminated in 1987 due to hangar construction activities. A total of 4,043 gallons of JP-5 fuel was recovered by the interim system.

The recovery system at the JP-5 Line Area was in operation from February 1994 to July 2000. The remediation system was designed to recover free product and to remediate contaminated groundwater. The free product recovery system consisted of two recovery wells (USTAS4141-RW01 and USTAS4141-RW02) located within the contaminant plume. The recovery wells were designed to prevent the migration of contamination, recover free product and extract contaminated groundwater. Free product was recovered from the recovery wells through the use of pneumatic pumps. A controller that established pumping rates and optimized free product recovery set the operation cycle of the pumps. Groundwater was recovered from the two wells, treated using an oil/water separator, air stripping, followed by carbon adsorption, and discharged to the MCAS WWTP. On July 19, 2000, J.A. Jones shut down the treatment system based on recommendations provided by Radian under the JP-5 Treatment System Optimization Study (Radian, 2000). On August 7, 2000, a passive product skimmer was installed in recovery well RW-1 to assist with free product recovery.

Starting in August 1999, AFVR actions were conducted at the recovery wells to enhance the removal of free product. AFVR events were completed if product thickness was equal to or greater than 0.1 foot in a recovery well. The recovery wells USTAS4141-RW01 and USTAS4141-RW02 were gauged weekly for product thickness. The monitoring requirements of the JP-5 Line Area included monthly monitoring of free product levels in 11 wells and quarterly groundwater sampling and analysis from five wells. Between April 1999 and December 2002, approximately 51,450 gallons of groundwater from monitoring well development and AFVR events had been transported and disposed.

Dating back to 1998, free phase product has been observed in three on-site wells (USTAS4141-MW10, USTAS4141-RW01 and USTAS4141-RW02). Monitoring well USTAS4141-MW10 displayed approximately 0.9 feet from April through July 1998. By September 1998, AFVR events conducted at USTAS4141-MW10 had removed product from the well. Product has not been measured in monitoring well USTAS4141-MW10 since October 1998. Recovery well USTAS4141-RW02 consistently displayed product from April 1998 to July 1999. Measured product thickness ranged from 0.02 feet in July

1999 to 4.3 feet in April 1998. Recovery well USTAS4141-RW01 consistently displayed the presence of free product from April 1998 through April 2002. Measured product thickness decreased from a high of 7.8 feet in April 1998 to 0.6 feet in April 2002.

Free phase product was monitored on a monthly basis starting in April 1998 to April 2002 by J.A. Jones. During this time period, free phase product was detected at the following thicknesses in April 1998: USTAS4141-MW10 at 0.87 foot, USTAS4141-RW01 at 7.79 feet and USTAS4141-RW02 at 4.31 feet. In May 1999, free phase product was no longer detected in USTAS4141-MW10, but was detected in USTAS4141-RW01 at 3.69 feet and USTAS4141-RW02 at 0.02 foot. In April 2000, free phase product was no longer detected in USTAS4141-RW02, but was detected in USTAS4141-RW01 at 1.10 feet. In April 2001 free phase product was detected in USTAS4141-RW01 at 0.35 foot. In April 2002 free phase product was detected in USTAS4141-RW01 at 0.57 foot.

EEI took over monitoring free phase product measurements from early 2003 until March 2005. The EEI activities are documented in a report entitled Annual Groundwater Monitoring Report 2004-2005, dated July 29, 2005. Shaw conducted seven AFVR events from monitoring wells USTAS4141-OBG06 and USTAS4141-RW01 during July 2003 to March 2005 with approximately 596 gallons of fluids recovered, which consisted of 63.3 gallons of gasoline.

In April 2005 to February 2007, Shaw took over operations for the site which included free phase product recovery using AFVR events for recovery well USTAS4141-RW1 and monitoring well USTAS4141-OBG03R and using a peristaltic pump in piezometers USTAS4141-TPZ01 through USTAS4141-TPZ05. From November 2005 to August 2006, a total of eight AFVR events were completed at the JP-5 Fuel Line Area. Recovery well USTAS4141-RW01 required three AFVR events and monitoring well USTAS4141-OBG03R required five AFVR events. A total of 20 gallons of product was recovered from USTAS4141-RW01 and 52.5 gallons of product was recovered from USTAS4141-OBG03R since the well was installed in October 2005. Shaw conducted four AFVR events from recovery well USTAS4141-RW01 during December 2006 to January 2007 for CATLIN's pilot tests with approximately 33 gallons of gasoline recovered. A range of 3 to 12 gallons of free phase product per week was recovered from the five piezometers from April 2005 to February 2007.

Shaw monitored free phase product on a weekly basis starting in June 2008 to April 2009 in nine monitoring wells (USTAS4141-MW14, USTAS4141-MW15, USTAS4141-MW17, USTAS4141-MW19, USTAS4141-MW20, USTAS4141-MW21, USTAS4141-OBG03R, USTAS4141-OBG06, and USTAS4141-RW01), and four piezometers (USTAS4141-TPZ01, USTAS4141-TPZ02, USTAS4141-TPZ03, USTAS4141-TPZ04).

From June 2008 to April 2009, there were no AFVR events conducted for recovery well USTAS4141-RW01 or monitoring well USTAS4141-OBG03R since the free product thickness was less than 0.60 feet. An absorbent sock was used to remove free product for these wells; the sock was changed monthly. Osage of Virginia (Osage) has taken over the product recovery operations for piezometers USTAS4141-TPZ01 through USTAS4141-TPZ05 to remove free phase product.

3.3.2 DPE System Installation and Operation

On October 31, 2008, Shaw completed the installation and started up the DPE system at Site AS4141. The system recovers free phase product and contaminated groundwater from the site via four wells, RW01, RW03, RW04 and RW05 as shown in Figure 5.

The system effectively operated from October 31, 2008, until late January 2009 when it shut down due to damage caused by freezing. The damage was assessed and repairs (piping, pump casing and bag filter housing replacement) were initiated and completed. The system was successfully re-started on March 5, 2009 and was operated by Shaw through May 31, 2009, except for minor down time for planned maintenance activities. During May 2009, heat tape and piping insulation were installed on key areas of the system to prevent future freeze damage.

On June 1, 2009, Rhēa assumed control of the operations and management (O&M) of the DPE system. From June through September 2009, the system operated for approximately 2,304 hours and removed approximately 152,500 gallons of water from the four recovery wells. Approximately 50 gallons of product were recovered from the oil-water separator during this monitoring period.

System downtime has been attributed to excessive back pressure from the carbon tanks in association with improper float design at the air stripper tower sump tank. At the time of this report, appropriate measures are underway to correct these problems to allow for more continuous system operation and recovery.

4.0 GROUNDWATER ANALYSIS SUMMARY

4.1 GROUNDWATER SAMPLING SUMMARY (1998 THROUGH 2008)

Groundwater samples were collected quarterly from the site monitoring wells between March 1998 and March 2002 by J.A. Jones. Groundwater samples were collected from monitoring wells USTAS4141-OBG04, USTAS4141-OBG05, USTAS4141-MW07, USTAS4141-MW08 and USTAS4141-MW13. Based on laboratory analytical results,

Volatile Organic Compounds (VOCs) were below the quantitation limit (BQL) in all of the groundwater samples dating back to March 1998.

Bis(2-ethylhexyl)phthalate, naphthalene, 1-methylnaphthalene and 2-methylnaphthalene were the only Semi-volatile Organic Compounds (SVOCs) detected in groundwater samples collected from the five wells and these compounds have not been detected since the September 23, 1998 sampling event. Bis(2-ethylhexyl)phthalate is primarily used as a plasticizer in polyvinyl chloride resins and as a non plasticizer used as a replacement for polychlorinated biphenyls (PCBs) in dielectric fluids for electric capacitors. It is also found in analytical results as a false positive caused by one of the following sources: sample containers, handling plastics during extractions, plastic sheeting and gloves used in the field and laboratory, plastic wrapping of pipettes and other lab supplies, and tygon tubing. Also, the occurrence of the compound appears to be inconsistent for individual wells. For this reason, Shaw did not believe that the source of bis(2-ethylhexyl)phthalate was related to the JP-5 Fuel Line area.

Groundwater samples were collected from the site monitoring wells in March 2003 and June 2004 by EEI. Groundwater samples were collected from the following monitoring wells:

USTAS4141-OBG04	USTAS4141-OBG05	USTAS4141-MW07	USTAS4141-MW08	USTAS4141-MW13
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Based on laboratory analytical results obtained in March 2003, benzene, ethylbenzene, toluene, and total xylenes were detected above the quantitation limit at maximum concentrations of 52.7 micrograms per liter ($\mu\text{g/l}$), 8.6 $\mu\text{g/l}$, 24.7 $\mu\text{g/l}$, and 60.3 $\mu\text{g/l}$, respectively. The VOCs were BQL in all of the groundwater samples in June 2004. Bis(2-ethylhexyl)phthalate, naphthalene, and benzo(a)anthracene were the only SVOCs detected in groundwater samples collected from the five wells in the March 2003 and June 2004 sampling events.

In December 2005, Shaw collected groundwater samples from monitoring wells:

USTAS4141-OBG06	USTAS4141-RW02	USTAS4141-MW02	USTAS4141-MW14	USTAS4141-MW15
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Analytical results from the groundwater samples did not detect VOC compounds above North Carolina Administrative Code (NCAC) 2L Groundwater Quality Standards (GWQS) in any of the monitoring wells. Analytical results from the groundwater samples did not detect polyaromatic hydrocarbons (PAH) compounds above the NCAC 2L GWQS standard in any of the monitoring wells with the exception of USTAS4141-

MW15 (2-methylnaphthalene, 36.2 µg/l). Analytical results from the groundwater samples detected lead in excess of NCAC 2L GWQS in monitoring wells USTAS4141-MW02 (102 µg/l) and USTAS4141-MW15 (19.9 µg/l).

In October 2006, groundwater samples were collected from monitoring wells:

USTAS4141-MW02	USTAS4141-MW10	USTAS4141-MW14	USTAS4141-MW15
USTAS4141-MW16	USTAS4141-MW17	USTAS4141-MW18	USTAS4141-MW19
USTAS4141-MW20	USTAS4141-MW21	USTAS4141-OBG03R	USTAS4141OBG06

Based on laboratory analytical results obtained in October 2006, VOCs which include benzene, methyl tert-butyl ether, toluene, ethylbenzene, and total xylenes were detected above the quantitation limit at maximum concentrations of 13.5 µg/l, <1.0 µg/l, 3.2 µg/l, 52.1 µg/l, and 171 µg/l, respectively. SVOCs 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were detected above the quantitation limit at maximum concentrations of 466 µg/l, 589 µg/l and 461 µg/l, respectively. Lead was detected above the quantitation limit at a maximum concentration of 68 µg/l.

In March 2007, groundwater samples were collected from monitoring wells:

USTAS4141-MW02	USTAS4141-MW07	USTAS4141-MW10	USTAS4141-MW14
USTAS4141-MW15	USTAS4141-MW16	USTAS4141-MW17	USTAS4141-MW18
USTAS4141-MW19	USTAS4141-OBG06		

Based on laboratory analytical results obtained in March 2007, VOCs which include benzene, methyl tert-butyl ether, toluene, ethylbenzene, and total xylenes were detected above the quantitation limit at maximum concentrations of 6.0 µg/l, <1.0 µg/l, <1.0 µg/l, 16.7 µg/l and 21 µg/l, respectively. SVOCs 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were detected above the quantitation limit at maximum concentrations of 120 µg/l, 87.6 µg/l, and 257 µg/l, respectively. Lead was not detected above the quantitation limit.

From October 25 through October 30, 2007, groundwater samples were collected from monitoring wells:

USTAS4141-MW02	USTAS4141-MW07	USTAS4141-MW10	USTAS4141-MW14	USTAS4141-MW15
USTAS4141-MW16	USTAS4141-MW18	USTAS4141-MW19	USTAS4141-OBG06	

Groundwater samples were not collected from monitoring wells USTAS4141-MW17, USTAS4141MW20, USTAS4141-MW21 and USTAS4141-OBG03R due to the

presence of free phase product. Monitoring well USTAS4141-MW16 displayed two compounds in excess of NCAC 2L GWQS (2-methylnaphtalene, 76.6 µg/l and naphthalene, 83.6 µg/l).

From March 27 through March 28, 2008, groundwater samples were collected from monitoring wells:

USTAS4141-MW02	USTAS4141-MW07	USTAS4141-MW10	USTAS4141-MW14	USTAS4141-MW15
USTAS4141-MW16	USTAS4141-MW17	USTAS4141-MW18	USTAS4141-MW19	USTAS4141-OBG06

Groundwater samples were not collected from monitoring wells USTAS4141-MW19, USTAS4141-MW20, USTAS4141-MW21 and USTAS4141-OBG03R due to the presence of free phase product. Three monitoring wells displayed compounds in excess of NCAC 2L GWQS.

- USTAS4141-MW07 [lead, 37.2 µg/l],
- USTAS4141-MW16 [2-methylnaphtalene, 49.3 µg/l; and naphthalene 65.6 µg/l],
- USTAS4141-MW17 [benzene, 4.0 µg/l; 2-methylnaphtalene, 176 µg/l; and naphthalene 274 µg/l].

From September 19 through September 22, 2008, Shaw collected groundwater samples from nine monitoring wells:

USTAS4141-MW02	USTAS4141-MW07	USTAS4141-MW10	USTAS4141-MW14	USTAS4141-MW15
USTAS4141-MW16	USTAS4141-MW18	USTAS4141-MW19	USTAS4141-OBG06	

Groundwater samples were not collected from five monitoring wells (USTAS4141-MW17, USTAS4141-MW20, USTAS4141-MW21, USTAS4141-RW01 and USTAS4141-OBG03R) due to the presence of free phase product. Of the nine monitoring wells sampled, one monitoring well (USTAS4141-MW16) contained 101 µg/L of naphthalene, which is in excess of the NCAC 2L GWQS of 21µg/L.

4.2 GROUNDWATER SAMPLING SEPTEMBER 2009

In September 2009, annual groundwater samples were collected from 12 monitoring wells:

USTAS4141-MW07	USTAS4141-MW10	USTAS4141-MW14	USTAS4141-MW16
USTAS4141-MW17	USTAS4141-MW18	USTAS4141-MW19	USTAS4141-OBG03R
USTAS4141-RW01	USTAS4141-RW03	USTAS4141-RW04	USTAS4141-RW05

Samples could not be collected from USTAS4141-MW20 and USTAS4141-MW21 due to the presence of free product.

Monitoring wells were sampled using low flow techniques in accordance with the Final Master Project Plans Marine Corps Base Camp Lejeune dated June 2008. Wells were purged until water quality parameters (pH, temperature, conductivity, oxidation-reduction potential, dissolved oxygen and turbidity) stabilized. The water quality parameters at the time of sampling are presented in Table 5. The groundwater sample collection field logs for the annual groundwater gauging and sampling event performed in September 2009 are provided in Appendix B.

If a monitoring well purged to dryness, the monitoring well was allowed to recharge before sampling. Samples were collected using the laboratory-prepared sample bottles, placed on ice, and delivered under proper chain of custody to SGS North America Inc., located in Wilmington, North Carolina (NC Certification Number 481). Groundwater samples were analyzed for VOCs by United States Environmental Protection Agency (US EPA) Method 602 and PAHs by US EPA Method 610 utilizing the Method 625 list. Analytical results are depicted in Table 6 and Figure 5. Laboratory reports and chain of custody documentation are included in Appendix C.

Laboratory analytical results for VOCs above the appropriate clean up standards were only detected in USTAS4141-RW01 (benzene at 3.86 µg /L). Ethylbenzene and m,p xylene were also detected in USTAS4141-RW01, USTAS4141-MW16 and USTAS4141-MW17 above laboratory detection limits but below their respective NCAC 2L GWQS.

Naphthalene was detected above the NCAC 2L GWQS in USTAS4141-RW01, USTAS4141-OBG3R, USTAS4141-MW16 and USTAS4141-MW17 at concentrations ranging from 24.1 µg /L to 123 µg /L.

Only USTAS4141-MW16 contained a detection of 2-methylnaphthalene at 108 µg /L above the NCAC 2L GWQS.

USTAS4141-RW01, USTAS4141-OBG3R, USTAS4141-MW16 and USTAS4141-MW17 contained detections of 1-methylnaphthalene above the NCAC 2L GWQS for 2-methylnaphthalene (14 µg /L) at concentrations ranging from 37.7 µg /L to 162 µg /L.

Acenaphthene, acenaphthylene, and fluorine were also detected at concentrations below their respective NCAC 2L GWQS.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Groundwater elevations and free phase product thicknesses were measured monthly from June 2009 to September 2009 in all available monitoring wells at the site. Free phase product has been detected throughout this monitoring period at thicknesses ranging from 0.01 foot (USTAS4141-OBG3R in July 2009) to 2.66 feet (USTAS4141-TPZ03 in September 2009). Continued monthly monitoring of groundwater elevations and free phase product thicknesses is recommended at the site.

From June 2009 to present, Rhēa operated the existing DPE system. From June 2009 through September 2009, approximately 152,500 gallons of water and 50 gallons of free product have been removed from the four recovery wells. As free product has been historically persistent at the site, the continued operation of the DPE system is recommended. With continued efficient operation of the DPE system, additional free product should be removed as the system creates a cone of depression around the recovery wells.

Continued annual tightness testing of the adjacent fuel lines is also recommended to confirm that there are no further leaks in the fuel system.

Continued annual groundwater sample collection and analysis are recommended for the following 14 monitoring wells:

USTAS4141-MW07	USTAS4141-MW10	USTAS4141-MW14	USTAS4141-MW16	USTAS4141-MW17
USTAS4141-MW18	USTAS4141-MW19	USTAS4141-MW20	USTAS4141-MW21	USTAS4141-RW01
USTAS4141-RW03	USTAS4141-RW04	USTAS4141-RW05	USTAS4141-OBG03R	

Samples will only be collected from monitoring wells where free phase product is not detected. The samples will be analyzed for VOCs using EPA Method 602/w xylenes and EPA Method 625 (PAHs only)

6.0 REFERENCES

CATLIN, 2004. "Final Remedial Action Optimization and Revised Corrective Action Plan JP-5 Line Area." CATLIN Engineers and Scientists, December 21, 2004.

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CH2M HILL, 2008. "Final Master Project Plans Marine Corps Base Camp Lejeune." CH2M HILL, June 2008.

O'Brien and Gere, 1991. "Corrective Action Plan JP-5 Line Area Marine Corps Air Station New River." O'Brien and Gere, June 1991.

Radian, 2000. "Remedial Action Operation Optimization Case Study JP-5 Line Area Marine Corps Air Station New River." Radian International, Inc., May, 2000.

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Shaw, 2006. "JP-5 Line Area 2005 Annual Monitoring Report, Marine Corps Air Station, New River, North Carolina." Shaw Environmental Inc., June 2006.

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Shaw, 2009. "Final 2008-2009 Annual Monitoring Report Building AS-4141." Shaw Environmental Inc., June 2009.

TABLES

Table 1
DPE System Data
Building AS-4141
June through September 2009 Annual Monitoring Report
Contract No. N40085-08-D-1409, CTO: 0008
MCB Camp Lejeune, North Carolina

Month	Approximate System Run Hours	Total Discharge (gallons)	Approximate Well Yield		Product Recovery (gallons)			
			(gpm)	(gpd)	Product Tank	OWS	Total	Cumulative
Jun-09	456	NM	NM	NM	0	0	0	0
Jul-09	600	95,100	3	3,068	50	0	50	50
Aug-09	600	41,060	1	1,325	50	0	50	50
Sep-09	648	16,340	0.4	527	50	0	50	50

152,500 Total Discharge

NM: Not measured, flow meters installed in July 2009.

OWS: Oil water separator

gpm: gallons per minute

gpd: gallons per day

gph: gallons per hour

Note: system run hours is currently estimated based on site visit times and system status.

