LEAKING UNDERGROUND STORAGE TANK
COMPREHENSIVE SITE ASSESSMENT REPORT

FOR

AS-4147 (JP-5 2009 PIPELINE RELEASE)

MARINE CORPS AIR STATION
NEW RIVER, NORTH CAROLINA

NCDENR UST INCIDENT NO. 32542
RISK CLASSIFICATION: PENDING
LAND USE CLASSIFICATION: PENDING
CATLIN PROJECT NO. 209-033

SEPTEMBER 24, 2009

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LEAKING UNDERGROUND STORAGE TANK
COMPREHENSIVE SITE ASSESSMENT REPORT

FOR

AS-4147 (JP-5 2009 PIPELINE RELEASE)

MARINE CORPS AIR STATION
NEW RIVER, NORTH CAROLINA

SEPTEMBER 24, 2009

EXECUTIVE SUMMARY

CATLIN Engineers and Scientists (CATLIN) was authorized to prepare this Comprehensive Site Assessment (CSA) for the AS-4147 (JP-5 April 2009 Pipeline Release) by Rhēa Engineers and Consultants, Inc. (Rhēa). This CSA has been completed in accordance with the North Carolina Department of Environment and Natural Resource (NCDENR) – Underground Storage Tank (UST) Section, Guidelines for Assessment and Corrective Action effective July 15, 2008 (*2008 Guidelines*). The JP-5 2009 pipeline release occurred between Building AS-4147 and White Street. The AS-4147 site is aboard Marine Corps Air Station (MCAS) New River, North Carolina. CATLIN assessed remnant JP-5 release impact to site soils and groundwater by completing the following tasks:

- A receptor survey was conducted and based on CATLIN's interpretation of the *2008 Guidelines* and experience with similar sites, a Land Use Classification of Industrial/Commercial and Risk Classification of Intermediate has been assumed.

- Five (5) Type II and one (1) Type III groundwater monitoring wells were installed to assess horizontal and vertical extent of free-phase and dissolved-phase JP-5 constituent concentrations in site surficial groundwater.

  Groundwater samples were obtained from each groundwater monitoring well that contained no free-phase product for analysis of suspected JP-5 (jet fuel) dissolved-phase contaminants per the following methods: Environmental Protection Agency (EPA) Method 602 + Isopropyl ether (IPE) + Methyl-tert-butyl ether (MTBE) + Xylenes, EPA Method 625 + top ten Tentatively Identified Compounds (TICs) and Massachusetts Department of Environmental Protection Extractable Petroleum Hydrocarbons/Volatile Petroleum Hydrocarbons (MADEP EPH/VPH). Only groundwater samples from monitoring well USTAS4147-MW02 exhibited compound concentrations in excess of the NCAC T15A:02L Groundwater Quality Standards (2L GWQS) as follows: Acenaphthene at 326 ug/L, Naphthalene at 1,090 ug/L and hydrocarbon fraction C_9-C_{22} Aromatics at 3,181 ug/L. Horizontal extent of the compounds of concern detected at USTAS4147-MW02 are not delineated to the east of USTAS4147-MW02.

CATLIN personnel gauged site groundwater monitoring wells on August 12 and September 9, 2009. For the August event, only USTAS4141-MW15 had free-phase product (0.01 feet). Site monitoring wells were gauged in September and USTAS4141-MW15 had no measureable free-phase product thickness.

- One soil sample for laboratory analysis was collected during installation of each groundwater monitoring well and analyzed for suspected JP-5 (jet fuel) contaminants per the following methods: EPA Method 8260 + IPE + MTBE, EPA Method 8270 + top ten TICs and MADEP EPH/VPH.

  The only measurable compound of concern is 2-Butanone (0.00529 J mg/kg) at USTAS4147-MW04. There is no established MSCC for 2-Butanone, therefore any concentration above the method detection limit is considered a compound of concern. This soil compound of concern is apparently confined to the immediate vicinity of USTAS4147-MW04.

Based on the findings of this CSA, additional site assessment work is warranted prior to initiating a Corrective Action Plan (CAP) including:

- Soil samples should be taken from the banks of the drainage canal and surface water samples should be taken from the drainage canal.

- Delineate horizontal extent of impacted site groundwater east of USTAS4147-MW02 by obtaining groundwater samples from existing monitoring well USTAS4141-OBG06 located approximately 70 feet southeast of USTAS4147-MW02.

- Where the AS-4147 JP-5 2009 pipeline release breach was excavated and repaired, excavation sidewall soil samples were taken at depths below the water table. Soil samples USTAS4147-MW03 and USTAS4147-MW04 delineate the west excavation sidewall, while north, east and south sidewalls have not been assessed. Recommendations are to collect soil samples (1-2 feet below land surface) from the north, east and south excavation sidewalls and test for JP-5 constituents.

Upon completion of the above listed field and laboratory tasks, results are to be submitted in a CSA Addendum.

COMPREHENSIVE SITE ASSESSMENT REPORT

A. SITE IDENTIFICATION

DATE OF REPORT: September 24, 2009
Facility ID: V-002740 **UST Incident Number (if known):** 32542
Site Name: AS-4147 (JP-5 2009 Pipeline Release)
Site Location: Marine Corps Air Station (MCAS) New River
Nearest City/Town: Jacksonville **County:** Onslow
Risk Classification: Pending **Land Use Classification:** Pending
UST Owner: Commanding Officer Marine Corps Base/ Attn: Director I&E/EMD/EQB
Address: PSC Box 2004, MCB, Camp Lejeune, NC **Phone:** 910-451-5068
UST Operator: MCAS New River, Fuels Division, Attn: Fuels Officer
Address: Building AS-140, MCAS New River, 28542 **Phone:** 910-451-9660
Property Owner: Same as UST Owner
Address: Same as UST Owner **Phone:**
Property Occupant: Same as UST Operator
Address: Same as UST Operator **Phone:**
Consultant/Contractor: CATLIN Engineers and Scientists
Address: 220 Old Dairy Road Wilmington, North Carolina 28405 **Phone:** (910) 452-5861

Release Information

Date Discovered: 04/03/2009
Description of Geographical Data Point: Monitoring Well USTAS4147-MW04 location.
Location Method: GPS **Northing:** 3844350.3 **Easting:** 275525.0
Estimated Quantity of Release: Unknown
Cause of Release: Leak in JP-5 transfer pipeline.
Source of Release (e.g. Piping/UST):
Six inch diameter underground pipeline transfers fuel from the Campbell Street Fuel Farm to the Rapid Refueler Systems aboard MCAS New River.

Sizes and contents of UST system(s) from which the release occurred:
Rapid Refueler Systems include: 6-inch diameter fiberglass line – approximately 4,000'; 8-inch diameter stainless steel line – approximately 1,000'; two USTs 30,000 gallons each and two USTs approximately 20,000 gallons each for storage and transfer of JP-5 fuel.

I, **Michael E. Mason** a Professional Engineer/Licensed Geologist **(circle one)** for CATLIN Engineers and Scientists, do certify that the information contained in this report is correct and accurate to the best of my knowledge.

NORTH CAROLINA PROFESSIONAL SEAL 11299 ENGINEER MICHAEL E. MASON
9-24-09

(Please Affix Seal and Signature)

B. INTRODUCTION

1. Authorization

CATLIN was authorized to prepare this CSA, for the AS-4147 (JP-5 2009 Pipeline Release) by Rhēa.

2. Purpose of Investigation

The purpose of the CSA is to provide sufficient field and laboratory data to satisfy the site assessment requirements denoted in the North Carolina Department of Environment and Natural Resource (NCDENR) – Underground Storage Tank (UST) Section document "*Guidelines for Assessment and Corrective Action*" effective July 15, 2008 (*2008 Guidelines*), Section 280.65 of 40 Code of Federal Regulations (CFR) Part 280, *Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (USTs)*, and Section .0706 of the North Carolina Administration Code Title 15A, Chapter 2, Subchapter 2N (NCAC T15A:02N), *North Carolina Criteria and Standards Applicable to Underground Storage Tanks.* This CSA focused on delineation of remnant free-phase JP-5 product and dissolved-phase JP-5 constituent(s) impact to site soil and groundwater in the vicinity of the JP-5 pipeline release through the following tasks:

- Use groundwater monitoring wells to assess horizontal extent of remnant free-phase JP-5 product.
- Conduct soil and groundwater sampling in the vicinity of the release location to assess the horizontal and vertical extent of remnant dissolved-phase JP-5 constituents.
- Complete a Limited Site Assessment Risk Classification and Land Use Form for NCDENR UST Section personnel to assign a Risk Ranking and Land Use classification to the subject site.
- Determine geologic/hydrogeologic characteristics relative to potential free and dissolved-phase JP-5 transport; and
- Provide a CSA document summarizing field activities, laboratory findings and recommendations for the project site.

This CSA document was prepared in general accordance with CSA report format denoted in the *2008 Guidelines.*

3. Scope of Work

The initial phase of this investigation was a review of the Initial Abatement measures undertaken by other consultant(s) after the JP-5 pipeline release was detected. Existing groundwater monitoring well USTAS4141-MW15, located adjacent (~10 feet west) to JP-5 pipeline release source, was installed as part of an assessment concerning a separate JP-5 release. Prior to the April 2009 JP-5 pipeline release, analysis of soil and groundwater samples from USTAS4141-MW15 were compliant with applicable MSCCs and 2L GWQS. In addition, no free-phase product had been detected at USTAS4141-MW15. Since the JP-5 pipeline release, free-phase product ($\geq$0.01 feet) has repeatedly been gauged at USTAS4141-MW15.

To assess remnant JP-5 release impact to site groundwater, the following tasks were completed:

- Five (5) Type II groundwater monitoring wells were installed, with screened intervals in the surficial groundwater table, to assess horizontal extent of potential JP-5 free-phase product level(s) and dissolved-phase JP-5 constituent concentrations in site surficial groundwater.

- One (1) Type III groundwater monitoring well was installed, with the screen interval in a deeper interval of site surficial groundwater, to assess vertical extent of potential dissolved-phase JP-5 constituent concentrations in site surficial groundwater.

One soil sample for laboratory analysis was collected during installation of each groundwater monitoring well. In accordance with Table 3 of the *2008 Guidelines*, site soil samples were analyzed for suspected JP-5 (jet fuel) dissolved-phase contaminants per the following methods:

- EPA Method 8260 + IPE + MTBE
- EPA Method 8270 + top ten TICs
- MADEP EPH/VPH

After the monitoring wells were installed and developed, the groundwater was allowed to equilibrate and samples were obtained from each monitoring well that contained no free-phase product. In accordance with Table 5 of the *2008 Guidelines*, site groundwater samples were analyzed for suspected JP-5 (jet fuel) dissolved-phase contaminants per the following methods:

- EPA Method 602 + IPE + MTBE + Xylenes
- EPA Method 625 + top ten TICs
- MADEP EPH/VPH

A receptor survey was conducted in order to obtain information necessary for the NCDENR UST Section to assign a Land Use and Risk Classification to the release incident.

To provide regional geology and hydrogeology data, available literature and web database material was reviewed. In addition, field data was gathered to assess the following site groundwater characteristics:

- Vertical Hydraulic Gradients
- Hydraulic Conductivity
- Groundwater Linear Flow Velocity

Field work was conducted in general accordance with CATLIN's Standard Methods of Investigation which has been provided in Appendix A.

4. Area of Interest

The JP-5 2009 pipeline release is located between Building AS-4147 and White Street aboard MCAS New River. The JP-5 pipeline release location in relation to MCAS New River is shown in Figure 1.

C. SITE HISTORY AND SOURCE CHARACTERIZATION

1. Site Operations and History

The AS-4147 (JP-5 2009 Pipeline Release) source was a breach in a buried 6-inch diameter fiberglass pipeline, part of the MCAS New River Rapid Refueler system. The Rapid Refueler system includes: the Campbell Street Bulk Fuel Farm with four above ground storage tanks with capacities of 200,000 gallons each; approximately 4,000 feet of buried 6-inch diameter fiberglass lines; and approximately 1,000 feet of 8-inch diameter stainless steel lines that transfer fuel to two separate aircraft fueling systems (A/B, and C/D system). The A/B system includes: two 30,000 gallon fuel USTs and a 2,500 gallon fuel product recovery UST. The C/D system includes: two 20,000 gallon fuel USTs and a 1,000 gallon fuel product recovery UST. Reportedly, in a typical month, approximately 350,000 gallons of JP-5 is transferred through the Rapid Refueler system. Refer to Table 1 for UST System Information and Table 2 for site owner/operator information.

2. Contaminant Source Inventory

Within the immediate area of interest there are several above and below ground fuel storage or transfer structures that act as potential sources for petroleum products. A list of potential petroleum sources, product type, size and current status is listed in Table 3. The only source for JP-5 within the immediate area is the JP-5 Pipeline. A copy of a JP-5 Material Safety Data Sheet has been provided in Appendix B.

3. Release Incident History

On January 30, 2009 fuel was visible in a storm drainage ditch located between Building AS-4147 and the intersection of Campbell and White Streets. Initially the source of the fuel was unknown and base personnel initiated a leak detection and tracer test on the JP-5 transfer line. As a result of the tracer test, a leak in the subject site 6-inch fiberglass JP-5 transfer line was confirmed on April 3, 2009 in front of Building AS-4147. From April 6 to 10, 2009, a MCAS New River approved subcontractor excavated, removed and replaced approximately 118 feet of the JP-5 transfer line, effectively eliminating the primary source of JP-5.

4. Previous Investigations

There have been several JP-5 releases associated with the New River Rapid Refueler system. A list of previous incidents is as follows:

Incident Number	Material Released	Date of Release	Description of Release
23691	JP-5	2000	Transfer Line Leak
32101	JP-5	May 2002	Rapid Refueler Leak
32004	JP-5	October 2002	Rapid Refueler Leak
32086	JP-5	2003	Rapid Refueler Leak
32238	JP-5	2005	Transfer Line Leak
87537	JP-5	2005	Campbell Street Fuel Farm
32466	JP-5	2007	Transfer Line Leak
94045	JP-5	2008	Campbell Street Fuel Farm
32542	JP-5	2009	Transfer Line leak – Current Incident

USTAS4141-MW15 was installed as part of assessment activities for an adjacent site investigation – Transfer Line Leak Probe #52. Reported historical groundwater gauging data at USTAS4141-MW15 revealed no history of free-phase product prior to the April 2009 JP-5 pipeline release. Laboratory analysis of historical soil and groundwater samples obtained from USTAS4141-MW15 revealed no soil or groundwater contaminants. To date, there has been no information to indicate that site free-phase product and any soil/groundwater contaminants originated from a source other than the April 2009 JP-5 pipeline release.

5. History of Corrective Actions

Initial abatement measures have been detailed in a Baker Environmental, Inc. report entitled "Initial Abatement Action Report Building AS-4146, Probe 49" dated June 15, 2009. Initial abatement measures detailed in this report have been summarized as follows:

As stated in Section B.4, in January of 2009, free-phase JP-5 was detected in the storm water drainage ditch, located between Building AS-4146, and the intersection of White and Campbell Street. Field observations indicate

JP-5 leaked from the transfer line breach, infiltrated the adjacent subsurface storm water drain system which discharges to the storm water drainage canal parallel to Campbell Street.

Initial abatement measures included placing sorbent booms in the storm drain system to contain free-phase JP-5 in the drainage canal. From January through June 1, 2009 sorbent materials and vacuum trucks were used to recover free-phase product accumulated at the drainage canal booms and at the storm drain manhole. During this period, initial abatement efforts recovered approximately 3,700 gallons of impacted water and 675 gallons of product. Once the transfer pipeline was secured and then repaired (April 2009), levels of free-phase product at the drainage canal and storm drain manhole reduced significantly. Recovered water and fuel was disposed at the Camp Lejeune used fuel recovery area. No soil samples were taken from the banks of the drainage canal and no surface water samples were taken from the drainage canal.

While repairing the JP-5 pipeline breach, 49.87 tons of impacted soils were excavated from around the pipeline, characterized and transported to ES&J Enterprises, Inc. facility in Autryville, North Carolina for permanent disposal. While the excavation was open, a vacuum truck was utilized to recover any water and free-phase product. By the time pipeline repairs were completed and the excavation was ready for backfilling an additional 1,033 gallons of impacted water and 217 gallons of product were recovered. Again, recovered water and fuel was disposed of at the Camp Lejeune used fuel recovery area. Excavation sidewall samples were taken at 5 feet below land surface, or below the site water table.

D. RECEPTOR INFORMATION

As defined Section .0102 of NCAC T15A:02L, potential receptors include any human, plant, animal, or structure with the potential to be adversely affected by the release or migration of contaminants. Guidance documents issued by the regulatory agency indicate that structures may include items such as utility lines, basements, and elevator shafts. Although not specifically included in the rule definition (NCAC T15A:02L .0102), regulatory officials also consider potential receptors to include environmental resources such as water supply wells, surface waters, drinking water supplies, and "regions of groundwater that have been identified for planned resource development".

Receptor information that NCDENR requests for a CSA are also incorporated in those required in a Risk Classification and Land Use Form. A completed Risk Classification and Land Use Form for the JP-5 pipeline release is included in Appendix C. Based on the completed form, the site can be classified as Intermediate Risk and Industrial/Commercial land use. Pertinent receptor information from the Risk Classification and Land Use Form is described below.

1. Water Supply Wells

No active potable water supply wells are located within 1,500 feet of the subject site. The active water supply wells closest to the source area are PSWAS-4150 (approximately 2,500 feet to the south) and PSWAS-191 (approximately 2,800 feet to the northwest) as indicated on Figure 1.

2. Public Water Supplies

Camp Lejeune operates five water treatment facilities and associated distribution systems. The subject site is within the MCAS New River water supply system. The MCAS buildings and facilities within 1,500 feet of the subject site are supplied potable water through pressurized mains. Typically, groundwater obtained from the Castle Hayne aquifer is the raw water source for MCB Camp Lejeune water supply treatment facilities.

3. Surface Water

According to the Camp Lejeune USGS Topographic Quadrangle, the nearest named surface water body is Southwest Creek approximately 4,000 feet southwest of the subject site. Based on a review of the NCDENR Division of Water Quality (DWQ) Surface Water Classification, Southwest Creek is classified as SC NSW and the water is classified as tidal salt water (SC) with a supplemental classification as a Nutrient Sensitive Water (NSW). The surface water bodies are shown on Figure 1.

4. Wellhead Protection Areas

At the MCAS New River, wellhead protection areas defined by 42 USC 300h-7(e) have not, as of this time, been designated by the State. However, MCAS New River has identified wellhead protection areas on the base. Based on the most recent Wellhead Protection Plan – 2002 Update, the potential source area is not located within a proposed wellhead protection area.

5. Deep Aquifers in the Coastal Plain Physiographic Region

As identified in the Geologic Map of North Carolina (North Carolina Department of Natural Resources and Community Development, 1985), the subject site lies within the Coastal Plain physiographic province.

The potential source area is located just above an apparent unconfined surficial groundwater aquifer. While there is the potential for recharge by rainfall to the unconfined surficial aquifer at the Base, the surficial aquifer is not used for water supply aboard MCB Camp Lejeune. As stated previously, the Castle Hayne aquifer is typically the raw water source for the MCB Camp Lejeune potable water treatment facilities.

To determine deep aquifers underlying the subject site, the area was profiled in the "Visual Hydrogeologic Framework" database provided in the NCDENR Division of Water Resources website (VHF website). This is a database of well and soil boring log data from numerous locations across the North Carolina Coastal Plain. Information from the Visual Hydrogeologic Framework website indicated the following:

Hydrogeologic Units	Approximate Depth (feet)
Surficial Aquifer	0-53
Upper Tertiary Confining Unit	53-55
Upper Tertiary Aquifer	55-60
Castle Hayne Confining Unit	60-80
Castle Hayne Aquifer	80-185
Pee Dee Confining Unit	185±190

A copy of the Visual Hydrogeologic Framework results has been provided in Appendix D.

6. Subsurface Structures

With the exception of underground utilities, no subsurface structures were identified at the subject site. Building AS-4147 is slab-on-grade construction. See Figure 3 for locations of utilities at the project site.

7. Property Owners and Occupants

The MCB Camp Lejeune has historically and continues to be the property owner and occupant. Refer to Table 2 for property owner/operator details. The subject site and surrounding facilities are equivalent to a private sector Industrial/Commercial site. Site workers are MCAS Marines and/or subcontractors approved for work in designated areas.

E. REGIONAL GEOLOGY AND HYDROGEOLOGY

1. Regional Geology

The project site lies within the southeastern portion of the Outer Coastal Plain physiographic province of North Carolina. The Outer Coastal Plain, as described by David R. Soller and Hugh H. Mills in *The Geology of the Carolinas* (1991), is the eastern portion of the Coastal Plain where constructional topography is evident or dominant. The Inner Coastal Plain begins at the Fall Line, narrows northerly, and is considered an area of erosional topography. According to Horton and Zullo in *The Geology of the*

Carolinas (1991), the Coastal Plain is comprised of a seaward thickening wedge of post-Triassic, primarily unconsolidated, siliclastic sediments and carbonate rocks that extend from the Fall Line to the continental shelf break. Coastal Plain sediments were deposited in a number of different environments including, but not limited to, offshore marine, near-shore marine, lagoonal, and deltaic. The eustatic rise and fall of sea level has resulted in numerous sedimentary packages of transgressive and regressive sequences deposited throughout the Coastal Plain. In Onslow County, the pre-Mesozoic crystalline basement rock, onto which the Coastal Plain was deposited, lies approximately 1,300 feet below mean sea level (MSL). The dominant structural features within the surrounding area of the subject site are the Cape Fear arch, a seaward (southeasterly) plunging anticline and the Albemarle Embayment. The axis of the Cape Fear arch is located roughly 100 miles southwest of the subject site. The Albemarle Embayment lies along the northeastern border of the Cape Fear arch (Horton and Zullo, 1991).

2. Regional Hydrogeology

As detailed by Cardinell, et al (1993), the area is located in the Coastal Plain physiographic province that contains numerous varieties of coastal environments of deposition. The majority of the underlying sediments were deposited in marine or near-shore environments. The thickness of the sedimentary beds in the area is roughly 1500 feet. Aquifers underlying MCAS New River includes the surficial, Castle Hayne, Beaufort, and Peedee. These aquifers are typically separated by confining units of less permeable materials consisting of beds or groups of clay and silt containing varying amounts of sand (Winner and Coble, 1989). Recharge to Coastal Plain aquifers occurs predominantly through direct surface recharge by rainfall in interstream areas (Cardinell, et al, 1993).

The surficial aquifer consists of sand, clay, sandy clay, and silts. The average hydraulic conductivity of the surficial aquifer was estimated by Cardinell, et al (1993) to be about 50 feet per day (ft/d).

The Castle Hayne aquifer includes the Eocene Castle Hayne Formation and Oligocene River Bend Formation. The Castle Hayne aquifer consists of beds of sand, limestone, and cemented/calcareous sand with discontinuous lenses of clay, silt and clay/silt sand mixtures. According to Cardinell, et al (1993), the upper portion of the Castle Hayne aquifer is composed of calcareous sand with interbedded clay and silt beds. Numerous studies have been conducted to estimate the hydraulic properties of the Castle Hayne aquifer. A summary of the results as presented by Cardinell, et al (1993) include:

Transmissivity (T) 820 – 24500 $[(ft^3/d)/ft^2]ft$
Hydraulic conductivity (K) 14 – 91 ft/d (65 ft/day average)
Storage coefficients (S) 0.0002 – 0.001

F. SITE GEOLOGY AND HYDROGEOLOGY

1. Site Topography

The project site is generally flat and covered by asphalt roads, asphalt parking, and grass. The average elevation of the project site is approximately 18 feet MSL.

2. Site Soils and Geology

Representative soil samples were collected from each boring advanced during this investigation to facilitate the installation of groundwater monitoring wells. Soils samples were described in the field utilizing visual/manual techniques as described in the American Society for Testing and Materials (ASTM) D-2488. The soils were classified in accordance with the Unified Soils Classification System (USCS) and a boring log of each boring was produced. Boring logs are included in Appendix E.

Site subsurface soils are described below utilizing the Type III monitoring well USTAS4147-MW04 boring log:

Depth in feet	Soil Description
0 - 4	Silty coarse to fine Sand, organic-rich Clayey to Sandy Silt
4 - 21.5	high plasticity Clay, trace Silt, trace wood fragments
21.5 – 33	Silty Sands, interlayered medium to fine Sand
33 - 40	Silty to Clayey fine to very fine calcareous Sand, trace limestone fragments, trace shell fragments
Boring terminated at 40 feet BLS	

Two geologic cross sections were generated based on the information obtained from monitoring well installation during this investigation. Figure 4A illustrates the plan view of the cross section layouts, and Figures 4B and 4C depict cross sections A-A' and B-B', respectively.

3. Site Groundwater

Comprehensive groundwater gauging events were conducted on August 12 and September 9, 2009 by CATLIN personnel. Groundwater gauging was accomplished by using an engineer's tape marked with water and petroleum gauging paste to measure the distance from the top of casing of each monitoring well to the groundwater and/or petroleum/water interface. Groundwater table elevations were then calculated and groundwater table contours were generated. Groundwater elevations on September 9, 2009 in the Type II monitoring wells across the site ranged from 15.01 (USTAS4147-MW05) to 17.90 (USTAS4147-MW01) feet above mean sea level. Depth

from land surface to surficial water table is approximately 3 feet BLS. Monitoring well gauging data is included in Table 4. Site surficial water table elevation contours shown on Figure 5 were developed with the September 9, 2009 gauging data. While the water table contours indicate an overall groundwater migration trend to the north, contours also indicate a possible water table depression centered around monitoring well USTAS4147-MW05. Site hydrogeologic characteristics are further discussed in Section J of this report.

G. SOIL SAMPLING RESULTS

Soil samples collected during the installation of the monitoring wells were split in two and placed in separate plastic zip top bags. One sample was immediately placed on ice and the second was allowed to equilibrate then screened with a Photo Ionization Detector (PID). Due to the relatively shallow water table (approximately 3 feet BLS), samples for laboratory analysis were taken at each well location from 1 to 2.5 feet BLS. Soil samples selected for laboratory analysis were placed in laboratory glassware, labeled, placed immediately into a cooler, and transported under proper Chain-of-Custody protocol to SGS Environmental Services, Inc. (SGS) of Wilmington, North Carolina. Samples were collected in general accordance with CATLIN's Standard Methods of Investigation included in Appendix A.

Site soil samples were analyzed for suspected JP-5 (jet fuel) dissolved-phase contaminants per the following methods:

- EPA Method 8260 + IPE + MTBE
- EPA Method 8270 + top ten TICs
- MADEP EPH/VPH

Site soil contaminants are compared to the lowest of the Residential, Industrial/Commercial or Soil-to-Groundwater (STGW) MSCCs. A copy of the SGS laboratory analytical report for site soil samples has been provided in Appendix F and is summarized as follows:

<u>EPA METHOD 8260 + IPE + MTBE</u>
Laboratory analysis of site soil samples detected the following EPA Method 8260 + IPE + MTBE compounds:

- USTAS4147-MW01: Acetone (0.0622 milligrams per kilogram - mg/kg)
- USTAS4147-MW02: Acetone (0.0169 J mg/kg) and Methylene Chloride (0.00163 J mg/kg)
- USTAS4147-MW03: Acetone (0.0210 J mg/kg), Ethylbenzene (0.00154 J), Methylene Chloride (0.00152 J mg/kg) and Toluene (0.00129 J mg/kg)
- USTAS4147-MW04: Acetone (0.0319 J mg/kg), **2-Butanone** (0.00529 J mg/kg) and Methylene Chloride (0.00145 J mg/kg)
- USTAS4147-MW05: Acetone (0.0101 J mg/kg), Carbon Disulfide (0.00359 J mg/kg) and Methylene Chloride (0.00181 J mg/kg)

- USTAS4147-MW06: Acetone (0.0207 J mg/kg) and Methylene Chloride (0.00280 J mg/kg)

NOTE: J indicates an estimated concentration, below calibration range and above method detection limits.
A bold EPA Method 8260 compound indicates a compound that has no established MSCC; however, it was detected at concentrations above method detection limits.

The remaining compound concentrations are less than the laboratory method detection limit. The EPA Method 8260 + IPE + MTBE analysis results have been summarized in Table 5A and Figure 6.

EPA METHOD 8270 + top ten TICs
Laboratory analysis of site soil samples revealed no detectable levels of EPA Method 8270 compounds. The EPA Method 8270 analysis results have been summarized in Table 5B.

MADEP EPH/VPH
Laboratory analysis of site soil samples revealed no detectable levels of MADEP EPH/VPH hydrocarbon fractions. The MADEP EPH/VPH analysis results have been summarized in Table 5C and compared to NCDENR MSCCs in Table 5D.

H. GROUNDWATER SAMPLING RESULTS

As stated in Section F.3., on August 12, 2009 CATLIN personnel gauged site groundwater monitoring wells for depth to water table and potential free-phase product thickness. Groundwater samples were then obtained from each groundwater monitoring well that contained no free-phase product. Groundwater samples were collected in accordance with CATLIN's Standard Methods and Procedures included in Appendix A. Groundwater samples were placed in laboratory glassware, labeled, placed immediately on ice in a cooler, and transported under proper Chain-of-Custody protocol to SGS. In accordance with Table 5 of the *2008 Guidelines*, site groundwater samples were analyzed for suspected JP-5 (jet fuel) dissolved-phase contaminants per the following methods:

- EPA Method 602 + IPE + MTBE + Xylenes
- EPA Method 625 + top ten TICs
- MADEP EPH/VPH

Groundwater contaminants at Intermediate risk sites are compared to the 2L GWQS. A copy of the SGS laboratory analytical report has been provided in Appendix F and is summarized as follows:

EPA METHOD 602 + IPE + MTBE + Xylenes
Laboratory analysis of site groundwater samples revealed no detectable levels of EPA Method 602 + IPE + MTBE + Xylenes compounds. The EPA Method 602 analysis results have been summarized in Table 6A and Figure 7A.

EPA METHOD 625 + top ten TICs

Laboratory analysis of site groundwater samples detected the following EPA Method 625 compounds:

- USTAS4147-MW02: **Acenaphthene** (326 micrograms per Liter – ug/L), Anthracene (11.3 J ug/L), Fluoranthene (37.4 J ug/L), Fluorene (163 ug/L), **Naphthalene** (1,090 ug/L), Phenanthrene (203 ug/L) and Pyrene (25.1 J mg/kg).

NOTE: EPA Method 625 compounds in bold have concentrations above applicable 2L GWQS.

All other EPA Method 625 compound concentrations are less than laboratory method detection limit. The EPA Method 625 analysis results have been summarized in Table 6B and Figure 7A.

MADEP EPH/VPH

Laboratory analysis of site groundwater samples only detected MADEP EPH/VPH hydrocarbon fractions in the groundwater sample from USTAS4147-MW02 in excess of 2L GWQS. The MADEP Aliphatic and Aromatic hydrocarbon fractions in all remaining groundwater samples were below the laboratory method detection limit. Only C_9-C_{22} Aromatics (3,181 ug/L) were detected in excess of applicable 2L GWQS. Analytical results are summarized on Table 7C and compared to the 2L GWQS on Table 7D and Figure 7B.

I. FREE-PHASE PRODUCT INVESTIGATION/RECOVERY

The initial abatement measures included gauging depth to groundwater table and free-phase product thicknesses at groundwater monitoring well USTAS4141-MW15. Initial abatement and CSA field measurements of depth to water and free-phase product levels at groundwater monitoring well USTAS4141-MW15 have been summarized as follows:

Date	Depth to Water Table Below Top Of Casing Uncorrected (in feet)	Free-Phase Product Thickness (in feet)
2/3/2009	2.84	0.02
2/9/2009	3.04	0.05
2/16/2009	3.11	0.01
2/25/2009	3.02	0.01
3/4/2009	2.34	0.04
3/9/2009	2.67	0.02
3/17/2009	2.82	0.00
3/26/2009	2.89	0.00
4/1/2009	3.05	0.02
4/9/2009	3.64	0.01
4/20/2009	3.92	0.06
8/12/2009	3.96	0.01
9/9/2009	2.48	0.00

As stated previously, site monitoring well gauging data from the comprehensive gauging event conducted by CATLIN is presented on Table 4. Estimated horizontal extent of free-phase product (8/12/2009 data) is presented on Figures 7A and 7B.

J. HYDROGEOLOGIC INVESTIGATION

1. Vertical Gradient Determination

The vertical hydraulic gradient was calculated on Type II and Type III wells USTAS4141-MW15 and USTAS4147-MW02 with resultant vertical hydraulic gradient of + 0.0533. The positive (+) gradient indicates the potential for "downward" groundwater movement. Vertical gradient calculations are provided in Appendix G.

2. Hydraulic Conductivity

Two falling head slug tests were preformed at the subject site during this investigation. Slug tests were preformed on Type II monitoring well USTAS4147-MW02 on August 14, 2009 and Type III monitoring well USTAS4147-MW04 on August 13, 2009. Hydraulic conductivity values were calculated using the Bouwer-Rice Solution Method. A hydraulic conductivity value of 0.000001996 feet per second or 0.172 feet per day, was calculated for the shallow Type II monitoring well USTAS4147-MW02. A hydraulic conductivity value of 0.00003139 feet per second or 2.712 feet per day was calculated for the deep monitoring well USTAS4147-MW04. Slug test data is included in Appendix H.

3. Rate of Groundwater Linear Flow Velocity

Groundwater travel time or average groundwater linear flow velocity serves as the basis for estimating the rate of contaminant migration at the site. Groundwater flow rates should represent the maximum rate of contaminant migration with variations among contaminants due to geohydrochemical processes including molecular diffusion, mechanical mixing, sorption-desorption, ion-exchange, hydrolysis, and biodegradation.

However, due to the difficulties in estimating the effects of many of the processes on contaminant migration rates and the desire to produce relatively conservative (higher) estimates, only adsorption processes are incorporated into rate calculations.

The average groundwater linear flow velocity was calculated using a modification of Darcy's Law (Todd, 1980) and is presented in Appendix I. The hydraulic gradient was extrapolated from the calculated groundwater elevations in monitoring wells USTAS4147-MW02 and USTAS4147-MW05. The hydraulic gradient was determined to be 0.92 feet per foot towards the north northwest. A hydraulic conductivity value of 0.172 feet per day was used in the calculations. An average effective porosity value of 0.437 was

estimated from the values for fine-grained sand, silt, and clay. The average groundwater linear flow velocity was determined to be 0.005 ft/day to the north northwest.

K. GROUNDWATER MODELING

No detailed groundwater modeling was conducted during this investigation. However, the estimated velocity of the petroleum contaminant Naphthalene was calculated in accordance with the USEPA (1985). As shown in the calculations in Appendix J, the contaminant velocity (V_c) for Naphthalene was found to be 0.000145 feet per day.

L. SUMMARY AND RECOMMENDATIONS

1. Summary

This CSA has been completed in accordance with the NCDENR UST Section *2008 Guidelines*. Based on CATLIN's interpretation of the *2008 Guidelines* and experience with similar sites, a Land Use Classification of Industrial/Commercial and Risk Classification of Intermediate have been assumed. CATLIN's CSA field and laboratory findings can be summarized as follows:

- CSA field work included assessment of existing groundwater monitoring well USTAS4141-MW15 and installation of an additional five Type II and one Type III groundwater monitoring wells. Soil samples were collected and submitted for laboratory analysis from monitoring wells installed on the project site. Site soil samples were analyzed for suspected JP-5 (jet fuel) contaminants per the following methods:

  - EPA Method 8260 + IPE + MTBE
  - EPA Method 8270 + top ten TICs
  - MADEP EPH/VPH

  For regulatory compliance, site soil sample analysis results were compared to the lowest of the applicable Residential, Industrial/Commercial or Soil-to-Groundwater MSCCs. Only 2-Butanone concentration (0.00529 J mg/kg) at USTAS41417-MW04 was of concern. There is no established MSCC for 2-Butanone so any concentration above method detection limit is considered a compound of concern. This soil contaminant is apparently confined to the immediate vicinity of USTAS4147-MW04.

- CATLIN personnel collected groundwater samples from each groundwater monitoring well containing no free-phase product. In accordance with the *2008 Guidelines*, site groundwater samples were analyzed for suspected JP-5 (jet fuel) contaminants per the following methods:

  - EPA Method 602 + IPE + MTBE + Xylenes
  - EPA Method 625 + top ten TICs
  - MADEP EPH/VPH

  For regulatory compliance, site groundwater sample analysis results were compared to applicable 2L GWQS. Only groundwater samples from monitoring well USTAS4147-MW02 exhibited compound concentrations in excess of the 2L GWQS: Acenaphthene at 326 ug/L, Naphthalene at 1,090 ug/L and hydrocarbon fraction C_9-C_{22} Aromatics at 3,181 ug/L. Horizontal extent of the compounds of concern detected at USTAS4147-MW02 are not delineated to the east of USTAS4147-MW02.

- CSA field work included CATLIN personnel gauging site groundwater monitoring wells on August 12 and September 9, 2009. For the August event, only USTAS4141-MW15 had free-phase product (0.01 feet). Site monitoring wells were gauged September 9, 2009 and USTAS4141-MW15 had no measureable free-phase product thickness.

- CSA field work and subsequent calculations have determined the following characteristics of the impacted site surficial groundwater:

  - Vertical hydraulic gradient: + 0.0533 or positive (+) gradient that indicates the potential for "downward" groundwater movement
  - Hydraulic Conductivity:
    Shallow: 0.172 feet per day
    Deep: 2.712 feet per day
  - Average Groundwater Linear Flow Velocity: 0.005 ft/day to the north northwest
  - Contaminant Velocity (V_c) for Naphthalene: 0.000145 feet per day

Based on the findings of this CSA, additional site assessment work is warranted prior to initiating a CAP.

2. Recommendations

As stated previously in Section L.1 additional field and laboratory assessment measures are warranted. The following tasks are recommended:

- In the location where the AS-4147 JP-5 2009 pipeline release was first noted, the storm drainage ditch parallel to Campbell Street, area soils and surface water should be assessed. Recommendations are to:

  - Obtain soil samples from both sides of the drainage canal and test for JP-5 constituents in accordance with Table 1 of the *2008 Guidelines.*

  - Obtain standing water samples from the drainage canal for analysis of remnant dissolved-phase JP-5 constituents per EPA Method 625. Compare results to applicable water quality standards listed in NCDENR Division of Water Quality "REDBOOK" Surface Water and Wetland Standards, amended effective May 1, 2007.

- The horizontal extent of impacted site groundwater east of USTAS4147-MW02 can be further defined by sampling existing monitoring well USTAS4141-OBG06, located approximately 70 feet southeast of USTAS4147-MW02. The groundwater samples should be analyzed per EPA Method 602 + IPE + MTBE + Xylenes, EPA Method 625 + top ten TICs and MADEP EPH/VPH and results compared to applicable 2L GWQS. The groundwater in the well has previously tested compliant with the 2L GWQS.

- Where the AS-4147 JP-5 2009 pipeline release breach was excavated and repaired, excavation sidewall soil samples were taken at depths below the water table. Soil samples USTAS4147-MW03 and USTAS4147-MW04 delineate the west excavation sidewall, while north, east and south sidewalls have not been assessed. Recommendations are to collect soil samples (1-2 feet below land surface) from the north, east and south excavation sidewalls and test for JP-5 constituents in accordance with Table 1 of the *2008 Guidelines.*

Upon completion of the above listed field and laboratory tasks, results are to be submitted in a CSA Addendum. Additional recommendations include:

- Add the gauging and removal of free-phase product from monitoring well USTAS4141-MW15 to the Camp Lejeune UST Management Program as part of the AS-4141 site.

- When free-phase product has been absent from USTAS4141-MW15 for one year and a groundwater sample from this well indicates contaminants are below the GCLs, then the site could be ranked as Low Risk and a No-Further Action request could be submitted.

M. LIMITATIONS

The soil and groundwater samples analyzed as part of this investigation only provide isolated data points and may not represent conditions at every location in the project area. Analyses and conclusions of this report, being based on interpolation between data points at the project area, may not be completely representative of all site conditions. Conclusions and recommendations of this investigation and report are based on the best available data in an effort to comply with current regulatory requirements.

N. REFERENCES

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TABLES

TABLE 1
SITE HISTORY - UST SYSTEM INFORMATION

Incident Name and No.: AS-4147 and 32542

UST ID Number	**Product** (gasoline, diesel, jet fuel, etc.)	**Capacity** (gallons)	**Date Installed**	**Date Permanently Closed (P), or Still in Use* (C)** (m/dd/yy)	**Was Release Associated With UST System?** (Yes / No)
Transfer line for Rapid Refeuler A/B and C/D - 6 USTs	JP-5	Typically the lines transfer ±350,000 gallons per month	1986	C	Yes

* Still in use means not permanently closed.

TABLE 2
SITE HISTORY - UST OWNER/OPERATOR INFORMATION

Incident Name and No.: AS-4147 and 32542

UST ID Number	Name of Owner or Operator	Dates of Ownership/Operation	Owner or Operator?
Transfer line for Rapid Refuelers A/B and C/D - 6 USTs	MCB, Camp Lejeune	1986 - present	Owner and Operator

Address	Telephone Number
Commanding Officer I&E/EMD/EQB (Mr. Thomas Burton) Marine Corps Base PSC 20004 McHugh Blvd. Building 12 Camp Lejeune, NC 28542-0004	(910) 451-9421

TABLE 3
CONTAMINANT SOURCE INVENTORY

Incident Name and No.: AS-4147 and 32542

SOURCE	PRODUCT TYPE	SIZE	STATUS/COMMENT
AS-4147A	Diesel	100 gal.	Backup generator AST in caged area
AS-4147	Diesel	2000 gal.	AST inside compound
AS-4147	Used oil	500 gal.	AST inside compound
AS-4146	Diesel, oil	N/A	Equipment and trailer maintenance related activities
AS-4146	Oil	3000 gal.	Oil/water separator with 3000 gal. AST
AS-4141	Diesel, oil	N/A	Airfield equipment storage
AS-4151	No. 2 Fuel oil	100000 gal.	AS-4154, AST, Steam Plant large capacity Tank # 1
AS-4151	No. 2 Fuel oil	100000 gal.	AS-4152, AST, Steam Plant large capacity Tank # 2
AS-4151	No. 2 Fuel oil	100000 gal.	AS-4153, AST, Steam Plant large capacity Tank # 3
AS-4151	No. 2 Fuel oil	1000 gal.	AS-4149, AST in Steam Plant compound
AS-4151	No. 2 Fuel oil	30000 gal.	AST in Steam Plant compound used as temporary holding tank
AS-171	JP-5	215000 gal.	Fuel Farm AST, Tank # 1
AS-172	JP-5	215000 gal.	Fuel Farm AST, Tank # 2
AS-173	JP-5	217000 gal.	Fuel Farm AST, Tank # 3
AS-174	JP-5	217000 gal.	Fuel Farm AST, Tank # 4
AS-143	Unleaded Gasoline	1000 gal.	AST
AS-143	Diesel	125 gal.	Backup generator AST
AS-143	JP-5	N/A	Tanker-truck storage lot

TABLE 4
MONITORING WELL CONSTRUCTION INFORMATION

Incident Name and No.: AS-4147 and 32542

Well ID	Date Installed (m/dd/yy)	Date Water Level Measured (m/dd/yy)	Well Casing Depth (ft. BLS)	Screened Interval (x to y ft. BLS)	Bottom of Well (ft. BLS)	Top of Casing Elevation (ft.)	Depth to Water from Top of Casing (ft.)	Free-Phase Product Thickness** (ft.)	Ground Water Elevation* (ft.)	Comments
Type II Groundwater Monitoring Wells										
USTAS4147-MW01	7/30/2009	8/12/2009 9/9/2009	2.0	2.0 to 12.0	12.0	20.13	2.02 2.23	0.00 0.00	18.11 17.90	
USTAS4147-MW02	7/31/2009	8/12/2009 9/9/2009	2.0	2.0 to 12.0	12.0	18.18	1.99 2.25	0.00 0.00	16.19 15.93	Slight HCO
USTAS4147-MW03	7/30/2009	8/12/2009 9/9/2009	2.0	2.0 to 12.0	12.0	17.90	2.72 2.26	0.00 0.00	15.18 15.64	HCO
USTAS4147-MW05	7/30/2009	8/12/2009 9/9/2009	2.0	2.0 to 12.0	12.0	18.01	3.82 3.00	0.00 0.00	14.19 15.01	
USTAS4147-MW06	7/30/2009	8/12/2009 9/9/2009	2.0	2.0 to 12.0	12.0	17.62	3.13 2.06	0.00 0.00	14.49 15.56	
USTAS4141-MW15	10/27/2009	8/12/2009 9/9/2009	3.0	3.0 to 13.0	13.0	18.11	3.96 2.48	0.01 0.00	14.15 15.63	
Type III Groundwater Monitoring Well										
USTAS4147-MW04	7/29/2009	8/12/2009 9/9/2009	34.5	34.5 to 39.5	39.5	18.05	5.15 3.97	0.00 0.00	12.90 14.08	Outer casing to 19.0'

* Reference point for elevation measurements is monitoring well USTAS4141-MW15 top of casing, elevation: 18.11ft.

** If free-phase product is present in a well, ground water elevation should be calculated by: [top of casing elevation - depth to water] + [free product thickness x 0.82]

HCO = hydrocarbon odor

ft. BLS = feet below land surface

TABLE 5A
SUMMARY OF SOIL LABORATORY RESULTS
Analytical Method: EPA METHOD 8260 + IPE + MTBE

Incident Name and No.: AS-4147 and 32542

Sample ID	Contaminant of Concern →		Acetone	2-Butanone	Carbon disulfide	Ethylbenzene	Methylene chloride	Toluene	All other 8260 analytes
	Date Collected	Sample Depth (ft. BLS)							
Residential MSCC (mg/kg)			1,564	NE	1,564	1,560	85	3,200	Varies
Industrial/Commercial MSCC (mg/kg)			40,880	NE	40,880	40,000	763	82,000	Varies
STGW MSCC (mg/kg)			2.8	NE	4.3	4.6	0.02	7.3	Varies
Type II Monitoring Wells									
Trip Blank (Not on COC)	7/31/2009	N/A	<0.00691	<0.00543	<0.00268	<0.00087	0.00485 J	<0.00100	BMDL
USTAS4147-MW01(1-2.5)	7/30/2009	1-2.5	0.0622	<0.00544	<0.00269	<0.00087	<0.00119	<0.00100	BMDL
USTAS4147-MW02(1-2.5)	7/31/2009	1-2.5	0.0169 J	<0.00469	<0.00231	<0.00075	0.00163 J	<0.00086	BMDL
USTAS4147-MW03(1-2.5)	7/30/2009	1-2.5	0.0210 J	<0.00474	<0.00234	0.00154 J	0.00152 J	0.00129 J	BMDL
USTAS4147-MW05(1-2.5)	7/30/2009	1-2.5	0.0101 J	<0.00475	0.00359 J	<0.00076	0.00181 J	<0.00087	BMDL
USTAS4147-MW05(1-2.5) DUP	7/30/2009	1-2.5	0.00694 J	<0.00448	0.00329 J	<0.00071	0.00176 J	<0.00082	BMDL
USTAS4147-MW06(1-2.5)	7/30/2009	1-2.5	0.0207 J	<0.00552	<0.00272	<0.00088	0.00280 J	<0.00101	BMDL
Type III Monitoring Well									
USTAS4147-MW04(1-2.5)	7/27/2009	1-2.5	0.0319 J	**0.00529 J**	<0.00220	<0.00071	0.00145 J	<0.00082	BMDL

All results in milligrams per kilogram (mg/kg)
NE = None Established
N/A = Not Applicable
J = Estimated concentration, below calibration range and above method detection limit
BMDL = Below Method Detection Limit
ft. BLS = Feet Below Land Surface
Bold results indicate concentrations above lowest maximum soil contaminant concentration
< = Less than method detection limit
MSCC = Maximum Soil Contaminant Concentration
STGW = Soil-to-Groundwater

TABLE 5B
SUMMARY OF SOIL LABORATORY RESULTS
Analytical Method: EPA METHOD 8270

Incident Name and No.: AS-4147 and 32542

Sample ID	Contaminant of Concern →		2-Methylnaphthalene	Naphthalene	All other 8270 analytes
	Date Collected	Sample Depth (ft. BLS)			
Residential MSCC (mg/kg)			63	313	Varies
Industrial/Commercial MSCC (mg/kg)			1,635	8,176	Varies
STGW MSCC (mg/kg)			1.7	0.58	Varies
Type II Monitoring Wells					
USTAS4147-MW01(1-2.5)	7/30/2009	1-2.5	<0.061	<0.052	BMDL
USTAS4147-MW02(1-2.5)	7/31/2009	1-2.5	<0.059	<0.050	BMDL
USTAS4147-MW03(1-2.5)	7/30/2009	1-2.5	<0.052	<0.044	BMDL
USTAS4147-MW05(1-2.5)	7/30/2009	1-2.5	<0.061	<0.052	BMDL
USTAS4147-MW06(1-2.5)	7/30/2009	1-2.5	<0.063	<0.054	BMDL
Type III Monitoring Well					
USTAS4147-MW04(1-2.5)	7/27/2009	1-2.5	<0.057	<0.049	BMDL

All results in milligrams per kilogram (mg/kg).

