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BASELINE SAMPLING AND ASSESSMENT REPORT FOR DEPOT GAS STATION BUILDING 170 DRAFT ACTING AS FINAL MCRD PARRIS ISLAND SC

12/1/2009

TETRA TECH NUS

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-04-D-0055

Rev. 1
12/09

Baseline Sampling and Assessment Report
for
Depot Gas Station (Building 170)

South Carolina Department of Health and Environmental Control
Site ID #01386

Marine Corps Recruit Depot
Parris Island, South Carolina

Contract Task Order 0136

December 2009

NAVFAC
Naval Facilities Engineering Command
NAVFAC SOUTHEAST

NAS Jacksonville
Jacksonville, Florida 32212-0030

TETRA TECH NUS, Inc.

REVISION 1
DECEMBER 2009

BASELINE SAMPLING AND ASSESSMENT REPORT

FOR

DEPOT GAS STATION (BUILDING 170)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL SITE ID #01386

MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
AST	aboveground storage tank
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAP	Corrective Action Plan
CLEAN	Comprehensive Long-Term Environmental Action Navy
CTO	Contract Task Order
DO	dissolved oxygen
IDW	investigation derived waste
MCRD	Marine Corps Recruit Depot
mg/L	milligrams per liter
MTBE	methyl tert butyl ether
NAVFAC SE	Naval Facilities Engineering Command Southeast
NTU	nephelometric turbidity unit
PAH	Polynuclear aromatic hydrocarbon
RBSL	Risk-Based Screening Level
SAP	Sampling and Analysis Plan
SSTL	Site-Specific Target Level
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
UST	underground storage tank

1.0 INTRODUCTION

This Baseline Sampling and Assessment Report was prepared by Tetra Tech NUS, Inc. (TtNUS) for Naval Facilities Engineering Command Southeast (NAVFAC SE), under Contract Task Order (CTO) 0136 for the Comprehensive Long-Term Environmental Action Navy (CLEAN) IV Contract Number N62467-04-D-0055.

TtNUS performed an investigation of groundwater at the Depot Gas Station (Building 170) at Marine Corps Recruit Depot (MCRD) Parris Island in Parris Island, South Carolina. The investigation at the Depot Gas Station included groundwater sampling and analysis from all existing monitoring wells. This document includes results of field activities described in the Sampling and Analysis Plan (SAP) (TtNUS, 2009) for this site.

Section 1.0 of this report provides a brief introduction to the project, and Section 2.0 presents a brief description of the site location, description, history, and sampling analysis plan implementation. Section 3.0 provides a summary of field sampling event performed in July 2009. Section 4.0 presents analytical results, and Section 5.0 discusses conclusions and recommendations. References are provided in Section 6.0. This report also includes four appendices.

2.0 SITE DESCRIPTION AND HISTORY

2.1 SITE LOCATION AND DESCRIPTION

MCRD Parris Island is located approximately 5 miles south of Beaufort in Beaufort County, South Carolina, between the Broad River and the Beaufort River (Figure 2-1). MCRD Parris Island is an active facility providing for the reception and recruit training of enlisted male personnel east of the Mississippi River and all female personnel nationwide upon their entry into the Marine Corps. MCRD Parris Island also provides field and combat skills training for recruits, schools to train enlisted Marines as Drill Instructors and Field Staff, rifle marksmanship training for Marine officers and enlisted personnel in the southeastern United States, and training for Marine reserves.

The Depot Gas Station was located at the northeastern end of the island at former Building 170, near former Building 139, and Building 155 at the northeastern part of MCRD Parris Island (Figure 2-2). The site is relatively flat and consists of both grassy and paved areas.

2.2 SITE HISTORY

The Depot Gas Station formerly provided both gasoline and diesel fuel to facility vehicles through two gasoline dispensers located at Building 170 and one diesel dispenser at the aboveground storage tanks (ASTs). The dispensers, tanks, and Building 170 were removed in March 2000. In December 1983, approximately 97 gallons of gasoline spilled in the vicinity of Building 170 when a tank overflowed during filling operations. Contaminated soil was removed, but exact details of the removal activities are not available. There also may have been other past spills during offloading of fuels at the storage tanks.

The Depot Gas Station had been in service since the 1940s. During past operations a 2-inch-diameter dispenser line from the ASTs to dispensers at Building 157 also supplied fuel for facility vehicles. The fuel line reportedly had not been used for some time and the dispensers at Building 157 were later supplied by underground storage tanks (USTs). The dispensers and USTs at Building 157 have been removed and the fuel line was capped in late 1997. The dispenser line passed by the southern part of Buildings 139 and 155 (Figure 2-2) and may have contributed to the impacted soil and groundwater at Buildings 139 and 155. Building 139 was used as a warehouse before it was torn down at the end of 1997. Past activities at Building 139 may have included vehicle maintenance. Building 155 is the Depot vehicle maintenance facility.

A Tier II Assessment was performed at the site in 2003. During the assessment, sixteen subsurface soil samples were collected and analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene,

polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), and inorganics. Benzene was detected in six of the soil samples above the Risk-Based Screening Level (RBSL) protective of leaching to groundwater (7 µg/kg for sandy soil). Naphthalene was detected in eight samples at concentrations in excess of the RBSL (36 µg/kg). Ethylbenzene and xylenes were detected in two samples above RBSLs (1,150 µg/kg and 93,000 µg/kg, respectively). Toluene was detected in one sample above the RBSL (1,450 µg/kg).

Thirty-six groundwater samples were collected during the 2003 Tier II Assessment for analysis of BTEX, methyl tert butyl ether (MTBE), naphthalene, TPH, PAHs, and inorganics. Benzene exceeded the RBSL (5 µg/L) in 12 samples. Thirteen samples detected naphthalene and six 2-methyl naphthalene in groundwater above the RBSL (25 µg/L). Ethylbenzene exceeded the RBSL (700 µg/L) in four groundwater samples. Toluene exceeded the RBSL in three samples. Inorganics including arsenic, chromium, iron, and lead were also detected above respective RBSLs.

A Corrective Action Plan (CAP), subsequently submitted to SCDHEC in July 2005 (TtNUS, 2005), recommended corrective action alternatives to address impacted soil and groundwater with contaminant concentrations exceeding site-specific target levels (SSTLs). SSTLs were derived utilizing the Domenico Fate and Transport Model as specified in SCDHEC guidance (SCDHEC, 2001). The CAP recommended soil remediation via excavation and off-site disposal, and groundwater remediation via enhanced bioremediation using oxygen addition (TtNUS, 2005). A soil excavation of 540 tons was completed on March 15, 2005 and the excavation was backfilled with clean fill.

This Baseline Sampling and Assessment Report was prepared to describe the sampling and analysis event which occurred at the site in July 2009. This event included the installation of new monitoring wells and groundwater sampling from new and existing wells. Sampling and analysis was designed to evaluate if new baseline site conditions exist following the 2005 soil excavation, and whether the bioremediation recommended in the 2005 CAP is still appropriate.

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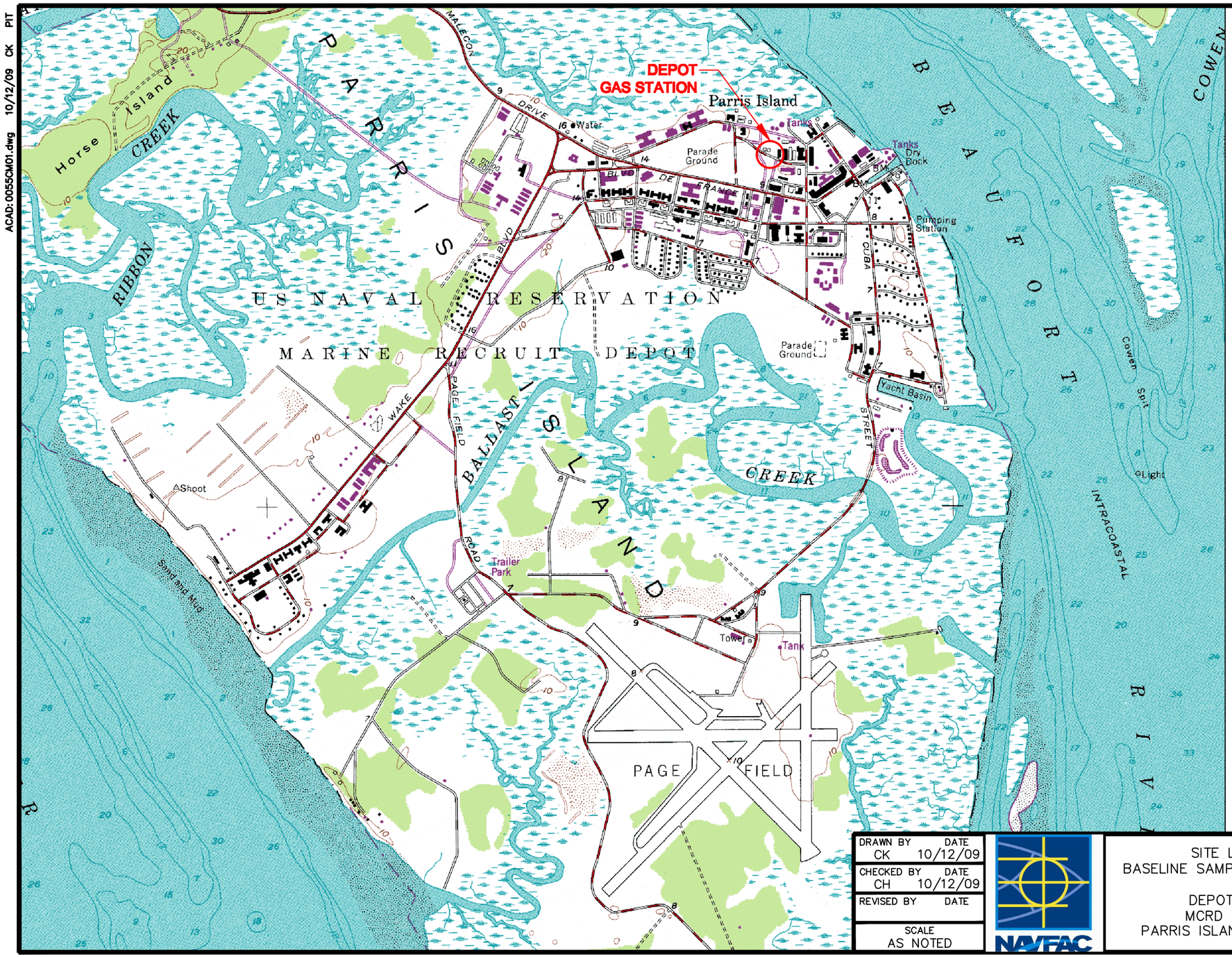

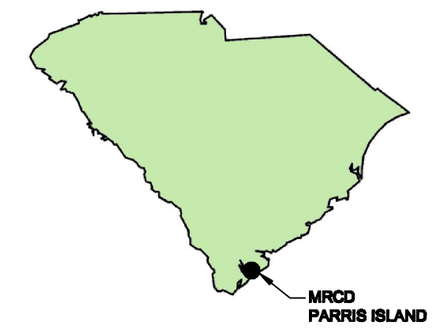

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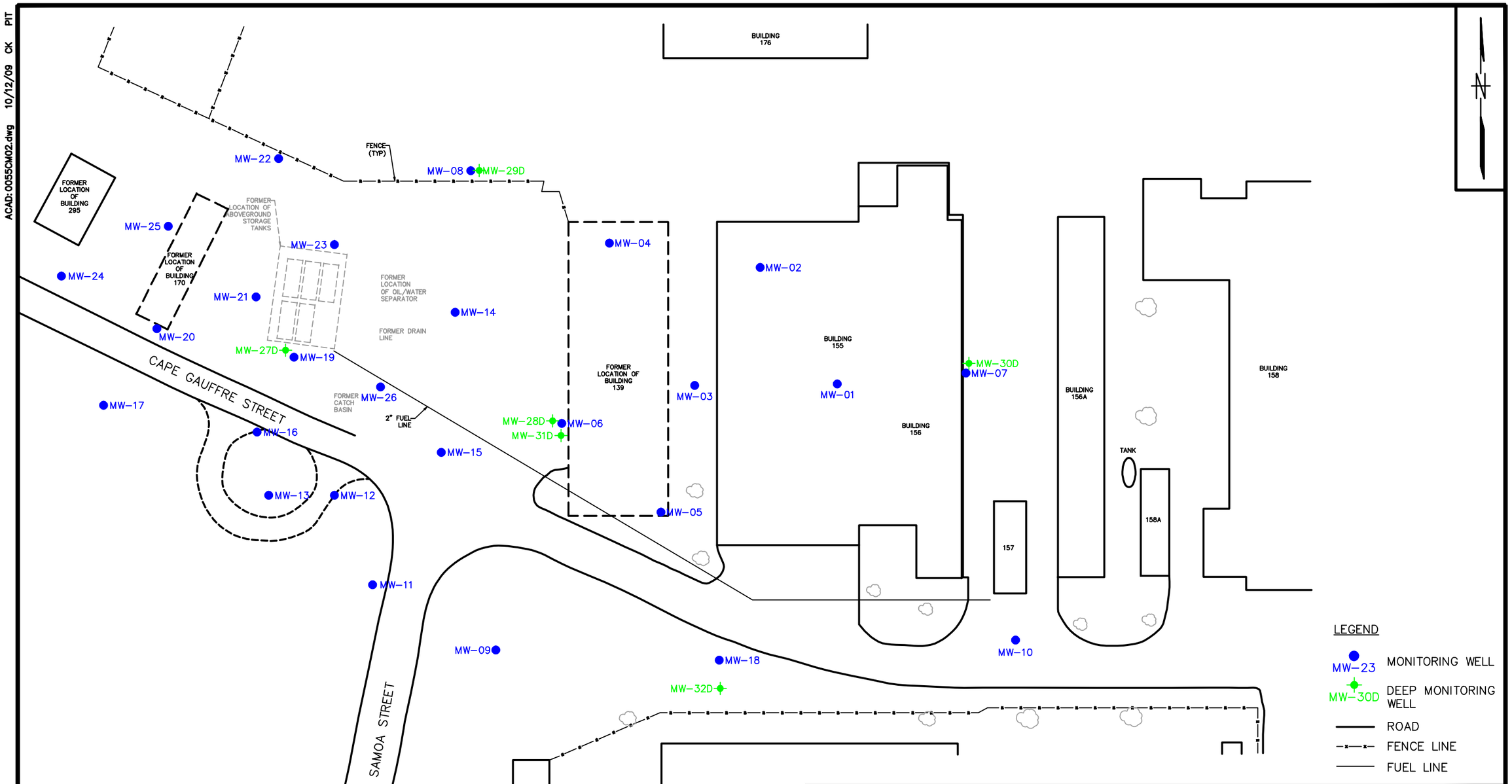

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SITE MAP
BASELINE SAMPLING AND ASSESSMENT REPORT
DEPOT GAS STATION
MCRD PARRIS ISLAND
PARRIS ISLAND, SOUTH CAROLINA

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3.0 FIELD ACTIVITIES

This section describes the TtNUS field effort to collect groundwater samples at the sampling event that took place in July 2009 at the Depot Gas Station at MCRD Parris Island. The field activities were performed in accordance with the SAP (TtNUS, 2009).

3.1 OBJECTIVES

The objective of this field activity was to obtain groundwater samples from the Depot Gas Station area in order to determine whether new baseline site conditions exist. The results of this investigation will be used to provide a basis for final remedial technology selection and appropriate treatability testing.

3.2 FIELD ACTIVITIES

The following field activities were performed from July 6-14, 2009:

- Mobilization
- Well location and development
- Groundwater sampling
- Demobilization

3.2.1 Mobilization

Mobilization of TtNUS personnel occurred on July 6, 2009. Upon arrival at MCRD Parris Island, TtNUS personnel met with the Investigation Derived Waste (IDW) subcontractor. Drums for IDW disposal were delivered to the site at this time as well.

3.2.2 Well Location and Development

Location of existing wells commenced on the first day of the event. Nine monitoring wells were not able to be located:

- MW-06
- MW-10
- MW-13
- MW-15
- MW-18
- MW-26

- MW-18D
- MW-31D
- MW-32D

It is assumed that the missing monitoring wells were abandoned during the previous remedial actions.

Monitoring wells were developed to remove fine material from the annular space around the sand pack and the screened interval of the well. Wells were developed by pumping and surging. Measurements of pH, temperature, turbidity, and specific conductance were collected during development.

A minimum of three times the standing water volume in the well casing plus three times the water volume in the saturated sand pack was removed. The wells were developed until the discharge water was visibly clear, and the temperature, pH, and specific conductivity stabilized to within 10 percent variance for three consecutive measurements or determined by TtNUS field personnel. All water quality measurements and volumes removed were recorded for each well on a well development form. Well development forms are contained in Appendix A.

3.2.3 Groundwater Sampling

3.2.3.1 Water-Level Measurements

Water-level measurements were collected from the monitoring wells using an electronic water-level indicator using the notch at the top of the well casing as the reference point for determining depths to water. Water-level measurements were recorded to the nearest 0.01 foot in the appropriate well development form. Water level measurements are provided in Appendix A.

3.2.3.2 Groundwater Purging

All monitoring wells were purged before sampling using a low-flow peristaltic pump and polyethylene tubing. Well purging was performed immediately before each well was sampled. The water level and total depth of the monitoring well was measured before the start of purging.

Temperature, pH, turbidity, specific conductance, dissolved oxygen (DO), and salinity were measured during purging. These measurements were taken at the start of purging and every 5 to 10 minutes thereafter until the temperature, specific conductance, and salinity stabilized to within 10 percent over a minimum of three readings, pH stabilized to within $\pm$ 0.2 pH units over a minimum of three readings, and turbidity is less than 10 NTUs. All purge water removed from the wells was containerized and handled/disposed as IDW.

3.2.3.3 Groundwater Sampling

Groundwater samples were collected from 23 monitoring wells using low-flow sampling procedures. All samples were transferred directly from the peristaltic pump tubing to the sample container. Volatile organic samples were collected first, directly from the discharge side of the tubing after reducing the pump's flow rate to minimize turbulence and making sure that zero headspace is present in the filled sample container. Natural attenuation samples were collected next. Quality control samples were collected during the sampling event and included field blanks and trip blanks.

Groundwater Sample Log Sheets are contained in Appendix B and Chain of Custody forms are contained in Appendix C.

3.2.4 Demobilization

Demobilization occurred on July 14, 2009. IDW was removed from the site by a licensed waste hauler on September 11, 2009.

4.0 GROUNDWATER ANALYTICAL RESULTS

4.1 OVERVIEW

Groundwater samples were collected and submitted to Gulf Coast Analytical Laboratories for analysis of the following parameters:

- VOCs: BTEX, MTBE, naphthalene, and 1,2-dichloroethane
- 1,2-Dibromoethane
- PAHs
- Oxygenates: Ethyl tert-butyl ether, ethyl tert-butyl alcohol, tertiary-amyl methyl ether, diisopropyl ether, tert-butyl formate, tert-butyl alcohol, tert-amyl alcohol, and ethanol
- Methane
- Ferrous iron
- Lead
- Nitrate and sulfate
- Total organic carbon (TOC)

In addition, 2 wells (MW-05 and MW-14) were sampled for biological parameters, including alkalinity, ammonia nitrogen, hydrocarbon degrading bacteria, and heterotrophic plate count, to support a cursory natural attenuation evaluation.

Copies of laboratory analytical reports for the groundwater samples are provided in Appendix D. Positive hits and exceedances of screening levels are shown in Table 4-1a and Figure 4-1. Duplicate and average results are included in Table 4-1b.

4.2 NATURAL ATTENUATION EVALUATION

Sampling data was reviewed to assess whether natural attenuation processes (i.e. biodegradation) are occurring at the site and are effectively reducing contaminant concentrations in groundwater. BTEX compounds have been found in groundwater and soil at the site, and a soil removal action was undertaken in 2005. The data reviewed includes contaminant concentrations from sampling events in 2000 and 2009, along with geochemical data collected in 2009 and chemical concentration data.

4.2.1 Contaminant Concentration Trends

The focus of the evaluation of contaminant concentration trends over the 2000 to 2009 time frame is on benzene, ethylbenzene, toluene, and MTBE as these are the contaminants currently found at concentrations above target cleanup levels in at least one well. Table 4-2 presents concentration data for wells that were sampled in both 2000 and 2009 and that had at least one exceedance of a target cleanup level for the focus contaminants in either sampling round. The following presents observations on a contaminant-specific basis:

- **Benzene** – Eight wells had a detection of benzene at a concentration above the target cleanup level (5 µg/L). Of the eight, 7 had exceedances in 2000 and 6 had exceedances in 2009. Five of the eight wells had lower concentrations in 2009 versus 2000; the other three had higher concentrations. Including two wells with no detections in either round, the overall average benzene concentration dropped from 884 µg/L to 748 µg/L.

- **Ethylbenzene** – One well had a detection of benzene at a concentration above the target cleanup level (700 µg/L), which was detected in the 2009 round. Of the nine wells with ethylbenzene detections, six wells had lower concentrations in 2009 versus 2000; the other three had higher concentrations. Including one well with no detections in either round, the overall average ethylbenzene concentration dropped from 194 µg/L to 151 µg/L.