Note: System flow meters installed in July 2009 to determine total discharge

Table 2
Revised Site Rehabilitation Goals For Detecteds Chemicals of Concern
Building AS-4141
June through September 2009 Annual Monitoring Report
Contract No. N40085-08-D-1409, CTO: 0008
MCB Camp Lejeune, North Carolina

Analyte	2006 Maximum Concentration	2007 Maximum Concentration	2008 Maximum Concentration	2009 Maximum Concentration	Target Concentration NCAC 2L GWQS
Benzene	13.5	6	BQL	3.86	1
Methyl Tert-Butyl Ether	BQL	BQL	BQL	BQL	200
Toluene	3.2	BQL	BQL	BQL	1000
Ethylbenzene	52.1	16.7	10.6	5.04	550
Xylenes	171	21	16	4.91	530
Lead	68	BQL	37.2	NA	15
Naphthalene	461	257	274	207	21
1-Methylnaphthalene	466	120	163	162	14
2-Methylnaphthalene	589	87.6	176	108	14

Results reported in ug/L

Historical results from the Final 2008-2009 Annual Monitoring Report Building 4141 prepared by Shaw Environmental dated June 2009

NA: Not applicable

BQL - below quantitation limit

Table 3
Well Gauging Data
Building AS-4141
June through September 2009 Annual Monitoring Report
Contract No. N40085-08-D-1409, CTO: 0008
MCB Camp Lejeune, North Carolina

Well I.D.	Date	TOC ¹ Elevation (feet-MSL)	Well Diameter (inches)	Total Depth (ft, bgs)	PVC Screen Interval (ft-ft, btoc)	Depth to Product from TOC (feet)	Depth to Water from TOC (feet)	Product Thickness (feet)	Previous Month Product Thickness (feet)	Change in Product Thickness (feet)	Groundwater Elevation ² (feet)
USTAS4141-MW02	9/28/2009	23.47	NA	18.92	NA	ND	5.89	NA	NA	NA	17.58
USTAS4141-MW07	9/28/2009	21.60	NA	15.54	NA	NA	2.68	NA	NA	NA	18.92
USTAS4141-MW08	9/28/2009	25.61	NA	16.58	NA	ND	11.22	NA	NA	NA	14.39
USTAS4141-MW10	9/28/2009	21.56	NA	14.88	NA	NA	3.38	NA	NA	NA	18.18
USTAS4141-MW13	9/28/2009	18.87	NA	15.56	NA	ND	4.85	NA	NA	NA	14.02
USTAS4141-MW14	9/28/2009	19.56	2.00	24.81	20-25	ND	5.31	NA	NA	NA	14.25
USTAS4141-MW15	9/28/2009	18.11	2.00	12.79	3-13	ND	2.98	NA	NA	NA	15.13
USTAS4141-MW16	9/28/2009	21.29	2.00	14.47	NA	ND	5.61	NA	NA	NA	15.68
USTAS4141-MW17	9/28/2009	19.77	2.00	14.45	5-15	ND	5.50	NA	NA	NA	14.27
USTAS4141-MW18	9/28/2009	21.15	2.00	15.07	5-15	ND	6.40	NA	NA	NA	14.75
USTAS4141-MW19	9/28/2009	20.45	2.00	15.57	5-15	ND	5.35	NA	NA	NA	15.10
USTAS4141-MW20	9/28/2009	19.58	NA	12.93	NA	5.70	5.90	0.20	0.27	-0.07	13.84
USTAS4141-MW21	9/28/2009	19.59	NA	12.23	NA	5.55	6.38	0.83	0.46	0.37	13.87
USTAS4141-OBG02	9/28/2009	23.84	NA	23.85	NA	NA	5.11	NA	NA	NA	18.73
USTAS4141-OBG03	9/28/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
USTAS4141-OBG04	9/28/2009	20.27	NA	20.28	NA	ND	6.14	NA	NA	NA	14.13
USTAS4141-OBG05	9/28/2009	19.54	NA	19.55	NA	ND	4.73	NA	NA	NA	14.81
USTAS4141-OBG06	9/28/2009	20.88	NA	17.30	NA	ND	4.40	NA	NA	NA	16.48
USTAS4141-OBG03R	9/28/2009	20.63	2.00	12.70	NA	ND	6.74	NA	NA	NA	13.89
USTAS4141-RW01	9/28/2009	18.70	6.00	23.93	NA	NA	4.80	NA	NA	NA	13.90
USTAS4141-RW02	9/28/2009	NA	6.00	21.00	NA	NA	CNL	NA	NA	NA	NA
USTAS4141-RW03	9/28/2009	NA	6.00	9.50	NA	NA	0.00	NA	NA	NA	NA
USTAS4141-RW04	9/28/2009	NA	6.00	9.50	NA	NA	3.56	NA	NA	NA	NA
USTAS4141-RW05	9/28/2009	NA	6.00	9.50	NA	NA	0.00	NA	NA	NA	NA
AS3905-TPZ01	9/28/2009	20.40	1.00	12.62	3-13	5.58	6.33	0.75	0.21	0.54	14.67
AS3905-TPZ02	9/28/2009	20.24	1.00	13.00	3-13	5.88	5.99	0.11	NA	NA	14.34
AS3905-TPZ03	9/28/2009	20.36	1.00	13.00	3-13	5.64	8.30	2.66	NA	NA	14.19
AS3905-TPZ04	9/28/2009	20.17	1.00	13.00	3-13	5.74	6.00	0.26	NA	NA	14.38
AS3905-TPZ05	9/28/2009	20.26	1.00	13.00	3-13	5.75	6.95	1.20	NA	NA	14.27

¹ TOC = Top of Well Casing

² Groundwater elevations adjusted to account for the presence of free product (Specific Gravity = 0.8).

NA: Not Available

CNL: Could Not Locate. Well may no longer exist.

ND: Not detected

Product detections indicated in bold

Note: TOC elevations, well diameters, total depths, and screen intervals determined from 2007-2008 Annual Monitoring Report prepared by Shaw Environmental, Inc. dated May 2008 and Building AS-4141 Remedial Action Optimization & Revised Corrective Action P

Table 4
Groundwater Elevation and Free Product Thickness Table
Building AS-4141
June through September 2009 Annual Monitoring Report
Contract No. N40085-08-D-1409, CTO: 0008
MCB Camp Lejeune, North Carolina

Well I.D.	Date	TOC ¹ Elevation (feet-MSL)	Well Diameter (inches)	Depth to Product from TOC (feet)	Depth to Water from TOC (feet)	Product Thickness (feet)	Groundwater Elevation ² (feet)
USTAS4141-MW02	9/28/2009	23.47	NA	ND	5.89	NA	17.58
	8/7/2009	23.47	NA	ND	6.05	NA	17.42
	7/27/2009	23.47	NA	ND	6.65	NA	16.82
	6/11/2009	23.47	NA	ND	6.53	NA	16.94
USTAS4141-MW07	9/28/2009	21.60	NA	NA	2.68	NA	NA
	8/7/2009	21.60	NA	NA	CNL	NA	NA
	7/27/2009	21.60	NA	NA	CNL	NA	NA
	6/11/2009	21.60	NA	NA	CNL	NA	NA
USTAS4141-MW08	9/28/2009	25.61	NA	ND	11.22	NA	14.39
	8/7/2009	25.61	NA	ND	11.47	NA	14.14
	7/27/2009	25.61	NA	ND	12.22	NA	13.39
	6/11/2009	25.61	NA	ND	11.50	NA	14.11
USTAS4141-MW10	9/28/2009	21.56	NA	NA	3.38	NA	18.18
	8/7/2009	21.56	NA	NA	CNL	NA	NA
	7/27/2009	21.56	NA	NA	CNL	NA	NA
	6/11/2009	21.56	NA	NA	CNL	NA	NA
USTAS4141-MW13	9/28/2009	18.87	NA	ND	4.85	NA	14.02
	8/7/2009	18.87	NA	ND	6.02	NA	12.85
	7/27/2009	18.87	NA	ND	6.00	NA	12.87
	6/11/2009	18.87	NA	ND	5.30	NA	13.57
USTAS4141-MW14	9/28/2009	19.56	2.00	ND	5.31	NA	14.25
	8/7/2009	19.56	2.00	ND	7.49	NA	12.07
	7/27/2009	19.56	2.00	ND	8.73	NA	10.83
	6/11/2009	19.56	2.00	ND	5.88	NA	13.68
USTAS4141-MW15	9/28/2009	18.11	2.00	ND	2.98	NA	15.13
	8/7/2009	18.11	2.00	ND	3.02	NA	15.09
	7/27/2009	18.11	2.00	ND	3.00	NA	15.11
	6/11/2009	18.11	2.00	ND	4.01	NA	14.10

Table 4
Groundwater Elevation and Free Product Thickness Table
Building AS-4141
June through September 2009 Annual Monitoring Report
Contract No. N40085-08-D-1409, CTO: 0008
MCB Camp Lejeune, North Carolina

Well I.D.	Date	TOC ¹ Elevation (feet-MSL)	Well Diameter (inches)	Depth to Product from TOC (feet)	Depth to Water from TOC (feet)	Product Thickness (feet)	Groundwater Elevation ² (feet)
USTAS4141-MW16	9/28/2009	21.29	2.00	ND	5.61	NA	15.68
	8/7/2009	21.29	2.00	ND	7.40	NA	13.89
	7/27/2009	21.29	2.00	ND	8.70	NA	12.59
	6/11/2009	21.29	2.00	ND	6.21	NA	15.08
USTAS4141-MW17	9/28/2009	19.77	2.00	ND	5.50	NA	14.27
	8/7/2009	19.77	2.00	ND	5.62	NA	14.15
	7/27/2009	19.77	2.00	ND	9.71	NA	10.06
	6/11/2009	19.77	2.00	ND	6.10	NA	13.67
USTAS4141-MW18	9/28/2009	21.15	2.00	ND	6.40	NA	NA
	8/7/2009	21.15	2.00	ND	6.62	NA	NA
	7/27/2009	21.15	2.00	ND	6.69	NA	NA
	6/11/2009	21.15	2.00	ND	6.45	NA	NA
USTAS4141-MW19	9/28/2009	20.45	2.00	ND	5.35	NA	15.10
	8/7/2009	20.45	2.00	ND	6.62	NA	13.83
	7/27/2009	20.45	2.00	ND	7.38	NA	13.07
	6/11/2009	20.45	2.00	ND	5.86	NA	14.59
USTAS4141-MW20	9/28/2009	19.58	NA	5.70	5.90	0.20	13.84
	8/7/2009	19.58	NA	10.03	10.30	0.27	9.50
	7/27/2009	19.58	NA	11.21	12.00	0.79	8.21
	6/11/2009	19.58	NA	6.25	6.40	0.15	13.30
USTAS4141-MW21	9/28/2009	19.59	NA	5.55	6.38	0.83	13.87
	8/7/2009	19.59	NA	8.99	9.45	0.46	10.51
	7/27/2009	19.59	NA	10.20	10.91	0.71	9.25
	6/11/2009	19.59	NA	6.25	6.36	0.11	13.32
USTAS4141-OBG02	9/28/2009	23.84	NA	NA	5.11	NA	18.73
	8/7/2009	23.84	NA	NA	3.56	NA	20.28
	7/27/2009	23.84	NA	NA	CNG	NA	NA
	6/11/2009	23.84	NA	NA	CNG	NA	NA

Table 4
Groundwater Elevation and Free Product Thickness Table
Building AS-4141
June through September 2009 Annual Monitoring Report
Contract No. N40085-08-D-1409, CTO: 0008
MCB Camp Lejeune, North Carolina

Well I.D.	Date	TOC ¹ Elevation (feet-MSL)	Well Diameter (inches)	Depth to Product from TOC (feet)	Depth to Water from TOC (feet)	Product Thickness (feet)	Groundwater Elevation ² (feet)
USTAS4141-OBG04	9/28/2009	20.27	NA	ND	6.14	NA	14.13
	8/7/2009	20.27	NA	ND	7.13	NA	13.14
	7/27/2009	20.27	NA	ND	7.70	NA	12.57
	6/11/2009	20.27	NA	ND	6.65	NA	13.62
USTAS4141-OBG05	9/28/2009	19.54	NA	ND	4.73	NA	14.81
	8/7/2009	19.54	NA	ND	5.50	NA	14.04
	7/27/2009	19.54	NA	ND	6.67	NA	12.87
	6/11/2009	19.54	NA	ND	5.40	NA	14.14
USTAS4141-OBG06	9/28/2009	20.88	NA	ND	4.40	NA	16.48
	8/7/2009	20.88	NA	ND	4.10	NA	16.78
	7/27/2009	20.88	NA	ND	4.40	NA	16.48
	6/11/2009	20.88	NA	ND	4.48	NA	16.40
USTAS4141-OBG03R	9/28/2009	20.63	2.00	ND	6.74	NA	13.89
	8/7/2009	20.63	2.00	ND	8.87	NA	11.76
	7/27/2009	20.63	2.00	10.42	10.43	0.01	10.21
	6/11/2009	20.63	2.00	ND	6.20	NA	14.43
USTAS4141-RW01	9/28/2009	18.70	6.00	NA	4.80	NA	13.90
	8/7/2009	18.70	6.00	NA	CNG	NA	NA
	7/27/2009	18.70	6.00	NA	CNG	NA	NA
	6/11/2009	18.70	6.00	NA	CNG	NA	NA
USTAS4141-RW03	9/28/2009	NA	6.00	NA	0.00	NA	NA
	8/7/2009	NA	6.00	NA	CNG	NA	NA
	7/27/2009	NA	6.00	NA	CNG	NA	NA
	6/11/2009	NA	6.00	NA	CNG	NA	NA
USTAS4141-RW04	9/28/2009	NA	6.00	NA	3.56	NA	NA
	8/7/2009	NA	6.00	NA	CNG	NA	NA
	7/27/2009	NA	6.00	NA	CNG	NA	NA
	6/11/2009	NA	6.00	NA	CNG	NA	NA

Table 4
Groundwater Elevation and Free Product Thickness Table
Building AS-4141
June through September 2009 Annual Monitoring Report
Contract No. N40085-08-D-1409, CTO: 0008
MCB Camp Lejeune, North Carolina

Well I.D.	Date	TOC ¹ Elevation (feet-MSL)	Well Diameter (inches)	Depth to Product from TOC (feet)	Depth to Water from TOC (feet)	Product Thickness (feet)	Groundwater Elevation ² (feet)
USTAS4141-RW05	9/28/2009	NA	6.00	NA	0.00	NA	NA
	8/7/2009	NA	6.00	NA	CNG	NA	NA
	7/27/2009	NA	6.00	NA	CNG	NA	NA
	6/11/2009	NA	6.00	NA	CNG	NA	NA
AS3905-TPZ01	9/28/2009	20.40	1.00	5.58	6.33	0.75	14.67
	8/7/2009	20.40	1.00	11.25	11.46	0.21	9.11
	7/27/2009	20.40	1.00	ND	12.20	ND	8.20
	6/11/2009	20.40	1.00	6.52	6.56	0.04	13.87
AS3905-TPZ02	9/28/2009	20.24	1.00	5.88	5.99	0.11	14.34
	8/7/2009	20.24	1.00	NA	NA	NA	NA
	7/27/2009	20.24	1.00	NA	NA	NA	NA
	6/11/2009	20.24	1.00	NA	NA	NA	NA
AS3905-TPZ03	9/28/2009	20.36	1.00	5.64	8.30	2.66	14.19
	8/7/2009	20.36	1.00	NA	NA	NA	NA
	7/27/2009	20.36	1.00	NA	NA	NA	NA
	6/11/2009	20.36	1.00	NA	NA	NA	NA
AS3905-TPZ04	9/28/2009	20.17	1.00	5.74	6.00	0.26	14.38
	8/7/2009	20.17	1.00	NA	NA	NA	NA
	7/27/2009	20.17	1.00	NA	NA	NA	NA
	6/11/2009	20.17	1.00	NA	NA	NA	NA
AS3905-TPZ05	9/28/2009	20.26	1.00	5.75	6.95	1.20	14.27
	8/7/2009	20.26	1.00	NA	NA	NA	NA
	7/27/2009	20.26	1.00	NA	NA	NA	NA
	6/11/2009	20.26	1.00	NA	NA	NA	NA

¹ TOC = Top of Well Casing

² Groundwater elevations adjusted to account for the presence of free product (Specific Gravity = 0.8).

NA: Not Available/not applicable

CNG: Could Not Gauge, well obstructed or no access available

CNL: Could Not Locate. Well may no longer exist.

ND: Not detected

Product detections indicated in bold

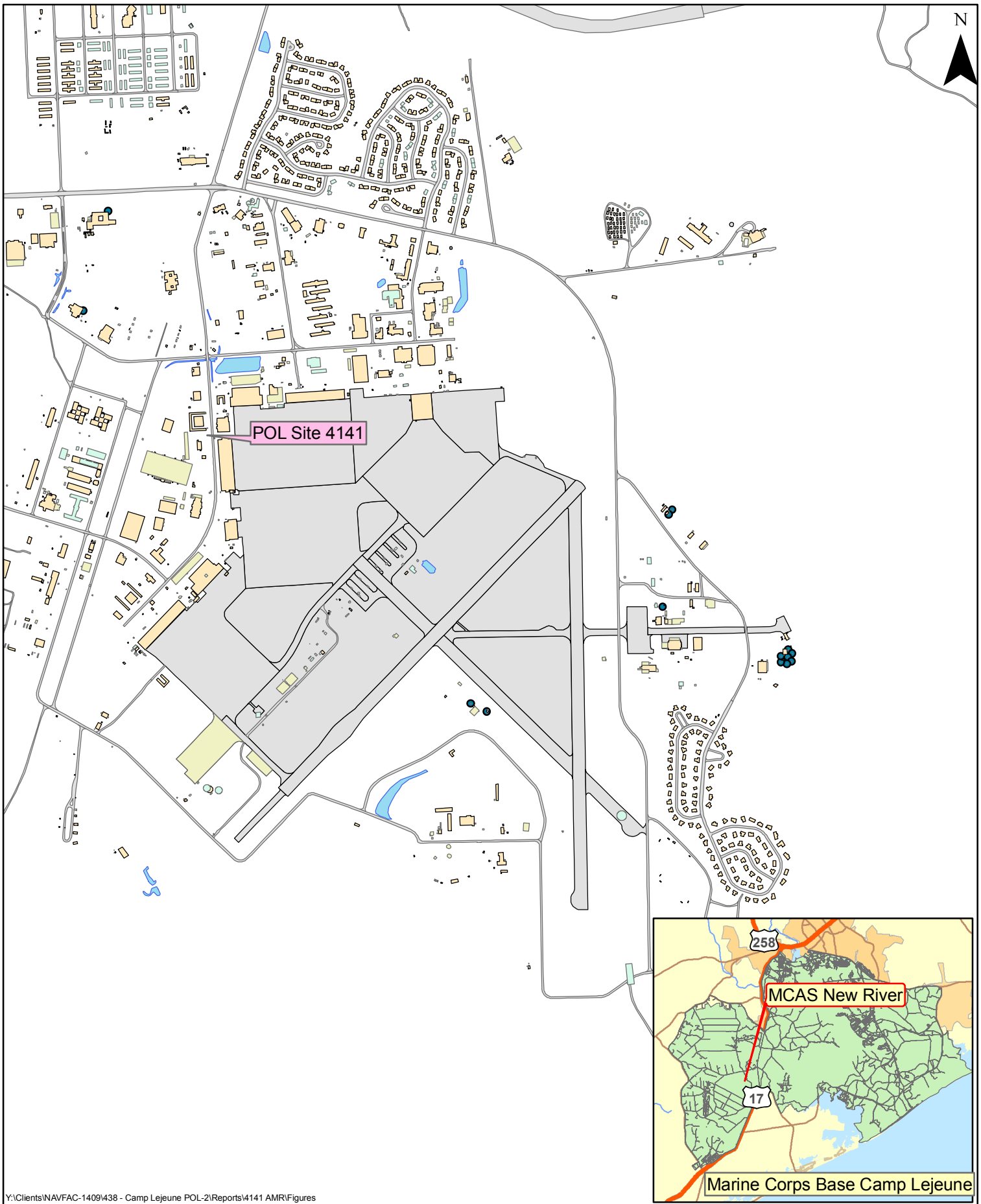
Note: TOC elevations, well diameters, total depths, and screen intervals determined from 2007-2008
Annual Monitoring Report prepared by Shaw Environmental, Inc. dated May 2008 and Building AS-4141
Remedial Action Optimization & Revised Corrective Action P

Table 5
Field Data Summary
Building AS-4141
June through September 2009 Annual Monitoring Report
Contract No. N40085-08-D-1409, CTO: 0008
MCB Camp Lejeune, North Carolina