BMDL = Below Method Detection Limit

ft. BLS = Feet Below Land Surface

MSCC = Maximum Soil Contaminant Concentration

< = Less than method detection limit

STGW = Soil-to-Groundwater

TABLE 5C
SUMMARY OF SOIL LABORATORY RESULTS
MADEP EPH/VPH

Incident Name and No.: AS-4147 and 32542

Sample ID	Contaminant of Concern →		C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics
	Date Collected	Sample Depth (ft. BLS)						
Type II Monitoring Wells								
USTAS4147-MW01(1-2.5)	7/30/2009	1-2.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
USTAS4147-MW02(1-2.5)	7/31/2009	1-2.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
USTAS4147-MW03(1-2.5)	7/30/2009	1-2.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
USTAS4147-MW05(1-2.5)	7/30/2009	1-2.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
USTAS4147-MW06(1-2.5)	7/30/2009	1-2.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Type III Monitoring Well								
USTAS4147-MW04(1-2.5)	7/27/2009	1-2.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0

All results in milligrams per kilogram (mg/kg).
ft. BLS = Feet Below Land Surface
< = Less than method detection limit

TABLE 5D
SUMMARY OF SOIL LABORATORY RESULTS
MADEP EPH/VPH AS COMPARED TO NCDENR MSCCs

Incident Name and No.: AS-4147 and 32542

Sample ID	Contaminant of Concern →		C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C22 Aromatics	C5-C8 Aliphatics
	Date Collected	Sample Depth (ft. BLS)				
Residential MSCC (mg/kg)			9,386	93,860	469	939
Industrial/Commercial MSCC (mg/kg)			245,280	#	12,264	24,528
STGW MSCC (mg/kg)			3,300	##	34	72
Type II Monitoring Wells						
USTAS4147-MW01(1-2.5)	7/30/2009	1-2.5	<10.0	<10.0	<20.0	<10.0
USTAS4147-MW02(1-2.5)	7/31/2009	1-2.5	<10.0	<10.0	<20.0	<10.0
USTAS4147-MW03(1-2.5)	7/30/2009	1-2.5	<10.0	<10.0	<20.0	<10.0
USTAS4147-MW05(1-2.5)	7/30/2009	1-2.5	<10.0	<10.0	<20.0	<10.0
USTAS4147-MW06(1-2.5)	7/30/2009	1-2.5	<10.0	<10.0	<20.0	<10.0
Type III Monitoring Well						
USTAS4147-MW04(1-2.5)	7/27/2009	1-2.5	<10.0	<10.0	<20.0	<10.0

All results in milligrams per kilogram (mg/kg).
ft. BLS = Feet Below Land Surface
< = less than Method Detection Limit
= Health based level (>100%)
= Considered Immobile
MSCC = Maximum Soil Contaminant Concentration
STGW = Soil-to-Groundwater

TABLE 6A
SUMMARY OF GROUNDWATER LABORATORY RESULTS
Analytical Method: EPA METHOD 602

Incident Name and No.: AS-4147 and 32542

Well ID	Contaminant of Concern →		Benzene	Diisopropyl ether (DIPE)	Ethylbenzene	Methyl-tert butyl ether (MTBE)	Toluene	Total Xylenes
	Sample ID	Date Collected						
GCL (µg/L)			5,000	70,000	84,500	200,000	257,500	87,500
2L GWQS (µg/L)			1	70	550	200	1,000	530
Type II Monitoring Wells								
USTAS4147-MW01	USTAS4147-MW01	8/12/2009	<0.177	<0.253	<0.19	<0.306	<0.313	<0.886
USTAS4147-MW02	USTAS4147-MW02	8/12/2009	0.589 J	<0.253	8.74	<0.306	1.59	24.8
USTAS4147-MW03	USTAS4147-MW03	8/12/2009	<0.177	<0.253	<0.19	<0.306	<0.313	<0.886
USTAS4147-MW05	USTAS4147-MW05	8/12/2009	<0.177	<0.253	<0.19	<0.306	<0.313	<0.886
USTAS4147-MW06	USTAS4147-MW06	8/12/2009	<0.177	<0.253	<0.19	<0.306	<0.313	<0.886
USTAS4147-MW02	USTAS4147-MW02 DUP	8/12/2009	0.598 J	<0.253	9.02	<0.306	1.57	25.5
USTAS4141-MW15	USTAS4141-MW-15	8/12/2009	Not Sampled: 0.01 feet free-phase product					
N/A	Trip Blank	8/12/2009	<0.177	<0.253	<0.19	<0.306	<0.313	<0.886
Type III Monitoring Well								
USTAS4147-MW04	USTAS4147-MW04	8/12/2009	<0.177	<0.253	<0.19	<0.306	<0.313	<0.886

All results in micrograms per liter (µg/L).
N/A = Not Applicable
BMDL = Below Method Detection Limit
GCL = Gross Contaminant Level
2L GWQS = NCAC T15A:02L Groundwater Quality Standards
< = Less than method detection limit
J = Estimated concentration, below calibration range and above Method Detection Limit (MDL)

TABLE 6B
SUMMARY OF GROUNDWATER LABORATORY RESULTS
Analytical Method: EPA METHOD 625

Incident Name and No.: AS-4147 and 32542

Well ID	Contaminant of Concern →		Acenaphthene	Anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	All other 625 analytes
	Sample ID	Date Collected								
GCL (µg/L)			2,120	2,100	280	950	15,500	410	210	Varies
2L GWQS (µg/L)			80	2,100	280	280	21	210	210	Varies
Type II Monitoring Wells										
USTAS4147-MW01	USTAS4147-MW01	8/12/2009	<0.769	<0.903	<0.728	<0.748	<0.939	<0.459	<2.13	BMDL
USTAS4147-MW02	USTAS4147-MW02	8/12/2009	**326**	11.3 J	37.4 J	163	**1,090**	203	25.1 J	BMDL
USTAS4147-MW03	USTAS4147-MW03	8/12/2009	<0.793	<0.931	<0.750	<0.771	<0.968	<0.473	<2.20	BMDL
USTAS4147-MW05	USTAS4147-MW05	8/12/2009	<0.766	<0.900	<0.725	<0.746	<0.936	<0.458	<2.12	BMDL
USTAS4147-MW06	USTAS4147-MW06	8/12/2009	<0.764	<0.897	<0.723	<0.744	<0.933	<0.456	<2.12	BMDL
USTAS4141-MW15	USTAS4141-MW15	8/12/2009	Not Sampled: 0.01 feet free-phase product							
Type III Monitoring Well										
USTAS4147-MW04	USTAS4147-MW04	8/12/2009	<0.795	<0.934	<0.752	<0.774	<0.971	<0.475	<2.20	BMDL

All results in micrograms per liter (µg/L).
J = Estimated concentration, below calibration range and above Method Detection Limit (MDL)
BMDL = Below Method Detection Limit
GCL = Gross Contaminant Level
2L GWQS = NCAC T15A:02L Groundwater Quality Standards
Bold results indicate concentrations above 2L GWQS or GCL
< = Less than method detection limit

TABLE 6C
SUMMARY OF GROUNDWATER LABORATORY RESULTS
MADEP EPH/VPH

Incident Name and No.: AS-4147 and 32542

Well ID	Contaminant of Concern →		C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics
	Sample ID	Date Collected						
Type II Monitoring Wells								
USTAS4147-MW01	USTAS4147-MW01	8/12/2009	<100	<100	<100	<100	<100	<100
USTAS4147-MW02	USTAS4147-MW02	8/12/2009	<100	<100	2,770	<100	<100	411
USTAS4147-MW03	USTAS4147-MW03	8/12/2009	<100	<100	<100	<100	<100	<100
USTAS4147-MW05	USTAS4147-MW05	8/12/2009	<100	<100	<100	<100	<100	<100
USTAS4147-MW06	USTAS4147-MW06	8/12/2009	<100	<100	<100	<100	<100	<100
USTAS4141-MW15	USTAS4141-MW15	8/12/2009	Not Sampled: 0.01 feet free-phase product					
Type III Monitoring Well								
USTAS4147-MW04	USTAS4147-MW04	8/12/2009	<100	<100	<100	<100	<100	<100

All results in micrograms per liter (µg/L).
< = Less than method detection limit

TABLE 6D
SUMMARY OF GROUNDWATER LABORATORY RESULTS
MADEP EPH/VPH AS COMPARED TO NCDENR 2L GWQS

Incident Name and No.: AS-4147 and 32542

Well ID	Contaminant of Concern →		C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C22 Aromatics	C5-C8 Aliphatics
	Sample ID	Date Collected				
2L GWQS (µg/L)			4,200	42,000	210	420
Type II Monitoring Wells						
USTAS4147-MW01	USTAS4147-MW01	8/12/2009	<100	<100	<200	<100
USTAS4147-MW02	USTAS4147-MW02	8/12/2009	<211*	<100	**3,181**	<100
USTAS4147-MW03	USTAS4147-MW03	8/12/2009	<100	<100	<200	<100
USTAS4147-MW05	USTAS4147-MW05	8/12/2009	<100	<100	<200	<100
USTAS4147-MW06	USTAS4147-MW06	8/12/2009	<100	<100	<200	<100
Type III Monitoring Well						
USTAS4147-MW04	USTAS4147-MW04	8/12/2009	<100	<100	<200	<100

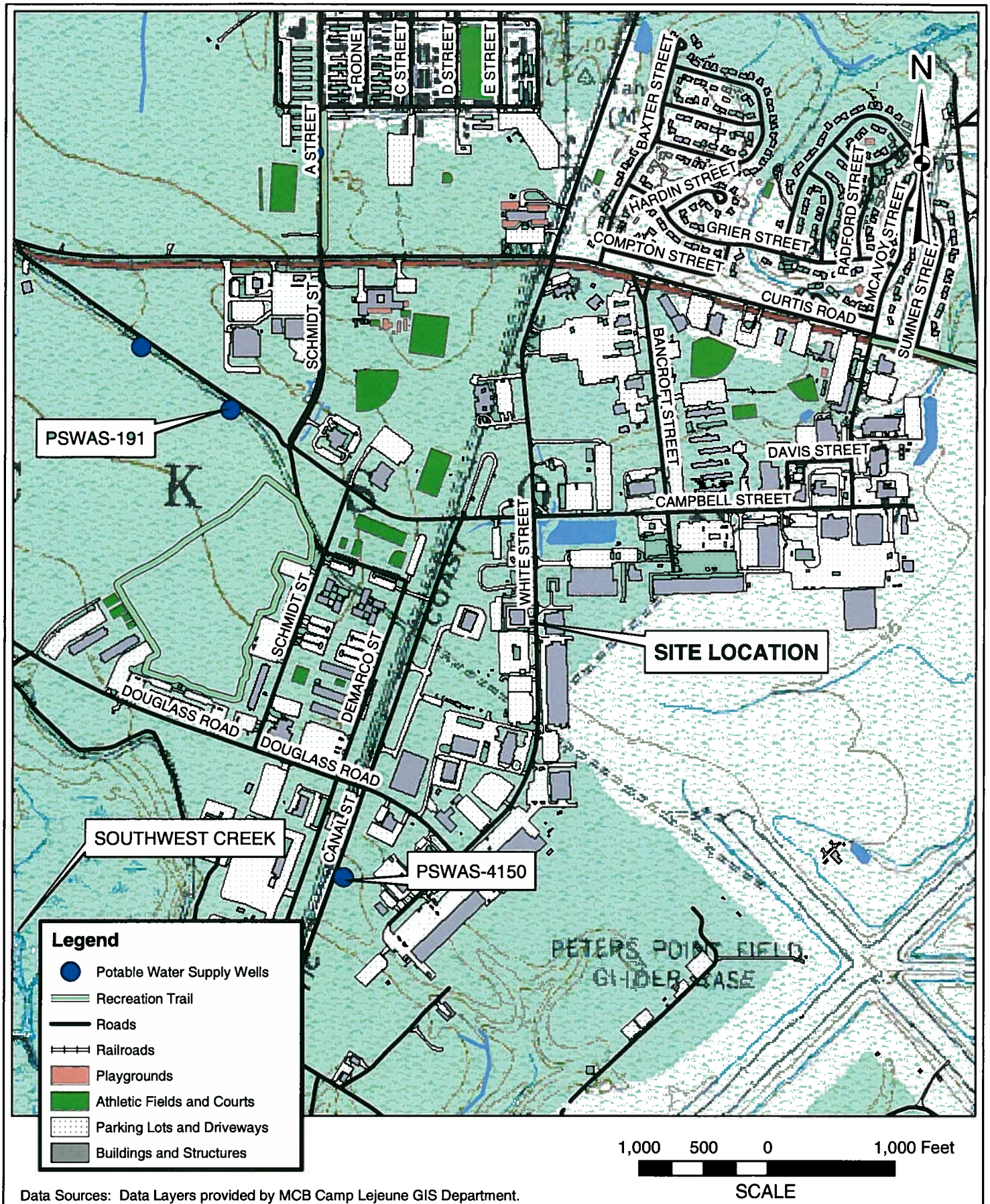
All results in micrograms per liter (µg/L).

Bold results indicate concentrations above 2L GWQS.

2L GWQS = NCAC T15A:02L Groundwater Quality Standards

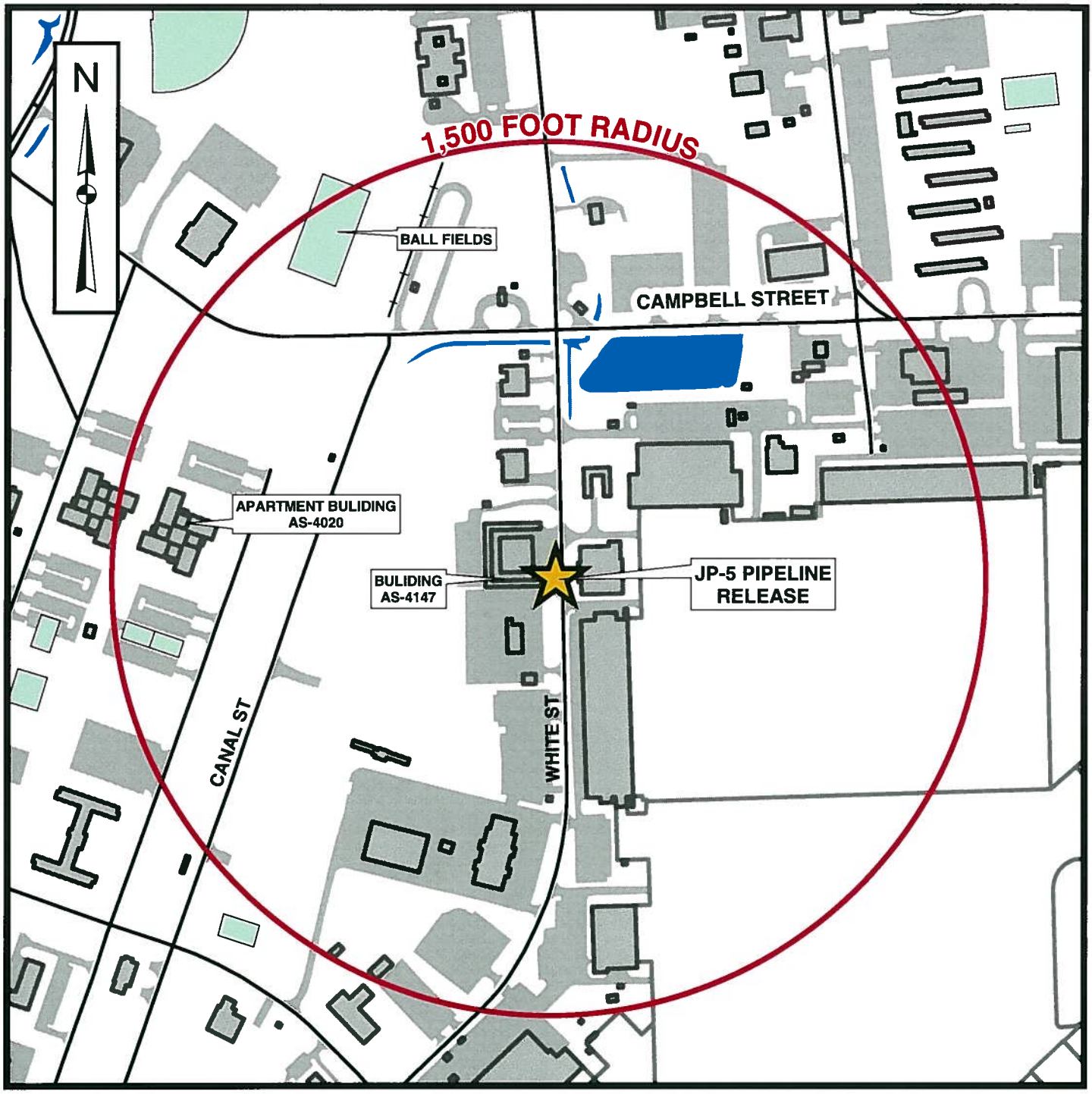
* = The value represents the sum of the reported practical quantitation limit of one fraction and the detect concentration of the other fraction.

FIGURES



Data Sources: Data Layers provided by MCB Camp Lejeune GIS Department.

CATLIN Engineers and Scientists, 220 Old Dairy Road, Wilmington, NC 28405, Corporate Licensure No. for Engineering Services C-0585	PROJECT: BUILDING AS-4147, MARINE CORPS AIR STATION, NEW RIVER, NC		TITLE: GENERAL LOCATION USGS TOPOGRAPHIC QUADRANGLE			FIGURE 1
	JOB NO. 209-033	DATE SEPT 2009	SCALE AS SHOWN	DRAWN BY THW	CHECKED BY SAT	



NOTE: GIS Data Layers provided by MCB Camp Lejeune GIS Department.

500 0 500 Feet

SCALE

LEGEND

Water Supply Wells
- ACTIVE
- CLOSED
- INACTIVE
- PENDING

Roads
Railroads
Recreational Horse Trail
Buildings and Structures
Parking Lots
Playgrounds
Driveways
Athletic Fields
Athletic Courts
Surface Water
Creeks
Surface Water

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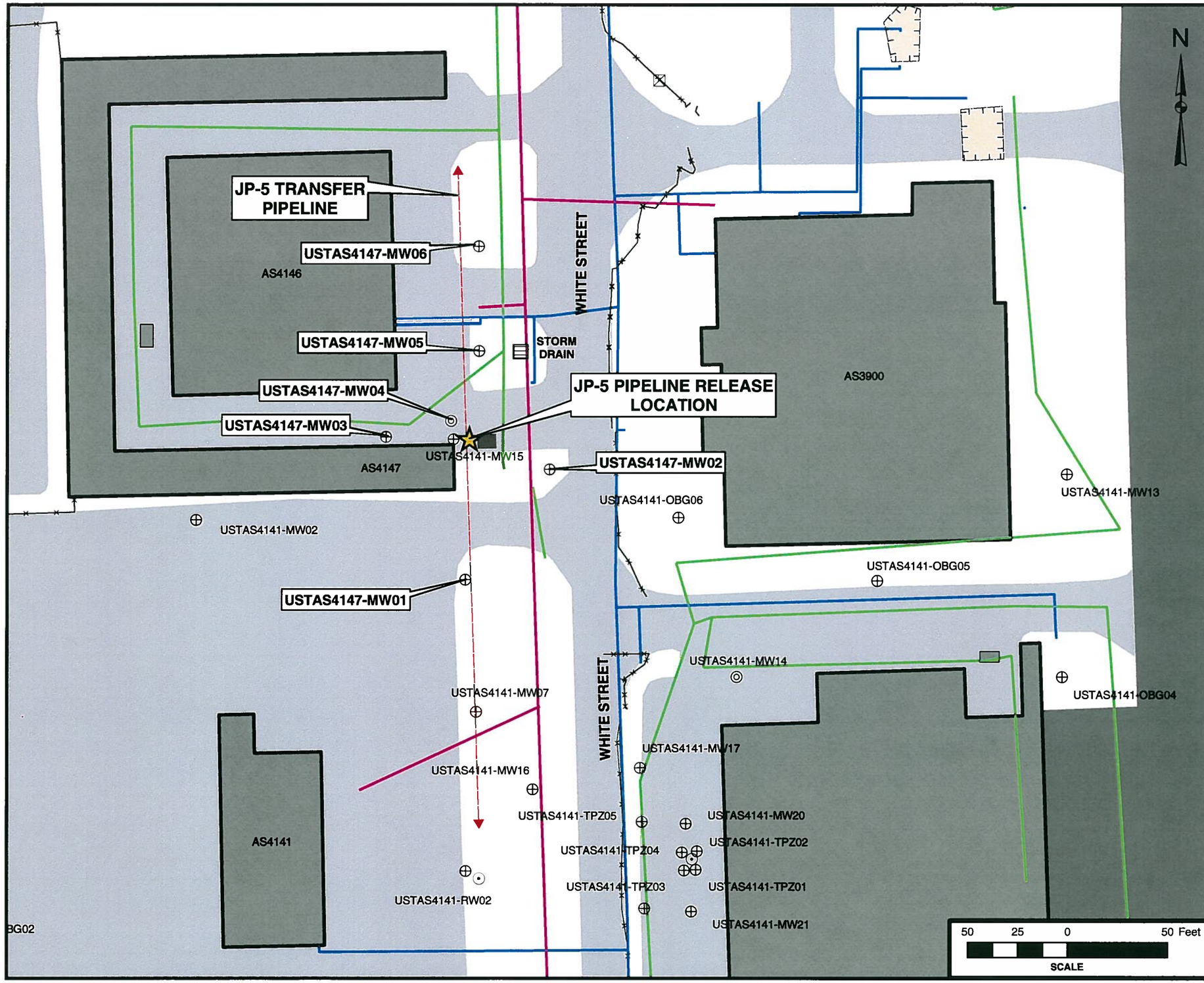
DRAWN BY:	CHECKED BY:	APPROVED BY:
THW	ST	SAT
PROJ No.: 209-033	DATE: SEPT 2009	

1,500 FOOT RADIUS WITH PLACES OF PUBLIC ASSEMBLY

BUILDING AS-4147
MCAS NEW RIVER

FIGURE

2



BUILDING AS-4147
MCAS NEW RIVER

NAVFAC
Naval Facilities Engineering Command

LEGEND

Monitoring Wells
- Type I
- Type II
- Type III
- Pumping Well

Underground Storage Tank
Railroad Tracks

Walls and Fences
- FENCE
- GATE
- WALL

Utilities
- Natural Gas Line
- Strom Sewer Line
- Water Line
- Power Line

Buildings and Structures
Demolished Structures
Oil/Water Separators
Slabs
Roads
Driveways
Parking Lots
Surface Water Bodies
Creeks and Streams
Groundwater Flow Direction

Vegetation Cover
- Forestland
- Scrubland
- Wetland

Airfield Pavement
- HELIPAD
- RAMP
- RUNWAY
- SHLDR_OVERRUN
- TAXIWAY

NOTES

1. GIS Data Layers provided by MCB Camp Lejeune GIS Department.

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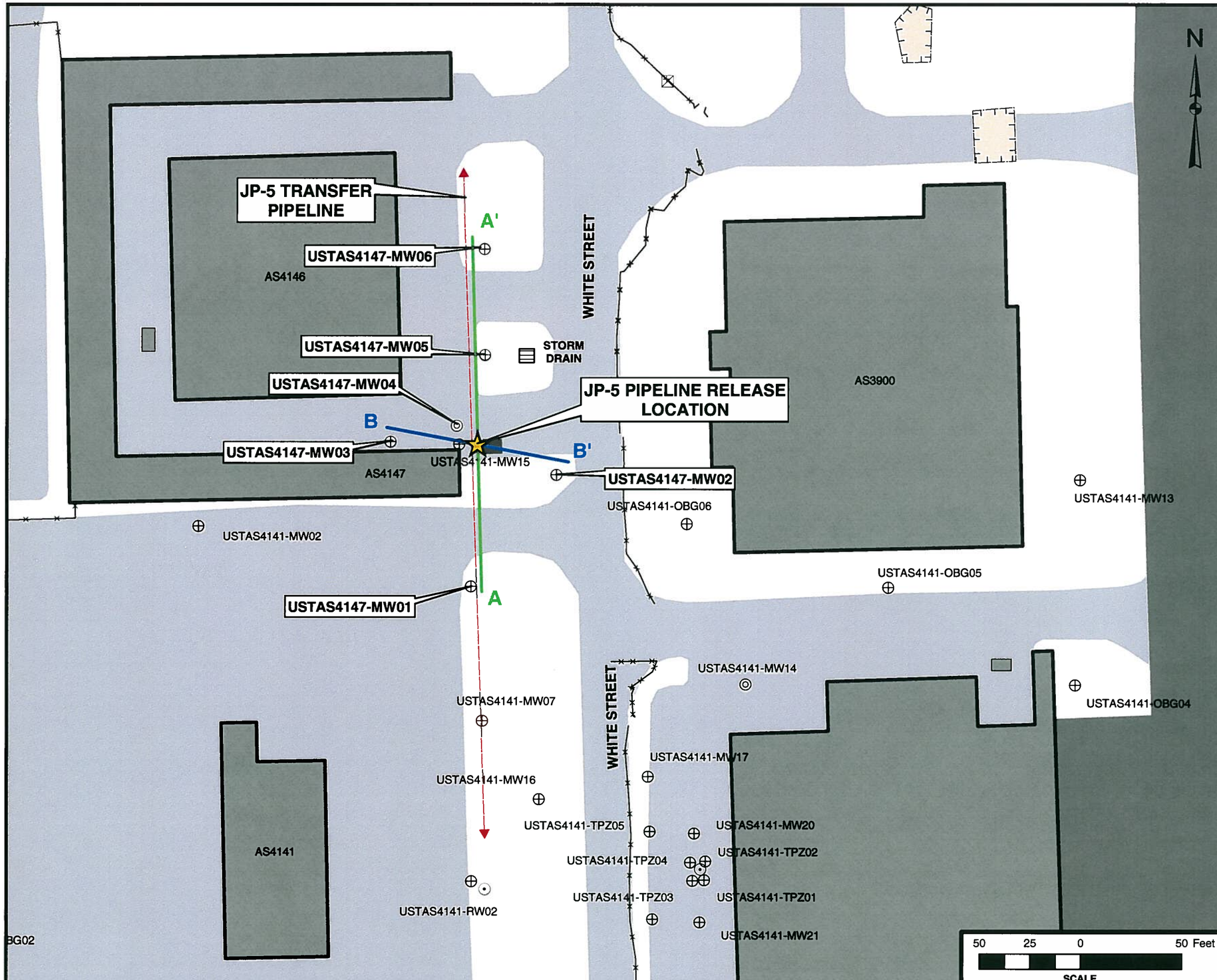
SITE MAP WITH GROUNDWATER MONITORING WELL LOCATIONS

FIGURE 3

Job No.:	Date:	Scale:	Drawn By:	Checked By:
209-033	SEPT 2009	AS SHOWN	THW	SAT



BUILDING AS-4147
MCAS NEW RIVER

NAVFAC
Naval Facilities Engineering Command

LEGEND

Monitoring Wells
- Type I
- Type II
- Type III
- Pumping Well

Underground Storage Tank
Railroad Tracks

Walls and Fences
- FENCE
- GATE
- WALL

Buildings and Structures
Demolished Structures
Oil/Water Separators
Slabs
Roads
Driveways
Parking Lots
Surface Water Bodies
Creeks and Streams
Groundwater Flow Direction

Vegetation Cover
- Forestland
- Scrubland
- Wetland

Airfield Pavement
- HELIPAD
- RAMP
- RUNWAY
- SHLDR_OVERRUN
- TAXIWAY

NOTES

1. GIS Data Layers provided by MCB Camp Lejeune GIS Department.

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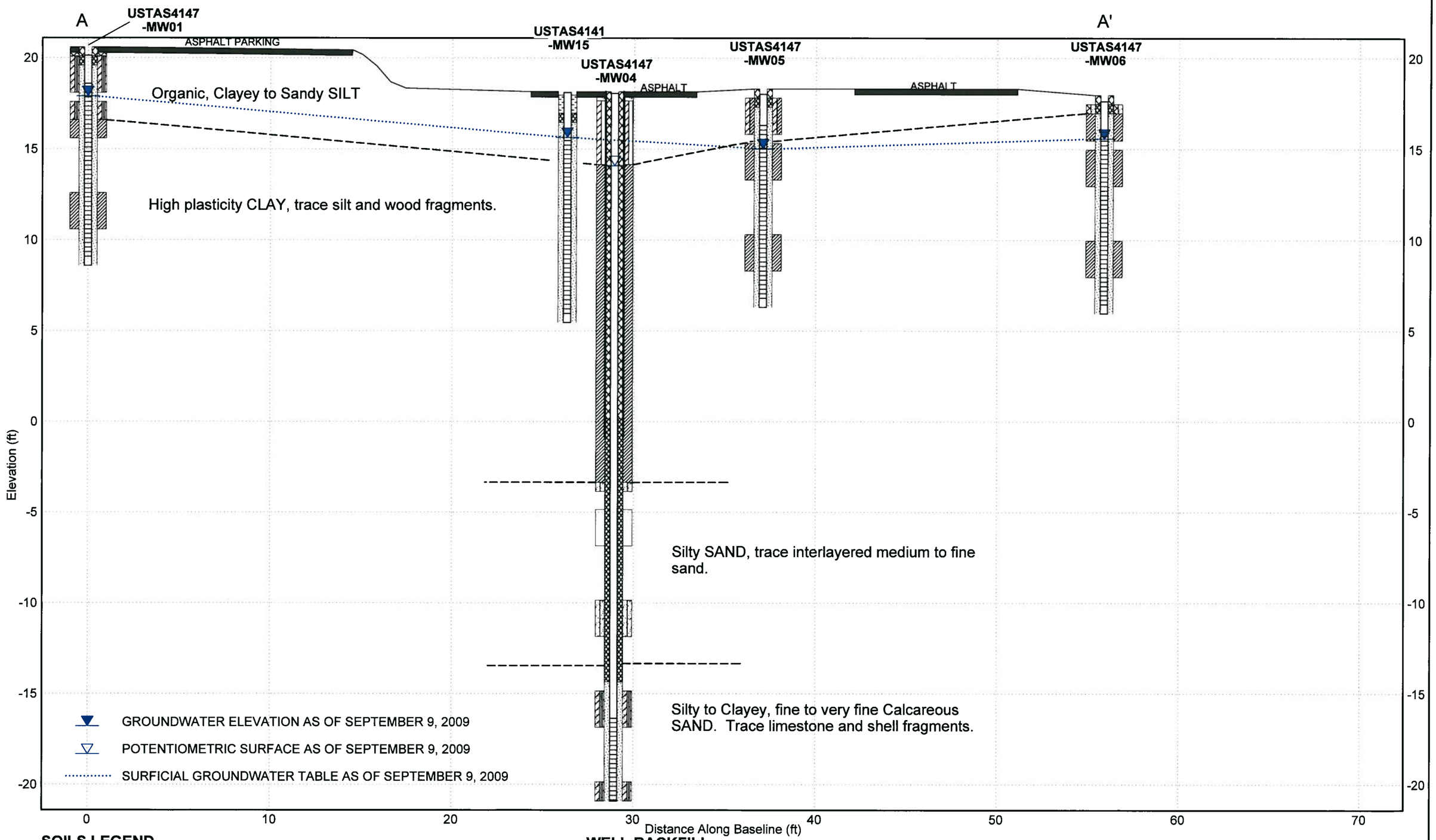
CROSS SECTION - PLAN VIEW

FIGURE **4A**

Job No.:	Date:	Scale:	Drawn By:	Checked By:
209-033	SEPT 2009	AS SHOWN	THW	SAT



SOILS LEGEND

- Asphalt
- (SW) Well-graded Sand
- SILTY SAND FILL
- Fill (made ground)
- USCS Low Plasticity Silty Clay
- (SC-SM) Clayey/Silty Sand
- (SM) Silty Sand
- (CH) High Plasticity Clay
- (CH) High Plasticity Clay to Sandy Clay

WELL BACKFILL

- Portland Cement
- Bentonite Pellets
- #2 Medium Sand

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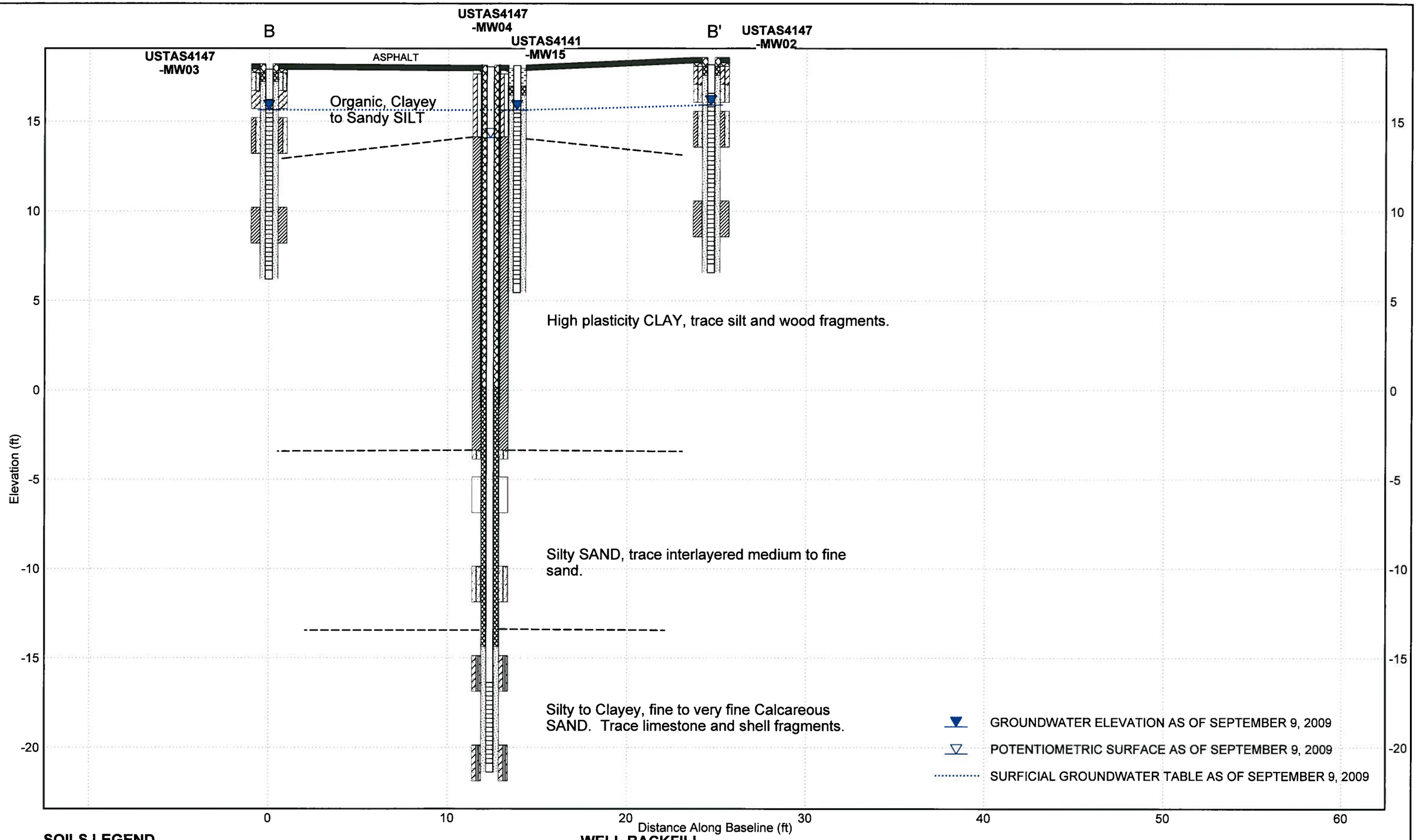
PROJECT	TITLE	FIGURE
AS-4147 MCAS, New River	CROSS SECTION A - A'	4B

JOB NO.:	DATE:	SCALE:	DRAWN BY:	CHECKED BY:
209-033	SEPT 2009	VERT: 1"=5' HORZ: 1"=5'	SVH	SAT



SOILS LEGEND

- Asphalt
- (CH/SM) Interbedded High Plasticity Clay and Silty Sand
- (SW) Well-graded Sand
- Fill (made ground)
- (CH) High Plasticity Clay
- USCS Low Plasticity Silty Clay
- (SC-CL) Clayey Sand to Sandy Clay
- USCS Well-graded Sand with Silt
- (SC-SM) Clayey/Silty Sand
- (SM) Silty Sand
- (SC) Clayey Sand

WELL BACKFILL

- Portland Cement
- Bentonite Pellets
- #2 Medium Sand

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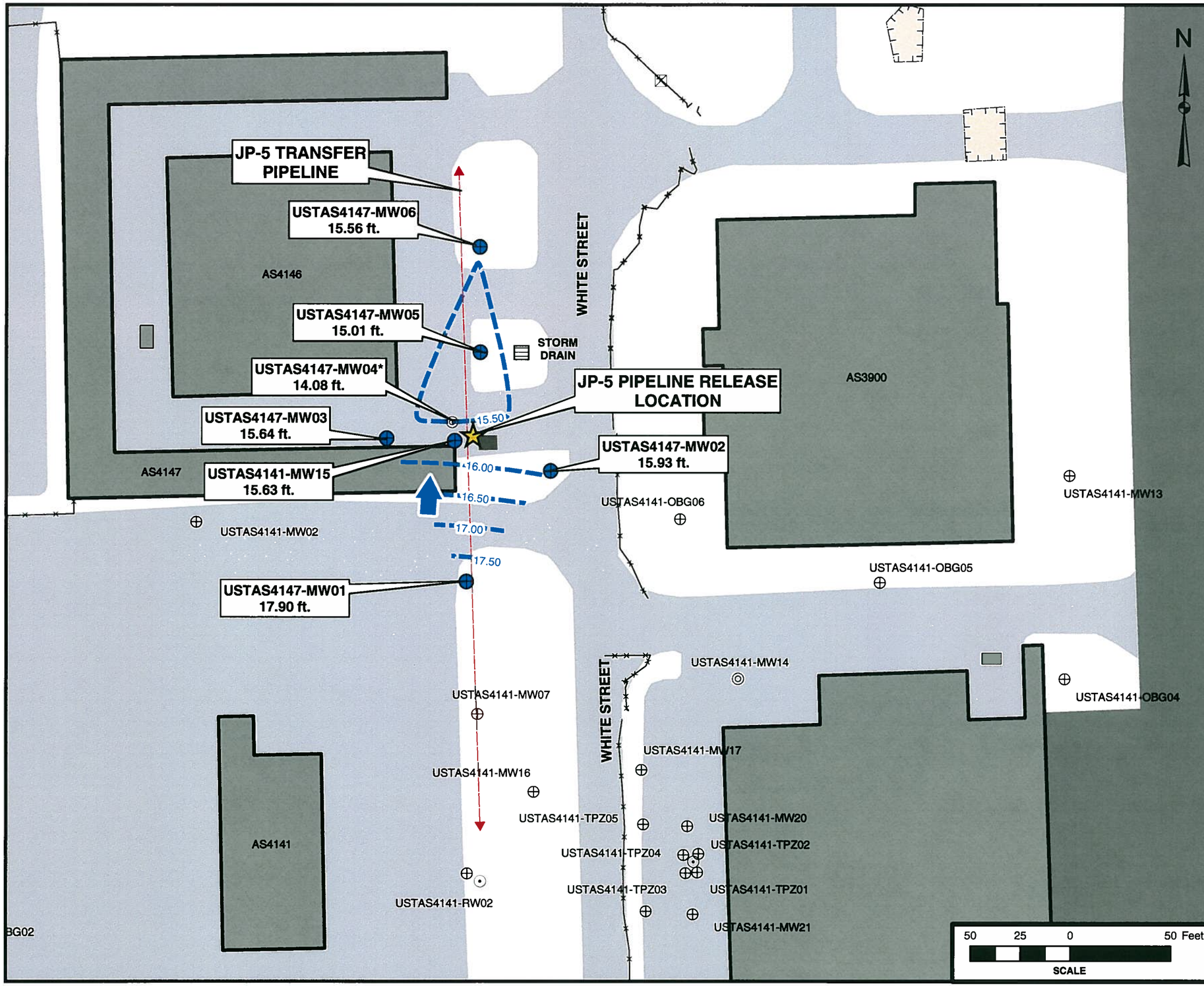
PROJECT	TITLE	FIGURE
AS-4147 MCAS, New River	CROSS SECTION B - B'	4C

JOB NO.	DATE	SCALE	DRAWN BY	CHECKED BY
209-033	SEPT 2009	VERT: 1"=5' HORZ: 1"=5'	SVH	SAT



BUILDING AS-4147
MCAS NEW RIVER

NAVFAC
Naval Facilities Engineering Command

LEGEND

Monitoring Wells
- Type II Used for Groundwater Contours
- Type I
- Type II
- Type III
- Pumping Well
- Underground Storage Tank
- Railroad Tracks
- Groundwater Contours

Walls and Fences
- FENCE
- GATE
- WALL

- Buildings and Structures
- Demolished Structures
- Oil/Water Separators
- Slabs
- Roads
- Driveways
- Parking Lots
- Surface Water Bodies
- Creeks and Streams
- Groundwater Flow Direction

Vegetation Cover
- Forestland
- Scrubland
- Wetland

Airfield Pavement
- HELIPAD
- RAMP
- RUNWAY
- SHLDR_OVERRUN
- TAXIWAY

NOTES

1. GIS Data Layers provided by MCB Camp Lejeune GIS Department.
2. * = Type III Monitoring Well omitted from groundwater contours.
3. Groundwater Contour interval is 0.5 feet.

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SITE MAP WITH WATER TABLE CONTOURS AS OF SEPTEMBER 9, 2009

FIGURE 5

Job No.:	Date:	Scale:	Drawn By:	Checked By:
209-033	SEPT. 2009	AS SHOWN	THW	SAT

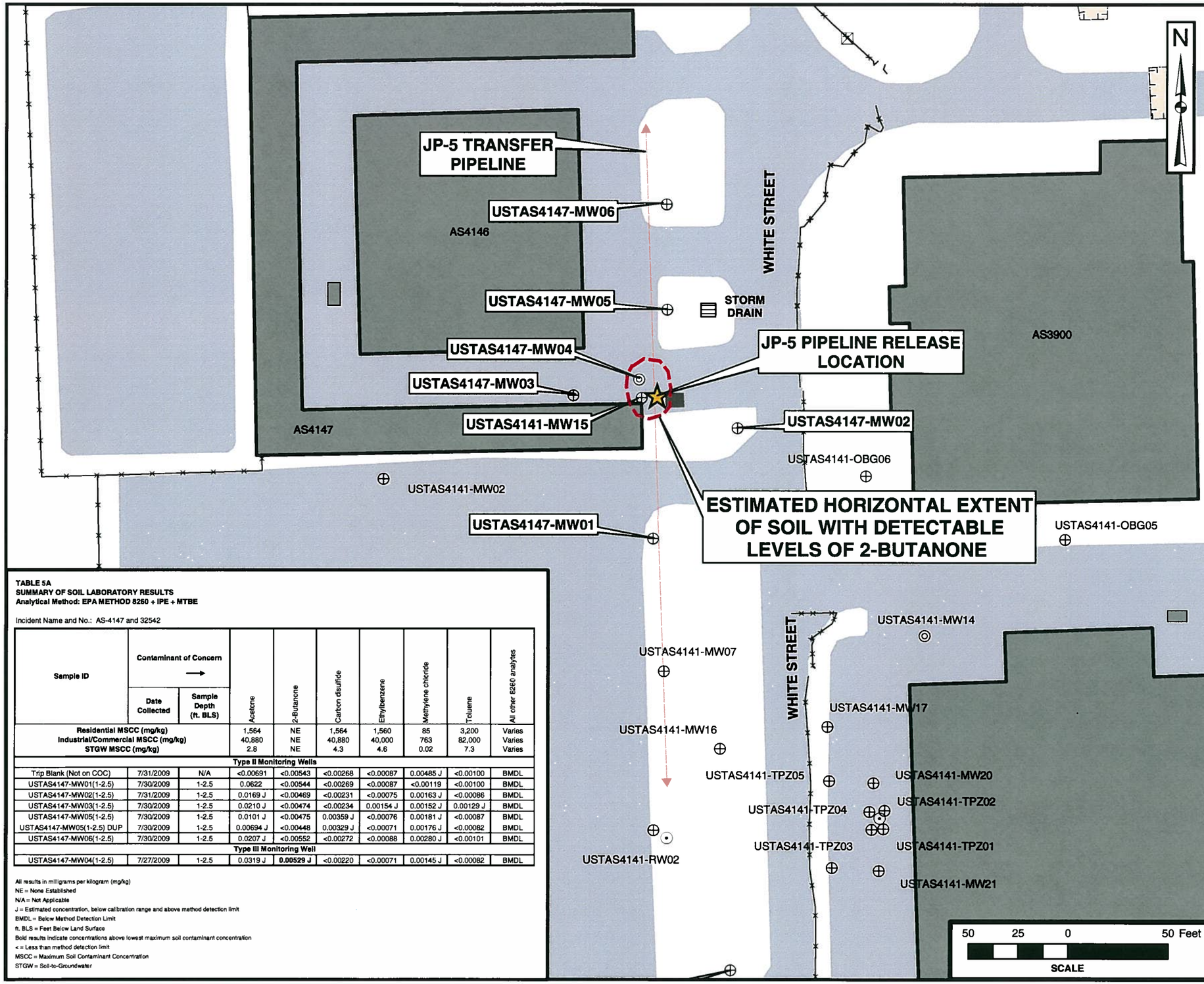

TABLE 5A
SUMMARY OF SOIL LABORATORY RESULTS
Analytical Method: EPA METHOD 8260 + IPE + MTBE

Incident Name and No.: AS-4147 and 32542

Sample ID	Contaminant of Concern →		Acetone	2-Butanone	Carbon disulfide	Ethylbenzene	Methylene chloride	Toluene	All other 8260 analytes
	Date Collected	Sample Depth (ft. BLS)							
Residential MSCC (mg/kg)			1,564	NE	1,564	1,560	85	3,200	Varies
Industrial/Commercial MSCC (mg/kg)			40,880	NE	40,880	40,000	763	82,000	Varies
STGW MSCC (mg/kg)			2.8	NE	4.3	4.6	0.02	7.3	Varies
Type II Monitoring Wells									
Trip Blank (Not on COC)	7/31/2009	N/A	<0.00691	<0.00543	<0.00268	<0.00087	0.00485 J	<0.00100	BMDL
USTAS4147-MW01(1-2.5)	7/30/2009	1-2.5	0.0622	<0.00544	<0.00269	<0.00087	<0.00119	<0.00100	BMDL
USTAS4147-MW02(1-2.5)	7/31/2009	1-2.5	0.0169 J	<0.00469	<0.00231	<0.00075	0.00163 J	<0.00086	BMDL
USTAS4147-MW03(1-2.5)	7/30/2009	1-2.5	0.0210 J	<0.00474	<0.00234	0.00154 J	0.00152 J	0.00129 J	BMDL
USTAS4147-MW05(1-2.5)	7/30/2009	1-2.5	0.0101 J	<0.00475	0.00359 J	<0.00076	0.00181 J	<0.00087	BMDL
USTAS4147-MW05(1-2.5) DUP	7/30/2009	1-2.5	0.00694 J	<0.00448	0.00329 J	<0.00071	0.00176 J	<0.00082	BMDL
USTAS4147-MW06(1-2.5)	7/30/2009	1-2.5	0.0207 J	<0.00552	<0.00272	<0.00088	0.00280 J	<0.00101	BMDL
Type III Monitoring Well									
USTAS4147-MW04(1-2.5)	7/27/2009	1-2.5	0.0319 J	**0.00529 J**	<0.00220	<0.00071	0.00145 J	<0.00082	BMDL

All results in milligrams per kilogram (mg/kg)
NE = None Established
N/A = Not Applicable
J = Estimated concentration, below calibration range and above method detection limit
BMDL = Below Method Detection Limit
ft. BLS = Feet Below Land Surface
Bold results indicate concentrations above lowest maximum soil contaminant concentration
< = Less than method detection limit
MSCC = Maximum Soil Contaminant Concentration
STGW = Soil-to-Groundwater

BUILDING AS-4147
MCAS NEW RIVER

NAVFAC Naval Facilities Engineering Command

LEGEND

Monitoring Wells
- Type I
- Type II
- Type III
- Pumping Well
- Underground Storage Tank
- Railroad Tracks

Walls and Fences
- FENCE
- GATE
- WALL

- Buildings and Structures
- Demolished Structures
- Oil/Water Separators
- Slabs
- Roads
- Driveways
- Parking Lots
- Surface Water Bodies
- Creeks and Streams
- Groundwater Flow Direction

Vegetation Cover
- Forestland
- Scrubland
- Wetland

Airfield Pavement
- HELIPAD
- RAMP
- RUNWAY
- SHLDR_OVERRUN
- TAXIWAY

NOTES

1. GIS Data Layers provided by MCB Camp Lejeune GIS Department.
2. Monitoring well USTAS4141-MW15 not sampled due to presence of Free-Phase Product (0.01').

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SITE MAP WITH SOIL LABORATORY RESULTS- EPA METHOD 8260+IPE+MTBE

FIGURE 6

Job No.:	Date:	Scale:	Drawn By:	Checked By:
209-033	SEPT 2009	AS SHOWN	THW	SAT

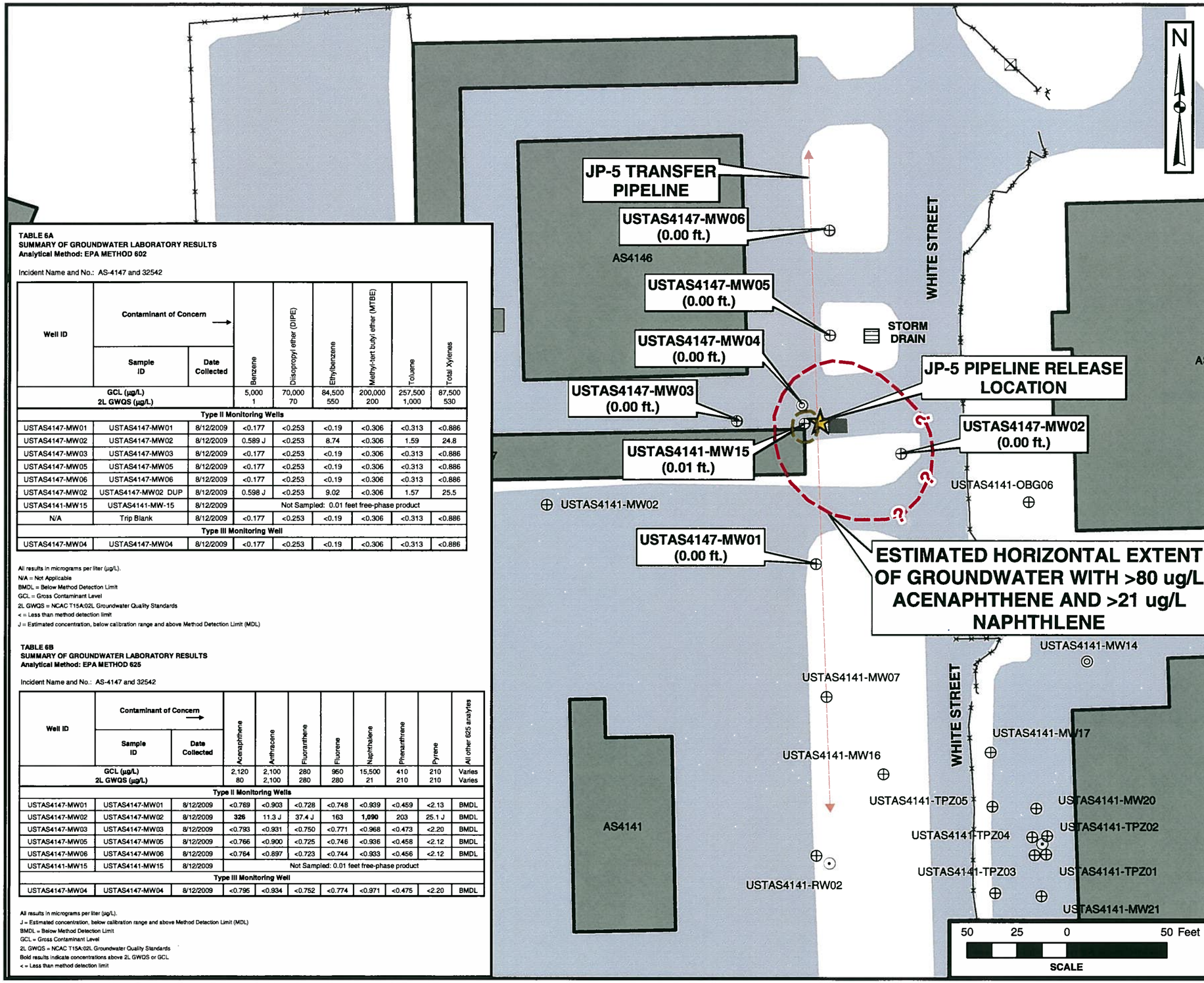

TABLE 6A
SUMMARY OF GROUNDWATER LABORATORY RESULTS
Analytical Method: EPA METHOD 602

Incident Name and No.: AS-4147 and 32542

Well ID	Contaminant of Concern → Sample ID	Date Collected	Benzene	Diisopropyl ether (DIPE)	Ethylbenzene	Methyl-tert butyl ether (MTBE)	Toluene	Total Xylenes
GCL (µg/L)			5,000	70,000	84,500	200,000	257,500	87,500
2L GWQS (µg/L)			1	70	550	200	1,000	530
Type II Monitoring Wells								
USTAS4147-MW01	USTAS4147-MW01	8/12/2009	<0.177	<0.253	<0.19	<0.306	<0.313	<0.886
USTAS4147-MW02	USTAS4147-MW02	8/12/2009	0.589 J	<0.253	8.74	<0.306	1.59	24.8
USTAS4147-MW03	USTAS4147-MW03	8/12/2009	<0.177	<0.253	<0.19	<0.306	<0.313	<0.886
USTAS4147-MW05	USTAS4147-MW05	8/12/2009	<0.177	<0.253	<0.19	<0.306	<0.313	<0.886
USTAS4147-MW06	USTAS4147-MW06	8/12/2009	<0.177	<0.253	<0.19	<0.306	<0.313	<0.886
USTAS4147-MW02	USTAS4147-MW02 DUP	8/12/2009	0.598 J	<0.253	9.02	<0.306	1.57	25.5
USTAS4141-MW15	USTAS4141-MW-15	8/12/2009	Not Sampled: 0.01 feet free-phase product					
N/A	Trip Blank	8/12/2009	<0.177	<0.253	<0.19	<0.306	<0.313	<0.886
Type III Monitoring Well								
USTAS4147-MW04	USTAS4147-MW04	8/12/2009	<0.177	<0.253	<0.19	<0.306	<0.313	<0.886

All results in micrograms per liter (µg/L).
N/A = Not Applicable
BMDL = Below Method Detection Limit
GCL = Gross Contaminant Level
2L GWQS = NCAC T15A:02L Groundwater Quality Standards
< = Less than method detection limit
J = Estimated concentration, below calibration range and above Method Detection Limit (MDL)

TABLE 6B
SUMMARY OF GROUNDWATER LABORATORY RESULTS
Analytical Method: EPA METHOD 625

Incident Name and No.: AS-4147 and 32542

Well ID	Contaminant of Concern → Sample ID	Date Collected	Acenaphthene	Anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	All other 625 analytes
GCL (µg/L)			2,120	2,100	280	950	15,500	410	210	Varies
2L GWQS (µg/L)			80	2,100	280	280	21	210	210	Varies
Type II Monitoring Wells										
USTAS4147-MW01	USTAS4147-MW01	8/12/2009	<0.769	<0.903	<0.728	<0.748	<0.939	<0.459	<2.13	BMDL
USTAS4147-MW02	USTAS4147-MW02	8/12/2009	**326**	11.3 J	37.4 J	163	**1,090**	203	25.1 J	BMDL
USTAS4147-MW03	USTAS4147-MW03	8/12/2009	<0.793	<0.931	<0.750	<0.771	<0.968	<0.473	<2.20	BMDL
USTAS4147-MW05	USTAS4147-MW05	8/12/2009	<0.766	<0.900	<0.725	<0.746	<0.936	<0.458	<2.12	BMDL
USTAS4147-MW06	USTAS4147-MW06	8/12/2009	<0.764	<0.897	<0.723	<0.744	<0.933	<0.456	<2.12	BMDL
USTAS4141-MW15	USTAS4141-MW15	8/12/2009	Not Sampled: 0.01 feet free-phase product							
Type III Monitoring Well										
USTAS4147-MW04	USTAS4147-MW04	8/12/2009	<0.795	<0.934	<0.752	<0.774	<0.971	<0.475	<2.20	BMDL

All results in micrograms per liter (µg/L).
J = Estimated concentration, below calibration range and above Method Detection Limit (MDL)
BMDL = Below Method Detection Limit
GCL = Gross Contaminant Level
2L GWQS = NCAC T15A:02L Groundwater Quality Standards
Bold results indicate concentrations above 2L GWQS or GCL
< = Less than method detection limit

BUILDING AS-4147
MCAS NEW RIVER

NAVFAC
Naval Facilities Engineering Command

LEGEND

Monitoring Wells
- Type I
- Type II
- Type III
- Pumping Well
- Underground Storage Tank
- Railroad Tracks

Walls and Fences
- FENCE
- GATE
- WALL

- Buildings and Structures
- Demolished Structures
- Oil/Water Separators
- Slabs
- Roads
- Driveways
- Parking Lots
- Surface Water Bodies
- Creeks and Streams
- Groundwater Flow Direction

Vegetation Cover
- Forestland
- Scrubland
- Wetland

Airfield Pavement
- HELIPAD
- RAMP
- RUNWAY
- SHLDR_OVERRUN
- TAXIWAY

NOTES

1. GIS Data Layers provided by MCB Camp Lejeune GIS Department.
2. Monitoring well USTAS4141-MW15 not sampled due to presence of Free-Phase Product (0.01').
3. Free-Phase Product measurement noted in ( ).