- **Toluene** – One well had a detection of toluene at a concentration above the target cleanup level (1,000 µg/L), which was detected in the 2009 round. Of the eight wells with toluene detections, five wells had lower concentrations in 2009 versus 2000; the other three had higher concentrations. Including two wells with no detections in either round, the overall average toluene concentration increased from 642 µg/L to 1,434 µg/L. The increase is driven by the high toluene concentration found in MW-03 (14,250 µg/L) in 2009 – aside from this well, overall toluene concentrations are down from 2000.

- **MTBE** – Four wells had a detection of MTBE at a concentration above the target cleanup level (40 µg/L). Of the four, 3 had exceedances in 2000 and 1 had an exceedance in 2009. Of the 6 wells with one or more MTBE detections above 1 µg/L, five had lower concentrations in 2009 versus 2000; the other had a higher concentration. It should be noted that MW-19 had an MTBE concentration of 152 µg/L in 2000 and no detection in 2009, while adjacent well MW-27 had an MTBE concentration of 1 µg/L in 2000 and 157 µg/L in 2009, suggesting a potential mislabeling of a sample during one of the rounds. Including three wells with no detections in either round, the overall average MTBE concentration dropped from 30 µg/L to 19 µg/L.

Overall, it is apparent that petroleum hydrocarbon concentrations have declined from 2000 to 2009. On a well-by-well basis, it should be noted that concentrations have increased in a few wells located near the 2005 excavation area (most notably ethylbenzene and toluene in MW-03 and benzene in MW-05 and MW-12). The increase in concentration in these wells may be related to the excavation work and associated disturbance of the subsurface. Aside from these, concentration declines are generally evident. For MTBE, concentration declines are evident with the exception of well MW-27, where the MTBE concentration has risen well above the target cleanup level. This isolated exceedance in 2009 (157 µg/L) is in the same area and is of the same magnitude as the highest detection in 2000 (152 µg/L in adjacent well MW-19).

4.2.2 Natural Attenuation Indicator Parameters

Several geochemical indicator parameters (dissolved oxygen, methane, nitrate, sulfate, and total organic carbon) were evaluated to determine whether evidence exists to support the biodegradation of the petroleum hydrocarbon contamination at the site. Table 4-3 presents the 2009 sampling data for these indicator parameters, broken out into two groupings; the background grouping includes the wells where there were no petroleum hydrocarbon detections in 2009 and the impacted wells grouping includes the six wells with one or more petroleum hydrocarbon detections above the target cleanup level in 2009. Geometric mean concentrations were calculated for each parameter for comparison purposes. The following presents observations on a parameter-specific basis:

- **Dissolved Oxygen** – The geometric mean DO concentration is slightly in the aerobic range in the background wells (1.34 mg/L) and slightly anaerobic in the impacted wells (0.98 µg/L). The slight depletion of oxygen in the impacted wells is an indicator that aerobic microbes are more active and are depleting oxygen levels somewhat relative to unimpacted areas, which indicates that biodegradation processes are active.

- **Methane** – The geometric mean methane concentration is elevated in the impacted wells (2,803 µg/L) versus the background wells (22 µg/L). Methane is a metabolic by-product of biological activity, thus the elevated methane level is a clear indication that biodegradation is occurring in the area where groundwater is impacted by petroleum hydrocarbons.

- **Nitrate** – The geometric mean nitrate concentration is slightly lower in the impacted wells (0.003 mg/L) versus the background wells (0.01 mg/L). Nitrate is used by bacteria during the consumption of petroleum hydrocarbons, thus the slightly lower nitrate level in the impacted wells suggests that biodegradation is occurring in the area where groundwater is impacted by petroleum hydrocarbons.

- **Sulfate** – The geometric mean sulfate concentration is significantly lower in the impacted wells (0.91 mg/L) versus the background wells (8.97 mg/L). Like nitrate, sulfate is used by bacteria in the metabolism of petroleum hydrocarbons, thus the notably lower sulfate level in the impacted wells is a strong indication that biodegradation is occurring in the area where groundwater is impacted by petroleum hydrocarbons.

- **Total Organic Carbon** – The geometric mean TOC concentration is notably higher in the impacted wells (44.54 mg/L) versus the background wells (13.96 mg/L). This is expected given that petroleum hydrocarbons are organic carbon compounds. The elevated TOC confirms the presence of contamination in the area of the impacted wells and confirms that there is an adequate food source to support biological activity.

In addition to the geochemical parameters discussed above, the groundwater pH was generally in the 6-7 range and groundwater temperatures were in the 25°C to 28°C range, both of which are conducive to biological activity.

TABLE 4-1a

SUMMARY OF DETECTED CONCENTRATIONS IN GROUNDWATER SAMPLES
DEPOT GAS STATION
MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA

Sample Location Sample Date	Federal MCL	SCRBCAPRGW[1]	MW-01 9-Jul-09	MW-02 10-Jul-09	MW-03 12-Jul-09	MW-04 10-Jul-09	MW-05 14-Jul-09	MW-07 10-Jul-09	MW-08 10-Jul-09	MW-09 12-Jul-09	MW-11 13-Jul-09
Inorganics (ug/L)											
LEAD	15	15	5.9	2.7 U	12	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
Miscellaneous Parameters (mg/L)											
ALKALINITY	NA	NA					194				
AMMONIA	NA	NA					1.3				
BACTERIA (AEROBIC) (CFU/100)	NA	NA					850				
NITRATE-N	NA	NA	0.003 U	0.639	0.003 U	0.295	0.025	0.112	0.006	0.003 U	0.003 U
PLATE COUNT-95LL (CFU/100)	NA	NA					752				
PLATE COUNT-95UL (CFU/100)	NA	NA					948				
SULFATE	NA	NA	0.11	5.74	0.23	10.3	3.7	0.91	9.1	17.9	5
TOTAL ORGANIC CARBON	NA	NA	117	12.7	53.8	6	24.2	21.8	16.7	11.7	26.3
Volatile Organics (ug/L)											
BENZENE	5	5	1790 [FED] [SC]	2.62 J	4770 [FED] [SC]	0.075 U	62.1 [FED] [SC]	4.94 J	0.075 U	0.075 U	0.075 U
DIISOPROPYL ETHER	NA	NA	0.529 U	0.529 U	10.6 U	0.529 U	0.529 U	0.529 U	0.529 U	0.529 U	0.529 U
ETHYLBENZENE	700	700	152	0.052 U	1120 [FED] [SC]	0.052 U	158	0.052 U	0.052 U	0.052 U	0.052 U
METHYL TERT-BUTYL ETHER	NA	40	0.516 J	0.077 U	1.54 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
TERT-AMYL ALCOHOL	NA	NA	7680 J	15.6 UR	1210 J	15.6 UR	68.7 J	767 J	15.6 UR	15.6 UR	15.6 UR
TERT-AMYL METHYL ETHER	NA	NA	0.348 U	0.348 U	6.96 U	0.348 U	0.348 U	0.348 U	0.348 U	0.348 U	0.348 U
TERTIARY-BUTYL ALCOHOL	NA	NA	217 J	4.12 UR	82.4 UR	4.12 UR	4.12 UR	28.7 J	4.12 UR	4.12 UR	4.12 UR
TOLUENE	1000	1000	37.9	0.082 U	14000 [FED] [SC]	0.082 U	40.3	0.082 U	0.082 U	0.082 U	0.082 U
TOTAL XYLENES	10000	10000	242	0.334 U	5910	0.334 U	103	0.334 U	0.334 U	0.334 U	0.334 U
Volatile Gases (ug/L)											
METHANE	NA	NA	2170	1190	4790	0.187 U	5160	530	133	27.9	132
PAHs (ug/L)											
1-METHYLNAPHTHALENE	NA	NA	17.5	0.024 U	5.11 J	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U
2-METHYLNAPHTHALENE	NA	NA	34.2	0.024 U	2.68 J	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U
ACENAPHTHYLENE	NA	NA	0.378 U	0.038 U	0.376 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U
ANTHRACENE	NA	NA	0.542 J	0.027 U	0.269 U	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U
FLUORANTHENE	NA	NA	0.505 J	0.037 U	0.365 U	0.036 U	0.037 U	0.036 U	0.037 U	0.037 U	0.036 U
NAPHTHALENE	NA	NA	75	0.038 U	142 J	0.037 U	0.038 U	0.037 U	0.07 J	0.038 U	0.037 U
PHENANTHRENE	NA	NA	0.753 J	0.029 U	0.289 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U
PYRENE	NA	NA	0.689 J	0.026 U	0.262 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U

1. South Carolina Risk-Based Corrective Action for Petroleum Releases for groundwater

TABLE 4-1a

SUMMARY OF DETECTED CONCENTRATIONS IN GROUNDWATER SAMPLES
DEPOT GAS STATION
MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA

Sample Location Sample Date	Federal MCL	SCRBCAPRGW[1]	MW-12 13-Jul-09	MW-14 14-Jul-09	MW-16 13-Jul-09	MW-17 13-Jul-09	MW-20 13-Jul-09	MW-21 14-Jul-09	MW-22 10-Jul-09	MW-23 10-Jul-09
Inorganics (ug/L)										
LEAD	15	15	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
Miscellaneous Parameters (mg/L)										
ALKALINITY	NA	NA		72.9						
AMMONIA	NA	NA		6.1						
BACTERIA (AEROBIC) (CFU/100)	NA	NA		900						
NITRATE-N	NA	NA	0.039	0.003 U	0.111	0.058	0.03	0.003 U	0.003 U	0.003 U
PLATE COUNT-95LL (CFU/100)	NA	NA		704						
PLATE COUNT-95UL (CFU/100)	NA	NA		1100						
SULFATE	NA	NA	1.45	0.32	4.23	19.1	10.4	2.15	12.2	1.96
TOTAL ORGANIC CARBON	NA	NA	35.1	43.7	28.4	15.6	19.1	23.4	11.8	57.1
Volatile Organics (ug/L)										
BENZENE	**5**	**5**	**122 [FED] [SC]**	3.95 J	0.075 U	3.73 J	0.075 U	**8.11 [FED] [SC]**	0.075 U	**18.9 [FED] [SC]**
DIISOPROPYL ETHER	NA	NA	0.529 U	0.529 U	0.529 U	0.529 U	0.529 U	0.529 U	0.529 U	0.529 U
ETHYLBENZENE	**700**	**700**	11.6	0.052 U	0.052 U	0.052 U	0.052 U	20.3	0.052 U	12
METHYL TERT-BUTYL ETHER	NA	**40**	0.968 J	0.077 U	1.19 J	4.93 J	0.077 U	0.436 J	0.077 U	5.17
TERT-AMYL ALCOHOL	NA	NA	78.5 J	15.6 UR	15.6 UR	15.6 UR	15.6 UR	15.6 UR	15.6 UR	15.6 UR
TERT-AMYL METHYL ETHER	NA	NA	0.348 U	0.348 U	0.348 U	0.348 U	0.348 U	0.348 U	0.348 U	8.73
TERTIARY-BUTYL ALCOHOL	NA	NA	4.12 UR	4.12 UR	4.12 UR	4.12 UR	4.12 UR	4.12 UR	4.12 UR	9.79 J
TOLUENE	**1000**	**1000**	5.06	0.082 U	0.082 U	0.845 J	0.082 U	1.3 J	0.082 U	2.29 J
TOTAL XYLENES	10000	10000	5.16 J	0.334 U	0.334 U	0.334 U	0.334 U	0.334 U	0.334 U	10.4
Volatile Gases (ug/L)										
METHANE	NA	NA	1880	6080	191	5.05	369	920	30.7	5240
PAHs (ug/L)										
1-METHYLNAPHTHALENE	NA	NA	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	8.11
2-METHYLNAPHTHALENE	NA	NA	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	1.09
ACENAPHTHYLENE	NA	NA	0.075 J	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.188 U
ANTHRACENE	NA	NA	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.241	0.118	0.134 U
FLUORANTHENE	NA	NA	0.036 U	0.037 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.182 U
NAPHTHALENE	NA	NA	0.037 U	0.161	0.129	0.037 U	0.037 U	0.637	0.037 U	9.85
PHENANTHRENE	NA	NA	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.095 J	0.029 U	0.144 U
PYRENE	NA	NA	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.131 U

TABLE 4-1a

SUMMARY OF DETECTED CONCENTRATIONS IN GROUNDWATER SAMPLES
DEPOT GAS STATION
MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA

Sample Location Sample Date	Federal MCL	SCRBCAPRGW[1]	MW-19 12-Jul-09	MW-24 13-Jul-09	MW-25 14-Jul-09	MW-27 12-Jul-09	MW-29 10-Jul-09	MW-30 9-Jul-09
Inorganics (ug/L)								
LEAD	15	15	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
Miscellaneous Parameters (mg/L)								
ALKALINITY	NA	NA						
AMMONIA	NA	NA						
BACTERIA (AEROBIC) (CFU/100)	NA	NA						
NITRATE-N	NA	NA	0.003 U	0.003 U	0.133	0.003 U	0.003 U	0.003 U
PLATE COUNT-95LL (CFU/100)	NA	NA						
PLATE COUNT-95UL (CFU/100)	NA	NA						
SULFATE	NA	NA	16.4	12.1	8.11	2.5	0.69	4.87
TOTAL ORGANIC CARBON	NA	NA	90.5	31.8	13.3	28	23.6	15.6
Volatile Organics (ug/L)								
BENZENE	**5**	**5**	0.075 U	0.075 U	0.075 U	0.075 U	0.075 U	0.075 U
DIISOPROPYL ETHER	NA	NA	0.529 U	0.529 U	0.529 U	2.11 J	1.8 J	0.529 U
ETHYLBENZENE	**700**	**700**	0.052 U	0.052 U	0.052 U	0.052 U	0.052 U	0.052 U
METHYL TERT-BUTYL ETHER	NA	**40**	0.681 J	27.3	0.077 U	**157 [SC]**	0.077 U	0.077 U
TERT-AMYL ALCOHOL	NA	NA	15.6 UR	15.6 UR	15.6 UR	15.6 UR	78.7 J	15.6 UR
TERT-AMYL METHYL ETHER	NA	NA	0.348 U	17.8	0.348 U	0.348 U	0.348 U	0.348 U
TERTIARY-BUTYL ALCOHOL	NA	NA	4.12 UR	4.12 UR	4.12 UR	4.12 UR	9.38 J	4.12 UR
TOLUENE	**1000**	**1000**	0.66 J	0.082 U	0.082 U	0.082 U	0.862 J	0.082 U
TOTAL XYLENES	10000	10000	0.334 U	0.334 U	0.334 U	0.334 U	12.7	0.334 U
Volatile Gases (ug/L)								
METHANE	NA	NA	1430	14.5	19.5	976	6940	536
PAHs (ug/L)								
1-METHYLNAPHTHALENE	NA	NA	1.3	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U
2-METHYLNAPHTHALENE	NA	NA	0.311 J	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U
ACENAPHTHYLENE	NA	NA	0.19 U	0.241	0.038 U	0.038 U	0.038 U	0.038 U
ANTHRACENE	NA	NA	0.136 U	0.161	0.027 U	0.027 U	0.027 U	0.027 U
FLUORANTHENE	NA	NA	0.184 U	0.037 U	0.036 U	0.036 U	0.036 U	0.036 U
NAPHTHALENE	NA	NA	9.01	0.038 U	0.037 U	0.072 J	0.037 U	0.037 U
PHENANTHRENE	NA	NA	0.146 U	0.158	0.029 U	0.029 U	0.029 U	0.029 U
PYRENE	NA	NA	0.132 U	0.148	0.026 U	0.026 U	0.026 U	0.026 U

TABLE 4-1b

SUMMARY OF DETECTED CONCENTRATIONS IN GROUNDWATER SAMPLES (INCLUDING DUPLICATES AND AVERAGES)
DEPOT GAS STATION
MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA

Sample Location Sample Date	Federal MCL	SCRBCAPRGW[1]	MW-01 9-Jul-09	MW-02 10-Jul-09	MW-03 12-Jul-09	MW-03-AVG 12-Jul-09	MW-03-D 12-Jul-09	MW-04 10-Jul-09	MW-05 14-Jul-09	MW-07 10-Jul-09
Inorganics (ug/L)										
LEAD	15	15	5.9	2.7 U	12	12	12	2.7 U	2.7 U	2.7 U
Miscellaneous Parameters (mg/L)										
ALKALINITY	NA	NA							194	
AMMONIA	NA	NA							1.3	
BACTERIA (AEROBIC) (CFU/100)	NA	NA							850	
NITRATE-N	NA	NA	0.003 U	0.639	0.003 U	0.003 UJ	0.003 UJ	0.295	0.025	0.112
PLATE COUNT-95LL (CFU/100)	NA	NA							752	
PLATE COUNT-95UL (CFU/100)	NA	NA							948	
SULFATE	NA	NA	0.11	5.74	0.23	0.235	0.24	10.3	3.7	0.91
TOTAL ORGANIC CARBON	NA	NA	117	12.7	53.8	58.8	63.8	6	24.2	21.8
Volatile Organics (ug/L)										
BENZENE	5	5	1790 [FED] [SC]	2.62 J	4770 [FED] [SC]	4915 [FED] [SC]	5060 [FED] [SC]	0.075 U	62.1 [FED] [SC]	4.94 J
DIISOPROPYL ETHER	NA	NA	0.529 U	0.529 U	10.6 U	10.6 U	10.6 U	0.529 U	0.529 U	0.529 U
ETHYLBENZENE	700	700	152	0.052 U	1120 [FED] [SC]	1155 [FED] [SC]	1190 [FED] [SC]	0.052 U	158	0.052 U
METHYL TERT-BUTYL ETHER	NA	40	0.516 J	0.077 U	1.54 U	1.54 U	1.54 U	0.077 U	0.077 U	0.077 U
TERT-AMYL ALCOHOL	NA	NA	7680 J	15.6 UR	1210 J	1165 J	1120 J	15.6 UR	68.7 J	767 J
TERT-AMYL METHYL ETHER	NA	NA	0.348 U	0.348 U	6.96 U	6.96 U	6.96 U	0.348 U	0.348 U	0.348 U
TERTIARY-BUTYL ALCOHOL	NA	NA	217 J	4.12 UR	82.4 UR	82.4 UR	82.4 UR	4.12 UR	4.12 UR	28.7 J
TOLUENE	1000	1000	37.9	0.082 U	14000 [FED] [SC]	14250 [FED] [SC]	14500 [FED] [SC]	0.082 U	40.3	0.082 U
TOTAL XYLENES	10000	10000	242	0.334 U	5910	6095	6280	0.334 U	103	0.334 U
Volatile Gases (ug/L)										
METHANE	NA	NA	2170	1190	4790	4780	4770	0.187 U	5160	530
PAHs (ug/L)										
1-METHYLNAPHTHALENE	NA	NA	17.5	0.024 U	5.11 J	3.695 J	2.28 J	0.024 U	0.024 U	0.024 U
2-METHYLNAPHTHALENE	NA	NA	34.2	0.024 U	2.68 J	1.6045 J	0.529 J	0.024 U	0.024 U	0.024 U
ACENAPHTHYLENE	NA	NA	0.378 U	0.038 U	0.376 U	0.282 U	0.188 U	0.038 U	0.038 U	0.038 U
ANTHRACENE	NA	NA	0.542 J	0.027 U	0.269 U	0.2015 U	0.134 U	0.027 U	0.027 U	0.027 U
FLUORANTHENE	NA	NA	0.505 J	0.037 U	0.365 U	0.2735 U	0.182 U	0.036 U	0.037 U	0.036 U
NAPHTHALENE	NA	NA	75	0.038 U	142 J	98.1 J	54.2 J	0.037 U	0.038 U	0.037 U
PHENANTHRENE	NA	NA	0.753 J	0.029 U	0.289 U	0.2165 U	0.144 U	0.029 U	0.029 U	0.029 U
PYRENE	NA	NA	0.689 J	0.026 U	0.262 U	0.1965 U	0.131 U	0.026 U	0.026 U	0.026 U

1. South Carolina Risk-Based Corrective Action for Petroleum Releases for groundwater

TABLE 4-1b

SUMMARY OF DETECTED CONCENTRATIONS IN GROUNDWATER SAMPLES (INCLUDING DUPLICATES AND AVERAGES)
DEPOT GAS STATION
MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA

Sample Location Sample Date	Federal MCL	SCRBCAPRGW[1]	MW-08 10-Jul-09	MW-09 12-Jul-09	MW-11 13-Jul-09	MW-12 13-Jul-09	MW-14 14-Jul-09	MW-16 13-Jul-09	MW-17 13-Jul-09	MW-20 13-Jul-09	MW-21 14-Jul-09
Inorganics (ug/L)											
LEAD	15	15	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
Miscellaneous Parameters (mg/L)											
ALKALINITY	NA	NA					72.9				
AMMONIA	NA	NA					6.1				
BACTERIA (AEROBIC) (CFU/100)	NA	NA					900				
NITRATE-N	NA	NA	0.006	0.003 U	0.003 U	0.039	0.003 U	0.111	0.058	0.03	0.003 U
PLATE COUNT-95LL (CFU/100)	NA	NA					704				
PLATE COUNT-95UL (CFU/100)	NA	NA					1100				
SULFATE	NA	NA	9.1	17.9	5	1.45	0.32	4.23	19.1	10.4	2.15
TOTAL ORGANIC CARBON	NA	NA	16.7	11.7	26.3	35.1	43.7	28.4	15.6	19.1	23.4
Volatile Organics (ug/L)											
BENZENE	**5**	**5**	0.075 U	0.075 U	0.075 U	**122 [FED] [SC]**	3.95 J	0.075 U	3.73 J	0.075 U	**8.11 [FED] [SC]**
DIISOPROPYL ETHER	NA	NA	0.529 U	0.529 U	0.529 U	0.529 U	0.529 U	0.529 U	0.529 U	0.529 U	0.529 U
ETHYLBENZENE	**700**	**700**	0.052 U	0.052 U	0.052 U	11.6	0.052 U	0.052 U	0.052 U	0.052 U	20.3
METHYL TERT-BUTYL ETHER	NA	**40**	0.077 U	0.077 U	0.077 U	0.968 J	0.077 U	1.19 J	4.93 J	0.077 U	0.436 J
TERT-AMYL ALCOHOL	NA	NA	15.6 UR	15.6 UR	15.6 UR	78.5 J	15.6 UR	15.6 UR	15.6 UR	15.6 UR	15.6 UR
TERT-AMYL METHYL ETHER	NA	NA	0.348 U	0.348 U	0.348 U	0.348 U	0.348 U	0.348 U	0.348 U	0.348 U	0.348 U
TERTIARY-BUTYL ALCOHOL	NA	NA	4.12 UR	4.12 UR	4.12 UR	4.12 UR	4.12 UR	4.12 UR	4.12 UR	4.12 UR	4.12 UR
TOLUENE	**1000**	**1000**	0.082 U	0.082 U	0.082 U	5.06	0.082 U	0.082 U	0.845 J	0.082 U	1.3 J
TOTAL XYLENES	10000	10000	0.334 U	0.334 U	0.334 U	5.16 J	0.334 U	0.334 U	0.334 U	0.334 U	0.334 U
Volatile Gases (ug/L)											
METHANE	NA	NA	133	27.9	132	1880	6080	191	5.05	369	920
PAHs (ug/L)											
1-METHYLNAPHTHALENE	NA	NA	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U
2-METHYLNAPHTHALENE	NA	NA	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U
ACENAPHTHYLENE	NA	NA	0.038 U	0.038 U	0.038 U	0.075 J	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U
ANTHRACENE	NA	NA	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.241
FLUORANTHENE	NA	NA	0.037 U	0.037 U	0.036 U	0.036 U	0.037 U	0.036 U	0.036 U	0.036 U	0.036 U
NAPHTHALENE	NA	NA	0.07 J	0.038 U	0.037 U	0.037 U	0.161	0.129	0.037 U	0.037 U	0.637
PHENANTHRENE	NA	NA	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.095 J
PYRENE	NA	NA	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U

TABLE 4-1b

SUMMARY OF DETECTED CONCENTRATIONS IN GROUNDWATER SAMPLES (INCLUDING DUPLICATES AND AVERAGES)
DEPOT GAS STATION
MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA

Sample Location Sample Date	Federal MCL	SCRBCAPRGW[1]	MW-22 10-Jul-09	MW-23 10-Jul-09	MW-19 12-Jul-09	MW-24 13-Jul-09	MW-25 14-Jul-09	MW-27 12-Jul-09	MW-27-AVG 12-Jul-09	MW-27-D 12-Jul-09	MW-29 10-Jul-09
Inorganics (ug/L)											
LEAD	15	15	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
Miscellaneous Parameters (mg/L)											
ALKALINITY	NA	NA									
AMMONIA	NA	NA									
BACTERIA (AEROBIC) (CFU/100)	NA	NA									
NITRATE-N	NA	NA	0.003 U	0.003 U	0.003 U	0.003 U	0.133	0.003 U	0.003 UJ	0.003 UJ	0.003 U
PLATE COUNT-95LL (CFU/100)	NA	NA									
PLATE COUNT-95UL (CFU/100)	NA	NA									
SULFATE	NA	NA	12.2	1.96	16.4	12.1	8.11	2.5	2.565	2.63	0.69
TOTAL ORGANIC CARBON	NA	NA	11.8	57.1	90.5	31.8	13.3	28	27.15	26.3	23.6
Volatile Organics (ug/L)											
BENZENE	5	5	0.075 U	18.9 [FED] [SC]	0.075 U	0.075 U	0.075 U	0.075 U	0.075 U	0.075 U	0.075 U
DIISOPROPYL ETHER	NA	NA	0.529 U	0.529 U	0.529 U	0.529 U	0.529 U	2.11 J	2.065 J	2.02 J	1.8 J
ETHYLBENZENE	700	700	0.052 U	12	0.052 U	0.052 U	0.052 U	0.052 U	0.052 U	0.052 U	0.052 U
METHYL TERT-BUTYL ETHER	NA	40	0.077 U	5.17	0.681 J	27.3	0.077 U	157 [SC]	156.5 [SC]	156 [SC]	0.077 U
TERT-AMYL ALCOHOL	NA	NA	15.6 UR	15.6 UR	15.6 UR	15.6 UR	15.6 UR	15.6 UR	15.6 UR	15.6 UR	78.7 J
TERT-AMYL METHYL ETHER	NA	NA	0.348 U	8.73	0.348 U	17.8	0.348 U	0.348 U	0.348 U	0.348 U	0.348 U
TERTIARY-BUTYL ALCOHOL	NA	NA	4.12 UR	9.79 J	4.12 UR	4.12 UR	4.12 UR	4.12 UR	4.12 UR	4.12 UR	9.38 J
TOLUENE	1000	1000	0.082 U	2.29 J	0.66 J	0.082 U	0.082 U	0.082 U	0.082 U	0.082 U	0.862 J
TOTAL XYLENES	10000	10000	0.334 U	10.4	0.334 U	0.334 U	0.334 U	0.334 U	0.334 U	0.334 U	12.7
Volatile Gases (ug/L)											
METHANE	NA	NA	30.7	5240	1430	14.5	19.5	976	1033	1090	6940
PAHs (ug/L)											
1-METHYLNAPHTHALENE	NA	NA	0.024 U	8.11	1.3	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U
2-METHYLNAPHTHALENE	NA	NA	0.024 U	1.09	0.311 J	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U
ACENAPHTHYLENE	NA	NA	0.038 U	0.188 U	0.19 U	0.241	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U
ANTHRACENE	NA	NA	0.118	0.134 U	0.136 U	0.161	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U
FLUORANTHENE	NA	NA	0.036 U	0.182 U	0.184 U	0.037 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U
NAPHTHALENE	NA	NA	0.037 U	9.85	9.01	0.038 U	0.037 U	0.072 J	0.064 J	0.056 J	0.037 U
PHENANTHRENE	NA	NA	0.029 U	0.144 U	0.146 U	0.158	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U
PYRENE	NA	NA	0.026 U	0.131 U	0.132 U	0.148	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U

TABLE 4-1b

SUMMARY OF DETECTED CONCENTRATIONS IN GROUNDWATER SAMPLES (INCLUDING DUPLICATES AND AVERAGES)
DEPOT GAS STATION
MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA

Sample Location Sample Date	Federal MCL	SCRBCAPRGW[1]	MW-30 9-Jul-09
Inorganics (ug/L)			
LEAD	15	15	2.7 U
Miscellaneous Parameters (mg/L)			
ALKALINITY	NA	NA	
AMMONIA	NA	NA	
BACTERIA (AEROBIC) (CFU/100)	NA	NA	
NITRATE-N	NA	NA	0.003 U
PLATE COUNT-95LL (CFU/100)	NA	NA	
PLATE COUNT-95UL (CFU/100)	NA	NA	
SULFATE	NA	NA	4.87
TOTAL ORGANIC CARBON	NA	NA	15.6
Volatile Organics (ug/L)			
BENZENE	**5**	**5**	0.075 U
DIISOPROPYL ETHER	NA	NA	0.529 U
ETHYLBENZENE	**700**	**700**	0.052 U
METHYL TERT-BUTYL ETHER	NA	**40**	0.077 U
TERT-AMYL ALCOHOL	NA	NA	15.6 UR
TERT-AMYL METHYL ETHER	NA	NA	0.348 U
TERTIARY-BUTYL ALCOHOL	NA	NA	4.12 UR
TOLUENE	**1000**	**1000**	0.082 U
TOTAL XYLENES	10000	10000	0.334 U
Volatile Gases (ug/L)			
METHANE	NA	NA	536
PAHs (ug/L)			
1-METHYLNAPHTHALENE	NA	NA	0.024 U
2-METHYLNAPHTHALENE	NA	NA	0.024 U
ACENAPHTHYLENE	NA	NA	0.038 U
ANTHRACENE	NA	NA	0.027 U
FLUORANTHENE	NA	NA	0.036 U
NAPHTHALENE	NA	NA	0.037 U
PHENANTHRENE	NA	NA	0.029 U
PYRENE	NA	NA	0.026 U

TABLE 4-2

CONTAMINANT TRENDS
DEPOT GAS STATION
MCRD PARRIS ISLAND

Well	Benzene (5 ug/l)		Ethylbenzene (700 ug/l)		Toluene (1000 ug/l)		MTBE (40 ug/l)	
	2000	2009	2000	2009	2000	2009	2000	2009
MW01	1725	1790	310	152	67.5	37.9	0	0.5
MW03	6650	4915	699	1155	6300	14250	0	0
MW05	234	622	334	158	38	40.3	0	0
MW12	0	122	0	11.6	0	5.1	3.4	1
MW19	80.8	0	31.6	0	4	0.66	152	0
MW20	7.2	0	263	0	2.2	0	0	0
MW21	63.1	8.11	115	20.3	3.9	1.3	31.8	1
MW23	81.7	18.9	192	12	8.7	2.3	62.8	5.2
MW24	0	0	0	0	0	0	53.1	27.3
MW27D	0	0	0	2	0	0	1	157
Average	884.2	747.6	194.5	151.1	642.4	1433.8	30.4	19.2

Note: Nondetections are shown as 0.

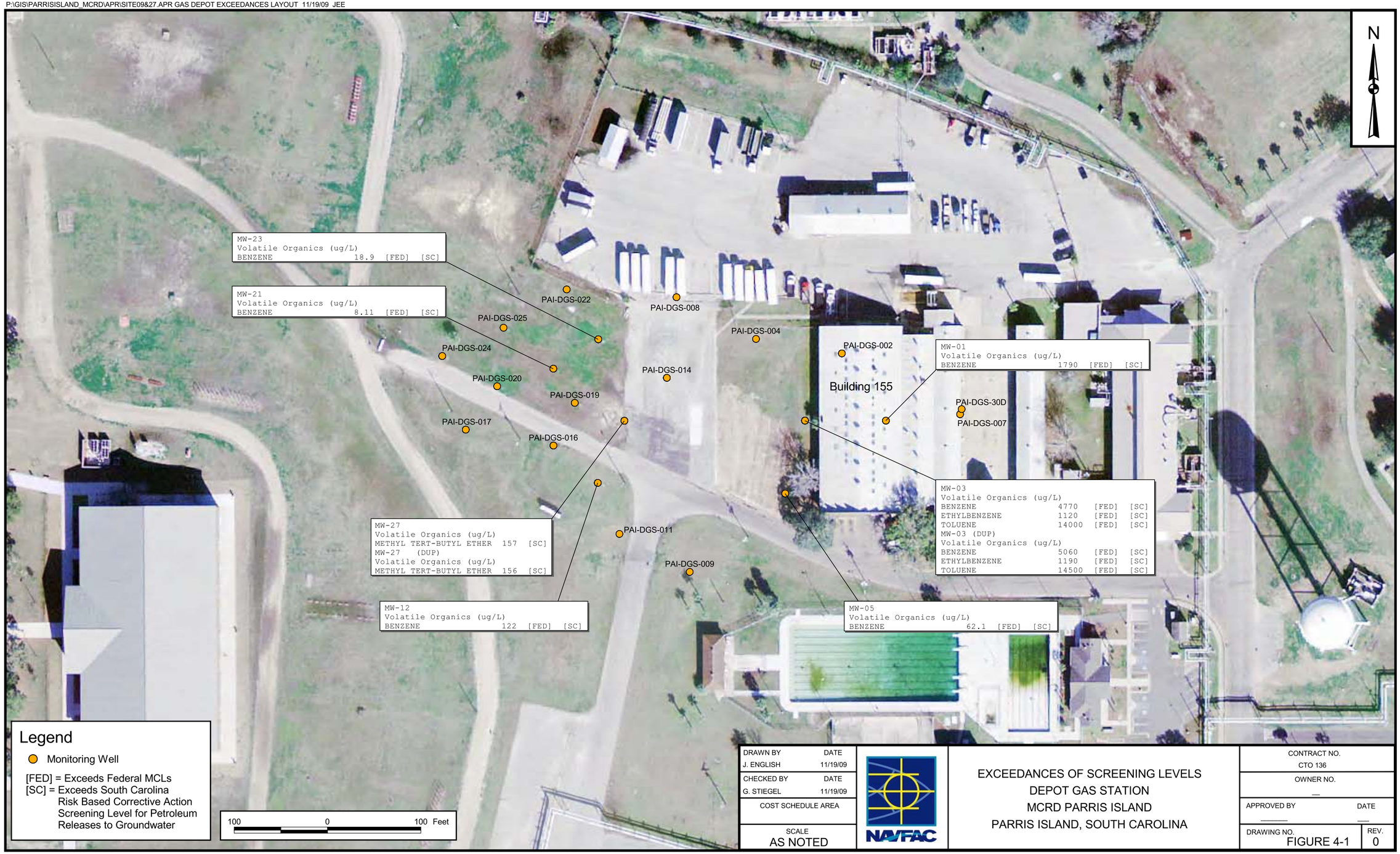
TABLE 4-3

GEOCHEMICAL PARAMETERS
DEPOT GAS STATION
MCRD PARRIS ISLAND

Well	Parameter (mg/l except methane, ug/l)				
	DO	Methane	Nitrate	Sulfate	TOC
Background Wells					
MW04	4.52	0.001	0.295	10.3	6
MW08	0.96	133	0.006	9.1	16.7
MW09	1.67	27.9	0.001	17.9	11.7
MW11	1.06	132	0.001	5	26.3
MW20	0.96	369	0.03	10.4	19.1
MW22	0.96	30.7	0.001	12.2	11.8
MW25	2.02	19.5	0.133	8.11	13.3
MW30D	0.72	536	0.001	4.87	15.6
Geo Mean	1.34	22.15	0.01	8.97	13.96
Impacted Wells					
MW01	1	2170	0.001	0.11	117
MW03	0.67	4780	0.001	0.235	58.8
MW05	0.77	5160	0.025	3.7	24.2
MW12	1.73	1880	0.039	1.45	35.1
MW21	1.08	920	0.001	2.15	23.4
MW23	0.94	5240	0.001	1.96	57.1
Geo Mean	0.98	2803.08	0.003	0.91	44.54

Note: ND values assigned as 0.001 for geometric mean calculation purposes

P:\GIS\PARRISISLAND_MCRD\APR\SITE09&27.APR GAS DEPOT EXCEEDANCES LAYOUT 11/19/09 JEE



DRAWN BY	DATE
J. ENGLISH	11/19/09
CHECKED BY	DATE
G. STIEGEL	11/19/09
COST SCHEDULE AREA	
SCALE	AS NOTED

NAVFAC

EXCEEDANCES OF SCREENING LEVELS
DEPOT GAS STATION
MCRD PARRIS ISLAND
PARRIS ISLAND, SOUTH CAROLINA

CONTRACT NO.	
CTO 136	
OWNER NO.	
—	
APPROVED BY	DATE
DRAWING NO. FIGURE 4-1	REV. 0

5.0 CONCLUSIONS AND RECOMMENDATIONS

The objective of the 2005 CAP was to reduce groundwater benzene concentrations below 455 µg/L for groundwater in open areas, and below 7.92 µg/L for groundwater beneath buildings. The results of the July 2009 sampling event indicate that this objective has not been met in monitoring wells MW-01 and MW-03. Additionally, monitoring wells MW-06 and MW-15 (both containing benzene concentrations above the 455 µg/L threshold in historic sampling) were not located for sampling during the July 2009 event; most likely because they were abandoned to enable the soil excavation. Both of these wells should be reinstalled to determine whether the groundwater benzene concentration objective was met at these two locations.

Overall, the contaminant concentration trends and the geochemical patterns observed match up well and indicate that biodegradation processes are ongoing at the site and are reducing contaminant concentrations (both petroleum hydrocarbons and MTBE). MTBE is generally considered less amenable to biodegradation than petroleum hydrocarbons, however some biodegradation can and does occur. When co-mingled with petroleum hydrocarbons (as is typical since it is a fuel additive), microbes tend to prefer the petroleum hydrocarbons as a food source versus MTBE.

The current dataset is not suitable for estimating cleanup timeframes, primarily due to the increase in concentrations in some of the wells located near the excavation area (as mentioned previously, the increase may be related to disturbance of the aquifer during 2005 excavation activities). The 2009 data should be considered the new baseline concentrations for these wells, and concentration trend projections made based on additional sampling. It is recommended that at least 2 additional annual rounds of data be collected and used with the 2009 sampling round if cleanup timeframes are to be estimated. The installation of a replacement well for MW-15 should also be considered to provide data from an area of historic high concentrations.

Based on the results of the July 2009 sampling event and the natural attenuation evaluation, the enhanced bioremediation via oxygen addition, proposed in the 2005 CAP, should be reconsidered, and pilot tests of other technologies should be evaluated. The following are potential pilot test candidates:

- Chemical oxidation injection using oxygen and peroxide
- Pumping test to evaluate the feasibility of a future bioremediation recirculation system
- Air sparge with soil vapor extraction (this could be done under the building if there is an adequate vadose zone for vapor capture)

Additional natural attenuation data must be collected to determine if natural attenuation can be considered a viable remedy component.

6.0 REFERENCES

SCDHEC (South Carolina Department of Health and Environmental Control), 2001. South Carolina Risk Based Corrective Action for Petroleum Releases. South Carolina Department of Health and Environmental Control, Columbia, SC. May.

TtNUS (Tetra Tech NUS, Inc), 2009. Baseline Sampling and Assessment Work Plan for Depot Gas Station (Building 170). Marine Corp Recruit Depot Parris Island, Parris Island, South Carolina. March.

TtNUS, 2005. Corrective Action Plan for Depot Gas Station. MarineCorp Recruit Depot Parris Island, Parris Island, South Carolina. July.