Sample ID		USTAS4141-RW01	USTAS4141-RW03	USTAS4141-RW04	USTAS4141-RW05	USTAS4141-OBG3R	USTAS4141-MW07
Sample Date		9/24/2009	9/25/2009	9/24/2009	9/24/2009	9/24/2009	9/25/2009
Field Parameter	Unit	Result	Result	Result	Result	Result	Result
Depth to Water	feet	ND	ND	ND	0.25	6.86	2.76
pH	NA	4.53	6.62	6.54	6.12	5.47	5.49
Conductivity	mS/cm	0.482	2.120	1.125	0.119	0.339	0.140
Turbidity	NTU	0.05	2.92	6.11	9.4	8.2	9.7
Dissolved Oxygen	mg/L	0.21	0.26	0.76	0.35	7.18	1.38
Temperature	°C	22.79	26.65	27.7	24.27	24.72	21.63
Oxidation-Reducton Potential	mV	11.2	-73.7	-57.9	24.9	-38.4	40.3
Sample ID		USTAS4141-MW10	USTAS4141-MW14	USTAS4141-MW16	USTAS4141-MW17	USTAS4141-MW18	USTAS4141-MW19
Sample Date		9/28/2009	9/24/2009	9/25/2009	9/24/2009	9/25/2009	9/24/2009
Field Parameter	Unit	Result	Result	Result	Result	Result	Result
Depth to Water	feet	3.41	ND	ND	ND	6.43	5.43
pH	NA	6.28	6.51	6.1	6.43	5.66	5.15
Conductivity	mS/cm	0.750	1.136	1.044	1.160	0.380	0.151
Turbidity	NTU	2.78	1.46	2.03	11.1	5.4	8.4
Dissolved Oxygen	mg/L	0.51	0.01	0.4	0.03	1.29	0.4
Temperature	°C	25.71	24.3	26.15	24.56	24.51	25.71
Oxidation-Reducton Potential	mV	-13.3	-57.8	-69.3	-155.4	-45.3	80.9

ND: Not determined

FIGURES



Legend

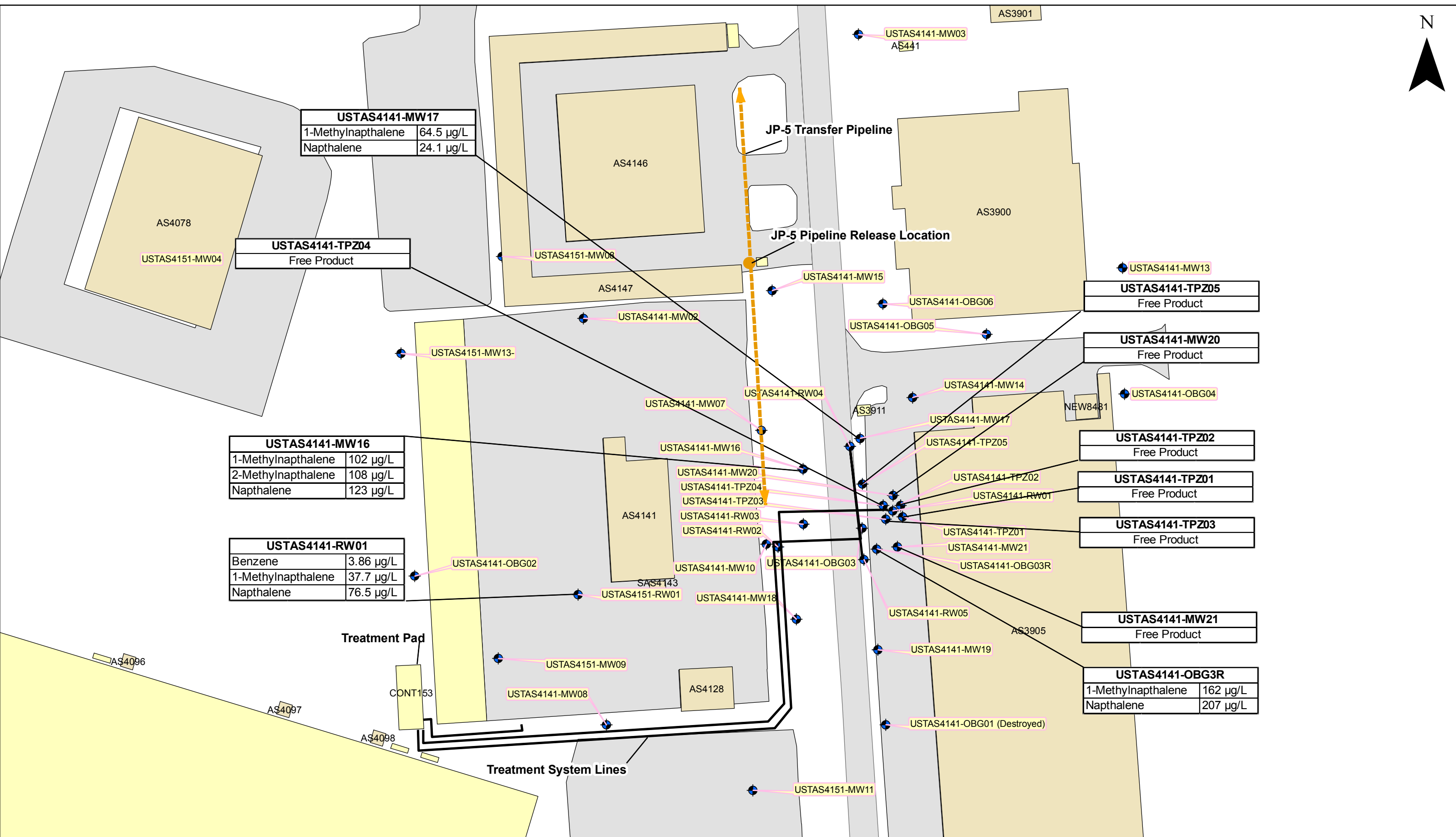
- Buildings
- Surface Water
- Roads
- Airfield Surface Area



0 500 1,000 2,000 Feet

Figure 1
Vicinity Map
Building AS - 4141
MCAS New River,
MCB Camp Lejeune, North Carolina





Legend

 Slab Area	 Roads
 Buildings / Structures	 Parking Area
 Groundwater Sample Location Point	

Figure 5
Groundwater Exceedance Map - September 2009
Building AS - 4141
MCAS New River,
MCB Camp Lejeune, North Carolina


0 25 50 100 Feet

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APPENDIX A

2009 HISTORICAL GROUNDWATER ELEVATIONS AND FREE PHASE THICKNESS

JP-5 Line Area (Building AS4141)
Well Gauging Total Fluids Recovery

Well ID	Date		TOC Elevation	11/22/2005				11/30/2005				1/6/2006				Total Fluids Recovery (gal)		
	DTB			DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP		Product Thickness	Groundwater Elevation
MW-14	24.82		19.56	5.62	0	0	13.94		5.57	0	0	13.99		5.28	0	0	14.28	
MW-15	12.79		18.62	1.27	0	0	17.35		2.78	0	0	15.84		3.15	0	0	15.47	
TP-1	12.25		20.4	6.35	0	0	14.05		6.3	0	0	14.1		6.09	0	0	14.31	
TP-2	12.96		20.24	6.31	0	0	13.93		6.24	0	0	14		5.98	0	0	14.26	
TP-3	12.59		20.37	6.72	6.37	0.35	13.65		6.75	6.3	0.45	13.62		6.53	5.81	0.72	13.84	
TP-4	12.61		20.17	5.66	0	0	14.51		5.65	0	0	14.52		5.59	0	0	14.58	
TP-5	12.32		20.26	6.68	6.67	0.01	13.58		6.35	6.3	0.05	13.91		6.69	6.014	0.55	13.57	
OBG-03R	12.71		20.64	8.23	6.81	1.42	12.41		8.15	6.37	1.78	12.49		7.74	5.71	2.03	12.9	81
RW-1	21.48		NM	5.01	4.85	0.16	NM		4.99	4.89	0.1	NM		4.89	4.62	0.27	NM	
OBG-06	17.39		20.88	3.67	0	0	17.21		3.83	0	0	17.05		4.54	0	0	16.34	
																	gas	11.1

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

	Date	1/11/2006				1/16/2006				1/23/2006						
		DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
Well ID	DTB	TOC Elevation														
MW-14	24.82	19.56	0	0	14.07		5.49	0	0	14.07		5.54	0	0	14.02	
MW-15	12.79	18.62	0	0	15.36		3.26	0	0	15.36		3.03	0	0	15.59	
TP-1	12.25	20.4	6.17	0.02	14.21		6.19	6.17	0.36	13.89	5	6.51	6.15	0.36	13.89	5
TP-2	12.96	20.24	0	0	14.13		6.11	0	0	14.13		6.15	0	0	14.09	
TP-3	12.59	20.37	6.65	5.9	13.72		7.69	5.93	1.76	12.68	5	7.69	5.93	1.76	12.68	5
TP-4	12.61	20.17	5.64	0	14.53		5.64	0	0	14.53		5.63	0	0	14.54	
TP-5	12.32	20.26	6.84	6.18	13.42		6.84	6.18	0.66	13.42	5	7.13	6.26	0.87	13.13	5
OBG-03R	12.71	20.64	8.3	5.85	12.34		8.3	5.85	2.45	12.34	81	7.34	6.19	1.16	13.3	81
RW-1	21.48	NM	4.78	4.6	0.18		4.78	4.6	0.18	NM		5.19	4.64	0.55	NM	
OBG-06	17.39	20.88	4.67	0	16.21		4.67	0	0	16.21		4.47	0	0	16.41	

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

JP-5 Line Area (Building AS4141)
Well Gauging Total Fluids Recovery

	Date		TOC Elevation	2/6/2006				2/16/2006				2/20/2006						
Well ID	DTB			DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
MW-14	24.82		19.24	5.5	0	0	14.06		5.61	0	0	13.95		5.68	0	0	13.88	
MW-15	12.79		18.62	3.07	0	0	15.55		3.02	0	0	15.6		3.13	0	0	15.49	
TP-1	12.25		20.09	6.5	6.3	0.2	13.25		6.73	6.36	0.37	13.67		6.77	6.45	0.32	13.63	
TP-2	12.96		19.92	6.14	0	30	14.1		6.23	0	0	14.01		6.28	0	0	13.96	
TP-3	12.59		20.06	7.01	6.07	0.94	13.36		7.45	6.08	1.37	12.92		7.6	6.15	1.45	12.77	
TP-4	12.61		19.87	5.64	0	0	14.53		5.64	0	0	14.53		5.64	0	0	14.53	
TP-5	12.32		19.98	6.35	6.11	0.24	13.91		6.98	6.18	0.8	13.28		7.51	6.27	1.24	12.75	
OBG-03R	12.71		20.35	6.63	6.15	0.48	14.01	75	6.75	6.31	0.44	13.89	59.2	6.83	6.4	0.43	13.81	
RW-1	21.48		NM	4.81	4.6	0.21	NM		4.89	0	0	NM		4.79	4.75	0.04	NM	
OBG-06	17.39		21.63	4.33	0	0	16.55		5.06	0	0	15.82		5.22	0	0	15.66	
							gas	12				gas	9.4					

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

	Date		TOC Elevation	3/14/2006				3/21/2006				3/28/2006						
Well ID	DTB			DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
MW-14	24.82		19.24	5.7	0	0	13.86		5.86	0	0	13.7		6.02	0	0	13.54	
MW-15	12.79		18.62	3.1	0	0	15.52		3.23	0	0	15.39		2.96	0	0	15.66	
TP-1	12.25		20.09	6.82	6.48	0.34	13.58		7.02	6.56	0.46	13.38		7.24	6.76	0.48	13.16	
TP-2	12.96		19.92	6.33	0	0	13.91		6.51	0	0	13.73		6.58	0	0	13.66	
TP-3	12.59		20.06	8.25	6.02	2.23	12.12		8.3	6.17	2.13	12.07		8.93	6.24	2.69	11.44	
TP-4	12.61		19.87	5.63	0	0	14.54		5.86	0	0	14.31		5.7	0	0	14.47	
TP-5	12.32		19.98	8.07	6.3	1.77	12.19		8.14	6.23	1.91	12.12		8.31	6.3	2.01	11.95	
OBG-03R	12.71		20.35	6.83	6.48	0.35	13.81		7.01	6.54	0.47	13.63		7.22	6.82	0.4	13.42	
RW-1	21.48		NM	5.54	4.78	0.76	NM		5.81	4.9	0.91	NM		5.85	5.08	0.77	NM	
OBG-06	17.39		21.63	5.18	0	0	15.7		5.29	0	0	15.59		5.68	0	0	15.2	

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

JP-5 Line Area (Building AS4141)
Well Gauging Total Fluids Recovery

	Date		4/6/2006						4/12/2006						4/18/2006					
Well ID	DTB	TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)			
MW-14	24.82	19.24	6.1	0	0	13.46		6.12	0	0	13.44		6.04	0	0	13.52				
MW-15	12.79	18.62	3.2	0	0	15.42		4.33	0	0	14.29		4.17	0	0	14.45				
TP-1	12.25	20.09	7.38	6.81	0.57	13.02		7.52	6.86	0.66	12.88		7.28	6.78	0.5	13.12				
TP-2	12.96	19.92	6.68	0	0	13.56		6.84	6.36	0.48	13.4		6.68	0	0	13.56				
TP-3	12.59	20.06	9.33	6.25	3.08	11.04		9.48	6.23	3.25	10.89		9.69	6.13	3.56	10.68				
TP-4	12.61	19.87	5.7	0	0	14.47		5.71	0	0	14.46		5.56	0	0	14.61				
TP-5	12.32	19.98	8.88	6.51	2.37	11.38		8.78	6.46	2.32	11.48		9.09	6.55	2.54	11.17				
OBG-03R	12.71	20.35	7.35	6.93	0.42	13.29		7.34	6.95	0.39	13.3		6.9	6.67	0.23	13.74				
RW-1	21.48	NM	5.29	5.16	0.13	NM		6	5.48	0.52	NM		5.96	5.1	0.86	NM	41.6			
OBG-06	17.39	21.63	5.67	0	0	15.21		5.66	0	0	15.22		6.28	0	0	14.6				
																gas	6.6			

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

	Date		5/2/2006						5/9/2006						5/15/2006					
Well ID	DTB	TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)			
MW-14	24.82	19.24	5.8	0	0	13.76		5.77	0	0	13.79		5.86	5.85	0.01	13.7				
MW-15	12.79	18.62	2.6	0	0	16.02		1.74	0	0	16.88		2.63	2.62	0.01	15.99				
TP-1	12.25	20.09	6.7	6.6	0.1	13.7		6.85	6.57	0.28	13.55		6.82	6.61	0.21	13.58				
TP-2	12.96	19.92	6.4	0	0	13.84		6.75	0	0	13.49		6.55	6.43	0.12	13.69				
TP-3	12.59	20.06	7.29	6.34	0.95	13.08		7.14	6.38	0.76	13.23		7.45	6.4	1.05	12.92				
TP-4	12.61	19.87	5.64	0	0	14.53		5.67	0	0	14.5		5.69	5.68	0.01	14.48				
TP-5	12.32	19.98	7.31	6.47	0.84	12.95		7.16	6.55	0.61	13.1		7.56	6.59	0.97	12.7				
OBG-03R	12.71	20.35	6.69	6.63	0.06	13.95		6.98	6.63	0.36	13.66		7.29	6.75	0.54	13.35				
RW-1	21.48	NM	5.03	4.99	0.04	NM		4.91	4.84	0.07	NM		5.1	5.01	0.09	NM				
OBG-06	17.39	21.63	4.64	0	0	16.24		3.89	0	0	16.99		4.85	4.78	0.07	16.03				

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

JP-5 Line Area (Building AS4141)
Well Gauging Total Fluids Recovery

	Date		TOC Elevation	5/24/2006				6/1/2006				6/5/2006						
Well ID	DTB			DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
MW-14	24.82		19.24	6.03	0	0	13.53		6.03	0	0	13.53		6.04	0	0	13.52	
MW-15	12.79		18.62	2.99	0	0	15.63		3.48	0	0	15.14		3.58	0	0	15.04	
TP-1	12.25		20.09	7.17	6.78	0.39	13.23		7.1	6.83	0.27	13.3		7.21	6.82	0.39	13.19	
TP-2	12.96		19.92	6.63	0	0	13.61		6.64	0	0	13.6		6.67	0	0	13.57	
TP-3	12.59		20.06	7.74	6.52	1.22	12.63		7.9	6.5	1.4	12.47		8.05	6.5	1.55	12.32	
TP-4	12.61		19.87	5.68	0	0	14.49		5.73	0	0	14.44		5.71	0	0	14.46	
TP-5	12.32		19.98	7.96	6.76	1.2	12.3		8.2	6.82	1.38	12.06		8.19	6.72	1.47	12.07	
OBG-03R	12.71		20.35	7.04	6.72	0.32	13.6		6.42	5.99	0.43	14.22		7.33	6.94	0.39	13.31	
RW-1	21.48		NM	5.33	5.2	0.13	NM		5.34	5.2	0.14	NM		5.39	5.24	0.15	NM	
OBG-06	17.39		21.63	5.58	0	0	15.3		5.55	0	0	15.33		5.64	0	0	15.24	

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

	Date		TOC Elevation	6/12/2006				6/19/2006				6/27/2006						
Well ID	DTB			DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
MW-14	24.82		19.24	5.91	0	0	13.65		5.69	0	0	13.87		3.25	0	0	16.31	
MW-15	12.79		18.62	3.43	0	0	15.19		3.29	0	0	15.33		3.6	0	0	15.02	
TP-1	12.25		20.09	6.86	6.68	0.18	13.54		6.54	6.42	0.12	13.86		6.24	6.13	0.11	14.16	
TP-2	12.96		19.92	6.59	6.58	0.01	13.65		6.25	0	0	13.99		6.27	0	0	13.97	
TP-3	12.59		20.06	8.09	6.31	1.78	12.28		7.8	6.04	1.76	12.57		7.29	5.73	1.56	13.08	
TP-4	12.61		19.87	5.71	0	0	14.46		5.7	0	0	14.47		5.43	0	0	14.74	
TP-5	12.32		19.98	8.08	6.68	1.4	12.18		7.95	6.35	1.6	12.31		7.76	6.12	1.64	12.5	
OBG-03R	12.71		20.35	7.27	6.84	0.43	13.37		6.99	6.54	0.45	13.65		6.83	6.4	0.43	13.81	
RW-1	21.48		NM	5.26	5.07	0.19	NM		4.96	4.8	0.16	NM		4.73	4.52	0.21	NM	
OBG-06	17.39		21.63	3.75	0	0	17.13		4.45	0	0	16.43		3.38	0	0	17.5	

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

JP-5 Line Area (Building AS4141)
Well Gauging Total Fluids Recovery

	Date		TOC Elevation	7/16/2006				7/12/2006				7/19/2006				Total Fluids Recovery (gal)		
Well ID	DTB			DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
MW-14	24.82		19.24	5.32	0	0	14.24		5.67	0	0	13.89		5.76	0	0	13.8	
MW-15	12.79		18.62	3.72	0	0	14.9		3.8	0	0	14.82		3.61	0	0	15.01	
TP-1	12.25		20.09	6.41	6.13	0.28	13.99		6.75	6.43	0.32	13.65		6.72	6.55	0.17	13.68	
TP-2	12.96		19.92	5.97			14.27		6.3	0	0	13.94		6.39	0	0	13.85	
TP-3	12.59		20.06	7.91	5.7	2.21	12.46		8.54	5.95	2.59	11.83		8.17	5.6	2.57	12.2	
TP-4	12.61		19.87	5.64	0	0	14.53		5.68	0	0	14.49		5.64	0	0	14.53	
TP-5	12.32		19.98	8.09	6.01	2.08	12.17		8.7	6.3	2.4	11.56		8.8	6.4	2.4	11.46	
OBG-03R	12.71		20.35	6.94	6.42	0.52	13.7		7.12	6.6	0.52	13.52		7.14	6.61	0.53	13.5	
RW-1	21.48		NM	4.57	4.52	0.05	NM		5.05	4.85	0.2	NM		5.14	4.91	0.23	NM	
OBG-06	17.39		21.63	4.67	0	0	16.21		5.72	0	0	15.16		4.12	0	0	16.76	