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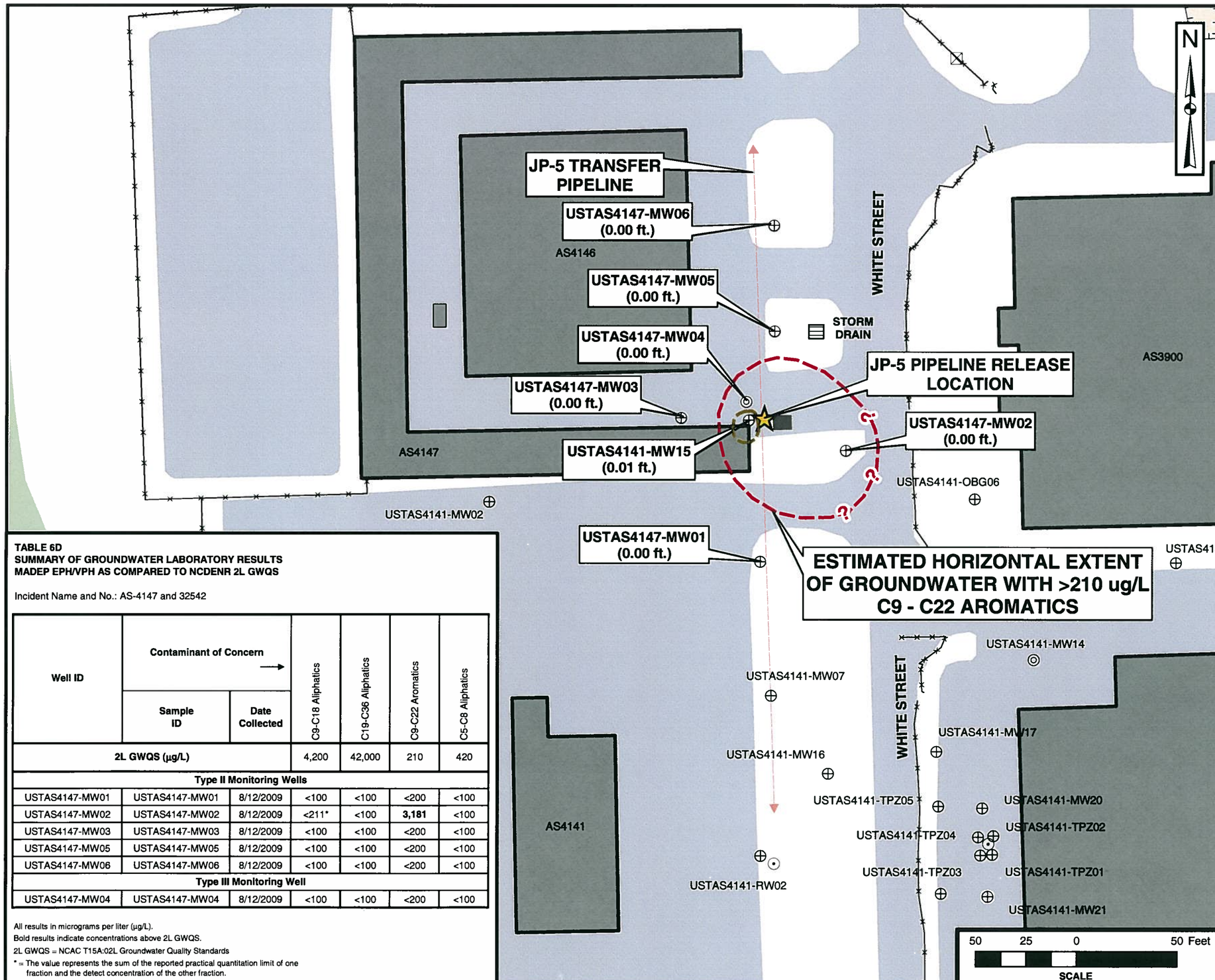
SITE MAP WITH GROUNDWATER LABORATORY RESULTS- EPA METHOD 602 AND EPA METHOD 625

FIGURE **7A**

Job No.:	Date:	Scale:	Drawn By:	Checked By:
209-033	SEPT 2009	AS SHOWN	THW	SAT

BUILDING AS-4147
MCAS NEW RIVER

NAVFAC
Naval Facilities Engineering Command



LEGEND

Monitoring Wells
- Type I
- Type II
- Type III
- Pumping Well
- Underground Storage Tank
- Railroad Tracks

Walls and Fences
- FENCE
- GATE
- WALL

- Buildings and Structures
- Demolished Structures
- Oil/Water Separators
- Slabs
- Roads
- Driveways
- Parking Lots
- Surface Water Bodies
- Creeks and Streams
- Groundwater Flow Direction

Vegetation Cover
- Forestland
- Scrubland
- Wetland

Airfield Pavement
- HELIPAD
- RAMP
- RUNWAY
- SHLDR_OVERRUN
- TAXIWAY

NOTES

1. GIS Data Layers provided by MCB Camp Lejeune GIS Department.
2. Monitoring well USTAS4141-MW15 not sampled due to presence of Free-Phase Product (0.01').
3. Free-Phase Product measurement noted in ( ).

TABLE 6D
SUMMARY OF GROUNDWATER LABORATORY RESULTS
MADEP EPH/VPH AS COMPARED TO NCDENR 2L GWQS

Incident Name and No.: AS-4147 and 32542

Well ID	Contaminant of Concern →		C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C22 Aromatics	C5-C8 Aliphatics
	Sample ID	Date Collected				
2L GWQS (µg/L)			4,200	42,000	210	420
Type II Monitoring Wells						
USTAS4147-MW01	USTAS4147-MW01	8/12/2009	<100	<100	<200	<100
USTAS4147-MW02	USTAS4147-MW02	8/12/2009	<211*	<100	**3,181**	<100
USTAS4147-MW03	USTAS4147-MW03	8/12/2009	<100	<100	<200	<100
USTAS4147-MW05	USTAS4147-MW05	8/12/2009	<100	<100	<200	<100
USTAS4147-MW06	USTAS4147-MW06	8/12/2009	<100	<100	<200	<100
Type III Monitoring Well						
USTAS4147-MW04	USTAS4147-MW04	8/12/2009	<100	<100	<200	<100

All results in micrograms per liter (µg/L).
Bold results indicate concentrations above 2L GWQS.
2L GWQS = NCAC T15A:02L Groundwater Quality Standards
* = The value represents the sum of the reported practical quantitation limit of one fraction and the detect concentration of the other fraction.

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SITE MAP WITH GROUNDWATER LABORATORY RESULTS-MADEP EPH/VPH AS COMPARED TO NCDENR 2L GWQS

FIGURE **7B**

Job No.:	Date:	Scale:	Drawn By:	Checked By:
209-033	SEPT 2009	AS SHOWN	THW	SAT

APPENDICES

APPENDIX A

CATLIN
STANDARD METHODS OF INVESTIGTION

CATLIN STANDARD METHODS OF INVESTIGATION

(REVISED APRIL 2002)

1.0 DATA COLLECTION

1.1 BACKGROUND DATA

Background data and history information relevant to the site investigation is generated through numerous sources. These sources may include, but are not limited to, the following:

- Conversations with the client and regulatory officials involved with the incident.
- Review of pertinent regulatory correspondence.
- Review of previous and existing reports and other technical data.
- Review of available historical records.

1.2 SURVEYS AND POTENTIAL RECEPTOR DATA

Physical survey and potential receptor data are collected in accordance with the intended level of investigation. In general, the purpose is to collect sufficient information for site assessment and corrective action planning.

Individual receptors are identified and evaluated in the context of their potential for contaminant impact. Potential receptors of contamination can include surface water bodies, groundwater supply wells, wellhead protection areas, and subsurface building structures.

1.2.1 Horizontal Survey

Horizontal survey data was generated using a combination of accepted traditional field surveying and geographical positioning system (GPS) techniques incorporated into existing maps. All horizontal measurements were recorded in meters and referenced to the Universal Transverse Mercator (UTM) coordinate system and North American Datum 1983 (NAD 83) Continental Unites States (Conus) project datum.

1.2.2 Vertical Survey

A vertical survey is conducted at the site typically within an accuracy of 0.01 foot. The North American Vertical Datum 1988 (NAVD 88) datum plane as established with a survey grade geographical positioning

system (GPS) was used determining the elevation of existing monitoring wells used as temporary benchmarks (TBM). The vertical survey includes such points as top of all well casings, selected ground shots, important utility inverts, utility fluid levels, important surface water levels, and other items determined to be significant.

1.3 DRILLING AND MONITORING WELL/PIEZOMETER INSTALLATION

Necessary permits are applied for and obtained in accordance with federal, state, and local requirements prior to drilling or well construction activities. Additionally, the well locations are scanned for underground utilities prior to conducting intrusive subsurface activities. Wells are installed under applicable licensing requirements, and are designed and constructed in accordance with accepted standards and practices. Any wells purposely installed at off-site locations are permitted through appropriate right-of-entry agreements with all necessary property owners and/or their agents.

1.3.1 Drilling Methods and Subsurface Data Collection

Drilling is accomplished utilizing one or more of the following methods:

Auger Drilling

Auger drilling is the preferred, most often used method of subsurface investigation and is accomplished using a vehicle or trailer mounted drill rig. Continuous flight auger types used vary upon the site and situation; ranging from the 4-inch outside diameter solid stem to the 12-inch outside diameter hollow stem. Auger type is selected based upon appropriateness and/or site-specific requirements.

Hand Augering

Hand augering is utilized when economically and scientifically feasible, or when no other method is suitable. Hand augers typically produce three-inch diameter holes and are generally limited to depths of less than 15 feet.

Direct Push

Direct push methods of subsurface investigation are used generally for soil screening purposes or collection of groundwater samples where permanent wells are not viable.

Other Methods

Other drilling methods, such as mud and air rotary, rock coring, cable tool, and large bucket augering are used when site conditions or project requirements dictate.

Regardless of the drilling method used, the drill rig(s) and all drilling tools are thoroughly cleaned between boreholes to prevent cross introduction of contaminants. Split spoon samples are collected and field-described at intervals of five feet or less, and cuttings are continuously monitored for organic vapors. Drill cuttings are containerized for off-site disposal or are spread on the ground surface in proximity to the well or boring in accordance with North Carolina Department of Environment and Natural Resources (NCDENR) requirements. A geologist or engineer, trained in using visual/manual techniques, is always present during drilling and is responsible for subsurface contaminant and geologic data collection. Soils are classified in general agreement with the Unified Soils Classification System (USCS).

1.3.2 Hydropunch Installation

Hydropunch penetrometers (Hydropunches) are used to delineate the spatial extent of dissolved and free-phase phase plumes. Soil borings are advanced to the appropriate depth and then the Hydropunch is advanced through the soil boring into undisturbed material. Groundwater samples are collected by pulling back on the body of the Hydropunch and allowing the groundwater to enter the screened portion of the sample chamber. Samples are retrieved using a decontaminated Teflon bailer or peristaltic pump.

1.3.3 Well Installation

Wells are typically constructed of threaded PVC casing and screen. No glues or cements are used in joining PVC components. Well diameter, slot sizes, and protective covers vary depending upon site-specific conditions or situation-specific requirements.

1.3.4 Well Development

Wells are developed by over-pumping or surging using appropriate pumps, blocks, or bailers. Through development, unwanted fine materials are removed from the natural formation surrounding the well. Well development will be performed no sooner than 24-hours after grouting is completed for the Type III wells. Water generated during development is containerized and properly disposed or is discharged onto the ground in proximity of the well in accordance with NCDENR requirements.

1.4 HYDROGEOLOGIC DATA COLLECTION

Data used to help characterize hydrogeologic conditions at a site are obtained through various procedures including, but not necessarily limited to, those described below:

1.4.1 Regional Geology

Information pertaining to the regional geologic framework is compiled from existing publications, maps, and scientific papers.

1.4.2 Site Geology

Shallow site geology is generally determined from field descriptions and borehole samples. Interpretations with regard to hydrogeologically important contacts, zones, fractures, faults, cleavage, and facies changes are made when possible.

1.4.3 Groundwater Occurrence and Characteristics

Groundwater data is obtained utilizing a number of methods and procedures, not limited to the general list below:

Well Water Levels

After well development, wells are allowed to stabilize for a minimum of 24 hours prior to measuring. Water level and free-phase product thickness (where applicable) measurements are performed using an electronic interface probe or steel tape with water/product finding pastes.

The specific gravity of any accumulated product is determined and used to calculate true hydraulic grade from measured water levels. This information is combined with vertical survey data to determine relative potentiometric surface elevations for all wells.

Aquifer Testing

Various aquifer tests may be used to make determinations of hydraulic conductivity. Slug or pumping tests are often used to characterize site hydrogeologic conditions and to develop remedial action alternatives utilizing appropriate pumping technologies.

Other Methods

Other methods may be deemed appropriate for determining various groundwater characteristics. These other methods may include nested well configurations and/or clustered piezometer installations; sieve or pipette analysis; fracture trace analysis; computer modeling; and geophysical logging.

1.5 PETROLEUM HYDROCARBON DATA COLLECTION

1.5.1 Collection Methods

Petroleum hydrocarbon data is obtained through various methods including, but not limited to, the following:

Field Analysis

- Direct thickness measurement of phase separated components using tapes and/or probes.
- Manual vapor analysis using a photoionization detector (PID) or flame ionization detector (FID).
- Detectable odor and visual observation.

Laboratory Analysis

- Laboratory analysis of phase-separated products.
- Laboratory vapor, soil, and groundwater analysis using appropriate EPA Methods.

1.5.2 Field Sampling

Field sampling procedures are performed in accordance with recommended protocol, accepted industry standards, and under appropriate chain-of-custody procedures. Generally, sampling procedures are as follows:

Product Samples

Product samples are obtained using clean equipment and containers. Each is shipped to the analytical laboratory in protective containers.

Soil Samples

Soil samples are immediately packed into clean containers, and refrigerated for shipment to the analytical laboratory.

Groundwater Samples

Groundwater samples are collected in accordance with the following procedures:

- Creeks/Lakes/Etc.

  Grab samples are obtained.

- Domestic Wells

  Wells are pumped for a time sufficient to completely purge the well and any pressure or holding tanks prior to sampling.

- Monitoring Wells

  Water level measurements are made and well volumes calculated for each well.

  Three well volumes are removed from each well using a thoroughly cleaned Teflon bailer or appropriate purging pump. If it is not possible to remove three volumes, due to very low yields, a minimum of one volume is removed prior to obtaining a sample.

  Where analysis for metals is required, wells are typically sampled utilizing low flow techniques, which reduce turbidity and the potential for matrix interference.

Samples are collected and containerized in a manner that minimizes agitation and contact with the air.

Sampling records are field prepared.

Samples are labeled and proper chain of custody documents are maintained.

Samples are promptly protectively packed, refrigerated, and shipped to the analytical laboratory for analysis.

2.0 DATA EVALUATION

Data obtained as a result of the site investigation is compiled and evaluated and a report is prepared for client review and distribution to the appropriate agencies. Generally, specific data are evaluated as follows:

- Background data are evaluated in context with the suspected or confirmed problem.
- Survey data are utilized to develop site maps and to evaluate contaminant receptors.
- Well construction records are compiled and presented as part of the report. As-built information is used in combination with other data to evaluate subsurface conditions and monitoring well screen settings as they relate to the investigation.
- Subsurface drilling logs are used to develop geologic cross-sections, fence diagrams, isopachs, structure contours, or other constructions. Regional geologic data are used to obtain an overall framework.
- Hydrogeologic data are used to develop contour maps, flow nets and other constructions. The data is also used to calculate various hydrogeologic parameters that describe aquifer characteristics.
- Hydrocarbon data are utilized to develop various plume geometry and isoconcentration maps.

All data are compiled and utilized for making specific recommendations with regard to remedial action alternate.

APPENDIX B

MATERIAL SAFETY DATA SHEET JP-5

MATERIAL SAFETY DATA SHEET

Jet Fuel JP-5 **MSDS No. 9942**

EMERGENCY OVERVIEW
CAUTION!
COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT
EFFECTS CENTRAL NERVOUS SYSTEM
HARMFUL OR FATAL IF SWALLOWED

NFPA 704 (Section 16)

Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause eye irritation and skin irritation (rash). Long-term, repeated exposure may cause skin cancer.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).

1. CHEMICAL PRODUCT and COMPANY INFORMATION

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs): **CHEMTREC (800) 424-9300**
COMPANY CONTACT (business hours): Corporate EHS (732) 750-6000
MSDS Internet Website: www.hess.com

SYNONYMS: JP – 5; Military Aviation Jet Fuel JP –5
See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Kerosene (8008-20-6)	100
Naphthalene (91-20-3)	Typically 0.04

A complex combination of hydrocarbons including naphthenes, paraffins, and aromatics.

3. HAZARDS IDENTIFICATION

EYES
Contact with eyes may cause mild to moderate irritation.

SKIN
May cause skin irritation with prolonged or repeated contact. Practically non-toxic if absorbed following acute (single) exposure. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

INGESTION

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION
Excessive exposure may cause irritation to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY
Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11 Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

4. FIRST AID MEASURES

EYES
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

INGESTION
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION
Remove person to fresh air. If person is not breathing provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT:	> 140 °F (60 °C) TCC
AUTOIGNITION POINT:	475 °F (246 °C)
OSHA/NFPA FLAMMABILITY CLASS:	IIIA (COMBUSTIBLE)
LOWER EXPLOSIVE LIMIT (%):	0.7
UPPER EXPLOSIVE LIMIT (%):	5.0

FIRE AND EXPLOSION HAZARDS
Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA
SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO_2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

FIRE FIGHTING INSTRUCTIONS
Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY'S SPILL CONTINGENCY OR EMERGENCY RESPONSE PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE

HANDLING PRECAUTIONS

Handle as a combustible liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a

cleaning solvent on the skin. Do not use gasoline or solvents (naphtha, kerosene, etc.) for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION

EXPOSURE LIMITS

Components (CAS No.)	Source	Exposure Limits TWA/STEL	Note
Kerosene (8008-20-6)	OSHA	5 mg/m^3 as mineral oil mist	
	ACGIH	100 mg/m^3 TWA	A3
Naphthalene (91-20-3)	OSHA	10 ppm	
	ACGIH	10 ppm TWA/ 15 ppm STEL	A4

ENGINEERING CONTROLS
Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION
Safety glasses or goggles are recommended where there is a possibility of splashing or spraying

SKIN PROTECTION
Gloves constructed of nitrile, neoprene, or PVC are recommended. Chemical protective clothing such as of E.I. DuPont Tyvek QC®, Saranex®, TyChem® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information

RESPIRATORY PROTECTION
A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

WORK/HYGIENIC PRACTICES
Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use gasoline or solvents (naphtha, kerosene, etc.) for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE
Pale yellow to water-white liquid

ODOR
Characteristic petroleum distillate odor

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	0.029 psia @ 100 °F (38 °C)
VAPOR DENSITY (air = 1):	AP 4.5
SPECIFIC GRAVITY (H_2O = 1):	AP 0.80
PERCENT VOLATILES:	100 %
EVAPORATION RATE:	Slow; varies with conditions
SOLUBILITY (H_2O):	Negligible

10. STABILITY and REACTIVITY

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers such as nitric and sulfuric acids.

HAZARDOUS DECOMPOSITION PRODUCTS:

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenicity: OSHA: NO IARC: NO NTP: NO ACGIH: 1997 NOIC: A3
Dermal carcinogenicity: positive (mice)

ACUTE TOXICITY

Acute dermal LD50 (rabbits): > 5 g/kg
Acute oral LD50 (rats): > 25 g/kg
Primary dermal irritation: mildly irritating (rabbits)
Primary eye irritation: mildly irritating (rabbits)
Guinea pig sensitization: negative

Studies have shown that similar products produce skin cancer or skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage and waterways. Report spills and releases, as applicable, under Federal and State regulations.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME:	Fuel, Aviation, Turbine Engine
DOT HAZARD CLASS and PACKING GROUP:	3, PG II
DOT IDENTIFICATION NUMBER:	UN 1863
DOT SHIPPING LABEL:	FLAMMABLE LIQUID

PLACARD:

May be reclassified for transportation as a COMBUSTIBLE LIQUID under conditions of DOT 49 CFR 173.120(b)(2).

15. REGULATORY INFORMATION

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other regulations at the state and/or local level. Consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the *de minimis* levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 3 (Combustible Liquid) Class D, Division 2, Subdivision B (Toxic by other means)

CALIFORNIA PROPOSITON 65 LIST OF CHEMICALS

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

INGREDIENT NAME (CAS NUMBER)	Date Listed
Naphthalene	04/19/2002

16. OTHER INFORMATION

NFPA® HAZARD RATING	HEALTH:	0	
	FIRE:	2	
	REACTIVITY:	0	

Refer to NJPA 704 "Identification of the Fire Hazards of Materials" for further information

HMIS® HAZARD RATING	HEALTH:	1*	Slight
	FIRE:	2	Moderate
	PHYSICAL:	0	Negligible
			*Chronic

SUPERSEDES MSDS DATED: 1/14/99

ABBREVIATIONS:

AP = Approximately	< = Less than	> = Greater than
N/A = Not Applicable	N/D = Not Determined	ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute (212)642-4900
API	American Petroleum Institute (202)682-8000
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation [General info: (800)467-4922]
EPA	U.S. Environmental Protection Agency
HMIS	Hazardous Materials Information System
IARC	International Agency For Research On Cancer
MSHA	Mine Safety and Health Administration
NFPA	National Fire Protection Association (617)770-3000
NIOSH	National Institute of Occupational Safety and Health
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
NTP	National Toxicology Program
OPA	Oil Pollution Act of 1990
OSHA	U.S. Occupational Safety & Health Administration
PEL	Permissible Exposure Limit (OSHA)
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit (NIOSH)
SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA	Self-Contained Breathing Apparatus
SPCC	Spill Prevention, Control, and Countermeasures
STEL	Short-Term Exposure Limit (generally 15 minutes)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average (8 hr.)
WEEL	Workplace Environmental Exposure Level (AIHA)
WHMIS	Canadian Workplace Hazardous Materials Information System

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

APPENDIX C

RISK CLASSIFICATION AND LAND USE FORM

Risk Classification and Land Use Form
AS-4147 (JP-5 Pipeline Release), White Street, MCAS New River Air Station, North Carolina

Part I - Groundwater/Surface Water/Vapor Impacts
High Risk

1. *Has the release contaminated any water supply well including any used for non-drinking purposes?* YES **NO**

   According to I&E/EMD/EQB, MCB Camp Lejeune samples the raw water supply wells on a regular basis. CATLIN has reviewed the latest water supply well sampling data from the Marine Corp Base, Camp Lejeune Environmental Management's website 2008 Annual Water Quality Report data. The information provided indicates that the water supply wells closest to the site source area, PSWAS-4150 (approximately 2,500 feet to the south) and PSWAS-191 (approximately 2,600 feet to the northwest), have not been contaminated as a result of the releases from the JP-5 source area.

2. *Is a water supply well used for drinking water located within 1,000 feet of the source area of the discharge or release?* YES **NO**

   There is no water supply well located within 1,000 feet of the source area of the release (refer to Figure 2).

3. *Is a water supply well not used for drinking water (e.g., irrigation, washing cars, industrial cooling water, filling swimming pools) located within 250 feet of the source area of the release?* YES **NO**

   There is no water supply well not used for drinking water located within 250 feet of the source area of the release (refer to Figure 2).

4. *Does groundwater within 500 feet of the source area of the release have the potential for future use (there is no other source of water supply other than the groundwater)?* YES **NO**

   Currently MCB Camp Lejeune has several locations for potential water supply well locations that are greater than 500 feet from the potential source area (refer to Figure 2).

5. *Do vapors from the release pose a threat of explosion because of accumulation of the vapors in a confined space or pose any other serious threat to public health, public safety or the environment?* YES **NO**
   If YES describe.

   No evidence of vapor accumulation has been reported.

6. *Are there any other factors that would cause the discharge or release to pose an imminent danger to public health, public safety, or the environment?* YES **NO**
If YES describe.

A review of data collected during this investigation does not provide evidence to suggest other factors that would cause remnants of the discharge or release to pose an imminent danger to public health, public safety, or the environment.

Intermediate Risk

7. *Is a surface water body located within 500 feet of the source area of the discharge or release?* YES **NO**

A review of Figure 1, shows the nearest mapped surface water body is Southwest Creek approximately 4,000 feet southwest of the subject site. Figure 1 surface water features shown within 500 feet of the source area are manmade structures.

*If **YES**, does the maximum groundwater contaminant concentration exceed the surface water quality standards and criteria found in 15A NCAC 2B.0200 by a factor of 10?*

YES **NO**

8. *Is the source area of the discharge or release located within an approved or planned wellhead protection area as defined in 42 USC 300h-7(e)?* YES **NO**
If YES describe.

Wellhead protection areas defined by 42 USC 300h-7(e) have not, as of this time, been designated by the State. However, MCB Camp Lejeune has identified wellhead protection areas on the base. Based on the most recent Wellhead Protection Plan – 2002 Update, the potential source area is not located within a proposed wellhead protection area.

9. *Is the release located in the Coastal Plain physiographic region as designated on a map entitled "Geology of North Carolina" published by the Department in 1985?* **YES** NO

As identified in the Geologic Map of North Carolina (North Carolina Department of Natural Resources and Community Development 1985), the subject site lies within the Coastal Plain Physiographic Province.

If YES, is the source area of the release located in an area in which there is recharge to an unconfined or semi-confined deeper aquifer that is being used or may be used as a source of drinking water? YES **NO**
If YES describe.

The potential source area is located just above an apparent unconfined surficial groundwater aquifer. While there is the potential for recharge by rainfall to the unconfined surficial aquifer at the Base, the surficial aquifer is not used for water supply aboard MCB, Camp Lejeune. Groundwater obtained from the Castle Hayne Aquifer is the raw water source for MCB Camp Lejeune potable water treatment facilities. Data from the Visual Hydrogeologic Framework (run on July 31, 2009) estimated the depths of Castle Hayne aquifer and confining units at the subject site as follows:

Surficial Aquifer: Ground surface to – 53' Below Land Surface (BLS)
Upper Tertiary Confining Unit: 53 to 55' BLS
Upper Tertiary Aquifer: 55 to 60' BLS
Castle Hayne Confining Unit: 60 to 80' BLS
Castle Hayne Aquifer: 80 to 185' BLS

10. *Do the levels of groundwater contamination for any contaminant exceed the gross contamination levels (GCLs) established by the Department?* YES **NO**

Groundwater samples from site monitoring wells were analyzed per EPA Method 602 + IPE + MTBE + Xylenes, EPA Method 625 + top ten TICs and MADEP EPH/VPH. A review of laboratory analysis results indicates no detected compound concentrations in excess of applicable GCLs.

Part II - Land Use

Property Containing Source Area of Release

The questions below pertain to the property containing the source area of the release.

1. *Does the property contain one or more primary or secondary residences (permanent or temporary)?* YES **NO**
Describe.

The source area does not contain primary or secondary residences. The nearest residence area is Marine Apartment Building AS-4020 approximately 1,200 feet west of the potential source area. Please refer to Figure 2.

2. *Does the property contain a school, daycare center, hospital, playground, park, recreation area, church, nursing home, or other place of public assembly?* YES **NO**
Describe.

The source area does not contain a school, daycare center, hospital, playground, park, recreation area, church, nursing home, or other place of public assembly. The nearest place of public assembly is a sports field (baseball, basketball and soccer) located approximately 1,100 feet northwest of the source area.

3. *Does the property contain a commercial (e.g., retail, warehouse, office/business space, etc.) or industrial (e.g., manufacturing, utilities, industrial research and development, chemical/petroleum bulk storage, etc.) enterprise, an inactive commercial or industrial enterprise, or is the land undeveloped?* **YES** NO
Describe.

The immediate area surrounding Building AS-4147 includes fenced storage areas to the west and White Street and military aircraft maintenance hangars to the east.

4. *Do children visit the property?* YES **NO**
Explain.

Under normal circumstances, children are not expected to visit the property.

Is access to the property reliably restricted consistent with its use (e.g., by fences, security personnel or both)? YES **NO**
Explain.

The buried JP-5 Pipeline runs just east of the AS-4147 fenced (fence/locked gate) area. The bulk of the remnant JP-5 Pipeline release is not within the AS-4147 fenced area.

5. *Do pavement, buildings, or other structures cap the contaminated soil?* **YES** NO
Describe.

Only soil samples form the USTAS4147-MW02 location had contamination. USTAS4147-MW02 is located in a paved area.

If YES, what mechanisms are in place or can be put into place to ensure that the contaminated soil will remain capped in the foreseeable future?

The current site use is not expected to change in the near future.

6. *What is the zoning status of the property?*

MCB Camp Lejeune is not subject to local or county-zoning requirements; however, the project site use is consistent with an Industrial/Commercial area.

7. *Is the use of the property likely to change in the next 20 years?* YES **NO**
Explain.

The current use of MCB Camp Lejeune and the subject site is not likely to change in the near future.

Property Surrounding Source Area of Release
The questions below pertain to the area within 1,500 feet of the source area of the release (excludes property containing source area of the release): See Figure 1

1. *What is the distance from the source area of the release to the **nearest** primary or secondary residence (permanent or temporary)?*

   The nearest temporary or permanent residence is approximately 1,200 feet west. Please refer to Figure 2.

2. *What is the distance from the source area of the release to the **nearest** school, daycare center, hospital, playground, park, recreation area, church, nursing home or other place of public assembly?*

   The nearest place of public assembly is a sports field (baseball, basketball and soccer) located approximately 1,100 feet northwest of the source area.

3. *What is the zoning status of properties in the surrounding area?*

   As previously stated, MCB Camp Lejeune is not subject to local or county-zoning requirements; however, the area is consistent with an Industrial/Commercial area.

4. *Briefly characterize the use and activities of the land in the surrounding area.*

   Building As-4147 and the surrounding area is utilized for storage and maintenance operations for Marine Corps aircraft operations.

Ultimately, North Carolina Department of Environment and Natural Resources (NCDENR) Division of Waste Management UST Section personnel determine the Land Use and Risk Classification for the subject site. The following conclusions are based on CATLIN personnel evaluating site findings in accordance with the NCDENR Guidelines for Assessment and Corrective Action fir UST Releases effective July 15, 2008.

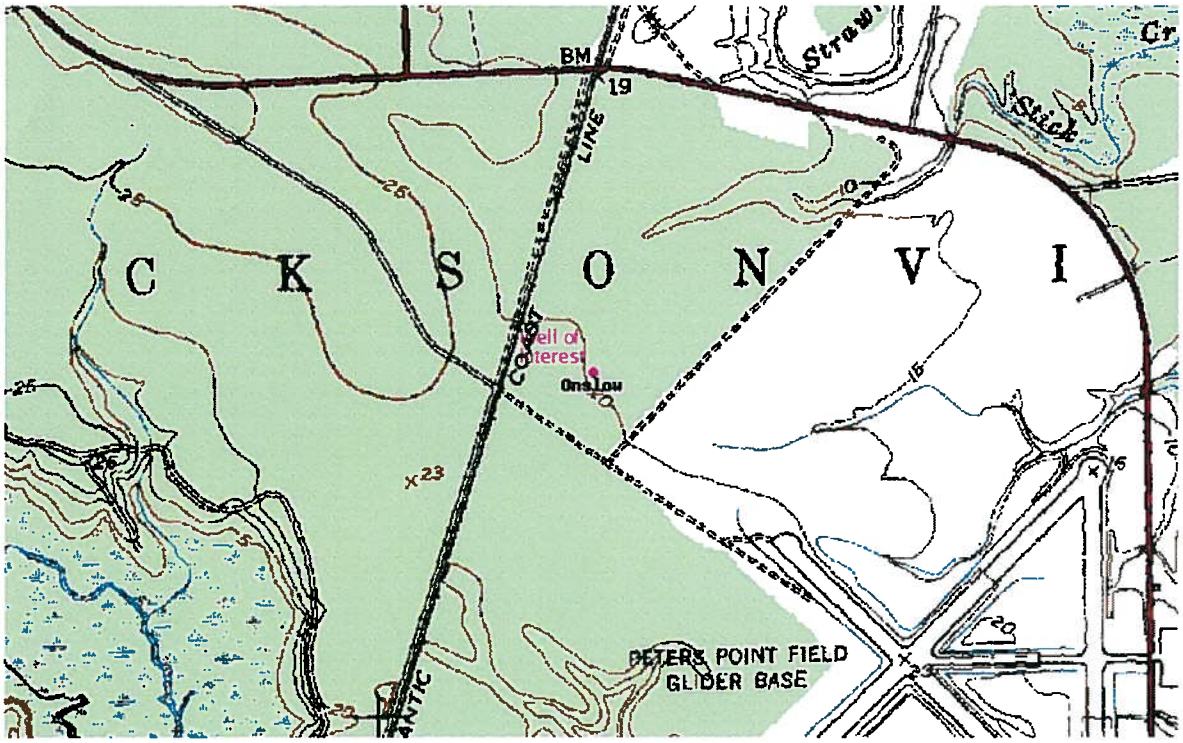
- Based on the field findings of this CSA, CATLIN concludes that the project site meets the criteria for Industrial/Commercial Land Use and a Risk Classification of Intermediate.

APPENDIX D

VISUAL HYDROGEOLOGIC FRAMEWORK

North Carolina Department of Environment and Natural Resources

Division of Water Resources



Legend:

- Point of Interest
- County Boundaries
- 7.5 Minute Quads

Set Map Buffer:

1000 meters

0 230 460 690 m

Show Yahoo Map

Show Google Map

(Name: USTAS4147-MW04)

NC Division of Water Resources, DENR - 1611 Mail Service Center - Raleigh, NC 27699-1611
Phone: (919)733-4064 - Fax: (919)733-3558

Last Modified: 07.10.2009

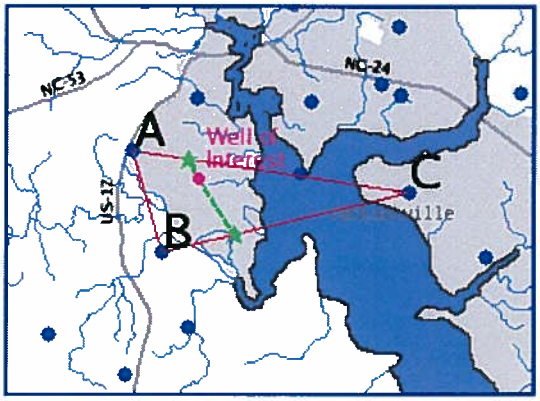
FrameWork Query Results

Scroll to bottom half of page for cross-section.

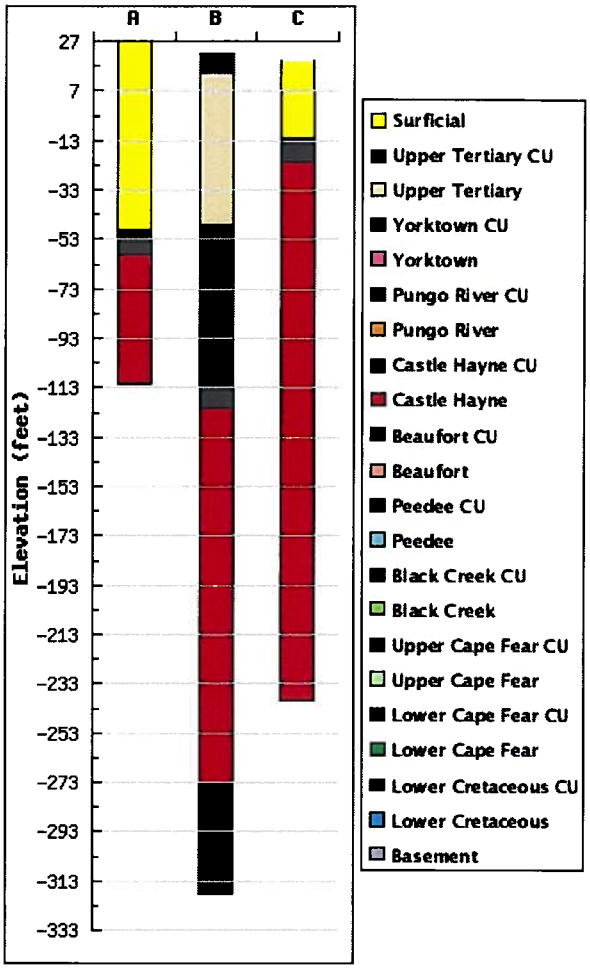
Framework Map with borehole locations is shown to the right and may be viewed in a separate window.

Cross-section line is oriented approximately: **NNW-SSE**
(149 degrees)

6, 3, AC-BC



Borehole Hydrogeology



Well of Interest (Name: USTAS4147-MW04)

Location: 34.716874, -77.451496; **Well Depth:** 40 feet; **Screen Depth:** 35 feet; **Land Surface (estimated):** 18 feet; **Show Map**

Approximate depths to (and elevations of) hydrogeological units (feet):

SURFICIAL 0 (18)
• Hydrogeologic unit top depths estimated to well depth. USGS National Elevation Dataset 1/9 Arc Second Elevation = 18 feet

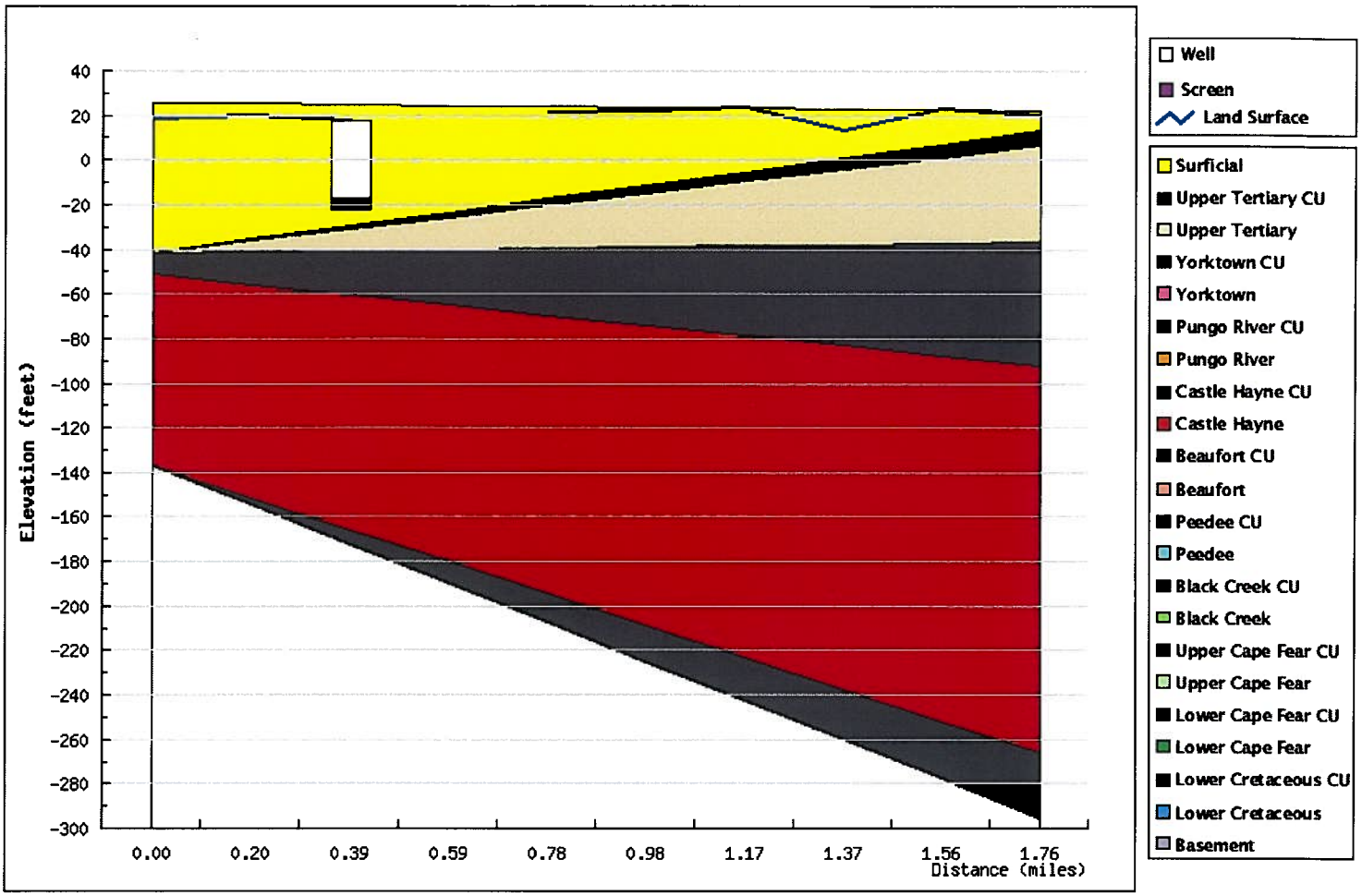
Boreholes

A: Carl Beacham, X 25G; **Land Surface:** 27 feet; **Location:** 34.725, -77.475; Geophysical Logs, Hydrogeologic Units

B: Alliance Environmental, X 25R; **Land Surface:** 23 feet; **Location:** 34.695555, -77.465; Geophysical Logs, Hydrogeologic Units

C: USMC ON-T-2-87, X 24M; **Land Surface:** 20 feet; **Location:** 34.711388, -77.377777; Geophysical Logs, Hydrogeologic Units

Calculated Cross-Section



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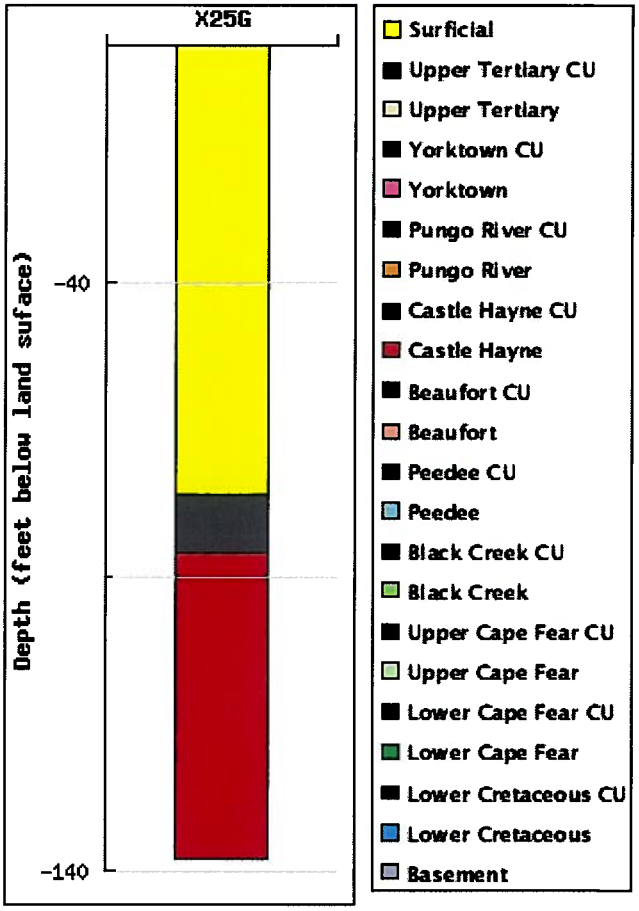
Last Modified: 07.09.2009

DWR Hydrogeologic Framework Detail for Carl Beacham

Field	Data
County	Onslow
Latitude	34.725000
Longitude	-77.475000
Location Accuracy	Map Show Map
Quad	X 25G
Name link to logs	Carl Beacham
Depth	138.00
Land Surface	27.00
Upper Tertiary CU	10001
Upper Tertiary	10001
Yorktown CU	10001
Yorktown	10001
Pungo River CU	10001
Pungo River	10001
Castle Hayne CU	-49
Castle Hayne	-59
Beaufort CU	10003
Beaufort	10003
Peedee CU	10003
Peedee	10003
Black Creek CU	10003
Black Creek	10003
Upper Cape Fear CU	10003
Upper Cape Fear	10003
Lower Cape Fear CU	10003
Lower Cape Fear	10003
Lower Cretaceous CU	10000
Lower Cretaceous	10000
Basement	10003

Unit top elevations are shown in table, depths are shown in plot



- 10002 - unit likely exists, but there is no data to pick elevation or correlation is uncertain;
- 10001 - unit does not exist;
- 10000 - unit does not exist and is not penetrated;
- 10003 - unit likely exists, but is not penetrated.

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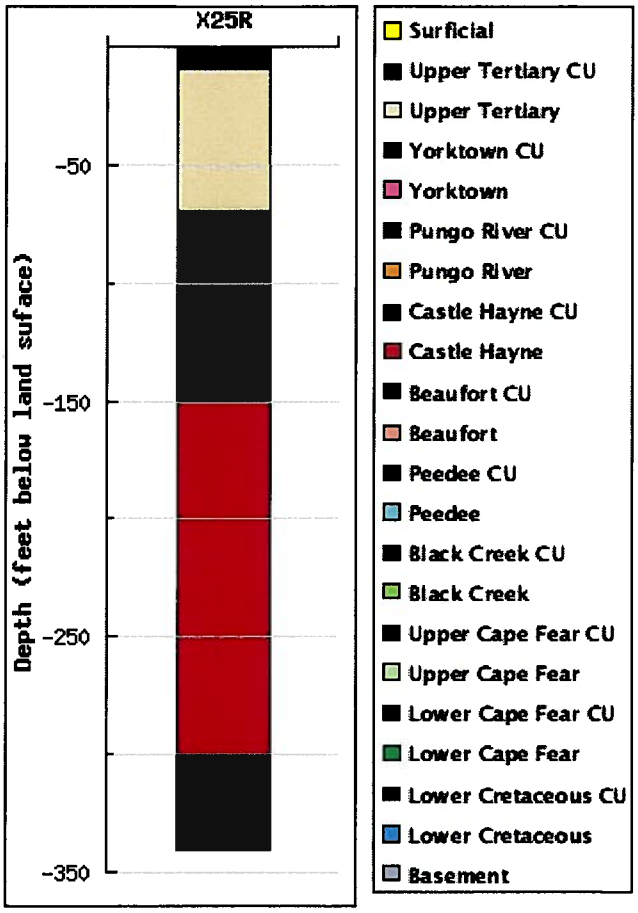
Last Modified: 11.14.2008

DWR Hydrogeologic Framework Detail for Alliance Environmental

Field	Data
County	Onslow
Latitude	34.695555
Longitude	-77.465000
Location Accuracy	Map Show Map
Quad	X 25R
Name link to logs	Alliance Environmental
Depth	341.00
Land Surface	23.00
Upper Tertiary CU	23
Upper Tertiary	14
Yorktown CU	10001
Yorktown	10001
Pungo River CU	10001
Pungo River	10001
Castle Hayne CU	-47
Castle Hayne	-121
Beaufort CU	10001
Beaufort	10001
Peedee CU	-277
Peedee	10003
Black Creek CU	10003
Black Creek	10003
Upper Cape Fear CU	10003
Upper Cape Fear	10003
Lower Cape Fear CU	10003
Lower Cape Fear	10003
Lower Cretaceous CU	10000
Lower Cretaceous	10000
Basement	10003

Unit top elevations are shown in table, depths are shown in plot



- 10002 - unit likely exists, but there is no data to pick elevation or correlation is uncertain;
- 10001 - unit does not exist;
- 10000 - unit does not exist and is not penetrated;
- 10003 - unit likely exists, but is not penetrated.

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Phone: (919)733-4064 - Fax: (919)733-3558

Last Modified: 11.14.2008

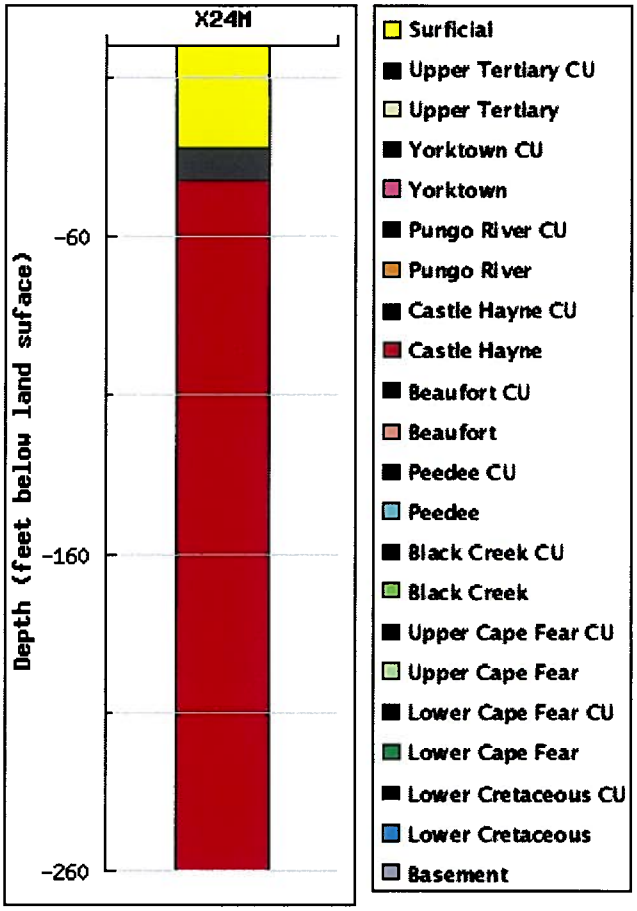
North Carolina Department of Environment and Natural Resources

Division of Water Resources

DWR Hydrogeologic Framework Detail for USMC ON-T-2-87

Field	Data
County	Onslow
Latitude	34.711388
Longitude	-77.377777
Location Accuracy	Map Show Map
Quad	X 24M
Name link to logs	USMC ON-T-2-87
Depth	260.00
Land Surface	20.00
Upper Tertiary CU	10001
Upper Tertiary	10001
Yorktown CU	10001
Yorktown	10001
Pungo River CU	10001
Pungo River	10001
Castle Hayne CU	-12
Castle Hayne	-22
Beaufort CU	10003
Beaufort	10003
Peedee CU	10003
Peedee	10003
Black Creek CU	10003
Black Creek	10003
Upper Cape Fear CU	10003
Upper Cape Fear	10003
Lower Cape Fear CU	10003
Lower Cape Fear	10003
Lower Cretaceous CU	10000
Lower Cretaceous	10000
Basement	10003

Unit top elevations are shown in table, depths are shown in plot



- 10002 - unit likely exists, but there is no data to pick elevation or correlation is uncertain;
- 10001 - unit does not exist;
- 10000 - unit does not exist and is not penetrated;
- 10003 - unit likely exists, but is not penetrated.