APPENDIX A

MONITORING WELL DEVELOPMENT RECORD SHEETS

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-01
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7/8/09
Dev. Method: Pump + Surge
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 11.75
Static Water Level Before (ft.): 2.85
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ~~ms/cm~~)	Turbidity (NTU)	Remarks (odor, color, etc.)
1255			2	26.47	6.45	0.968	800+	well dry, mostly clear
1310			4.5'	26.03	6.48	0.939	613	" " "
1320		4 gal		25.97	6.51	0.937	674	" "
1335		5 gal		26.08	6.55	0.915	708	" "
1345		6 gal		25.90	6.48	0.894	800+	well dry, cloudy
1358		7 gal/s		25.91	6.51	0.890	800+	" "
1413		9 gal		25.97	6.44	0.909	717	" "
1425		11 gal		26.25	6.50	0.826	800+	" "
1450		12.5 gal		26.16	6.47	0.827	498	" "
1500		13.5 gal		25.94	6.48	0.869	799	" "
1512		15 gal		25.86	6.51	0.843	778	" "

Ran surge Block 3 times prior to purging

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-02
Site: PARRIS ISLAND, SC
Date Installed:
Date Developed: 7/9/09
Dev. Method: PUMP + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 11.72
Static Water Level Before (ft.): 2.50
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK MENGEL / SHANNON HILL
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
0755		2gal		24.07	5.91	0.541	210	well dry, Brn turning nearly clear
0803		5gal		23.98	6.55	0.519	81.4	" "
0812		7gal		23.91	6.69	0.500	36	well dry, clear
0822		9gal		23.62	6.91	0.505	20.4	" "
0842		11gal		24.55	6.78	0.440	13.3	" "
0852		13gal		24.24	6.82	0.453	9.7	" "

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-03
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7/8/09
Dev. Method: Pump + Surge
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 11.70
Static Water Level Before (ft.): 3.25
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
0930		4gal		23.78	6.23	0.397	190	relatively clear well doesn't dry out
0950		6gal		24.11	6.37	0.389	126	" "
1000		7.5		23.95	6.24	0.375	100	" "
1010		9gal		24.03	6.22	0.336	136	" "
1020		11gal		24.33	6.22	0.333	129	" "

Ran surge block 3 times prior to begining development

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-04
Site: PARRIS ISLAND, SC
Date Installed:
Date Developed: 7-8-09
Dev. Method: PUMP + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 11.80
Static Water Level Before (ft.): 3.15
Static Water Level After (ft.):
Screen Length (ft.): 10ft
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK MENGEL / SHANNON HILL
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
0805								first purge no readings taken
0815		3.5gal		24.34	6.71	0.503	182	Dry well, clearing up
0825				23.90	6.82	0.500	87	" "
0845		5.5		24.02	6.84	0.502	69.2	" "
0855		6.5		24.04	6.87	0.486	119	" "
0905		7.25		24.15	6.92	0.464	82.9	Dry well visibly clear water

* Ran surge block through 3 times before begining development

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-05
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7/8/09
Dev. Method: Pump + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 11.77
Static Water Level Before (ft.): 2.98
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1045		4 gal		23.69	6.33	0.451	237	Doesn't dry out; Grey/Blk odor
1100		6 gal		23.91	6.37	0.592	42	odor, clear
1110		8 gal		23.89	6.47	0.651	30.6	" "
1125		10 gal		24.31	6.48	0.635	9.2	" "
1135		12 gal		23.90	6.44	0.658	8.3	" "

Ran surge block 3 times prior to beginning development

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-07
Site: PARRIS ISLAND, SC
Date Installed:
Date Developed: 7/8/09
Dev. Method: PUMP + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.25
Static Water Level Before (ft.): 2.96
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK MENGEL / SHANNON HILL
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1340		2.5 gal		27.86	6.83	0.516	390	PURGED DRY
1400		2 gal		28.17	6.89	0.536	280	PURGED DRY
1410		1.6 gal		28.26	6.85	0.540	230	PURGED DRY
1415		1.6 gal		28.19	6.70	0.528	250	PURGED DRY
1420		1.6 gal		28.22	6.75	0.523	270	
1425		1.6 gal		28.14	6.82	0.543	270	
1430		1.6 gal		27.53	6.72	0.605	500	
1435		1.6 gal		27.65	6.81	0.574	400	
1440		1.6 gal		27.52	6.69	0.587	210	
1445		1.6 gal		27.95	6.76	0.567	380	
1455		1.6 gal		27.23	6.59	0.696	106	
1500		1.6 gal		27.12	6.70	0.696	150	
1505		1.6 gal		27.21	6.56	0.749	116	

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-08
Site: PARRIS ISLAND, SC
Date Installed:
Date Developed: 7/8/09
Dev. Method: PUMP + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.15
Static Water Level Before (ft.): 2.69
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK MENGEL / SHANNON HILL
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/c)	Turbidity (NTU)	Remarks (odor, color, etc.)
1005		1.6		28.40	6.69	0.398	–	Purged dry
1020		1.4		28.93	6.58	0.390	–	" "
1035		1.4		28.63	6.62	0.382	–	" "
1050		1.4		28.44	6.62	0.379	620	" "
1105		1.4		29.26	6.65	0.380	750	" "
1115		1.4		29.34	6.64	0.382	740	" "
				DONE				

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-09
Site: PARRIS ISLAND, SC
Date Installed:
Date Developed: 7/11/09
Dev. Method: PUMP + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.40
Static Water Level Before (ft.): 2.02
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
0810		5gal		23.74	6.78	0.620	800+	well dry, brn/orange color clearing up
0817		10 gal		23.78	6.51	0.695	719	well dry, clearing up
0830		14gal		24.00	6.59	0.609	193	" "
0837		17gal		23.91	6.39	0.598	132	" "
0847		20 gal		24.09	6.51	0.602	82.7	well dry, clear
0900		23 gal		24.07	6.51	0.606	58	" "
0910		26 gal		24.18	6.45	0.601	49.2	" "
0917		29 gal		24.10	6.39	0.603	29	" "
0927		31 gal		24.65	6.40	0.592	46.3	" "
	Done purging							

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-11
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7-12-09
Dev. Method: Pump + Surge
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.25
Static Water Level Before (ft.): 2.65
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0950		2.5 gal		25.07	6.03	0.459	800+	well dry, Brn cloudy +20
1000		6 gal		24.90	6.02	0.465	800+	well dry, cloudy
1010		8 gal		25.40	6.01	0.425	800+	" "
1020		11 gal		25.55	5.91	0.428	800+	" "
1030		14 gal		24.66	~~6.02~~ 5.90	0.469	638	" "
1040		17 gal		24.62	5.93	0.480	800+	" "
1053		19 gal		25.25	5.90	0.419	684	" "
1103		22 gal		24.64	6.02	0.494	724	well dry Clearing up
1113		24 gal		25.38	6.03	0.408	588	" "
1123		27 gal		25.44	6.00	0.421	380	" "
1133		29 gal		24.81	6.03	0.465	246	" "
1145		32 gal		25.36	5.95	0.417	293	" "
1155		35 gal		25.32	6.00	0.480	190	" "
1205		38 gal		25.21	5.95	0.485	175	" "

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-12
Site: PARRIS ISLAND, SC
Date Installed:
Date Developed: 7-11-09
Dev. Method: PUMP + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.46
Static Water Level Before (ft.): 2.86
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK MENGEL / SHANNON HILL
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1310				26.41	6.59	0.469	800+	well dry; had brn cloudy
1317		5 gal		25.35	6.59	0.485	800+	" " petroleum odor
1327		7 gal		25.22	6.40	0.486	800+	" "
1332		10 gal		25.17	6.45	0.478	800+	" "
1342		12 gal		25.35	6.47	0.464	800+	" "
1352		15 gal		25.03	6.37	0.471	800+	" "
1359		17 gal		25.10	6.35	0.472	187	" "
1405		19 gal		25.05	6.33	0.470	532	" "
1413		22 gal		25.01	6.21	0.460	293	" "
1420		25 gal		24.87	6.26	0.450	359	" "

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-14
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7/7/09
Dev. Method: Pump + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.25
Static Water Level Before (ft.): 2.75
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1300		7gal		28.40	6.33	0.293	Max	purge dry; Cloudy
1305		7gal		28.62	6.41	0.303	800+	" " "
1315		3~~7~~gal		28.73	6.41	0.311	800+	" "
								~17 gal total ~~purged~~

Ran Surge block through well 3 times prior to pumping

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-16
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7-11-09
Dev. Method: Pump + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.40
Static Water Level Before (ft.): 3.50
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1436				25.91	6.63	0.596	800+	well drys out, orange brn color
1449		4gal		26.42	6.54	0.534	800+	" " "
1459		6gal		26.62	6.55	0.485	800+	well drys clearing up
1520		9gal		26.72	6.55	0.519	800+	" "
1530		11gal		27.72	6.45	0.482	528	" "
1538		13gal		27.74	6.38	0.476	390	" "
1547		15gal		28.13	6.56	0.489	305	" "
1555		17gal		28.06	6.47	0.487	293	" "

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-17
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7-11-09
Dev. Method: Pump + surge
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 1230
Static Water Level Before (ft.): 3.01
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK mengel / shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1450		2		–	–	–	–	Purged DRY - NO
1500		2		25.84	6.69	0.328	–	Reading for Purge -
1505		2		25.91	6.52	0.333	220	to dirty
1510		2		25.88	6.49	0.345	400	
1515		2		26.28	6.77	0.349	335	
1520		2		26.07	6.65	0.344	260	
1530		1.6		25.88	6.71	0.344	260	
1535		1.6		25.80	6.63	0.343	255	
1540		1.6		25.91	6.70	0.344	200	
		15 gal		DONE				

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-19
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7-7-09
Dev. Method: Pump + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.40
Static Water Level Before (ft.): 3.15
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1340								dry well, cloudy, odor
1352				25.86	6.39	0.607	147	" "
1402		4gal		24.93	6.51	0.588	58.1	" "
1412		5.0		25.34	6.50	0.563	290	pump was moved bumping turbidity
1422		6.0		24.97	6.47	0.539	251	" "

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-20
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7-11-09
Dev. Method: Pump + surge
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 13.45
Static Water Level Before (ft.): 3.12
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK mengel / shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1315		2		27.14	6.83	0.333	—	Purged dry - water
1320		2		26.82	6.77	0.314	—	is black
1325		2		26.61	6.74	0.315	—	
1330		2		26.63	6.75	0.318	—	
1340		2		26.71	6.66	0.316	560	
1350		2		26.42	6.59	0.312	600	
1400		2		26.42	6.68	0.318	700	
1410		2		26.30	6.65	0.316	—	
1420		2		26.53	6.62	0.335	470	
1430		1.6		26.44	6.58	0.335	500	
1435		1.6		26.54	6.67	0.329	400	
		21 gal		DONE				

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-21
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7-7-09
Dev. Method: Pump + Surge
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.42
Static Water Level Before (ft.): 2.95
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK mengel / shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1440		1.4		25.66	6.35	0.292	—	PURGE DRY (GREY)
1450		1.4		24.66	6.21	0.284	—	" " "
1500		1.4		24.86	6.23	0.279	—	" " "
1515		1.4		26.09	6.32	0.280	—	" " "
1525		1.4		25.25	6.32	0.257	—	" " "
1535		1.4		25.32	6.33	0.259	—	" " "
1545		1.4		24.53	5.75	0.250	714	" " "
1600		1.4		24.57	6.19	0.244	276	
1615		1.4		24.50	6.22	0.253	229	

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-22
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7/9/09
Dev. Method: Pump + Surge
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.57
Static Water Level Before (ft.): 2.82
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0725		2.6						Purged dry
0735		2.6		24.18	6.41	0.192	345	" "
0740		2.6		23.83	6.26	0.190	325	" "
0750		1.6		24.48	6.28	0.174	300	
0800		1.6		25.20	6.34	0.171	500	
0810		1.6		25.20	6.50	0.170	650	
0820		1.6		25.33	6.51	0.167	520	
0830		1.6		~~24.59~~ 25.20	~~6.29~~ 6.62	0.164	260	
0840		1.6		25.43	6.53	0.167	215	
				DONE				

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-23
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7-7-09
Dev. Method: Pump + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.90
Static Water Level Before (ft.): 2.76
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
								Dry well, dk brn/BLK, odor
1450		1 gal		—	—	—	—	Very turbid wait for
1500				26.13	6.46	0.554	MAX	Dry well, dk Brn/BLK to next
1510		4 gal		25.37	6.41	0.549	max	Dry well, cloudy tan purge
1520		5.5		24.97	6.42	0.543	800+	" "
1530		6.5		24.91	6.38	0.536	548	" "
1540		8		24.90	6.33	0.531	343	" "
1555		10		24.58	6.42	0.531	270	" "
1615		12.5		24.77	6.45	0.513	185	Dry well fairly clear

* Ran surge block 3 times prior to purging

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW 24
Site: PARRIS ISLAND, SC
Date Installed:
Date Developed: 7-2-09
Dev. Method: PUMP + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.66
Static Water Level Before (ft.): 2.82
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK MENGEL / SHANNON HILL
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1020		2		25.82	6.61	0.522	—	PURGED DRY
1025		2		26.14	6.72	0.472	400	
1030		2		25.46	6.77	0.466	500	
1040		2		25.62	6.81	0.477	500	
1050		2		25.31	6.72	0.452	400	
1100		2		25.79	6.70	0.417	—	
1110		2		25.20	6.91	0.423	—	
1120		2		25.08	6.53	0.416	—	
1130		2		24.99	6.37	0.417	600	
1140		1.6		25.14	6.47	0.425	300	
1150		1.6		25.11	6.42	0.427	250	
1200		1.6		25.09	6.44	0.418	130	
		24 gal		DONE				

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW 25
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7-11-09
Dev. Method: PUMP + SURGE
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 12.95
Static Water Level Before (ft.): 3.20
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0810		2						PURGED DRY (No Readings
0815		2		25.43	6.85	0.185	—	" "
0825		2		25.60	6.26	0.185	275	" "
0835		2		25.86	6.16	0.184	400	
0845		2		26.16	6.37	0.180	380	
0855		2		25.74	6.24	0.176	430	
0905		2		25.85	6.15	0.175	450	
0915		2		26.10	6.33	0.181	700	
0920		2		25.76	6.36	0.179	—	
0930		2		25.71	6.27	0.179	500	
0935		1.5		25.80	6.35	0.180	367	
0940		1.5		25.87	6.34	0.183	270	
0945		1.5		25.85	6.39	0.185	135	
0950		1.5		25.67	6.41	0.181	125	
		26 gal		DONE				

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-27D
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7-7-09
Dev. Method: Pump + Surge
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 33.84
Static Water Level Before (ft.): 2.90
Static Water Level After (ft.):
Screen Length (ft.):
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1350		7gal	~~2.230~~	24.41	6.61	0.720	12.5	WATER CLEAR
1355		14gal	22.30	23.68	6.97	0.775	4.6	" "
1410		21gal	22.90	24.34	7.26	0.785	4.1	" "
1415		28gal	22.90	23.84	7.24	0.788	2.0	" "
				DONE				

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-290
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7/8/09
Dev. Method: Pump + Surge
Pump Type: WATER SPOUT

Depth to Bottom (ft.): 35.05
Static Water Level Before (ft.): 4.80
Static Water Level After (ft.):
Screen Length (ft.): 2'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK mengel / shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ms/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
0825		7 gal	22.00	24.81	6.78	0.757	76	
0835		12 gal		24.93	6.98	0.809	23	well purged dry
0850		15 gal		24.95	7.03	0.762	7.9	
0855		18 gal		25.00	6.89	0.760	7.3	
0910		21 gal		25.18	6.89	0.762	2.5	
0915		28 gal		25.08	6.81	0.762	4.9	
				DONE				

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-30D
Site: PARRIS Island, SC
Date Installed:
Date Developed: 7/8/09
Dev. Method: Pump + Surge
Pump Type: WATER SPOUT

Depth to Bottom (ft.): ~~MW 30D~~
Static Water Level Before (ft.): 33.60
Static Water Level After (ft.): 6.20
Screen Length (ft.): 5'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: MARK Mengel / Shannon Hill
Drilling Co.:
Project Name: DEPOT GAS STATION
Project Number: 112601822

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1215		7 gal		26.22	7.15	0.925	190	Purged dry
1245		14 gal		25.89	7.35	0.968	650	Purged dry
1305		21 gal		25.78	7.28	0.945	16.2	Purged dry
1330		28 gal		26.06	7.40	0.952	11	Purged dry
				DONE				

APPENDIX B

GROUNDWATER SAMPLE LOG SHEETS

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01882

Sample ID:	PAIDGSMW0101	Sampled By:	S. Hill
QA/QC Duplicate ID:	NA	Sample Date:	07/09/09
MS/MSD Collected:	NO	Sample Time:	1440

WELL INFORMATION:

Well ID :	MW-01	Purge Date:	07/09/09
Well Diameter (in):	2"	Static Water Level (ft-BTOR):	2.85
Top of Screen (ft-BTOR):	2'	PID Monitor Reading:	
Bottom of Screen (ft-BTOR):	12'	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	12.25	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-50-18F7N03R	Pump Controller:	U55074X
Turbidity Meter:	Horiba U-50-18F7NO3R		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1340											
1350	3.05	200	clear	6.5	0.485	1.2	40.6	25.96	-27	0.3	
1400	3.1	200	clear	6.45	0.489	1	35	25.99	-32	0.3	
1410	3.15	200	clear	6.46	0.487	0.97	20	26.05	-35	0.3	
1420	3.2	200	clear	6.47	0.488	0.98	19.6	26.14	-37	0.3	
1430	3.2	200	clear	6.47	0.485	0.96	16	26.23	-42	0.3	
1435	3.25	200	clear	6.47	0.486	1.05	10	26.25	-43	0.3	
1440	3.25	200	clear	6.46	0.487	1	8.9	26.27	-45	0.3	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1340	1440	60	3.1 gal.	6.46	0.487	1	8.9	26.27	-45	0.3	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3, Alkalinity	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

Petroleum odor in well.
FERROUS IRON FIELD TEST: 0.5 mg/L

Signature(s): *Shannon Hill*

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW0201	Sampled By:	S. Hill
QA/QC Duplicate ID:		Sample Date:	07/10/09
MS/MSD Collected:	YES	Sample Time:	0840

WELL INFORMATION:

Well ID :	MW-02	Purge Date:	07/10/09
Well Diameter (in):	2"	Static Water Level (ft-BTOR):	2.6
Top of Screen (ft-BTOR):	2'	PID Monitor Reading:	
Bottom of Screen (ft-BTOR):	12'	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	11.72'	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-52-18F7N03R	Pump Controller:	U55074X
Turbidity Meter:	Horiba U-52-18F7N03R		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0740											
0750	3.05	175	clear	6.67	0.404	2.26	8.6	25.98	36	0.1	
0800	3.20	175	clear	6.63	0.394	2.55	13.8	26.12	31	0.1	
0810	3.23	175	clear	6.59	0.362	2.90	11.2	26.45	33	0.1	
0815	3.28	175	clear	6.60	0.359	2.76	9.6	26.43	34	0.1	
0825	3.40	175	clear	6.60	0.371	2.06	8.7	26.36	37	0.1	
0830	3.41	175	clear	6.55	0.376	1.94	9.3	26.32	37	0.1	
0835	3.43	175	clear	6.60	0.377	1.90	9.1	26.32	39	0.1	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0740	0840	60	2.8 gal.	6.60	0.377	1.90	9.1	26.32	39	0.1	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3, Alkalinity	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

Ferrous Iron Field Test: 0.5 mg/L

Signature(s): *Shannon Hill*

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW0301	Sampled By:	S. Hill
QA/QC Duplicate ID:	FD0712090101	Sample Date:	07/12/09
MS/MSD Collected:	NO	Sample Time:	1500

WELL INFORMATION:

Well ID :	MW-03	Purge Date:	07/12/09
Well Diameter (in):	2"	Static Water Level (ft-BTOR):	3.1
Top of Screen (ft-BTOR):	2'	PID Monitor Reading:	
Bottom of Screen (ft-BTOR):	12'	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	11.70'	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-52-18F7N03R	Pump Controller:	U55074X
Turbidity Meter:	Horiba U-52-18F7N03R		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1415											
1425	3.62	200	clear	6.20	0.411	0.81	3.4	25.91	-31	0.1	
1430	3.71	200	clear	6.23	0.400	0.73	4.5	25.66	-37	0.1	
1435	3.80	200	clear	6.25	0.401	0.70	5.5	25.57	-41	0.1	
1445	8.20	200	clear	6.26	0.412	0.67	7.2	25.30	-46	0.1	
1450	8.50	200	clear	6.22	0.418	0.67	8.2	25.23	-47	0.1	
1455	8.50	200	clear	6.24	0.421	0.67	8.5	25.23	-49	0.1	
1500											

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1415	1500	45	2.3 gal.	6.24	0.421	0.67	8.50	25.23	-49	0.1	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3, Alkalinity	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

Petroleum odor in well.
Ferrous Iron Field Test: 3.4 mg/L

Signature(s): *Shannon Hill*

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW0401	Sampled By:	S. Hill
QA/QC Duplicate ID:	NA	Sample Date:	07/10/09
MS/MSD Collected:	NO	Sample Time:	1430

WELL INFORMATION:

Well ID :	MW-04	Purge Date:	07/10/09
Well Diameter (in):	2"	Static Water Level (ft-BTOR):	3.08
Top of Screen (ft-BTOR):	2'	PID Monitor Reading:	
Bottom of Screen (ft-BTOR):	12'	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	11.80'	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-52-18F7N03R	Pump Controller:	U55074X
Turbidity Meter:	Horiba U-52-18F7N03R		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1325											
1335	4.15	200	clear	6.93	0.513	4.17	32.2	26.75	73	0.1	
1345	5.10	200	clear	6.85	0.509	3.99	19.2	26.65	38	0.1	
1355	5.95	200	clear	6.92	0.499	4.42	13.3	26.90	58	0.1	
1405	6.68	200	clear	6.93	0.491	4.75	11.8	26.67	79	0.1	
1415	7.19	200	clear	6.90	0.485	4.62	10.0	26.54	93	0.1	
1420	7.50	200	clear	6.89	0.485	4.53	9.8	26.47	96	0.1	
1425	7.30	200	clear	6.89	0.485	4.52	9.9	26.46	99	0.1	
1430											

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1325	1430	65	3.4 gal.	6.89	0.485	4.52	9.9	26.46	99	0.1	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3, Alkalinity	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

Ferrous Iron Field Test: 0.0 mg/L

Signature(s): *Shannon Hill*

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW0501			Sampled By:	S. Hill
QA/QC Duplicate ID:	NA			Sample Date:	07/14/09
MS/MSD Collected:		NO		Sample Time:	0825

WELL INFORMATION:

Well ID :	MW-05	Purge Date:	07/14/09
Well Diameter (in):	2"	Static Water Level (ft-BTOR):	2.65
Top of Screen (ft-BTOR):	2'	PID Monitor Reading:	
Bottom of Screen (ft-BTOR):	12'	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	11.77'	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-52-18F7N03R	Pump Controller:	U55074X
Turbidity Meter:	LaMotte- 26858		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0740											
0750	3.25	220	clear	6.44	0.665	1.39	7.6	23.63	-37	0.2	
0800	3.3	220	clear	6.46	0.68	0.97	5.8	23.66	-46	0.2	
0810	3.4	220	clear	4.46	0.682	1.42	4.7	23.69	-54	0.2	
0815	3.4	220	clear	6.47	0.683	0.81	5.7	23.70	-55	0.2	
0820	3.4	220	clear	6.48	0.689	0.77	4	23.73	-57	0.2	
0825											