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

	Date		7/24/2006						8/2/2006						8/7/2006					
Well ID	DTB	TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)			
MW-14	24.82	19.24	5.63	0	0	13.93		4.07	0	0	15.49		5.32	0	0	14.24				
MW-15	12.79	18.62	3.48	0	0	15.14		3.3	0	0	15.32		3.36	0	0	15.26				
TP-1	12.25	20.09	6.56	6.37	0.19	13.84		6.18	6.05	0.13	14.22		6.46	6.25	0.21	13.94				
TP-2	12.96	19.92	6.21			14.03		5.93	0	0	14.31		6.1	0	0	14.14				
TP-3	12.59	20.06	7.19	5.72	1.47	13.18		8.32	5.52	2.8	12.05		6.86	6.11	0.75	13.51				
TP-4	12.61	19.87	5.66	0	0	14.51		5.63	0	0	14.54		5.66	0	0	14.51				
TP-5	12.32	19.98	8.57	6.11	2.46	11.69		8.33	5.8	2.53	11.93		6.95	6.03	0.92	13.31				
OBG-03R	12.71	20.35	7.11	6.43	0.68	13.53		6.95	6.45	0.5	13.69		7.08	6.38	0.7	13.56				
RW-1	21.48	NM	5.01	4.76	0.25	NM		4.65	4.44	0.21	NM		4.89	4.62	0.27	NM				
OBG-06	17.39	21.63	3.63	0	0	17.25		4.01	0	0	16.87		4.61	0	0	16.27				

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

JP-5 Line Area (Building AS4141)
Well Gauging Total Fluids Recovery

	Date		8/14/2006						8/21/2006						8/28/2006					
Well ID	DTB	TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)			
MW-14	24.82	19.24	5.52	0	0	14.04		5.71	0	0	13.85		4.98	0	0	14.58				
MW-15	12.79	18.62	2.48	0	0	16.14		2.73	0	0	15.89		2.94	0	0	15.68				
TP-1	12.25	20.09	6.5	6.32	0.18	13.9		6.69	6.48	0.21	13.71		6.25	6.11	0.14	14.15				
TP-2	12.96	19.92	6.18	0	0	14.06		6.38	0	0	13.86		5.98	0	0	14.26				
TP-3	12.59	20.06	6.91	6.09	0.82	13.46		6.95	6.24	0.71	13.42		6.78	5.98	0.8	13.59				
TP-4	12.61	19.87	5.65	0	0	14.52		5.6	0	0	14.57		5.64	0	0	14.53				
TP-5	12.32	19.98	7.15	6.42	0.73	13.11		7.51	6.88	0.63	12.75		6.99	6.22	0.77	13.27				
OBS-03R	12.71	20.35	7.12	6.37	0.75	13.52		7.04	6.32	0.72	13.6		6.96	6.09	0.87	13.68				
RW-1	21.48	NM	4.98	4.67	0.31	NM		5.14	4.88	0.26	NM		4.78	4.46	0.32	NM				
OBS-06	17.39	21.63	4.22	0	0	16.66		5	0	0	15.88		4.27	0	0	16.61				

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

	Date		9/5/2006						9/12/2006						9/20/2006					
Well ID	DTB	TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)			
MW-14	24.82	19.24	4.85	0	0	14.71		4.85	0	0	14.61		5.04	0	0	14.52				
MW-15	12.79	18.62	3.08	0	0	15.54		3.28	0	0	15.34		3.12	0	0	15.5				
TP-1	12.25	20.09	6.64	6.57	0.07	13.76		5.79	5.61	0.18	14.61		5.92	5.82	0.1	14.48				
TP-2	12.96	19.92	5.54	0	0	14.7		5.63	0	0	14.61		5.71	0	0	14.53				
TP-3	12.59	20.06	6.42	5.52	0.9	13.95		6.4	5.62	0.78	13.97		6.62	5.77	0.85	13.75				
TP-4	12.61	19.87	5.52	5.47	0.28	14.65		5.75	5.47	0.28	14.42		5.82	5.52	0.3	14.35				
TP-5	12.32	19.98	6.48	5.65	0.83	13.78		6.9	5.66	1.24	13.36		6.63	5.81	0.82	13.63				
OBS-03R	12.71	20.35	6.02	5.77	0.25	14.62		6.41	5.91	0.5	14.23		6.15	5.93	0.22	14.49				
RW-1	21.48	NM	4.3	3.97	0.33	NM		4.18	4.17	0.01	NM		4.34	4.32	0.02	NM				
OBS-06	17.39	21.63	3.5	0	0	17.38		4.67	0	0	16.21		4.92	0	0	15.96				

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

JP-5 Line Area (Building AS4141)
Well Gauging Total Fluids Recovery

	Date		9/27/2006				10/3/2006				10/10/2006						
Well ID	DTB	TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
MW-14	24.82	19.24	5.31	0	0	14.25		5.62	0	0	13.94		5.55	0	0	14.01	
MW-15	12.79	18.62	3.01	0		15.61		3.43	0	0	15.19		3.35	0	0	15.27	
TP-1	12.25	20.09	6.27	6.14	0.13	14.13		6.58	6.43	0.15	13.82		6.4	6.35	0.05	14	
TP-2	12.96	19.92	6.01	0	0	14.23		6.29	0	0	13.95		6.02	0	0	14.22	
TP-3	12.59	20.06	7	5.95	1.05	13.37		7.28	6.21	1.07	13.09		7.11	6.15	0.96	13.26	
TP-4	12.61	19.87	5.86	5.51	0.35	14.31		6.12	5.51	0.61	14.05		6.06	5.51	0.55	14.11	
TP-5	12.32	19.98	7.23	6.18	1.05	13.03		7.76	6.52	1.24	12.5		7.25	6.75	0.5	13.01	
OBG-03R	12.71	20.35	6.23	6	0.23	14.41		7.23	6.52	0.71	13.41		7	6.4	0.6	13.64	
RW-1	21.48	NM	4.59	4.58	0.01	NM		4.92	4.88	0.04	NM		4.83	4.74	0.09	NM	
OBG-06	17.39	21.63	5.17	0	0	15.71		5.54	0	0	15.34		3.95	0	0	15.93	

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

	Date		10/25/2006						10/30/2006						11/9/2006					
Well ID	DTB	TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)			
MW-14	24.82	19.24	5.49	0	0	14.07		5.74	0	0	13.82		5.71	0	0	13.85				
MW-15	12.79	18.62	3.35	0	0	15.27		1.86	0	0	16.76		3.1	0	0	15.52				
TP-1	12.25	20.09	7.03	6.65	0.38	13.37		6.6	6.45	0.15	13.8		6.63	6.54	0.09	13.77				
TP-2	12.96	19.92	6.53	0	0	13.71		6.25	0	0	13.99		6.36	0	0	13.88				
TP-3	12.59	20.06	8.86	6.41	2.45	11.51		7.69	6.23	1.46	12.68		7.48	6.28	1.2	12.89				
TP-4	12.61	19.87	5.86	5.51	0.35	14.31		6.12	5.5	0.62	14.05		5.63	5.57	0.11	14.49				
TP-5	12.32	19.98	8.13	6.62	1.51	12.13		7.63	6.46	1.17	12.63		6.88	6.23	0.65	13.38				
OBG-03R	12.71	20.35	7.3	6.83	0.47	13.34		7.05	6.61	0.44	13.59		7.05	6.61	0.44	13.59				
RW-1	21.48	NM	5.14	5.1	0.04	NM		5.34	5.23	0.11	NM		5.08	4.95	0.13	NM				
OBG-06	17.39	21.63	5.41	0	0	15.47		4.35	0	0	16.53		4.16	0	0	16.72				

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

JP-5 Line Area (Building AS4141)
Well Gauging Total Fluids Recovery

Well ID	Date		TOC Elevation	11/15/2006				11/28/2006				12/5/2006				Total Fluids Recovery (gal)		
	DTB			DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP		Product Thickness	Groundwater Elevation
MW-14	24.82		19.24	5.78	0	0	13.78		4.01	0	0	15.55		5.45	0	0	14.11	
MW-15	12.79		18.62	2.81	0	0	15.81		2.73	0	0	15.89		2.84	0	0	15.78	
TP-1	12.25		20.09	6.76	6.59	0.17	13.64		6.11	6.08	0.03	14.29		6.4	6.28	0.12	14	
TP-2	12.96		19.92	6.43	0	0	13.81		5.92	0	0	14.32		6.12	0	0	14.12	
TP-3	12.59		20.06	7.63	6.31	1.32	12.74		6.9	5.78	1.12	13.47		7.62	5.96	1.66	12.75	
TP-4	12.61		19.87	5.78	0	0	14.39		5.82	5.56	0.26	14.35		5.88	5.54	0.34	14.29	
TP-5	12.32		19.98	7.4	6.55	0.85	12.86		5.98	5.74	0.24	14.28		7.1	6.02	1.08	13.16	
OBG-03R	12.71		20.35	7.12	6.65	0.47	13.52		6.5	6.04	0.46	14.14		6.82	6.34	0.48	13.82	
RW-1	21.48		NM	5.13	4.96	0.17	NM		4.74	0	0	NM		4.82	4.63	0.19	NM	
OBG-06	17.39		21.63	4.85	0	0	16.03		4.57	0	0	16.31		5.22	0	0	15.66	

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

	Date		TOC Elevation	12/13/2006				12/19/2006				12/27/2006						
Well ID	DTB			DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
MW-14	24.82		19.24	5.69	0	0	13.87		5.96	0	0	13.6		5.15	0	0	14.41	
MW-15	12.79		18.62	3.04	0	0	15.58		3.16	0	0	15.46		3.15	0	0	15.47	
TP-1	12.25		20.09	6.84	5.52	1.32	13.56		6.92	6.74	0.18	13.48		6.08	6.06	0.02	14.32	
TP-2	12.96		19.92	6.38	0	0	13.86		6.56	6.55	0.01	13.68		5.96	0	0	14.28	
TP-3	12.59		20.06	8.19	6.15	2.04	12.18		8.39	6.34	2.05	11.98		7.82	5.8	2.02	12.55	
TP-4	12.61		19.87	5.9	5.55	0.35	14.27		5.85	5.56	0.29	14.32		5.74	5.53	0.21	14.43	
TP-5	12.32		19.98	7.64	6.3	1.34	12.62		7.96	6.54	1.42	12.3		5.85	5.04	0.81	14.41	
OBG-03R	12.71		20.35	7.15	6.61	0.54	13.49		7.41	6.85	0.56	13.23		6.68	6.15	0.53	13.96	
RW-1	21.48		NM	5.5	5.29	0.21	NM		5.19	5.16	0.03	NM		4.9	4.89	0.01	NM	
OBG-06	17.39		21.63	5.42	0	0	15.46		5.64	0	0	15.24		4.03	0	0	16.85	

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

JP-5 Line Area (Building AS4141)
Well Gauging Total Fluids Recovery

	Date			1/12/2007				1/11/2007				1/15/2007								
Well ID	DTB	TOC Elevation		DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)		DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)		DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
MW-14	24.82	19.24		5.4	0	0	14.16			5.25	0	0	14.31			5.34	0	0	14.22	
MW-15	12.79	18.62		2.71	0	0	15.91			2.91	0	0	15.71			2.83	0	0	15.79	
TP-1	12.25	20.09		6.27	6.23	0.04	14.13			6.19	6.02	0.17	14.21			6.2	6.04	0.16	14.2	
TP-2	12.96	19.92		6.01	0	0	14.23			5.91	0	0	14.33			5.88	0	0	14.36	
TP-3	12.59	20.06		7.92	5.81	2.11	12.45			7.9	5.63	2.27	12.47			8	5.77	2.23	12.37	
TP-4	12.61	19.87		5.56	5.5	0.06	14.61			5.93	5.55	0.38	14.24			5.72	5.5	0.22	14.45	
TP-5	12.32	19.98		7.03	5.77	1.26	13.23			7.29	5.64	1.65	12.97			7.25	5.75	1.5	13.01	
OBG-03R	12.71	20.35		6.63	6.2	0.43	14.01			6.5	5.99	0.51	14.14			6.5	6.07	0.43	14.14	
RW-1	21.48	NM		4.68	4.65	0.03	NM			4.8	4.75	0.05	NM			4.78	4.76	0.02	NM	
OBG-06	17.39	21.63		4.43	0	0	16.45			4.25	0	0	16.63			4.68	0	0	16.2	

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

Well ID	Date		TOC Elevation	1/23/2007				1/30/2007				2/6/2007						
	DTB			DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
MW-14	24.82		19.24	5.29	0	0	14.27		5.39	0	0	14.17		5.33	0	0	14.23	
MW-15	12.79		18.62	3	0	0	15.62		3.01			15.61		2.95	0	0	15.67	
TP-1	12.25		20.09	6.19	6.03	0.16	14.21		6.45	6.18	0.27	13.95		6.32	6.09	0.23	14.08	
TP-2	12.96		19.92	5.88	0	0	14.36		6.06	6.55	0.01	14.18		5.99	0	0	14.25	
TP-3	12.59		20.06	8.13	5.56	2.57	12.24		8.51	5.69	2.82	11.86		8.53	5.55	2.98	11.84	
TP-4	12.61		19.87	5.72	5.54	0.18	14.45		6.05	5.55	0.5	14.12		5.75	5.49	0.26	14.42	
TP-5	12.32		19.98	7.37	5.66	1.71	12.89		7.73	5.78	1.95	12.53		7.61	5.66	1.95	12.65	
OBG-03R	12.71		20.35	6.45	6	0.45	14.19		6.7	6.18	0.52	13.94		6.58	6.03	0.55	14.06	
RW-1	21.48		NM	4.79	4.78	0.01	NM		5.05	4.95	0.1	NM		5.03	4.83	0.2	NM	
OBG-06	17.39		21.63	4.04	0	0	16.84		4.79	0	0	16.09		4.87	0	0	16.01	

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

JP-5 Line Area (Building AS4141)
Well Gauging Total Fluids Recovery

	Date		2/14/2007						2/20/2007						3/13/2007					
Well ID	DTB	TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)			
MW-14	24.82	19.24	5.39	0	0	14.17		3.15	0	0	16.41		5.7	0	0	13.86				
MW-15	12.79	18.62	3.06	0	0	15.56		5.64	0	0	12.98		2.2	0	0	16.42				
TP-1	12.25	20.09	6.25	6.14	0.11	14.15		6.73	6.37	0.36	13.67		6.68	6.42	0.26	13.72				
TP-2	12.96	19.92	6.05	0	0	14.19		6.29	0	0	13.95		5.79	0	0	14.45				
TP-3	12.59	20.06	8.7	6.58	2.12	11.67		9.05	5.83	3.22	11.32		9.58	5.77	3.81	10.79				
TP-4	12.61	19.87	5.85	5.5	0.35	14.32		5.76	5.5	0.26	14.41		6.48	6.15	0.33	13.69				
TP-5	12.32	19.98	7.99	5.8	2.19	12.27		8.25	5.99	2.26	12.01		7.66	5.21	2.45	12.6				
OBG-03R	12.71	20.35	6.65	6.13	0.52	13.99		7.04	6.4	0.64	13.6		7.1	6.46	0.64	13.54				
RW-1	21.48	NM	5	4.85	0.15	NM		5.32	5.15	0.17	NM		5.38	5.13	0.25	NM				
OBG-06	17.39	21.63	4.85	0	0	16.03		5.25	0	0	15.63		5.21	0	0	15.67				

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

Well ID	Date		4/10/2007						5/15/2007						6/9/2007					
	DTB	TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)			
MW-14	24.82	19.24	6.02	0	0	13.54		6.08	0	0	13.48		NM	0	0	NM				
MW-15	12.79	18.62	2.9	0	0	15.72		2.71	0	0	15.91		NM	0	0	NM				
TP-1	12.25	20.09	7.25	6.65	0.6	13.15		8.45	7.77	0.68	11.95		7.12	6.65	0.47	13.28				
TP-2	12.96	19.92	6.64	0	0	13.6		6.7	0	0	13.54		NM	0	0	NM				
TP-3	12.59	20.06	10.05	6	4.05	10.32		11.04	5.86	5.18	9.33		11.54	5.85	5.69	8.83				
TP-4	12.61	19.87	6.99	6.25	0.74	13.18		7.04	6.26	0.78	13.13		6.82	6.2	0.62	13.35				
TP-5	12.32	19.98	9.48	6.24	3.24	10.78		10.03	6.28	3.75	10.23		10.25	6.35	3.9	10.01				
OBG-03R	12.71	20.35	7.55	6.93	0.62	13.09		7.51	6.91	0.6	13.13		7.46	7	0.46	13.18				
RW-1	21.48	NM	5.74	5.55	0.19	NM		5.85	5.55	0.3	NM		NM	0	0	NM				
OBG-06	17.39	21.63	5.84	0	0	15.04		6	0	0	14.88		NM	0	0	NM				

DTB = Depth to bottom of well (feet)
DTP = Depth to product (feet)

JP-5 Line Area (Building AS4141)
Well Gauging Total Fluids Recovery

Date		7/16/2007					8/15/2007					9/19/2007					
Well ID	DTB	TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
MW-14	24.82	19.24	6.49	0	0	13.07		6.43	0	0	13.13		6.82	0	0	12.74	
MW-15	12.79	18.62	3.33	0	0	15.29		2.95	0	0	15.67		3.14	0	0	15.48	
TP-1	12.25	20.09	8.12	7.25	0.87	12.28		7.3	7.06	0.24	13.1		8	7.52	0.48	12.4	
TP-2	12.96	19.92	7.15	7.12	0.03	13.09		7.05	7.03	0.02	13.19		6.73	6.72	0.01	13.51	
TP-3	12.59	20.06	8.71	7	1.71	11.66		8.79	6.87	1.92	11.58		8.5	7.44	1.06	11.87	
TP-4	12.61	19.87	7.13	6.25	0.88	13.04		7.01	6.26	0.75	13.16		6.73	6.34	0.39	13.44	
TP-5	12.32	19.98	8.7	7.55	1.15	11.56		8.91	7.43	1.48	11.35		7.35	6.95	0.4	12.91	
OBG-03R	12.71	20.35	7.61	7.39	0.22	13.03		7.73	7.3	0.43	12.91		7.65	7.55	0.1	12.99	
RW-1	21.48	NM	6.26	5.93	0.33	NM		6.18	5.84	0.34	NM		6.44	6.25	0.19	NM	
OBG-06	17.39	21.63	6.9	0	0	13.98		5.62	0	0	15.26		6.48	0	0	14.4	

DTB = Depth to bottom of well (feet)

DTP = Depth to product (feet)

	Date		10/29/2007				11/27/2007				12/18/2007						
		TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
Well ID																	
MW-14	24.82	19.24	6.96	0	0	12.6		7.29	0	0	12.27		7	0	0	12.56	
MW-15	12.79	18.62	3.5	0	0	15.12		3.63	0	0	14.99		2.85	0	0	15.77	
TP-1	12.25	20.09	8.25	7.6	0.65	12.15		8.49	7.69	0.8	11.91		8.25	8.1	0.15	12.15	
TP-2	12.96	19.92	7.5	7.47	0.03	12.74		7.63	7.5	0.13	12.61		7.8	7.79	0.01	12.44	
TP-3	12.59	20.06	8.53	7.45	1.08	11.84		8.81	7.32	1.49	11.56		9.05	7.25	1.8	11.32	
TP-4	12.61	19.87	6.51	6.31	0.2	13.66		6.68	6.36	0.32	13.49		6.81	6.54	0.27	13.36	
TP-5	12.32	19.98	8.3	7.32	0.98	11.96		9.47	7.41	2.06	10.79		8.08	7.12	0.96	12.18	
OBG-03R	12.71	20.35	8.08	7.81	0.27	12.56		8.36	7.99	0.37	12.28		8.1	7.95	0.15	12.54	
RW-1	21.48	NM	6.7	6.35	0.35	NM		7.15	6.82	0.33	NM		7.1	6.74	0.36	NM	
OBG-06	17.39	21.63	4.38	0	0	16.5		6.65	0	0	14.23		5.18	0	0	15.7	

DTB = Depth to bottom of well (feet)

DTP = Depth to product (feet)