NC Division of Water Resources, DENR - 1611 Mail Service Center - Raleigh, NC 27699-1611
Phone: (919)733-4064 - Fax: (919)733-3558

Last Modified: 11.14.2008

APPENDIX E

BORING LOGS, MONITORING WELL CONSTRUCTION DETAILS, AND NORTH CAROLINA WELL CONSTRUCTION RECORDS

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources - Division of Water Quality

WELL CONTRACTOR CERTIFICATION #: 2799

1. WELL CONTRACTOR:

John E. Wood, III
Well Contractor (Individual) Name

CATLIN Engineers and Scientists
Well Contractor Company Name

STREET ADDRESS 220 Old Dairy Road

Wilmington | North Carolina | 28405
City or Town | State | Zip Code

(910) - 452-5861
Area code - Phone number

2. WELL INFORMATION

SITE WELL ID #(if applicable): USTAS4147- MW01
STATE WELL PERMIT #(if applicable): N/A
DWQ or OTHER PERMIT # (if applicable): N/A
WELL USE (Check Applicable Box): Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use):
DATE DRILLED: 07/30/2009
TIME COMPLETED: 17:00 **AM** ☐ **PM** ☒

3. WELL LOCATION:

CITY: Camp Lejeune COUNTY: Onslow

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING
Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other:

NORTHING: 3,844,321.3
EASTING: 275,531.3
UTM NAD83 (m)

May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: ☒ GPS ☐ Topo. map

(Location of well must be shown on a USGS topo map and attached to this form if not using a GPS.)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable) N/A
NAME OF FACILITY: N/A
STREET ADDRESS:

Camp Lejeune | NC
City or Town | State | Zip Code

CONTACT PERSON: Mr. Nick Schultz
STREET ADDRESS: Attn: I&E/ EMD/ EQB/ PSC Box 20004

Camp Lejeune | NC | 28542-0004
City or Town | State | Zip Code

(910)- 451-5068
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 12
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 2.37 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS -0.45 FT. Above Land Surface*
* Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C.0118

e. YIELD (gpm): N/A **METHOD OF TEST:** N/A
f. DISINFECTION: Type N/A **Amount:** N/A
g. WATER ZONES (depth):
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From	0.45	To 1.8 ft.	2"	Sch. 40	PVC
From		To ft.	"		
From		To ft.	"		

7. GROUT:

	Depth		Material	Method
From	0	To 0.5 Ft.	Portland Cement	Surface Pour
From	0.5	To 1 Ft.	Bent. Pellets	Surface Pour
From		To Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From	1.8	To 11.8 Ft.	2 in.	Slot .010 in.	PVC
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From	1	To 12 Ft.	#2 Medium	Torpedo Sand
From		To Ft.		
From		To Ft.		

10. DRILLING LOG

From	To	Formation Description
		SEE ATTACHED

11. REMARKS:

New flush mount Type II

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

John Wood III — 9-17-09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

John E. Wood, III
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days, Attn: Information Management, 1617 Mail Service Center - Raleigh, NC 27699167, Phone No. (919) 733-7015 ext 568.

Modified from Form GW-1b Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources - Division of Water Quality

WELL CONTRACTOR CERTIFICATION #: 2799

1. WELL CONTRACTOR:

John E. Wood, III
Well Contractor (Individual) Name

CATLIN Engineers and Scientists
Well Contractor Company Name

STREET ADDRESS 220 Old Dairy Road

Wilmington | North Carolina | 28405
City or Town | State | Zip Code

(910) - 452-5861
Area code - Phone number

2. WELL INFORMATION

SITE WELL ID #(if applicable): USTAS4147- MW02
STATE WELL PERMIT #(if applicable): N/A
DWQ or OTHER PERMIT # (if applicable): N/A
WELL USE(Check Applicable Box): Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use): _____
DATE DRILLED: 07/31/2009
TIME COMPLETED: 17:00 **AM** ☐ **PM** ☒

3. WELL LOCATION:

CITY: Camp Lejeune COUNTY: Onslow

_____
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING
Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other: _____

NORTHING: 3,844,348.7
EASTING: 275,537.3
UTM NAD83 (m)

May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: ☒ GPS ☐ Topo. map

(Location of well must be shown on a USGS topo map and attached to this form if not using a GPS.)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable) N/A
NAME OF FACILITY: N/A
STREET ADDRESS:

Camp Lejeune | NC | _____
City or Town | State | Zip Code

CONTACT PERSON: Mr. Nick Schultz
STREET ADDRESS: Attn: I&E/ EMD/ EQB/ PSC Box 20004

Camp Lejeune | NC | 28542-0004
City or Town | State | Zip Code

(910)- 451-5068
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 12
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 9.39 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS -0.4 FT. Above Land Surface*
* Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C.0118

e. YIELD (gpm): N/A **METHOD OF TEST:** N/A
f. DISINFECTION: Type N/A **Amount:** N/A
g. WATER ZONES(depth):

From	To	From	To
From	To	From	To
From	To	From	To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.4	To 1.8	ft.	2"	Sch. 40	PVC
From	To	ft.	"		
From	To	ft.	"		

7. GROUT:

	Depth		Material	Method
From 0	To 0.5	Ft.	Portland Cement	Surface Pour
From 0.5	To 1	Ft.	Bent. Pellets	Surface Pour
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 1.8	To 11.8	Ft.	2 in.	Slot .010in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 1	To 12	Ft.	#2 Medium	Torpedo Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
		SEE ATTACHED

11. REMARKS:

New flush mount Type II

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

John Wood III — 9-17-09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

John E. Wood, III
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days, Attn: Information Management, 1617 Mail Service Center - Raleigh, NC 27699167, Phone No. (919) 733-7015 ext 568.

Modified from Form GW-1b Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources - Division of Water Quality

WELL CONTRACTOR CERTIFICATION #: 2799

1. WELL CONTRACTOR:

John E. Wood, III
Well Contractor (Individual) Name

CATLIN Engineers and Scientists
Well Contractor Company Name

STREET ADDRESS 220 Old Dairy Road

Wilmington | North Carolina | 28405
City or Town | State | Zip Code

(910) - 452-5861
Area code - Phone number

2. WELL INFORMATION

SITE WELL ID #(if applicable): USTAS4147- MW03
STATE WELL PERMIT #(if applicable): N/A
DWQ or OTHER PERMIT # (if applicable): N/A
WELL USE (Check Applicable Box): Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use):
DATE DRILLED: 07/30/2009
TIME COMPLETED: 17:00 **AM** ☐ **PM** ☒

3. WELL LOCATION:

CITY: Camp Lejeune COUNTY: Onslow
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING
Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other:

NORTHING: 3,844,349.5
EASTING: 275,512.6
UTM NAD83 (m)

May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: ☒ GPS ☐ Topo. map
(Location of well must be shown on a USGS topo map and attached to this form if not using a GPS.)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable) N/A
NAME OF FACILITY: N/A
STREET ADDRESS:

Camp Lejeune | NC
City or Town | State | Zip Code

CONTACT PERSON: Mr. Nick Schultz
STREET ADDRESS: Attn: I&E/ EMD/ EQB/ PSC Box 20004
Camp Lejeune | NC | 28542-0004
City or Town | State | Zip Code
(910)- 451-5068
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 12
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 4.22 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS -0.302 FT. Above Land Surface*
* Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C.0118

e. YIELD (gpm): N/A **METHOD OF TEST:** N/A
f. DISINFECTION: Type N/A **Amount:** N/A
g. WATER ZONES(depth):
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.302	To 1.8	ft.	2"	Sch. 40	PVC
From ____	To ____	ft.	"		
From ____	To ____	ft.	"		

7. GROUT:

	Depth		Material	Method
From 0	To 0.5	Ft.	Portland Cement	Surface Pour
From 0.5	To 1	Ft.	Bent. Pellets	Surface Pour
From ____	To ____	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 1.8	To 11.8	Ft.	2 in.	Slot .010 in.	PVC
From ____	To ____	Ft.	in.	in.	
From ____	To ____	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 1	To 12	Ft.	#2 Medium	Torpedo Sand
From ____	To ____	Ft.		
From ____	To ____	Ft.		

10. DRILLING LOG

From	To	Formation Description
		SEE ATTACHED

11. REMARKS:

New flush mount Type II

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

John Wood III — 9-17-09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

John E. Wood, III
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days, Attn: Information Management, 1617 Mail Service Center - Raleigh, NC 27699167, Phone No. (919) 733-7015 ext 568.

Modified from Form GW-1b Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources - Division of Water Quality

WELL CONTRACTOR CERTIFICATION #: 2799

1. WELL CONTRACTOR:

John E. Wood, III
Well Contractor (Individual) Name

CATLIN Engineers and Scientists
Well Contractor Company Name

STREET ADDRESS 220 Old Dairy Road

Wilmington | North Carolina | 28405
City or Town | State | Zip Code

(910) - 452-5861
Area code - Phone number

2. WELL INFORMATION

SITE WELL ID #(if applicable): USTAS4147- MW04
STATE WELL PERMIT #(if applicable): N/A
DWQ or OTHER PERMIT # (if applicable): N/A
WELL USE(Check Applicable Box): Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use): _____

DATE DRILLED: 07/29/2009
TIME COMPLETED: 15:45 **AM** ☐ **PM** ☒

3. WELL LOCATION:

CITY: Camp Lejeune COUNTY: Onslow

_____
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING
Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other: _____

NORTHING: 3,844,350.3
EASTING: 275,525.0
UTM NAD83 (m)

May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: ☒ GPS ☐ Topo. map

(Location of well must be shown on a USGS topo map and attached to this form if not using a GPS.)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable) N/A
NAME OF FACILITY: N/A
STREET ADDRESS:

Camp Lejeune | NC
City or Town | State | Zip Code

CONTACT PERSON: Mr. Nick Schultz
STREET ADDRESS: Attn: I&E/ EMD/ EQB/ PSC Box 20004

Camp Lejeune | NC | 28542-0004
City or Town | State | Zip Code

(910)- 451-5068
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 39.5
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 5.27 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS -0.086 FT. Above Land Surface*
* Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C.0118

e. YIELD (gpm): N/A **METHOD OF TEST:** N/A
f. DISINFECTION: Type N/A **Amount:** N/A
g. WATER ZONES(depth):

From	To	From	To
From	To	From	To
From	To	From	To

6. CASING:

	Depth			Diameter	Thickness/ Weight	Material
From	0.086	To	34.3 ft.	2"	Sch. 40	PVC
From	0	To	19 ft.	6"	Sch. 40	PVC
From		To	ft.	"		

7. GROUT:

	Depth			Material	Method
From	0	To	18 Ft.	Portland Cement	Tremie
From	18	To	32.5 Ft.	Bent. Pellets	Surface Pour
From		To	Ft.		

8. SCREEN:

	Depth			Diameter	Slot Size	Material
From	34.3	To	39.3 Ft.	2 in.	Slot .010in.	PVC
From		To	Ft.	in.	in.	
From		To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth			Size	Material
From	32.5	To	39.5 Ft.	#2 Medium	Torpedo Sand
From		To	Ft.		
From		To	Ft.		

10. DRILLING LOG

From	To	Formation Description
		SEE ATTACHED

11. REMARKS:

New flush mount Type III

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

John Wood III — 9-17-09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

John E. Wood, III
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days, Attn: Information Management, 1617 Mail Service Center - Raleigh, NC 27699167, Phone No. (919) 733-7015 ext 568.

Modified from Form GW-1b Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources - Division of Water Quality

WELL CONTRACTOR CERTIFICATION #: 2799

1. WELL CONTRACTOR:

John E. Wood, III
Well Contractor (Individual) Name

CATLIN Engineers and Scientists
Well Contractor Company Name

STREET ADDRESS 220 Old Dairy Road

Wilmington | North Carolina | 28405
City or Town | State | Zip Code

(910) - 452-5861
Area code - Phone number

2. WELL INFORMATION

SITE WELL ID #(if applicable): USTAS4147- MW05

STATE WELL PERMIT #(if applicable): N/A

DWQ or OTHER PERMIT # (if applicable): N/A

WELL USE (Check Applicable Box): Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use): _____

DATE DRILLED: 07/30/2009

TIME COMPLETED: 17:00 **AM** ☐ **PM** ☒

3. WELL LOCATION:

CITY: Camp Lejeune COUNTY: Onslow

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING

Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other: _____

NORTHING: 3,844,358.4
EASTING: 275,531.3
UTM NAD83 (m)

May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: ☒ GPS ☐ Topo. map

(Location of well must be shown on a USGS topo map and attached to this form if not using a GPS.)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable) N/A

NAME OF FACILITY: N/A

STREET ADDRESS:

Camp Lejeune | NC
City or Town | State | Zip Code

CONTACT PERSON: Mr. Nick Schultz

STREET ADDRESS: Attn: I&E/ EMD/ EQB/ PSC Box 20004

Camp Lejeune | NC | 28542-0004
City or Town | State | Zip Code

(910)- 451-5068
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 12

b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒

c. WATER LEVEL Below Top of Casing: 8.18 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS -0.286 FT. Above Land Surface*
* Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C.0118

e. YIELD (gpm): N/A **METHOD OF TEST:** N/A

f. DISINFECTION: Type N/A **Amount:** N/A

g. WATER ZONES (depth):

From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.286	To 1.8	ft.	2"	Sch. 40	PVC
From ____	To ____	ft.	"		
From ____	To ____	ft.	"		

7. GROUT:

	Depth		Material	Method
From 0	To 0.5	Ft.	Portland Cement	Surface Pour
From 0.5	To 1	Ft.	Bent. Pellets	Surface Pour
From ____	To ____	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 1.8	To 11.8	Ft.	2 in.	Slot .010 in.	PVC
From ____	To ____	Ft.	in.	in.	
From ____	To ____	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 1	To 12	Ft.	#2 Medium	Torpedo Sand
From ____	To ____	Ft.		
From ____	To ____	Ft.		

10. DRILLING LOG

From	To	Formation Description
		SEE ATTACHED

11. REMARKS:

New flush mount Type II

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

John Wood III 9-17-09
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

John E. Wood, III
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days, Attn: Information Management, 1617 Mail Service Center - Raleigh, NC 27699167, Phone No. (919) 733-7015 ext 568.

Modified from Form GW-1b Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources - Division of Water Quality

WELL CONTRACTOR CERTIFICATION #: 2799

1. WELL CONTRACTOR:

John E. Wood, III
Well Contractor (Individual) Name

CATLIN Engineers and Scientists
Well Contractor Company Name

STREET ADDRESS 220 Old Dairy Road

Wilmington | North Carolina | 28405
City or Town | State | Zip Code

(910) - 452-5861
Area code - Phone number

2. WELL INFORMATION

SITE WELL ID #(if applicable): USTAS4147- MW06
STATE WELL PERMIT #(if applicable): N/A
DWQ or OTHER PERMIT # (if applicable): N/A
WELL USE(Check Applicable Box): Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use):
DATE DRILLED: 07/30/2009
TIME COMPLETED: 17:00 **AM** ☐ **PM** ☒

3. WELL LOCATION:

CITY: Camp Lejeune COUNTY: Onslow

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING
Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other:

NORTHING: 3,844,377.2
EASTING: 275,531.3
UTM NAD83 (m)

May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: ☒ GPS ☐ Topo. map
(Location of well must be shown on a USGS topo map and attached to this form if not using a GPS.)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable) N/A
NAME OF FACILITY: N/A
STREET ADDRESS:

Camp Lejeune | NC
City or Town | State | Zip Code

CONTACT PERSON: Mr. Nick Schultz
STREET ADDRESS: Attn: I&E/ EMD/ EQB/ PSC Box 20004

Camp Lejeune | NC | 28542-0004
City or Town | State | Zip Code

(910)- 451-5068
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 12
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 3.63 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS -0.332 FT. Above Land Surface*
* Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C.0118

e. YIELD (gpm): N/A **METHOD OF TEST:** N/A
f. DISINFECTION: Type N/A **Amount:** N/A
g. WATER ZONES(depth):
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.332	To 1.8	ft.	2"	Sch. 40	PVC
From ____	To ____	ft.	"		
From ____	To ____	ft.	"		

7. GROUT:

	Depth		Material	Method
From 0	To 0.5	Ft.	Portland Cement	Surface Pour
From 0.5	To 1	Ft.	Bent. Pellets	Surface Pour
From ____	To ____	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 1.8	To 11.8	Ft.	2 in.	Slot .010in.	PVC
From ____	To ____	Ft.	____ in.	____ in.	
From ____	To ____	Ft.	____ in.	____ in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 1	To 12	Ft.	#2 Medium	Torpedo Sand
From ____	To ____	Ft.		
From ____	To ____	Ft.		

10. DRILLING LOG

From	To	Formation Description
		SEE ATTACHED

11. REMARKS:

New flush mount Type II

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

John Wood III — 9-17-09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

John E. Wood, III
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days, Attn: Information Management, 1617 Mail Service Center - Raleigh, NC 27699167, Phone No. (919) 733-7015 ext 568.

Modified from Form GW-1b Rev. 7/05

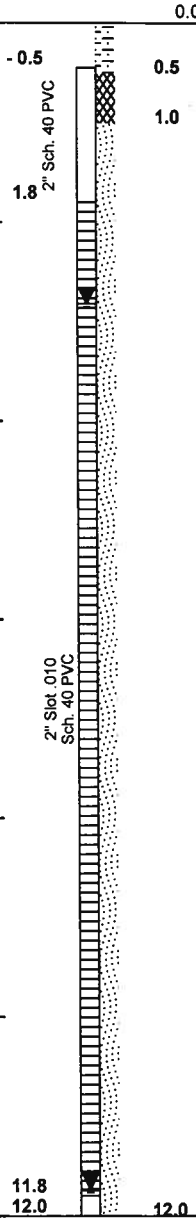
WELL LOG

CATLIN Engineers and Scientists
209-033 Wilmington, NC

PROJECT NO.: 209-033	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: AS-4147 JP-5 Pipeline Release		LOGGED BY: Tom Stetler	WELL ID: USTAS4147-MW01
		DRILLER: John E. Wood, III	
NORTHING: 3844321.3	EASTING: 275531.3	CREW: Roger Caulder	
SYSTEM: UTM NAD83 (m)	BORING LOCATION: In AS-4147 parking lot.		T.O.C. ELEV.: 20.13
DRILL MACHINE: Diedrich D-50	METHOD: HSA	0 HOUR DTW: 11.7	TOTAL DEPTH: 12.0
START DATE: 7/30/09	FINISH DATE: 7/30/09	24 HOUR DTW: 2.4	WELL DEPTH: 12.0

DEPTH	BLOW COUNT 6in	6in	6in	6in	OVA (ppm)	LAB.	MOIS	LOG	SOIL AND ROCK DESCRIPTION (DEPTH / ELEVATION)
									0.0 LAND SURFACE 20.6
									0.3 ASPHALT 20.3
0.5									0.5 GRAVEL 20.1
	12	10	5	5	561.3	UST AS4147 -MW01 (1-2.5')	M		(SC/SM) - Dark brown Silty to Clayey SAND. Strong organic odor. 2.5 18.1
3.0									3.0 17.6
	2	1	1	1	149.8		M		(SC/SM) - Brown Silty to Clayey, fine to very fine SAND. No HCO. 4.0 16.6
									(CH) - Brown Silty CLAY. High plasticity. Soft. No HCO. 5.0 15.6
8.0									8.0 12.6
	0	1	0	1	11.5		M		(CH) - Gray fat CLAY. High plasticity. No HCO. 10.0 10.6
									Boring Terminated at Elev. 8.6 ft CLAY.

WELL DETAIL



Portland Cement | Bentonite Pellets | #2 Medium Sand

CATLIN BORING LOG_209-033 AS4147 GPJ CATLIN.GDT 9/17/09

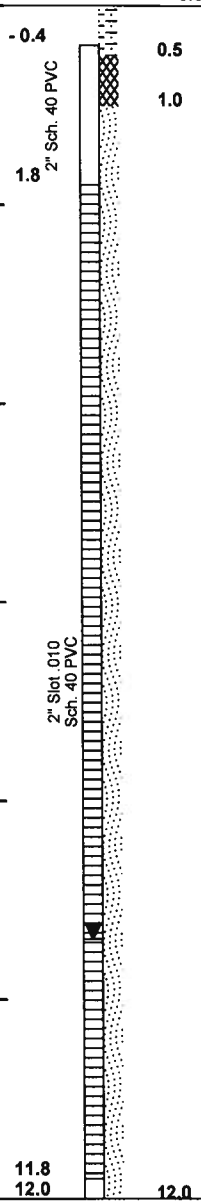
WELL LOG

CATLIN Engineers and Scientists
209-033 Wilmington, NC

PROJECT NO.: 209-033	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: AS-4147 JP-5 Pipeline Release	LOGGED BY: Tom Stetler	DRILLER: John E. Wood, III	WELL ID: USTAS4147-MW02
NORTHING: 3844348.7	EASTING: 275537.3	CREW: Roger Caulder	
SYSTEM: UTM NAD83 (m)	BORING LOCATION: Along White St.		T.O.C. ELEV.: 18.18
DRILL MACHINE: Diedrich D-50	METHOD: HSA	0 HOUR DTW: 9.4	TOTAL DEPTH: 12.0
START DATE: 7/31/09	FINISH DATE: 7/31/09	24 HOUR DTW:	WELL DEPTH: 12.0

DEPTH	BLOW COUNT 6in	6in	6in	6in	OVA (ppm)	LAB.	MOIS	LOG	SOIL AND ROCK DESCRIPTION (DEPTH – DESCRIPTION – ELEVATION)
									0.0 LAND SURFACE 18.6
									0.3 ASPHALT 18.3
									0.5 GRAVEL 18.1
0.5	1	1	2	1	744.2	UST AS4147 -MW02 (1-2.5')	M		(SC/CL) - Brown Clayey, fine to very fine SAND to Sandy CLAY. Very soft. No HCO. 1.5 17.1
									(SM) - Dark brown to tan Silty, fine to very fine SAND. No HCO. 2.5 16.1
3.0									3.0 15.6
	0	1	1	1	320.9		M		(CH) - Brown to gray Silty CLAY with trace interlayered SAND horizons up to 1" in thickness. High plasticity. Very soft. 5.0 13.6
8.0									8.0 10.6
	0	0	0	0	9.7		M		(CH) - Gray high plasticity CLAY. Very soft. No HCO. 10.0 8.6
									Boring Terminated at Elev. 6.6 ft CLAY.

WELL DETAIL



Portland Cement | Bentonite Pellets | #2 Medium Sand

CATLIN BORING LOG 209-033 AS4147 GPJ CATLIN.GDT 9/17/09

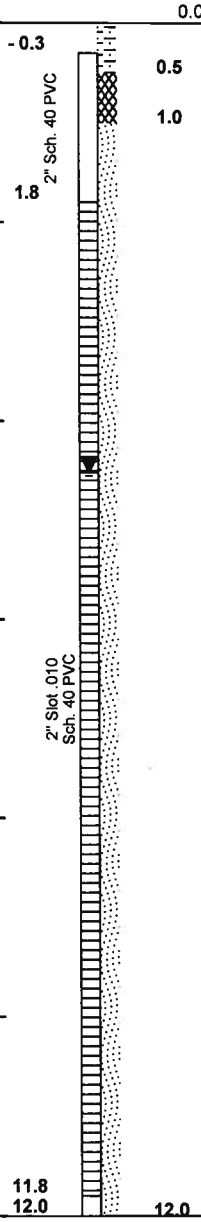
WELL LOG

CATLIN Engineers and Scientists
209-033 Wilmington, NC

PROJECT NO.: 209-033	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: AS-4147 JP-5 Pipeline Release		LOGGED BY: Tom Stetler	WELL ID: USTAS4147-MW03
		DRILLER: John E. Wood, III	
NORTHING: 3844349.5	EASTING: 275512.6	CREW: Roger Caulder	
SYSTEM: UTM NAD83 (m)	BORING LOCATION: Inside AS-4147 compound.		T.O.C. ELEV.: 17.90
DRILL MACHINE: Diedrich D-50	METHOD: HSA	0 HOUR DTW: Dry	TOTAL DEPTH: 12.0
START DATE: 7/30/09	FINISH DATE: 7/30/09	24 HOUR DTW: 4.2	WELL DEPTH: 12.0

DEPTH	BLOW COUNT 6in	6in	6in	6in	OVA (ppm)	LAB.	MOIS	LOG	SOIL AND ROCK DESCRIPTION (DEPTH / ELEVATION)
									0.0 LAND SURFACE 18.2
									0.3 ASPHALT 17.9
0.5									0.5 GRAVEL 17.7
	9	14	10	7	9.2	UST AS4147 -MW03 (1-2.5')	M		(SW/SM) - Fill - Light brown Silty, medium to fine SAND. Moderate grading. No HCO. 1.5 16.7
									(SC) - Native - Brown Silty to Clayey, very fine SAND. No HCO. 2.5 15.7
3.0									3.0 15.2
	1	1	1	2	50.0		M		(CH) - Grayish-brown Silty CLAY. Trace interlayered very fine SAND (approximately 1" in thickness). High plasticity. No HCO. 5.0 13.2
8.0									8.0 10.2
	0	0	0	0	24.6		M		(CH) - Gray high plasticity CLAY. Trace Silt. Very soft. No HCO. 10.0 8.2
									Boring Terminated at Elev. 6.2 ft CLAY.

WELL DETAIL



Portland Cement | Bentonite Pellets | #2 Medium Sand

CATLIN BORING LOG 209-033 AS4147 GPJ CATLIN.GDT 9/17/09

WELL LOG

CATLIN Engineers and Scientists
209-033 Wilmington, NC

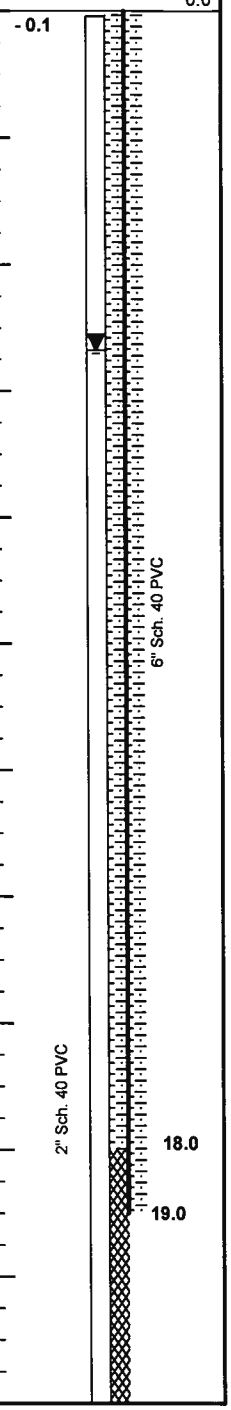
PROJECT NO.: 209-033	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: AS-4147 JP-5 Pipeline Release		LOGGED BY: Tom Stetler	WELL ID: USTAS4147-MW04
		DRILLER: John E. Wood, III	
NORTHING: 3844350.3	EASTING: 275525.0	CREW: Roger Caulder	
SYSTEM: UTM NAD83 (m)	BORING LOCATION: Near USTAS4141-MW15.		T.O.C. ELEV.: 18.05
DRILL MACHINE: Diedrich D-50	METHOD: H.S. Augers w/ M.R.	0 HOUR DTW: NM	TOTAL DEPTH: 40.0
START DATE: 7/27/09	FINISH DATE: 7/29/09	24 HOUR DTW: 5.3	WELL DEPTH: 39.5

DEPTH	BLOW COUNT 6in	6in	6in	6in	OVA (ppm)	LAB.	MOIS	LOG
0.0	3	5	5	5	57.8	UST AS4147 -MW04 (1-2.5')	M	
2.0	4	4	4	3	1910		M	
4.0	0	0	1	1	352.7		W	
6.0	0	0	0	0	81.1		W	
8.0	0	0	0	0	19.3		W	
10.0	0	0	1	1	23.1		W	
12.0	0	0	1	2	37.8		M	
14.0	0	0	1	2	126.9		W	
16.0	1	1	1	2	65.4		M	
18.0	0	0	0	2	33.6		M	
20.0	1	2	6	8	135.2		M	

SOIL AND ROCK DESCRIPTION

DEPTH	DESCRIPTION	ELEVATION
0.0	LAND SURFACE	18.1
0.3	(GW) - ASPHALT.	17.8
0.5	(SW) - Brown Silty, coarse to fine SAND. Well graded fill. Few limestone gravels. Slight HCO (?).	17.6
	(CL/ML) - Dark brown organic-rich Clayey to Sandy SILT. Moderate HCO. Wet at 4' BLS.	
4.0		14.1
	(CH) - Grayish-brown high plasticity CLAY. Trace Silt. Very soft. Slight HCO, to no HCO below 10' BLS. Strong organic odor between 20-21.5' BLS. Trace wood fragments from 6-20' BLS. No silts past 8' BLS. Greenish-brown color from 14-16' BLS.	
21.5		-3.4
22.0	(SM) - Brown to gray Silty, fine to very fine	-3.9

WELL DETAIL



Portland Cement | Bentonite Pellets | #2 Medium Sand

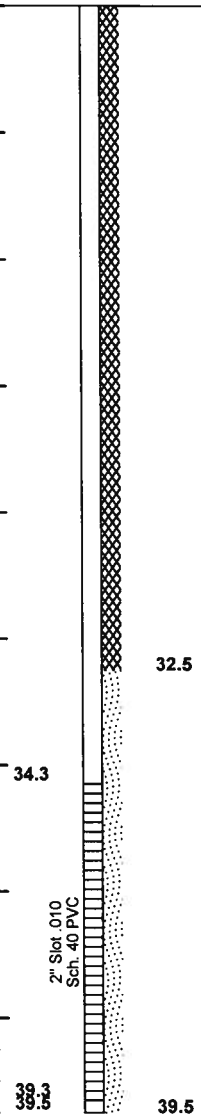
WELL LOG

CATLIN Engineers and Scientists
209-033 Wilmington, NC

PROJECT NO.: 209-033	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: AS-4147 JP-5 Pipeline Release		LOGGED BY: Tom Stetler	WELL ID: USTAS4147-MW04
		DRILLER: John E. Wood, III	
NORTHING: 3844350.3	EASTING: 275525.0	CREW: Roger Caulder	
SYSTEM: UTM NAD83 (m)	BORING LOCATION: Near USTAS4141-MW15.		T.O.C. ELEV.: 18.05
DRILL MACHINE: Diedrich D-50	METHOD: H.S. Augers w/ M.R.	0 HOUR DTW: NM	TOTAL DEPTH: 40.0
START DATE: 7/27/09	FINISH DATE: 7/29/09	24 HOUR DTW: 5.3	WELL DEPTH: 39.5

DEPTH	BLOW COUNT 6in	6in	6in	6in	OVA (ppm)	LAB.	MOIS	LOG	SOIL AND ROCK DESCRIPTION (DEPTH / ELEVATION)
									SAND. No HCO. 23.0 / -4.9
23.0	2	3	2	6					No return on sample. 25.0 / -6.9
									28.0 / -9.9
28.0	2	7	15	18	224.1		W		(SM) - Gray Silty, very fine SAND. Trace interlayered medium to fine SAND up to 2" in thickness. No HCO. 30.0 / -11.9
									33.0 / -14.9
33.0	9	10	6	7	67.4		W		(SC/SM) - Tan Silty to CLAYEY fine to very fine calcareous SAND. Trace limestone fragments. No HCO. Hole caving at 32' BLS prior to sampling this interval. 35.0 / -16.9
									38.0 / -19.9
38.0	2	3	9	36	139.8		W		(SC/SM) - Same as above with trace shell fragments and lower clay component. 40.0 / -21.9
									Boring Terminated at Elev. -21.9 ft Silty calcareous sand.

WELL DETAIL



Portland Cement | Bentonite Pellets | #2 Medium Sand

CATLIN BORING LOG 209-033 AS4147.GPJ CATLIN.GDT 9/17/09

WELL LOG

CATLIN Engineers and Scientists
209-033 Wilmington, NC

PROJECT NO.: 209-033	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: AS-4147 JP-5 Pipeline Release		LOGGED BY: Tom Stetler	WELL ID: USTAS4147-MW05
		DRILLER: John E. Wood, III	
NORTHING: 3844358.4	EASTING: 275531.3	CREW: Roger Caulder	
SYSTEM: UTM NAD83 (m)	BORING LOCATION: Outside fence along White St.		T.O.C. ELEV.: 18.01
DRILL MACHINE: Diedrich D-50	METHOD: HSA	0 HOUR DTW: Dry	TOTAL DEPTH: 12.0
START DATE: 7/30/09	FINISH DATE: 7/30/09	24 HOUR DTW: 8.2	WELL DEPTH: 12.0

DEPTH	BLOW COUNT 6in	6in	6in	6in	OVA (ppm)	LAB.	MOIS	LOG	SOIL AND ROCK DESCRIPTION DEPTH	ELEVATION
									0.0 LAND SURFACE	18.3
0.5	3	5	3	4	1.1	UST AS4147 -MW05 (1-2.5')	M		0.5 (SC/CH) - Dark brown Silty to Clayey, very fine SAND grading downward to high plasticity CLAY. No HCO. 2.5	17.8 / 15.8
3.0	1	1	2	2	0.0		M		3.0 (CH) - Grayish-brown to orange-brown Silty CLAY. High plasticity. Trace SILT. Mottled. Trace iron stained root fragments. No HCO. 5.0	15.3 / 13.3
8.0	0	0	0	0	7.5		M		8.0 (CH) - Same as above. 8.5 (CH) - Gray high plasticity CLAY. No HCO. No mottling. 10.0	10.3 / 9.8 / 8.3
									Boring Terminated at Elev. 6.3 ft CLAY.	

WELL DETAIL

Portland Cement | Bentonite Pellets | #2 Medium Sand

CATLIN BORING LOG 209-033 AS4147 GPJ CATLIN.GDT 9/17/09

WELL LOG

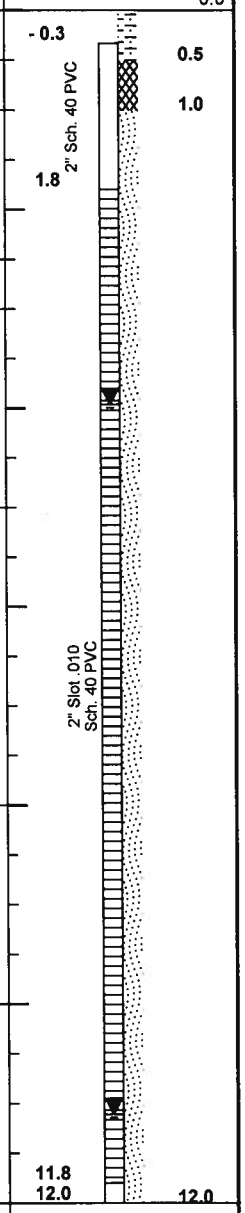
CATLIN Engineers and Scientists
209-033 Wilmington, NC

SHEET 1 OF 1

PROJECT NO.: 209-033	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: AS-4147 JP-5 Pipeline Release		LOGGED BY: Tom Stetler	WELL ID: USTAS4147-MW06
		DRILLER: John E. Wood, III	
NORTHING: 3844377.2	EASTING: 275531.3	CREW: Roger Caulder	
SYSTEM: UTM NAD83 (m)	BORING LOCATION: Outside fence along White St.		T.O.C. ELEV.: 17.62
DRILL MACHINE: Diedrich D-50	METHOD: HSA	0 HOUR DTW: 11.1	TOTAL DEPTH: 12.0
START DATE: 7/30/09	FINISH DATE: 7/30/09	24 HOUR DTW: 3.6	WELL DEPTH: 12.0

DEPTH	BLOW COUNT 6in	6in	6in	6in	OVA (ppm)	LAB.	MOIS	LOG	SOIL AND ROCK DESCRIPTION (DEPTH – DESCRIPTION – ELEVATION)
									0.0 LAND SURFACE 18.0
0.5									0.5 17.5
									(SM) - Fill - Orange to tan Silty, fine SAND. Dry. 1.0 17.0
	3	2	3	3	0.0	UST AS4147 -MW06 (1-2.5')	M		(CH) - Dark brown to brown Silty CLAY. Trace root fragments. Soft. No HCO. 2.5 15.5
3.0									3.0 15.0
	0	0	1	1	0.4		M		(CH) - Orange-brown to brown Silty CLAY. High plasticity. Very soft. Color grades to gray with depth. 5.0 13.0
8.0									8.0 10.0
	0	0	0	1	112.9		M		(CH) - Gray fat CLAY. High plasticity. No HCO. 10.0 8.0
									Boring Terminated at Elev. 6.0 ft CLAY.

WELL DETAIL



Portland Cement | Bentonite Pellets | #2 Medium Sand

CATLIN BORING LOG 209-033 AS4147 GPJ CATLIN GDT 9/17/09

APPENDIX F

LABORATORY REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

SGS

Steve Hudson
Richard Catlin & Associates
P.O. Box 10279
Wilmington, NC 28404-0279

Report Number: G128-2429

Client Project: AS-4147 JP-5 Pipeline Release

Dear Steve Hudson,

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 Barbara Hager 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.

Barbara Hager Aug 20, 2009

Project Manager
Barbara Hager

Date

Environmental Division 5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

Member of the SGS Group

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

% soilds = 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.

MI34.021808.4

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW01(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-1A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-30-2009 10:50
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.07 g
%Solids: 82.1

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Acetone	**0.0622**	0.0501	0.00692	1	8/9/2009	
Benzene	BQL	0.00501	0.00107	1	8/9/2009	
Bromobenzene	BQL	0.00501	0.00103	1	8/9/2009	
Bromochloromethane	BQL	0.00501	0.00172	1	8/9/2009	
Bromodichloromethane	BQL	0.00501	0.00099	1	8/9/2009	
Bromoform	BQL	0.00501	0.00100	1	8/9/2009	
Bromomethane	BQL	0.00501	0.00105	1	8/9/2009	
2-Butanone	BQL	0.0250	0.00544	1	8/9/2009	
n-Butylbenzene	BQL	0.00501	0.00096	1	8/9/2009	
sec-Butylbenzene	BQL	0.00501	0.00101	1	8/9/2009	
tert-Butylbenzene	BQL	0.00501	0.00112	1	8/9/2009	
Carbon disulfide	BQL	0.00501	0.00269	1	8/9/2009	
Carbon tetrachloride	BQL	0.00501	0.00102	1	8/9/2009	
Chlorobenzene	BQL	0.00501	0.00119	1	8/9/2009	
Chloroethane	BQL	0.00501	0.00159	1	8/9/2009	
Chloroform	BQL	0.00501	0.00120	1	8/9/2009	
Chloromethane	BQL	0.00501	0.00113	1	8/9/2009	
2-Chlorotoluene	BQL	0.00501	0.00101	1	8/9/2009	
4-Chlorotoluene	BQL	0.00501	0.00125	1	8/9/2009	
Dibromochloromethane	BQL	0.00501	0.00138	1	8/9/2009	
1,2-Dibromo-3-chloropropane	BQL	0.0250	0.00145	1	8/9/2009	
Dibromomethane	BQL	0.00501	0.00151	1	8/9/2009	
1,2-Dibromoethane (EDB)	BQL	0.00501	0.00113	1	8/9/2009	
1,2-Dichlorobenzene	BQL	0.00501	0.00129	1	8/9/2009	
1,3-Dichlorobenzene	BQL	0.00501	0.00128	1	8/9/2009	
1,4-Dichlorobenzene	BQL	0.00501	0.00105	1	8/9/2009	
trans-1,4-Dichloro-2-butene	BQL	0.0250	0.00138	1	8/9/2009	
1,1-Dichloroethane	BQL	0.00501	0.00106	1	8/9/2009	
1,1-Dichloroethene	BQL	0.00501	0.00148	1	8/9/2009	
1,2-Dichloroethane	BQL	0.00501	0.00132	1	8/9/2009	
cis-1,2-Dichloroethene	BQL	0.00501	0.00128	1	8/9/2009	
trans-1,2-dichloroethene	BQL	0.00501	0.00113	1	8/9/2009	
1,2-Dichloropropane	BQL	0.00501	0.00118	1	8/9/2009	
1,3-Dichloropropane	BQL	0.00501	0.00112	1	8/9/2009	
2,2-Dichloropropane	BQL	0.00501	0.00120	1	8/9/2009	
1,1-Dichloropropene	BQL	0.00501	0.00157	1	8/9/2009	
cis-1,3-Dichloropropene	BQL	0.00501	0.00084	1	8/9/2009	
trans-1,3-Dichloropropene	BQL	0.00501	0.00097	1	8/9/2009	
Dichlorodifluoromethane	BQL	0.00501	0.00132	1	8/9/2009	
Diisopropyl ether (DIPE)	BQL	0.00501	0.00113	1	8/9/2009	
Ethylbenzene	BQL	0.00501	0.00087	1	8/9/2009	
Hexachlorobutadiene	BQL	0.00501	0.00098	1	8/9/2009	
2-Hexanone	BQL	0.0125	0.00325	1	8/9/2009	
Iodomethane	BQL	0.00501	0.00108	1	8/9/2009	

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW01(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-1A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-30-2009 10:50
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.07 g
%Solids: 82.1

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Isopropylbenzene	BQL	0.00501	0.00089	1	8/9/2009	
4-Isopropyltoluene	BQL	0.00501	0.00107	1	8/9/2009	
Methylene chloride	BQL	0.0200	0.00119	1	8/9/2009	
4-Methyl-2-pentanone	BQL	0.0125	0.00464	1	8/9/2009	
Methyl-tert-butyl ether (MTBE)	BQL	0.00501	0.00111	1	8/9/2009	
Naphthalene	BQL	0.00501	0.00085	1	8/9/2009	
n-Propyl benzene	BQL	0.00501	0.00126	1	8/9/2009	
Styrene	BQL	0.00501	0.00110	1	8/9/2009	
1,1,1,2-Tetrachloroethane	BQL	0.00501	0.00102	1	8/9/2009	
1,1,2,2-Tetrachloroethane	BQL	0.00501	0.00113	1	8/9/2009	
Tetrachloroethene	BQL	0.00501	0.00092	1	8/9/2009	
Toluene	BQL	0.00501	0.00100	1	8/9/2009	
1,2,3-Trichlorobenzene	BQL	0.00501	0.00104	1	8/9/2009	
1,2,4-Trichlorobenzene	BQL	0.00501	0.00103	1	8/9/2009	
Trichloroethene	BQL	0.00501	0.00096	1	8/9/2009	
1,1,1-Trichloroethane	BQL	0.00501	0.00113	1	8/9/2009	
1,1,2-Trichloroethane	BQL	0.00501	0.00164	1	8/9/2009	
Trichlorofluoromethane	BQL	0.00501	0.00103	1	8/9/2009	
1,2,3-Trichloropropane	BQL	0.00501	0.00124	1	8/9/2009	
1,2,4-Trimethylbenzene	BQL	0.00501	0.00126	1	8/9/2009	
1,3,5-Trimethylbenzene	BQL	0.00501	0.00114	1	8/9/2009	
Vinyl chloride	BQL	0.00501	0.00136	1	8/9/2009	
m-,p-Xylene	BQL	0.0100	0.00192	1	8/9/2009	
o-Xylene	BQL	0.00501	0.00097	1	8/9/2009	

	Spike Added	Spike Result	Percent Recovered
1,2-Dichloroethane-d4	0.05	0.06	120
Toluene-d8	0.05	0.0513	103
4-Bromofluorobenzene	0.05	0.0478	96

Comments:

Flags:
BQL = Below Quantitation Limits.

Analyst: _____

Reviewed By: _____

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW02(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-2A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-31-2009 08:30
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.61 g
%Solids: 87.6

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Acetone	**0.0169**	0.0432	0.00597	1	8/8/2009	J
Benzene	BQL	0.00432	0.00092	1	8/8/2009	
Bromobenzene	BQL	0.00432	0.00089	1	8/8/2009	
Bromochloromethane	BQL	0.00432	0.00149	1	8/8/2009	
Bromodichloromethane	BQL	0.00432	0.00086	1	8/8/2009	
Bromoform	BQL	0.00432	0.00086	1	8/8/2009	
Bromomethane	BQL	0.00432	0.00091	1	8/8/2009	
2-Butanone	BQL	0.0216	0.00469	1	8/8/2009	
n-Butylbenzene	BQL	0.00432	0.00083	1	8/8/2009	
sec-Butylbenzene	BQL	0.00432	0.00087	1	8/8/2009	
tert-Butylbenzene	BQL	0.00432	0.00097	1	8/8/2009	
Carbon disulfide	BQL	0.00432	0.00231	1	8/8/2009	
Carbon tetrachloride	BQL	0.00432	0.00088	1	8/8/2009	
Chlorobenzene	BQL	0.00432	0.00103	1	8/8/2009	
Chloroethane	BQL	0.00432	0.00137	1	8/8/2009	
Chloroform	BQL	0.00432	0.00104	1	8/8/2009	
Chloromethane	BQL	0.00432	0.00098	1	8/8/2009	
2-Chlorotoluene	BQL	0.00432	0.00087	1	8/8/2009	
4-Chlorotoluene	BQL	0.00432	0.00108	1	8/8/2009	
Dibromochloromethane	BQL	0.00432	0.00119	1	8/8/2009	
1,2-Dibromo-3-chloropropane	BQL	0.0216	0.00125	1	8/8/2009	
Dibromomethane	BQL	0.00432	0.00130	1	8/8/2009	
1,2-Dibromoethane (EDB)	BQL	0.00432	0.00098	1	8/8/2009	
1,2-Dichlorobenzene	BQL	0.00432	0.00111	1	8/8/2009	
1,3-Dichlorobenzene	BQL	0.00432	0.00111	1	8/8/2009	
1,4-Dichlorobenzene	BQL	0.00432	0.00091	1	8/8/2009	
trans-1,4-Dichloro-2-butene	BQL	0.0216	0.00119	1	8/8/2009	
1,1-Dichloroethane	BQL	0.00432	0.00092	1	8/8/2009	
1,1-Dichloroethene	BQL	0.00432	0.00128	1	8/8/2009	
1,2-Dichloroethane	BQL	0.00432	0.00114	1	8/8/2009	
cis-1,2-Dichloroethene	BQL	0.00432	0.00111	1	8/8/2009	
trans-1,2-dichloroethene	BQL	0.00432	0.00098	1	8/8/2009	
1,2-Dichloropropane	BQL	0.00432	0.00102	1	8/8/2009	
1,3-Dichloropropane	BQL	0.00432	0.00097	1	8/8/2009	
2,2-Dichloropropane	BQL	0.00432	0.00104	1	8/8/2009	
1,1-Dichloropropene	BQL	0.00432	0.00136	1	8/8/2009	
cis-1,3-Dichloropropene	BQL	0.00432	0.00072	1	8/8/2009	
trans-1,3-Dichloropropene	BQL	0.00432	0.00083	1	8/8/2009	
Dichlorodifluoromethane	BQL	0.00432	0.00114	1	8/8/2009	
Diisopropyl ether (DIPE)	BQL	0.00432	0.00098	1	8/8/2009	
Ethylbenzene	BQL	0.00432	0.00075	1	8/8/2009	
Hexachlorobutadiene	BQL	0.00432	0.00084	1	8/8/2009	
2-Hexanone	BQL	0.0108	0.00280	1	8/8/2009	
Iodomethane	BQL	0.00432	0.00093	1	8/8/2009	

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW02(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-2A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-31-2009 08:30
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.61 g
%Solids: 87.6

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Isopropylbenzene	BQL	0.00432	0.00077	1	8/8/2009	
4-Isopropyltoluene	BQL	0.00432	0.00092	1	8/8/2009	
Methylene chloride	**0.00163**	0.0173	0.00103	1	8/8/2009	J
4-Methyl-2-pentanone	BQL	0.0108	0.00400	1	8/8/2009	
Methyl-tert-butyl ether (MTBE)	BQL	0.00432	0.00096	1	8/8/2009	
Naphthalene	BQL	0.00432	0.00073	1	8/8/2009	
n-Propyl benzene	BQL	0.00432	0.00109	1	8/8/2009	
Styrene	BQL	0.00432	0.00095	1	8/8/2009	
1,1,1,2-Tetrachloroethane	BQL	0.00432	0.00088	1	8/8/2009	
1,1,2,2-Tetrachloroethane	BQL	0.00432	0.00098	1	8/8/2009	
Tetrachloroethene	BQL	0.00432	0.00079	1	8/8/2009	
Toluene	BQL	0.00432	0.00086	1	8/8/2009	
1,2,3-Trichlorobenzene	BQL	0.00432	0.00090	1	8/8/2009	
1,2,4-Trichlorobenzene	BQL	0.00432	0.00089	1	8/8/2009	
Trichloroethene	BQL	0.00432	0.00082	1	8/8/2009	
1,1,1-Trichloroethane	BQL	0.00432	0.00098	1	8/8/2009	
1,1,2-Trichloroethane	BQL	0.00432	0.00142	1	8/8/2009	
Trichlorofluoromethane	BQL	0.00432	0.00089	1	8/8/2009	
1,2,3-Trichloropropane	BQL	0.00432	0.00107	1	8/8/2009	
1,2,4-Trimethylbenzene	BQL	0.00432	0.00109	1	8/8/2009	
1,3,5-Trimethylbenzene	BQL	0.00432	0.00099	1	8/8/2009	
Vinyl chloride	BQL	0.00432	0.00117	1	8/8/2009	
m-,p-Xylene	BQL	0.00864	0.00166	1	8/8/2009	
o-Xylene	BQL	0.00432	0.00084	1	8/8/2009	

	Spike Added	Spike Result	Percent Recovered
1,2-Dichloroethane-d4	0.05	0.0595	119
Toluene-d8	0.05	0.0505	101
4-Bromofluorobenzene	0.05	0.0481	96

Comments:

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

Analyst: _____

Reviewed By: _____

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW03(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-3A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-30-2009 09:20
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.38 g
%Solids: 89.8

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Acetone	**0.0210**	0.0436	0.00603	1	8/9/2009	J
Benzene	BQL	0.00436	0.00093	1	8/9/2009	
Bromobenzene	BQL	0.00436	0.00090	1	8/9/2009	
Bromochloromethane	BQL	0.00436	0.00150	1	8/9/2009	
Bromodichloromethane	BQL	0.00436	0.00087	1	8/9/2009	
Bromoform	BQL	0.00436	0.00087	1	8/9/2009	
Bromomethane	BQL	0.00436	0.00092	1	8/9/2009	
2-Butanone	BQL	0.0218	0.00474	1	8/9/2009	
n-Butylbenzene	BQL	0.00436	0.00083	1	8/9/2009	
sec-Butylbenzene	BQL	0.00436	0.00088	1	8/9/2009	
tert-Butylbenzene	BQL	0.00436	0.00098	1	8/9/2009	
Carbon disulfide	BQL	0.00436	0.00234	1	8/9/2009	
Carbon tetrachloride	BQL	0.00436	0.00089	1	8/9/2009	
Chlorobenzene	BQL	0.00436	0.00104	1	8/9/2009	
Chloroethane	BQL	0.00436	0.00139	1	8/9/2009	
Chloroform	BQL	0.00436	0.00105	1	8/9/2009	
Chloromethane	BQL	0.00436	0.00099	1	8/9/2009	
2-Chlorotoluene	BQL	0.00436	0.00088	1	8/9/2009	
4-Chlorotoluene	BQL	0.00436	0.00109	1	8/9/2009	
Dibromochloromethane	BQL	0.00436	0.00120	1	8/9/2009	
1,2-Dibromo-3-chloropropane	BQL	0.0218	0.00126	1	8/9/2009	
Dibromomethane	BQL	0.00436	0.00132	1	8/9/2009	
1,2-Dibromoethane (EDB)	BQL	0.00436	0.00099	1	8/9/2009	
1,2-Dichlorobenzene	BQL	0.00436	0.00113	1	8/9/2009	
1,3-Dichlorobenzene	BQL	0.00436	0.00112	1	8/9/2009	
1,4-Dichlorobenzene	BQL	0.00436	0.00092	1	8/9/2009	
trans-1,4-Dichloro-2-butene	BQL	0.0218	0.00120	1	8/9/2009	
1,1-Dichloroethane	BQL	0.00436	0.00093	1	8/9/2009	
1,1-Dichloroethene	BQL	0.00436	0.00129	1	8/9/2009	
1,2-Dichloroethane	BQL	0.00436	0.00115	1	8/9/2009	
cis-1,2-Dichloroethene	BQL	0.00436	0.00112	1	8/9/2009	
trans-1,2-dichloroethene	BQL	0.00436	0.00099	1	8/9/2009	
1,2-Dichloropropane	BQL	0.00436	0.00103	1	8/9/2009	
1,3-Dichloropropane	BQL	0.00436	0.00098	1	8/9/2009	
2,2-Dichloropropane	BQL	0.00436	0.00105	1	8/9/2009	
1,1-Dichloropropene	BQL	0.00436	0.00137	1	8/9/2009	
cis-1,3-Dichloropropene	BQL	0.00436	0.00073	1	8/9/2009	
trans-1,3-Dichloropropene	BQL	0.00436	0.00084	1	8/9/2009	
Dichlorodifluoromethane	BQL	0.00436	0.00115	1	8/9/2009	
Diisopropyl ether (DIPE)	BQL	0.00436	0.00099	1	8/9/2009	
Ethylbenzene	**0.00154**	0.00436	0.00076	1	8/9/2009	J
Hexachlorobutadiene	BQL	0.00436	0.00085	1	8/9/2009	
2-Hexanone	BQL	0.0109	0.00283	1	8/9/2009	
Iodomethane	BQL	0.00436	0.00094	1	8/9/2009	

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW03(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-3A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-30-2009 09:20
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.38 g
%Solids: 89.8

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Isopropylbenzene	BQL	0.00436	0.00078	1	8/9/2009	
4-Isopropyltoluene	BQL	0.00436	0.00093	1	8/9/2009	
Methylene chloride	**0.00152**	0.0174	0.00104	1	8/9/2009	J
4-Methyl-2-pentanone	BQL	0.0109	0.00404	1	8/9/2009	
Methyl-tert-butyl ether (MTBE)	BQL	0.00436	0.00097	1	8/9/2009	
Naphthalene	BQL	0.00436	0.00074	1	8/9/2009	
n-Propyl benzene	BQL	0.00436	0.00110	1	8/9/2009	
Styrene	BQL	0.00436	0.00096	1	8/9/2009	
1,1,1,2-Tetrachloroethane	BQL	0.00436	0.00089	1	8/9/2009	
1,1,2,2-Tetrachloroethane	BQL	0.00436	0.00099	1	8/9/2009	
Tetrachloroethene	BQL	0.00436	0.00080	1	8/9/2009	
Toluene	**0.00129**	0.00436	0.00087	1	8/9/2009	J
1,2,3-Trichlorobenzene	BQL	0.00436	0.00091	1	8/9/2009	
1,2,4-Trichlorobenzene	BQL	0.00436	0.00090	1	8/9/2009	
Trichloroethene	BQL	0.00436	0.00083	1	8/9/2009	
1,1,1-Trichloroethane	BQL	0.00436	0.00099	1	8/9/2009	
1,1,2-Trichloroethane	BQL	0.00436	0.00143	1	8/9/2009	
Trichlorofluoromethane	BQL	0.00436	0.00090	1	8/9/2009	
1,2,3-Trichloropropane	BQL	0.00436	0.00108	1	8/9/2009	
1,2,4-Trimethylbenzene	BQL	0.00436	0.00110	1	8/9/2009	
1,3,5-Trimethylbenzene	BQL	0.00436	0.00099	1	8/9/2009	
Vinyl chloride	BQL	0.00436	0.00119	1	8/9/2009	
m-,p-Xylene	BQL	0.00872	0.00167	1	8/9/2009	
o-Xylene	BQL	0.00436	0.00085	1	8/9/2009	

	Spike Added	Spike Result	Percent Recovered
1,2-Dichloroethane-d4	0.05	0.0605	121
Toluene-d8	0.05	0.0514	103
4-Bromofluorobenzene	0.05	0.0492	98

Comments:

Flags:
BQL = Below Quantitation Limits.