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0740	0825	45	2.6 gal.	6.48	0.689	0.77	4	23.73	-57	0.2	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3, Alkalinity	9056	4°C	1	500 ml	PE	Y
Ammonia		H2SO4, 4°C	1	500 ml	PE	Y
Heterotrophic Plate Count		4°C	2	40 ml	Glass vials	Y

OBSERVATIONS / NOTES:

Petroleum odor in well.
Ferrous Iron Field Test: 5.0 mg/L

Signature(s): *Shannon Hill*

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01882

Sample ID:	PAIDGSMW0701	Sampled By:	MARK MENGEL
QA/QC Duplicate ID:	NA	Sample Date:	07/10/09
MS/MSD Collected:	YES / NO X	Sample Time:	0825

WELL INFORMATION:

Well ID :	MW07	Purge Date:	07/10/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	2.91
Top of Screen (ft-BTOR):	2.5	PID Monitor Reading:	NA
Bottom of Screen (ft-BTOR):	12.5	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	12.5	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	HORIBA - U5000	Pump Controller:	
Turbidity Meter:	HORIBA - U5000		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0730	3.21	240	CLEAR	6.65	0.682	7.21	7.6	25.91	-71	NA	
0740	3.31	250	CLEAR	6.66	0.575	3.3	6.4	26.91	-66	NA	
0750	3.35	240	CLEAR	6.62	0.547	2.02	5.1	27.35	-61	NA	
0800	3.29	220	CLEAR	6.61	0.569	1.53	3.6	27.5	-64	NA	
0810	3.29	220	CLEAR	6.62	0.59	1.49	2.4	27.6	-67	NA	
0820	3.29	220	CLEAR	6.62	0.601	0.96	1.9	27.67	-68	NA	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
730	0820	50	2.4 gal.	6.62	0.601	0.96	1.9	27.67	-68	NA	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

FERROUS IRON FIELD TEST: 4.4 mg/L

Signature(s): MARK L MENGEL

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01882

Sample ID:	PAIDGSMW0801	Sampled By:	MARK MENGEL
QA/QC Duplicate ID:	NA	Sample Date:	07/10/09
MS/MSD Collected:	YES / NO X	Sample Time:	1230

WELL INFORMATION:

Well ID :	MW08	Purge Date:	07/10/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	2.67
Top of Screen (ft-BTOR):	2.15	PID Monitor Reading:	NA
Bottom of Screen (ft-BTOR):	12.15	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	12.15	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	HORIBA - U5000	Pump Controller:	
Turbidity Meter:	HORIBA - U5000		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1130	3.37	220	CLEAR	6.58	0.356	5.61	28	28.84	73	NA	
1140	3.64	200	CLEAR	6.56	0.354	2.72	32	29.02	71	NA	
1150	4.32	200	CLEAR	6.49	0.343	1.91	32	30.61	31	NA	
1200	4.55	200	CLEAR	6.51	0.348	1.68	38	30.86	6	NA	
1210	4.74	200	CLEAR	6.58	0.360	2.04	23	30.61	-21	NA	
1220	4.85	200	CLEAR	6.59	0.364	0.96	16	30.51	-31	NA	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1130	1220	50	2.6 gal.	6.59	0.364	0.96	16	30.51	-31	NA	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

FERROUS IRON FIELD TEST: 3.0 mg/L

Signature(s): MARK L MENGEL

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW0901			Sampled By:	S. Hill
QA/QC Duplicate ID:				Sample Date:	07/12/09
MS/MSD Collected:		NO		Sample Time:	1735

WELL INFORMATION:

Well ID :	MW-09	Purge Date:	07/12/09
Well Diameter (in):	2"	Static Water Level (ft-BTOR):	1.8
Top of Screen (ft-BTOR):	2'	PID Monitor Reading:	
Bottom of Screen (ft-BTOR):	12'	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	12.04'	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-52-18F7N03R	Pump Controller:	U55074X
Turbidity Meter:	Horiba U-52-18F7N03R		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1640											
1650	2.1	200	clear	6.18	0.583	1.11	77.4	25.29	59	0.1	
1700	2.15	200	clear	6.22	0.590	1.46	56.9	25.04	34	0.1	
1710	2.2	200	clear	6.22	0.590	1.65	58.4	24.98	25	0.1	
1720	2.2	200	clear	6.21	0.590	1.63	11	25.02	26	0.1	
1725	2.2	200	clear	6.18	0.593	1.67	9	24.89	26	0.1	
1730	2.2	200	clear	6.20	0.593	1.67	8.9	24.85	25	0.1	
1735											

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1640	1735	55	2.9 gal.	6.20	0.593	1.67	8.9	24.85	25	0.1	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3, Alkalinity	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

Ferrous Iron Field Test: 3.4 mg/L

Signature(s): *Shannon Hill*

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW1101			Sampled By:	S. Hill
QA/QC Duplicate ID:	NA			Sample Date:	07/13/09
MS/MSD Collected:		NO		Sample Time:	

WELL INFORMATION:

Well ID :	MW-11	Purge Date:	07/13/09
Well Diameter (in):	2"	Static Water Level (ft-BTOR):	2.5
Top of Screen (ft-BTOR):	2'	PID Monitor Reading:	
Bottom of Screen (ft-BTOR):	12'	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	12'	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-52-18F7N03R	Pump Controller:	U55074X
Turbidity Meter:	Horiba U-52-18F7N03R		

PURGE DATA:

Time (Hrs)	H^2O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0732											
0742	2.92	220	clear	5.82	0.438	1.23	59.1	24.79	84	0.1	
0752	2.92	220	clear	5.8	0.436	1.07	39.7	25.09	75	0.1	
0802	2.92	220	clear	5.71	0.441	1.12	35.2	25.41	73	0.1	
0812	2.92	220	clear	5.70	0.437	1.00	28.9	25.71	66	0.1	
0822	2.95	220	clear	5.86	0.437	0.97	25	26.05	59	0.1	
0830	2.95	220	clear	5.82	0.442	1.03	20.1	25.75	58	0.1	
0840	2.95	220	clear	5.83	0.441	1.02	19.3	25.91	56	0.1	
0850	2.95	220	clear	5.81	0.445	1.04	11	25.85	56	0.1	
0900	3.00	220	clear	5.81	0.442	1.06	11	25.75	54	0.1	
0910											

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0732	0910	98	5.7 gal.	5.81	0.442	1.06	11	25.75	54	0.1	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3, Alkalinity	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

Ferrous Iron Field Test: 3.6 mg/L

Signature(s): *Shannon Hill*

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW1201	Sampled By:	S. Hill
QA/QC Duplicate ID:		Sample Date:	07/13/09
MS/MSD Collected:	NO	Sample Time:	1030

WELL INFORMATION:

Well ID :	MW-12	Purge Date:	07/13/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	2.65
Top of Screen (ft-BTOR):	2'	PID Monitor Reading:	
Bottom of Screen (ft-BTOR):	12'	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	12.4	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-52-18F7N03R	Pump Controller:	U55074X
Turbidity Meter:	Horiba U-52-18F7N03R		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0945											
0955	2.9	220	clear	6.58	0.441	2.52	43.90	25.11	9	0.1	
1005	2.9	220	clear	6.53	0.443	2.05	28.50	25.26	8	0.1	
1015	2.9	220	clear	6.47	0.450	1.83	12.50	25.32	7	0.1	
1020	2.9	220	clear	6.43	0.453	1.74	8.90	25.31	7	0.1	
1025	2.9	220	clear	6.43	0.455	1.73	9.10	25.33	6	0.1	
1030											

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0945	1030	45	2.6 gal.	6.43	0.455	1.73	9.10	25.33	6	0.1	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3, Alkalinity	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

Ferrous Iron Field Test: 5.0 mg/L

Signature(s): *Shannon Hill*

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW1401	Sampled By:	S. Hill
QA/QC Duplicate ID:		Sample Date:	07/14/09
MS/MSD Collected:	NO	Sample Time:	1035

WELL INFORMATION:

Well ID :	MW-14	Purge Date:	07/14/09
Well Diameter (in):	2"	Static Water Level (ft-BTOR):	2.3
Top of Screen (ft-BTOR):	2'	PID Monitor Reading:	
Bottom of Screen (ft-BTOR):	12'	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	12.25'	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-52-18F7N03R	Pump Controller:	U55074X
Turbidity Meter:	Horiba U-52-18F7N03R		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0945											
0955	2.84	250	clear	6.49	0.463	1.09	7.6	28.06	-42	0.1	
1005	2.86	250	clear	6.52	0.456	0.87	5.3	28.54	-48	0.1	
1015	2.90	250	clear	6.52	0.456	0.80	5.3	28.80	-51	0.1	
1025	3.95	250	clear	6.52	0.457	0.76	5.1	28.97	-53	0.1	
1030	3.00	250	clear	6.52	0.455	0.75	4.7	29.02	-54	0.1	
1035											

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0945	1035	50	3.3 gal.	6.52	0.455	0.75	4.7	29.02	-54	0.1	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3, Alkalinity	9056	4°C	1	500 ml	PE	Y
Ammonia		H2SO4, 4°C	1	500 ml	PE	Y
Heterotrophic Plate Count		4°C	2	40 ml	Glass vials	Y

OBSERVATIONS / NOTES:

Petroleum odor in well.
Ferrous Iron Field Test: 3.6 mg/L

Signature(s): *Shannon Hill*

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW1601	Sampled By:	MARK MENGEL
QA/QC Duplicate ID:	NA	Sample Date:	07/13/09
MS/MSD Collected:	YES / NO X	Sample Time:	0840

WELL INFORMATION:

Well ID :	MW16	Purge Date:	07/13/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	3.11
Top of Screen (ft-BTOR):	2.5	PID Monitor Reading:	NA
Bottom of Screen (ft-BTOR):	12.5	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	12.5	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	HORIBA - U5000	Pump Controller:	
Turbidity Meter:	HORIBA - U5000		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0740	3.55	220	CLEAR	6.66	0.455	9.52	6.1	26.36	136	NA	
0750	3.65	220	CLEAR	6.55	0.451	2.57	4.8	27.02	20	NA	
0800	3.70	220	CLEAR	6.58	0.452	1.83	3.6	27.56	0	NA	
0810	3.71	220	CLEAR	6.59	0.454	1.48	3.6	28.23	-16	NA	
0820	3.73	220	CLEAR	6.59	0.454	1.39	3.4	28.61	-22	NA	
0830	3.74	220	CLEAR	6.59	0.453	1.28	3.4	29.02	-27	NA	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0740	0830	50	2.9 gal.	6.59	0.453	1.28	3.4	29.02	-27	NA	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

FERROUS IRON FIELD TEST: 3.0 mg/L

Signature(s): MARK L MENGEL

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW1701	Sampled By:	MARK MENGEL
QA/QC Duplicate ID:	NA	Sample Date:	07/13/09
MS/MSD Collected:	YES / NO X	Sample Time:	1030

WELL INFORMATION:

Well ID :	MW17	Purge Date:	07/13/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	2.75
Top of Screen (ft-BTOR):	2.5	PID Monitor Reading:	NA
Bottom of Screen (ft-BTOR):	12.5	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	12.5	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	HORIBA - U5000	Pump Controller:	
Turbidity Meter:	HORIBA - U5000		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0920	2.75	220	CLEAR	6.39	0.331	1.97	22.4	31.14	74	NA	
0930	3.12	220	CLEAR	6.35	0.335	1.40	23.4	30.30	71	NA	
0940	3.21	220	CLEAR	6.30	0.338	0.76	18.8	30.01	95	NA	
0950	3.27	220	CLEAR	6.19	0.327	0.93	13.6	30.07	104	NA	
1000	3.29	220	CLEAR	6.10	0.319	0.95	10.3	30.27	90	NA	
1010	3.30	220	CLEAR	6.23	0.315	0.92	8.6	30.30	65	NA	
1020	3.31	220	CLEAR	6.28	0.312	0.89	6.1	30.41	52	NA	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0920	1020	60	3.5 gal	6.28	0.312	0.89	6.1	30.41	52	NA	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

FERROUS IRON FIELD TEST: 0.75 mg/L

Signature(s): MARK L MENGEL

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW1901	Sampled By:	MARK MENGEL
QA/QC Duplicate ID:	NA	Sample Date:	07/12/09
MS/MSD Collected:	YES / NO X	Sample Time:	1520

WELL INFORMATION:

Well ID :	MW19	Purge Date:	07/12/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	2.85
Top of Screen (ft-BTOR):	2.5	PID Monitor Reading:	NA
Bottom of Screen (ft-BTOR):	12.5	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	12.4	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	HORIBA - U5000	Pump Controller:	
Turbidity Meter:	HORIBA - U5000		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1425	3.25	220	CLEAR	6.51	0.547	7.54	5.5	29.43	-66	NA	
1435	3.85	220	CLEAR	6.49	0.57	1.7	10	27.65	-83	NA	
1445	4.18	200	CLEAR	6.47	0.572	0.96	6.6	28.02	-86	NA	
1455	4.36	200	CLEAR	6.46	0.602	1.03	3.5	28.09	-90	NA	
1505	4.44	200	CLEAR	6.46	0.619	0.49	2.9	28.13	-90	NA	
1515	4.49	200	CLEAR	6.47	0.616	0.41	2.6	28.1	-89	NA	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1425	1515	50	2.7 gal.	6.47	0.616	0.41	2.6	28.1	-89	NA	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

FERROUS IRON FIELD TEST: 3.0 mg/L

Signature(s): MARK L MENGEL

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW2001	Sampled By:	S. Hill
QA/QC Duplicate ID:		Sample Date:	07/13/09
MS/MSD Collected:	NO	Sample Time:	1300

WELL INFORMATION:

Well ID :	MW-20	Purge Date:	07/13/09
Well Diameter (in):	2"	Static Water Level (ft-BTOR):	2.98
Top of Screen (ft-BTOR):	2'	PID Monitor Reading:	
Bottom of Screen (ft-BTOR):	12'	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	13.25'	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-52-18F7N03R	Pump Controller:	U55074X
Turbidity Meter:	Horiba U-52-18F7N03R		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1215											
1225	3.64	220	clear	6.68	0.401	1.22	36.6	26.91	-38	0.1	
1235	3.70	220	clear	6.68	0.383	1.12	26.9	27.54	-40	0.1	
1245	3.70	220	clear	6.69	0.391	1.02	11.3	27.65	-49	0.1	
1250	3.70	220	clear	6.69	0.397	1.00	8.1	27.56	-52	0.1	
1255	3.70	220	clear	6.69	0.403	0.96	8	27.45	-54	0.1	
1300											

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1215	1300	45	2.6 gal.	6.69	0.403	0.96	8	27.45	-54	0.1	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3, Alkalinity	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

Ferrous Iron Field Test: 3.6 mg/L

Signature(s): *Shannon Hill*

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW2101	Sampled By:	MARK MENGEL
QA/QC Duplicate ID:	NA	Sample Date:	07/14/09
MS/MSD Collected:	YES / NO X	Sample Time:	1040

WELL INFORMATION:

Well ID :	MW21	Purge Date:	07/14/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	2.48
Top of Screen (ft-BTOR):	2.5	PID Monitor Reading:	NA
Bottom of Screen (ft-BTOR):	12.5	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	13	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	HORIBA - U5000	Pump Controller:	
Turbidity Meter:	HORIBA - U5000		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0940	2.84	200	CLEAR	6.22	0.268	10.33	17.7	26.35	38	NA	
0950	2.84	200	CLEAR	6.26	0.272	1.39	15.0	26.12	9	NA	
1000	2.85	200	CLEAR	6.24	0.275	0.77	5.6	26.19	4	NA	
1010	2.88	200	CLEAR	6.23	0.276	0.58	1.9	26.42	-4	NA	
1020	2.90	200	CLEAR	6.23	0.278	1.24	1.5	26.59	-13	NA	
1030	2.91	200	CLEAR	6.23	0.277	1.08	1.5	26.32	-11	NA	
										NA	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0940	1030	50	2.7 gal.	6.23	0.277	1.08	1.5	26.32	-11	NA	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

FERROUS IRON FIELD TEST: 3.60 mg/L

Signature(s): MARK L MENGEL

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01882

Sample ID:	PAIDGSMW2201	Sampled By:	MARK MENGEL
QA/QC Duplicate ID:	NA	Sample Date:	07/10/09
MS/MSD Collected:	YES / NO X	Sample Time:	1440

WELL INFORMATION:

Well ID :	MW22	Purge Date:	07/10/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	2.26
Top of Screen (ft-BTOR):	2.5	PID Monitor Reading:	NA
Bottom of Screen (ft-BTOR):	12.5	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	12.57	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	HORIBA - U5000	Pump Controller:	
Turbidity Meter:	HORIBA - U5000		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1345	2.60	240	CLEAR	6.43	0.190	6.07	3.8	28.00	93	NA	
1355	2.72	240	CLEAR	6.13	0.190	2.28	4.1	27.7	80	NA	
1405	2.82	240	CLEAR	6.14	0.202	1.86	4.2	28.01	44	NA	
1415	2.86	240	CLEAR	6.35	0.200	1.63	2.9	28.00	22	NA	
1425	2.88	240	CLEAR	6.25	0.192	1.14	2.3	27.93	23	NA	
1435	2.91	240	CLEAR	6.17	0.188	0.96	1.8	27.98	23	NA	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1345	1435	50	3.2 gal.	6.17	0.188	0.96	1.8	27.98	23	NA	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

FERROUS IRON FIELD TEST: 3.4 mg/L

Signature(s): MARK L MENGEL

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW2301	Sampled By:	S. Hill
QA/QC Duplicate ID:	NA	Sample Date:	07/10/09
MS/MSD Collected:	NO	Sample Time:	1120

WELL INFORMATION:

Well ID :	MW-23	Purge Date:	07/10/09
Well Diameter (in):	2"	Static Water Level (ft-BTOR):	3
Top of Screen (ft-BTOR):	2'	PID Monitor Reading:	
Bottom of Screen (ft-BTOR):	12'	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	11.70'	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-52-18F7N03R	Pump Controller:	U55074X
Turbidity Meter:	Horiba U-52-18F7N03R		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1040											
1050	3.59	200	clear	6.60	0.583	1.25	11.9	25.83	-64	0.1	
1100	3.63	200	clear	6.59	0.591	1.05	10.4	25.99	-71	0.1	
1105	3.65	200	clear	6.56	0.597	1.00	9.90	26.11	-70	0.1	
1110	3.68	200	clear	6.59	0.599	0.97	9.10	26.18	-71	0.1	
1115	3.68	200	clear	6.58	0.601	0.94	8.40	26.30	-71	0.1	
1120											

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1040	1120	40	2.1 gal.	6.58	0.601	0.94	8.4	26.30	-71	0.1	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3, Alkalinity	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

Ferrous Iron Field Test: 5.0 mg/L

Signature(s): *Shannon Hill*

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW2401	Sampled By:	MARK MENGEL
QA/QC Duplicate ID:	NA	Sample Date:	07/13/09
MS/MSD Collected:	YES / NO X	Sample Time:	1330

WELL INFORMATION:

Well ID :	MW24	Purge Date:	07/13/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	2.82
Top of Screen (ft-BTOR):	2.5	PID Monitor Reading:	NA
Bottom of Screen (ft-BTOR):	12.5	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	13	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	HORIBA - U5000	Pump Controller:	
Turbidity Meter:	HORIBA - U5000		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1220	3.25	240	CLEAR	6.48	0.386	1.87	32.7	31.52	-7	NA	
1230	3.55	220	CLEAR	6.42	0.386	1.01	32.7	30.76	-6	NA	
1240	3.85	220	CLEAR	6.39	0.382	0.72	32.4	30.85	21	NA	
1250	4.20	220	CLEAR	6.38	0.384	0.55	25.2	30.56	-14	NA	
1300	4.42	220	CLEAR	6.11	0.394	1.65	26.1	30.04	-10	NA	
1310	4.59	220	CLEAR	6.46	0.400	0.61	28.0	29.82	-35	NA	
1320	4.71	220	CLEAR	6.30	0.405	0.49	23.7	29.25	-26	NA	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1220	1320	60	3.5 gal.	6.30	0.405	0.49	23.7	29.25	-26	NA	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

FERROUS IRON FIELD TEST: 3.80 mg/L

Signature(s): MARK L MENGEL

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW2501	Sampled By:	MARK MENGEL
QA/QC Duplicate ID:	NA	Sample Date:	07/14/09
MS/MSD Collected:	YES / NO X	Sample Time:	0850

WELL INFORMATION:

Well ID :	MW25	Purge Date:	07/14/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	2.82
Top of Screen (ft-BTOR):	2.5	PID Monitor Reading:	NA
Bottom of Screen (ft-BTOR):	12.5	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	13	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	HORIBA - U5000	Pump Controller:	
Turbidity Meter:	HORIBA - U5000		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0740	2.82	240	CLEAR	5.66	0.168	6.70	54.2	24.48	122	NA	
0750	3.30	220	CLEAR	5.47	0.159	3.66	7.1	24.70	178	NA	
0800	3.40	220	CLEAR	5.65	0.161	2.55	6.7	25.05	125	NA	
0810	3.46	220	CLEAR	5.82	0.163	2.62	13.9	25.24	91	NA	
0820	3.48	220	CLEAR	5.92	0.165	1.67	13.7	25.48	71	NA	
0830	3.52	220	CLEAR	5.99	0.166	1.39	13.2	25.65	59	NA	
0840	3.54	220	CLEAR	5.97	0.167	2.02	12.8	25.75	49	NA	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0740	0840	60	3.5 gal.	5.97	0.167	2.02	12.8	25.75	49	NA	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

FERROUS IRON FIELD TEST: 3.60 mg/L

Signature(s): MARK L MENGEL

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01822

Sample ID:	PAIDGSMW27D01	Sampled By:	MARK MENGEL
QA/QC Duplicate ID:	FD0712090201	Sample Date:	07/12/09
MS/MSD Collected:	YES / NO X	Sample Time:	1700

WELL INFORMATION:

Well ID :	MW27D	Purge Date:	07/12/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	3.66
Top of Screen (ft-BTOR):	29	PID Monitor Reading:	NA
Bottom of Screen (ft-BTOR):	34	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	38	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	HORIBA - U5000	Pump Controller:	
Turbidity Meter:	HORIBA - U5000		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1600	4.05	200	CLEAR	7.35	0.645	2.98	4.6	31.22	-122	NA	
1610	4.06	200	CLEAR	7.47	0.684	1.21	3.1	28.89	-145	NA	
1620	4.09	200	CLEAR	7.46	0.695	0.79	2.5	28.28	-150	NA	
1630	4.11	200	CLEAR	7.31	0.700	0.53	2.5	27.84	-144	NA	
1640	4.13	200	CLEAR	7.13	0.705	0.59	1.6	27.57	-135	NA	
1650	4.14	200	CLEAR	7.1	0.710	0.38	2.2	27.29	-133	NA	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1600	1650	50	2.6 G	7.10	0.710	0.38	2.2	27.29	-133	NA	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

FERROUS IRON FIELD TEST: 2.6 mg/L

Signature(s): MARK L MENGEL

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01882

Sample ID:	PAIDGSMW29D01	Sampled By:	MARK MENGEL
QA/QC Duplicate ID:	NA	Sample Date:	07/10/09
MS/MSD Collected:	YES / NO X	Sample Time:	1055

WELL INFORMATION:

Well ID :	MW29D	Purge Date:	07/10/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	4.16
Top of Screen (ft-BTOR):	33	PID Monitor Reading:	NA
Bottom of Screen (ft-BTOR):	35	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	35.05	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	HORIBA - U5000	Pump Controller:	
Turbidity Meter:	HORIBA - U5000		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0950	4.16	220	CLEAR	7.07	0.721	7.76	4.1	28.75	86	NA	
1000	5.22	220	CLEAR	7.01	0.751	1.42	1.0	28.11	68	NA	
1010	5.32	220	CLEAR	6.91	0.751	0.78	0.7	27.79	62	NA	
1020	5.37	240	CLEAR	6.87	0.751	0.57	0.5	27.60	51	NA	
1030	5.42	240	CLEAR	6.92	0.753	1.33	0.2	27.48	42	NA	
1040	5.42	240	CLEAR	6.86	0.749	0.49	0.2	27.42	42	NA	
1050	5.42	240	CLEAR	6.85	0.749	0.43	0.1	27.40	41	NA	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0950	1050	60	3.6 gal.	6.85	0.749	0.43	0.1	27.40	41	NA	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

FERROUS IRON FIELD TEST: 6.0 mg/L

Signature(s): MARK L MENGEL

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Event:	Groundwater Sampling
Project Site Name:	Depot Gas Station - Parris Island
Project No.:	112G01882

Sample ID:	PAIDGSMW30D01	Sampled By:	MARK MENGEL
QA/QC Duplicate ID:	NA	Sample Date:	07/09/09
MS/MSD Collected:	YES / NO X	Sample Time:	1455

WELL INFORMATION:

Well ID :	MW30D	Purge Date:	07/09/09
Well Diameter (in):	2	Static Water Level (ft-BTOR):	5.65
Top of Screen (ft-BTOR):	29	PID Monitor Reading:	NA
Bottom of Screen (ft-BTOR):	34	Purge Method:	Peristaltic Pump
Total Well Depth (ft-BTOR):	34	Sample Method:	Peristaltic Pump

EQUIPMENT INFORMATION:

Water Quality Instrument:	HORIBA - U5000	Pump Controller:	
Turbidity Meter:	HORIBA - U5000		

PURGE DATA:

Time (Hrs)	H^20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1410	5.65	300	CLEAR	7.36	0.995	1.80	2.1	25.73	31	NA	
1420	8.75	220	CLEAR	7.37	0.991	1.51	1.0	26.58	31	NA	
1430	8.55	220	CLEAR	7.35	0.982	0.99	0.5	26.44	-10	NA	
1440	8.65	220	CLEAR	7.35	0.975	0.81	0.3	26.15	-43	NA	
1450	8.70	220	CLEAR	7.30	0.973	0.72	0.2	25.56	-55	NA	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1410	1450	40	2.3 gal.	7.30	0.973	0.72	0.2	25.56	-55	NA	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOCs, Oxygenates	5030B, 8260B	HCL, 4°C	3	40 ml	Glass vials	Y
EDB	8011	HCL, 4°C	2	40 ml	Glass vials	Y
PAHs	8310	4°C	2	1 L	Amber Glass	Y
Methane	RSK	4°C	3	40 ml	Glass vials	Y
TOC	9060	HCL, 4°C	2	40 ml	Amber glass vials	Y
Lead	7421	HNO3, 4°C	1	250 ml	PE	Y
SO4, NO3	9056	4°C	1	500 ml	PE	Y

OBSERVATIONS / NOTES:

FERROUS IRON FIELD TEST: 0.5 mg/L

Signature(s): MARK L MENGEL

APPENDIX C

CHAIN OF CUSTODY FORMS

TETRA TECH NUS, INC.

CHAIN OF CUSTODY | NUMBER 27212 | PAGE ____ OF _____

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112601822	PARRIS ISLAND	MARK SLAPIC	412-921-7090	GCAL - ELIZABETH MARTIN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Mark L. Mengel		MARK MENGEL	724 777 0035	7979 GSRI AVE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX 8631 2526 6491		BATON ROUGE, LA 70820

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2009	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	VOCs, OXYGENATES	EDB	PAH'S	Methane	SO4, NITRATE	TOC	LEAD	COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	G	G	PE	G	PE	
PRESERVATIVE USED									HCL	HCL	NA	NA	NA	HCL	HNO3	
7/9	1440	PAIDGSMW00101				GW	G		3	2	2	3	1	2	1	
7/9	1455	PAIDGSMW30D01				GW	G	14	3	2	2	3	1	2	1	
7/9	1500	~~PAIDGS~~TB07090901				QC	G	2	2							

1. RELINQUISHED BY Mark L. Mengel	DATE 7-9-09	TIME 1630	1. RECEIVED BY FED EX	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC.

CHAIN OF CUSTODY | NUMBER 27213 | PAGE ____ OF _____

PROJECT NO: 11260 1822	FACILITY: PARRIS ISLAND	PROJECT MANAGER: MARK SLADIC	PHONE NUMBER: 412 921-7090	LABORATORY NAME AND CONTACT: GCAL - LIZ MARTIN
SAMPLERS (SIGNATURE): Mark L. Mengel		FIELD OPERATIONS LEADER: MARK MENGEL	PHONE NUMBER: 724 777 0035	ADDRESS: 7979 GSRI AVE
		CARRIER/WAYBILL NUMBER: FED EX # 8631 2526 9619		CITY, STATE: BATON ROUGE, LA. 70820

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G G G G PE PE

PRESERVATIVE USED: HCL HCL NA HCL NA NA HNO3

TYPE OF ANALYSIS

DATE YEAR 2009	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	VOCs, OXYGENATES	EDB	METHANE	TOC	PAHS	SO4, NITRATE	LEAD	COMMENTS
7/10	0700	TB07100901				QC	G	2	2							
7/10	0825	PAIDGSMW0701				GW	G	14	3	2	3	2	2	1	1	
7/10	0840	PAIPGSMW0201				GW	G	40	9	6	9	6	6	1	3	RUN MS/MSD
7/10	1055	PAIDGSMW29D01				GW	G	14	3	2	3	2	2	1	1	
7/10	1120	PAIDGSMW2301				GW	G	14	3	2	3	2	2	1	1	
7/10	1230	PAIDGSMW0801				GW	G	14	3	2	3	2	2	1	1	
7/10	1430	PAIDGSMW0401				GW	G	14	3	2	3	2	2	1	1	
7/10	1440	PAIDGSMW2201				GW	G	14	3	2	3	2	2	1	1	

1. RELINQUISHED BY: Mark L. Mengel	DATE: 7-10-09	TIME: 1600	1. RECEIVED BY	DATE / TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE / TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE / TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC.

CHAIN OF CUSTODY | NUMBER 27214 | PAGE ____ OF _____

PROJECT NO: 112601822	FACILITY: PARRIS ISLAND	PROJECT MANAGER: MARK SLADIC	PHONE NUMBER: 412-921-7090	LABORATORY NAME AND CONTACT: GCAL - LIZ MARTIN
SAMPLERS (SIGNATURE): Mark L. Mengel		FIELD OPERATIONS LEADER: MARK McABEE	PHONE NUMBER: 724-777-0035	ADDRESS: 7979 GSRI AVE
		CARRIER/WAYBILL NUMBER: FED EX # 863125269608		CITY, STATE: BATON ROUGE, LA 70820

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G)

PRESERVATIVE USED

TYPE OF ANALYSIS

DATE YEAR 2009	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	VOCs, Oxygenates	FDB	PAH's	Methane	SO4, Nitrate	TOC	Lead	COMMENTS
									HCL	HCL	NA	NA	NA	HCL	HNO3	
7/12	1500	PAIDGSMW0301				GW	G	14	3	2	2	3	1	2	1	
7/12	0000	FD0712090101				GW	G	14	3	2	2	3	1	2	1	DUPLICATE OF PAIDGSMW0301
7/12	1520	PAIDGSMW1901				GW	G	14	3	2	2	3	1	2	1	
7/12	1700	PAIDGSMW27D01				GW	G	14	3	2	2	3	1	2	1	
7/12	0000	FD0712090201				GW	G	14	3	2	2	3	1	2	1	DUPLICATE OF PAIDGSMW27D01
7/12	1735	PAIDGSMW0901				GW	G	14	3	2	2	3	1	2	1	
7/13	0800	TB0713090 1				QC	G	2	2							
7/13	0840	PAIDGSMW1601				GW	G	14	3	2	2	3	1	2	1	
7/13	0910	PAIDGSMW1101				GW	G	14	3	2	2	3	1	2	1	
7/13	1030	PAIDGSMW1701				GW	G	14	3	2	2	3	1	2	1	
7/13	1030	PAIDGSMW1201				GW	G	14	3	2	2	3	1	2	1	
7/13	1330	PAIDGSMW2401				GW	G	14	3	2	2	3	1	2	1	
7/13	1300	PAIDGSMW2001				GW	G	14	3	2	2	3	1	2	1	

1. RELINQUISHED BY: Mark L. Mengel	DATE: 7-13-09	TIME: 1600	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

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FORM NO. TtNUS-001

TETRA TECH NUS, INC.

CHAIN OF CUSTODY | NUMBER 27215 | PAGE 1 OF 1

PROJECT NO: 112601822	FACILITY: PARRIS ISLAND	PROJECT MANAGER: MARK SLADIC	PHONE NUMBER: 412 921-7090	LABORATORY NAME AND CONTACT: GCAL - LIZ MARTIN
SAMPLERS (SIGNATURE): Mark L. Mengel		FIELD OPERATIONS LEADER: MARK MENGEL	PHONE NUMBER: 724-777-0035	ADDRESS: 7979 GSRI AVE
		CARRIER/WAYBILL NUMBER: FED EX # 863125269593		CITY, STATE: BATON ROUGE, LA 70820

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2009	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	VOCs, OXYGENATES	EDB	PAH'S	METHANE	SO4, NITRATE	SO4, NITRATE, ALK.	TOC	LEAD	AMMONIA	COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	G	G	P	P	G	P		
PRESERVATIVE USED									HCL	HCL	NA	NA	NA	NA	HCL	HNO3		
7/14	0825	PAIDGSMW0501				GW	G	14	3	2	2	3		1	2	1	1	
7/14	0850	PAIDGSMW2501				GW	G	14	3	2	2	3	1		2	1		
7/14	1040	PAIDGSMW2101				GW	G	14	3	2	2	3	1		2	1		
7/14	1035	PAIDGSMW1401				GW	G	14	3	2	2	3		1	2	1	1	
7/14	0800	TB07140901				QC	G	2	2									
7/14	1130	FB07140901				QC	G	14	3	2	2	3		1	2	1		

1. RELINQUISHED BY: Mark L. Mengel	DATE: 7-14-09	TIME: 1600	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

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FORM NO. TtNUS-001

TETRA TECH NUS, INC.

CHAIN OF CUSTODY | NUMBER 27216 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G01822	PARRIS ISLAND	MARK SLADIC	412-921-7090	MICROBIAL
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Mark L. Mengel		MARK MENGEL	724-777-0035	2340 STOCK CREEK BLVD
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX # 8631 2526 9582		ROCKFORD, TN 37853

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2009	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: Heterotrophic Plate CT.								COMMENTS
									CONTAINER TYPE PLASTIC (P) or GLASS (G)	G							
									PRESERVATIVE USED								
7/14	0825	PAIDGS MW0501				GW	G	2	2								
7/14	1035	PAIDGS MW1401				GW	G	2	2								

1. RELINQUISHED BY Mark L. Mengel	DATE 07-14-09	TIME 1600	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

APPENDIX D

DATA VALIDATION RECORDS AND ANALYTICAL RESULTS

Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO:	M. SLADIC	DATE:	SEPTEMBER 8, 2009
FROM:	TERRI L. SOLOMON	COPIES:	DV FILE

SUBJECT: **ORGANIC / INORGANIC DATA VALIDATION – VOCs, PAHs, METHANE, LEAD, NITRATE, TOTAL ORGANIC CARBON, SULFATE**
CTO – 0136 MCRD PARRIS ISLAND
SAMPLE DELIVERY GROUP (SDG) – 209071010

SAMPLES: 11/Aqueous/

PAIDGSMW00101	PAIDGSMW0201	PAIDGSMW0401
PAIDGSMW0701	PAIDGSMW0801	PAIDGSMW2201
PAIDGSMW2301	PAIDGSMW29D01	PAIDGSMW30D01
TB07090901	TB07100901	

Overview

The sample set for CTO 0136, MCRD Parris Island, SDG 2092071010, consists of nine (9) aqueous environmental samples and two (2) trip blanks (TB07090901 and TB07100901). No field duplicates were included within this SDG.

All samples with the exception of TB07090901 and TB07100901 were analyzed for select oxygenated volatile organic compounds, BTEX, 1,2-dichloroethane, 1,2-dibromoethane, polycyclic aromatic hydrocarbons, methane, lead, nitrate, total organic carbon and sulfate. Samples TB07090901 and TB07100901 were analyzed for select oxygenate volatile organic compounds only. The samples were collected by Tetra Tech NUS on July 9 and 10, 2009 and analyzed by Gulf Coast Analytical Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Select oxygenated volatile organic compounds, BTEX and 1,2-dichloroethane analyses were conducted using SW-846 method 8260 and 1,2-dibromomethane analyses were conducted using SW-846 method 8011. Methane analyses were conducted using method RSK-175. PAH analyses were conducted using SW-846 method 8270 by SIM. Lead analyses were conducted using SW-846 method 6010B. Nitrate analyses were conducted using EPA method 353.2. Total organic carbon analyses were conducted using Standard method 5310B. Sulfate analyses were conducted using Sw-846 method 9056.

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • GC/MS Tune
• Initial / Continuing Calibration Results
* • Laboratory Method / Preparation / Trip Blank Analyses
* • Detection Limits

* - All quality control criteria were met for this parameter.

VOCs

The initial calibration relative response factors (RRFs) for ethanol, 3,3-dimethyl-1-butanol, t-amyl alcohol and tert-butyl alcohol on 7/5/09, instrument MSV6, were < 0.05 quality control limit affecting all samples. The nondetected results reported for ethanol, 3,3-dimethyl-1-butanol, t0amyl alcohol and tert-butyl alcohol were qualified as rejected, "UR". The positive results reported for t-amyl alcohol and tert-butyl alcohol were qualified as estimated, "J".

The continuing calibration RRFs for tert-butyl alcohol and ethanol on 7/11/09 at 11:12 and 7/16/09 at 7:53, instrument MSV6, were < 0.05 quality control limit affecting all samples. The nondetected results reported for tert-butyl alcohol and ethanol were qualified as rejected, "UR". The positive results reported for tert-butyl alcohol were qualified as estimated, "J".

Notes

Positive results reported below the reporting limit (RL) but above the method detection limit (MDL) for the organic analyses were qualified as estimated, "J".

Executive Summary

Laboratory Performance: Several RRF factors for ethanol, 3,3-dimethyl-1-butanol, t-amyl alcohol and tert-butyl alcohol were < 0.05 quality control limit.

Other Factors Affecting Data Quality: Positive results reported below the RL but above the MDL for the organic analyses were qualified as estimated, "J".

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Review", Oct 1999, "National Functional Guidelines for Inorganic Review", October 2004, and the DOD document entitled "Quality System Manual (QSM) for Environmental Laboratories" (Jan 2006).

The text of this report has been formulated to address only those problem areas affecting data quality.

Terri L. Solomon

Tetra Tech NUS
Terri L. Solomon
Environmental Scientist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS-GFAA MSA's r < 0.995 / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O - Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DOT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 01822	NSAMPLE	PAIDGSMW00101			PAIDGSMW0201			PAIDGSMW0401			PAIDGSMW0701		
SDG: 209071010	LAB_ID	20907101001			20907101006			20907101012			20907101005		
FRACTION: OV	SAMP_DATE	7/9/2009			7/10/2009			7/10/2009			7/10/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,2-DIBROMOETHANE		0.0035	U		0.0035	U		0.0035	U		0.0035	U	
1,2-DICHLOROETHANE		0.064	U		0.064	U		0.064	U		0.064	U	
BENZENE		1790			2.62	J	P	0.075	U		4.94	J	P
DIISOPROPYL ETHER		0.529	U		0.529	U		0.529	U		0.529	U	
ETHANOL		59.5	UR	C	59.5	UR	C	59.5	UR	C	59.5	UR	C
ETHYL TERT-BUTANOL		5.56	UR	C	5.56	UR	C	5.56	UR	C	5.56	UR	C
ETHYL TERT-BUTYL ETHER		0.259	U		0.259	U		0.259	U		0.259	U	
ETHYLBENZENE		152			0.052	U		0.052	U		0.052	U	
METHYL TERT-BUTYL ETHER		0.516	J	P	0.077	U		0.077	U		0.077	U	
TERT-AMYL ALCOHOL		7680	J	C	15.6	UR	C	15.6	UR	C	767	J	C
TERT-AMYL METHYL ETHER		0.348	U		0.348	U		0.348	U		0.348	U	
TERT-BUTYL FORMATE		0.357	U		0.357	U		0.357	U		0.357	U	
TERTIARY-BUTYL ALCOHOL		217	J	C	4.12	UR	C	4.12	UR	C	28.7	J	C
TOLUENE		37.9			0.082	U		0.082	U		0.082	U	
TOTAL XYLENES		242			0.334	U		0.334	U		0.334	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW0801			PAIDGSMW2201			PAIDGSMW2301			PAIDGSMW29D01		
SDG: 209071010	LAB_ID	20907101011			20907101013			20907101010			20907101009		
FRACTION: OV	SAMP_DATE	7/10/2009			7/10/2009			7/10/2009			7/10/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,2-DIBROMOETHANE		0.0035	U		0.0035	U		0.0035	U		0.0035	U	
1,2-DICHLOROETHANE		0.064	U		0.064	U		0.064	U		0.064	U	
BENZENE		0.075	U		0.075	U		18.9			0.075	U	
DIISOPROPYL ETHER		0.529	U		0.529	U		0.529	U		1.8	J	P
ETHANOL		59.5	UR	C	59.5	UR	C	59.5	UR	C	59.5	UR	C
ETHYL TERT-BUTANOL		5.56	UR	C	5.56	UR	C	5.56	UR	C	5.56	UR	C
ETHYL TERT-BUTYL ETHER		0.259	U		0.259	U		0.259	U		0.259	U	
ETHYLBENZENE		0.052	U		0.052	U		12			0.052	U	
METHYL TERT-BUTYL ETHER		0.077	U		0.077	U		5.17			0.077	U	
TERT-AMYL ALCOHOL		15.6	UR	C	15.6	UR	C	15.6	UR	C	78.7	J	C
TERT-AMYL METHYL ETHER		0.348	U		0.348	U		8.73			0.348	U	
TERT-BUTYL FORMATE		0.357	U		0.357	U		0.357	U		0.357	U	
TERTIARY-BUTYL ALCOHOL		4.12	UR	C	4.12	UR	C	9.79	J	CP	9.38	J	CP
TOLUENE		0.082	U		0.082	U		2.29	J	P	0.862	J	P
TOTAL XYLENES		0.334	U		0.334	U		10.4			12.7		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW30D01			TB07090901			TB07100901		
SDG: 209071010	LAB_ID	20907101002			20907101003			20907101004		
FRACTION: OV	SAMP_DATE	7/9/2009			7/9/2009			7/10/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS									
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,2-DIBROMOETHANE		0.0035	U							
1,2-DICHLOROETHANE		0.064	U		0.064	U		0.064	U	
BENZENE		0.075	U		0.075	U		0.075	U	
DIISOPROPYL ETHER		0.529	U		0.529	U		0.529	U	
ETHANOL		59.5	UR	C	59.5	UR	C	59.5	UR	C
ETHYL TERT-BUTANOL		5.56	UR	C	5.56	UR	C	5.56	UR	C
ETHYL TERT-BUTYL ETHER		0.259	U		0.259	U		0.259	U	
ETHYLBENZENE		0.052	U		0.052	U		0.052	U	
METHYL TERT-BUTYL ETHER		0.077	U		0.077	U		0.077	U	
TERT-AMYL ALCOHOL		15.6	UR	C	15.6	UR	C	15.6	UR	C
TERT-AMYL METHYL ETHER		0.348	U		0.348	U		0.348	U	
TERT-BUTYL FORMATE		0.357	U		0.357	U		0.357	U	
TERTIARY-BUTYL ALCOHOL		4.12	UR	C	4.12	UR	C	4.12	UR	C
TOLUENE		0.082	U		0.082	U		0.082	U	
TOTAL XYLENES		0.334	U		0.334	U		0.334	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW00101			PAIDGSMW0201			PAIDGSMW0401			PAIDGSMW0701		
SDG: 209071010	LAB_ID	20907101001			20907101006			20907101012			20907101005		
FRACTION: OVG	SAMP_DATE	7/9/2009			7/10/2009			7/10/2009			7/10/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
METHANE		2170			1190			0.187	U		530		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW0801			PAIDGSMW2201			PAIDGSMW2301			PAIDGSMW29D01		
SDG: 209071010	LAB_ID	20907101011			20907101013			20907101010			20907101009		
FRACTION: OVG	SAMP_DATE	7/10/2009			7/10/2009			7/10/2009			7/10/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
METHANE		133			30.7			5240			6940		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW30D01		
SDG: 209071010	LAB_ID	20907101002		
FRACTION: OVG	SAMP_DATE	7/9/2009		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS			
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
METHANE		536		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW00101			PAIDGSMW0201			PAIDGSMW0401			PAIDGSMW0701		
SDG: 209071010	LAB_ID	20907101001			20907101006			20907101012			20907101005		
FRACTION: PAH	SAMP_DATE	7/9/2009			7/10/2009			7/10/2009			7/10/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1-METHYLNAPHTHALENE		17.5			0.024	U		0.024	U		0.024	U	
2-METHYLNAPHTHALENE		34.2			0.024	U		0.024	U		0.024	U	
ACENAPHTHENE		0.598	U		0.06	U		0.059	U		0.059	U	
ACENAPHTHYLENE		0.378	U		0.038	U		0.038	U		0.038	U	
ANTHRACENE		0.542	J	P	0.027	U		0.027	U		0.027	U	
BENZO(A)ANTHRACENE		0.35	U		0.035	U		0.035	U		0.035	U	
BENZO(A)PYRENE		0.225	U		0.023	U		0.022	U		0.022	U	
BENZO(B)FLUORANTHENE		0.262	U		0.026	U		0.026	U		0.026	U	
BENZO(G,H,I)PERYLENE		0.138	U		0.014	U		0.014	U		0.014	U	
BENZO(K)FLUORANTHENE		0.276	U		0.028	U		0.027	U		0.027	U	
CHRYSENE		0.242	U		0.024	U		0.024	U		0.024	U	
DIBENZO(A,H)ANTHRACENE		0.145	U		0.015	U		0.014	U		0.014	U	
FLUORANTHENE		0.505	J	P	0.037	U		0.036	U		0.036	U	
FLUORENE		0.284	U		0.029	U		0.028	U		0.028	U	
INDENO(1,2,3-CD)PYRENE		0.129	U		0.013	U		0.013	U		0.013	U	
NAPHTHALENE		75			0.038	U		0.037	U		0.037	U	
PHENANTHRENE		0.753	J	P	0.029	U		0.029	U		0.029	U	
PYRENE		0.689	J	P	0.026	U		0.026	U		0.026	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW0801			PAIDGSMW2201			PAIDGSMW2301			PAIDGSMW29D01		
SDG: 209071010	LAB_ID	20907101011			20907101013			20907101010			20907101009		
FRACTION: PAH	SAMP_DATE	7/10/2009			7/10/2009			7/10/2009			7/10/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1-METHYLNAPHTHALENE		0.024	U		0.024	U		8.11			0.024	U	
2-METHYLNAPHTHALENE		0.024	U		0.024	U		1.09			0.024	U	
ACENAPHTHENE		0.06	U		0.059	U		0.297	U		0.059	U	
ACENAPHTHYLENE		0.038	U		0.038	U		0.188	U		0.038	U	
ANTHRACENE		0.027	U		0.118			0.134	U		0.027	U	
BENZO(A)ANTHRACENE		0.035	U		0.035	U		0.174	U		0.035	U	
BENZO(A)PYRENE		0.023	U		0.022	U		0.112	U		0.022	U	
BENZO(B)FLUORANTHENE		0.026	U		0.026	U		0.13	U		0.026	U	
BENZO(G,H,I)PERYLENE		0.014	U		0.014	U		0.069	U		0.014	U	
BENZO(K)FLUORANTHENE		0.028	U		0.027	U		0.137	U		0.027	U	
CHRYSENE		0.024	U		0.024	U		0.12	U		0.024	U	
DIBENZO(A,H)ANTHRACENE		0.015	U		0.014	U		0.072	U		0.014	U	
FLUORANTHENE		0.037	U		0.036	U		0.182	U		0.036	U	
FLUORENE		0.029	U		0.028	U		0.141	U		0.028	U	
INDENO(1,2,3-CD)PYRENE		0.013	U		0.013	U		0.064	U		0.013	U	
NAPHTHALENE		0.07	J	P	0.037	U		9.85			0.037	U	
PHENANTHRENE		0.029	U		0.029	U		0.144	U		0.029	U	
PYRENE		0.026	U		0.026	U		0.131	U		0.026	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW30D01		
SDG: 209071010	LAB_ID	20907101002		
FRACTION: PAH	SAMP_DATE	7/9/2009		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS			
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
1-METHYLNAPHTHALENE		0.024	U	
2-METHYLNAPHTHALENE		0.024	U	
ACENAPHTHENE		0.059	U	
ACENAPHTHYLENE		0.038	U	
ANTHRACENE		0.027	U	
BENZO(A)ANTHRACENE		0.035	U	
BENZO(A)PYRENE		0.022	U	
BENZO(B)FLUORANTHENE		0.026	U	
BENZO(G,H,I)PERYLENE		0.014	U	
BENZO(K)FLUORANTHENE		0.027	U	
CHRYSENE		0.024	U	
DIBENZO(A,H)ANTHRACENE		0.014	U	
FLUORANTHENE		0.036	U	
FLUORENE		0.028	U	
INDENO(1,2,3-CD)PYRENE		0.013	U	
NAPHTHALENE		0.037	U	
PHENANTHRENE		0.029	U	
PYRENE		0.026	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW00101			PAIDGSMW0201			PAIDGSMW0401			PAIDGSMW0701		
SDG: 209071010	LAB_ID	20907101001			20907101006			20907101012			20907101005		
FRACTION: M	SAMP_DATE	7/9/2009			7/10/2009			7/10/2009			7/10/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
LEAD		0.0059			0.0027	U		0.0027	U		0.0027	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW0801			PAIDGSMW2201			PAIDGSMW2301			PAIDGSMW29D01		
SDG: 209071010	LAB_ID	20907101011			20907101013			20907101010			20907101009		
FRACTION: M	SAMP_DATE	7/10/2009			7/10/2009			7/10/2009			7/10/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
LEAD		0.0027	U		0.0027	U		0.0027	U		0.0027	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW30D01		
SDG: 209071010	LAB_ID	20907101002		
FRACTION: M	SAMP_DATE	7/9/2009		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	MG/L		
	PCT_SOLIDS			
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
LEAD		0.0027	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW00101			PAIDGSMW0201			PAIDGSMW0401			PAIDGSMW0701		
SDG: 209071010	LAB_ID	20907101001			20907101006			20907101012			20907101005		
FRACTION: MISC	SAMP_DATE	7/9/2009			7/10/2009			7/10/2009			7/10/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
NITRATE-N		0.003	U		0.639			0.295			0.112		
SULFATE		0.11			5.74			10.3			0.91		
TOTAL ORGANIC CARBON		117			12.7			6			21.8		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW0801			PAIDGSMW2201			PAIDGSMW2301			PAIDGSMW29D01		
SDG: 209071010	LAB_ID	20907101011			20907101013			20907101010			20907101009		
FRACTION: MISC	SAMP_DATE	7/10/2009			7/10/2009			7/10/2009			7/10/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
NITRATE-N		0.006			0.003	U		0.003	U		0.003	U	
SULFATE		9.1			12.2			1.96			0.69		
TOTAL ORGANIC CARBON		16.7			11.8			57.1			23.6		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW30D01		
SDG: 209071010	LAB_ID	20907101002		
FRACTION: MISC	SAMP_DATE	7/9/2009		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	MG/L		
	PCT_SOLIDS			
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
NITRATE-N		0.003	U	
SULFATE		4.87		
TOTAL ORGANIC CARBON		15.6		

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**M. SLADIC**	**DATE:**	**September 3, 2009**
FROM:	**MEGAN CARSON**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC / INORGANIC DATA VALIDATION – VOCs, PAHs, METHANE, LEAD, NITRATE, TOTAL ORGANIC CARBON, SULFATE, HETEROTROPHIC PLATE**
CTO – 0136 MCRD PARRIS ISLAND
SAMPLE DELIVERY GROUP (SDG) – 209071403

SAMPLES: 19/Aqueous/

FB07140901	FD0712090101	FD0712090201	PAIDGSMW0301
PAIDGSMW0501	PAIDGSMW0901	PAIDGSMW1101	PAIDGSMW1201
PAIDGSMW1401	PAIDGSMW1601	PAIDGSMW1701	PAIDGSMW1901
PAIDGSMW2001	PAIDGSMW2101	PAIDGSMW2401	PAIDGSMW2501
PAIDGSMW27D01	TB07130901	TB07140901	

Overview

The sample set for CTO 0136, MCRD Parris Island, SDG 209071403, consists of nineteen (19) aqueous environmental samples and two (2) trip blanks (TB07130901 and TB07140901). There were two field duplicate pairs in this SDG: FD0712090101/PAIDGSMW0301 and FD0712090201/ PAIDGSMW27D01.

All samples with the exception of TB07130901 and TB07140901were analyzed for select oxygenate volatile organic compounds, 1,2-dibromoethane, polycyclic aromatic hydrocarbons, methane, lead, nitrate, total organic carbon and sulfate. Samples TB07090901 and TB07100901 were analyzed for select oxygenate volatile organic compounds only. Samples PAIDGSMW0501 and PAIDGSMW1401 were analyzed for heterotrophic plating. The samples were collected by Tetra Tech NUS on July 12, 13, 14, 2009 and analyzed by Gulf Coast Analytical Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Microbial Insights was subcontracted to perform heterotrophic plating. Select oxygenate volatile organic compounds analyses were conducted using SW-846 method 8260 and 1,2-dibromomethane analyses were conducted using SW-846 method 8011. Methane analyses were conducted using method RSK-175. PAH analyses were conducted using SW-846 method 8270 by SIM. Lead analyses were conducted using SW-846 method 6010B. Nitrate analyses were conducted using EPA method 353.2. Total organic carbon analyses were conducted using Standard method 5310B. Sulfate analyses were conducted using Sw-846 method 9056.

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • GC/MS Tune
• Initial / Continuing Calibration Results
* • Laboratory Method / Preparation / Trip Blank Analyses
• Field Duplicates
* • Detection Limits

* - All quality control criteria were met for this parameter.

VOC

The following samples were analyzed at dilutions to bring target compounds with calibration range:

Sample	Compound	Dilution Factor
FD0712090201	benzene, toluene	20X
	benzene, toluene	200X
PAIDGSMW0301	benzene, toluene	20X
	benzene, toluene	200X

The continuing calibration performed on 7/16/09 at 09:21 had a relative response factor <0.05 for tertiary-butyl alcohol, tert-amyl alcohol, 3,3-dimethyl-1-butanol and ethanol. Samples PAIDGSMW0301, FD0712090101, FD0712090201, PAIDGSMW1901, PAIDGSMW27D01, and PAIDGSMW0901 were affected. Positive results were qualified as estimated (J) and non-detects were qualified as rejected (UR).

The continuing calibration performed on 7/22/09 at 07:24 had a relative response factor <0.05 for tertiary-butyl alcohol, tert-amyl alcohol, 3,3-dimethyl-1-butanol and ethanol. Samples PAIDGSMW1201, PAIDGSMW0501, PAIDGSMW1601, PAIDGSMW1101, PAIDGSMW1701, PAIDGSMW2401, TB07130901, PAIDGSMW1401, PAIDGSMW2001, PAIDGSMW2501, PAIDGSMW2101, FB07140901, and TB07140901 were affected. Positive results were qualified as estimated (J) and non-detects were qualified as rejected (UR).

PAH:

The following samples were analyzed at dilutions to bring target compounds with calibration range or due to matrix interference with analysis:

Sample	Compound	Dilution Factor
FD0712090101	naphthalene	5X
PAIDGSMW0301	naphthalene	10X
PAIDGSMW1901	matrix	5X

The field duplicate pair FD071209010/ PAIDGSMW0301 had a relative percent difference >30% for 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene. Positive results for these compounds were qualified as estimated (J).

OVG:

The following samples were analyzed at dilutions to bring methane within calibration range:

Sample	Dilution Factor
FD0712090101	100X
FD0712090201	50X
PAIDGSMW0301	100X
PAIDGSMW0501	100X
PAIDGSMW1101	10X
PAIDGSMW1201	100X
PAIDGSMW1401	200X
PAIDGSMW1601	10X
PAIDGSMW1901	100X
PAIDGSMW2001	30X
PAIDGSMW2101	50X
PAIDGSMW2501	2X
PAIDGSMW27D01	50X

Miscellaneous inorganic:
The following samples were analyzed at dilutions to bring target analytes with calibration range:

Sample	Compound	Dilution Factor
FD0712090101	TOC	5X
FD0712090201	TOC	5X
PAIDGSMW0301	TOC	5X
PAIDGSMW0501	TOC	5X
	sulfate	2X
PAIDGSMW0901	TOC, sulfate	5X
PAIDGSMW1101	TOC	5X
PAIDGSMW1201	TOC	5X
PAIDGSMW1401	TOC	5X
PAIDGSMW1601	TOC	5X
PAIDGSMW1701	TOC	5X

Sample	Compound	Dilution Factor
PAIDGSMW1901	sulfate	10X
PAIDGSMW2001	TOC, sulfate	5X
PAIDGSMW2101	TOC	5X
	sulfate	2X
PAIDGSMW2401	TOC, sulfate	5X
PAIDGSMW2501	TOC	5X
	Sulfate	2X
PAIDGSMW27D01	TOC	5X

Samples FD0712090201 and FD0712090101 were analyzed five (5) hours past the forty eight (48) hour hold time for the nitrate analyses. Results for both samples were non-detect and were qualified as estimated (UJ).

Notes

Positive results reported below the reporting limit (RL) but above the method detection limit (MDL) for the organic analyses were qualified as estimated (J).

Metals data for lead was reported in mg/L.

Executive Summary

Laboratory Performance: Low RRF values in continuing calibrations resulted in the rejection of data. Two samples were out of hold time for the nitrate analyses.

Other Factors Affecting Data Quality: Positive results reported below the RL but above the MDL for the organic analyses were qualified as estimated (J). Field duplicates were found to have several compounds out of quality control limits.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Review", Oct 1999, "National Functional Guidelines for Inorganic Review", October 2004, and the DOD document entitled "Quality System Manual (QSM) for Environmental Laboratories" (Jan 2006).

The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech NUS
Megan Carson
Chemist/Data Validator

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 01822	NSAMPLE	FB07140901			FD0712090101			FD0712090201			PAIDGSMW0301		
SDG: 209071403	LAB_ID	20907140318			20907140302			20907140305			20907140301		
FRACTION: OV	SAMP_DATE	7/14/2009			7/12/2009			7/12/2009			7/12/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF				PAIDGSMW0301			PAIDGSMW27D01					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,2-DIBROMOETHANE		0.0035	U		0.0035	U		0.0035	U		0.0035	U	
1,2-DICHLOROETHANE		0.064	U		1.28	U		0.064	U		1.28	U	
BENZENE		0.075	U		5060			0.075	U		4770		
DIISOPROPYL ETHER		0.529	U		10.6	U		2.02	J	P	10.6	U	
ETHANOL		59.5	UR	C	1190	UR	C	59.5	UR	C	1190	UR	C
ETHYL TERT-BUTANOL		5.56	UR	C	111	UR	C	5.56	UR	C	111	UR	C
ETHYL TERT-BUTYL ETHER		0.259	U		5.18	U		0.259	U		5.18	U	
ETHYLBENZENE		0.052	U		1190			0.052	U		1120		
METHYL TERT-BUTYL ETHER		0.077	U		1.54	U		156			1.54	U	
TERT-AMYL ALCOHOL		15.6	UR	C	1120	J	C	15.6	UR	C	1210	J	C
TERT-AMYL METHYL ETHER		0.348	U		6.96	U		0.348	U		6.96	U	
TERT-BUTYL FORMATE		0.357	U		7.14	U		0.357	U		7.14	U	
TERTIARY-BUTYL ALCOHOL		4.12	UR	C	82.4	UR	C	4.12	UR	C	82.4	UR	C
TOLUENE		0.082	U		14500			0.082	U		14000		
TOTAL XYLENES		0.334	U		6280			0.334	U		5910		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW0501			PAIDGSMW0901			PAIDGSMW1101			PAIDGSMW1201		
SDG: 209071403	LAB_ID	20907140314			20907140306			20907140308			20907140310		
FRACTION: OV	SAMP_DATE	7/14/2009			7/12/2009			7/13/2009			7/13/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,2-DIBROMOETHANE		0.0035	U		0.0035	U		0.0035	U		0.0035	U	
1,2-DICHLOROETHANE		0.064	U		0.064	U		0.064	U		0.064	U	
BENZENE		62.1			0.075	U		0.075	U		122		
DIISOPROPYL ETHER		0.529	U		0.529	U		0.529	U		0.529	U	
ETHANOL		59.5	UR	C	59.5	UR	C	59.5	UR	C	59.5	UR	C
ETHYL TERT-BUTANOL		5.56	UR	C	5.56	UR	C	5.56	UR	C	5.56	UR	C
ETHYL TERT-BUTYL ETHER		0.259	U		0.259	U		0.259	U		0.259	U	
ETHYLBENZENE		158			0.052	U		0.052	U		11.6		
METHYL TERT-BUTYL ETHER		0.077	U		0.077	U		0.077	U		0.968	J	P
TERT-AMYL ALCOHOL		68.7	J	C	15.6	UR	C	15.6	UR	C	78.5	J	C
TERT-AMYL METHYL ETHER		0.348	U		0.348	U		0.348	U		0.348	U	
TERT-BUTYL FORMATE		0.357	U		0.357	U		0.357	U		0.357	U	
TERTIARY-BUTYL ALCOHOL		4.12	UR	C	4.12	UR	C	4.12	UR	C	4.12	UR	C
TOLUENE		40.3			0.082	U		0.082	U		5.06		
TOTAL XYLENES		103			0.334	U		0.334	U		5.16	J	P