JP-5 Line Area (Building AS4141)
Well Gauging Total Fluids Recovery

	Date		2/4/2008				3/13/2008				4/9/2008						
Well ID	DTB	TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
MW-14	24.82	19.24	6.97	0	0	12.59		6.93	0	0	12.63		7.05	0	0	12.51	
MW-15	12.79	18.62	2.74	0	0	15.88		2.61	0	0	16.01		2.38	0	0	16.24	
TP-1	12.25	20.09	8.02	4.8	3.22	12.38		7.96	4.99	2.97	12.44		6.98	6.35	0.63	13.42	
TP-2	12.96	19.92	7.2	0	0	13.04		7.17	0	0	13.07		6.53	0	0	13.71	
TP-3	12.59	20.06	9.16	6.97	2.19	11.21		9.12	6.9	2.22	11.25		9.93	5.81	4.12	10.44	
TP-4	12.61	19.87	6.43	6.27	0.16	13.74		6.38	6.24	0.14	13.79		6.25	6	0.25	13.92	
TP-5	12.32	19.98	9.62	6.97	2.65	10.64		9.58	7.01	2.57	10.68		9.57	5.9	3.67	10.69	
OBG-03R	12.71	20.35	7.88	7.44	0.44	12.76		7.8	7.33	0.47	12.84		6.92	6.63	0.29	13.72	
RW-1	21.48	NM	6.54	6.08	0.46	NM		6.51	6.07	0.44	NM		5.77	5.27	0.5	NM	
OBG-06	17.39	21.63	5.06	0	0	15.82		5	0	0	15.88		4.01	0	0	16.87	

DTB = Depth to bottom of well (feet)

DTP = Depth to product (feet)

Well ID	Date		2/4/2008				3/13/2008				4/9/2008						
	DTB	TOC Elevation	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)	DTW	DTP	Product Thickness	Groundwater Elevation	Total Fluids Recovery (gal)
MW-14	24.82	19.24															
MW-15	12.79	18.62															
TP-1	12.25	20.09															
TP-2	12.96	19.92															
TP-3	12.59	20.06															
TP-4	12.61	19.87															
TP-5	12.32	19.98															
OBG-03R	12.71	20.35															
RW-1	21.48	NM															
OBG-06	17.39	21.63															

DTB = Depth to bottom of well (feet)

DTP = Depth to product (feet)

**Groundwater Elevation and Free Product Thickness Table
AS-4141
MCAS New River, North Carolina
April 2008 - April 2009**

Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
USTAS4141-MW14	06/13/08	2	19.56		5.89	0.00	13.67
	06/25/08		19.56		6.13	0.00	13.43
	06/30/08		19.56		6.13	0.00	13.43
	07/08/08		19.56		6.32	0.00	13.24
	07/17/08		19.56		6.30	0.00	13.26
	07/22/08		19.56		6.27	0.00	13.29
	07/29/08		19.56		NG	0.00	
	08/15/08		19.56		6.31	0.00	13.25
	08/22/08		19.56		NG	0.00	
	08/29/08		19.56		6.00	0.00	13.56
	09/10/08		19.56		5.82	0.00	13.74
	10/02/08		19.56		6.05	0.00	13.51
	10/22/08		19.56		6.15	0.00	13.41
	10/29/08		19.56		6.40	0.00	13.16
	11/04/08		19.56		6.74	0.00	12.82
	11/12/08		19.56		6.11	0.00	13.45
	11/21/08		19.56		5.39	0.00	14.17
	11/25/08		19.56		6.82	0.00	12.74
	12/01/08		19.56		6.24	0.00	13.32
	12/08/08		19.56		6.34	0.00	13.22
	12/15/08		19.56		5.92	0.00	13.64
	12/22/08		19.56		5.92	0.00	13.64
	12/29/08		19.56		5.21	0.00	14.35
	01/05/09		19.56		5.88	0.00	13.68
	01/14/09		19.56		5.54	0.00	14.02
	01/21/09		19.56		5.82	0.00	13.74
	01/30/09		19.56		5.88	0.00	13.68
	02/02/09		19.56		5.88	0.00	13.68
	02/09/09		19.56		5.82	0.00	13.74
	02/16/09		19.56		5.97	0.00	13.59
	02/25/09		19.56		5.92	0.00	13.64
	03/04/09		19.56		5.88	0.00	13.68
	03/09/09		19.56		5.99	0.00	13.57
	03/17/09		19.56		5.73	0.00	13.83
	03/26/09		19.56		5.91	0.00	13.65
	04/01/09		19.56		5.69	0.00	13.87
	04/09/09		19.56		5.55	0.00	14.01
	04/13/09		19.56		5.55	0.00	14.01
	04/20/09		19.56		5.64	0.00	13.92
USTAS4141-MW15	06/13/08	2	18.11		NG	0.00	
	06/25/08		18.11		2.60	0.00	15.51
	06/30/08		18.11		3.02	0.00	15.09

Groundwater Elevation and Free Product Thickness Table
AS-4141
MCAS New River, North Carolina
April 2008 - April 2009

Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
	07/08/08		18.11		NG	0.00	
	07/17/08		18.11		0.80	0.00	17.31
	07/22/08		18.11		1.68	0.00	16.43
	07/29/08		18.11		NG	0.00	
	08/15/08		18.11		NG	0.00	
	08/22/08		18.11		NG	0.00	
	08/29/08		18.11		NG	0.00	
	09/10/08		18.11		NG	0.00	
	09/19/08		18.11		2.95	0.00	15.16
	10/02/08		18.11		NG	0.00	
	10/22/08		18.11		3.12	0.00	14.99
	10/29/08		18.11	2.90	3.01	0.11	15.10
	11/04/08		18.11		2.77	0.00	15.34
	11/12/08		18.11		NG	0.00	
	11/21/08		18.11	1.60	1.75	0.15	16.36
	11/25/08		18.11		6.82	0.00	11.29
	12/01/08		18.11	3.11	3.18	0.07	14.93
	12/08/08		18.11	2.99	3.02	0.03	15.09
	12/15/08		18.11	2.81	2.85	0.04	15.26
	12/22/08		18.11	3.10	3.17	0.07	14.94
	12/29/08		18.11	2.79	2.84	0.05	15.27
	01/05/09		18.11		2.98	0.00	15.13
	01/14/09		18.11		2.84	0.00	15.27
	01/21/09		18.11	2.87	2.88	0.01	15.23
	01/30/09		18.11		NG	0.00	
	02/02/09		18.11	2.31	2.36	0.05	15.75
	02/09/09		18.11	2.99	3.04	0.05	15.07
	02/16/09		18.11	3.10	3.11	0.01	15.00
	02/25/09		18.11	3.01	3.02	0.01	15.09
	03/04/09		18.11	2.30	2.34	0.04	15.77
	03/09/09		18.11	2.65	2.67	0.02	15.44
	03/17/09		18.11		2.82	0.00	15.29
	03/26/09		18.11		2.89	0.00	15.22
	04/01/09		18.11	3.03	3.05	0.02	15.06
	04/09/09		18.11	3.64	3.65	0.01	14.46
	04/13/09		18.11		NG	0.00	
	04/20/09		18.11	3.92	3.98	0.06	14.13
USTAS4141-MW17	06/13/08	2	19.77		NG	0.00	
	06/25/08		19.77	6.30	6.32	0.02	13.45
	06/30/08		19.77		NG	0.00	
	07/01/08		19.77	6.39	6.42	0.03	13.35
	07/08/08		19.77		6.47	0.00	

**Groundwater Elevation and Free Product Thickness Table
AS-4141**

**MCAS New River, North Carolina
April 2008 - April 2009**

Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
	07/17/08		19.77	6.40	6.43	0.03	13.34
	07/22/08		19.77	6.46	6.49	0.03	13.28
	07/29/08		19.77	6.18	6.19	0.01	13.58
	08/15/08		19.77	5.95	5.98	0.03	13.79
	08/22/08		19.77		6.15	0.00	13.62
	08/29/08		19.77		6.02	0.00	13.75
	09/10/08		19.77	6.90	6.91	0.01	12.86
	09/19/08		19.77		NG	0.00	
	10/02/08		19.77		6.25	0.00	13.52
	10/22/08		19.77	6.25	6.29	0.04	13.48
	10/29/08		19.77		6.50	0.00	13.27
	11/04/08		19.77	7.40	7.45	0.05	12.32
	11/12/08		19.77	6.40	6.45	0.05	13.32
	11/21/08		19.77		7.50	0.00	12.27
	11/25/08		19.77		6.70	0.00	13.07
	12/01/08		19.77		6.60	0.00	13.17
	12/08/08		19.77		6.82	0.00	12.95
	12/15/08		19.77		6.01	0.00	13.76
	12/22/08		19.77		6.12	0.00	13.65
	12/29/08		19.77		6.10	0.00	13.67
	01/05/09		19.77	5.90	5.94	0.04	13.83
	01/14/09		19.77		6.03	0.00	13.74
	01/21/09		19.77		6.00	0.00	13.77
	01/30/09		19.77		5.91	0.00	13.86
	02/02/09		19.77		5.89	0.00	13.88
	02/09/09		19.77	6.09	6.12	0.03	13.65
	02/16/09		19.77	6.21	6.23	0.02	13.54
	02/25/09		19.77	6.21	6.23	0.02	13.54
	03/04/09		19.77	6.01	6.03	0.02	13.74
	03/09/09		19.77	5.90	5.95	0.05	13.82
	03/17/09		19.77	5.54	5.55	0.01	14.22
	03/26/09		19.77	6.30	6.41	0.11	13.36
	04/01/09		19.77		5.82	0.00	13.95
	04/09/09		19.77	6.18	6.28	0.10	13.49
	04/13/09		19.77		5.93	0.00	13.84
	04/20/09		19.77		5.75	0.00	14.02

Groundwater Elevation and Free Product Thickness Table AS-4141

MCAS New River, North Carolina

April 2008 - April 2009

Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
USTAS4141-MW19	06/13/08	2	20.45		6.48	0.00	13.97
	06/25/08		20.45		6.69	0.00	13.76
	06/30/08		20.45		6.72	0.00	13.73
	07/01/08		20.45		NG	0.00	
	07/08/08		20.45		6.95	0.00	13.50
	07/17/08		20.45		6.82	0.00	13.63
	07/22/08		20.45		6.90	0.00	13.55
	07/29/08		20.45		6.54	0.00	13.91
	08/15/08		20.45		6.33	0.00	14.12
	08/22/08		20.45		6.47	0.00	13.98
	08/29/08		20.45		NG	0.00	
	09/10/08		20.45		6.22	0.00	14.23
	09/19/08		20.45		6.50	0.00	13.95
	10/02/08		20.45		6.50	0.00	13.95
	10/22/08		20.45		6.54	0.00	13.91
	10/29/08		20.45		6.54	0.00	13.91
	11/04/08		20.45		6.74	0.00	13.71
	11/12/08		20.45		6.36	0.00	14.09
	11/21/08		20.45		6.33	0.00	14.12
	11/25/08		20.45		6.64	0.00	13.81
	12/01/08		20.45		6.49	0.00	13.96
	12/08/08		20.45		5.65	0.00	14.80
	12/15/08		20.45		6.05	0.00	14.40
	12/22/08		20.45		6.03	0.00	14.42
	12/29/08		20.45		5.95	0.00	14.50
	01/05/09		20.45		6.09	0.00	14.36
	01/14/09		20.45		6.18	0.00	14.27
	01/21/09		20.45		6.05	0.00	14.40
	01/30/09		20.45		5.99	0.00	14.46
	02/02/09		20.45		6.51	0.00	13.94
	02/09/09		20.45		6.21	0.00	14.24
	02/16/09		20.45		6.31	0.00	14.14
	02/25/09		20.45		6.04	0.00	14.41
	03/04/09		20.45		6.74	0.00	13.71
	03/09/09		20.45		5.78	0.00	14.67
	03/17/09		20.45		5.63	0.00	14.82
	03/26/09		20.45		5.98	0.00	14.47
	04/01/09		20.45		5.54	0.00	14.91
	04/09/09		20.45		5.54	0.00	14.91
	04/13/09		20.45		5.71	0.00	14.74
	04/20/09		20.45		5.64	0.00	14.81
USTAS4141-MW20	06/13/08	2	19.58	6.06	7.50	1.44	12.08

Groundwater Elevation and Free Product Thickness Table
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MCAS New River, North Carolina
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Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
	06/25/08		19.58	6.43	7.00	0.57	12.58
	06/30/08		19.58	6.48	6.78	0.30	12.80
	07/01/08		19.58	6.60	6.96	0.36	12.62
	07/08/08		19.58	6.62	6.87	0.25	12.71
	07/17/08		19.58	6.60	6.85	0.25	12.73
	07/22/08		19.58	6.68	6.83	0.15	12.75
	07/29/08		19.58	6.40	6.53	0.13	13.05
	08/15/08		19.58	6.21	6.22	0.01	13.36
	08/22/08		19.58		6.37	0.00	13.21
	08/29/08		19.58	6.28	6.33	0.05	13.25
	09/10/08		19.58	6.17	6.23	0.06	13.35
	09/19/08		19.58		NG	0.00	
	10/02/08		19.58	6.50	6.60	0.10	12.98
	10/22/08		19.58	6.60	6.72	0.12	12.86
	10/29/08		19.58	6.64	6.79	0.15	12.79
	11/04/08		19.58	7.99	8.11	0.12	11.47
	11/12/08		19.58	6.65	6.81	0.16	12.77
	11/21/08		19.58		6.90	0.00	12.68
	11/25/08		19.58		7.09	0.00	12.49
	12/01/08		19.58	6.71	6.79	0.08	12.79
	12/08/08		19.58	6.79	6.92	0.13	12.66
	12/15/08		19.58	6.25	6.28	0.03	13.30
	12/22/08		19.58	6.26	6.48	0.22	13.10
	12/29/08		19.58	6.19	6.25	0.06	13.33
	01/05/09		19.58	6.15	6.30	0.15	13.28
	01/14/09		19.58	5.91	6.04	0.13	13.54
	01/21/09		19.58	6.23	6.25	0.02	13.33
	01/30/09		19.58	6.16	6.26	0.10	13.32
	02/02/09		19.58	6.11	6.22	0.11	13.36
	02/09/09		19.58	6.32	6.51	0.19	13.07
	02/16/09		19.58	6.41	6.71	0.30	12.87
	02/25/09		19.58	6.34	6.55	0.21	13.03
	03/04/09		19.58	6.16	6.30	0.14	13.28
	03/09/09		19.58	6.11	6.21	0.10	13.37
	03/17/09		19.58	6.18	6.30	0.12	13.28
	03/26/09		19.58	6.20	6.35	0.15	13.23
	04/01/09		19.58	5.99	6.23	0.24	13.35
	04/09/09		19.58	5.94	6.10	0.16	13.48
	04/13/09		19.58	6.01	6.18	0.17	13.40
	04/20/09		19.58	5.91	5.99	0.08	13.59

Groundwater Elevation and Free Product Thickness Table
AS-4141
MCAS New River, North Carolina
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Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
USTAS4141-MW21	06/13/08	2	19.59	6.34	6.90	0.56	12.69
	06/25/08		19.59	6.50	6.90	0.40	12.69
	06/30/08		19.59	6.52	6.72	0.20	12.87
	07/01/08		19.59	6.66	6.83	0.17	12.76
	07/08/08		19.59	6.70	6.91	0.21	12.68
	07/17/08		19.59	6.64	6.81	0.17	12.78
	07/22/08		19.59	6.68	6.80	0.12	12.79
	07/29/08		19.59	6.39	7.20	0.81	12.39
	08/15/08		19.59	6.20	6.33	0.13	13.26
	08/22/08		19.59	6.37	6.57	0.20	13.02
	08/29/08		19.59	6.27	6.35	0.08	13.24
	09/10/08		19.59	6.15	6.31	0.16	13.28
	09/19/08		19.59		NG	0.00	
	10/02/08		19.59	6.50	6.58	0.08	13.01
	10/22/08		19.59	6.62	6.72	0.10	12.87
	10/29/08		19.59	6.65	6.74	0.09	12.85
	11/04/08		19.59		7.13	0.00	12.46
	11/12/08		19.59	6.64	6.75	0.11	12.84
	11/21/08		19.59	6.67	6.71	0.04	12.88
	11/25/08		19.59	6.82	6.85	0.03	12.74
	12/01/08		19.59	6.64	6.84	0.20	12.75
	12/08/08		19.59	6.71	6.99	0.28	12.60
	12/15/08		19.59	6.22	6.35	0.13	13.24
	12/22/08		19.59	6.29	6.42	0.13	13.17
	12/29/08		19.59	6.39	6.51	0.12	13.08
	01/05/09		19.59	6.29	6.44	0.15	13.15
	01/14/09		19.59	6.34	6.52	0.18	13.07
	01/21/09		19.59		6.21	0.00	13.38
	01/30/09		19.59	6.15	6.22	0.07	13.37
	02/02/09		19.59	6.29	6.43	0.14	13.16
	02/09/09		19.59	6.39	6.60	0.21	12.99
	02/16/09		19.59		6.53	0.00	13.06
	02/25/09		19.59	6.36	6.49	0.13	13.10
	03/04/09		19.59	6.33	6.40	0.07	13.19
	03/09/09		19.59	6.37	6.45	0.08	13.14
	03/17/09		19.59	6.20	6.28	0.08	13.31
	03/26/09		19.59	6.30	6.41	0.11	13.18
	04/01/09		19.59	6.15	6.25	0.10	13.34
	04/09/09		19.59	6.06	6.17	0.11	13.42
	04/13/09		19.59	6.18	6.25	0.07	13.34
	04/20/09		19.59	6.12	6.20	0.08	13.39
USTAS4141-OBG03R	06/13/08	2	20.63	6.91	7.12	0.21	13.51

**Groundwater Elevation and Free Product Thickness Table
AS-4141
MCAS New River, North Carolina
April 2008 - April 2009**

Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
	06/25/08		20.63	7.13	7.30	0.17	13.33
	06/30/08		20.63	7.15	7.23	0.08	13.40
	07/01/08		20.63	7.28	7.42	0.14	13.21
	07/08/08		20.63	7.28	7.31	0.03	13.32
	07/17/08		20.63	7.26	7.30	0.04	13.33
	07/22/08		20.63	7.25	7.29	0.04	13.34
	07/29/08		20.63	6.97	7.01	0.04	13.62
	08/15/08		20.63	6.58	6.59	0.01	14.04
	08/22/08		20.63	6.98	7.03	0.05	13.60
	08/29/08		20.63	6.86	6.87	0.01	13.76
	09/10/08		20.63	6.73	6.76	0.03	13.87
	09/19/08		20.63		NG	0.00	
	10/02/08		20.63	7.13	7.14	0.01	13.49
	10/22/08		20.63	7.15	7.17	0.02	13.46
	10/29/08		20.63	7.14	7.15	0.01	13.48
	11/04/08		20.63		7.50	0.00	13.13
	11/12/08		20.63		7.06	0.00	13.57
	11/21/08		20.63		NG	0.00	
	11/25/08		20.63	7.44	7.49	0.05	13.14
	12/01/08		20.63	7.2	7.30	0.10	13.33
	12/08/08		20.63	7.29	7.31	0.02	13.32
	12/15/08		20.63	6.65	6.80	0.15	13.83
	12/22/08		20.63	6.7	6.79	0.09	13.84
	12/29/08		20.63		6.31	0.00	14.32
	01/05/09		20.63	6.42	6.49	0.07	14.14
	01/14/09		20.63		6.79	0.00	13.84
	01/21/09		20.63		6.68	0.00	13.95
	01/30/09		20.63		6.59	0.00	14.04
	02/02/09		20.63		6.56	0.00	14.07
	02/09/09		20.63		6.74	0.00	13.89
	02/16/09		20.63		6.85	0.00	13.78
	02/25/09		20.63	6.74	6.75	0.01	13.88
	03/04/09		20.63	6.54	6.55	0.01	14.08
	03/09/09		20.63		6.50	0.00	14.13
	03/17/09		20.63		6.55	0.00	14.08
	03/26/09		20.63		6.82	0.00	13.81
	04/01/09		20.63		6.31	0.00	14.32
	04/09/09		20.63		6.44	0.00	14.19
	04/13/09		20.63		6.48	0.00	14.15
	04/20/09		20.63	6.18	6.71	0.53	13.92
USTAS4141-OBG06	06/13/08	2	20.88		5.49	0.00	15.39
	06/25/08		20.88		5.73	0.00	15.15

TABLE 312
Groundwater Elevation and Free Product Thickness Table
AS-4141
MCAS New River, North Carolina
April 2008 - April 2009

Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
	06/30/08		20.88		5.83	0.00	15.05
	07/01/08		20.88		NG	0.00	
	07/08/08		20.88		5.92	0.00	14.96
	07/17/08		20.88		5.20	0.00	15.68
	07/22/08		20.88		5.68	0.00	15.20
	07/29/08		20.88		NG	0.00	
	08/15/08		20.88		3.80	0.00	17.08
	08/22/08		20.88		NG	0.00	
	08/29/08		20.88		3.94	0.00	16.94
	09/10/08		20.88		4.80	0.00	16.08
	09/19/08		20.88		5.41	0.00	15.47
	10/02/08		20.88		4.54	0.00	16.34
	10/22/08		20.88		4.63	0.00	16.25
	10/29/08		20.88		6.55	0.00	14.33
	11/04/08		20.88		3.88	0.00	17.00
	11/12/08		20.88		5.13	0.00	15.75
	11/21/08		20.88		5.31	0.00	15.57
	11/25/08		20.88		5.63	0.00	15.25
	12/01/08		20.88		5.74	0.00	15.14
	12/08/08		20.88		5.60	0.00	15.28
	12/15/08		20.88		4.31	0.00	16.57
	12/22/08		20.88		4.46	0.00	16.42
	12/29/08		20.88		5.05	0.00	15.83
	01/05/09		20.88		5.09	0.00	15.79
	01/14/09		20.88		4.96	0.00	15.92
	01/21/09		20.88		4.55	0.00	16.33
	01/30/09		20.88		4.59	0.00	16.29
	02/02/09		20.88		4.66	0.00	16.22
	02/09/09		20.88		5.28	0.00	15.60
	02/16/09		20.88		5.57	0.00	15.31
	02/25/09		20.88		5.81	0.00	15.07
	03/04/09		20.88		4.16	0.00	16.72
	03/09/09		20.88		4.76	0.00	16.12
	03/17/09		20.88		5.28	0.00	15.60
	03/26/09		20.88		5.27	0.00	15.61
	04/01/09		20.88		4.31	0.00	16.57
	04/09/09		20.88		4.99	0.00	15.89
	04/13/09		20.88		5.34	0.00	15.54
	04/20/09		20.88		4.09	0.00	16.79
USTAS4141-RW01	06/13/08	6	18.70	5.45	5.46	0.01	13.24
	06/25/08		18.70	5.98	6.00	0.02	12.70

Groundwater Elevation and Free Product Thickness Table
AS-4141
MCAS New River, North Carolina
April 2008 - April 2009

Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
	06/30/08		18.70		5.65	0.00	13.05
	07/01/08		18.70	5.79	5.80	0.01	12.90
	07/08/08		18.70		5.82	0.00	12.88
	07/17/08		18.70	5.81	5.82	0.01	12.88
	07/22/08		18.70	5.83	5.84	0.01	12.86
	07/29/08		18.70	5.46	5.48	0.02	13.22
	08/15/08		18.70	5.38	5.39	0.01	13.31
	08/22/08		18.70	5.61	5.68	0.07	13.02
	08/29/08		18.70	5.38	5.46	0.08	13.24
	09/10/08		18.70	5.28	5.41	0.13	13.29
	09/19/08		18.70		NG	0.00	
	10/02/08		18.70	5.65	5.67	0.02	13.03
	10/22/08		18.70	5.73	5.80	0.07	12.90
	10/29/08		18.70	5.83	5.89	0.06	12.81
	11/04/08		18.70		Closed	0.00	Well closed
	11/12/08		18.70			0.00	18.70
	11/21/08		18.70			0.00	18.70
	11/25/08		18.70			0.00	18.70
	12/01/08		18.70			0.00	18.70
	12/08/08		18.70			0.00	18.70
	12/15/08		18.70			0.00	18.70
	12/22/08		18.70			0.00	18.70
	12/29/08		18.70			0.00	18.70
	01/05/09		18.70			0.00	18.70
	01/14/09		18.70			0.00	18.70
	01/21/09		18.70			0.00	18.70
	01/30/09		18.70			0.00	18.70
	02/02/09		18.70			0.00	18.70
	02/09/09		18.70			0.00	18.70
	02/16/09		18.70			0.00	18.70
	02/25/09		18.70			0.00	18.70
	03/04/09		18.70			0.00	18.70
	03/09/09		18.70			0.00	18.70
	03/17/09		18.70			0.00	18.70
	03/26/09		18.70			0.00	18.70
	04/01/09		18.70			0.00	18.70
	04/09/09		18.70			0.00	18.70
	04/13/09		18.70			0.00	18.70
	04/20/09		18.70			0.00	18.70
USTAS4141-TPZ01	06/13/08	1	20.40	6.48	6.75	0.27	13.65
	06/25/08		20.40	6.91	7.50	0.59	12.90
	06/30/08		20.40	6.96	7.33	0.37	13.07

Groundwater Elevation and Free Product Thickness Table
AS-4141
MCAS New River, North Carolina
April 2008 - April 2009

Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
	07/01/08		20.40	7.01	7.51	0.50	12.89
	07/08/08		20.40	7.10	7.49	0.39	12.91
	07/17/08		20.40	7.00	7.38	0.38	13.02
	07/22/08		20.40	7.10	7.48	0.38	12.92
	07/29/08		20.40	6.38	6.41	0.03	13.99
	08/15/08		20.40	6.45	6.68	0.23	13.72
	08/22/08		20.40	6.78	6.95	0.17	13.45
	08/29/08		20.40	6.48	6.58	0.10	13.82
	09/10/08		20.40	6.42	6.52	0.10	13.88
	09/19/08		20.40		NG	0.00	
	10/02/08		20.40	6.88	7.18	0.30	13.22
	10/22/08		20.40	7.05	7.31	0.26	13.09
	10/29/08		20.40	5.83	5.89	0.06	14.51
	11/04/08		20.40	8.80	9.03	0.23	11.37
	11/12/08		20.40	7.01	7.35	0.34	13.05
	11/21/08		20.40		7.21	0.00	13.19
	11/25/08		20.40		7.31	0.00	13.09
	12/01/08		20.40	7.05	7.19	0.14	13.21
	12/08/08		20.40	7.14	7.49	0.35	12.91
	12/15/08		20.40	6.57	6.79	0.22	13.61
	12/22/08		20.40	6.54	6.81	0.27	13.59
	12/29/08		20.40	6.49	6.76	0.27	13.64
	01/05/09		20.40	6.49	6.69	0.20	13.71
	01/14/09		20.40	6.61	6.82	0.21	13.58
	01/21/09		20.40	6.50	6.51	0.01	13.89
	01/30/09		20.40	6.44	6.61	0.17	13.79
	02/02/09		20.40	6.44	6.53	0.09	13.87
	02/09/09		20.40	6.64	6.82	0.18	13.58
	02/16/09		20.40	6.80	7.03	0.23	13.37
	02/25/09		20.40	6.68	6.89	0.21	13.51
	03/04/09		20.40	6.47	6.61	0.14	13.79
	03/09/09		20.40	6.43	6.52	0.09	13.88
	03/17/09		20.40	6.54	6.67	0.13	13.73
	03/26/09		20.40	6.60	6.72	0.12	13.68
	04/01/09		20.40	6.34	6.36	0.02	14.04
	04/09/09		20.40	6.33	6.42	0.09	13.98
	04/13/09		20.40	6.42	6.54	0.12	13.86
	04/20/09		20.40	6.22	6.23	0.01	14.17
USTAS4141-TPZ02	06/13/08	1	20.24		5.90	0.00	14.34
	06/25/08		20.24		6.75	0.00	13.49
	06/30/08		20.24		6.77	0.00	13.47
	07/01/08		20.24		NG	0.00	

Groundwater Elevation and Free Product Thickness Table
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MCAS New River, North Carolina
April 2008 - April 2009

Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
	07/08/08		20.24		6.91	0.00	13.33
	07/17/08		20.24		6.82	0.00	13.42
	07/22/08		20.24		6.92	0.00	13.32
	07/29/08		20.24	5.75	5.77	0.02	14.47
	08/15/08		20.24		6.47	0.00	13.77
	08/22/08		20.24	6.65	6.66	0.01	13.58
	08/29/08		20.24		6.48	0.00	13.76
	09/10/08		20.24		6.40	0.00	13.84
	09/19/08		20.24		NG	0.00	
	10/02/08		20.24		6.75	0.00	13.49
	10/22/08		20.24		6.86	0.00	13.38
	10/29/08		20.24		6.45	0.00	13.79
	11/04/08		20.24		8.74	0.00	11.50
	11/12/08		20.24		6.90	0.00	13.34
	11/21/08		20.24		7.11	0.00	13.13
	11/25/08		20.24		7.23	0.00	13.01
	12/01/08		20.24		6.95	0.00	13.29
	12/08/08		20.24	7.02	7.04	0.02	13.20
	12/15/08		20.24		6.52	0.00	13.72
	12/22/08		20.24		6.52	0.00	13.72
	12/29/08		20.24		6.42	0.00	13.82
	01/05/09		20.24		6.41	0.00	13.83
	01/14/09		20.24		6.54	0.00	13.70
	01/21/09		20.24		6.45	0.00	13.79
	01/30/09		20.24		6.40	0.00	13.84
	02/02/09		20.24		6.36	0.00	13.88
	02/09/09		20.24		6.56	0.00	13.68
	02/16/09		20.24	6.64	6.82	0.18	13.42
	02/25/09		20.24	6.57	6.58	0.01	13.66
	03/04/09		20.24	6.38	6.44	0.06	13.80
	03/09/09		20.24	6.35	6.37	0.02	13.87
	03/17/09		20.24	6.41	6.49	0.08	13.75
	03/26/09		20.24	6.50	6.59	0.09	13.65
	04/01/09		20.24	6.20	6.26	0.06	13.98
	04/09/09		20.24	6.20	6.30	0.10	13.94
	04/13/09		20.24	6.26	6.42	0.16	13.82
	04/20/09		20.24	6.11	6.12	0.01	14.12
USTAS4141-TPZ03	06/13/08	1	20.36	5.68	11.28	5.60	9.08
	06/25/08		20.36	6.73	7.88	1.15	12.48
	06/30/08		20.36	6.81	7.40	0.59	12.96
	07/01/08		20.36	6.92	7.56	0.64	12.80
	07/08/08		20.36	7	7.51	0.51	12.85

Groundwater Elevation and Free Product Thickness Table

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MCAS New River, North Carolina

April 2008 - April 2009

Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
	07/17/08		20.36	6.92	7.58	0.66	12.78
	07/22/08		20.36	6.96	7.62	0.66	12.74
	07/29/08		20.36	6.98	7.50	0.52	12.86
	08/15/08		20.36	6.55	6.94	0.39	13.42
	08/22/08		20.36	6.75	7.15	0.40	13.21
	08/29/08		20.36	6.61	6.95	0.34	13.41
	09/10/08		20.36	6.5	6.87	0.37	13.49
	09/19/08		20.36		NG	0.00	
	10/02/08		20.36	6.83	7.20	0.37	13.16
	10/22/08		20.36	6.94	7.33	0.39	13.03
	10/29/08		20.36	6.94	7.34	0.40	13.02
	11/04/08		20.36	8.72	9.21	0.49	11.15
	11/12/08		20.36	5.88	6.16	0.28	14.20
	11/21/08		20.36	7.15	7.38	0.23	12.98
	11/25/08		20.36	7.34	7.59	0.25	12.77
	12/01/08		20.36	6.84	8.32	1.48	12.04
	12/08/08		20.36	6.85	8.29	1.44	12.07
	12/15/08		20.36	6.4	7.84	1.44	12.52
	12/22/08		20.36	6.61	7.51	0.90	12.85
	12/29/08		20.36	6.39	7.39	1.00	12.97
	01/05/09		20.36	6.39	7.41	1.02	12.95
	01/14/09		20.36	6.58	7.48	0.90	12.88
	01/21/09		20.36	6.5	7.35	0.85	13.01
	01/30/09		20.36	6.46	6.99	0.53	13.37
	02/02/09		20.36	6.42	6.82	0.40	13.54
	02/09/09		20.36	6.65	7.11	0.46	13.25
	02/16/09		20.36	6.74	7.23	0.49	13.13
	02/25/09		20.36	6.63	7.23	0.60	13.13
	03/04/09		20.36	6.48	6.98	0.50	13.38
	03/09/09		20.36	6.41	6.88	0.47	13.48
	03/17/09		20.36	6.72	7.01	0.29	13.35
	03/26/09		20.36	6.52	7.05	0.53	13.31
	04/01/09		20.36	6.35	6.71	0.36	13.65
	04/09/09		20.36	6.32	6.69	0.37	13.67
	04/13/09		20.36	6.39	6.69	0.30	13.67
	04/20/09		20.36	6.23	6.53	0.30	13.83
USTAS4141-TPZ04	06/13/08	1	20.17	6.04	6.28	0.24	13.89
	06/25/08		20.17	6.06	6.25	0.19	13.92
	06/30/08		20.17	6.06	6.17	0.11	14.00
	07/01/08		20.17	6.10	6.33	0.23	13.84
	07/08/08		20.17	6.03	6.20	0.17	13.97
	07/17/08		20.17	5.58	6.21	0.63	13.96

Groundwater Elevation and Free Product Thickness Table
AS-4141
MCAS New River, North Carolina
April 2008 - April 2009

Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
	07/22/08		20.17	5.93	6.08	0.15	14.09
	07/29/08		20.17	5.87	5.89	0.02	14.28
	08/15/08		20.17	5.90	5.95	0.05	14.22
	08/22/08		20.17	5.90	6.12	0.22	14.05
	08/29/08		20.17	5.85	6.50	0.65	13.67
	09/10/08		20.17	5.77	6.60	0.83	13.57
	09/19/08		20.17		NG	0.00	
	10/02/08		20.17	5.90	6.18	0.28	13.99
	10/22/08		20.17	5.81	6.60	0.79	13.57
	10/29/08		20.17	5.75	6.60	0.85	13.57
	11/04/08		20.17	5.85	6.40	0.55	13.77
	11/12/08		20.17	5.88	6.16	0.28	14.01
	11/21/08		20.17	5.99	6.67	0.68	13.50
	11/25/08		20.17	6.20	6.55	0.35	13.62
	12/01/08		20.17	6.14	6.65	0.51	13.52
	12/08/08		20.17	6.15	6.49	0.34	13.68
	12/15/08		20.17	5.91	6.62	0.71	13.55
	12/22/08		20.17	6.01	6.65	0.64	13.52
	12/29/08		20.17	5.99	6.59	0.60	13.58
	01/05/09		20.17	6.00	6.61	0.61	13.56
	01/14/09		20.17	6.00	6.55	0.55	13.62
	01/21/09		20.17	6.01	6.60	0.59	13.57
	01/30/09		20.17	6.01	6.59	0.58	13.58
	02/02/09		20.17	6.08	6.37	0.29	13.80
	02/09/09		20.17	6.11	6.54	0.43	13.63
	02/16/09		20.17	6.11	6.51	0.40	13.66
	02/25/09		20.17	6.08	6.48	0.40	13.69
	03/04/09		20.17	5.97	6.40	0.43	13.77
	03/09/09		20.17	5.96	6.45	0.49	13.72
	03/17/09		20.17	5.98	6.58	0.60	13.59
	03/26/09		20.17	6.00	6.52	0.52	13.65
	04/01/09		20.17	5.82	6.42	0.60	13.75
	04/09/09		20.17	5.82	6.64	0.82	13.53
	04/13/09		20.17	5.86	6.46	0.60	13.71
	04/20/09		20.17	5.80	6.45	0.65	13.72
USTAS141-TPZ05	06/13/08	1	20.26	5.75	10.61	4.86	9.65
	06/25/08		20.26	6.58	8.10	1.52	12.16
	06/30/08		20.26	6.75	7.52	0.77	12.74
	07/01/08		20.26	6.81	7.72	0.91	12.54
	07/08/08		20.26	6.12	6.15	0.03	14.11
	07/17/08		20.26	6.85	7.52	0.67	12.74
	07/22/08		20.26	6.91	7.53	0.62	12.73

Groundwater Elevation and Free Product Thickness Table
AS-4141
MCAS New River, North Carolina
April 2008 - April 2009

Monitoring Well	Date	Well Diameter	TOC Elevation	Depth to Product from TOC	Depth to Water from TOC	Free Product Thickness	Groundwater Elevation
	07/29/08		20.26	6.11	6.18	0.07	14.08
	08/15/08		20.26	6.06	6.20	0.14	14.06
	08/22/08		20.26	6.62	7.19	0.57	13.07
	08/29/08		20.26	6.51	7.00	0.49	13.26
	09/10/08		20.26	6.35	7.09	0.74	13.17
	09/19/08		20.26		NG	0.00	
	10/02/08		20.26		NG	0.00	
	10/22/08		20.26		NG	0.00	
	10/29/08		20.26	6.91	8.00	1.09	12.26
	11/04/08		20.26	7.64	8.42	0.78	11.84
	11/12/08		20.26		6.89	0.00	13.37
	11/21/08		20.26	6.91	7.35	0.44	12.91
	11/25/08		20.26	7.04	7.59	0.55	12.67
	12/01/08		20.26	6.89	7.41	0.52	12.85
	12/08/08		20.26	6.95	7.42	0.47	12.84
	12/15/08		20.26	6.50	6.70	0.20	13.56
	12/22/08		20.26	6.55	6.68	0.13	13.58
	12/29/08		20.26	6.35	6.95	0.60	13.31
	01/05/09		20.26	6.34	7.10	0.76	13.16
	01/14/09		20.26	6.55	7.10	0.55	13.16
	01/21/09		20.26	6.38	6.95	0.57	13.31
	01/30/09		20.26	6.41	6.69	0.28	13.57
	02/02/09		20.26	6.41	6.94	0.53	13.32
	02/09/09		20.26	6.51	7.14	0.63	13.12
	02/16/09		20.26	6.62	7.31	0.69	12.95
	02/25/09		20.26	6.65	7.41	0.76	12.85
	03/04/09		20.26	6.59	7.15	0.56	13.11
	03/09/09		20.26	6.32	6.84	0.52	13.42
	03/17/09		20.26	7.05	7.42	0.37	12.84
	03/26/09		20.26	6.40	7.09	0.69	13.17
	04/01/09		20.26	6.42	7.11	0.69	13.15
	04/09/09		20.26	6.17	6.83	0.66	13.43
	04/13/09		20.26	6.32	6.83	0.51	13.43
	04/20/09		20.26	6.18	6.71	0.53	13.55

APPENDIX B

2009 GROUNDWATER SAMPLE COLLECTION FIELD LOGS



Tubing Diameter: 3/8
 Depth to Groundwater: 3.38
 Well Depth: 14.85
 Feet of Water: 11.47
 Volume of Water in Well: 1.85

[illegible]

Approx. Purge Rate: 100 ml/min
Approx. Well Volume: 1.85
Total Volume Purged: 2.5
Well Volume (gal.) (2" well)= (ft of water)(0.163)

Comments: Sampled at 905



Tubing Diameter: $\frac{3}{8}$
 Depth to Groundwater: 5.31
 Well Depth: 24.83
 Feet of Water: 19.54
 Volume of Water in Well: 3.16

[illegible]

Approx. Purge Rate: 400 ml/min
 Approx. Well Volume: 7.5
 Total Volume Purged: 6
 Well Volume (gal.) (2" well)= (ft of water)(0.163)

Comments: ST 9:55



Tubing Diameter: 3/8
 Depth to Groundwater: 55
 Well Depth: 15
 Feet of Water: 9.5
 Volume of Water in Well: 3.18

[illegible]

Approx. Purge Rate: 460 ml/min
 Approx. Well Volume: 3.16
 Total Volume Purged: 8
 Well Volume (gal.) (2" well) = (ft of water)(0.163)

admin/forms/environmental/Low Flow Purging Form

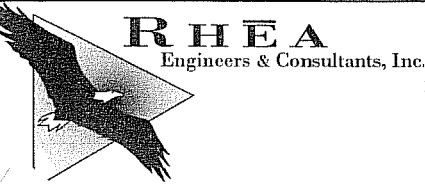


Tubing Diameter: 3/8
 Depth to Groundwater: 3.56
 Well Depth: 7
 Feet of Water: 3.5
 Volume of Water in Well: 1.18

$$\text{Gallons} = (\text{ft of water} * 3.14 * (\text{half well diam}/12) * (\text{half well diam}/12) * 7.48)$$
[illegible]

Approx. Purge Rate: 250 ml/min
 Approx. Well Volume: 1.13
 Total Volume Purged: 5
 Well Volume (gal.) (2" well)= (ft of water)(0.163)

Comments: Dry at 11:55 waited 15 min took sample.
ST 12:15



WELL PURGING RECORD LOW-FLOW SAMPLING

Site: 4141
Project No.: 438
Sampling Device: Pacostat/c
Date: 9/24/09
Well I.D.: 45TAS 4141 - 0401

Tubing Diameter: 3/8
Depth to Groundwater: 5.25
Well Depth: 24.6
Feet of Water: 19.35
Volume of Water in Well: 3.13