Analyst: _____

Reviewed By: _____

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW04(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-4A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-27-2009 12:45
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.98 g
%Solids: 87.2

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Acetone	**0.0319**	0.0411	0.00568	1	8/7/2009	J
Benzene	BQL	0.00411	0.00088	1	8/7/2009	
Bromobenzene	BQL	0.00411	0.00085	1	8/7/2009	
Bromochloromethane	BQL	0.00411	0.00141	1	8/7/2009	
Bromodichloromethane	BQL	0.00411	0.00082	1	8/7/2009	
Bromoform	BQL	0.00411	0.00082	1	8/7/2009	
Bromomethane	BQL	0.00411	0.00086	1	8/7/2009	
2-Butanone	**0.00529**	0.0205	0.00446	1	8/7/2009	J
n-Butylbenzene	BQL	0.00411	0.00079	1	8/7/2009	
sec-Butylbenzene	BQL	0.00411	0.00083	1	8/7/2009	
tert-Butylbenzene	BQL	0.00411	0.00092	1	8/7/2009	
Carbon disulfide	BQL	0.00411	0.00220	1	8/7/2009	
Carbon tetrachloride	BQL	0.00411	0.00084	1	8/7/2009	
Chlorobenzene	BQL	0.00411	0.00098	1	8/7/2009	
Chloroethane	BQL	0.00411	0.00131	1	8/7/2009	
Chloroform	BQL	0.00411	0.00099	1	8/7/2009	
Chloromethane	BQL	0.00411	0.00093	1	8/7/2009	
2-Chlorotoluene	BQL	0.00411	0.00083	1	8/7/2009	
4-Chlorotoluene	BQL	0.00411	0.00103	1	8/7/2009	
Dibromochloromethane	BQL	0.00411	0.00113	1	8/7/2009	
1,2-Dibromo-3-chloropropane	BQL	0.0205	0.00119	1	8/7/2009	
Dibromomethane	BQL	0.00411	0.00124	1	8/7/2009	
1,2-Dibromoethane (EDB)	BQL	0.00411	0.00093	1	8/7/2009	
1,2-Dichlorobenzene	BQL	0.00411	0.00106	1	8/7/2009	
1,3-Dichlorobenzene	BQL	0.00411	0.00105	1	8/7/2009	
1,4-Dichlorobenzene	BQL	0.00411	0.00086	1	8/7/2009	
trans-1,4-Dichloro-2-butene	BQL	0.0205	0.00113	1	8/7/2009	
1,1-Dichloroethane	BQL	0.00411	0.00087	1	8/7/2009	
1,1-Dichloroethene	BQL	0.00411	0.00122	1	8/7/2009	
1,2-Dichloroethane	BQL	0.00411	0.00108	1	8/7/2009	
cis-1,2-Dichloroethene	BQL	0.00411	0.00105	1	8/7/2009	
trans-1,2-dichloroethene	BQL	0.00411	0.00093	1	8/7/2009	
1,2-Dichloropropane	BQL	0.00411	0.00097	1	8/7/2009	
1,3-Dichloropropane	BQL	0.00411	0.00092	1	8/7/2009	
2,2-Dichloropropane	BQL	0.00411	0.00099	1	8/7/2009	
1,1-Dichloropropene	BQL	0.00411	0.00129	1	8/7/2009	
cis-1,3-Dichloropropene	BQL	0.00411	0.00069	1	8/7/2009	
trans-1,3-Dichloropropene	BQL	0.00411	0.00079	1	8/7/2009	
Dichlorodifluoromethane	BQL	0.00411	0.00108	1	8/7/2009	
Diisopropyl ether (DIPE)	BQL	0.00411	0.00093	1	8/7/2009	
Ethylbenzene	BQL	0.00411	0.00071	1	8/7/2009	
Hexachlorobutadiene	BQL	0.00411	0.00080	1	8/7/2009	
2-Hexanone	BQL	0.0103	0.00266	1	8/7/2009	
Iodomethane	BQL	0.00411	0.00089	1	8/7/2009	

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW04(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-4A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-27-2009 12:45
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.98 g
%Solids: 87.2

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Isopropylbenzene	BQL	0.00411	0.00073	1	8/7/2009	
4-Isopropyltoluene	BQL	0.00411	0.00088	1	8/7/2009	
Methylene chloride	**0.00145**	0.0164	0.00098	1	8/7/2009	J
4-Methyl-2-pentanone	BQL	0.0103	0.00380	1	8/7/2009	
Methyl-tert-butyl ether (MTBE)	BQL	0.00411	0.00091	1	8/7/2009	
Naphthalene	BQL	0.00411	0.00070	1	8/7/2009	
n-Propyl benzene	BQL	0.00411	0.00104	1	8/7/2009	
Styrene	BQL	0.00411	0.00090	1	8/7/2009	
1,1,1,2-Tetrachloroethane	BQL	0.00411	0.00084	1	8/7/2009	
1,1,2,2-Tetrachloroethane	BQL	0.00411	0.00093	1	8/7/2009	
Tetrachloroethene	BQL	0.00411	0.00075	1	8/7/2009	
Toluene	BQL	0.00411	0.00082	1	8/7/2009	
1,2,3-Trichlorobenzene	BQL	0.00411	0.00086	1	8/7/2009	
1,2,4-Trichlorobenzene	BQL	0.00411	0.00085	1	8/7/2009	
Trichloroethene	BQL	0.00411	0.00078	1	8/7/2009	
1,1,1-Trichloroethane	BQL	0.00411	0.00093	1	8/7/2009	
1,1,2-Trichloroethane	BQL	0.00411	0.00135	1	8/7/2009	
Trichlorofluoromethane	BQL	0.00411	0.00085	1	8/7/2009	
1,2,3-Trichloropropane	BQL	0.00411	0.00102	1	8/7/2009	
1,2,4-Trimethylbenzene	BQL	0.00411	0.00104	1	8/7/2009	
1,3,5-Trimethylbenzene	BQL	0.00411	0.00094	1	8/7/2009	
Vinyl chloride	BQL	0.00411	0.00112	1	8/7/2009	
m-,p-Xylene	BQL	0.00822	0.00158	1	8/7/2009	
o-Xylene	BQL	0.00411	0.00080	1	8/7/2009	

	Spike Added	Spike Result	Percent Recovered
1,2-Dichloroethane-d4	0.05	0.0638	128
Toluene-d8	0.05	0.0497	99
4-Bromofluorobenzene	0.05	0.0455	91

Comments:

Flags:
BQL = Below Quantitation Limits.

Analyst: _____

Reviewed By: _____

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW05(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-5A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-30-2009 15:05
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.90 g
%Solids: 82.7

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Acetone	**0.0101**	0.0438	0.00605	1	8/9/2009	J
Benzene	BQL	0.00438	0.00094	1	8/9/2009	
Bromobenzene	BQL	0.00438	0.00090	1	8/9/2009	
Bromochloromethane	BQL	0.00438	0.00151	1	8/9/2009	
Bromodichloromethane	BQL	0.00438	0.00087	1	8/9/2009	
Bromoform	BQL	0.00438	0.00088	1	8/9/2009	
Bromomethane	BQL	0.00438	0.00092	1	8/9/2009	
2-Butanone	BQL	0.0219	0.00475	1	8/9/2009	
n-Butylbenzene	BQL	0.00438	0.00084	1	8/9/2009	
sec-Butylbenzene	BQL	0.00438	0.00088	1	8/9/2009	
tert-Butylbenzene	BQL	0.00438	0.00098	1	8/9/2009	
Carbon disulfide	**0.00359**	0.00438	0.00235	1	8/9/2009	J
Carbon tetrachloride	BQL	0.00438	0.00089	1	8/9/2009	
Chlorobenzene	BQL	0.00438	0.00104	1	8/9/2009	
Chloroethane	BQL	0.00438	0.00139	1	8/9/2009	
Chloroform	BQL	0.00438	0.00105	1	8/9/2009	
Chloromethane	BQL	0.00438	0.00099	1	8/9/2009	
2-Chlorotoluene	BQL	0.00438	0.00088	1	8/9/2009	
4-Chlorotoluene	BQL	0.00438	0.00109	1	8/9/2009	
Dibromochloromethane	BQL	0.00438	0.00121	1	8/9/2009	
1,2-Dibromo-3-chloropropane	BQL	0.0219	0.00127	1	8/9/2009	
Dibromomethane	BQL	0.00438	0.00132	1	8/9/2009	
1,2-Dibromoethane (EDB)	BQL	0.00438	0.00099	1	8/9/2009	
1,2-Dichlorobenzene	BQL	0.00438	0.00113	1	8/9/2009	
1,3-Dichlorobenzene	BQL	0.00438	0.00112	1	8/9/2009	
1,4-Dichlorobenzene	BQL	0.00438	0.00092	1	8/9/2009	
trans-1,4-Dichloro-2-butene	BQL	0.0219	0.00121	1	8/9/2009	
1,1-Dichloroethane	BQL	0.00438	0.00093	1	8/9/2009	
1,1-Dichloroethene	BQL	0.00438	0.00130	1	8/9/2009	
1,2-Dichloroethane	BQL	0.00438	0.00116	1	8/9/2009	
cis-1,2-Dichloroethene	BQL	0.00438	0.00112	1	8/9/2009	
trans-1,2-dichloroethene	BQL	0.00438	0.00099	1	8/9/2009	
1,2-Dichloropropane	BQL	0.00438	0.00103	1	8/9/2009	
1,3-Dichloropropane	BQL	0.00438	0.00098	1	8/9/2009	
2,2-Dichloropropane	BQL	0.00438	0.00105	1	8/9/2009	
1,1-Dichloropropene	BQL	0.00438	0.00137	1	8/9/2009	
cis-1,3-Dichloropropene	BQL	0.00438	0.00073	1	8/9/2009	
trans-1,3-Dichloropropene	BQL	0.00438	0.00084	1	8/9/2009	
Dichlorodifluoromethane	BQL	0.00438	0.00116	1	8/9/2009	
Diisopropyl ether (DIPE)	BQL	0.00438	0.00099	1	8/9/2009	
Ethylbenzene	BQL	0.00438	0.00076	1	8/9/2009	
Hexachlorobutadiene	BQL	0.00438	0.00085	1	8/9/2009	
2-Hexanone	BQL	0.0109	0.00284	1	8/9/2009	
Iodomethane	BQL	0.00438	0.00095	1	8/9/2009	

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW05(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-5A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-30-2009 15:05
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.90 g
%Solids: 82.7

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Isopropylbenzene	BQL	0.00438	0.00078	1	8/9/2009	
4-Isopropyltoluene	BQL	0.00438	0.00094	1	8/9/2009	
Methylene chloride	**0.00181**	0.0175	0.00104	1	8/9/2009	J
4-Methyl-2-pentanone	BQL	0.0109	0.00405	1	8/9/2009	
Methyl-tert-butyl ether (MTBE)	BQL	0.00438	0.00097	1	8/9/2009	
Naphthalene	BQL	0.00438	0.00074	1	8/9/2009	
n-Propyl benzene	BQL	0.00438	0.00110	1	8/9/2009	
Styrene	BQL	0.00438	0.00096	1	8/9/2009	
1,1,1,2-Tetrachloroethane	BQL	0.00438	0.00089	1	8/9/2009	
1,1,2,2-Tetrachloroethane	BQL	0.00438	0.00099	1	8/9/2009	
Tetrachloroethene	BQL	0.00438	0.00080	1	8/9/2009	
Toluene	BQL	0.00438	0.00087	1	8/9/2009	
1,2,3-Trichlorobenzene	BQL	0.00438	0.00091	1	8/9/2009	
1,2,4-Trichlorobenzene	BQL	0.00438	0.00090	1	8/9/2009	
Trichloroethene	BQL	0.00438	0.00084	1	8/9/2009	
1,1,1-Trichloroethane	BQL	0.00438	0.00099	1	8/9/2009	
1,1,2-Trichloroethane	BQL	0.00438	0.00144	1	8/9/2009	
Trichlorofluoromethane	BQL	0.00438	0.00090	1	8/9/2009	
1,2,3-Trichloropropane	BQL	0.00438	0.00109	1	8/9/2009	
1,2,4-Trimethylbenzene	BQL	0.00438	0.00110	1	8/9/2009	
1,3,5-Trimethylbenzene	BQL	0.00438	0.00100	1	8/9/2009	
Vinyl chloride	BQL	0.00438	0.00119	1	8/9/2009	
m-,p-Xylene	BQL	0.00875	0.00168	1	8/9/2009	
o-Xylene	BQL	0.00438	0.00085	1	8/9/2009	

	Spike Added	Spike Result	Percent Recovered
1,2-Dichloroethane-d4	0.05	0.0614	123
Toluene-d8	0.05	0.0511	102
4-Bromofluorobenzene	0.05	0.0481	96

Comments:

Flags:
BQL = Below Quantitation Limits.

Analyst: _____

Reviewed By: _____

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW05(1-2.5) DUP
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-6A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-30-2009 15:05
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.92 g
%Solids: 87.7

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Acetone	**0.00694**	0.0412	0.00570	1	8/9/2009	J
Benzene	BQL	0.00412	0.00088	1	8/9/2009	
Bromobenzene	BQL	0.00412	0.00085	1	8/9/2009	
Bromochloromethane	BQL	0.00412	0.00142	1	8/9/2009	
Bromodichloromethane	BQL	0.00412	0.00082	1	8/9/2009	
Bromoform	BQL	0.00412	0.00082	1	8/9/2009	
Bromomethane	BQL	0.00412	0.00087	1	8/9/2009	
2-Butanone	BQL	0.0206	0.00448	1	8/9/2009	
n-Butylbenzene	BQL	0.00412	0.00079	1	8/9/2009	
sec-Butylbenzene	BQL	0.00412	0.00083	1	8/9/2009	
tert-Butylbenzene	BQL	0.00412	0.00092	1	8/9/2009	
Carbon disulfide	**0.00329**	0.00412	0.00221	1	8/9/2009	J
Carbon tetrachloride	BQL	0.00412	0.00084	1	8/9/2009	
Chlorobenzene	BQL	0.00412	0.00098	1	8/9/2009	
Chloroethane	BQL	0.00412	0.00131	1	8/9/2009	
Chloroform	BQL	0.00412	0.00099	1	8/9/2009	
Chloromethane	BQL	0.00412	0.00093	1	8/9/2009	
2-Chlorotoluene	BQL	0.00412	0.00083	1	8/9/2009	
4-Chlorotoluene	BQL	0.00412	0.00103	1	8/9/2009	
Dibromochloromethane	BQL	0.00412	0.00114	1	8/9/2009	
1,2-Dibromo-3-chloropropane	BQL	0.0206	0.00120	1	8/9/2009	
Dibromomethane	BQL	0.00412	0.00124	1	8/9/2009	
1,2-Dibromoethane (EDB)	BQL	0.00412	0.00093	1	8/9/2009	
1,2-Dichlorobenzene	BQL	0.00412	0.00106	1	8/9/2009	
1,3-Dichlorobenzene	BQL	0.00412	0.00106	1	8/9/2009	
1,4-Dichlorobenzene	BQL	0.00412	0.00087	1	8/9/2009	
trans-1,4-Dichloro-2-butene	BQL	0.0206	0.00114	1	8/9/2009	
1,1-Dichloroethane	BQL	0.00412	0.00087	1	8/9/2009	
1,1-Dichloroethene	BQL	0.00412	0.00122	1	8/9/2009	
1,2-Dichloroethane	BQL	0.00412	0.00109	1	8/9/2009	
cis-1,2-Dichloroethene	BQL	0.00412	0.00106	1	8/9/2009	
trans-1,2-dichloroethene	BQL	0.00412	0.00093	1	8/9/2009	
1,2-Dichloropropane	BQL	0.00412	0.00097	1	8/9/2009	
1,3-Dichloropropane	BQL	0.00412	0.00092	1	8/9/2009	
2,2-Dichloropropane	BQL	0.00412	0.00099	1	8/9/2009	
1,1-Dichloropropene	BQL	0.00412	0.00129	1	8/9/2009	
cis-1,3-Dichloropropene	BQL	0.00412	0.00069	1	8/9/2009	
trans-1,3-Dichloropropene	BQL	0.00412	0.00079	1	8/9/2009	
Dichlorodifluoromethane	BQL	0.00412	0.00109	1	8/9/2009	
Diisopropyl ether (DIPE)	BQL	0.00412	0.00093	1	8/9/2009	
Ethylbenzene	BQL	0.00412	0.00071	1	8/9/2009	
Hexachlorobutadiene	BQL	0.00412	0.00080	1	8/9/2009	
2-Hexanone	BQL	0.0103	0.00267	1	8/9/2009	
Iodomethane	BQL	0.00412	0.00089	1	8/9/2009	

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW05(1-2.5) DUP
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-6A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-30-2009 15:05
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.92 g
%Solids: 87.7

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Isopropylbenzene	BQL	0.00412	0.00073	1	8/9/2009	
4-Isopropyltoluene	BQL	0.00412	0.00088	1	8/9/2009	
Methylene chloride	**0.00176**	0.0165	0.00098	1	8/9/2009	J
4-Methyl-2-pentanone	BQL	0.0103	0.00382	1	8/9/2009	
Methyl-tert-butyl ether (MTBE)	BQL	0.00412	0.00092	1	8/9/2009	
Naphthalene	BQL	0.00412	0.00070	1	8/9/2009	
n-Propyl benzene	BQL	0.00412	0.00104	1	8/9/2009	
Styrene	BQL	0.00412	0.00091	1	8/9/2009	
1,1,1,2-Tetrachloroethane	BQL	0.00412	0.00084	1	8/9/2009	
1,1,2,2-Tetrachloroethane	BQL	0.00412	0.00093	1	8/9/2009	
Tetrachloroethene	BQL	0.00412	0.00076	1	8/9/2009	
Toluene	BQL	0.00412	0.00082	1	8/9/2009	
1,2,3-Trichlorobenzene	BQL	0.00412	0.00086	1	8/9/2009	
1,2,4-Trichlorobenzene	BQL	0.00412	0.00085	1	8/9/2009	
Trichloroethene	BQL	0.00412	0.00079	1	8/9/2009	
1,1,1-Trichloroethane	BQL	0.00412	0.00093	1	8/9/2009	
1,1,2-Trichloroethane	BQL	0.00412	0.00135	1	8/9/2009	
Trichlorofluoromethane	BQL	0.00412	0.00085	1	8/9/2009	
1,2,3-Trichloropropane	BQL	0.00412	0.00102	1	8/9/2009	
1,2,4-Trimethylbenzene	BQL	0.00412	0.00104	1	8/9/2009	
1,3,5-Trimethylbenzene	BQL	0.00412	0.00094	1	8/9/2009	
Vinyl chloride	BQL	0.00412	0.00112	1	8/9/2009	
m-,p-Xylene	BQL	0.00824	0.00158	1	8/9/2009	
o-Xylene	BQL	0.00412	0.00080	1	8/9/2009	

	Spike Added	Spike Result	Percent Recovered
1,2-Dichloroethane-d4	0.05	0.0607	121
Toluene-d8	0.05	0.0511	102
4-Bromofluorobenzene	0.05	0.0473	95

Comments:

Flags:
BQL = Below Quantitation Limits.

Analyst: _____

Reviewed By: _____

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW06(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-7A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-30-2009 13:15
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.11 g
%Solids: 80.4

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Acetone	**0.0207**	0.0508	0.00702	1	8/9/2009	J
Benzene	BQL	0.00508	0.00109	1	8/9/2009	
Bromobenzene	BQL	0.00508	0.00105	1	8/9/2009	
Bromochloromethane	BQL	0.00508	0.00175	1	8/9/2009	
Bromodichloromethane	BQL	0.00508	0.00101	1	8/9/2009	
Bromoform	BQL	0.00508	0.00102	1	8/9/2009	
Bromomethane	BQL	0.00508	0.00107	1	8/9/2009	
2-Butanone	BQL	0.0254	0.00552	1	8/9/2009	
n-Butylbenzene	BQL	0.00508	0.00097	1	8/9/2009	
sec-Butylbenzene	BQL	0.00508	0.00103	1	8/9/2009	
tert-Butylbenzene	BQL	0.00508	0.00114	1	8/9/2009	
Carbon disulfide	BQL	0.00508	0.00272	1	8/9/2009	
Carbon tetrachloride	BQL	0.00508	0.00104	1	8/9/2009	
Chlorobenzene	BQL	0.00508	0.00121	1	8/9/2009	
Chloroethane	BQL	0.00508	0.00162	1	8/9/2009	
Chloroform	BQL	0.00508	0.00122	1	8/9/2009	
Chloromethane	BQL	0.00508	0.00115	1	8/9/2009	
2-Chlorotoluene	BQL	0.00508	0.00103	1	8/9/2009	
4-Chlorotoluene	BQL	0.00508	0.00127	1	8/9/2009	
Dibromochloromethane	BQL	0.00508	0.00140	1	8/9/2009	
1,2-Dibromo-3-chloropropane	BQL	0.0254	0.00147	1	8/9/2009	
Dibromomethane	BQL	0.00508	0.00153	1	8/9/2009	
1,2-Dibromoethane (EDB)	BQL	0.00508	0.00115	1	8/9/2009	
1,2-Dichlorobenzene	BQL	0.00508	0.00131	1	8/9/2009	
1,3-Dichlorobenzene	BQL	0.00508	0.00130	1	8/9/2009	
1,4-Dichlorobenzene	BQL	0.00508	0.00107	1	8/9/2009	
trans-1,4-Dichloro-2-butene	BQL	0.0254	0.00140	1	8/9/2009	
1,1-Dichloroethane	BQL	0.00508	0.00108	1	8/9/2009	
1,1-Dichloroethene	BQL	0.00508	0.00150	1	8/9/2009	
1,2-Dichloroethane	BQL	0.00508	0.00134	1	8/9/2009	
cis-1,2-Dichloroethene	BQL	0.00508	0.00130	1	8/9/2009	
trans-1,2-dichloroethene	BQL	0.00508	0.00115	1	8/9/2009	
1,2-Dichloropropane	BQL	0.00508	0.00120	1	8/9/2009	
1,3-Dichloropropane	BQL	0.00508	0.00114	1	8/9/2009	
2,2-Dichloropropane	BQL	0.00508	0.00122	1	8/9/2009	
1,1-Dichloropropene	BQL	0.00508	0.00160	1	8/9/2009	
cis-1,3-Dichloropropene	BQL	0.00508	0.00085	1	8/9/2009	
trans-1,3-Dichloropropene	BQL	0.00508	0.00098	1	8/9/2009	
Dichlorodifluoromethane	BQL	0.00508	0.00134	1	8/9/2009	
Diisopropyl ether (DIPE)	BQL	0.00508	0.00115	1	8/9/2009	
Ethylbenzene	BQL	0.00508	0.00088	1	8/9/2009	
Hexachlorobutadiene	BQL	0.00508	0.00099	1	8/9/2009	
2-Hexanone	BQL	0.0127	0.00329	1	8/9/2009	
Iodomethane	BQL	0.00508	0.00110	1	8/9/2009	

SGS North America, Inc.

Results for Volatiles
by GCMS 8260-5035

Client Sample ID: USTAS4147-MW06(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID G128-2429-7A
Lab Project ID: G128-2429
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 07-30-2009 13:15
Date Received: 7/31/2009
Matrix: Soil
Sample Amount: 6.11 g
%Solids: 80.4

Report Name Compound	Result MG/KG	Quantitation Limit MG/KG	MDL MG/KG	Dilution Factor	Date Analyzed	Flag
Isopropylbenzene	BQL	0.00508	0.00090	1	8/9/2009	
4-Isopropyltoluene	BQL	0.00508	0.00109	1	8/9/2009	
Methylene chloride	**0.00280**	0.0203	0.00121	1	8/9/2009	J
4-Methyl-2-pentanone	BQL	0.0127	0.00471	1	8/9/2009	
Methyl-tert-butyl ether (MTBE)	BQL	0.00508	0.00113	1	8/9/2009	
Naphthalene	BQL	0.00508	0.00086	1	8/9/2009	
n-Propyl benzene	BQL	0.00508	0.00128	1	8/9/2009	
Styrene	BQL	0.00508	0.00112	1	8/9/2009	
1,1,1,2-Tetrachloroethane	BQL	0.00508	0.00104	1	8/9/2009	
1,1,2,2-Tetrachloroethane	BQL	0.00508	0.00115	1	8/9/2009	
Tetrachloroethene	BQL	0.00508	0.00093	1	8/9/2009	
Toluene	BQL	0.00508	0.00101	1	8/9/2009	
1,2,3-Trichlorobenzene	BQL	0.00508	0.00106	1	8/9/2009	
1,2,4-Trichlorobenzene	BQL	0.00508	0.00105	1	8/9/2009	
Trichloroethene	BQL	0.00508	0.00097	1	8/9/2009	
1,1,1-Trichloroethane	BQL	0.00508	0.00115	1	8/9/2009	
1,1,2-Trichloroethane	BQL	0.00508	0.00167	1	8/9/2009	
Trichlorofluoromethane	BQL	0.00508	0.00105	1	8/9/2009	
1,2,3-Trichloropropane	BQL	0.00508	0.00126	1	8/9/2009	
1,2,4-Trimethylbenzene	BQL	0.00508	0.00128	1	8/9/2009	
1,3,5-Trimethylbenzene	BQL	0.00508	0.00116	1	8/9/2009	
Vinyl chloride	BQL	0.00508	0.00138	1	8/9/2009	
m-,p-Xylene	BQL	0.0102	0.00195	1	8/9/2009	
o-Xylene	BQL	0.00508	0.00099	1	8/9/2009	

	Spike Added	Spike Result	Percent Recovered
1,2-Dichloroethane-d4	0.05	0.0598	120
Toluene-d8	0.05	0.0507	101
4-Bromofluorobenzene	0.05	0.0486	97

Comments:

Flags:
BQL = Below Quantitation Limits.

Analyst: _____

Reviewed By: _____

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTAS4147-MW01(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-1J
Lab Project ID: G128-2429
Report Basis: Dry weight
Initial Weight: 32.77 g

Analyzed By: EAW
Date Collected: 7/30/2009 10:50
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Matrix: Soil
% Solids: 82.08

Compound	Result mg/Kg	RL mg/Kg	MDL mg/Kg	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	0.372	0.057	1	8/11/2009	
Acenaphthylene	BQL	0.372	0.052	1	8/11/2009	
Anthracene	BQL	0.372	0.051	1	8/11/2009	
Benzo[a]anthracene	BQL	0.372	0.051	1	8/11/2009	
Benzo[a]pyrene	BQL	0.372	0.054	1	8/11/2009	
Benzo[b]fluoranthene	BQL	0.372	0.052	1	8/11/2009	
Benzo[g,h,i]perylene	BQL	0.372	0.065	1	8/11/2009	
Benzo[k]fluoranthene	BQL	0.372	0.053	1	8/11/2009	
Benzoic Acid	BQL	1.86	0.459	1	8/11/2009	
Bis(2-chloroethoxy)methane	BQL	0.372	0.055	1	8/11/2009	
Bis(2-chloroethyl)ether	BQL	0.372	0.076	1	8/11/2009	
Bis(2-chloroisopropyl)ether	BQL	0.372	0.060	1	8/11/2009	
Bis(2-ethylhexyl)phthalate	BQL	0.372	0.057	1	8/11/2009	
4-bromophenyl phenyl ether	BQL	0.372	0.066	1	8/11/2009	
Butylbenzylphthalate	BQL	0.372	0.055	1	8/11/2009	
2-Chloronaphthalene	BQL	0.372	0.052	1	8/11/2009	
2-Chlorophenol	BQL	0.372	0.047	1	8/11/2009	
4-Chloro-3-methylphenol	BQL	0.372	0.054	1	8/11/2009	
4-Chloroaniline	BQL	1.86	0.061	1	8/11/2009	
4-Chlorophenyl phenyl ether	BQL	0.372	0.055	1	8/11/2009	
Chrysene	BQL	0.372	0.036	1	8/11/2009	
Dibenzo[a,h]anthracene	BQL	0.372	0.048	1	8/11/2009	
Dibenzofuran	BQL	0.372	0.052	1	8/11/2009	
Di-n-Butylphthalate	BQL	0.372	0.054	1	8/11/2009	
1,2-Dichlorobenzene	BQL	0.372	0.063	1	8/11/2009	
1,3-Dichlorobenzene	BQL	0.372	0.060	1	8/11/2009	
1,4-Dichlorobenzene	BQL	0.372	0.054	1	8/11/2009	
3,3'-Dichlorobenzidine	BQL	0.744	0.061	1	8/11/2009	
2,4-Dichlorophenol	BQL	0.372	0.041	1	8/11/2009	
Diethylphthalate	BQL	0.372	0.050	1	8/11/2009	
Dimethylphthalate	BQL	0.372	0.058	1	8/11/2009	
2,4-Dimethylphenol	BQL	0.372	0.067	1	8/11/2009	
Di-n-octylphthalate	BQL	0.372	0.057	1	8/11/2009	
4,6-Dinitro-2-methylphenol	BQL	1.86	0.044	1	8/11/2009	
2,4-Dinitrophenol	BQL	1.86	0.048	1	8/11/2009	
2,4-Dinitrotoluene	BQL	0.372	0.057	1	8/11/2009	
2,6-Dinitrotoluene	BQL	0.372	0.061	1	8/11/2009	
Fluoranthene	BQL	0.372	0.060	1	8/11/2009	
Fluorene	BQL	0.372	0.058	1	8/11/2009	
Hexachlorobenzene	BQL	0.372	0.081	1	8/11/2009	
Hexachlorobutadiene	BQL	0.372	0.068	1	8/11/2009	
Hexachlorocyclopentadiene	BQL	0.744	0.073	1	8/11/2009	
Hexachloroethane	BQL	0.372	0.058	1	8/11/2009	
Indeno(1,2,3-c,d)pyrene	BQL	0.372	0.044	1	8/11/2009	
Isophorone	BQL	0.372	0.054	1	8/11/2009	
2-Methylnaphthalene	BQL	0.372	0.061	1	8/11/2009	
2-Methylphenol	BQL	0.372	0.057	1	8/11/2009	

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTAS4147-MW01(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-1J
Lab Project ID: G128-2429
Report Basis: Dry weight
Initial Weight: 32.77 g

Analyzed By: EAW
Date Collected: 7/30/2009 10:50
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Matrix: Soil
% Solids: 82.08

Compound	Result mg/Kg	RL mg/Kg	MDL mg/Kg	Dilution Factor	Date Analyzed	Flag
3- & 4-Methylphenol	BQL	0.372	0.048	1	8/11/2009	
Naphthalene	BQL	0.372	0.052	1	8/11/2009	
2-Nitroaniline	BQL	0.372	0.050	1	8/11/2009	
3-Nitroaniline	BQL	1.86	0.055	1	8/11/2009	
4-Nitroaniline	BQL	1.86	0.050	1	8/11/2009	
Nitrobenzene	BQL	0.372	0.049	1	8/11/2009	
2-Nitrophenol	BQL	0.372	0.054	1	8/11/2009	
4-Nitrophenol	BQL	1.86	0.065	1	8/11/2009	
Diphenylamine *	BQL	0.372	0.060	1	8/11/2009	
Pentachlorophenol	BQL	1.86	0.034	1	8/11/2009	
Phenanthrene	BQL	0.372	0.052	1	8/11/2009	
Phenol	BQL	0.372	0.051	1	8/11/2009	
Pyrene	BQL	0.372	0.051	1	8/11/2009	
1,2,4-Trichlorobenzene	BQL	0.372	0.067	1	8/11/2009	
2,4,5-Trichlorophenol	BQL	0.372	0.055	1	8/11/2009	
2,4,6-Trichlorophenol	BQL	0.372	0.033	1	8/11/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.7	87
2-Fluorophenol	10	8.1	81
Nitrobenzene-d5	10	9.1	91
Phenol-d6	10	8	80
2,4,6-Tribromophenol	10	6.1	61
4-Terphenyl-d14	10	9.2	92

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

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

Reviewed By: _____

SGS North America, Inc.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTAS4147-MW01(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-1J
Lab Project ID: G128-2429
Sample Wt/Vol: 32.77 g
Dilution: 1

Analyzed By: DES
Date Collected: 7/30/2009 10:50
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Date Analyzed: 8/11/2009
Matrix: Soil
% Solids: 82.08

No.	Compound	Retention Time	CAS#	Match Probability	Result mg/Kg
1	Unknown	6.67			8280
2	Aromatic, Unknown	14.30			5720
3	Unknown	14.80			2040
4	Ketone, Unknown	14.40			1400
5	Alcohol, Unknown	11.60			869
6	Unknown	10.40			693
7	Unknown	15.20			561
8	Alkane, Unknown	14.90			512
9	Alkane, Unknown	10.90			471
10	Alkane, Unknown	12.40			418

Comment:

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

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

Reviewed by: _____

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTAS4147-MW02(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-2J
Lab Project ID: G128-2429
Report Basis: Dry weight
Initial Weight: 31.81 g

Analyzed By: EAW
Date Collected: 7/31/2009 8:30
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Matrix: Soil
% Solids: 87.58

Compound	Result mg/Kg	RL mg/Kg	MDL mg/Kg	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	0.359	0.055	1	8/11/2009	
Acenaphthylene	BQL	0.359	0.050	1	8/11/2009	
Anthracene	BQL	0.359	0.049	1	8/11/2009	
Benzo[a]anthracene	BQL	0.359	0.049	1	8/11/2009	
Benzo[a]pyrene	BQL	0.359	0.052	1	8/11/2009	
Benzo[b]fluoranthene	BQL	0.359	0.050	1	8/11/2009	
Benzo[g,h,i]perylene	BQL	0.359	0.063	1	8/11/2009	
Benzo[k]fluoranthene	BQL	0.359	0.051	1	8/11/2009	
Benzoic Acid	BQL	1.79	0.443	1	8/11/2009	
Bis(2-chloroethoxy)methane	BQL	0.359	0.053	1	8/11/2009	
Bis(2-chloroethyl)ether	BQL	0.359	0.073	1	8/11/2009	
Bis(2-chloroisopropyl)ether	BQL	0.359	0.058	1	8/11/2009	
Bis(2-ethylhexyl)phthalate	BQL	0.359	0.055	1	8/11/2009	
4-bromophenyl phenyl ether	BQL	0.359	0.064	1	8/11/2009	
Butylbenzylphthalate	BQL	0.359	0.053	1	8/11/2009	
2-Chloronaphthalene	BQL	0.359	0.050	1	8/11/2009	
2-Chlorophenol	BQL	0.359	0.046	1	8/11/2009	
4-Chloro-3-methylphenol	BQL	0.359	0.052	1	8/11/2009	
4-Chloroaniline	BQL	1.79	0.059	1	8/11/2009	
4-Chlorophenyl phenyl ether	BQL	0.359	0.053	1	8/11/2009	
Chrysene	BQL	0.359	0.035	1	8/11/2009	
Dibenzo[a,h]anthracene	BQL	0.359	0.046	1	8/11/2009	
Dibenzofuran	BQL	0.359	0.051	1	8/11/2009	
Di-n-Butylphthalate	BQL	0.359	0.052	1	8/11/2009	
1,2-Dichlorobenzene	BQL	0.359	0.061	1	8/11/2009	
1,3-Dichlorobenzene	BQL	0.359	0.058	1	8/11/2009	
1,4-Dichlorobenzene	BQL	0.359	0.052	1	8/11/2009	
3,3'-Dichlorobenzidine	BQL	0.718	0.059	1	8/11/2009	
2,4-Dichlorophenol	BQL	0.359	0.039	1	8/11/2009	
Diethylphthalate	BQL	0.359	0.048	1	8/11/2009	
Dimethylphthalate	BQL	0.359	0.056	1	8/11/2009	
2,4-Dimethylphenol	BQL	0.359	0.065	1	8/11/2009	
Di-n-octylphthalate	BQL	0.359	0.055	1	8/11/2009	
4,6-Dinitro-2-methylphenol	BQL	1.79	0.043	1	8/11/2009	
2,4-Dinitrophenol	BQL	1.79	0.047	1	8/11/2009	
2,4-Dinitrotoluene	BQL	0.359	0.055	1	8/11/2009	
2,6-Dinitrotoluene	BQL	0.359	0.059	1	8/11/2009	
Fluoranthene	BQL	0.359	0.058	1	8/11/2009	
Fluorene	BQL	0.359	0.056	1	8/11/2009	
Hexachlorobenzene	BQL	0.359	0.078	1	8/11/2009	
Hexachlorobutadiene	BQL	0.359	0.065	1	8/11/2009	
Hexachlorocyclopentadiene	BQL	0.718	0.070	1	8/11/2009	
Hexachloroethane	BQL	0.359	0.056	1	8/11/2009	
Indeno(1,2,3-c,d)pyrene	BQL	0.359	0.042	1	8/11/2009	
Isophorone	BQL	0.359	0.052	1	8/11/2009	
2-Methylnaphthalene	BQL	0.359	0.059	1	8/11/2009	
2-Methylphenol	BQL	0.359	0.055	1	8/11/2009	

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Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTAS4147-MW02(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-2J
Lab Project ID: G128-2429
Report Basis: Dry weight
Initial Weight: 31.81 g

Analyzed By: EAW
Date Collected: 7/31/2009 8:30
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Matrix: Soil
% Solids: 87.58

Compound	Result mg/Kg	RL mg/Kg	MDL mg/Kg	Dilution Factor	Date Analyzed	Flag
3- & 4-Methylphenol	BQL	0.359	0.047	1	8/11/2009	
Naphthalene	BQL	0.359	0.050	1	8/11/2009	
2-Nitroaniline	BQL	0.359	0.048	1	8/11/2009	
3-Nitroaniline	BQL	1.79	0.053	1	8/11/2009	
4-Nitroaniline	BQL	1.79	0.048	1	8/11/2009	
Nitrobenzene	BQL	0.359	0.048	1	8/11/2009	
2-Nitrophenol	BQL	0.359	0.052	1	8/11/2009	
4-Nitrophenol	BQL	1.79	0.063	1	8/11/2009	
Diphenylamine *	BQL	0.359	0.058	1	8/11/2009	
Pentachlorophenol	BQL	1.79	0.033	1	8/11/2009	
Phenanthrene	BQL	0.359	0.050	1	8/11/2009	
Phenol	BQL	0.359	0.049	1	8/11/2009	
Pyrene	BQL	0.359	0.049	1	8/11/2009	
1,2,4-Trichlorobenzene	BQL	0.359	0.065	1	8/11/2009	
2,4,5-Trichlorophenol	BQL	0.359	0.054	1	8/11/2009	
2,4,6-Trichlorophenol	BQL	0.359	0.032	1	8/11/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.3	93
2-Fluorophenol	10	9	90
Nitrobenzene-d5	10	9.6	96
Phenol-d6	10	8.9	89
2,4,6-Tribromophenol	10	7.5	75
4-Terphenyl-d14	10	10.9	109

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

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

Reviewed By: _____

SGS North America, Inc.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTAS4147-MW02(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-2J
Lab Project ID: G128-2429
Sample Wt/Vol: 31.81 g
Dilution: 1

Analyzed By: DES
Date Collected: 7/31/2009 8:30
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Date Analyzed: 8/11/2009
Matrix: Soil
% Solids: 87.58

No.	Compound	Retention Time	CAS#	Match Probability	Result mg/Kg
	No TIC's detected.				

Comment:

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

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

Reviewed by: _____

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTAS4147-MW03(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-3L
Lab Project ID: G128-2429
Report Basis: Dry weight
Initial Weight: 35.2 g

Analyzed By: EAW
Date Collected: 7/30/2009 9:20
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Matrix: Soil
% Solids: 89.84

Compound	Result mg/Kg	RL mg/Kg	MDL mg/Kg	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	0.316	0.048	1	8/11/2009	
Acenaphthylene	BQL	0.316	0.044	1	8/11/2009	
Anthracene	BQL	0.316	0.043	1	8/11/2009	
Benzo[a]anthracene	BQL	0.316	0.043	1	8/11/2009	
Benzo[a]pyrene	BQL	0.316	0.046	1	8/11/2009	
Benzo[b]fluoranthene	BQL	0.316	0.044	1	8/11/2009	
Benzo[g,h,i]perylene	BQL	0.316	0.055	1	8/11/2009	
Benzo[k]fluoranthene	BQL	0.316	0.045	1	8/11/2009	
Benzoic Acid	BQL	1.58	0.391	1	8/11/2009	
Bis(2-chloroethoxy)methane	BQL	0.316	0.047	1	8/11/2009	
Bis(2-chloroethyl)ether	BQL	0.316	0.064	1	8/11/2009	
Bis(2-chloroisopropyl)ether	BQL	0.316	0.051	1	8/11/2009	
Bis(2-ethylhexyl)phthalate	BQL	0.316	0.048	1	8/11/2009	
4-bromophenyl phenyl ether	BQL	0.316	0.056	1	8/11/2009	
Butylbenzylphthalate	BQL	0.316	0.047	1	8/11/2009	
2-Chloronaphthalene	BQL	0.316	0.044	1	8/11/2009	
2-Chlorophenol	BQL	0.316	0.040	1	8/11/2009	
4-Chloro-3-methylphenol	BQL	0.316	0.046	1	8/11/2009	
4-Chloroaniline	BQL	1.58	0.052	1	8/11/2009	
4-Chlorophenyl phenyl ether	BQL	0.316	0.047	1	8/11/2009	
Chrysene	BQL	0.316	0.030	1	8/11/2009	
Dibenzo[a,h]anthracene	BQL	0.316	0.041	1	8/11/2009	
Dibenzofuran	BQL	0.316	0.045	1	8/11/2009	
Di-n-Butylphthalate	BQL	0.316	0.046	1	8/11/2009	
1,2-Dichlorobenzene	BQL	0.316	0.053	1	8/11/2009	
1,3-Dichlorobenzene	BQL	0.316	0.051	1	8/11/2009	
1,4-Dichlorobenzene	BQL	0.316	0.046	1	8/11/2009	
3,3'-Dichlorobenzidine	BQL	0.632	0.052	1	8/11/2009	
2,4-Dichlorophenol	BQL	0.316	0.035	1	8/11/2009	
Diethylphthalate	BQL	0.316	0.042	1	8/11/2009	
Dimethylphthalate	BQL	0.316	0.049	1	8/11/2009	
2,4-Dimethylphenol	BQL	0.316	0.057	1	8/11/2009	
Di-n-octylphthalate	BQL	0.316	0.049	1	8/11/2009	
4,6-Dinitro-2-methylphenol	BQL	1.58	0.038	1	8/11/2009	
2,4-Dinitrophenol	BQL	1.58	0.041	1	8/11/2009	
2,4-Dinitrotoluene	BQL	0.316	0.048	1	8/11/2009	
2,6-Dinitrotoluene	BQL	0.316	0.052	1	8/11/2009	
Fluoranthene	BQL	0.316	0.051	1	8/11/2009	
Fluorene	BQL	0.316	0.049	1	8/11/2009	
Hexachlorobenzene	BQL	0.316	0.069	1	8/11/2009	
Hexachlorobutadiene	BQL	0.316	0.058	1	8/11/2009	
Hexachlorocyclopentadiene	BQL	0.632	0.062	1	8/11/2009	
Hexachloroethane	BQL	0.316	0.049	1	8/11/2009	
Indeno(1,2,3-c,d)pyrene	BQL	0.316	0.037	1	8/11/2009	
Isophorone	BQL	0.316	0.046	1	8/11/2009	
2-Methylnaphthalene	BQL	0.316	0.052	1	8/11/2009	
2-Methylphenol	BQL	0.316	0.048	1	8/11/2009	

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Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTAS4147-MW03(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-3L
Lab Project ID: G128-2429
Report Basis: Dry weight
Initial Weight: 35.2 g

Analyzed By: EAW
Date Collected: 7/30/2009 9:20
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Matrix: Soil
% Solids: 89.84

Compound	Result mg/Kg	RL mg/Kg	MDL mg/Kg	Dilution Factor	Date Analyzed	Flag
3- & 4-Methylphenol	BQL	0.316	0.041	1	8/11/2009	
Naphthalene	BQL	0.316	0.044	1	8/11/2009	
2-Nitroaniline	BQL	0.316	0.042	1	8/11/2009	
3-Nitroaniline	BQL	1.58	0.047	1	8/11/2009	
4-Nitroaniline	BQL	1.58	0.042	1	8/11/2009	
Nitrobenzene	BQL	0.316	0.042	1	8/11/2009	
2-Nitrophenol	BQL	0.316	0.046	1	8/11/2009	
4-Nitrophenol	BQL	1.58	0.055	1	8/11/2009	
Diphenylamine *	BQL	0.316	0.051	1	8/11/2009	
Pentachlorophenol	BQL	1.58	0.029	1	8/11/2009	
Phenanthrene	BQL	0.316	0.044	1	8/11/2009	
Phenol	BQL	0.316	0.043	1	8/11/2009	
Pyrene	BQL	0.316	0.043	1	8/11/2009	
1,2,4-Trichlorobenzene	BQL	0.316	0.057	1	8/11/2009	
2,4,5-Trichlorophenol	BQL	0.316	0.047	1	8/11/2009	
2,4,6-Trichlorophenol	BQL	0.316	0.028	1	8/11/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.7	97
2-Fluorophenol	10	8.8	88
Nitrobenzene-d5	10	9.6	96
Phenol-d6	10	9.4	94
2,4,6-Tribromophenol	10	8	80
4-Terphenyl-d14	10	11.1	111

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

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

Reviewed By: _____

SGS North America, Inc.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTAS4147-MW03(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-3L
Lab Project ID: G128-2429
Sample Wt/Vol: 35.20 g
Dilution: 1

Analyzed By: DES
Date Collected: 7/30/2009 9:20
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Date Analyzed: 8/11/2009
Matrix: Soil
% Solids: 89.84

No.	Compound	Retention Time	CAS#	Match Probability	Result mg/Kg
	No TIC's detected.				

Comment:

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

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

Reviewed by: _____

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTAS4147-MW04(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-4J
Lab Project ID: G128-2429
Report Basis: Dry weight
Initial Weight: 32.62 g

Analyzed By: EAW
Date Collected: 7/27/2009 12:45
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Matrix: Soil
% Solids: 87.17

Compound	Result mg/Kg	RL mg/Kg	MDL mg/Kg	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	0.352	0.054	1	8/12/2009	
Acenaphthylene	BQL	0.352	0.049	1	8/12/2009	
Anthracene	BQL	0.352	0.048	1	8/12/2009	
Benzo[a]anthracene	BQL	0.352	0.048	1	8/12/2009	
Benzo[a]pyrene	BQL	0.352	0.051	1	8/12/2009	
Benzo[b]fluoranthene	BQL	0.352	0.049	1	8/12/2009	
Benzo[g,h,i]perylene	BQL	0.352	0.061	1	8/12/2009	
Benzo[k]fluoranthene	BQL	0.352	0.050	1	8/12/2009	
Benzoic Acid	BQL	1.76	0.434	1	8/12/2009	
Bis(2-chloroethoxy)methane	BQL	0.352	0.052	1	8/12/2009	
Bis(2-chloroethyl)ether	BQL	0.352	0.071	1	8/12/2009	
Bis(2-chloroisopropyl)ether	BQL	0.352	0.057	1	8/12/2009	
Bis(2-ethylhexyl)phthalate	BQL	0.352	0.054	1	8/12/2009	
4-bromophenyl phenyl ether	BQL	0.352	0.062	1	8/12/2009	
Butylbenzylphthalate	BQL	0.352	0.052	1	8/12/2009	
2-Chloronaphthalene	BQL	0.352	0.049	1	8/12/2009	
2-Chlorophenol	BQL	0.352	0.045	1	8/12/2009	
4-Chloro-3-methylphenol	BQL	0.352	0.051	1	8/12/2009	
4-Chloroaniline	BQL	1.76	0.057	1	8/12/2009	
4-Chlorophenyl phenyl ether	BQL	0.352	0.052	1	8/12/2009	
Chrysene	BQL	0.352	0.034	1	8/12/2009	
Dibenzo[a,h]anthracene	BQL	0.352	0.045	1	8/12/2009	
Dibenzofuran	BQL	0.352	0.050	1	8/12/2009	
Di-n-Butylphthalate	BQL	0.352	0.051	1	8/12/2009	
1,2-Dichlorobenzene	BQL	0.352	0.059	1	8/12/2009	
1,3-Dichlorobenzene	BQL	0.352	0.057	1	8/12/2009	
1,4-Dichlorobenzene	BQL	0.352	0.051	1	8/12/2009	
3,3'-Dichlorobenzidine	BQL	0.703	0.058	1	8/12/2009	
2,4-Dichlorophenol	BQL	0.352	0.038	1	8/12/2009	
Diethylphthalate	BQL	0.352	0.047	1	8/12/2009	
Dimethylphthalate	BQL	0.352	0.055	1	8/12/2009	
2,4-Dimethylphenol	BQL	0.352	0.064	1	8/12/2009	
Di-n-octylphthalate	BQL	0.352	0.054	1	8/12/2009	
4,6-Dinitro-2-methylphenol	BQL	1.76	0.042	1	8/12/2009	
2,4-Dinitrophenol	BQL	1.76	0.046	1	8/12/2009	
2,4-Dinitrotoluene	BQL	0.352	0.054	1	8/12/2009	
2,6-Dinitrotoluene	BQL	0.352	0.058	1	8/12/2009	
Fluoranthene	BQL	0.352	0.057	1	8/12/2009	
Fluorene	BQL	0.352	0.055	1	8/12/2009	
Hexachlorobenzene	BQL	0.352	0.076	1	8/12/2009	
Hexachlorobutadiene	BQL	0.352	0.064	1	8/12/2009	
Hexachlorocyclopentadiene	BQL	0.703	0.069	1	8/12/2009	
Hexachloroethane	BQL	0.352	0.055	1	8/12/2009	
Indeno(1,2,3-c,d)pyrene	BQL	0.352	0.042	1	8/12/2009	
Isophorone	BQL	0.352	0.051	1	8/12/2009	
2-Methylnaphthalene	BQL	0.352	0.057	1	8/12/2009	
2-Methylphenol	BQL	0.352	0.054	1	8/12/2009	

SGS North America, Inc.

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTAS4147-MW04(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-4J
Lab Project ID: G128-2429
Report Basis: Dry weight
Initial Weight: 32.62 g

Analyzed By: EAW
Date Collected: 7/27/2009 12:45
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Matrix: Soil
% Solids: 87.17

Compound	Result mg/Kg	RL mg/Kg	MDL mg/Kg	Dilution Factor	Date Analyzed	Flag
3- & 4-Methylphenol	BQL	0.352	0.046	1	8/12/2009	
Naphthalene	BQL	0.352	0.049	1	8/12/2009	
2-Nitroaniline	BQL	0.352	0.047	1	8/12/2009	
3-Nitroaniline	BQL	1.76	0.052	1	8/12/2009	
4-Nitroaniline	BQL	1.76	0.047	1	8/12/2009	
Nitrobenzene	BQL	0.352	0.047	1	8/12/2009	
2-Nitrophenol	BQL	0.352	0.051	1	8/12/2009	
4-Nitrophenol	BQL	1.76	0.061	1	8/12/2009	
Diphenylamine *	BQL	0.352	0.057	1	8/12/2009	
Pentachlorophenol	BQL	1.76	0.032	1	8/12/2009	
Phenanthrene	BQL	0.352	0.049	1	8/12/2009	
Phenol	BQL	0.352	0.048	1	8/12/2009	
Pyrene	BQL	0.352	0.048	1	8/12/2009	
1,2,4-Trichlorobenzene	BQL	0.352	0.063	1	8/12/2009	
2,4,5-Trichlorophenol	BQL	0.352	0.052	1	8/12/2009	
2,4,6-Trichlorophenol	BQL	0.352	0.031	1	8/12/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.3	83
2-Fluorophenol	10	8.6	86
Nitrobenzene-d5	10	9	90
Phenol-d6	10	8.4	84
2,4,6-Tribromophenol	10	6.8	68
4-Terphenyl-d14	10	9.2	92

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

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

Reviewed By: _____

SGS North America, Inc.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID:	USTAS4147-MW04(1-2.5)	Analyzed By:	DES
Client Project ID:	AS-4147 JP-5 Pipeline Release	Date Collected:	7/27/2009 12:45
Lab Sample ID:	G128-2429-4J	Date Received:	7/31/2009
Lab Project ID:	G128-2429	Date Extracted:	8/7/2009
Sample Wt/Vol:	32.62 g	Date Analyzed:	8/12/2009
Dilution:	1	Matrix:	Soil
		% Solids:	87.17

No.	Compound	Retention Time	CAS#	Match Probability	Result mg/Kg
	No TIC's detected.				

Comment:

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

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

Reviewed by: _____

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTAS4147-MW05(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-5J
Lab Project ID: G128-2429
Report Basis: Dry weight
Initial Weight: 32.61 g

Analyzed By: EAW
Date Collected: 7/30/2009 15:05
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Matrix: Soil
% Solids: 82.68

Compound	Result mg/Kg	RL mg/Kg	MDL mg/Kg	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	0.371	0.057	1	8/12/2009	
Acenaphthylene	BQL	0.371	0.052	1	8/12/2009	
Anthracene	BQL	0.371	0.050	1	8/12/2009	
Benzo[a]anthracene	BQL	0.371	0.051	1	8/12/2009	
Benzo[a]pyrene	BQL	0.371	0.053	1	8/12/2009	
Benzo[b]fluoranthene	BQL	0.371	0.052	1	8/12/2009	
Benzo[g,h,i]perylene	BQL	0.371	0.065	1	8/12/2009	
Benzo[k]fluoranthene	BQL	0.371	0.053	1	8/12/2009	
Benzoic Acid	BQL	1.85	0.458	1	8/12/2009	
Bis(2-chloroethoxy)methane	BQL	0.371	0.055	1	8/12/2009	
Bis(2-chloroethyl)ether	BQL	0.371	0.075	1	8/12/2009	
Bis(2-chloroisopropyl)ether	BQL	0.371	0.060	1	8/12/2009	
Bis(2-ethylhexyl)phthalate	BQL	0.371	0.057	1	8/12/2009	
4-bromophenyl phenyl ether	BQL	0.371	0.066	1	8/12/2009	
Butylbenzylphthalate	BQL	0.371	0.055	1	8/12/2009	
2-Chloronaphthalene	BQL	0.371	0.052	1	8/12/2009	
2-Chlorophenol	BQL	0.371	0.047	1	8/12/2009	
4-Chloro-3-methylphenol	BQL	0.371	0.054	1	8/12/2009	
4-Chloroaniline	BQL	1.85	0.061	1	8/12/2009	
4-Chlorophenyl phenyl ether	BQL	0.371	0.055	1	8/12/2009	
Chrysene	BQL	0.371	0.036	1	8/12/2009	
Dibenzo[a,h]anthracene	BQL	0.371	0.048	1	8/12/2009	
Dibenzofuran	BQL	0.371	0.052	1	8/12/2009	
Di-n-Butylphthalate	BQL	0.371	0.054	1	8/12/2009	
1,2-Dichlorobenzene	BQL	0.371	0.063	1	8/12/2009	
1,3-Dichlorobenzene	BQL	0.371	0.060	1	8/12/2009	
1,4-Dichlorobenzene	BQL	0.371	0.054	1	8/12/2009	
3,3'-Dichlorobenzidine	BQL	0.742	0.061	1	8/12/2009	
2,4-Dichlorophenol	BQL	0.371	0.040	1	8/12/2009	
Diethylphthalate	BQL	0.371	0.050	1	8/12/2009	
Dimethylphthalate	BQL	0.371	0.058	1	8/12/2009	
2,4-Dimethylphenol	BQL	0.371	0.067	1	8/12/2009	
Di-n-octylphthalate	BQL	0.371	0.057	1	8/12/2009	
4,6-Dinitro-2-methylphenol	BQL	1.85	0.044	1	8/12/2009	
2,4-Dinitrophenol	BQL	1.85	0.048	1	8/12/2009	
2,4-Dinitrotoluene	BQL	0.371	0.056	1	8/12/2009	
2,6-Dinitrotoluene	BQL	0.371	0.061	1	8/12/2009	
Fluoranthene	BQL	0.371	0.060	1	8/12/2009	
Fluorene	BQL	0.371	0.058	1	8/12/2009	
Hexachlorobenzene	BQL	0.371	0.081	1	8/12/2009	
Hexachlorobutadiene	BQL	0.371	0.068	1	8/12/2009	
Hexachlorocyclopentadiene	BQL	0.742	0.072	1	8/12/2009	
Hexachloroethane	BQL	0.371	0.058	1	8/12/2009	
Indeno(1,2,3-c,d)pyrene	BQL	0.371	0.044	1	8/12/2009	
Isophorone	BQL	0.371	0.054	1	8/12/2009	
2-Methylnaphthalene	BQL	0.371	0.061	1	8/12/2009	
2-Methylphenol	BQL	0.371	0.057	1	8/12/2009	

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTAS4147-MW05(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-5J
Lab Project ID: G128-2429
Report Basis: Dry weight
Initial Weight: 32.61 g

Analyzed By: EAW
Date Collected: 7/30/2009 15:05
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Matrix: Soil
% Solids: 82.68

Compound	Result mg/Kg	RL mg/Kg	MDL mg/Kg	Dilution Factor	Date Analyzed	Flag
3- & 4-Methylphenol	BQL	0.371	0.048	1	8/12/2009	
Naphthalene	BQL	0.371	0.052	1	8/12/2009	
2-Nitroaniline	BQL	0.371	0.050	1	8/12/2009	
3-Nitroaniline	BQL	1.85	0.055	1	8/12/2009	
4-Nitroaniline	BQL	1.85	0.050	1	8/12/2009	
Nitrobenzene	BQL	0.371	0.049	1	8/12/2009	
2-Nitrophenol	BQL	0.371	0.054	1	8/12/2009	
4-Nitrophenol	BQL	1.85	0.065	1	8/12/2009	
Diphenylamine *	BQL	0.371	0.060	1	8/12/2009	
Pentachlorophenol	BQL	1.85	0.034	1	8/12/2009	
Phenanthrene	BQL	0.371	0.052	1	8/12/2009	
Phenol	BQL	0.371	0.050	1	8/12/2009	
Pyrene	BQL	0.371	0.050	1	8/12/2009	
1,2,4-Trichlorobenzene	BQL	0.371	0.067	1	8/12/2009	
2,4,5-Trichlorophenol	BQL	0.371	0.055	1	8/12/2009	
2,4,6-Trichlorophenol	BQL	0.371	0.033	1	8/12/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.4	94
2-Fluorophenol	10	8.8	88
Nitrobenzene-d5	10	9.4	94
Phenol-d6	10	9.1	91
2,4,6-Tribromophenol	10	7.7	78
4-Terphenyl-d14	10	10.6	106

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

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

Reviewed By: _____

SGS North America, Inc.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTAS4147-MW05(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-5J
Lab Project ID: G128-2429
Sample Wt/Vol: 32.61 g
Dilution: 1

Analyzed By: DES
Date Collected: 7/30/2009 15:05
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Date Analyzed: 8/12/2009
Matrix: Soil
% Solids: 82.68

No.	Compound	Retention Time	CAS#	Match Probability	Result mg/Kg
	No TIC's detected.				

Comment:

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

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

Reviewed by: _____

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTAS4147-MW06(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-7J
Lab Project ID: G128-2429
Report Basis: Dry weight
Initial Weight: 32.16 g

Analyzed By: EAW
Date Collected: 7/30/2009 13:15
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Matrix: Soil
% Solids: 80.37

Compound	Result mg/Kg	RL mg/Kg	MDL mg/Kg	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	0.387	0.059	1	8/12/2009	
Acenaphthylene	BQL	0.387	0.054	1	8/12/2009	
Anthracene	BQL	0.387	0.053	1	8/12/2009	
Benzo[a]anthracene	BQL	0.387	0.053	1	8/12/2009	
Benzo[a]pyrene	BQL	0.387	0.056	1	8/12/2009	
Benzo[b]fluoranthene	BQL	0.387	0.054	1	8/12/2009	
Benzo[g,h,i]perylene	BQL	0.387	0.067	1	8/12/2009	
Benzo[k]fluoranthene	BQL	0.387	0.055	1	8/12/2009	
Benzoic Acid	BQL	1.93	0.478	1	8/12/2009	
Bis(2-chloroethoxy)methane	BQL	0.387	0.057	1	8/12/2009	
Bis(2-chloroethyl)ether	BQL	0.387	0.079	1	8/12/2009	
Bis(2-chloroisopropyl)ether	BQL	0.387	0.062	1	8/12/2009	
Bis(2-ethylhexyl)phthalate	BQL	0.387	0.059	1	8/12/2009	
4-bromophenyl phenyl ether	BQL	0.387	0.069	1	8/12/2009	
Butylbenzylphthalate	BQL	0.387	0.057	1	8/12/2009	
2-Chloronaphthalene	BQL	0.387	0.054	1	8/12/2009	
2-Chlorophenol	BQL	0.387	0.049	1	8/12/2009	
4-Chloro-3-methylphenol	BQL	0.387	0.057	1	8/12/2009	
4-Chloroaniline	BQL	1.93	0.063	1	8/12/2009	
4-Chlorophenyl phenyl ether	BQL	0.387	0.057	1	8/12/2009	
Chrysene	BQL	0.387	0.037	1	8/12/2009	
Dibenzo[a,h]anthracene	BQL	0.387	0.050	1	8/12/2009	
Dibenzofuran	BQL	0.387	0.055	1	8/12/2009	
Di-n-Butylphthalate	BQL	0.387	0.057	1	8/12/2009	
1,2-Dichlorobenzene	BQL	0.387	0.065	1	8/12/2009	
1,3-Dichlorobenzene	BQL	0.387	0.063	1	8/12/2009	
1,4-Dichlorobenzene	BQL	0.387	0.056	1	8/12/2009	
3,3'-Dichlorobenzidine	BQL	0.774	0.064	1	8/12/2009	
2,4-Dichlorophenol	BQL	0.387	0.042	1	8/12/2009	
Diethylphthalate	BQL	0.387	0.052	1	8/12/2009	
Dimethylphthalate	BQL	0.387	0.060	1	8/12/2009	
2,4-Dimethylphenol	BQL	0.387	0.070	1	8/12/2009	
Di-n-octylphthalate	BQL	0.387	0.060	1	8/12/2009	
4,6-Dinitro-2-methylphenol	BQL	1.93	0.046	1	8/12/2009	
2,4-Dinitrophenol	BQL	1.93	0.050	1	8/12/2009	
2,4-Dinitrotoluene	BQL	0.387	0.059	1	8/12/2009	
2,6-Dinitrotoluene	BQL	0.387	0.064	1	8/12/2009	
Fluoranthene	BQL	0.387	0.062	1	8/12/2009	
Fluorene	BQL	0.387	0.060	1	8/12/2009	
Hexachlorobenzene	BQL	0.387	0.084	1	8/12/2009	
Hexachlorobutadiene	BQL	0.387	0.070	1	8/12/2009	
Hexachlorocyclopentadiene	BQL	0.774	0.075	1	8/12/2009	
Hexachloroethane	BQL	0.387	0.060	1	8/12/2009	
Indeno(1,2,3-c,d)pyrene	BQL	0.387	0.046	1	8/12/2009	
Isophorone	BQL	0.387	0.057	1	8/12/2009	
2-Methylnaphthalene	BQL	0.387	0.063	1	8/12/2009	
2-Methylphenol	BQL	0.387	0.059	1	8/12/2009	

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTAS4147-MW06(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-7J
Lab Project ID: G128-2429
Report Basis: Dry weight
Initial Weight: 32.16 g

Analyzed By: EAW
Date Collected: 7/30/2009 13:15
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Matrix: Soil
% Solids: 80.37

Compound	Result mg/Kg	RL mg/Kg	MDL mg/Kg	Dilution Factor	Date Analyzed	Flag
3- & 4-Methylphenol	BQL	0.387	0.050	1	8/12/2009	
Naphthalene	BQL	0.387	0.054	1	8/12/2009	
2-Nitroaniline	BQL	0.387	0.052	1	8/12/2009	
3-Nitroaniline	BQL	1.93	0.057	1	8/12/2009	
4-Nitroaniline	BQL	1.93	0.052	1	8/12/2009	
Nitrobenzene	BQL	0.387	0.052	1	8/12/2009	
2-Nitrophenol	BQL	0.387	0.057	1	8/12/2009	
4-Nitrophenol	BQL	1.93	0.067	1	8/12/2009	
Diphenylamine *	BQL	0.387	0.062	1	8/12/2009	
Pentachlorophenol	BQL	1.93	0.036	1	8/12/2009	
Phenanthrene	BQL	0.387	0.054	1	8/12/2009	
Phenol	BQL	0.387	0.053	1	8/12/2009	
Pyrene	BQL	0.387	0.053	1	8/12/2009	
1,2,4-Trichlorobenzene	BQL	0.387	0.070	1	8/12/2009	
2,4,5-Trichlorophenol	BQL	0.387	0.058	1	8/12/2009	
2,4,6-Trichlorophenol	BQL	0.387	0.034	1	8/12/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.9	79
2-Fluorophenol	10	7.8	78
Nitrobenzene-d5	10	8.4	84
Phenol-d6	10	7.3	73
2,4,6-Tribromophenol	10	6.7	67
4-Terphenyl-d14	10	9.4	94

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

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

Reviewed By: _____

SGS North America, Inc.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTAS4147-MW06(1-2.5)
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-7J
Lab Project ID: G128-2429
Sample Wt/Vol: 32.16 g
Dilution: 1

Analyzed By: DES
Date Collected: 7/30/2009 13:15
Date Received: 7/31/2009
Date Extracted: 8/7/2009
Date Analyzed: 8/12/2009
Matrix: Soil
% Solids: 80.37

No.	Compound	Retention Time	CAS#	Match Probability	Result mg/Kg
	No TIC's detected.				

Comment:

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

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

Reviewed by: _____

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW01(1-2.5)
Sample Matrix	Soil
Collection Option (for Soil)*	2
Date Collected	07/30/09 10:50
Date Received	07/31/09
Date Extracted	08/04/09
Date Analyzed	08/10/09 21:45 - 08/10/09 21:45
Dry Weight	82.1
Dilution Factor	1 - 1

Analytical Results			
Analyte	Result mg/Kg	Report Limit mg/Kg	Flags
C_5-C_8 Aliphatics**	BQL	10.0	
C_9-C_{12} Aliphatics**	BQL	10.0	
C_9-C_{10} Aromatics**	BQL	10.0	

	Percent Recovery	Flags	Limits Lower	Limits Upper
Surrogate % Recovery - PID	93.9		70	130
Surrogate % Recovery - FID	106		70	130

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

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: g128-2429-1f	Lab Info: g128-2429-1f
FID Info: VP081009/032F0101.D	PID Info: VP081009/032R0101.D

Reviewed By: CWA

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW02(1-2.5)
Sample Matrix	Soil
Collection Option (for Soil)*	2
Date Collected	07/31/09 08:30
Date Received	07/31/09
Date Extracted	08/04/09
Date Analyzed	08/10/09 22:11 - 08/10/09 22:11
Dry Weight	87.6
Dilution Factor	1 - 1

Analytical Results			
Analyte	Result mg/Kg	Report Limit mg/Kg	Flags
C_5-C_8 Aliphatics**	BQL	10.0	
C_9-C_{12} Aliphatics**	BQL	10.0	
C_9-C_{10} Aromatics**	BQL	10.0	

	Percent Recovery	Flags	Limits Lower	Limits Upper
Surrogate % Recovery - PID	92.5		70	130
Surrogate % Recovery - FID	107		70	130

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

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info:	g128-2429-2f	Lab Info:	g128-2429-2f
FID Info:	VP081009/033F0101.D	PID Info:	VP081009/033R0101.D

Reviewed By: [illegible]

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW03(1-2.5)
Sample Matrix	Soil
Collection Option (for Soil)*	2
Date Collected	07/30/09 09:20
Date Received	07/31/09
Date Extracted	08/04/09
Date Analyzed	08/10/09 22:38 - 08/10/09 22:38
Dry Weight	89.8
Dilution Factor	1 - 1

Analytical Results			
Analyte	Result mg/Kg	Report Limit mg/Kg	Flags
C_5-C_8 Aliphatics**	BQL	10.0	
C_9-C_{12} Aliphatics**	BQL	10.0	
C_9-C_{10} Aromatics**	BQL	10.0	

	Percent Recovery	Flags	Limits Lower	Limits Upper
Surrogate % Recovery - PID	91.7		70	130
Surrogate % Recovery - FID	105		70	130

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

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: g128-2429-3f	Lab Info: g128-2429-3f
FID Info: VP081009/034F0101.D	PID Info: VP081009/034R0101.D

Reviewed By: [illegible]

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW04(1-2.5)
Sample Matrix	Soil
Collection Option (for Soil)*	2
Date Collected	07/27/09 12:45
Date Received	07/31/09
Date Extracted	08/04/09
Date Analyzed	08/10/09 23:04 - 08/10/09 23:04
Dry Weight	87.2
Dilution Factor	1 - 1

Analytical Results			
Analyte	Result mg/Kg	Report Limit mg/Kg	Flags
C_5-C_8 Aliphatics**	BQL	10.0	
C_9-C_{12} Aliphatics**	BQL	10.0	
C_9-C_{10} Aromatics**	BQL	10.0	

	Percent Recovery	Flags	Limits Lower	Limits Upper
Surrogate % Recovery - PID	92.3		70	130
Surrogate % Recovery - FID	107		70	130

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

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info:	g128-2429-4f	Lab Info:	g128-2429-4f
FID Info:	VP081009/035F0101.D	PID Info:	VP081009/035R0101.D

Reviewed By: [illegible]

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW05(1-2.5)
Sample Matrix	Soil
Collection Option (for Soil)*	2
Date Collected	07/30/09 15:05
Date Received	07/31/09
Date Extracted	08/04/09
Date Analyzed	08/10/09 23:31 - 08/10/09 23:31
Dry Weight	82.7
Dilution Factor	1 - 1

Analytical Results			
Analyte	Result mg/Kg	Report Limit mg/Kg	Flags
C_5-C_8 Aliphatics**	BQL	10.0	
C_9-C_{12} Aliphatics**	BQL	10.0	
C_9-C_{10} Aromatics**	BQL	10.0	

	Percent Recovery	Flags	Limits Lower	Limits Upper
Surrogate % Recovery - PID	92.6		70	130
Surrogate % Recovery - FID	106		70	130

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

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: g128-2429-5f	Lab Info: g128-2429-5f
FID Info: VP081009/036F0101.D	PID Info: VP081009/036R0101.D

Reviewed By: WD

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW06(1-2.5)
Sample Matrix	Soil
Collection Option (for Soil)*	2
Date Collected	07/30/09 13:15
Date Received	07/31/09
Date Extracted	08/04/09
Date Analyzed	08/10/09 23:57 - 08/10/09 23:57
Dry Weight	80.4
Dilution Factor	1 - 1

Analytical Results			
Analyte	Result mg/Kg	Report Limit mg/Kg	Flags
C_5-C_8 Aliphatics**	BQL	10.0	
C_9-C_{12} Aliphatics**	BQL	10.0	
C_9-C_{10} Aromatics**	BQL	10.0	

	Percent Recovery	Flags	Limits Lower	Limits Upper
Surrogate % Recovery - PID	92.0		70	130
Surrogate % Recovery - FID	105		70	130

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

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: g128-2429-7f	Lab Info: g128-2429-7f
FID Info: VP081009/037F0101.D	PID Info: VP081009/037R0101.D

Reviewed By: DA

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 05/08/09 PID Initial Calibration Date: 05/08/09

Calibration Ranges and Limits

Range	MDL (µg/L)	MDL (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C_5-C_8 Aliphatics	2.02	0.175	6.42	0.557	100	10
C_9-C_{12} Aliphatics	1.51	0.118	4.80	0.375	100	10
C_9-C_{10} Aromatics	0.902	0.132	2.87	0.420	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD if CF r if LR	Method of Quantitation
C_5-C_8 Aliphatics	10	0.8	8.80	Calibration Factor
	50	4		
	100	8		
	200	16		
	500	40		
C_9-C_{12} Aliphatics	10	0.8	1.00	Linear Regression
	50	4		
	100	8		
	200	16		
	500	40		
C_9-C_{10} Aromatics	10	0.8	21.76	Calibration Factor
	50	4		
	100	8		
	200	16		
	500	40		

Calibration Check Date: 08/10/09 Filename: VP081009/003F0101.d

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	%Difference if CF %Drift if LR	Limits
C_5-C_8 Aliphatics	200	16	4.5	±25%
C_9-C_{12} Aliphatics	200	16	-5.2	±25%
C_9-C_{10} Aromatics	200	16	13.6	±25%

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 05/08/09 PID Initial Calibration Date: 05/08/09

Calibration Ranges and Limits

Range	MDL (µg/L)	MDL (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C_5-C_8 Aliphatics	2.02	0.175	6.42	0.557	100	10
C_9-C_{12} Aliphatics	1.51	0.118	4.80	0.375	100	10
C_9-C_{10} Aromatics	0.902	0.132	2.87	0.420	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD if CF r if LR	Method of Quantitation
C_5-C_8 Aliphatics	10	0.8	8.80	Calibration Factor
	50	4		
	100	8		
	200	16		
	500	40		
C_9-C_{12} Aliphatics	10	0.8	1.00	Linear Regression
	50	4		
	100	8		
	200	16		
	500	40		
C_9-C_{10} Aromatics	10	0.8	21.76	Calibration Factor
	50	4		
	100	8		
	200	16		
	500	40		

Calibration Check Date: 08/10/09 Filename: VP081009/040F0101.d

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	%Difference if CF %Drift if LR	Limits
C_5-C_8 Aliphatics	200	16	5.8	±25%
C_9-C_{12} Aliphatics	200	16	-5.0	±25%
C_9-C_{10} Aromatics	200	16	19.1	±25%

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW01(1-2.5)
Sample Matrix	Soil
Date Collected	07/30/09 10:50
Date Received	07/31/09
Date Extracted	08/06/09
Date Analyzed	08/19/09 11:05 - 08/19/09 11:34
Dry Weight	82.1
Dilution Factor	1 - 1
Initial weight (g)	14.33
Final Volume (mL)	10.0

Analytical Results			
Analytes**	Result mg/Kg	Report Limit mg/Kg	Flags
C9-C18 Aliphatics	BQL	10.0	
C19-C36 Aliphatics	BQL	10.0	
C11-C22 Aromatics	BQL	10.0	

Surrogates	Percent Recovery	Flags	Limits	
			Lower	Upper
Aliphatic (tricosane)	80.7		40	140
Aromatic (ortho-terphenyl)	75.5		40	140
Fractionation 1 (2-bromonaphthalene)	65.1		40	140
Fractionation 2 (2-fluorobiphenyl)	66.8		40	140

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: G128-2429-1I	Lab Info: G128-2429-1I
Aliphatic: EP081909/007F0701.D	Aromatic: EP081909/008F0801.D

Reviewed By: [illegible]

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW02(1-2.5)
Sample Matrix	Soil
Date Collected	07/31/09 08:30
Date Received	07/31/09
Date Extracted	08/06/09
Date Analyzed	08/19/09 12:31 - 08/19/09 13:00
Dry Weight	87.6
Dilution Factor	1 - 1
Initial weight (g)	12.80
Final Volume (mL)	10.0

Analytical Results

Analytes**	Result mg/Kg	Report Limit mg/Kg	Flags
C9-C18 Aliphatics	BQL	10.0	
C19-C36 Aliphatics	BQL	10.0	
C11-C22 Aromatics	BQL	10.0	

Surrogates	Percent Recovery	Flags	Limits Lower	Limits Upper
Aliphatic (tricosane)	85.6		40	140
Aromatic (ortho-terphenyl)	85.2		40	140
Fractionation 1 (2-bromonaphthalene)	87.0		40	140
Fractionation 2 (2-fluorobiphenyl)	88.5		40	140

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: G128-2429-2I	Lab Info: G128-2429-2I
Aliphatic: EP081909/010F1001.D	Aromatic: EP081909/011F1101.D

Reviewed By: [illegible]

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW03(1-2.5)
Sample Matrix	Soil
Date Collected	07/30/09 09:20
Date Received	07/31/09
Date Extracted	08/06/09
Date Analyzed	08/19/09 13:28 - 08/19/09 13:57
Dry Weight	89.8
Dilution Factor	1 - 1
Initial weight (g)	13.58
Final Volume (mL)	10.0

Analytical Results

Analytes**	Result mg/Kg	Report Limit mg/Kg	Flags
C9-C18 Aliphatics	BQL	10.0	
C19-C36 Aliphatics	BQL	10.0	
C11-C22 Aromatics	BQL	10.0	

Surrogates	Percent Recovery	Flags	Limits Lower	Limits Upper
Aliphatic (tricosane)	91.4		40	140
Aromatic (ortho-terphenyl)	77.7		40	140
Fractionation 1 (2-bromonaphthalene)	78.8		40	140
Fractionation 2 (2-fluorobiphenyl)	80.9		40	140

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: G128-2429-3K	Lab Info: G128-2429-3K
Aliphatic: EP081909/012F1201.D	Aromatic: EP081909/013F1301.D

Reviewed By: _____

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW04(1-2.5)
Sample Matrix	Soil
Date Collected	07/27/09 12:45
Date Received	07/31/09
Date Extracted	08/06/09
Date Analyzed	08/19/09 14:25 - 08/19/09 14:54
Dry Weight	87.2
Dilution Factor	1 - 1
Initial weight (g)	12.36
Final Volume (mL)	10.0

Analytical Results			
Analytes**	Result mg/Kg	Report Limit mg/Kg	Flags
C9-C18 Aliphatics	BQL	10.0	
C19-C36 Aliphatics	BQL	10.0	
C11-C22 Aromatics	BQL	10.0	

Surrogates	Percent Recovery	Flags	Limits Lower	Limits Upper
Aliphatic (tricosane)	84.3		40	140
Aromatic (ortho-terphenyl)	82.5		40	140
Fractionation 1 (2-bromonaphthalene)	89.0		40	140
Fractionation 2 (2-fluorobiphenyl)	94.3		40	140

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: G128-2429-4I	Lab Info: G128-2429-4I
Aliphatic: EP081909/014F1401.D	Aromatic: EP081909/015F1501.D

Reviewed By: DD

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW05(1-2.5)
Sample Matrix	Soil
Date Collected	07/30/09 15:05
Date Received	07/31/09
Date Extracted	08/06/09
Date Analyzed	08/19/09 15:23 - 08/19/09 15:52
Dry Weight	82.7
Dilution Factor	1 - 1
Initial weight (g)	14.19
Final Volume (mL)	10.0

Analytical Results			
Analytes**	Result mg/Kg	Report Limit mg/Kg	Flags
C9-C18 Aliphatics	BQL	10.0	
C19-C36 Aliphatics	BQL	10.0	
C11-C22 Aromatics	BQL	10.0	

Surrogates	Percent Recovery	Flags	Limits Lower	Limits Upper
Aliphatic (tricosane)	88.1		40	140
Aromatic (ortho-terphenyl)	84.1		40	140
Fractionation 1 (2-bromonaphthalene)	85.8		40	140
Fractionation 2 (2-fluorobiphenyl)	90.1		40	140

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: G128-2429-5I	Lab Info: G128-2429-5I
Aliphatic: EP081909/016F1601.D	Aromatic: EP081909/017F1701.D

Reviewed By: _____

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW06(1-2.5)
Sample Matrix	Soil
Date Collected	07/30/09 13:15
Date Received	07/31/09
Date Extracted	08/06/09
Date Analyzed	08/19/09 16:20 - 08/19/09 16:49
Dry Weight	80.4
Dilution Factor	1 - 1
Initial weight (g)	11.94
Final Volume (mL)	10.0

Analytical Results			
Analytes**	Result mg/Kg	Report Limit mg/Kg	Flags
C9-C18 Aliphatics	BQL	10.0	
C19-C36 Aliphatics	BQL	10.0	
C11-C22 Aromatics	BQL	10.0	

Surrogates	Percent Recovery	Flags	Limits	
			Lower	Upper
Aliphatic (tricosane)	90.7		40	140
Aromatic (ortho-terphenyl)	87.6		40	140
Fractionation 1 (2-bromonaphthalene)	89.7		40	140
Fractionation 2 (2-fluorobiphenyl)	93.3		40	140

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info:	G128-2429-7I	Lab Info:	G128-2429-7I
Aliphatic:	EP081909/018F1801.D	Aromatic:	EP081909/019F1901.D

Reviewed By: [illegible]

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 07/17/09

Calibration Ranges and Limits

Range	MDL (02/15/08) (µg/L)	MDL (02/11/08) (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C9-C18 Aliphatics	1.66	0.274	5.28	0.871	100	10
C19-C36 Aliphatics	2.79	0.201	8.87	0.639	100	10
C11-C22 Aromatics	2.64	0.110	8.40	0.350	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD if CF r if LR	Method of Quantitation
C_9-C_{18} Aliphatics	200	33.3	14.33	Calibration Factor
	100	16.7		
	50	8.33		
	25	4.17		
	5	0.833		
C_{19}-C_{36} Aliphatics	200	33.3	16.98	Calibration Factor
	100	16.7		
	50	8.33		
	25	4.17		
	5	0.833		
C_{11}-C_{22} Aromatics	200	33.3	7.33	Calibration Factor
	100	16.7		
	50	8.33		
	25	4.17		
	5	0.833		

Calibration Check Date: 08/19/09, 08/19/09

Filenames: ep081909/001f0101.d, ep081909/002f0201.d

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	%Difference if CF %Drift if LR	Limits
C9-C18 Aliphatics	100	16.7	-22.1	≤±25%
C19-C36 Aliphatics	100	16.7	-5.8	≤±25%
C11-C22 Aromatics	100	16.7	-4.8	≤±25%

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 07/17/09

Calibration Ranges and Limits

Range	MDL (02/15/08) (µg/L)	MDL (02/11/08) (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C9-C18 Aliphatics	1.66	0.274	5.28	0.871	100	10
C19-C36 Aliphatics	2.79	0.201	8.87	0.639	100	10
C11-C22 Aromatics	2.64	0.110	8.40	0.350	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD if CF r if LR	Method of Quantitation
C_9-C_{18} Aliphatics	200	33.3	14.33	Calibration Factor
	100	16.7		
	50	8.33		
	25	4.17		
	5	0.833		
C_{19}-C_{36} Aliphatics	200	33.3	16.98	Calibration Factor
	100	16.7		
	50	8.33		
	25	4.17		
	5	0.833		
C_{11}-C_{22} Aromatics	200	33.3	7.33	Calibration Factor
	100	16.7		
	50	8.33		
	25	4.17		
	5	0.833		

Calibration Check Date: 08/19/09 Filenames: ep081909/020f2001.d
08/19/09 ep081909/021f2101.d

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	%Difference if CF %Drift if LR	Limits
C9-C18 Aliphatics	100	16.7	12.8	≤±25%
C19-C36 Aliphatics	100	16.7	15.2	≤±25%
C11-C22 Aromatics	100	16.7	17.1	≤±25%

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

SGS North America, Inc.

Results for Total Petroleum Hydrocarbons
by **GC/FID 8015**

Client Sample ID:	USTAS4147-Waste	Analyzed By:	DVO
Client Project ID:	AS-4147 JP-5 Pipeline Release	Date Collected:	7/31/2009 10:50
Lab Sample ID:	G128-2429-8A	Date Received:	7/31/2009
Lab Project ID:	G128-2429	Matrix:	Soil
Report Basis:	Dry Weight	Solids	57.78

Analyte	Result	RL	Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	10.3	mg/Kg	1	08/10/09 19:31

Surrogate Spike Results

	Added	Result	Recovery	Flag	Limits
BFB	100	105.0	105.0		70-130

Comments:

Batch Information

Analytical Batch:	VP081009	Prep Method:	5035
Analytical Method:	8015	Initial Wt/Vol:	5.05 g
Instrument ID:	GC4	Final Volume:	5 mL
Analyst:	DVO		

Analyst: DVO

NC Certification #481

Reviewed By: GRO.XLS

SGS North America, Inc.

Results for Total Petroleum Hydrocarbons
by **GC/FID 8015**

Client Sample ID: USTAS4147-Waste
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2429-8F
Lab Project ID: G128-2429

Date Collected: 7/31/2009 10:50
Date Received: 7/31/2009
Matrix: Soil
Solids 57.78
Report Basis: Dry Weight

Parameter	Result	RL	MDL	Units	Dilution Factor	Date Analyzed	
Diesel Range Organics	**7.18**	10.8	2.11	mg/Kg	1	08/17/09 21:36	J

Surrogate Spike Results	Spike Added	Control Limits	Spike Result	Percent Recovery
OTP	40	40-140	34.3	85.8

Comments:

J= Estimated value between MDL and RL

Batch Information

Analytical Batch: EP081709
Analytical Method: 8015
Instrument: GC6
Analyst: EAW

Prep batch: 14865
Prep Method: 3541
Prep Date: 08/10/09
Initial Prep Wt/Vol: 32.01 G
Prep Final Vol: 10 mL

Analyst: _____

NC Certification #481

Reviewed By: _____

Results for Metals

Client Sample ID:	USTAS4147-Waste	Analyzed By:	PSW
Client Project ID:	AS-4147 JP-5 Pipeline Release	Date Collected:	7/31/2009 10:50
Lab Sample ID:	G128-2429-9	Date Received:	7/31/2009
Lab Project ID:	G128-2429	Matrix:	Leachate
ICP InitWt/Vol:	5 mL Final Vol: 50 mL		
Hg InitWt/Vol:	20 mL Final Vol: 57 mL		
Prep Batch:	14862 14871		

Metals TCLP	Result	RL	MDL	DF	Units	Method	Date Analyzed	Flags
Arsenic	BQL	0.200	0.0491	1	MG/L	6010B	8/11/2009	
Barium	**0.585**	5.00	0.0206	1	MG/L	6010B	8/10/2009	JB
Cadmium	**0.0465**	0.100	0.00800	1	MG/L	6010B	8/10/2009	JB
Chromium	**0.0697**	0.100	0.0146	1	MG/L	6010B	8/10/2009	JB
Lead	BQL	0.100	0.0679	1	MG/L	6010B	8/10/2009	
Mercury	BQL	0.000570	0.000048	1	MG/L	7470	8/11/2009	
Selenium	**0.0608**	0.200	0.0278	1	MG/L	6010B	8/10/2009	J
Silver	**0.0480**	0.100	0.00656	1	MG/L	6010B	8/10/2009	JB

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL
B= Amount in Prep Blank > MDL

Reviewed By: _____
METALS.XLS

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CLIENT: Catlin

CONTACT: Steve Hudson / Steve Tyler — PHONE NO: (910) 452-5861

PROJECT: AS-4147 JP-5 Pipeline Release — SITE/PWSID#:

REPORTS TO: Steve Hudson / Steve Tyler — E-MAIL:

FAX NO.: (910) 452-7563

INVOICE TO: Sheila @ Catlin — QUOTE # DOD 101

P.O. NUMBER 290731-4

SGS Reference: G128-2429

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	8260/5035 + IPE + MTBE	8270 + TICs	VPH	EPH	3550/5030 (TPH-DRO/GRO)	6010B (TCLP metals only)				REMARKS
1	USTAS4147-MW01(1-2.5)	7-30-09	10:50a	S	8	G	✓	✓	✓	✓						- Injure and summary
2	USTAS4147-MW02 (1-2.5)	7-31-09	8:30a	S	8	G	✓	✓	✓	✓						EDD format
4jar 3	USTAS4147-MW03(1-2.5)	7-30-09	9:20a	S	8	G	✓	✓	✓	✓						- report low runs
4	USTAS4147-MW04(1-2.5)	7-27-09	12:45	S	8	G	✓	✓	✓	✓						
5	USTAS4147-MW05(1-2.5)	7-30-09	3:05p	S	8	G	✓	✓	✓	✓						- MW03 reacted w/
6	USTAS4147-MW05(1-2.5)DUP	7-30-09	3:05p	S	7	G	✓									Sodium Bisulfate
7	USTAS4147-MW06(1-2.5)	7-30-09	1:15p	S	8	G	✓	✓	✓	✓						
8	USTAS4147-Waste	7-31-09	10:50a	S	4	C					✓	✓				

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:	Date	Time
Tom Stt	7-31-09	3:44p	[signature]	7/31/09	15:44
Relinquished By: (2)	Date	Time	Received By:	Date	Time
Relinquished By: (3)	Date	Time	Received By:	Date	Time
Relinquished By: (4)	Date	Time	Received By:	Date	Time

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C: 5.3 °F

Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Special Instructions:

Requested Turnaround Time:

☐ RUSH _____ Date Needed ☒ STD

SGS North America Inc.

N.C. Certification #481

☐ 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
☐ 1270 Greenbrier Street Charleston, WV 25311 Tel: (304) 346-0725 Fax: (304) 346-0761

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

SGS

Steve Tyler
Richard Catlin & Associates
P.O. Box 10279
Wilmington, NC 28404-0279

Report Number: G128-2430

Client Project: AS-4147 JP-5 Pipeline Release

Dear Steve Tyler,

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 Barbara Hager 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.

Barbara Hager Aug 28. 2009

Project Manager Date
Barbara Hager

Environmental Division 5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

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

% soilds = 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.

MI34.021808.4

Results for Volatiles
by GC 602

Client Sample ID: USTAS4147-MW01
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-1A
Lab Project ID: G128-2430

Analyzed By: DVO
Date Collected: 8/12/2009 10:15
Date Received: 8/13/2009
Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.177	1	8/17/2009	
Diisopropyl ether (DIPE)	BQL	1.00	0.253	1	8/17/2009	
Ethylbenzene	BQL	1.00	0.19	1	8/17/2009	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.306	1	8/17/2009	
Toluene	BQL	1.00	0.313	1	8/17/2009	
m/p-Xylene	BQL	2.00	0.481	1	8/17/2009	
o-Xylene	BQL	2.00	0.405	1	8/17/2009	

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	44.0	110

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: USTAS4147-MW02
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-2A
Lab Project ID: G128-2430

Analyzed By: DVO
Date Collected: 8/12/2009 10:45
Date Received: 8/13/2009
Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	**0.589**	1.00	0.177	1	8/17/2009	J
Diisopropyl ether (DIPE)	BQL	1.00	0.253	1	8/17/2009	
Ethylbenzene	**8.74**	1.00	0.19	1	8/17/2009	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.306	1	8/17/2009	
Toluene	**1.59**	1.00	0.313	1	8/17/2009	
m/p-Xylene	**10.1**	2.00	0.481	1	8/17/2009	
o-Xylene	**14.7**	2.00	0.405	1	8/17/2009	

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	44.3	111

Comments:
All values corrected for dilution.
BQL = Below quantitation limit.

Reviewed By: [signature]

Results for Volatiles
by GC 602

Client Sample ID: USTAS4147-MW03
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-3A
Lab Project ID: G128-2430

Analyzed By: DVO
Date Collected: 8/12/2009 12:45
Date Received: 8/13/2009
Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.177	1	8/17/2009	
Diisopropyl ether (DIPE)	BQL	1.00	0.253	1	8/17/2009	
Ethylbenzene	BQL	1.00	0.19	1	8/17/2009	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.306	1	8/17/2009	
Toluene	BQL	1.00	0.313	1	8/17/2009	
m/p-Xylene	BQL	2.00	0.481	1	8/17/2009	
o-Xylene	BQL	2.00	0.405	1	8/17/2009	

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	44.6	112

Comments:
All values corrected for dilution.
BQL = Below quantitation limit.

Reviewed By: _____

Results for Volatiles
by GC 602

Client Sample ID: USTAS4147-MW04
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-4A
Lab Project ID: G128-2430

Analyzed By: DVO
Date Collected: 8/12/2009 13:30
Date Received: 8/13/2009
Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.177	1	8/17/2009	
Diisopropyl ether (DIPE)	BQL	1.00	0.253	1	8/17/2009	
Ethylbenzene	BQL	1.00	0.19	1	8/17/2009	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.306	1	8/17/2009	
Toluene	BQL	1.00	0.313	1	8/17/2009	
m/p-Xylene	BQL	2.00	0.481	1	8/17/2009	
o-Xylene	BQL	2.00	0.405	1	8/17/2009	

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	44.5	111

Comments:
All values corrected for dilution.
BQL = Below quantitation limit.

Reviewed By: _____

Results for Volatiles
by GC 602

Client Sample ID: USTAS4147-MW05
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-5A
Lab Project ID: G128-2430

Analyzed By: DVO
Date Collected: 8/12/2009 12:15
Date Received: 8/13/2009
Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.177	1	8/17/2009	
Diisopropyl ether (DIPE)	BQL	1.00	0.253	1	8/17/2009	
Ethylbenzene	BQL	1.00	0.19	1	8/17/2009	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.306	1	8/17/2009	
Toluene	BQL	1.00	0.313	1	8/17/2009	
m/p-Xylene	BQL	2.00	0.481	1	8/17/2009	
o-Xylene	BQL	2.00	0.405	1	8/17/2009	

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	45.4	114

Comments:
All values corrected for dilution.
BQL = Below quantitation limit.

Reviewed By: [signature]

Results for Volatiles
by GC 602

Client Sample ID: USTAS4147-MW06
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-6A
Lab Project ID: G128-2430

Analyzed By: DVO
Date Collected: 8/12/2009 11:30
Date Received: 8/13/2009
Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.177	1	8/17/2009	
Diisopropyl ether (DIPE)	BQL	1.00	0.253	1	8/17/2009	
Ethylbenzene	BQL	1.00	0.19	1	8/17/2009	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.306	1	8/17/2009	
Toluene	BQL	1.00	0.313	1	8/17/2009	
m/p-Xylene	BQL	2.00	0.481	1	8/17/2009	
o-Xylene	BQL	2.00	0.405	1	8/17/2009	

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	44.3	111

Comments:
All values corrected for dilution.
BQL = Below quantitation limit.

Reviewed By: _____

Results for Volatiles
by GC 602

Client Sample ID: USTAS4147-MW02 DUP
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-7A
Lab Project ID: G128-2430

Analyzed By: DVO
Date Collected: 8/12/2009 10:45
Date Received: 8/13/2009
Matrix: Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	**0.598**	1.00	0.177	1	8/17/2009	J
Diisopropyl ether (DIPE)	BQL	1.00	0.253	1	8/17/2009	
Ethylbenzene	**9.02**	1.00	0.19	1	8/17/2009	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.306	1	8/17/2009	
Toluene	**1.57**	1.00	0.313	1	8/17/2009	
m/p-Xylene	**10.5**	2.00	0.481	1	8/17/2009	
o-Xylene	**15.0**	2.00	0.405	1	8/17/2009	

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	44.1	110

Comments:
All values corrected for dilution.
BQL = Below quantitation limit.

Reviewed By: _____

Results for Volatiles
by GC 602

Client Sample ID:	Trip Blank	Analyzed By:	DVO
Client Project ID:	AS-4147 JP-5 Pipeline Release	Date Collected:	
Lab Sample ID:	G128-2430-8A	Date Received:	8/13/2009
Lab Project ID:	G128-2430	Matrix:	Water

Analyte	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flags
Benzene	BQL	1.00	0.177	1	8/17/2009	
Diisopropyl ether (DIPE)	BQL	1.00	0.253	1	8/17/2009	
Ethylbenzene	BQL	1.00	0.19	1	8/17/2009	
Methyl-tert butyl ether (MTBE)	BQL	2.00	0.306	1	8/17/2009	
Toluene	BQL	1.00	0.313	1	8/17/2009	
m/p-Xylene	BQL	2.00	0.481	1	8/17/2009	
o-Xylene	BQL	2.00	0.405	1	8/17/2009	

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	44.8	112

Comments:
All values corrected for dilution.
BQL = Below quantitation limit.

Reviewed By: _____

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW01
Sample Matrix	Water
Collection Option (for Soil)*	NA
Date Collected	08/12/09 10:15
Date Received	08/13/09
Date Extracted	08/20/09 03:47 - 08/20/09 03:47
Date Analyzed	08/20/09 03:47 - 08/20/09 03:47
Dry Weight	NA
Dilution Factor	1 - 1

Analytical Results			
Analyte	Result µg/L	Report Limit µg/L	Flags
C_5-C_8 Aliphatics**	BQL	100	
C_9-C_{12} Aliphatics**	BQL	100	
C_9-C_{10} Aromatics**	BQL	100	

	Percent Recovery	Flags	Limits Lower	Limits Upper
Surrogate % Recovery - PID	87.4		70	130
Surrogate % Recovery - FID	102		70	130

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

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: g128-2430-1d	Lab Info: g128-2430-1d
FID Info: VP081909/044F0101.D	PID Info: VP081909/044R0101.D

Reviewed By: [illegible]

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW02
Sample Matrix	Water
Collection Option (for Soil)*	NA
Date Collected	08/12/09 10:45
Date Received	08/13/09
Date Extracted	08/20/09 04:14 - 08/20/09 04:14
Date Analyzed	08/20/09 04:14 - 08/20/09 04:14
Dry Weight	NA
Dilution Factor	1 - 1

Analytical Results			
Analyte	Result µg/L	Report Limit µg/L	Flags
C_5-C_8 Aliphatics**	BQL	100	
C_9-C_{12} Aliphatics**	BQL	100	
C_9-C_{10} Aromatics**	411	100	

	Percent Recovery	Flags	Limits Lower	Limits Upper
Surrogate % Recovery - PID	89.2		70	130
Surrogate % Recovery - FID	101		70	130

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

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: g128-2430-2d	Lab Info: g128-2430-2d
FID Info: VP081909/045F0101.D	PID Info: VP081909/045R0101.D

Reviewed By: [illegible]

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW03
Sample Matrix	Water
Collection Option (for Soil)*	NA
Date Collected	08/12/09 12:45
Date Received	08/13/09
Date Extracted	08/20/09 04:41 - 08/20/09 04:41
Date Analyzed	08/20/09 04:41 - 08/20/09 04:41
Dry Weight	NA
Dilution Factor	1 - 1

Analytical Results			
Analyte	Result µg/L	Report Limit µg/L	Flags
C_5-C_8 Aliphatics**	BQL	100	
C_9-C_{12} Aliphatics**	BQL	100	
C_9-C_{10} Aromatics**	BQL	100	

	Percent Recovery	Flags	Limits Lower	Limits Upper
Surrogate % Recovery - PID	100		70	130
Surrogate % Recovery - FID	110		70	130

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

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: g128-2430-3d	Lab Info: g128-2430-3d
FID Info: VP081909/046F0101.D	PID Info: VP081909/046R0101.D

Reviewed By: _____

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW04
Sample Matrix	Water
Collection Option (for Soil)*	NA
Date Collected	08/12/09 13:30
Date Received	08/13/09
Date Extracted	08/20/09 05:08 - 08/20/09 05:08
Date Analyzed	08/20/09 05:08 - 08/20/09 05:08
Dry Weight	NA
Dilution Factor	1 - 1

Analytical Results			
Analyte	Result µg/L	Report Limit µg/L	Flags
C_5-C_8 Aliphatics**	BQL	100	
C_9-C_{12} Aliphatics**	BQL	100	
C_9-C_{10} Aromatics**	BQL	100	

	Percent Recovery	Flags	Limits Lower	Limits Upper
Surrogate % Recovery - PID	92.1		70	130
Surrogate % Recovery - FID	104		70	130

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

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: g128-2430-4d	Lab Info: g128-2430-4d
FID Info: VP081909/047F0101.D	PID Info: VP081909/047R0101.D

Reviewed By: [illegible]

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW05
Sample Matrix	Water
Collection Option (for Soil)*	NA
Date Collected	08/12/09 12:15
Date Received	08/13/09
Date Extracted	08/20/09 05:35 - 08/20/09 05:35
Date Analyzed	08/20/09 05:35 - 08/20/09 05:35
Dry Weight	NA
Dilution Factor	1 - 1

Analytical Results			
Analyte	Result µg/L	Report Limit µg/L	Flags
C_5-C_8 Aliphatics**	BQL	100	
C_9-C_{12} Aliphatics**	BQL	100	
C_9-C_{10} Aromatics**	BQL	100	

	Percent Recovery	Flags	Limits Lower	Limits Upper
Surrogate % Recovery - PID	87.7		70	130
Surrogate % Recovery - FID	102		70	130

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

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: g128-2430-5d	Lab Info: g128-2430-5d
FID Info: VP081909/048F0101.D	PID Info: VP081909/048R0101.D

Reviewed By: _____

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW06
Sample Matrix	Water
Collection Option (for Soil)*	NA
Date Collected	08/12/09 11:30
Date Received	08/13/09
Date Extracted	08/20/09 06:01 - 08/20/09 06:01
Date Analyzed	08/20/09 06:01 - 08/20/09 06:01
Dry Weight	NA
Dilution Factor	1 - 1

Analytical Results			
Analyte	Result µg/L	Report Limit µg/L	Flags
C_5-C_8 Aliphatics**	BQL	100	
C_9-C_{12} Aliphatics**	BQL	100	
C_9-C_{10} Aromatics**	BQL	100	

	Percent Recovery	Flags	Limits Lower	Limits Upper
Surrogate % Recovery - PID	86.2		70	130
Surrogate % Recovery - FID	102		70	130

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

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info:	g128-2430-6d	Lab Info:	g128-2430-6d
FID Info:	VP081909/049F0101.D	PID Info:	VP081909/049R0101.D

Reviewed By: _____

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 05/08/09 PID Initial Calibration Date: 05/08/09

Calibration Ranges and Limits

Range	MDL (µg/L)	MDL (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C_5-C_8 Aliphatics	2.02	0.175	6.42	0.557	100	10
C_9-C_{12} Aliphatics	1.51	0.118	4.80	0.375	100	10
C_9-C_{10} Aromatics	0.902	0.132	2.87	0.420	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD if CF r if LR	Method of Quantitation
C_5-C_8 Aliphatics	10	0.8	8.80	Calibration Factor
	50	4		
	100	8		
	200	16		
	500	40		
C_9-C_{12} Aliphatics	10	0.8	1.00	Linear Regression
	50	4		
	100	8		
	200	16		
	500	40		
C_9-C_{10} Aromatics	10	0.8	21.76	Calibration Factor
	50	4		
	100	8		
	200	16		
	500	40		

Calibration Check Date: 08/19/09 Filename: VP081909/002F0101.d

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	%Difference if CF %Drift if LR	Limits
C_5-C_8 Aliphatics	200	16	0.3	±25%
C_9-C_{12} Aliphatics	200	16	-4.8	±25%
C_9-C_{10} Aromatics	200	16	17.9	±25%

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 05/08/09 PID Initial Calibration Date: 05/08/09

Calibration Ranges and Limits

Range	MDL (µg/L)	MDL (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C_5-C_8 Aliphatics	2.02	0.175	6.42	0.557	100	10
C_9-C_{12} Aliphatics	1.51	0.118	4.80	0.375	100	10
C_9-C_{10} Aromatics	0.902	0.132	2.87	0.420	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD if CF r if LR	Method of Quantitation
C_5-C_8 Aliphatics	10	0.8	8.80	Calibration Factor
	50	4		
	100	8		
	200	16		
	500	40		
C_9-C_{12} Aliphatics	10	0.8	1.00	Linear Regression
	50	4		
	100	8		
	200	16		
	500	40		
C_9-C_{10} Aromatics	10	0.8	21.76	Calibration Factor
	50	4		
	100	8		
	200	16		
	500	40		

Calibration Check Date: 08/19/09 Filename: VP081909/041F0101.d

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	%Difference if CF %Drift if LR	Limits
C_5-C_8 Aliphatics	200	16	-7.4	±25%
C_9-C_{12} Aliphatics	200	16	-11.4	±25%
C_9-C_{10} Aromatics	200	16	15.5	±25%

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 05/08/09 PID Initial Calibration Date: 05/08/09

Calibration Ranges and Limits

Range	MDL (µg/L)	MDL (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C_5-C_8 Aliphatics	2.02	0.175	6.42	0.557	100	10
C_9-C_{12} Aliphatics	1.51	0.118	4.80	0.375	100	10
C_9-C_{10} Aromatics	0.902	0.132	2.87	0.420	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD if CF r if LR	Method of Quantitation
C_5-C_8 Aliphatics	10	0.8	8.80	Calibration Factor
	50	4		
	100	8		
	200	16		
	500	40		
C_9-C_{12} Aliphatics	10	0.8	1.00	Linear Regression
	50	4		
	100	8		
	200	16		
	500	40		
C_9-C_{10} Aromatics	10	0.8	21.76	Calibration Factor
	50	4		
	100	8		
	200	16		
	500	40		

Calibration Check Date: 08/19/09 Filename: VP081909/051F0101.d

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	%Difference if CF %Drift if LR	Limits
C_5-C_8 Aliphatics	200	16	-10.4	±25%
C_9-C_{12} Aliphatics	200	16	-12.3	±25%
C_9-C_{10} Aromatics	200	16	15.4	±25%

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

SGS North America, Inc.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTAS4147-MW01
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-1J
Lab Project ID: G128-2430

Initial/Final Amt: 969 mL / 5.0 mL

Analyzed By: EAW
Date Collected: 8/12/2009 10:15
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	5.16	0.769	1	8/22/2009	
Acenaphthylene	BQL	5.16	0.769	1	8/22/2009	
Anthracene	BQL	5.16	0.903	1	8/22/2009	
Benzo[a]anthracene	BQL	5.16	0.702	1	8/22/2009	
Benzo[a]pyrene	BQL	5.16	0.655	1	8/22/2009	
Benzo[b]fluoranthene	BQL	5.16	0.738	1	8/22/2009	
Benzo[g,h,i]perylene	BQL	5.16	0.635	1	8/22/2009	
Benzo[k]fluoranthene	BQL	5.16	0.568	1	8/22/2009	
Bis(2-chloroethoxy)methane	BQL	5.16	1.06	1	8/22/2009	
Bis(2-chloroethyl)ether	BQL	5.16	1.07	1	8/22/2009	
Bis(2-chloroisopropyl)ether	BQL	5.16	1.01	1	8/22/2009	
Bis(2-ethylhexyl)phthalate	BQL	5.16	0.423	1	8/22/2009	
4-bromophenyl phenyl ether	BQL	5.16	0.805	1	8/22/2009	
Butylbenzylphthalate	BQL	5.16	0.459	1	8/22/2009	
2-Chloronaphthalene	BQL	5.16	0.893	1	8/22/2009	
2-Chlorophenol	BQL	5.16	1.21	1	8/22/2009	
4-Chloro-3-methylphenol	BQL	5.16	0.820	1	8/22/2009	
4-Chlorophenyl phenyl ether	BQL	5.16	3.36	1	8/22/2009	
Chrysene	BQL	5.16	0.573	1	8/22/2009	
Dibenzo[a,h]anthracene	BQL	5.16	0.454	1	8/22/2009	
Di-n-Butylphthalate	BQL	5.16	0.851	1	8/22/2009	
3,3'-Dichlorobenzidine	BQL	10.3	1.26	1	8/22/2009	
2,4-Dichlorophenol	BQL	5.16	1.16	1	8/22/2009	
Diethylphthalate	BQL	5.16	0.764	1	8/22/2009	
Dimethylphthalate	BQL	5.16	0.573	1	8/22/2009	
2,4-Dimethylphenol	BQL	5.16	1.67	1	8/22/2009	
Di-n-octylphthalate	BQL	5.16	0.599	1	8/22/2009	
4,6-Dinitro-2-methylphenol	BQL	25.8	0.568	1	8/22/2009	
2,4-Dinitrophenol	BQL	25.8	0.660	1	8/22/2009	
2,4-Dinitrotoluene	BQL	5.16	0.552	1	8/22/2009	
2,6-Dinitrotoluene	BQL	5.16	0.671	1	8/22/2009	
Diphenylamine *	BQL	5.16	0.588	1	8/22/2009	
Fluoranthene	BQL	5.16	0.728	1	8/22/2009	
Fluorene	BQL	5.16	0.748	1	8/22/2009	
Hexachlorobenzene	BQL	5.16	0.521	1	8/22/2009	
Hexachlorobutadiene	BQL	5.16	0.784	1	8/22/2009	
Hexachlorocyclopentadiene	BQL	10.3	10.3	1	8/22/2009	
Hexachloroethane	BQL	5.16	0.769	1	8/22/2009	
Indeno(1,2,3-c,d)pyrene	BQL	5.16	2.36	1	8/22/2009	
Isophorone	BQL	5.16	0.913	1	8/22/2009	
Naphthalene	BQL	5.16	0.939	1	8/22/2009	
Nitrobenzene	BQL	5.16	1.08	1	8/22/2009	
2-Nitrophenol	BQL	5.16	1.27	1	8/22/2009	
4-Nitrophenol	BQL	25.8	1.11	1	8/22/2009	
N-Nitrosodi-n-propylamine	BQL	5.16	1.55	1	8/22/2009	
Pentachlorophenol	BQL	25.8	1.46	1	8/22/2009	
Phenanthrene	BQL	5.16	0.459	1	8/22/2009	

SGS North America, Inc.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTAS4147-MW01
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-1J
Lab Project ID: G128-2430

Initial/Final Amt: 969 mL / 5.0 mL

Analyzed By: EAW
Date Collected: 8/12/2009 10:15
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Phenol	BQL	5.16	1.09	1	8/22/2009	
Pyrene	BQL	5.16	2.13	1	8/22/2009	
1,2,4-Trichlorobenzene	BQL	5.16	0.743	1	8/22/2009	
2,4,6-Trichlorophenol	BQL	5.16	0.955	1	8/22/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.7	87
2-Fluorophenol	10	7.9	79
Nitrobenzene-d5	10	9.5	95
Phenol-d6	10	8.3	83
2,4,6-Tribromophenol	10	8.4	84
4-Terphenyl-d14	10	8.4	84

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

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

Reviewed By: _____

SGS North America, Inc.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTAS4147-MW01
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-1J
Lab Project ID: G128-2430
Sample Wt/Vol: 969 ML
Dilution: 1

Analyzed By: DES
Date Collected: 8/12/2009 10:15
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Date Analyzed: 8/22/2009
Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result ug/L
1	Ketone, Unknown	7.17			82.5
2	Ketone, Unknown	7.17			20.6

Comment:

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

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

Reviewed by: _____

SGS North America, Inc.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTAS4147-MW02
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-2J
Lab Project ID: G128-2430

Initial/Final Amt: 975 mL / 5.0 mL

Analyzed By: EAW
Date Collected: 8/12/2009 10:45
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	**326**	51.3	7.64	10	8/28/2009	
Acenaphthylene	BQL	51.3	7.64	10	8/28/2009	
Anthracene	**11.3**	51.3	8.97	10	8/28/2009	J
Benzo[a]anthracene	BQL	51.3	6.97	10	8/28/2009	
Benzo[a]pyrene	BQL	51.3	6.51	10	8/28/2009	
Benzo[b]fluoranthene	BQL	51.3	7.33	10	8/28/2009	
Benzo[g,h,i]perylene	BQL	51.3	6.31	10	8/28/2009	
Benzo[k]fluoranthene	BQL	51.3	5.64	10	8/28/2009	
Bis(2-chloroethoxy)methane	BQL	51.3	10.6	10	8/28/2009	
Bis(2-chloroethyl)ether	BQL	51.3	10.7	10	8/28/2009	
Bis(2-chloroisopropyl)ether	BQL	51.3	10.0	10	8/28/2009	
Bis(2-ethylhexyl)phthalate	BQL	51.3	4.21	10	8/28/2009	
4-bromophenyl phenyl ether	BQL	51.3	8.00	10	8/28/2009	
Butylbenzylphthalate	BQL	51.3	4.56	10	8/28/2009	
2-Chloronaphthalene	BQL	51.3	8.87	10	8/28/2009	
2-Chlorophenol	BQL	51.3	12.0	10	8/28/2009	
4-Chloro-3-methylphenol	BQL	51.3	8.15	10	8/28/2009	
4-Chlorophenyl phenyl ether	BQL	51.3	33.4	10	8/28/2009	
Chrysene	BQL	51.3	5.69	10	8/28/2009	
Dibenzo[a,h]anthracene	BQL	51.3	4.51	10	8/28/2009	
Di-n-Butylphthalate	BQL	51.3	8.46	10	8/28/2009	
3,3'-Dichlorobenzidine	BQL	103	12.5	10	8/28/2009	
2,4-Dichlorophenol	BQL	51.3	11.5	10	8/28/2009	
Diethylphthalate	BQL	51.3	7.59	10	8/28/2009	
Dimethylphthalate	BQL	51.3	5.69	10	8/28/2009	
2,4-Dimethylphenol	BQL	51.3	16.6	10	8/28/2009	
Di-n-octylphthalate	BQL	51.3	5.95	10	8/28/2009	
4,6-Dinitro-2-methylphenol	BQL	256	5.64	10	8/28/2009	
2,4-Dinitrophenol	BQL	256	6.56	10	8/28/2009	
2,4-Dinitrotoluene	BQL	51.3	5.49	10	8/28/2009	
2,6-Dinitrotoluene	BQL	51.3	6.67	10	8/28/2009	
Diphenylamine *	BQL	51.3	5.85	10	8/28/2009	
Fluoranthene	**37.4**	51.3	7.23	10	8/28/2009	J
Fluorene	**163**	51.3	7.44	10	8/28/2009	
Hexachlorobenzene	BQL	51.3	5.18	10	8/28/2009	
Hexachlorobutadiene	BQL	51.3	7.79	10	8/28/2009	
Hexachlorocyclopentadiene	BQL	103	103	10	8/28/2009	
Hexachloroethane	BQL	51.3	7.64	10	8/28/2009	
Indeno(1,2,3-c,d)pyrene	BQL	51.3	23.4	10	8/28/2009	
Isophorone	BQL	51.3	9.08	10	8/28/2009	
Naphthalene	**1090**	51.3	9.33	10	8/28/2009	
Nitrobenzene	BQL	51.3	10.8	10	8/28/2009	
2-Nitrophenol	BQL	51.3	12.6	10	8/28/2009	
4-Nitrophenol	BQL	256	11.1	10	8/28/2009	
N-Nitrosodi-n-propylamine	BQL	51.3	15.4	10	8/28/2009	
Pentachlorophenol	BQL	256	14.5	10	8/28/2009	
Phenanthrene	**203**	51.3	4.56	10	8/28/2009	

SGS North America, Inc.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTAS4147-MW02
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-2J
Lab Project ID: G128-2430

Initial/Final Amt: 975 mL / 5.0 mL

Analyzed By: EAW
Date Collected: 8/12/2009 10:45
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Phenol	BQL	51.3	10.9	10	8/28/2009	
Pyrene	**25.1**	51.3	21.2	10	8/28/2009	J
1,2,4-Trichlorobenzene	BQL	51.3	7.38	10	8/28/2009	
2,4,6-Trichlorophenol	BQL	51.3	9.49	10	8/28/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	1	NA	NA
2-Fluorophenol	1	NA	NA
Nitrobenzene-d5	1	NA	NA
Phenol-d6	1	NA	NA
2,4,6-Tribromophenol	1	NA	NA
4-Terphenyl-d14	1	NA	NA

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

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

Reviewed By: _____

SGS North America, Inc.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTAS4147-MW02
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-2J
Lab Project ID: G128-2430
Sample Wt/Vol: 975 ML
Dilution: 10

Analyzed By: DES
Date Collected: 8/12/2009 10:45
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Date Analyzed: 8/28/2009
Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result ug/L
	No TIC's detected.				

Comment:

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

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

Reviewed by: _____

SGS North America, Inc.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTAS4147-MW03
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-3J
Lab Project ID: G128-2430

Initial/Final Amt: 940 mL / 5.0 mL

Analyzed By: EAW
Date Collected: 8/12/2009 12:45
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	5.32	0.793	1	8/22/2009	
Acenaphthylene	BQL	5.32	0.793	1	8/22/2009	
Anthracene	BQL	5.32	0.931	1	8/22/2009	
Benzo[a]anthracene	BQL	5.32	0.723	1	8/22/2009	
Benzo[a]pyrene	BQL	5.32	0.676	1	8/22/2009	
Benzo[b]fluoranthene	BQL	5.32	0.761	1	8/22/2009	
Benzo[g,h,i]perylene	BQL	5.32	0.654	1	8/22/2009	
Benzo[k]fluoranthene	BQL	5.32	0.585	1	8/22/2009	
Bis(2-chloroethoxy)methane	BQL	5.32	1.10	1	8/22/2009	
Bis(2-chloroethyl)ether	BQL	5.32	1.11	1	8/22/2009	
Bis(2-chloroisopropyl)ether	BQL	5.32	1.04	1	8/22/2009	
Bis(2-ethylhexyl)phthalate	BQL	5.32	0.436	1	8/22/2009	
4-bromophenyl phenyl ether	BQL	5.32	0.830	1	8/22/2009	
Butylbenzylphthalate	BQL	5.32	0.473	1	8/22/2009	
2-Chloronaphthalene	BQL	5.32	0.920	1	8/22/2009	
2-Chlorophenol	BQL	5.32	1.24	1	8/22/2009	
4-Chloro-3-methylphenol	BQL	5.32	0.846	1	8/22/2009	
4-Chlorophenyl phenyl ether	BQL	5.32	3.46	1	8/22/2009	
Chrysene	BQL	5.32	0.590	1	8/22/2009	
Dibenzo[a,h]anthracene	BQL	5.32	0.468	1	8/22/2009	
Di-n-Butylphthalate	BQL	5.32	0.878	1	8/22/2009	
3,3'-Dichlorobenzidine	BQL	10.6	1.30	1	8/22/2009	
2,4-Dichlorophenol	BQL	5.32	1.19	1	8/22/2009	
Diethylphthalate	BQL	5.32	0.787	1	8/22/2009	
Dimethylphthalate	BQL	5.32	0.590	1	8/22/2009	
2,4-Dimethylphenol	BQL	5.32	1.72	1	8/22/2009	
Di-n-octylphthalate	BQL	5.32	0.617	1	8/22/2009	
4,6-Dinitro-2-methylphenol	BQL	26.6	0.585	1	8/22/2009	
2,4-Dinitrophenol	BQL	26.6	0.681	1	8/22/2009	
2,4-Dinitrotoluene	BQL	5.32	0.569	1	8/22/2009	
2,6-Dinitrotoluene	BQL	5.32	0.691	1	8/22/2009	
Diphenylamine *	BQL	5.32	0.606	1	8/22/2009	
Fluoranthene	BQL	5.32	0.750	1	8/22/2009	
Fluorene	BQL	5.32	0.771	1	8/22/2009	
Hexachlorobenzene	BQL	5.32	0.537	1	8/22/2009	
Hexachlorobutadiene	BQL	5.32	0.809	1	8/22/2009	
Hexachlorocyclopentadiene	BQL	10.6	10.6	1	8/22/2009	
Hexachloroethane	BQL	5.32	0.793	1	8/22/2009	
Indeno(1,2,3-c,d)pyrene	BQL	5.32	2.43	1	8/22/2009	
Isophorone	BQL	5.32	0.941	1	8/22/2009	
Naphthalene	BQL	5.32	0.968	1	8/22/2009	
Nitrobenzene	BQL	5.32	1.12	1	8/22/2009	
2-Nitrophenol	BQL	5.32	1.31	1	8/22/2009	
4-Nitrophenol	BQL	26.6	1.15	1	8/22/2009	
N-Nitrosodi-n-propylamine	BQL	5.32	1.60	1	8/22/2009	
Pentachlorophenol	BQL	26.6	1.51	1	8/22/2009	
Phenanthrene	BQL	5.32	0.473	1	8/22/2009	

SGS North America, Inc.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTAS4147-MW03
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-3J
Lab Project ID: G128-2430

Initial/Final Amt: 940 mL / 5.0 mL

Analyzed By: EAW
Date Collected: 8/12/2009 12:45
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Phenol	BQL	5.32	1.13	1	8/22/2009	
Pyrene	BQL	5.32	2.20	1	8/22/2009	
1,2,4-Trichlorobenzene	BQL	5.32	0.766	1	8/22/2009	
2,4,6-Trichlorophenol	BQL	5.32	0.984	1	8/22/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.3	93
2-Fluorophenol	10	8	80
Nitrobenzene-d5	10	9.5	95
Phenol-d6	10	8.7	87
2,4,6-Tribromophenol	10	8.7	87
4-Terphenyl-d14	10	10.1	101

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

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

Reviewed By: _____

SGS North America, Inc.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTAS4147-MW03
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-3J
Lab Project ID: G128-2430
Sample Wt/Vol: 940 ML
Dilution: 1

Analyzed By: DES
Date Collected: 8/12/2009 12:45
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Date Analyzed: 8/22/2009
Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result ug/L
1	Unknown	7.17			104

Comment:

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

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

Reviewed by: _____

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTAS4147-MW04
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-4J
Lab Project ID: G128-2430

Initial/Final Amt: 937 mL / 5.0 mL

Analyzed By: EAW
Date Collected: 8/12/2009 13:30
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	5.34	0.795	1	8/22/2009	
Acenaphthylene	BQL	5.34	0.795	1	8/22/2009	
Anthracene	BQL	5.34	0.934	1	8/22/2009	
Benzo[a]anthracene	BQL	5.34	0.726	1	8/22/2009	
Benzo[a]pyrene	BQL	5.34	0.678	1	8/22/2009	
Benzo[b]fluoranthene	BQL	5.34	0.763	1	8/22/2009	
Benzo[g,h,i]perylene	BQL	5.34	0.656	1	8/22/2009	
Benzo[k]fluoranthene	BQL	5.34	0.587	1	8/22/2009	
Bis(2-chloroethoxy)methane	BQL	5.34	1.10	1	8/22/2009	
Bis(2-chloroethyl)ether	BQL	5.34	1.11	1	8/22/2009	
Bis(2-chloroisopropyl)ether	BQL	5.34	1.04	1	8/22/2009	
Bis(2-ethylhexyl)phthalate	BQL	5.34	0.438	1	8/22/2009	
4-bromophenyl phenyl ether	BQL	5.34	0.832	1	8/22/2009	
Butylbenzylphthalate	BQL	5.34	0.475	1	8/22/2009	
2-Chloronaphthalene	BQL	5.34	0.923	1	8/22/2009	
2-Chlorophenol	BQL	5.34	1.25	1	8/22/2009	
4-Chloro-3-methylphenol	BQL	5.34	0.848	1	8/22/2009	
4-Chlorophenyl phenyl ether	BQL	5.34	3.47	1	8/22/2009	
Chrysene	BQL	5.34	0.592	1	8/22/2009	
Dibenzo[a,h]anthracene	BQL	5.34	0.470	1	8/22/2009	
Di-n-Butylphthalate	BQL	5.34	0.880	1	8/22/2009	
3,3'-Dichlorobenzidine	BQL	10.7	1.30	1	8/22/2009	
2,4-Dichlorophenol	BQL	5.34	1.20	1	8/22/2009	
Diethylphthalate	BQL	5.34	0.790	1	8/22/2009	
Dimethylphthalate	BQL	5.34	0.592	1	8/22/2009	
2,4-Dimethylphenol	BQL	5.34	1.73	1	8/22/2009	
Di-n-octylphthalate	BQL	5.34	0.619	1	8/22/2009	
4,6-Dinitro-2-methylphenol	BQL	26.7	0.587	1	8/22/2009	
2,4-Dinitrophenol	BQL	26.7	0.683	1	8/22/2009	
2,4-Dinitrotoluene	BQL	5.34	0.571	1	8/22/2009	
2,6-Dinitrotoluene	BQL	5.34	0.694	1	8/22/2009	
Diphenylamine *	BQL	5.34	0.608	1	8/22/2009	
Fluoranthene	BQL	5.34	0.752	1	8/22/2009	
Fluorene	BQL	5.34	0.774	1	8/22/2009	
Hexachlorobenzene	BQL	5.34	0.539	1	8/22/2009	
Hexachlorobutadiene	BQL	5.34	0.811	1	8/22/2009	
Hexachlorocyclopentadiene	BQL	10.7	10.7	1	8/22/2009	
Hexachloroethane	BQL	5.34	0.795	1	8/22/2009	
Indeno(1,2,3-c,d)pyrene	BQL	5.34	2.44	1	8/22/2009	
Isophorone	BQL	5.34	0.945	1	8/22/2009	
Naphthalene	BQL	5.34	0.971	1	8/22/2009	
Nitrobenzene	BQL	5.34	1.12	1	8/22/2009	
2-Nitrophenol	BQL	5.34	1.31	1	8/22/2009	
4-Nitrophenol	BQL	26.7	1.15	1	8/22/2009	
N-Nitrosodi-n-propylamine	BQL	5.34	1.60	1	8/22/2009	
Pentachlorophenol	BQL	26.7	1.51	1	8/22/2009	
Phenanthrene	BQL	5.34	0.475	1	8/22/2009	

SGS North America, Inc.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTAS4147-MW04
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-4J
Lab Project ID: G128-2430

Initial/Final Amt: 937 mL / 5.0 mL

Analyzed By: EAW
Date Collected: 8/12/2009 13:30
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Phenol	BQL	5.34	1.13	1	8/22/2009	
Pyrene	BQL	5.34	2.20	1	8/22/2009	
1,2,4-Trichlorobenzene	BQL	5.34	0.768	1	8/22/2009	
2,4,6-Trichlorophenol	BQL	5.34	0.987	1	8/22/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9	90
2-Fluorophenol	10	8.3	83
Nitrobenzene-d5	10	9.6	96
Phenol-d6	10	8.3	83
2,4,6-Tribromophenol	10	7.5	75
4-Terphenyl-d14	10	9.8	98

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

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

Reviewed By: _____

SGS North America, Inc.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTAS4147-MW04
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-4J
Lab Project ID: G128-2430
Sample Wt/Vol: 937 ML
Dilution: 1

Analyzed By: DES
Date Collected: 8/12/2009 13:30
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Date Analyzed: 8/22/2009
Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result ug/L
1	Ketone, Unknown	7.16			121
2	Ketone, Unknown	7.16			21.3

Comment:

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

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

Reviewed by: _____

SGS North America, Inc.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTAS4147-MW05
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-5J
Lab Project ID: G128-2430

Initial/Final Amt: 972 mL / 5.0 mL

Analyzed By: EAW
Date Collected: 8/12/2009 12:15
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	5.14	0.766	1	8/22/2009	
Acenaphthylene	BQL	5.14	0.766	1	8/22/2009	
Anthracene	BQL	5.14	0.900	1	8/22/2009	
Benzo[a]anthracene	BQL	5.14	0.700	1	8/22/2009	
Benzo[a]pyrene	BQL	5.14	0.653	1	8/22/2009	
Benzo[b]fluoranthene	BQL	5.14	0.736	1	8/22/2009	
Benzo[g,h,i]perylene	BQL	5.14	0.633	1	8/22/2009	
Benzo[k]fluoranthene	BQL	5.14	0.566	1	8/22/2009	
Bis(2-chloroethoxy)methane	BQL	5.14	1.06	1	8/22/2009	
Bis(2-chloroethyl)ether	BQL	5.14	1.07	1	8/22/2009	
Bis(2-chloroisopropyl)ether	BQL	5.14	1.00	1	8/22/2009	
Bis(2-ethylhexyl)phthalate	BQL	5.14	0.422	1	8/22/2009	
4-bromophenyl phenyl ether	BQL	5.14	0.802	1	8/22/2009	
Butylbenzylphthalate	BQL	5.14	0.458	1	8/22/2009	
2-Chloronaphthalene	BQL	5.14	0.890	1	8/22/2009	
2-Chlorophenol	BQL	5.14	1.20	1	8/22/2009	
4-Chloro-3-methylphenol	BQL	5.14	0.818	1	8/22/2009	
4-Chlorophenyl phenyl ether	BQL	5.14	3.35	1	8/22/2009	
Chrysene	BQL	5.14	0.571	1	8/22/2009	
Dibenzo[a,h]anthracene	BQL	5.14	0.453	1	8/22/2009	
Di-n-Butylphthalate	BQL	5.14	0.849	1	8/22/2009	
3,3'-Dichlorobenzidine	BQL	10.3	1.26	1	8/22/2009	
2,4-Dichlorophenol	BQL	5.14	1.15	1	8/22/2009	
Diethylphthalate	BQL	5.14	0.761	1	8/22/2009	
Dimethylphthalate	BQL	5.14	0.571	1	8/22/2009	
2,4-Dimethylphenol	BQL	5.14	1.67	1	8/22/2009	
Di-n-octylphthalate	BQL	5.14	0.597	1	8/22/2009	
4,6-Dinitro-2-methylphenol	BQL	25.7	0.566	1	8/22/2009	
2,4-Dinitrophenol	BQL	25.7	0.658	1	8/22/2009	
2,4-Dinitrotoluene	BQL	5.14	0.550	1	8/22/2009	
2,6-Dinitrotoluene	BQL	5.14	0.669	1	8/22/2009	
Diphenylamine *	BQL	5.14	0.586	1	8/22/2009	
Fluoranthene	BQL	5.14	0.725	1	8/22/2009	
Fluorene	BQL	5.14	0.746	1	8/22/2009	
Hexachlorobenzene	BQL	5.14	0.520	1	8/22/2009	
Hexachlorobutadiene	BQL	5.14	0.782	1	8/22/2009	
Hexachlorocyclopentadiene	BQL	10.3	10.3	1	8/22/2009	
Hexachloroethane	BQL	5.14	0.766	1	8/22/2009	
Indeno(1,2,3-c,d)pyrene	BQL	5.14	2.35	1	8/22/2009	
Isophorone	BQL	5.14	0.910	1	8/22/2009	
Naphthalene	BQL	5.14	0.936	1	8/22/2009	
Nitrobenzene	BQL	5.14	1.08	1	8/22/2009	
2-Nitrophenol	BQL	5.14	1.27	1	8/22/2009	
4-Nitrophenol	BQL	25.7	1.11	1	8/22/2009	
N-Nitrosodi-n-propylamine	BQL	5.14	1.54	1	8/22/2009	
Pentachlorophenol	BQL	25.7	1.46	1	8/22/2009	
Phenanthrene	BQL	5.14	0.458	1	8/22/2009	

SGS North America, Inc.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTAS4147-MW05
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-5J
Lab Project ID: G128-2430

Initial/Final Amt: 972 mL / 5.0 mL

Analyzed By: EAW
Date Collected: 8/12/2009 12:15
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Phenol	BQL	5.14	1.09	1	8/22/2009	
Pyrene	BQL	5.14	2.12	1	8/22/2009	
1,2,4-Trichlorobenzene	BQL	5.14	0.741	1	8/22/2009	
2,4,6-Trichlorophenol	BQL	5.14	0.952	1	8/22/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.8	88
2-Fluorophenol	10	8.2	82
Nitrobenzene-d5	10	9.4	94
Phenol-d6	10	8.6	86
2,4,6-Tribromophenol	10	8.1	81
4-Terphenyl-d14	10	8.8	88

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

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

Reviewed By: _____

SGS North America, Inc.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTAS4147-MW05
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-5J
Lab Project ID: G128-2430
Sample Wt/Vol: 972 ML
Dilution: 1

Analyzed By: DES
Date Collected: 8/12/2009 12:15
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Date Analyzed: 8/22/2009
Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result ug/L
1	Ketone, Unknown	7.16			134

Comment:

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

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

Reviewed by: _____

SGS North America, Inc.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTAS4147-MW06
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-6J
Lab Project ID: G128-2430

Initial/Final Amt: 975 mL / 5.0 mL

Analyzed By: EAW
Date Collected: 8/12/2009 11:30
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	5.13	0.764	1	8/22/2009	
Acenaphthylene	BQL	5.13	0.764	1	8/22/2009	
Anthracene	BQL	5.13	0.897	1	8/22/2009	
Benzo[a]anthracene	BQL	5.13	0.697	1	8/22/2009	
Benzo[a]pyrene	BQL	5.13	0.651	1	8/22/2009	
Benzo[b]fluoranthene	BQL	5.13	0.733	1	8/22/2009	
Benzo[g,h,i]perylene	BQL	5.13	0.631	1	8/22/2009	
Benzo[k]fluoranthene	BQL	5.13	0.564	1	8/22/2009	
Bis(2-chloroethoxy)methane	BQL	5.13	1.06	1	8/22/2009	
Bis(2-chloroethyl)ether	BQL	5.13	1.07	1	8/22/2009	
Bis(2-chloroisopropyl)ether	BQL	5.13	1.00	1	8/22/2009	
Bis(2-ethylhexyl)phthalate	BQL	5.13	0.421	1	8/22/2009	
4-bromophenyl phenyl ether	BQL	5.13	0.800	1	8/22/2009	
Butylbenzylphthalate	BQL	5.13	0.456	1	8/22/2009	
2-Chloronaphthalene	BQL	5.13	0.887	1	8/22/2009	
2-Chlorophenol	BQL	5.13	1.20	1	8/22/2009	
4-Chloro-3-methylphenol	BQL	5.13	0.815	1	8/22/2009	
4-Chlorophenyl phenyl ether	BQL	5.13	3.34	1	8/22/2009	
Chrysene	BQL	5.13	0.569	1	8/22/2009	
Dibenzo[a,h]anthracene	BQL	5.13	0.451	1	8/22/2009	
Di-n-Butylphthalate	BQL	5.13	0.846	1	8/22/2009	
3,3'-Dichlorobenzidine	BQL	10.3	1.25	1	8/22/2009	
2,4-Dichlorophenol	BQL	5.13	1.15	1	8/22/2009	
Diethylphthalate	BQL	5.13	0.759	1	8/22/2009	
Dimethylphthalate	BQL	5.13	0.569	1	8/22/2009	
2,4-Dimethylphenol	BQL	5.13	1.66	1	8/22/2009	
Di-n-octylphthalate	BQL	5.13	0.595	1	8/22/2009	
4,6-Dinitro-2-methylphenol	BQL	25.6	0.564	1	8/22/2009	
2,4-Dinitrophenol	BQL	25.6	0.656	1	8/22/2009	
2,4-Dinitrotoluene	BQL	5.13	0.549	1	8/22/2009	
2,6-Dinitrotoluene	BQL	5.13	0.667	1	8/22/2009	
Diphenylamine *	BQL	5.13	0.585	1	8/22/2009	
Fluoranthene	BQL	5.13	0.723	1	8/22/2009	
Fluorene	BQL	5.13	0.744	1	8/22/2009	
Hexachlorobenzene	BQL	5.13	0.518	1	8/22/2009	
Hexachlorobutadiene	BQL	5.13	0.779	1	8/22/2009	
Hexachlorocyclopentadiene	BQL	10.3	10.3	1	8/22/2009	
Hexachloroethane	BQL	5.13	0.764	1	8/22/2009	
Indeno(1,2,3-c,d)pyrene	BQL	5.13	2.34	1	8/22/2009	
Isophorone	BQL	5.13	0.908	1	8/22/2009	
Naphthalene	BQL	5.13	0.933	1	8/22/2009	
Nitrobenzene	BQL	5.13	1.08	1	8/22/2009	
2-Nitrophenol	BQL	5.13	1.26	1	8/22/2009	
4-Nitrophenol	BQL	25.6	1.11	1	8/22/2009	
N-Nitrosodi-n-propylamine	BQL	5.13	1.54	1	8/22/2009	
Pentachlorophenol	BQL	25.6	1.45	1	8/22/2009	
Phenanthrene	BQL	5.13	0.456	1	8/22/2009	

SGS North America, Inc.

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTAS4147-MW06
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-6J
Lab Project ID: G128-2430

Initial/Final Amt: 975 mL / 5.0 mL

Analyzed By: EAW
Date Collected: 8/12/2009 11:30
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Matrix: Water

Compound	Result ug/L	RL ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Phenol	BQL	5.13	1.09	1	8/22/2009	
Pyrene	BQL	5.13	2.12	1	8/22/2009	
1,2,4-Trichlorobenzene	BQL	5.13	0.738	1	8/22/2009	
2,4,6-Trichlorophenol	BQL	5.13	0.949	1	8/22/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.2	92
2-Fluorophenol	10	8.2	82
Nitrobenzene-d5	10	9.5	95
Phenol-d6	10	8.7	87
2,4,6-Tribromophenol	10	8.3	83
4-Terphenyl-d14	10	8.8	88

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

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

Reviewed By: _____

SGS North America, Inc.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: USTAS4147-MW06
Client Project ID: AS-4147 JP-5 Pipeline Release
Lab Sample ID: G128-2430-6J
Lab Project ID: G128-2430
Sample Wt/Vol: 975 ML
Dilution: 1

Analyzed By: DES
Date Collected: 8/12/2009 11:30
Date Received: 8/13/2009
Date Extracted: 8/18/2009
Date Analyzed: 8/22/2009
Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result ug/L
	No TIC's detected.				

Comment:

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

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

Reviewed by: _____

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW01
Sample Matrix	Water
Date Collected	08/12/09 10:15
Date Received	08/13/09
Date Extracted	08/21/09
Date Analyzed	08/27/09 11:54 - 08/27/09 12:22
Dry Weight	NA
Dilution Factor	1 - 1
Initial Volume (mL)	922
Final Volume (mL)	5.0

Analytical Results			
Analytes**	Result µg/L	Report Limit µg/L	Flags
C9-C18 Aliphatics	BQL	100	
C19-C36 Aliphatics	BQL	100	
C11-C22 Aromatics	BQL	100	

Surrogates	Percent Recovery	Flags	Limits Lower	Limits Upper
Aliphatic (tricosane)	90.5		40	140
Aromatic (ortho-terphenyl)	88.8		40	140
Fractionation 1 (2-bromonaphthalene)	90.7		40	140
Fractionation 2 (2-fluorobiphenyl)	92.9		40	140

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: G128-2430-1L	Lab Info: G128-2430-1L
Aliphatic: EP082709/005F0301.D	Aromatic: EP082709/006F0401.D

Reviewed By: [illegible]

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW02
Sample Matrix	Water
Date Collected	08/12/09 10:45
Date Received	08/13/09
Date Extracted	08/21/09
Date Analyzed	08/27/09 12:51 - 08/27/09 13:19
Dry Weight	NA
Dilution Factor	1 - 1
Initial Volume (mL)	964
Final Volume (mL)	5.0

Analytical Results			
Analytes**	Result µg/L	Report Limit µg/L	Flags
C9-C18 Aliphatics	BQL	100	
C19-C36 Aliphatics	BQL	100	
C11-C22 Aromatics	2770	100	

Surrogates	Percent Recovery	Flags	Limits Lower	Limits Upper
Aliphatic (tricosane)	78.4		40	140
Aromatic (ortho-terphenyl)	83.2		40	140
Fractionation 1 (2-bromonaphthalene)	199	***	40	140
Fractionation 2 (2-fluorobiphenyl)	105		40	140

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

*** = High surrogate recovery due to matrix interference.

Lab Info: G128-2430-2L	Lab Info: G128-2430-2L
Aliphatic: EP082709/007F0501.D	Aromatic: EP082709/008F0601.D

Reviewed By: CA

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW03
Sample Matrix	Water
Date Collected	08/12/09 12:45
Date Received	08/13/09
Date Extracted	08/21/09
Date Analyzed	08/27/09 13:47 - 08/27/09 14:16
Dry Weight	NA
Dilution Factor	1 - 1
Initial Volume (mL)	958
Final Volume (mL)	5.0

Analytical Results			
Analytes**	Result µg/L	Report Limit µg/L	Flags
C9-C18 Aliphatics	BQL	100	
C19-C36 Aliphatics	BQL	100	
C11-C22 Aromatics	BQL	100	

Surrogates	Percent Recovery	Flags	Limits Lower	Limits Upper
Aliphatic (tricosane)	47.1		40	140
Aromatic (ortho-terphenyl)	76.2		40	140
Fractionation 1 (2-bromonaphthalene)	80.6		40	140
Fractionation 2 (2-fluorobiphenyl)	81.8		40	140

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: G128-2430-3L	Lab Info: G128-2430-3L
Aliphatic: EP082709/009F0701.D	Aromatic: EP082709/010F0801.D

Reviewed By: _____

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW04
Sample Matrix	Water
Date Collected	08/12/09 13:30
Date Received	08/13/09
Date Extracted	08/21/09
Date Analyzed	08/27/09 14:44 - 08/27/09 15:12
Dry Weight	NA
Dilution Factor	1 - 1
Initial Volume (mL)	955
Final Volume (mL)	5.0

Analytical Results			
Analytes**	Result µg/L	Report Limit µg/L	Flags
C9-C18 Aliphatics	BQL	100	
C19-C36 Aliphatics	BQL	100	
C11-C22 Aromatics	BQL	100	

Surrogates	Percent Recovery	Flags	Limits Lower	Limits Upper
Aliphatic (tricosane)	45.9		40	140
Aromatic (ortho-terphenyl)	76.4		40	140
Fractionation 1 (2-bromonaphthalene)	82.2		40	140
Fractionation 2 (2-fluorobiphenyl)	84.2		40	140

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: G128-2430-4L	Lab Info: G128-2430-4L
Aliphatic: EP082709/011F0901.D	Aromatic: EP082709/012F1001.D

Reviewed By: _____

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW05
Sample Matrix	Water
Date Collected	08/12/09 12:15
Date Received	08/13/09
Date Extracted	08/21/09
Date Analyzed	08/27/09 15:41 - 08/27/09 16:09
Dry Weight	NA
Dilution Factor	1 - 1
Initial Volume (mL)	814
Final Volume (mL)	5.0

Analytical Results

Analytes**	Result µg/L	Report Limit µg/L	Flags
C9-C18 Aliphatics	BQL	100	
C19-C36 Aliphatics	BQL	100	
C11-C22 Aromatics	BQL	100	

Surrogates	Percent Recovery	Flags	Limits Lower	Limits Upper
Aliphatic (tricosane)	92.8		40	140
Aromatic (ortho-terphenyl)	86.8		40	140
Fractionation 1 (2-bromonaphthalene)	92.2		40	140
Fractionation 2 (2-fluorobiphenyl)	94.1		40	140

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: G128-2430-5L	Lab Info: G128-2430-5L
Aliphatic: EP082709/013F1101.D	Aromatic: EP082709/014F1201.D

Reviewed By: [illegible]

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: AS-4147 JP-5 Pipeline Release

Sample Information	
Sample Identification	USTAS4147-MW06
Sample Matrix	Water
Date Collected	08/12/09 11:30
Date Received	08/13/09
Date Extracted	08/21/09
Date Analyzed	08/27/09 16:38 - 08/27/09 17:06
Dry Weight	NA
Dilution Factor	1 - 1
Initial Volume (mL)	960
Final Volume (mL)	5.0

Analytical Results			
Analytes**	Result µg/L	Report Limit µg/L	Flags
C9-C18 Aliphatics	BQL	100	
C19-C36 Aliphatics	BQL	100	
C11-C22 Aromatics	BQL	100	

Surrogates	Percent Recovery	Flags	Limits Lower	Limits Upper
Aliphatic (tricosane)	84.1		40	140
Aromatic (ortho-terphenyl)	77.7		40	140
Fractionation 1 (2-bromonaphthalene)	91.9		40	140
Fractionation 2 (2-fluorobiphenyl)	94.5		40	140

** = Excludes any surrogates or internal standards and are unadjusted for individual analytes.

Lab Info: G128-2430-6L	Lab Info: G128-2430-6L
Aliphatic: EP082709/015F1301.D	Aromatic: EP082709/016F1401.D

Reviewed By: [illegible]

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 07/17/09

Calibration Ranges and Limits

Range	MDL (02/15/08) (µg/L)	MDL (02/11/08) (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C9-C18 Aliphatics	1.66	0.274	5.28	0.871	100	10
C19-C36 Aliphatics	2.79	0.201	8.87	0.639	100	10
C11-C22 Aromatics	2.64	0.110	8.40	0.350	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD if CF r if LR	Method of Quantitation
C_9-C_{18} Aliphatics	200	33.3	14.33	Calibration Factor
	100	16.7		
	50	8.33		
	25	4.17		
	5	0.833		
C_{19}-C_{36} Aliphatics	200	33.3	16.98	Calibration Factor
	100	16.7		
	50	8.33		
	25	4.17		
	5	0.833		
C_{11}-C_{22} Aromatics	200	33.3	7.33	Calibration Factor
	100	16.7		
	50	8.33		
	25	4.17		
	5	0.833		

Calibration Check Date: 08/27/09 08/27/09

Filenames: ep082709/001f0101.d ep082709/002f0201.d

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	%Difference if CF %Drift if LR	Limits
C9-C18 Aliphatics	100	16.7	10.8	≤±25%
C19-C36 Aliphatics	100	16.7	10.2	≤±25%
C11-C22 Aromatics	100	16.7	9.3	≤±25%

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 07/17/09

Calibration Ranges and Limits

Range	MDL (02/15/08) (µg/L)	MDL (02/11/08) (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C9-C18 Aliphatics	1.66	0.274	5.28	0.871	100	10
C19-C36 Aliphatics	2.79	0.201	8.87	0.639	100	10
C11-C22 Aromatics	2.64	0.110	8.40	0.350	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD if CF r if LR	Method of Quantitation
C_9-C_{18} Aliphatics	200	33.3	14.33	Calibration Factor
	100	16.7		
	50	8.33		
	25	4.17		
	5	0.833		
C_{19}-C_{36} Aliphatics	200	33.3	16.98	Calibration Factor
	100	16.7		
	50	8.33		
	25	4.17		
	5	0.833		
C_{11}-C_{22} Aromatics	200	33.3	7.33	Calibration Factor
	100	16.7		
	50	8.33		
	25	4.17		
	5	0.833		

Calibration Check Date: 08/27/09, 08/27/09

Filenames: ep082709/023f2101.d, ep082709/024f2202.d

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	%Difference if CF %Drift if LR	Limits
C9-C18 Aliphatics	100	16.7	13.6	≤±25%
C19-C36 Aliphatics	100	16.7	16.1	≤±25%
C11-C22 Aromatics	100	16.7	10.1	≤±25%

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

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(1)

CLIENT: CATLIN

CONTACT: Steve Hudson/Steve Tyler PHONE NO:(910) 452-5861

PROJECT: AS-4147 JP-5 Pipeline Release SITE/PWSID#:

REPORTS TO: Steve Hudson/Steve Tyler FAX NO.:(910) 452-7563

INVOICE TO: Sheila @ Catlin QUOTE #: DOD 101

P.O. NUMBER: 290731-4

SGS Reference: G128-2430

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C= COMP, G= GRAB)	602 + MTBE + IPB + Xylenes (3)	625 + TICs	VPH	EPH						REMARKS
						Preservatives Used	HCl	1	HCl	HCl						
	USTAS4147-MW01	8-12-09	10:15a	GW			✓	✓	✓	✓						
	USTAS4147-MW02	8-12-09	10:45a	GW			✓	✓	✓	✓						-Lejeune and Summary
	USTAS4147-MW03	8-12-09	12:45	GW			✓	✓	✓	✓						EDD format
	USTAS4147-MW04	8-12-09	13:30	GW			✓	✓	✓	✓						-report low runs
	USTAS4147-MW05	8-12-09	12:15	GW			✓	✓	✓	✓						
	USTAS4147-MW06	8-12-09	11:30	GW			✓	✓	✓	✓						
	USTAS4147-MW02 DUP	8-12-09	10:45a	GW			✓									
	Trip blank						✓									

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:
[signature]	8/13/09	8:08	[signature]
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature°C: 5.9, 5.9

Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Special Instructions:

Requested Turnaround Time:

☐ RUSH _____ Date Needed ☒ STD

❑ 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

APPENDIX G

VERTICAL HYDRAULIC GRADIENT DETERMINATION AS OF SEPTEMBER 9, 2009

SUMMARY OF VERTICAL HYDRAULIC GRADIENT ESTIMATES

Comprehensive Site Assessment
AS-4147 (JP-5 2009 Pipeline Release)

Marine Corps Air Station
New River, NC

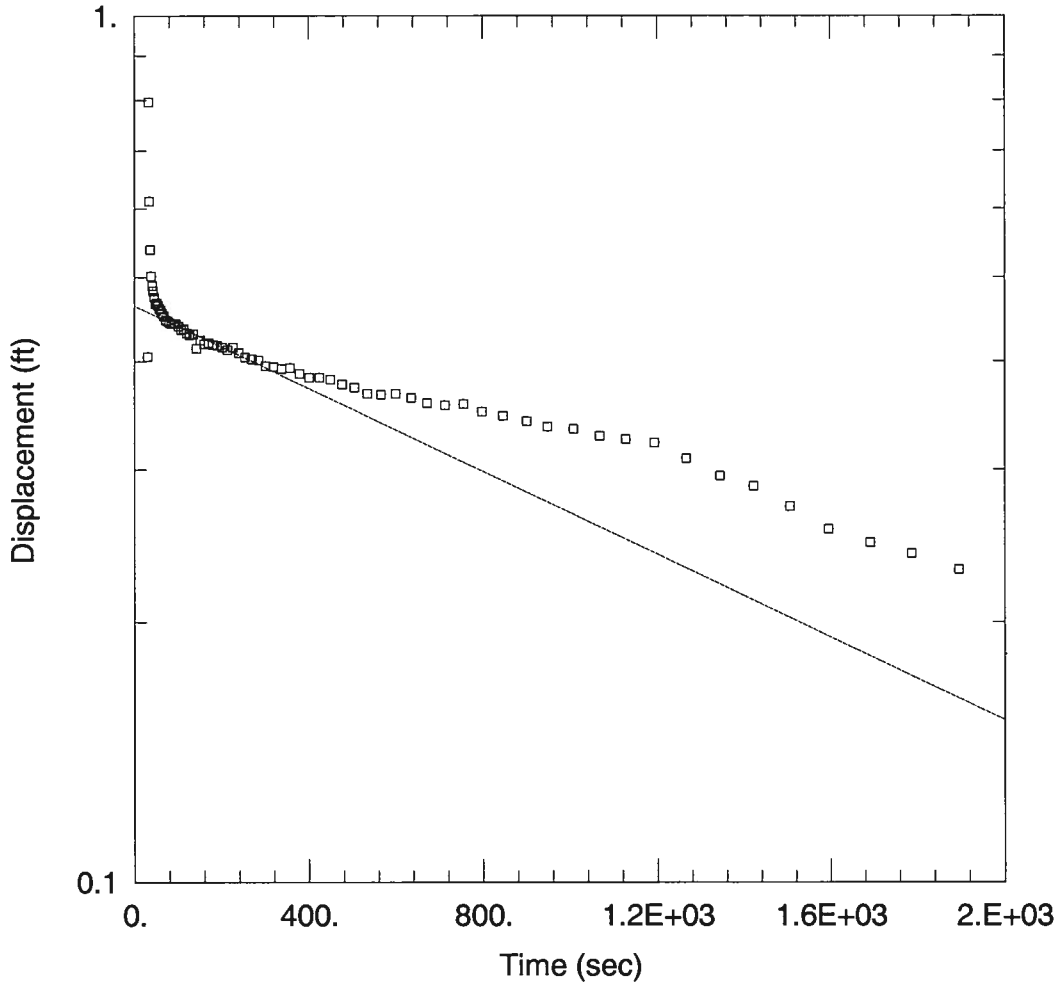
GAUGING DATE: **September 9, 2009**	**WELL PAIR**	
	SHALLOW	DEEP
WELL IDENTIFICATION	USTAS4141-MW15	USTAS4147-MW04
TOP OF CASING ELEVATION (FEET)	18.11	18.05
DEPTH TO WATER (FEET)	2.48	3.97
APPROXIMATE MID-SCREEN DEPTH (FEET)	8.00	37.00
APPROXIMATE MID-SCREEN ELEVATION (FEET)	10.11	-18.95
STATIC WATER LEVEL ELEVATION (FEET)	15.63	14.08
DIFFERENCE IN STATIC WATER LEVEL ELEVATION (FEET)	1.55	
DIFFERENCE IN MID-SCREEN ELEVATION (FEET)	29.06	
VERTICAL GRADIENT	0.0533	

Free phase product in well, elevation calculated by:
[Top of Casing Elevation - Depth to Water] +
[Free Product Thickness x (0.99)]

POSITIVE GRADIENT INDICATES "DOWNWARDS" GROUNDWATER MIGRATION POTENTIAL.

APPENDIX H

HYDRAULIC CONDUCTIVITY



BUIDLING AS-4147

Data Set: S:\WPMKTG\PROJECT\2009\209-03~4\SLUGTE~1\MW02.AQT
Date: 09/11/09 Time: 15:48:23

PROJECT INFORMATION

Company: CATLIN Eng. and Scientists
Client: LANTDIV
Project: 209-033
Test Location: Camp Lejeune, NC
Test Well: MW-02
Test Date: 8/14/2009

AQUIFER DATA

Saturated Thickness: 25. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.64 ft
Casing Radius: 0.0833 ft
Screen Length: 9.98 ft
Water Column Height: 9.98 ft
Wellbore Radius: 0.3333 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 1.996E-06 ft/sec
y0 = 0.4637 ft

Report Date: 9/11/2009 11:39:17 AM
Report User Name: scan
Report Computer Name: SCANPC

Log File Properties:

File Name:	mw02 2009-08-14 12.49.36.wsl
Create Date:	8/14/2009 12:49:25 PM

Device Properties:

Device:	Level TROLL® 700
Site:	as4147
Device Name:	
Serial Number:	125515
Firmware Version:	2.07

Log Configuration

Log Name:	mw02
Created By:	Unknown
Computer Name:	Field PC
Application:	WinSituMobile.exe
Application Version:	5.4.2.0
Create Date:	8/14/2009 10:25:31 AM
Notes Size(bytes):	4096
Type:	True Logarithmic
Overwrite when full:	Disabled
Scheduled Start:	Manual Start
Scheduled Stop:	No Stop Time
Max Interval:	Days: 0 Hours: 00 Mins: 20 Secs: 00

Level Reference Settings At Log Creation

Level Measurement Mode:	Level-DTW
Specific Gravity:	0.999
Level Reference Mode:	Set first logged value to offset
Level Reference Offset:	0 (ft)

Log Notes:

Date and Time	Note
8/14/2009 10:09:13 AM	User Note: "Level reference initialized to zero at start of log."
8/14/2009 10:09:28 AM	Manual Start Command
8/14/2009 10:10:36 AM	User Note: "Downloading log - Used Batt: 8% Memory: 32% User: Unknown"
8/14/2009 10:12:08 AM	User Note: "Downloading log - Used Batt: 8% Memory: 32% User: Unknown"
8/14/2009 10:25:08 AM	User Note: "Downloading log - Used Batt: 8% Memory: 32% User: Unknown"
8/14/2009 11:03:24 AM	User Note: "Downloading log - Used Batt: 8% Memory: 32% User: Unknown"
8/14/2009 11:17:27 AM	User Note: "Downloading log - Used Batt: 8% Memory: 32% User: Unknown"
8/14/2009 11:29:32 AM	User Note: "Downloading log - Used Batt: 8% Memory: 32% User: Unknown"
8/14/2009 11:57:02 AM	User Note: "Downloading log - Used Batt: 8% Memory: 32% User: Unknown"
8/14/2009 12:17:01 PM	User Note: "Downloading log - Used Batt: 8% Memory: 32% User: Unknown"

8/14/2009 12:28:58 PM User Note: "Downloading log - Used Batt: 8% Memory: 32% User: Unknown"
8/14/2009 12:32:01 PM User Note: "Downloading log - Used Batt: 8% Memory: 32% User: Unknown"
8/14/2009 12:32:44 PM Manual Stop Command

Log Data:
Record Count: 151

Date and Time	Elapsed Time Seconds	Sensor: Pres 30G SN#: 125515 Level-DTW (ft)	Sensor: Pres 30G SN#: 125515 Pressure (PSI)	Sensor: Pres 30G SN#: 125515 Temperature (C)
8/14/2009 10:09:28 AM	0.000	0.000	4.356	23.684
8/14/2009 10:09:28 AM	0.273	-0.000	4.356	23.705
8/14/2009 10:09:28 AM	0.501	-0.002	4.357	23.721
8/14/2009 10:09:29 AM	0.751	-0.003	4.358	23.727
8/14/2009 10:09:29 AM	1.202	-0.004	4.358	23.726
8/14/2009 10:09:29 AM	1.424	-0.004	4.358	23.736
8/14/2009 10:09:29 AM	1.646	0.001	4.356	23.745
8/14/2009 10:09:30 AM	1.868	-0.025	4.367	23.754
8/14/2009 10:09:30 AM	2.334	-0.007	4.359	23.791
8/14/2009 10:09:30 AM	2.555	-0.005	4.358	23.788
8/14/2009 10:09:31 AM	2.776	0.002	4.355	23.786
8/14/2009 10:09:31 AM	2.996	-0.008	4.360	23.839
8/14/2009 10:09:31 AM	3.490	-0.005	4.358	23.815
8/14/2009 10:09:32 AM	3.711	-0.008	4.360	23.807
8/14/2009 10:09:32 AM	3.935	0.002	4.355	23.804
8/14/2009 10:09:32 AM	4.156	-0.005	4.358	23.775
8/14/2009 10:09:32 AM	4.658	-0.008	4.360	23.781
8/14/2009 10:09:33 AM	4.880	-0.000	4.356	23.788
8/14/2009 10:09:33 AM	5.103	0.003	4.355	23.789
8/14/2009 10:09:33 AM	5.410	-0.001	4.357	23.783
8/14/2009 10:09:33 AM	5.630	0.001	4.356	23.789
8/14/2009 10:09:34 AM	5.851	-0.002	4.357	23.794
8/14/2009 10:09:34 AM	6.071	0.000		

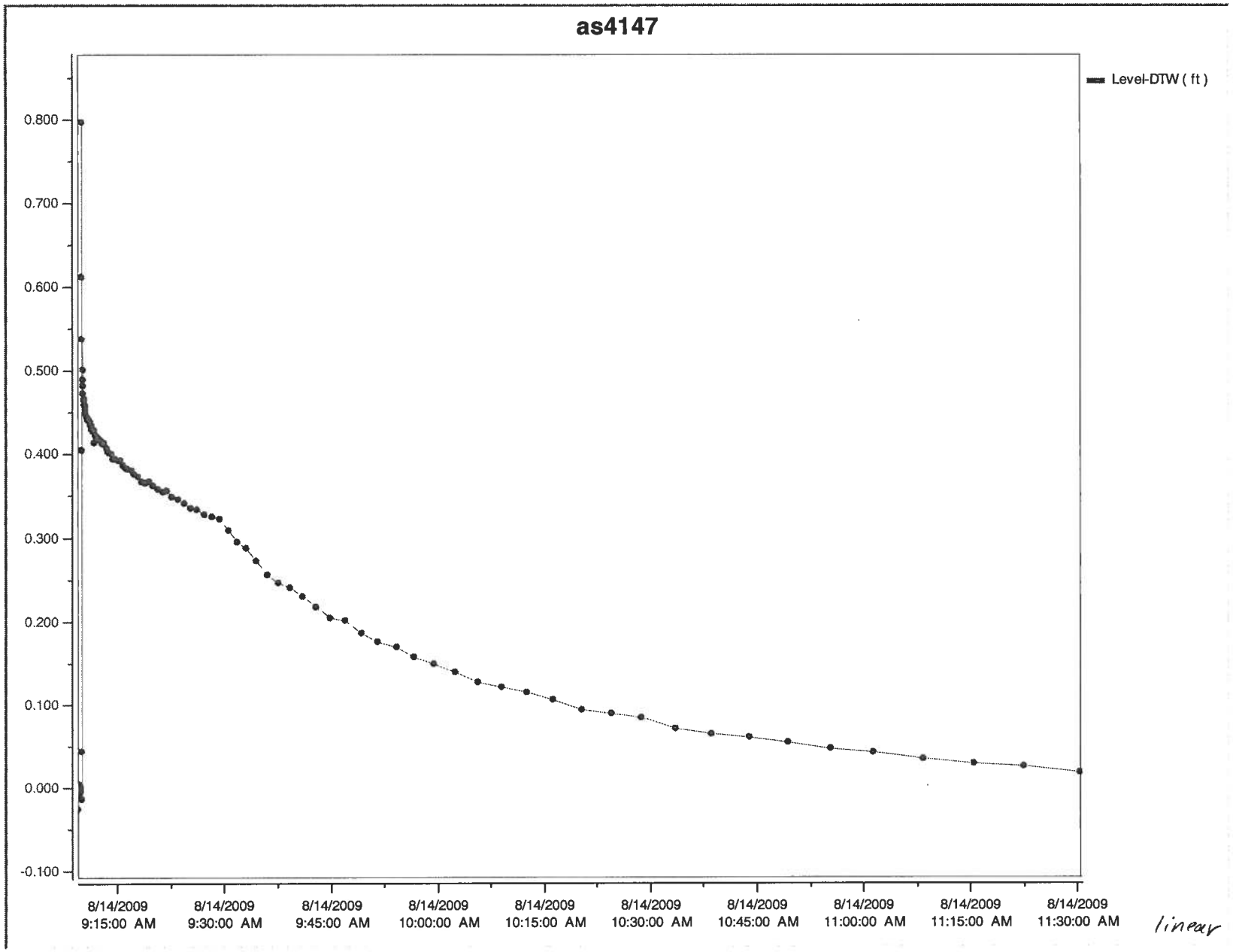
23.792		4.356	
8/14/2009 10:09:34 AM		6.292	0.000
23.797		4.356	
8/14/2009 10:09:34 AM		6.513	0.002
23.796		4.355	
8/14/2009 10:09:35 AM		6.735	0.002
23.798		4.356	
8/14/2009 10:09:35 AM		6.959	0.000
23.800		4.356	
8/14/2009 10:09:35 AM		7.181	-0.000
23.801		4.356	
8/14/2009 10:09:35 AM		7.561	0.005
23.779		4.354	
8/14/2009 10:09:36 AM		7.981	-0.000
23.775		4.356	
8/14/2009 10:09:36 AM		8.461	0.002
23.768		4.355	
8/14/2009 10:09:37 AM		9.001	-0.003
23.760		4.357	
8/14/2009 10:09:37 AM		9.481	0.001
23.758		4.356	
8/14/2009 10:09:38 AM		10.081	-0.000
23.751		4.356	
8/14/2009 10:09:39 AM		10.681	-0.003
23.749		4.358	
8/14/2009 10:09:39 AM		11.281	-0.002
23.747		4.357	
8/14/2009 10:09:40 AM		11.941	-0.001
23.742		4.357	
8/14/2009 10:09:40 AM		12.661	-0.000
23.741		4.356	
8/14/2009 10:09:41 AM		13.441	-0.000
23.741		4.356	
8/14/2009 10:09:42 AM		14.221	0.000
23.736		4.356	
8/14/2009 10:09:43 AM		15.061	-0.002
23.736		4.357	
8/14/2009 10:09:44 AM		15.961	-0.002
23.733		4.357	
8/14/2009 10:09:45 AM		16.921	0.002
23.730		4.355	
8/14/2009 10:09:46 AM		17.880	-0.003
23.733		4.357	
8/14/2009 10:09:47 AM		18.961	-0.005
23.727		4.358	
8/14/2009 10:09:48 AM		20.101	-0.000
23.728		4.356	
8/14/2009 10:09:49 AM		21.301	-0.004
23.728		4.358	
8/14/2009 10:09:50 AM		22.561	-0.003
23.726		4.357	
8/14/2009 10:09:52 AM		23.881	-0.003
23.727		4.357	
8/14/2009 10:09:53 AM		25.321	-0.002
23.724		4.357	
8/14/2009 10:09:55 AM		26.821	-0.014
23.725		4.362	
8/14/2009 10:09:56 AM		28.381	0.043
23.723		4.337	
8/14/2009 10:09:58 AM		30.061	0.405
23.723		4.181	
8/14/2009 10:10:00 AM		31.860	0.796
23.721		4.011	
8/14/2009 10:10:02 AM		33.721	0.612

23.720		4.091	
8/14/2009	10:10:04 AM	35.761	0.538
23.717		4.123	
8/14/2009	10:10:06 AM	37.861	0.502
23.718		4.139	
8/14/2009	10:10:08 AM	40.081	0.489
23.717		4.144	
8/14/2009	10:10:10 AM	42.481	0.482
23.715		4.148	
8/14/2009	10:10:13 AM	45.000	0.474
23.715		4.151	
8/14/2009	10:10:15 AM	47.641	0.466
23.714		4.154	
8/14/2009	10:10:18 AM	50.461	0.467
23.714		4.154	
8/14/2009	10:10:21 AM	53.461	0.464
23.712		4.155	
8/14/2009	10:10:24 AM	56.641	0.460
23.709		4.157	
8/14/2009	10:10:28 AM	60.001	0.458
23.714		4.158	
8/14/2009	10:10:31 AM	63.601	0.454
23.707		4.160	
8/14/2009	10:10:35 AM	67.200	0.451
23.707		4.161	
8/14/2009	10:10:39 AM	71.467	0.446
23.706		4.163	
8/14/2009	10:10:43 AM	75.600	0.445
23.705		4.163	
8/14/2009	10:10:48 AM	79.801	0.443
23.707		4.164	
8/14/2009	10:10:52 AM	84.601	0.442
23.703		4.165	
8/14/2009	10:10:58 AM	90.000	0.442
23.702		4.165	
8/14/2009	10:11:03 AM	94.801	0.442
23.702		4.165	
8/14/2009	10:11:09 AM	100.801	0.439
23.703		4.166	
8/14/2009	10:11:15 AM	106.801	0.435
23.699		4.168	
8/14/2009	10:11:21 AM	112.801	0.436
23.701		4.168	
8/14/2009	10:11:27 AM	119.401	0.431
23.695		4.169	
8/14/2009	10:11:34 AM	126.600	0.429
23.697		4.171	
8/14/2009	10:11:42 AM	134.401	0.430
23.695		4.170	
8/14/2009	10:11:50 AM	142.200	0.414
23.692		4.177	
8/14/2009	10:11:58 AM	150.600	0.423
23.695		4.173	
8/14/2009	10:12:07 AM	159.600	0.419
23.693		4.175	
8/14/2009	10:12:17 AM	169.200	0.420
23.693		4.174	
8/14/2009	10:12:27 AM	178.801	0.418
23.688		4.175	
8/14/2009	10:12:37 AM	189.600	0.417
23.692		4.176	
8/14/2009	10:12:49 AM	201.001	0.415
23.693		4.177	
8/14/2009	10:13:01 AM	213.001	0.412

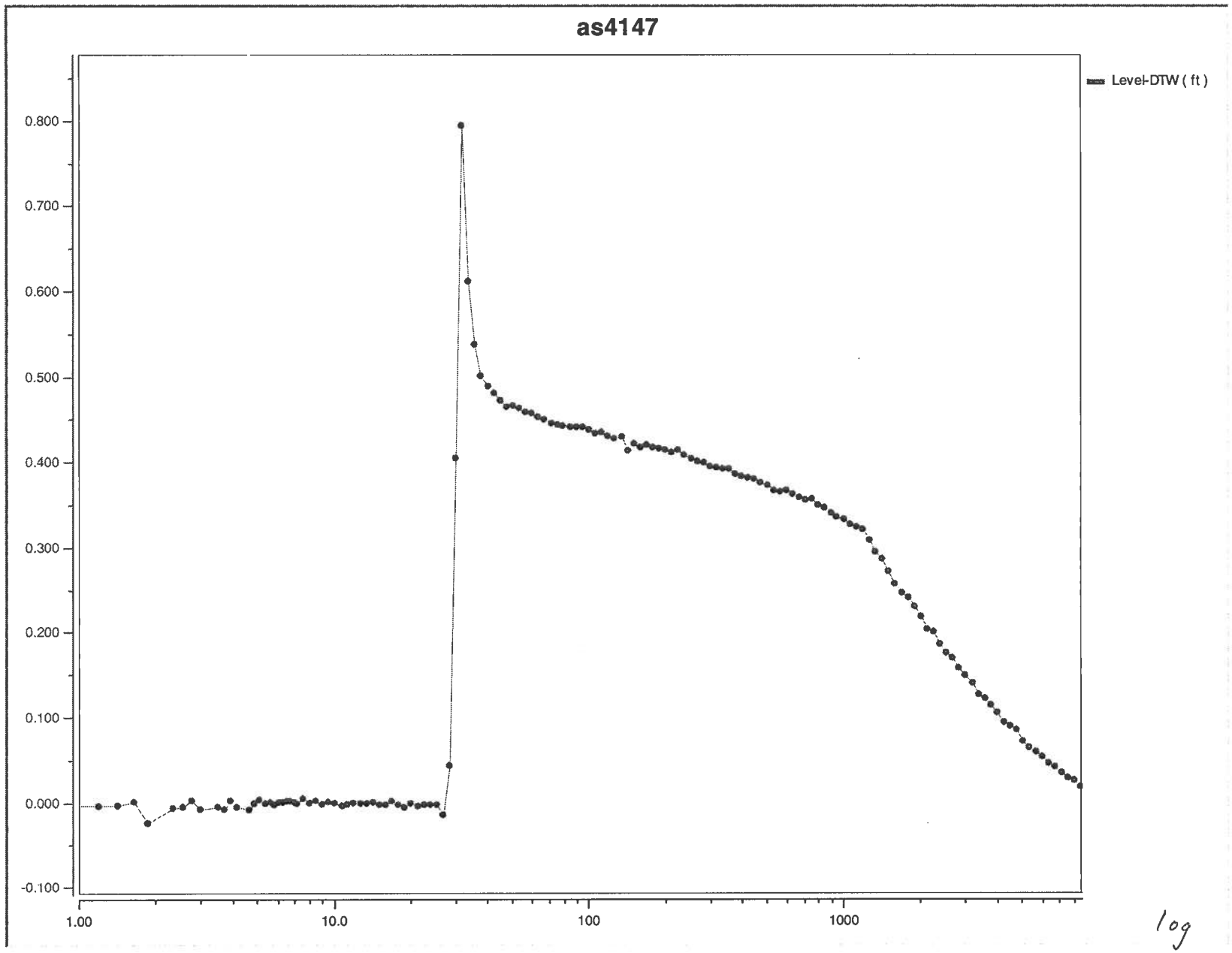
23.691	4.178	
8/14/2009 10:13:13 AM	225.600	0.415
23.688	4.177	
8/14/2009 10:13:27 AM	238.801	0.409
23.689	4.179	
8/14/2009 10:13:41 AM	253.201	0.404
23.687	4.181	
8/14/2009 10:13:56 AM	268.201	0.402
23.684	4.182	
8/14/2009 10:14:12 AM	283.800	0.401
23.686	4.183	
8/14/2009 10:14:28 AM	300.600	0.395
23.683	4.185	
8/14/2009 10:14:46 AM	318.600	0.394
23.681	4.186	
8/14/2009 10:15:05 AM	337.201	0.392
23.681	4.186	
8/14/2009 10:15:25 AM	357.600	0.393
23.681	4.186	
8/14/2009 10:15:46 AM	378.600	0.387
23.684	4.188	
8/14/2009 10:16:09 AM	400.800	0.383
23.679	4.190	
8/14/2009 10:16:33 AM	424.800	0.383
23.680	4.190	
8/14/2009 10:16:58 AM	450.000	0.381
23.682	4.191	
8/14/2009 10:17:24 AM	476.401	0.376
23.676	4.193	
8/14/2009 10:17:52 AM	504.600	0.373
23.675	4.195	
8/14/2009 10:18:22 AM	534.600	0.367
23.673	4.197	
8/14/2009 10:18:54 AM	566.401	0.366
23.674	4.198	
8/14/2009 10:19:28 AM	600.000	0.367
23.675	4.197	
8/14/2009 10:20:04 AM	636.000	0.363
23.673	4.199	
8/14/2009 10:20:40 AM	672.000	0.358
23.672	4.201	
8/14/2009 10:21:22 AM	714.000	0.356
23.672	4.202	
8/14/2009 10:22:04 AM	756.000	0.357
23.672	4.202	
8/14/2009 10:22:46 AM	798.000	0.350
23.669	4.205	
8/14/2009 10:23:34 AM	846.000	0.346
23.670	4.206	
8/14/2009 10:24:28 AM	900.000	0.341
23.671	4.208	
8/14/2009 10:25:16 AM	948.000	0.336
23.673	4.211	
8/14/2009 10:26:16 AM	1008.000	0.334
23.670	4.212	
8/14/2009 10:27:16 AM	1068.000	0.328
23.673	4.214	
8/14/2009 10:28:16 AM	1128.000	0.325
23.670	4.215	
8/14/2009 10:29:22 AM	1194.000	0.322
23.670	4.217	
8/14/2009 10:30:34 AM	1266.000	0.309
23.669	4.222	
8/14/2009 10:31:52 AM	1344.000	0.295

23.668		4.229	
8/14/2009 10:33:10 AM		1422.000	0.287
23.672		4.232	
8/14/2009 10:34:34 AM		1506.000	0.272
23.670		4.238	
8/14/2009 10:36:04 AM		1596.000	0.256
23.668		4.245	
8/14/2009 10:37:40 AM		1692.000	0.247
23.667		4.249	
8/14/2009 10:39:16 AM		1788.000	0.240
23.667		4.252	
8/14/2009 10:41:04 AM		1896.000	0.230
23.664		4.257	
8/14/2009 10:42:58 AM		2010.000	0.218
23.665		4.262	
8/14/2009 10:44:58 AM		2130.000	0.204
23.666		4.268	
8/14/2009 10:47:04 AM		2256.000	0.200
23.665		4.269	
8/14/2009 10:49:16 AM		2388.000	0.186
23.664		4.276	
8/14/2009 10:51:40 AM		2532.000	0.176
23.663		4.280	
8/14/2009 10:54:10 AM		2682.000	0.170
23.666		4.283	
8/14/2009 10:56:46 AM		2838.000	0.158
23.666		4.288	
8/14/2009 10:59:34 AM		3006.000	0.149
23.665		4.292	
8/14/2009 11:02:34 AM		3186.000	0.140
23.663		4.296	
8/14/2009 11:05:40 AM		3372.000	0.127
23.667		4.301	
8/14/2009 11:09:04 AM		3576.000	0.121
23.664		4.304	
8/14/2009 11:12:34 AM		3786.000	0.114
23.664		4.307	
8/14/2009 11:16:16 AM		4008.000	0.105
23.665		4.311	
8/14/2009 11:20:16 AM		4248.000	0.093
23.667		4.316	
8/14/2009 11:24:28 AM		4500.000	0.090
23.663		4.317	
8/14/2009 11:28:52 AM		4764.000	0.085
23.663		4.319	
8/14/2009 11:33:34 AM		5046.000	0.072
23.664		4.325	
8/14/2009 11:38:34 AM		5346.000	0.065
23.665		4.328	
8/14/2009 11:43:52 AM		5664.000	0.060
23.665		4.330	
8/14/2009 11:49:28 AM		6000.000	0.055
23.663		4.333	
8/14/2009 11:55:28 AM		6360.000	0.046
23.664		4.336	
8/14/2009 12:01:28 PM		6720.000	0.042
23.667		4.338	
8/14/2009 12:08:28 PM		7140.000	0.035
23.665		4.341	
8/14/2009 12:15:28 PM		7560.000	0.028
23.665		4.344	
8/14/2009 12:22:28 PM		7980.000	0.026
23.667		4.345	
8/14/2009 12:30:28 PM		8460.000	0.018

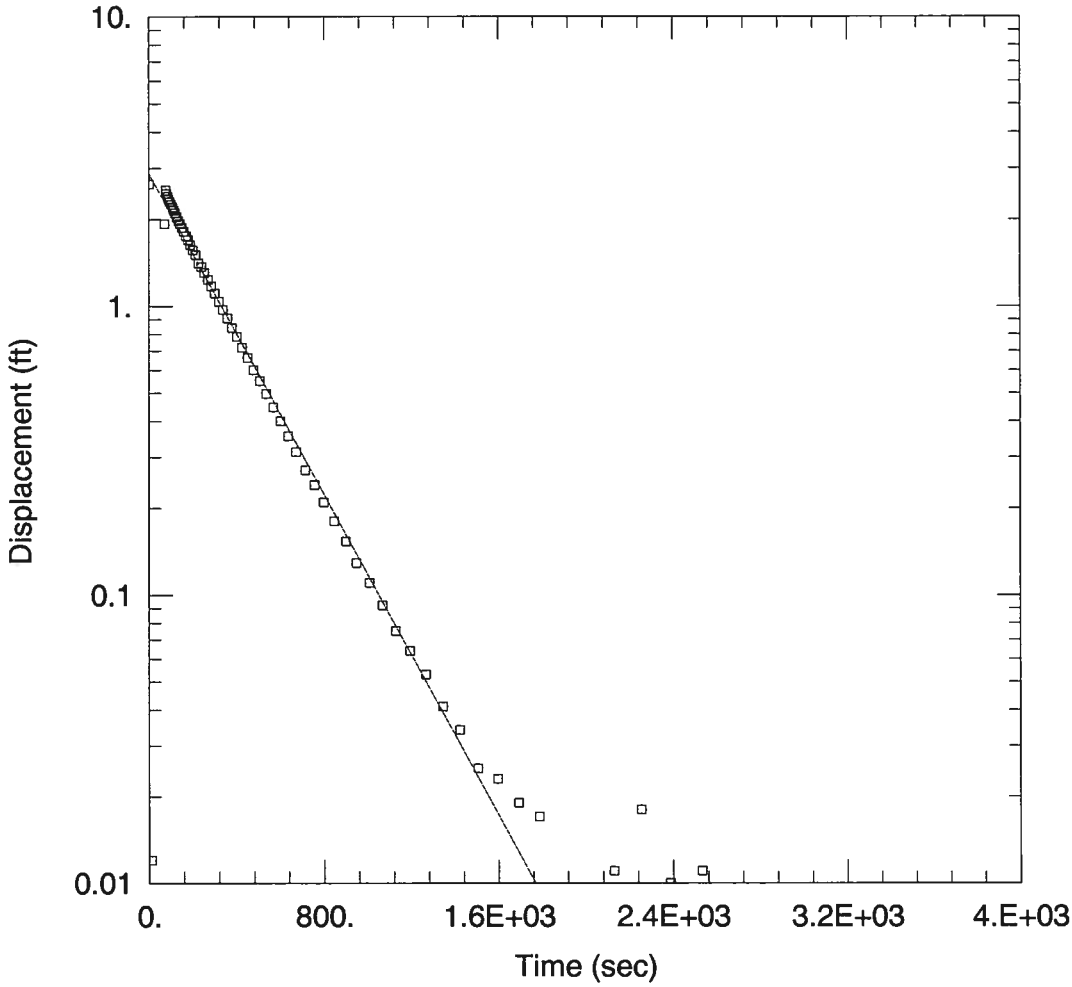
23.669 4.348


as4147
Level-DTW (ft)
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
-0.100
8/14/2009 9:15:00 AM
8/14/2009 9:30:00 AM
8/14/2009 9:45:00 AM
8/14/2009 10:00:00 AM
8/14/2009 10:15:00 AM
8/14/2009 10:30:00 AM
8/14/2009 10:45:00 AM
8/14/2009 11:00:00 AM
8/14/2009 11:15:00 AM
8/14/2009 11:30:00 AM

linear


as4147
Level-DTW (ft)
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
-0.100
1.00
10.0
100
1000

log



BUILDING AS-4147

Data Set: S:\WPMKTG\PROJECT\2009\209-03~4\SLUGTE~1\MW04.AQT
Date: 09/11/09 Time: 16:03:33

PROJECT INFORMATION

Company: CATLIN Eng. and Scientists
Client: LANTDIV
Project: 209-033
Test Location: Camp Lejeune, NC
Test Well: MW-04
Test Date: 8/13/2009

AQUIFER DATA

Saturated Thickness: 25. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.64 ft
Casing Radius: 0.0833 ft
Screen Length: 5. ft
Water Column Height: 35.09 ft
Wellbore Radius: 0.3333 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 3.139E-05 ft/sec
y0 = 2.875 ft

Report Date: 9/11/2009 11:41:12 AM
Report User Name: scan
Report Computer Name: SCANPC

Log File Properties:

File Name:	mw04 2009-08-13 11.43.08.wsl
Create Date:	8/13/2009 11:42:59 AM

Device Properties:

Device:	Level TROLL® 700
Site:	as4147
Device Name:	
Serial Number:	125515
Firmware Version:	2.07

Log Configuration

Log Name:	mw04
Created By:	Unknown
Computer Name:	Field PC
Application:	WinSituMobile.exe
Application Version:	5.4.2.0
Create Date:	8/13/2009 10:07:41 AM
Notes Size(bytes):	4096
Type:	True Logarithmic
Overwrite when full:	Disabled
Scheduled Start:	Manual Start
Scheduled Stop:	No Stop Time
Max Interval:	Days: 0 Hours: 00 Mins: 20 Secs: 00

Level Reference Settings At Log Creation

Level Measurement Mode:	Level-DTW
Specific Gravity:	0.999
Level Reference Mode:	Set first logged value to offset
Level Reference Offset:	0 (ft)

Log Notes:

Date and Time	Note
8/13/2009 9:51:21 AM	User Note: "Level reference initialized to zero at start of log."
8/13/2009 10:26:14 AM	Manual Start Command
8/13/2009 10:26:47 AM	User Note: "Downloading log - Used Batt: 8% Memory: 31% User: Unknown"
8/13/2009 10:28:27 AM	User Note: "Downloading log - Used Batt: 8% Memory: 31% User: Unknown"
8/13/2009 10:29:55 AM	User Note: "Downloading log - Used Batt: 8% Memory: 31% User: Unknown"
8/13/2009 10:51:23 AM	User Note: "Downloading log - Used Batt: 8% Memory: 31% User: Unknown"
8/13/2009 11:26:17 AM	Manual Stop Command

Log Data:
Record Count: 136

Sensor: Pres 30G Sensor:

Pres 30G Sensor: Pres 30G

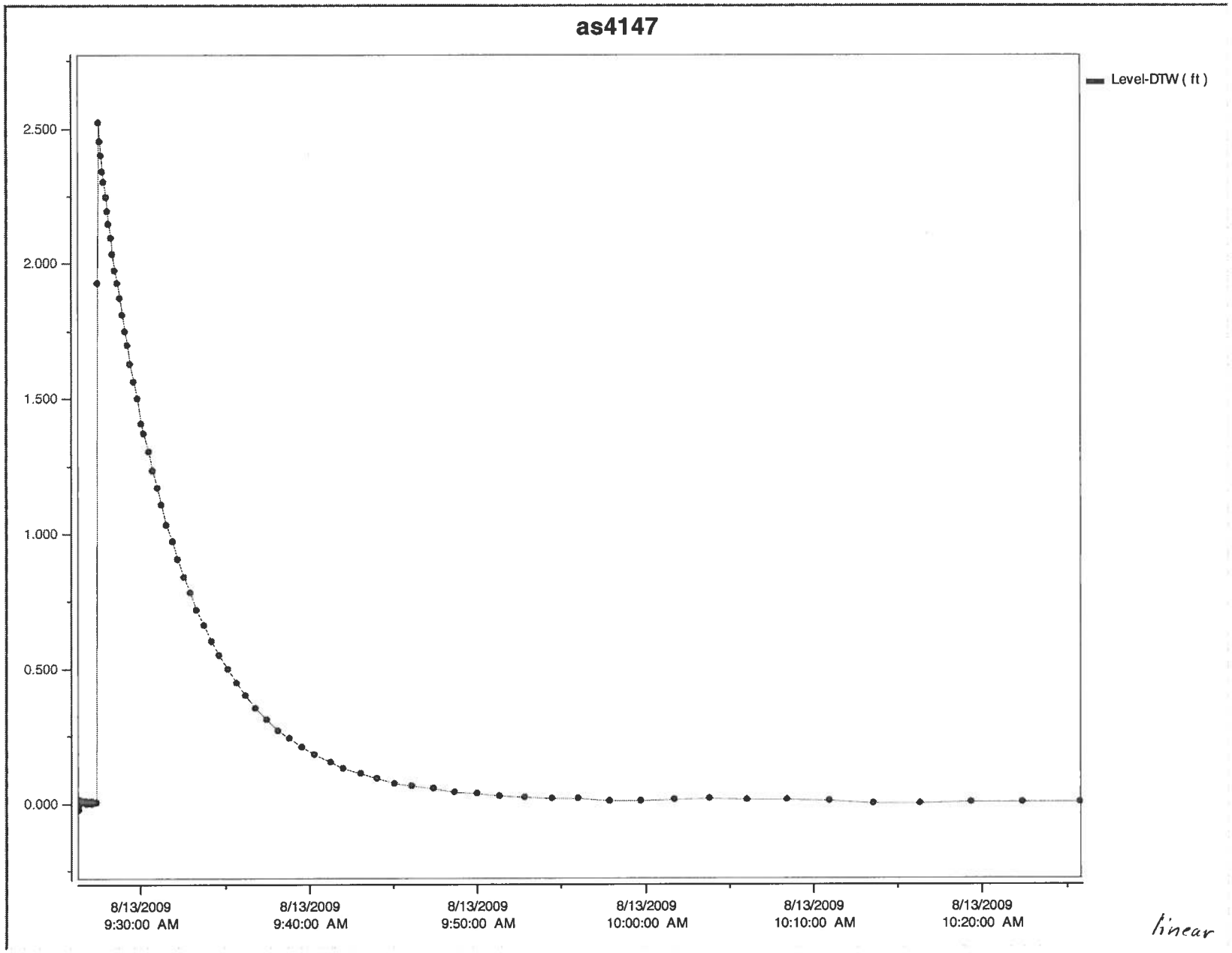
Date and Time	Elapsed Time Seconds	SN#: 125515 Level-DTW (ft)	SN#: 125515 Temperature (C)	Pressure (PSI)	SN#: 125515
8/13/2009 10:26:14 AM	0.000	0.000	24.102	7.627	
8/13/2009 10:26:14 AM	0.280	0.003	24.123	7.626	
8/13/2009 10:26:15 AM	0.502	0.004	24.138	7.626	
8/13/2009 10:26:15 AM	0.750	0.004	24.146	7.625	
8/13/2009 10:26:15 AM	1.000	0.006	24.155	7.624	
8/13/2009 10:26:15 AM	1.250	0.001	24.160	7.627	
8/13/2009 10:26:16 AM	1.500	0.002	24.164	7.626	
8/13/2009 10:26:16 AM	1.750	0.004	24.170	7.625	
8/13/2009 10:26:16 AM	2.000	0.009	24.175	7.623	
8/13/2009 10:26:16 AM	2.250	0.006	24.178	7.625	
8/13/2009 10:26:17 AM	2.500	0.004	24.180	7.625	
8/13/2009 10:26:17 AM	2.750	0.000	24.182	7.627	
8/13/2009 10:26:17 AM	3.230	0.001	24.167	7.627	
8/13/2009 10:26:18 AM	3.451	0.000	24.177	7.627	
8/13/2009 10:26:18 AM	3.672	0.005	24.183	7.625	
8/13/2009 10:26:18 AM	3.892	0.001	24.187	7.627	
8/13/2009 10:26:18 AM	4.357	0.002	24.173	7.626	
8/13/2009 10:26:19 AM	4.578	0.002	24.185	7.626	
8/13/2009 10:26:19 AM	4.800	0.007	24.191	7.624	
8/13/2009 10:26:19 AM	5.021	-0.024	24.191	7.637	
8/13/2009 10:26:20 AM	5.497	-0.002	24.229	7.628	
8/13/2009 10:26:20 AM	5.718	0.006	24.223	7.625	
8/13/2009 10:26:20 AM	5.941	0.005	24.219	7.625	
8/13/2009 10:26:20 AM	6.161	-0.005	24.272	7.629	
8/13/2009 10:26:21 AM	6.646	-0.002	24.247	7.628	
8/13/2009 10:26:21 AM	6.870	0.002	24.240	7.626	
8/13/2009 10:26:21 AM	7.095	0.003	24.235	7.626	
8/13/2009 10:26:21 AM	7.319	0.009	24.230	7.623	
8/13/2009 10:26:22 AM	7.560	0.001			

24.226		7.627	
8/13/2009 10:26:22 AM		7.982	0.008
24.206		7.624	
8/13/2009 10:26:23 AM		8.460	0.009
24.197		7.623	
8/13/2009 10:26:23 AM		9.000	0.005
24.186		7.625	
8/13/2009 10:26:24 AM		9.480	0.004
24.180		7.626	
8/13/2009 10:26:24 AM		10.080	0.004
24.171		7.625	
8/13/2009 10:26:25 AM		10.680	0.012
24.168		7.622	
8/13/2009 10:26:25 AM		11.280	0.004
24.164		7.626	
8/13/2009 10:26:26 AM		11.940	0.007
24.163		7.624	
8/13/2009 10:26:27 AM		12.660	0.002
24.159		7.626	
8/13/2009 10:26:28 AM		13.440	0.006
24.155		7.625	
8/13/2009 10:26:28 AM		14.220	0.007
24.154		7.624	
8/13/2009 10:26:29 AM		15.061	0.003
24.150		7.626	
8/13/2009 10:26:30 AM		15.960	0.003
24.150		7.626	
8/13/2009 10:26:31 AM		16.920	0.005
24.148		7.625	
8/13/2009 10:26:32 AM		17.880	0.004
24.145		7.625	
8/13/2009 10:26:33 AM		18.960	0.002
24.144		7.626	
8/13/2009 10:26:34 AM		20.100	0.002
24.143		7.626	
8/13/2009 10:26:35 AM		21.300	0.000
24.144		7.627	
8/13/2009 10:26:37 AM		22.560	0.005
24.139		7.625	
8/13/2009 10:26:38 AM		23.880	0.005
24.138		7.625	
8/13/2009 10:26:39 AM		25.321	0.003
24.137		7.626	
8/13/2009 10:26:41 AM		26.821	0.005
24.140		7.625	
8/13/2009 10:26:42 AM		28.380	0.003
24.137		7.626	
8/13/2009 10:26:44 AM		30.061	0.008
24.134		7.624	
8/13/2009 10:26:46 AM		31.862	0.000
24.134		7.627	
8/13/2009 10:26:48 AM		33.720	0.003
24.133		7.626	
8/13/2009 10:26:50 AM		35.760	-0.000
24.131		7.627	
8/13/2009 10:26:52 AM		37.860	-0.003
24.130		7.629	
8/13/2009 10:26:54 AM		40.080	0.003
24.128		7.626	
8/13/2009 10:26:57 AM		42.480	0.000
24.128		7.627	
8/13/2009 10:26:59 AM		45.000	0.001
24.128		7.627	
8/13/2009 10:27:02 AM		47.640	0.002

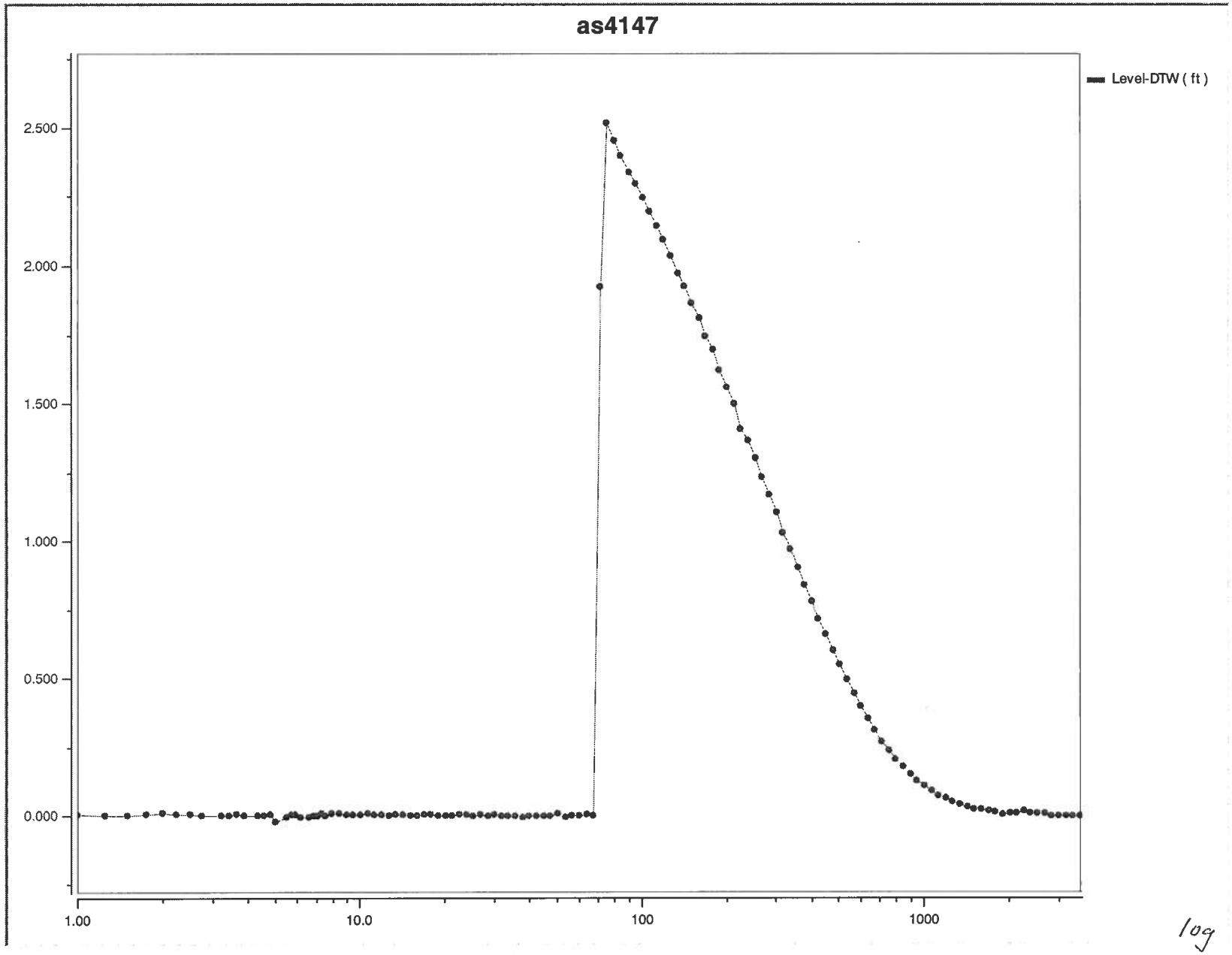
24.127		7.626	
8/13/2009 10:27:05 AM		50.460	0.008
24.125		7.624	
8/13/2009 10:27:08 AM		53.460	-0.001
24.123		7.628	
8/13/2009 10:27:11 AM		56.640	0.001
24.118		7.627	
8/13/2009 10:27:14 AM		60.000	0.002
24.119		7.626	
8/13/2009 10:27:18 AM		63.600	0.005
24.118		7.625	
8/13/2009 10:27:21 AM		67.200	0.001
24.116		7.627	
8/13/2009 10:27:25 AM		71.400	1.926
24.115		6.793	
8/13/2009 10:27:30 AM		75.600	2.520
24.112		6.536	
8/13/2009 10:27:34 AM		79.800	2.452
24.110		6.565	
8/13/2009 10:27:39 AM		84.600	2.398
24.109		6.588	
8/13/2009 10:27:44 AM		90.000	2.339
24.105		6.614	
8/13/2009 10:27:49 AM		94.800	2.300
24.103		6.631	
8/13/2009 10:27:55 AM		100.800	2.246
24.099		6.654	
8/13/2009 10:28:01 AM		106.800	2.196
24.096		6.676	
8/13/2009 10:28:07 AM		112.800	2.146
24.092		6.698	
8/13/2009 10:28:13 AM		119.400	2.095
24.084		6.720	
8/13/2009 10:28:21 AM		126.600	2.036
24.077		6.745	
8/13/2009 10:28:28 AM		134.400	1.974
24.068		6.772	
8/13/2009 10:28:36 AM		142.200	1.928
24.061		6.792	
8/13/2009 10:28:45 AM		150.600	1.869
24.048		6.818	
8/13/2009 10:28:54 AM		159.600	1.812
24.040		6.842	
8/13/2009 10:29:03 AM		169.200	1.750
24.030		6.869	
8/13/2009 10:29:13 AM		178.800	1.697
24.013		6.892	
8/13/2009 10:29:24 AM		189.600	1.626
23.994		6.923	
8/13/2009 10:29:35 AM		201.000	1.561
23.985		6.951	
8/13/2009 10:29:47 AM		213.000	1.502
23.961		6.976	
8/13/2009 10:30:00 AM		225.600	1.407
23.943		7.018	
8/13/2009 10:30:13 AM		238.800	1.369
23.927		7.034	
8/13/2009 10:30:27 AM		253.200	1.304
23.901		7.062	
8/13/2009 10:30:42 AM		268.200	1.236
23.879		7.092	
8/13/2009 10:30:58 AM		283.800	1.169
23.858		7.121	
8/13/2009 10:31:15 AM		300.600	1.106

23.831		7.148	
8/13/2009	10:31:33 AM	318.600	1.034
23.808		7.179	
8/13/2009	10:31:51 AM	337.200	0.971
23.780		7.206	
8/13/2009	10:32:12 AM	357.600	0.906
23.751		7.235	
8/13/2009	10:32:33 AM	378.600	0.840
23.726		7.263	
8/13/2009	10:32:55 AM	400.800	0.783
23.699		7.288	
8/13/2009	10:33:19 AM	424.800	0.718
23.671		7.316	
8/13/2009	10:33:44 AM	450.000	0.662
23.644		7.340	
8/13/2009	10:34:10 AM	476.400	0.601
23.618		7.367	
8/13/2009	10:34:39 AM	504.600	0.550
23.595		7.389	
8/13/2009	10:35:09 AM	534.600	0.497
23.567		7.412	
8/13/2009	10:35:40 AM	566.400	0.446
23.543		7.434	
8/13/2009	10:36:14 AM	600.000	0.400
23.518		7.454	
8/13/2009	10:36:50 AM	636.000	0.354
23.498		7.474	
8/13/2009	10:37:26 AM	672.000	0.313
23.479		7.492	
8/13/2009	10:38:08 AM	714.000	0.270
23.460		7.510	
8/13/2009	10:38:50 AM	756.000	0.240
23.447		7.523	
8/13/2009	10:39:32 AM	798.000	0.209
23.434		7.537	
8/13/2009	10:40:20 AM	846.000	0.180
23.423		7.549	
8/13/2009	10:41:14 AM	900.000	0.153
23.412		7.561	
8/13/2009	10:42:02 AM	948.000	0.129
23.403		7.571	
8/13/2009	10:43:02 AM	1008.000	0.110
23.399		7.580	
8/13/2009	10:44:02 AM	1068.000	0.092
23.392		7.587	
8/13/2009	10:45:02 AM	1128.000	0.075
23.392		7.595	
8/13/2009	10:46:08 AM	1194.000	0.064
23.392		7.599	
8/13/2009	10:47:20 AM	1266.000	0.053
23.393		7.604	
8/13/2009	10:48:38 AM	1344.000	0.041
23.400		7.609	
8/13/2009	10:49:56 AM	1422.000	0.034
23.403		7.613	
8/13/2009	10:51:20 AM	1506.000	0.025
23.423		7.616	
8/13/2009	10:52:50 AM	1596.000	0.023
23.414		7.617	
8/13/2009	10:54:26 AM	1692.000	0.019
23.425		7.619	
8/13/2009	10:56:02 AM	1788.000	0.017
23.430		7.620	
8/13/2009	10:57:50 AM	1896.000	0.007

23.435	7.624	
8/13/2009 10:59:44 AM	2010.000	0.008
23.442	7.623	
8/13/2009 11:01:44 AM	2130.000	0.011
23.449	7.622	
8/13/2009 11:03:50 AM	2256.000	0.018
23.459	7.619	
8/13/2009 11:06:02 AM	2388.000	0.010
23.463	7.623	
8/13/2009 11:08:26 AM	2532.000	0.011
23.476	7.622	
8/13/2009 11:10:56 AM	2682.000	0.008
23.479	7.624	
8/13/2009 11:13:32 AM	2838.000	-0.001
23.486	7.627	
8/13/2009 11:16:20 AM	3006.000	-0.001
23.493	7.627	
8/13/2009 11:19:20 AM	3186.000	0.001
23.497	7.627	
8/13/2009 11:22:26 AM	3372.000	0.003
23.504	7.626	
8/13/2009 11:25:50 AM	3576.000	0.001
23.506	7.627	


as4147
Level-DTW (ft)
2.500
2.000
1.500
1.000
0.500
0.000
8/13/2009 9:30:00 AM
8/13/2009 9:40:00 AM
8/13/2009 9:50:00 AM
8/13/2009 10:00:00 AM
8/13/2009 10:10:00 AM
8/13/2009 10:20:00 AM

linear


as4147
Level-DTW (ft)
2.500
2.000
1.500
1.000
0.500
0.000
1.00
10.0
100
1000

109

APPENDIX I

AVERAGE GROUNDWATER LINEAR FLOW VELOCITY AS OF SEPTEMBER 9, 2009

AVERAGE GROUNDWATER LINEAR FLOW VELOCITY CALCULATIONS

Comprehensive Site Assessment
AS-4147 (JP-5 2009 Pipeline Release)

Marine Corps Air Station
New River, NC

$$V_{AVG} = (K/Ne_{AVG})\ (dh/dl)$$

Where:

V_{AVG} = Average Groundwater Linear Flow Velocity (ft/day)

K = Hydraulic Conductivity in ft/day from slug test performed on USTAS4147-MW02. (Calculations Attached in Appendix H) = **0.172** ft/day

dh = Change in Hydraulic Head (ft) between wells
USTAS4147-MW02 and USTAS4147-MW05 = 15.93 - 15.01
= **0.92** ft.

dl = Horizontal Distance (ft) between wells
USTAS4147-MW02 and USTAS4147-MW05 = **68** ft.

Ne_{AVG} = Effective Porosity = Average of **0.437** from Table 2.1 in Todd (1980) for fine-grained sand, silt, and clay.

Using:

K = 0.172 ft/day

dh/dl = 0.013529 ft/ft

Ne_{AVG} = 0.437 unitless

$$V_{AVG} = \frac{0.17}{0.437} \times 0.013529$$

V_{AVG} = 0.005 ft/day TO THE North Northwest

COMPUTED BY: Steve Tyler
DATE: 9/14/2009

CHECKED BY: MDM
DATE: 9/16/09

APPENDIX J

CONTAMINANT VELOCITY CALCULATIONS

CONTAMINANT VELOCITY CALCULATIONS
for
NAPHTHALENE

Comprehensive Site Assessment
AS-4147 (JP-5 2009 Pipeline Release)

Marine Corps Air Stattion
New River, NC

K_{ow} = 2300 for NAPHTHALENE (p. 23, Table II-9, EPA, WQA Part I)

DETERMINE CONTAMINANT VELOCITY

$V_c = V_{AVG}/R_d$

WHERE:

V_c = Contaminant Velocity (ft/day)
V_{AVG} = Average Groundwater Linear Flow Velocity (ft/day)
R_d = Retardation Factor

CALCULATE RETARDATION FACTOR

$R_d = 1 + [K_d (r_b /P)]$

WHERE:

K_d = Distribution Coefficient (ml/g)
r_b = Bulk Density (ml/g)
P = Porosity (decimal)

DISTRIBUTION COEFFICIENT

$K_d = K_{oc} [0.2 (1-F) x^s_{oc} + F (x^f_{oc})]$

WHERE:

F = Mass of Silt and Clay/Mass of Sand, Silt, and Clay
x^s_{oc} = Organic Fraction of Sand [0 £ x^s_{oc} £ 0.1]
x^f_{oc} = Organic Fraction of Silt and Clay [0 £ x^f_{oc} £ 0.1]
K_{oc} = 0.63 (K_{ow})
K_{ow} = Octanol Water Partition Coefficient
F = 0.032 Estimated from grain size analyisis on samples with similar lithology.

FROM:

K_{ow} = 2300

K_{oc} = 0.63 (2300)

K_{oc} = 1449

r_b = 1.47 g/cm^3 for AVERAGE* (p. 314, Table VII-2, EPA, WQA Part II)

R = 0.44 for AVERAGE* (p. 318, Table VII-4, EPA, WQA Part II)

x^s_{oc} = 0.025 (Mean Value) * = Average for f. sand, silt, and clay.

x^f_{oc} = 0.065 (Mean Value)

THEREFORE:

$K_d = K_{oc}\,[0.2(1-F)\,x^s_{oc} + F\,(x^f_{oc})]$

K_d = 1449 [0.2(1- 0.032) 0.025 + 0.032 (0.065)]

K_d = 10.03

$R_d = 1 + K_d\,[(r_b/R)]$

R_d = 1+[10.03 (1.47 / 0.44)]

R_d = 34.50

CALCULATE CONTAMINANT VELOCITY

$V_c = V_{AVG}/R_d$

V_c = 0.005 (ft/day) / 34.50

V_c = 0.000145 (ft/day) for NAPHTHALENE

COMPUTED BY: Steve Tyler CHECKED BY: MBM

DATE: 9/14/2009 DATE: 9/16/09

* Contaminant velocity equations and reference data are from:

U.S. Environmental Protection Agency, September 1985, *Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water*, PB865-122496, Parts 1, 2, and 3, EPA #s 600685002 a,b, and c.

U.S. Environmental Protection Agency, Environmental Research Laboratory, Office of Research and Development, Revised 1985, *Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants*, Part II, 444 pp.