PROJ_NO: 01822	NSAMPLE	PAIDGSMW1401			PAIDGSMW1601			PAIDGSMW1701			PAIDGSMW1901		
SDG: 209071403	LAB_ID	20907140315			20907140307			20907140309			20907140303		
FRACTION: OV	SAMP_DATE	7/14/2009			7/13/2009			7/13/2009			7/12/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,2-DIBROMOETHANE		0.0035	U		0.0035	U		0.0035	U		0.0035	U	
1,2-DICHLOROETHANE		0.064	U		0.064	U		0.064	U		0.064	U	
BENZENE		3.95	J	P	0.075	U		3.73	J	P	0.075	U	
DIISOPROPYL ETHER		0.529	U		0.529	U		0.529	U		0.529	U	
ETHANOL		59.5	UR	C	59.5	UR	C	59.5	UR	C	59.5	UR	C
ETHYL TERT-BUTANOL		5.56	UR	C	5.56	UR	C	5.56	UR	C	5.56	UR	C
ETHYL TERT-BUTYL ETHER		0.259	U		0.259	U		0.259	U		0.259	U	
ETHYLBENZENE		0.052	U		0.052	U		0.052	U		0.052	U	
METHYL TERT-BUTYL ETHER		0.077	U		1.19	J	P	4.93	J	P	0.681	J	P
TERT-AMYL ALCOHOL		15.6	UR	C	15.6	UR	C	15.6	UR	C	15.6	UR	C
TERT-AMYL METHYL ETHER		0.348	U		0.348	U		0.348	U		0.348	U	
TERT-BUTYL FORMATE		0.357	U		0.357	U		0.357	U		0.357	U	
TERTIARY-BUTYL ALCOHOL		4.12	UR	C	4.12	UR	C	4.12	UR	C	4.12	UR	C
TOLUENE		0.082	U		0.082	U		0.845	J	P	0.66	J	P
TOTAL XYLENES		0.334	U		0.334	U		0.334	U		0.334	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW2001			PAIDGSMW2101			PAIDGSMW2401			PAIDGSMW2501		
SDG: 209071403	LAB_ID	20907140312			20907140317			20907140311			20907140316		
FRACTION: OV	SAMP_DATE	7/13/2009			7/14/2009			7/13/2009			7/14/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,2-DIBROMOETHANE		0.0035	U		0.0035	U		0.0035	U		0.0035	U	
1,2-DICHLOROETHANE		0.064	U		0.064	U		0.064	U		0.064	U	
BENZENE		0.075	U		8.11			0.075	U		0.075	U	
DIISOPROPYL ETHER		0.529	U		0.529	U		0.529	U		0.529	U	
ETHANOL		59.5	UR	C	59.5	UR	C	59.5	UR	C	59.5	UR	C
ETHYL TERT-BUTANOL		5.56	UR	C	5.56	UR	C	5.56	UR	C	5.56	UR	C
ETHYL TERT-BUTYL ETHER		0.259	U		0.259	U		0.259	U		0.259	U	
ETHYLBENZENE		0.052	U		20.3			0.052	U		0.052	U	
METHYL TERT-BUTYL ETHER		0.077	U		0.436	J	P	27.3			0.077	U	
TERT-AMYL ALCOHOL		15.6	UR	C	15.6	UR	C	15.6	UR	C	15.6	UR	C
TERT-AMYL METHYL ETHER		0.348	U		0.348	U		17.8			0.348	U	
TERT-BUTYL FORMATE		0.357	U		0.357	U		0.357	U		0.357	U	
TERTIARY-BUTYL ALCOHOL		4.12	UR	C	4.12	UR	C	4.12	UR	C	4.12	UR	C
TOLUENE		0.082	U		1.3	J	P	0.082	U		0.082	U	
TOTAL XYLENES		0.334	U		0.334	U		0.334	U		0.334	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW27D01			TB07130901			TB07140901		
SDG: 209071403	LAB_ID	20907140304			20907140313			20907140319		
FRACTION: OV	SAMP_DATE	7/12/2009			7/13/2009			7/14/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS									
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,2-DIBROMOETHANE		0.0035	U							
1,2-DICHLOROETHANE		0.064	U		0.064	U		0.064	U	
BENZENE		0.075	U		0.075	U		0.075	U	
DIISOPROPYL ETHER		2.11	J	P	0.529	U		0.529	U	
ETHANOL		59.5	UR	C	59.5	UR	C	59.5	UR	C
ETHYL TERT-BUTANOL		5.56	UR	C	5.56	UR	C	5.56	UR	C
ETHYL TERT-BUTYL ETHER		0.259	U		0.259	U		0.259	U	
ETHYLBENZENE		0.052	U		0.052	U		0.052	U	
METHYL TERT-BUTYL ETHER		157			0.077	U		0.077	U	
TERT-AMYL ALCOHOL		15.6	UR	C	15.6	UR	C	15.6	UR	C
TERT-AMYL METHYL ETHER		0.348	U		0.348	U		0.348	U	
TERT-BUTYL FORMATE		0.357	U		0.357	U		0.357	U	
TERTIARY-BUTYL ALCOHOL		4.12	UR	C	4.12	UR	C	4.12	UR	C
TOLUENE		0.082	U		0.082	U		0.082	U	
TOTAL XYLENES		0.334	U		0.334	U		0.334	U	

PROJ_NO: 01822	NSAMPLE	FB07140901			FD0712090101			FD0712090201			PAIDGSMW0301		
SDG: 209071403	LAB_ID	20907140318			20907140302			20907140305			20907140301		
FRACTION: PAH	SAMP_DATE	7/14/2009			7/12/2009			7/12/2009			7/12/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF				PAIDGSMW0301			PAIDGSMW27D01					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1-METHYLNAPHTHALENE		0.024	U		2.28	J	G	0.024	U		5.11	J	G
2-METHYLNAPHTHALENE		0.024	U		0.529	J	G	0.024	U		2.68	J	G
ACENAPHTHENE		0.059	U		0.297	U		0.059	U		0.595	U	
ACENAPHTHYLENE		0.038	U		0.188	U		0.038	U		0.376	U	
ANTHRACENE		0.027	U		0.134	U		0.027	U		0.269	U	
BENZO(A)ANTHRACENE		0.035	U		0.174	U		0.035	U		0.348	U	
BENZO(A)PYRENE		0.022	U		0.112	U		0.022	U		0.224	U	
BENZO(B)FLUORANTHENE		0.026	U		0.13	U		0.026	U		0.261	U	
BENZO(G,H,I)PERYLENE		0.014	U		0.069	U		0.014	U		0.137	U	
BENZO(K)FLUORANTHENE		0.027	U		0.137	U		0.027	U		0.275	U	
CHRYSENE		0.024	U		0.12	U		0.024	U		0.24	U	
DIBENZO(A,H)ANTHRACENE		0.014	U		0.072	U		0.014	U		0.144	U	
FLUORANTHENE		0.036	U		0.182	U		0.036	U		0.365	U	
FLUORENE		0.028	U		0.141	U		0.028	U		0.283	U	
INDENO(1,2,3-CD)PYRENE		0.013	U		0.064	U		0.013	U		0.128	U	
NAPHTHALENE		0.037	U		54.2	J	G	0.056	J	P	142	J	G
PHENANTHRENE		0.029	U		0.144	U		0.029	U		0.289	U	
PYRENE		0.026	U		0.131	U		0.026	U		0.262	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW0501			PAIDGSMW0901			PAIDGSMW1101			PAIDGSMW1201		
SDG: 209071403	LAB_ID	20907140314			20907140306			20907140308			20907140310		
FRACTION: PAH	SAMP_DATE	7/14/2009			7/12/2009			7/13/2009			7/13/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1-METHYLNAPHTHALENE		0.024	U		0.024	U		0.024	U		0.024	U	
2-METHYLNAPHTHALENE		0.024	U		0.024	U		0.024	U		0.024	U	
ACENAPHTHENE		0.06	U		0.06	U		0.059	U		0.059	U	
ACENAPHTHYLENE		0.038	U		0.038	U		0.038	U		0.075	J	P
ANTHRACENE		0.027	U		0.027	U		0.027	U		0.027	U	
BENZO(A)ANTHRACENE		0.035	U		0.035	U		0.035	U		0.035	U	
BENZO(A)PYRENE		0.023	U		0.023	U		0.022	U		0.022	U	
BENZO(B)FLUORANTHENE		0.026	U		0.026	U		0.026	U		0.026	U	
BENZO(G,H,I)PERYLENE		0.014	U		0.014	U		0.014	U		0.014	U	
BENZO(K)FLUORANTHENE		0.028	U		0.028	U		0.027	U		0.027	U	
CHRYSENE		0.024	U		0.024	U		0.024	U		0.024	U	
DIBENZO(A,H)ANTHRACENE		0.015	U		0.015	U		0.014	U		0.014	U	
FLUORANTHENE		0.037	U		0.037	U		0.036	U		0.036	U	
FLUORENE		0.029	U		0.029	U		0.028	U		0.028	U	
INDENO(1,2,3-CD)PYRENE		0.013	U		0.013	U		0.013	U		0.013	U	
NAPHTHALENE		0.038	U		0.038	U		0.037	U		0.037	U	
PHENANTHRENE		0.029	U		0.029	U		0.029	U		0.029	U	
PYRENE		0.026	U		0.026	U		0.026	U		0.026	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW1401			PAIDGSMW1601			PAIDGSMW1701			PAIDGSMW1901		
SDG: 209071403	LAB_ID	20907140315			20907140307			20907140309			20907140303		
FRACTION: PAH	SAMP_DATE	7/14/2009			7/13/2009			7/13/2009			7/12/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1-METHYLNAPHTHALENE		0.024	U		0.024	U		0.024	U		1.3		
2-METHYLNAPHTHALENE		0.024	U		0.024	U		0.024	U		0.311	J	
ACENAPHTHENE		0.06	U		0.059	U		0.059	U		0.301	U	
ACENAPHTHYLENE		0.038	U		0.038	U		0.038	U		0.19	U	
ANTHRACENE		0.027	U		0.027	U		0.027	U		0.136	U	
BENZO(A)ANTHRACENE		0.035	U		0.035	U		0.035	U		0.176	U	
BENZO(A)PYRENE		0.023	U		0.022	U		0.022	U		0.113	U	
BENZO(B)FLUORANTHENE		0.026	U		0.026	U		0.026	U		0.132	U	
BENZO(G,H,I)PERYLENE		0.014	U		0.014	U		0.014	U		0.069	U	
BENZO(K)FLUORANTHENE		0.028	U		0.027	U		0.027	U		0.139	U	
CHRYSENE		0.024	U		0.024	U		0.024	U		0.121	U	
DIBENZO(A,H)ANTHRACENE		0.015	U		0.014	U		0.014	U		0.073	U	
FLUORANTHENE		0.037	U		0.036	U		0.036	U		0.184	U	
FLUORENE		0.029	U		0.028	U		0.028	U		0.143	U	
INDENO(1,2,3-CD)PYRENE		0.013	U		0.013	U		0.013	U		0.065	U	
NAPHTHALENE		0.161			0.129			0.037	U		9.01		
PHENANTHRENE		0.029	U		0.029	U		0.029	U		0.146	U	
PYRENE		0.026	U		0.026	U		0.026	U		0.132	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW2001			PAIDGSMW2101			PAIDGSMW2401			PAIDGSMW2501		
SDG: 209071403	LAB_ID	20907140312			20907140317			20907140311			20907140316		
FRACTION: PAH	SAMP_DATE	7/13/2009			7/14/2009			7/13/2009			7/14/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1-METHYLNAPHTHALENE		0.024	U		0.024	U		0.024	U		0.024	U	
2-METHYLNAPHTHALENE		0.024	U		0.024	U		0.024	U		0.024	U	
ACENAPHTHENE		0.059	U		0.059	U		0.06	U		0.059	U	
ACENAPHTHYLENE		0.038	U		0.038	U		0.241			0.038	U	
ANTHRACENE		0.027	U		0.241			0.161			0.027	U	
BENZO(A)ANTHRACENE		0.035	U		0.035	U		0.035	U		0.035	U	
BENZO(A)PYRENE		0.022	U		0.022	U		0.023	U		0.022	U	
BENZO(B)FLUORANTHENE		0.026	U		0.026	U		0.026	U		0.026	U	
BENZO(G,H,I)PERYLENE		0.014	U		0.014	U		0.014	U		0.014	U	
BENZO(K)FLUORANTHENE		0.027	U		0.027	U		0.028	U		0.027	U	
CHRYSENE		0.024	U		0.024	U		0.024	U		0.024	U	
DIBENZO(A,H)ANTHRACENE		0.014	U		0.014	U		0.015	U		0.014	U	
FLUORANTHENE		0.036	U		0.036	U		0.037	U		0.036	U	
FLUORENE		0.028	U		0.028	U		0.028	U		0.028	U	
INDENO(1,2,3-CD)PYRENE		0.013	U		0.013	U		0.013	U		0.013	U	
NAPHTHALENE		0.037	U		0.637			0.038	U		0.037	U	
PHENANTHRENE		0.029	U		0.095	J	P	0.158			0.029	U	
PYRENE		0.026	U		0.026	U		0.148			0.026	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW27D01		
SDG: 209071403	LAB_ID	20907140304		
FRACTION: PAH	SAMP_DATE	7/12/2009		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS			
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
1-METHYLNAPHTHALENE		0.024	U	
2-METHYLNAPHTHALENE		0.024	U	
ACENAPHTHENE		0.059	U	
ACENAPHTHYLENE		0.038	U	
ANTHRACENE		0.027	U	
BENZO(A)ANTHRACENE		0.035	U	
BENZO(A)PYRENE		0.022	U	
BENZO(B)FLUORANTHENE		0.026	U	
BENZO(G,H,I)PERYLENE		0.014	U	
BENZO(K)FLUORANTHENE		0.027	U	
CHRYSENE		0.024	U	
DIBENZO(A,H)ANTHRACENE		0.014	U	
FLUORANTHENE		0.036	U	
FLUORENE		0.028	U	
INDENO(1,2,3-CD)PYRENE		0.013	U	
NAPHTHALENE		0.072	J	P
PHENANTHRENE		0.029	U	
PYRENE		0.026	U	

PROJ_NO: 01822	NSAMPLE	FB07140901			FD0712090101			FD0712090201			PAIDGSMW0301		
SDG: 209071403	LAB_ID	20907140318			20907140302			20907140305			20907140301		
FRACTION: OVG	SAMP_DATE	7/14/2009			7/12/2009			7/12/2009			7/12/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF				PAIDGSMW0301			PAIDGSMW27D01					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
METHANE		0.187	U		4770			1090			4790		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW0501			PAIDGSMW0901			PAIDGSMW1101			PAIDGSMW1201		
SDG: 209071403	LAB_ID	20907140314			20907140306			20907140308			20907140310		
FRACTION: OVG	SAMP_DATE	7/14/2009			7/12/2009			7/13/2009			7/13/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
METHANE		5160			27.9			132			1880		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW1401			PAIDGSMW1601			PAIDGSMW1701			PAIDGSMW1901		
SDG: 209071403	LAB_ID	20907140315			20907140307			20907140309			20907140303		
FRACTION: OVG	SAMP_DATE	7/14/2009			7/13/2009			7/13/2009			7/12/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
METHANE		6080			191			5.05			1430		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW2001			PAIDGSMW2101			PAIDGSMW2401			PAIDGSMW2501		
SDG: 209071403	LAB_ID	20907140312			20907140317			20907140311			20907140316		
FRACTION: OVG	SAMP_DATE	7/13/2009			7/14/2009			7/13/2009			7/14/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
METHANE		369			920			14.5			19.5		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW27D01		
SDG: 209071403	LAB_ID	20907140304		
FRACTION: OVG	SAMP_DATE	7/12/2009		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS			
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
METHANE		976		

PROJ_NO: 01822	NSAMPLE	FB07140901			FD0712090101			FD0712090201			PAIDGSMW0301		
SDG: 209071403	LAB_ID	20907140318			20907140302			20907140305			20907140301		
FRACTION: M	SAMP_DATE	7/14/2009			7/12/2009			7/12/2009			7/12/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS												
	DUP_OF				PAIDGSMW0301			PAIDGSMW27D01					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
LEAD		0.0027	U		0.012			0.0027	U		0.012		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW0501			PAIDGSMW0901			PAIDGSMW1101			PAIDGSMW1201		
SDG: 209071403	LAB_ID	20907140314			20907140306			20907140308			20907140310		
FRACTION: M	SAMP_DATE	7/14/2009			7/12/2009			7/13/2009			7/13/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
LEAD		0.0027	U		0.0027	U		0.0027	U		0.0027	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW1401			PAIDGSMW1601			PAIDGSMW1701			PAIDGSMW1901		
SDG: 209071403	LAB_ID	20907140315			20907140307			20907140309			20907140303		
FRACTION: M	SAMP_DATE	7/14/2009			7/13/2009			7/13/2009			7/12/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
LEAD		0.0027	U		0.0027	U		0.0027	U		0.0027	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW2001			PAIDGSMW2101			PAIDGSMW2401			PAIDGSMW2501		
SDG: 209071403	LAB_ID	20907140312			20907140317			20907140311			20907140316		
FRACTION: M	SAMP_DATE	7/13/2009			7/14/2009			7/13/2009			7/14/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
LEAD		0.0027	U		0.0027	U		0.0027	U		0.0027	U	

PROJ_NO: 01822	NSAMPLE	PAIDGSMW27D01		
SDG: 209071403	LAB_ID	20907140304		
FRACTION: M	SAMP_DATE	7/12/2009		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	MG/L		
	PCT_SOLIDS			
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
LEAD		0.0027	U	

PROJ_NO: 01822	NSAMPLE	FB07140901						FD0712090101			FD0712090201		
SDG: 209071403	LAB_ID	20907140318						20907140302			20907140305		
FRACTION: MISC	SAMP_DATE	7/14/2009						7/12/2009			7/12/2009		
MEDIA: WATER	QC_TYPE	NM						NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS												
	DUP_OF							PAIDGSMW0301			PAIDGSMW27D01		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ALKALINITY					0.37	U							
AMMONIA													
BACTERIA (AEROBIC)													
NITRATE		0.003	U					0.003	UJ	H	0.003	UJ	H
PLATE COUNT-95LL													
PLATE COUNT-95UL													
SULFATE		0.028	U					0.24			2.63		
TOTAL ORGANIC CARBON		0.26	U					63.8			26.3		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW0301			PAIDGSMW0501								
SDG: 209071403	LAB_ID	20907140301			20907140314								
FRACTION: MISC	SAMP_DATE	7/12/2009			7/14/2009								
MEDIA: WATER	QC_TYPE	NM			NM								
	UNITS	MG/L			CFU/100			MG/L			MG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ALKALINITY											194		
AMMONIA								1.3					
BACTERIA (AEROBIC)					850								
NITRATE		0.003	U					0.025					
PLATE COUNT-95LL					752								
PLATE COUNT-95UL					948								
SULFATE		0.23						3.7					
TOTAL ORGANIC CARBON		53.8						24.2					

PROJ_NO: 01822	NSAMPLE	PAIDGSMW0901			PAIDGSMW1101			PAIDGSMW1201			PAIDGSMW1401		
SDG: 209071403	LAB_ID	20907140306			20907140308			20907140310			20907140315		
FRACTION: MISC	SAMP_DATE	7/12/2009			7/13/2009			7/13/2009			7/14/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			CFU/100		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ALKALINITY													
AMMONIA													
BACTERIA (AEROBIC)											900		
NITRATE		0.003	U		0.003	U		0.039					
PLATE COUNT-95LL											704		
PLATE COUNT-95UL											1100		
SULFATE		17.9			5			1.45					
TOTAL ORGANIC CARBON		11.7			26.3			35.1					

PROJ_NO: 01822	NSAMPLE	PAIDGSMW1401						PAIDGSMW1601			PAIDGSMW1701		
SDG: 209071403	LAB_ID	20907140315						20907140307			20907140309		
FRACTION: MISC	SAMP_DATE	7/14/2009						7/13/2009			7/13/2009		
MEDIA: WATER	QC_TYPE	NM						NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ALKALINITY					72.9								
AMMONIA		6.1											
BACTERIA (AEROBIC)													
NITRATE		0.003	U					0.111			0.058		
PLATE COUNT-95LL													
PLATE COUNT-95UL													
SULFATE		0.32						4.23			19.1		
TOTAL ORGANIC CARBON		43.7						28.4			15.6		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW1901			PAIDGSMW2001			PAIDGSMW2101			PAIDGSMW2401		
SDG: 209071403	LAB_ID	20907140303			20907140312			20907140317			20907140311		
FRACTION: MISC	SAMP_DATE	7/12/2009			7/13/2009			7/14/2009			7/13/2009		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ALKALINITY													
AMMONIA													
BACTERIA (AEROBIC)													
NITRATE		0.003	U		0.03			0.003	U		0.003	U	
PLATE COUNT-95LL													
PLATE COUNT-95UL													
SULFATE		16.4			10.4			2.15			12.1		
TOTAL ORGANIC CARBON		90.5			19.1			23.4			31.8		

PROJ_NO: 01822	NSAMPLE	PAIDGSMW2501			PAIDGSMW27D01		
SDG: 209071403	LAB_ID	20907140316			20907140304		
FRACTION: MISC	SAMP_DATE	7/14/2009			7/12/2009		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	MG/L			MG/L		
	PCT_SOLIDS						
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
ALKALINITY							
AMMONIA							
BACTERIA (AEROBIC)							
NITRATE		0.133			0.003	U	
PLATE COUNT-95LL							
PLATE COUNT-95UL							
SULFATE		8.11			2.5		
TOTAL ORGANIC CARBON		13.3			28		