Gallons = (ft of water * 3.14 * (half well diam/12) * (half well diam/12) * 7.48)

Time	Depth to Water (ft TOR)	pH (s.u.)	Specific Conductance (/)	Temperature (C)	Dissolved Oxygen (ppm)	Turbidity (NTU)	Redox (mV)
12:35		5.63	1537	23.36	1.05	1.42	-8.0
12:40		5.39	1528	23.20	1.00	1.89	+10.4
12:45		5.26	1523	23.14	.72	1.02	-9.4
12:50		5.13	1513	23.08	1.58	1.05	-5.7
12:55		4.99	1500	23.12	1.22	.81	-1.8
13:00		4.93	1494	23.05	1.21	1.44	+0.9
13:05		4.86	1491	23.17	1.21	2.06	+3.2
13:10		4.76	1485	23.04	1.21	1.63	+5.7
13:15		4.69	1485	23.11	1.21	1.41	+7.3
13:20		4.61	1484	23.12	1.22	1.01	+8.4
13:25		4.55	1482	23.06	1.21	1.52	+10.5
13:30		4.53	1482	22.99	1.21	1.05	+11.2

Purge Start Time: 12:30
Purge End Time: 13:30
Sampler: 65

Approx. Purge Rate: 400 ml/min
Approx. Well Volume: 3.13
Total Volume Purged: 10
Well Volume (gal.) (2" well) = (ft of water)(0.163)

Weather: Sunny

Comments: ST 13:35



Tubing Diameter: $\frac{3}{8}$
 Depth to Groundwater: 0
 Well Depth: 7.4
 Feet of Water: 7.4
 Volume of Water in Well: _____

[illegible]

Approx. Purge Rate: 250 ml/min
 Approx. Well Volume: 2.4
 Total Volume Purged: 5
 Well Volume (gal.) (2" well)= (ft of water)(0.163)

Comments: ST 9:55



Tubing Diameter: 3/8
 Depth to Groundwater: 5.61
 Well Depth: 64.45
 Feet of Water: 9.84
 Volume of Water in Well:

[illegible]

Approx. Purge Rate: 500 ml/min

Approx. Well Volume: 1.5

Total Volume Purged: 5

Well Volume (gal.) (2" well)=(ft of water)(0.163)

Comments:

admin/forms/environmental/Low Flow Purging Form



Tubing Diameter: 3/8
 Depth to Groundwater: 0.0
 Well Depth: 7.40
 Feet of Water: 7.40
 Volume of Water in Well: 1.2

$$\text{Gallons} = (\text{ft of water} * 3.14 * (\text{half well diam}/12) * (\text{half well diam}/12) * 7.48)$$

Purge Start Time: 1115
Purge End Time: 1205
Sampler: B16

Approx. Purge Rate: 180 ml/min
 Approx. Well Volume: 1.2
 Total Volume Purged: 5
 Well Volume (gal.) (2" well)= (ft of water)(0.163)

admin/forms/environmental/Low Flow Purging Form



Tubing Diameter: $\frac{3}{8}$

Depth to Groundwater: 5.35

Well Depth: 14.55

Feet of Water: 9.2

Volume of Water in Well: 1.5

[illegible]

Approx. Purge Rate: 100 ml/min
 Approx. Well Volume: 1.5
 Total Volume Purged: 3
 Well Volume (gal.) (2" well)= (ft of water)(0.163)

Comments: *sampled at 1305*



Tubing Diameter: 3/8
 Depth to Groundwater: 2.68
 Well Depth: 14.22
 Feet of Water: 11.54
 Volume of Water in Well: 1.87

$$\text{Gallons} = (\text{ft of water} * 3.14 * (\text{half well diam}/12) * (\text{half well diam}/12) * 7.48)$$

Purge Start Time: 910
Purge End Time: 750
Sampler: RDG

Approx. Purge Rate: 100 ml/min
 Approx. Well Volume: 1.87
 Total Volume Purged: 2.5
 Well Volume (gal.) (2" well)= (ft of water)(0.163)

admin/forms/environmental/Low Flow Purging Form



Tubing Diameter: $\frac{3}{8}$
 Depth to Groundwater: 6.40
 Well Depth: 18.05
 Feet of Water: 8.65
 Volume of Water in Well: 1.4

[illegible]

Approx. Purge Rate: 100 ml/min
 Approx. Well Volume: 1.5
 Total Volume Purged: 2.5
 Well Volume (gal.) (2" well)= (ft of water)(0.163)

Comments: *sampled at ~~25~~ 1050*

APPENDIX C

GROUNDWATER LABORATORY ANALYTICAL REPORTS

Results for Volatiles

by GC 602

Client Sample ID: USTAS4141-MW14

Analyzed By: DVO

Client Project ID: AS4141

Date Collected: 9/24/2009 9:55

Lab Sample ID: G910-29-1A

Date Received: 9/25/2009

Lab Project ID: G910-29

Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	1.00	1	9/30/2009
Diisopropyl ether (DIPE)	BQL	1.00	1	9/30/2009
Ethylbenzene	BQL	1.00	1	9/30/2009
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	9/30/2009
Toluene	BQL	1.00	1	9/30/2009
m/p-Xylene	BQL	2.00	1	9/30/2009
o-Xylene	BQL	2.00	1	9/30/2009

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	42.1	105

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.



Ben Grosser
Rhea Engineer & Consultants
4951 William Flynn Hwy
Gibsonia, PA 15044

Report Number: G910-29

Client Project: AS4141

Dear Ben Grosser,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. 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 services performed during this project, please call Linda McWhirter at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America, Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America, Inc.

A handwritten signature in black ink, appearing to read 'Linda McWhirter', written over a horizontal line.

Project Manager
Linda McWhirter

10/15/09

Date

List of Reporting Abbreviations And Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantification Limit (RL or MDL)

DF = Dilution Factor

Dup = Duplicate

D = Detected, but RPD is > 40% between results in dual column method.

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/CL = Reporting Limit / Control Limit

RPD = Relative Percent Difference

UJ = Target analytes with recoveries that are $10\% < \%R < LCL$; # of MEs are allowable and compounds are not detected in the sample.

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.

Results for Volatiles

by GC 602

Client Sample ID: USTAS4141-MW17

Analyzed By: DVO

Client Project ID: AS4141

Date Collected: 9/24/2009 11:15

Lab Sample ID: G910-29-2A

Date Received: 9/25/2009

Lab Project ID: G910-29

Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	1.00	1	9/30/2009
Diisopropyl ether (DIPE)	BQL	1.00	1	9/30/2009
Ethylbenzene	2.03	1.00	1	9/30/2009
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	9/30/2009
Toluene	BQL	1.00	1	9/30/2009
m/p-Xylene	3.29	2.00	1	9/30/2009
o-Xylene	BQL	2.00	1	9/30/2009

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	43.3	108

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Results for Volatiles

by GC 602

Client Sample ID: USTAS4141-RW04

Analyzed By: DVO

Client Project ID: AS4141

Date Collected: 9/24/2009 12:15

Lab Sample ID: G910-29-3A

Date Received: 9/25/2009

Lab Project ID: G910-29

Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	1.00	1	9/30/2009
Diisopropyl ether (DIPE)	BQL	1.00	1	9/30/2009
Ethylbenzene	BQL	1.00	1	9/30/2009
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	9/30/2009
Toluene	BQL	1.00	1	9/30/2009
m/p-Xylene	BQL	2.00	1	9/30/2009
o-Xylene	BQL	2.00	1	9/30/2009

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	42.2	106

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

GC-VOA_WA.XLS

Results for Volatiles

by GC 602

Client Sample ID: USTAS4141-RW01

Analyzed By: DVO

Client Project ID: AS4141

Date Collected: 9/24/2009 13:35

Lab Sample ID: G910-29-4A

Date Received: 9/25/2009

Lab Project ID: G910-29

Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	3.86	1.00	1	9/30/2009
Diisopropyl ether (DIPE)	BQL	1.00	1	9/30/2009
Ethylbenzene	5.04	1.00	1	9/30/2009
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	9/30/2009
Toluene	BQL	1.00	1	9/30/2009
m/p-Xylene	4.43	2.00	1	9/30/2009
o-Xylene	BQL	2.00	1	9/30/2009

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	42.3	106

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Results for Volatiles

by GC 602

Client Sample ID: USTAS4141-MW19

Analyzed By: DVO

Client Project ID: AS4141

Date Collected: 9/24/2009 13:05

Lab Sample ID: G910-29-5A

Date Received: 9/25/2009

Lab Project ID: G910-29

Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	1.00	1	9/30/2009
Diisopropyl ether (DIPE)	BQL	1.00	1	9/30/2009
Ethylbenzene	BQL	1.00	1	9/30/2009
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	9/30/2009
Toluene	BQL	1.00	1	9/30/2009
m/p-Xylene	BQL	2.00	1	9/30/2009
o-Xylene	BQL	2.00	1	9/30/2009

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	42.0	105

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Results for Volatiles

by GC 602

Client Sample ID: USTAS4141-RW05

Analyzed By: DVO

Client Project ID: AS4141

Date Collected: 9/24/2009 12:05

Lab Sample ID: G910-29-6A

Date Received: 9/25/2009

Lab Project ID: G910-29

Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	1.00	1	9/30/2009
Diisopropyl ether (DIPE)	BQL	1.00	1	9/30/2009
Ethylbenzene	BQL	1.00	1	9/30/2009
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	9/30/2009
Toluene	BQL	1.00	1	9/30/2009
m/p-Xylene	BQL	2.00	1	9/30/2009
o-Xylene	BQL	2.00	1	9/30/2009

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	42.2	106

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

GC-VOA_WA.XLS

Results for Volatiles

by GC 602

Client Sample ID: USTAS4141-OBG3R

Analyzed By: DVO

Client Project ID: AS4141

Date Collected: 9/24/2009 10:40

Lab Sample ID: G910-29-7A

Date Received: 9/25/2009

Lab Project ID: G910-29

Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	5.00	5	9/30/2009
Diisopropyl ether (DIPE)	BQL	5.00	5	9/30/2009
Ethylbenzene	BQL	5.00	5	9/30/2009
Methyl-tert butyl ether (MTBE)	BQL	10.0	5	9/30/2009
Toluene	BQL	5.00	5	9/30/2009
m/p-Xylene	BQL	10.0	5	9/30/2009
o-Xylene	BQL	10.0	5	9/30/2009

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	42.2	105

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

**Results for Semivolatiles
by GCMS 625 for 610 Compounds**

Client Sample ID: USTAS4141-MW14
Client Project ID: AS4141
Lab Sample ID: G910-29-1F
Lab Project ID: G910-29

Analyzed By: EAW
Date Collected: 9/24/2009 9:55
Date Received: 9/25/2009
Date Extracted: 9/28/2009
Matrix: Water

Initial/Final Amt: 940 mL / 5.0 mL

Compound	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Acenaphthene	BQL	5.32	1	10/1/2009
Acenaphthylene	BQL	5.32	1	10/1/2009
Anthracene	BQL	5.32	1	10/1/2009
Benzo[a]anthracene	BQL	5.32	1	10/1/2009
Benzo[a]pyrene	BQL	5.32	1	10/1/2009
Benzo[b]fluoranthene	BQL	5.32	1	10/1/2009
Benzo[g,h,i]perylene	BQL	5.32	1	10/1/2009
Benzo[k]fluoranthene	BQL	5.32	1	10/1/2009
Chrysene	BQL	5.32	1	10/1/2009
Dibenzo[a,h]anthracene	BQL	5.32	1	10/1/2009
Fluoranthene	BQL	5.32	1	10/1/2009
Fluorene	BQL	5.32	1	10/1/2009
Indeno(1,2,3-c,d)pyrene	BQL	5.32	1	10/1/2009
1-Methylnaphthalene	BQL	5.32	1	10/1/2009
2-Methylnaphthalene	BQL	5.32	1	10/1/2009
Naphthalene	BQL	5.32	1	10/1/2009
Phenanthrene	BQL	5.32	1	10/1/2009
Pyrene	BQL	5.32	1	10/1/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.7	77
Nitrobenzene-d5	10	8	80
4-Terphenyl-d14	10	10.3	103

Comments:

Flags:

BQL = Below Quantitation Limits.

Reviewed By: CPM

**Results for Semivolatiles
by GCMS 625 for 610 Compounds**

Client Sample ID: USTAS4141-MW17
Client Project ID: AS4141
Lab Sample ID: G910-29-2F
Lab Project ID: G910-29

Analyzed By: EAW
Date Collected: 9/24/2009 11:15
Date Received: 9/25/2009
Date Extracted: 9/28/2009
Matrix: Water

Initial/Final Amt: 918 mL / 5.0 mL

Compound	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Acenaphthene	6.81	5.45	1	10/1/2009
Acenaphthylene	7.19	5.45	1	10/1/2009
Anthracene	BQL	5.45	1	10/1/2009
Benzo[a]anthracene	BQL	5.45	1	10/1/2009
Benzo[a]pyrene	BQL	5.45	1	10/1/2009
Benzo[b]fluoranthene	BQL	5.45	1	10/1/2009
Benzo[g,h,i]perylene	BQL	5.45	1	10/1/2009
Benzo[k]fluoranthene	BQL	5.45	1	10/1/2009
Chrysene	BQL	5.45	1	10/1/2009
Dibenzo[a,h]anthracene	BQL	5.45	1	10/1/2009
Fluoranthene	BQL	5.45	1	10/1/2009
Fluorene	7.68	5.45	1	10/1/2009
Indeno(1,2,3-c,d)pyrene	BQL	5.45	1	10/1/2009
1-Methylnaphthalene	64.5	5.45	1	10/1/2009
2-Methylnaphthalene	11.2	5.45	1	10/1/2009
Naphthalene	24.1	5.45	1	10/1/2009
Phenanthrene	BQL	5.45	1	10/1/2009
Pyrene	BQL	5.45	1	10/1/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.7	77
Nitrobenzene-d5	10	8.3	83
4-Terphenyl-d14	10	10.1	101

Comments:

Flags:

BQL = Below Quantitation Limits.

Reviewed By: 

**Results for Semivolatiles
by GCMS 625 for 610 Compounds**

Client Sample ID: USTAS4141-RW04
Client Project ID: AS4141
Lab Sample ID: G910-29-3F
Lab Project ID: G910-29

Analyzed By: EAW
Date Collected: 9/24/2009 12:15
Date Received: 9/25/2009
Date Extracted: 9/28/2009
Matrix: Water

Initial/Final Amt: 891 mL / 5.0 mL

Compound	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Acenaphthene	BQL	5.61	1	10/1/2009
Acenaphthylene	BQL	5.61	1	10/1/2009
Anthracene	BQL	5.61	1	10/1/2009
Benzo[a]anthracene	BQL	5.61	1	10/1/2009
Benzo[a]pyrene	BQL	5.61	1	10/1/2009
Benzo[b]fluoranthene	BQL	5.61	1	10/1/2009
Benzo[g,h,i]perylene	BQL	5.61	1	10/1/2009
Benzo[k]fluoranthene	BQL	5.61	1	10/1/2009
Chrysene	BQL	5.61	1	10/1/2009
Dibenzo[a,h]anthracene	BQL	5.61	1	10/1/2009
Fluoranthene	BQL	5.61	1	10/1/2009
Fluorene	BQL	5.61	1	10/1/2009
Indeno(1,2,3-c,d)pyrene	BQL	5.61	1	10/1/2009
1-Methylnaphthalene	7.30	5.61	1	10/1/2009
2-Methylnaphthalene	BQL	5.61	1	10/1/2009
Naphthalene	5.72	5.61	1	10/1/2009
Phenanthrene	BQL	5.61	1	10/1/2009
Pyrene	BQL	5.61	1	10/1/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.8	78
Nitrobenzene-d5	10	9.1	91
4-Terphenyl-d14	10	10.6	106

Comments:

Flags:

BQL = Below Quantitation Limits.

Reviewed By: baw

**Results for Semivolatiles
by GCMS 625 for 610 Compounds**

Client Sample ID: USTAS4141-RW01
Client Project ID: AS4141
Lab Sample ID: G910-29-4F
Lab Project ID: G910-29

Analyzed By: EAW
Date Collected: 9/24/2009 13:35
Date Received: 9/25/2009
Date Extracted: 9/28/2009
Matrix: Water

Initial/Final Amt: 893 mL / 5.0 mL

Compound	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Acenaphthene	BQL	5.60	1	10/1/2009
Acenaphthylene	BQL	5.60	1	10/1/2009
Anthracene	BQL	5.60	1	10/1/2009
Benzo[a]anthracene	BQL	5.60	1	10/1/2009
Benzo[a]pyrene	BQL	5.60	1	10/1/2009
Benzo[b]fluoranthene	BQL	5.60	1	10/1/2009
Benzo[g,h,i]perylene	BQL	5.60	1	10/1/2009
Benzo[k]fluoranthene	BQL	5.60	1	10/1/2009
Chrysene	BQL	5.60	1	10/1/2009
Dibenzo[a,h]anthracene	BQL	5.60	1	10/1/2009
Fluoranthene	BQL	5.60	1	10/1/2009
Fluorene	7.73	5.60	1	10/1/2009
Indeno(1,2,3-c,d)pyrene	BQL	5.60	1	10/1/2009
1-Methylnaphthalene	37.7	5.60	1	10/1/2009
2-Methylnaphthalene	9.63	5.60	1	10/1/2009
Naphthalene	76.5	5.60	1	10/1/2009
Phenanthrene	BQL	5.60	1	10/1/2009
Pyrene	BQL	5.60	1	10/1/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.3	73
Nitrobenzene-d5	10	8.4	84
4-Terphenyl-d14	10	10.4	104

Comments:

Flags:

BQL = Below Quantitation Limits.

Reviewed By: EA

**Results for Semivolatiles
by GCMS 625 for 610 Compounds**

Client Sample ID: USTAS4141-MW19
Client Project ID: AS4141
Lab Sample ID: G910-29-5F
Lab Project ID: G910-29

Analyzed By: EAW
Date Collected: 9/24/2009 13:05
Date Received: 9/25/2009
Date Extracted: 9/28/2009
Matrix: Water

Initial/Final Amt: 874 mL / 5.0 mL

Compound	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Acenaphthene	BQL	5.72	1	10/1/2009
Acenaphthylene	BQL	5.72	1	10/1/2009
Anthracene	BQL	5.72	1	10/1/2009
Benzo[a]anthracene	BQL	5.72	1	10/1/2009
Benzo[a]pyrene	BQL	5.72	1	10/1/2009
Benzo[b]fluoranthene	BQL	5.72	1	10/1/2009
Benzo[g,h,i]perylene	BQL	5.72	1	10/1/2009
Benzo[k]fluoranthene	BQL	5.72	1	10/1/2009
Chrysene	BQL	5.72	1	10/1/2009
Dibenzo[a,h]anthracene	BQL	5.72	1	10/1/2009
Fluoranthene	BQL	5.72	1	10/1/2009
Fluorene	BQL	5.72	1	10/1/2009
Indeno(1,2,3-c,d)pyrene	BQL	5.72	1	10/1/2009
1-Methylnaphthalene	BQL	5.72	1	10/1/2009
2-Methylnaphthalene	BQL	5.72	1	10/1/2009
Naphthalene	BQL	5.72	1	10/1/2009
Phenanthrene	BQL	5.72	1	10/1/2009
Pyrene	BQL	5.72	1	10/1/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.9	79
Nitrobenzene-d5	10	8.4	84
4-Terphenyl-d14	10	10.2	102

Comments:

Flags:

BQL = Below Quantitation Limits.

Reviewed By: EA

**Results for Semivolatiles
by GCMS 625 for 610 Compounds**

Client Sample ID: USTAS4141-RW05
Client Project ID: AS4141
Lab Sample ID: G910-29-6F
Lab Project ID: G910-29

Analyzed By: EAW
Date Collected: 9/24/2009 12:05
Date Received: 9/25/2009
Date Extracted: 9/28/2009
Matrix: Water

Initial/Final Amt: 898 mL / 5.0 mL

Compound	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Acenaphthene	BQL	5.57	1	10/1/2009
Acenaphthylene	BQL	5.57	1	10/1/2009
Anthracene	BQL	5.57	1	10/1/2009
Benzo[a]anthracene	BQL	5.57	1	10/1/2009
Benzo[a]pyrene	BQL	5.57	1	10/1/2009
Benzo[b]fluoranthene	BQL	5.57	1	10/1/2009
Benzo[g,h,i]perylene	BQL	5.57	1	10/1/2009
Benzo[k]fluoranthene	BQL	5.57	1	10/1/2009
Chrysene	BQL	5.57	1	10/1/2009
Dibenzo[a,h]anthracene	BQL	5.57	1	10/1/2009
Fluoranthene	BQL	5.57	1	10/1/2009
Fluorene	BQL	5.57	1	10/1/2009
Indeno(1,2,3-c,d)pyrene	BQL	5.57	1	10/1/2009
1-Methylnaphthalene	7.35	5.57	1	10/1/2009
2-Methylnaphthalene	BQL	5.57	1	10/1/2009
Naphthalene	5.90	5.57	1	10/1/2009
Phenanthrene	BQL	5.57	1	10/1/2009
Pyrene	BQL	5.57	1	10/1/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.5	75
Nitrobenzene-d5	10	8.3	83
4-Terphenyl-d14	10	8	80

Comments:

Flags:

BQL = Below Quantitation Limits.

Reviewed By: 

**Results for Semivolatiles
by GCMS 625 for 610 Compounds**

Client Sample ID: USTAS4141-OBG3R
Client Project ID: AS4141
Lab Sample ID: G910-29-7F
Lab Project ID: G910-29

Analyzed By: EAW
Date Collected: 9/24/2009 10:40
Date Received: 9/25/2009
Date Extracted: 9/28/2009
Matrix: Water

Initial/Final Amt: 869 mL / 5.0 mL

Compound	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Acenaphthene	BQL	57.5	10	10/2/2009
Acenaphthylene	BQL	57.5	10	10/2/2009
Anthracene	BQL	57.5	10	10/2/2009
Benzo[a]anthracene	BQL	57.5	10	10/2/2009
Benzo[a]pyrene	BQL	57.5	10	10/2/2009
Benzo[b]fluoranthene	BQL	57.5	10	10/2/2009
Benzo[g,h,i]perylene	BQL	57.5	10	10/2/2009
Benzo[k]fluoranthene	BQL	57.5	10	10/2/2009
Chrysene	BQL	57.5	10	10/2/2009
Dibenzo[a,h]anthracene	BQL	57.5	10	10/2/2009
Fluoranthene	BQL	57.5	10	10/2/2009
Fluorene	77.7	57.5	10	10/2/2009
Indeno(1,2,3-c,d)pyrene	BQL	57.5	10	10/2/2009
1-Methylnaphthalene	162	57.5	10	10/2/2009
2-Methylnaphthalene	BQL	57.5	10	10/2/2009
Naphthalene	207	57.5	10	10/2/2009
Phenanthrene	BQL	57.5	10	10/2/2009
Pyrene	BQL	57.5	10	10/2/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	1	NA	NA
Nitrobenzene-d5	1	NA	NA
4-Terphenyl-d14	1	NA	NA

Comments:

Flags:

BQL = Below Quantitation Limits.

Reviewed By: 



Locations Nationwide

- Alaska
- New Jersey
- North Carolina
- Maryland
- New York
- Ohio

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098004

200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

White - Retained by Lab
Pink - Retained by Client



Ben Grosser
Rhea Engineer & Consultants
4951 William Flynn Hwy
Gibsonia, PA 15044

Report Number: G910-30

Client Project: AS4141

Dear Ben Grosser,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. 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 services performed during this project, please call Linda McWhirter at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America, Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America, Inc.

A handwritten signature in black ink, appearing to read 'Linda McWhirter', written over a horizontal line.

Project Manager
Linda McWhirter

A handwritten date '10/8/05' in black ink, written over a horizontal line.

Date

SGS North America, Inc.
List of Reporting Abbreviations
And Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantification Limit (RL or MDL)

DF = Dilution Factor

Dup = Duplicate

D = Detected, but RPD is > 40% between results in dual column method.

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/CL = Reporting Limit / Control Limit

RPD = Relative Percent Difference

UJ = Target analytes with recoveries that are $10\% < \%R < LCL$; # of MEs are allowable and compounds are not detected in the sample.

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.

Results for Volatiles

by GC 602

Client Sample ID: USTAS4141-MW07

Analyzed By: DVO

Client Project ID: AS4141

Date Collected: 9/25/09 9:50

Lab Sample ID: G910-30-1A

Date Received: 9/25/09

Lab Project ID: G910-30

Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	1.00	1	10/6/09
Diisopropyl ether (DIPE)	BQL	1.00	1	10/6/09
Ethylbenzene	BQL	1.00	1	10/6/09
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	10/6/09
Toluene	BQL	1.00	1	10/6/09
m/p-Xylene	BQL	2.00	1	10/6/09
o-Xylene	BQL	2.00	1	10/6/09

Surrogate Spike Recoveries

	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	43.4	109

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

GC-VOA_WA.XLS

Results for Volatiles

by GC 602

Client Sample ID: USTAS4141-MW18

Analyzed By: DVO

Client Project ID: AS4141

Date Collected: 9/25/09 10:50

Lab Sample ID: G910-30-2A

Date Received: 9/25/09

Lab Project ID: G910-30

Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	1.00	1	10/6/09
Diisopropyl ether (DIPE)	BQL	1.00	1	10/6/09
Ethylbenzene	BQL	1.00	1	10/6/09
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	10/6/09
Toluene	BQL	1.00	1	10/6/09
m/p-Xylene	BQL	2.00	1	10/6/09
o-Xylene	BQL	2.00	1	10/6/09

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	43.4	109

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

GC-VOA_WA.XLS

Results for Volatiles

by GC 602

Client Sample ID: USTAS4141-RW03

Analyzed By: DVO

Client Project ID: AS4141

Date Collected: 9/25/09 9:55

Lab Sample ID: G910-30-3A

Date Received: 9/25/09

Lab Project ID: G910-30

Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	1.00	1	10/6/09
Diisopropyl ether (DIPE)	BQL	1.00	1	10/6/09
Ethylbenzene	BQL	1.00	1	10/6/09
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	10/6/09
Toluene	BQL	1.00	1	10/6/09
m/p-Xylene	BQL	2.00	1	10/6/09
o-Xylene	BQL	2.00	1	10/6/09

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	43.0	107

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

GC-VOA_WA.XLS

Results for Volatiles

by GC 602

Client Sample ID: USTAS4141-MW16

Analyzed By: CLP

Client Project ID: AS4141

Date Collected: 9/25/09 10:40

Lab Sample ID: G910-30-4B

Date Received: 9/25/09

Lab Project ID: G910-30

Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	1.00	1	10/8/09
Diisopropyl ether (DIPE)	BQL	1.00	1	10/8/09
Ethylbenzene	4.68	1.00	1	10/8/09
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	10/8/09
Toluene	BQL	1.00	1	10/8/09
m/p-Xylene	4.91	2.00	1	10/8/09
o-Xylene	BQL	2.00	1	10/8/09

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	41.5	104

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

GC-VOA_WA.XLS

**Results for Semivolatiles
by GCMS 625 for 610 Compounds**

Client Sample ID: USTAS4141-MW07
 Client Project ID: AS4141
 Lab Sample ID: G910-30-1F
 Lab Project ID: G910-30

Analyzed By: EAW
 Date Collected: 9/25/2009 9:50
 Date Received: 9/25/2009
 Date Extracted: 9/28/2009
 Matrix: Water

Initial/Final Amt: 887 mL / 5.0 mL

Compound	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Acenaphthene	BQL	5.64	1	10/1/2009
Acenaphthylene	BQL	5.64	1	10/1/2009
Anthracene	BQL	5.64	1	10/1/2009
Benzo[a]anthracene	BQL	5.64	1	10/1/2009
Benzo[a]pyrene	BQL	5.64	1	10/1/2009
Benzo[b]fluoranthene	BQL	5.64	1	10/1/2009
Benzo[g,h,i]perylene	BQL	5.64	1	10/1/2009
Benzo[k]fluoranthene	BQL	5.64	1	10/1/2009
Chrysene	BQL	5.64	1	10/1/2009
Dibenzo[a,h]anthracene	BQL	5.64	1	10/1/2009
Fluoranthene	BQL	5.64	1	10/1/2009
Fluorene	BQL	5.64	1	10/1/2009
Indeno(1,2,3-c,d)pyrene	BQL	5.64	1	10/1/2009
1-Methylnaphthalene	BQL	5.64	1	10/1/2009
2-Methylnaphthalene	BQL	5.64	1	10/1/2009
Naphthalene	BQL	5.64	1	10/1/2009
Phenanthrene	BQL	5.64	1	10/1/2009
Pyrene	BQL	5.64	1	10/1/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.3	73
Nitrobenzene-d5	10	7.9	79
4-Terphenyl-d14	10	9.6	96

Comments:

Flags:

BQL = Below Quantitation Limits.
 J = Detected below the quantitation limit.

Reviewed By: 

**Results for Semivolatiles
by GCMS 625 for 610 Compounds**

Client Sample ID: USTAS4141-MW18
 Client Project ID: AS4141
 Lab Sample ID: G910-30-2F
 Lab Project ID: G910-30

Analyzed By: EAW
 Date Collected: 9/25/2009 10:50
 Date Received: 9/25/2009
 Date Extracted: 9/28/2009
 Matrix: Water

Initial/Final Amt: 897 mL / 5.0 mL

Compound	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Acenaphthene	BQL	5.57	1	10/1/2009
Acenaphthylene	BQL	5.57	1	10/1/2009
Anthracene	BQL	5.57	1	10/1/2009
Benzo[a]anthracene	BQL	5.57	1	10/1/2009
Benzo[a]pyrene	BQL	5.57	1	10/1/2009
Benzo[b]fluoranthene	BQL	5.57	1	10/1/2009
Benzo[g,h,i]perylene	BQL	5.57	1	10/1/2009
Benzo[k]fluoranthene	BQL	5.57	1	10/1/2009
Chrysene	BQL	5.57	1	10/1/2009
Dibenzo[a,h]anthracene	BQL	5.57	1	10/1/2009
Fluoranthene	BQL	5.57	1	10/1/2009
Fluorene	BQL	5.57	1	10/1/2009
Indeno(1,2,3-c,d)pyrene	BQL	5.57	1	10/1/2009
1-Methylnaphthalene	BQL	5.57	1	10/1/2009
2-Methylnaphthalene	BQL	5.57	1	10/1/2009
Naphthalene	BQL	5.57	1	10/1/2009
Phenanthrene	BQL	5.57	1	10/1/2009
Pyrene	BQL	5.57	1	10/1/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.6	76
Nitrobenzene-d5	10	8.4	84
4-Terphenyl-d14	10	7.7	77

Comments:

Flags:

BQL = Below Quantitation Limits.
 J = Detected below the quantitation limit.

Reviewed By: 

**Results for Semivolatiles
by GCMS 625 for 610 Compounds**

Client Sample ID: USTAS4141-RW03
 Client Project ID: AS4141
 Lab Sample ID: G910-30-3F
 Lab Project ID: G910-30

Analyzed By: EAW
 Date Collected: 9/25/2009 9:55
 Date Received: 9/25/2009
 Date Extracted: 9/28/2009
 Matrix: Water

Initial/Final Amt: 898 mL / 5.0 mL

Compound	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Acenaphthene	6.51	5.57	1	10/1/2009
Acenaphthylene	BQL	5.57	1	10/1/2009
Anthracene	BQL	5.57	1	10/1/2009
Benzo[a]anthracene	BQL	5.57	1	10/1/2009
Benzo[a]pyrene	BQL	5.57	1	10/1/2009
Benzo[b]fluoranthene	BQL	5.57	1	10/1/2009
Benzo[g,h,i]perylene	BQL	5.57	1	10/1/2009
Benzo[k]fluoranthene	BQL	5.57	1	10/1/2009
Chrysene	BQL	5.57	1	10/1/2009
Dibenzo[a,h]anthracene	BQL	5.57	1	10/1/2009
Fluoranthene	BQL	5.57	1	10/1/2009
Fluorene	7.57	5.57	1	10/1/2009
Indeno(1,2,3-c,d)pyrene	BQL	5.57	1	10/1/2009
1-Methylnaphthalene	9.52	5.57	1	10/1/2009
2-Methylnaphthalene	BQL	5.57	1	10/1/2009
Naphthalene	6.40	5.57	1	10/1/2009
Phenanthrene	BQL	5.57	1	10/1/2009
Pyrene	BQL	5.57	1	10/1/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.2	72
Nitrobenzene-d5	10	8.6	86
4-Terphenyl-d14	10	9.7	97

Comments:

Flags:

BQL = Below Quantitation Limits.
 J = Detected below the quantitation limit.

Reviewed By: 

**Results for Semivolatiles
by GCMS 625 for 610 Compounds**

Client Sample ID: USTAS4141-MW16

Client Project ID: AS4141

Lab Sample ID: G910-30-4F

Lab Project ID: G910-30

Analyzed By: EAW

Date Collected: 9/25/2009 10:40

Date Received: 9/25/2009

Date Extracted: 9/28/2009

Matrix: Water

Initial/Final Amt: 942 mL / 5.0 mL

Compound	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Acenaphthene	12.7	10.6	2	10/1/2009
Acenaphthylene	BQL	10.6	2	10/1/2009
Anthracene	BQL	10.6	2	10/1/2009
Benzo[a]anthracene	BQL	10.6	2	10/1/2009
Benzo[a]pyrene	BQL	10.6	2	10/1/2009
Benzo[b]fluoranthene	BQL	10.6	2	10/1/2009
Benzo[g,h,i]perylene	BQL	10.6	2	10/1/2009
Benzo[k]fluoranthene	BQL	10.6	2	10/1/2009
Chrysene	BQL	10.6	2	10/1/2009
Dibenzo[a,h]anthracene	BQL	10.6	2	10/1/2009
Fluoranthene	BQL	10.6	2	10/1/2009
Fluorene	14.8	10.6	2	10/1/2009
Indeno(1,2,3-c,d)pyrene	BQL	10.6	2	10/1/2009
1-Methylnaphthalene	102	10.6	2	10/1/2009
2-Methylnaphthalene	108	10.6	2	10/1/2009
Naphthalene	123	10.6	2	10/1/2009
Phenanthrene	BQL	10.6	2	10/1/2009
Pyrene	BQL	10.6	2	10/1/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	5	4	79
Nitrobenzene-d5	5	4.3	87
4-Terphenyl-d14	5	4.5	90

Comments:**Flags:**

BQL = Below Quantitation Limits.

J = Detected below the quantitation limit.

Reviewed By: 



CHAIN OF CUSTODY RECORD SGS North America Inc.

Locations Nationwide
• Alaska
• New Jersey
• North Carolina
• Maryland
• New York
• Ohio

www.us.sgs.com

098005

1	CLIENT: <u>Rhea</u>
	CONTACT: <u>Ben Grosser</u> PHONE NO.: <u>910 650-7677</u>
	PROJECT: <u>AS4141</u> SITE/PWSID#:
	REPORTS TO: <u>ben@rhea.us</u>
	INVOICE TO: <u>erica@rhea.us</u> FAX NO.: ()
	QUOTE #:
	P.O. NUMBER:

2	LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX
		<u>UASTAS4141-MW17</u>	<u>9/25/09</u>	<u>1305</u>	<u>GW</u>
		<u>UASTAS4141-MW07</u>	<u>9/25/09</u>	<u>950</u>	<u>GW</u>
		<u>UASTAS4141-MW18</u>	<u>9/25/09</u>	<u>1050</u>	<u>GW</u>
		<u>UASTAS4141-RWB</u>	<u>9/25/09</u>	<u>955</u>	<u>GW</u>
		<u>UASTAS4141-MW16</u>	<u>9/25/09</u>	<u>1040</u>	<u>GW</u>

SGS Reference: <u>G910-30</u>		PAGE <u>1</u> OF <u>1</u>			
No	C O N T A I N E R S	SAMPLE TYPE	Preservatives Used	Analysis Required	REMARKS
5	G	G	<u>HCL</u>	<u>Yes</u>	
5	G	G	<u>Yes</u>	<u>Yes</u>	
5	G	G	<u>Yes</u>	<u>Yes</u>	
5	G	G	<u>Yes</u>	<u>Yes</u>	
5	G	G	<u>Yes</u>	<u>Yes</u>	

5	Collected/Relinquished By: (1)	Date	Time	Received By:	Time
	<u>[Signature]</u>	<u>9/25/09</u>	<u>1500</u>	<u>[Signature]</u>	<u>9/25/09</u>
	Relinquished By: (2)	Date	Time	Received By:	Time
	Relinquished By: (3)	Date	Time	Received By:	Time
	Relinquished By: (4)	Date	Time	Received By:	Time

4	Shipping Carrier:	Samples Received Cold? (Circle) YES NO
	Shipping Ticket No:	Temperature °C: <u>3.7°C</u>
	Special Deliverable Requirements:	Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT
	Special Instructions:	
	Requested Turnaround Time:	☐ RUSH ☒ STD
		Date Needed



Ben Grosser
Rhea Engineer & Consultants
4951 William Flynn Hwy
Gibsonia, PA 15044

Report Number: G910-31

Client Project: AS4141

Dear Ben Grosser,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. 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 services performed during this project, please call Linda McWhirter at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America, Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America, Inc.

A handwritten signature in black ink, appearing to read 'Linda McWhirter', written over a horizontal line.

Project Manager
Linda McWhirter

10/9/03

Date

SGS North America, Inc.

List of Reporting Abbreviations
And Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantification Limit (RL or MDL)

DF = Dilution Factor

Dup = Duplicate

D = Detected, but RPD is > 40% between results in dual column method.

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/CL = Reporting Limit / Control Limit

RPD = Relative Percent Difference

UJ = Target analytes with recoveries that are $10\% < \%R < LCL$; # of MEs are allowable and compounds are not detected in the sample.

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.

Results for Volatiles

by GC 602

Client Sample ID: USTAS4141MW10

Analyzed By: DVO

Client Project ID: AS4141

Date Collected: 9/28/09 9:05

Lab Sample ID: G910-31-1A

Date Received: 9/28/09

Lab Project ID: G910-31

Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	1.00	1	10/6/09
Diisopropyl ether (DIPE)	BQL	1.00	1	10/6/09
Ethylbenzene	BQL	1.00	1	10/6/09
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	10/6/09
Toluene	BQL	1.00	1	10/6/09
m/p-Xylene	BQL	2.00	1	10/6/09
o-Xylene	BQL	2.00	1	10/6/09

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	43.7	109

Comments:

All values corrected for dilution.

BQL = Below quantitation limit.

Reviewed By: 

GC-VOA_WA.XLS

**Results for Semivolatiles
by GCMS 625 for 610 Compounds**

Client Sample ID: USTAS4141MW10
 Client Project ID: AS4141
 Lab Sample ID: G910-31-1F
 Lab Project ID: G910-31

Analyzed By: EAW
 Date Collected: 9/28/2009 9:05
 Date Received: 9/28/2009
 Date Extracted: 10/5/2009
 Matrix: Water

Initial/Final Amt: 883 mL / 5.0 mL

Compound	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Acenaphthene	7.02	5.66	1	10/6/2009
Acenaphthylene	BQL	5.66	1	10/6/2009
Anthracene	BQL	5.66	1	10/6/2009
Benzo[a]anthracene	BQL	5.66	1	10/6/2009
Benzo[a]pyrene	BQL	5.66	1	10/6/2009
Benzo[b]fluoranthene	BQL	5.66	1	10/6/2009
Benzo[g,h,i]perylene	BQL	5.66	1	10/6/2009
Benzo[k]fluoranthene	BQL	5.66	1	10/6/2009
Chrysene	BQL	5.66	1	10/6/2009
Dibenzo[a,h]anthracene	BQL	5.66	1	10/6/2009
Fluoranthene	BQL	5.66	1	10/6/2009
Fluorene	7.93	5.66	1	10/6/2009
Indeno(1,2,3-c,d)pyrene	BQL	5.66	1	10/6/2009
1-Methylnaphthalene	7.87	5.66	1	10/6/2009
2-Methylnaphthalene	BQL	5.66	1	10/6/2009
Naphthalene	6.29	5.66	1	10/6/2009
Phenanthrene	BQL	5.66	1	10/6/2009
Pyrene	BQL	5.66	1	10/6/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7	70
Nitrobenzene-d5	10	8	80
4-Terphenyl-d14	10	6.5	65

Comments:

Flags:

BQL = Below Quantitation Limits.

Reviewed By: 



Locations Nationwide

- Alaska
- Ohio
- New Jersey
- West Virginia
- Hawaii
- Maryland
- North Carolina

079530

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler