ARMY DRAFT REMEDIAL ACTION COMPLETION REPORT LHAAP-35A (58), CHEMICAL LABORATORY LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

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Acronyms and Abbreviations

µg/L	micrograms per liter
1,1-DCE	1,1-dichloroethylene
AECOM	AECOM Technical Services, Inc.
ARAR	applicable or relevant and appropriate requirements
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cis-1,2-DCE	cis-1,2-dichloroethylene
cm/s	centimeters per second
COC	contaminant of concern
DHC	Dehalococcoides ethenogenes
DPT	direct push technology
DO	dissolved oxygen
ECP	Environmental Condition of Property
USEPA	(United States) Environmental Protection Agency
ft	feet
ft/ft	feet per foot
ft/yr	feet per year
IWWP	Installation-Wide Work Plan
LHAAP	Longhorn Army Ammunition Plant
LTM	Long-term Monitoring
LUC	Land Use Control
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
MNA	Monitored Natural Attenuation
mV	millivolts
ORP	oxidation reduction potential
PPE	personal protective equipment
QA/QC	Quality Assurance/Quality Control
RA	Remedial Action
RACR	Remedial Action Completion Report

RAO	Remedial Action Objective
ROD	Record of Decision
SDWA	Safe Drinking Water Act
sf	square feet
TAC	Texas Administrative Code
TCE	trichloroethylene
TCEQ	Texas Commission on Environmental Quality
TOC	total organic carbon
trans-1,2-DCE	trans-1,2-dichloroethylene
UUUE	unrestricted use and unlimited exposure
US Army	United States Army Corps of Engineers
VC	vinyl chloride
VFA	volatile fatty acid
VOC	volatile organic compound

1 OVERVIEW

Longhorn Army Ammunition Plant (LHAAP) is an inactive, government-owned, formerly contractor-operated and maintained industrial facility located in central-east Texas in the northeastern corner of Harrison County. The facility occupies approximately 1,400 of its former 8,416 acres located between State Highway 43 in Karnack, Texas, and the western shore of Caddo Lake as shown in **Figure 1-1**. LHAAP was listed as a National Priorities List site on August 9, 1990, due to threatened releases of hazardous substances, pollutants, or contaminants. The United States Environmental Protection Agency (USEPA), the Texas Water Commission (now the Texas Commission on Environmental Quality [TCEQ]), and the United States Department of the Army (US Army) signed a Federal Facility Agreement on December 30, 1991.

Remedial activities are required at LHAAP-35A (58) under the Record of Decision (ROD) issued for the site in September 2010 (Shaw, 2010). This Remedial Action Completion Report (RACR) discusses the remedial actions taken to address risks associated with contaminated groundwater at the LHAAP-35A (58) site. This RACR has been developed using the basis of the Remedial Design for the LHAAP-35A (58) site (Shaw, 2011) and the details in the Remedial Action Work Plan (RAWP) for the LHAAP-35A (58) site (AECOM, 2013a).

This work was performed under USACE Huntsville District's Worldwide Environmental Remediation Services Contract No. W912DY-09-D-0059 Task Order No. DS01. The U.S Army Environmental Command provides funding for the environmental remedial activities at LHAAP. The Base Realignment and Closure Division is responsible for all aspects of LHAAP including the environmental program, operations, and land transfer.

1.1 Organization of RACR

This RACR is composed of the following sections:

- Section 1: "Overview" summarizes the site background, remedial action objectives (RAOs), constituents of concern (COCs), selected remedy, and the land use assumptions.
- Section 2: "Land Use Control" summarizes the remedial activities with respect to the land use control that were implemented at the site.
- Section 3: "Plume Delineation Activities" summarizes the plume delineation activities implemented at the site, nature and extent of contamination, arsenic monitoring, and site geology and hydrogeology.
- Section 4: "Enhanced In-situ Bioremediation" summarizes the EISB work performed as part of the remedial activities at the site.
- Section 5: "Monitored Natural Attenuation" summarizes the MNA work performed as part of the remedial activities at the site.
- Section 6: "MNA Performance Evaluation and Reporting" outlines activities that were performed in support of MNA performance evaluation and reporting, annual long-term monitoring (LTM) reporting, and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) five-year reviews.

- Section 7: "Schedule" outlines the schedule and timeline of major site activities.
- Section 8: "Community Relations" summarizes public outreach conducted at the site.
- Section 9: "Conclusion" provides a general summary of the remedial action completion report.
- Section 10: "References" provides a list of references cited within the document.

The RACR also includes an Appendix supporting the main text:

- Appendix A: Land Use Control Recordation Document
- Appendix B: Annual Land Use Control Compliance Certification Documentation
- Appendix C: DPT and Monitoring Well Boring Logs, EISB Injection Logs
- Appendix D: Well Construction Logs and Development Forms
- Appendix E: Groundwater Sampling Forms
- Appendix F: Chain of Custody Forms, Data Validation Reports, Analytical Data Tables and Laboratory Reports
- Appendix G: PCE and TCE Concentration Trends in Eastern Plume Shallow Zone Groundwater (EISB Treatment Area)

Activities specified in this RACR were conducted in accordance with the draft Installation-Wide Work Plan (IWWP) (AECOM, 2013b) in place when field work was executed.

1.2 LHAAP-35A (58) Background

The LHAAP-35A (58) site, also known as the Shops Area, is located in the north-central portion of LHAAP and currently covers an area of approximately 11 acres (**Figure 1-2**) (Shaw, 2010). The surface features are a mixture of asphalt-paved roads, a parking area, and areas of wooded and grassy vegetation. The topography is relatively flat with the surface drainage flowing into the tributaries of Goose Prairie Creek. Runoff from the site enters Caddo Lake via Goose Prairie Creek.

The Shops Area now designated as LHAAP-35A (58) was established in 1942 as part of the installation's initial construction (Shaw, 2011). The facility was used to provide plant-operated laundry, automotive, woodworking, metalworking, painting, refrigeration, and electrical services. The site was active throughout LHAAP's mission and was deactivated along with the rest of the installation in 1996-1997. The LHAAP-35A (58) site boundary has had various configurations. **Figure 1-3** shows the historical site boundary and the current site boundary defined by the U.S. Army Corps of Engineers in November 2006 (Shaw, 2010). Earlier investigations for LHAAP-35A (58) covered additional areas to the south; however, the current boundary encompasses approximately 11 acres. Located within the boundary of LHAAP-35A (58) are additional sites consisting of:

- LHAAP-02, vacuum truck overnight parking;
- LHAAP-03, the Paint Shop Building 722 (waste collection);

- LHAAP-56, a vehicle wash rack & oil/water separator Building 744-A
- LHAAP-59, Storage Building 725
- LHAAP-60, Former Storage Building 714;
- LHAAP-61, Water Treatment Plant
- LHAAP-65, the Flammable Materials Storehouse Building 209
- LHAAP-68, a mobile storage tank parking area; and
- LHAAP-69, service station with underground storage tanks.

Between 1992 and 2008, multiple investigations were conducted in a phased approach to evaluate the nature and extent of contamination at the LHAAP-35A (58) site. The findings from these investigations were that the shallow zone groundwater was impacted with volatile organic compounds (VOCs), while the soil and former sump/waste rack sump areas posed no unacceptable threat to human health or the environment (Shaw, 2011). There have been no previous remedial actions at LHAAP-35A (58). The Feasibility Study completed in 2009 recommended the monitored natural attenuation remedial alternative (Shaw, 2009).

The shallow groundwater at the LHAAP-35A (58) site is impacted with the following constituents of concern (COCs): tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride (VC). In addition, there are low levels of 1,1,2-trichloroethane (TCA) and its daughter products 1,1-dichloroethane (DCA) and chloroethane in the site groundwater, but they are not considered COCs.

Although arsenic has not been designated as a COC, it is included in the groundwater monitoring program as discussed in the RAWP (AECOM, 2013a).

1.2.1 Remedial Action Objectives

The remedial action (RA) at LHAAP-35A (58) protects human health and meets applicable or relevant and appropriate requirements (ARARs). There are no ecological risks at the site (USACE, 2010).

The RAOs for LHAAP-35A (58), consistent with the reasonably anticipated future use as a national wildlife refuge, are:

- Protection of human health by preventing human exposure to the contaminated groundwater;
- Protection of human health and the environment by preventing contaminated groundwater from migrating into nearby surface water; and,
- Return of groundwater to its potential beneficial uses as drinking water, wherever practicable.

1.2.2 Summary of COCs and the Selected Remedy

The description of the remedy for the LHAAP-35A (58) site is separated into two areas: 1) eastern plume; and 2) western plume.

The COCs in the LHAAP-35A (58) site groundwater are dissolved-phase TCE, PCE, 1,1-DCE, Cis-1,2 DCE, Trans-1,2 DCE, and VC. In addition, there is arsenic, and low levels of 1,1,2-trichloroethane (TCA) and its daughter products 1,1-dichloroethane (DCA) and chloroethane in the site groundwater but they are not considered COCs.

Under the Safe Drinking Water Act (SDWA) the maximum contaminant levels (MCL) will be used as the cleanup levels if established for a COC. For those COCs without a MCL, the groundwater medium-specific concentration (MSC) for industrial use (GW-Ind) will be used as cleanup levels (Shaw, 2011). MSCs are provided under Texas Risk Reduction Rules (30 Texas Administrative Code [TAC] 335.551 through 335.569). **Table 1-1** presents the cleanup levels for the COCs at LHAAP-35A (58).

The remedy for LHAAP-35A (58) protects human health and the environment by preventing human exposure to the contaminated groundwater and preventing contaminated groundwater from migrating into nearby surface water. The approved remedies for the two plume areas are as follows:

- **Eastern Plume Area**: the eastern plume remedy includes land use control (LUC); enhanced in-situ bioremediation (EISB) in the area of highest levels of COCs followed by monitored natural attenuation (MNA) near wells LHSMW05; 35AWW08, and 03WW01; MNA for remainder of the plume beyond the influence of the EISB treatment; and LTM/Five-Year Reviews.
- Western Plume Area: The western plume remedy consists of LUC, MNA, and LTM/Five-Year Reviews.

The remedy includes the following components:

- **LUC**: LUC in the impacted area will ensure protection of human health by restricting the use of groundwater exceeding cleanup levels to environmental monitoring and testing only. The LUC will remain in effect until such time as the U.S. Army, USEPA and TCEQ agree that COC concentrations have met cleanup levels.
- **EISB**: EISB technology involves biological degradation of contaminants in groundwater via respiratory or metabolic processes through appropriate microbes. The EISB treatment involves injection of carbon substrates (electron donor), nutrients, and, if needed, microbial cultures, into the subsurface. EISB was implemented in the eastern plume area only, as the COC levels in this area represented highest concentrations in the shallow groundwater zone at the site and warranted active treatment.
- **MNA**: A MNA program is implemented to establish attenuation trends and verify that the VOC plume is stable or shrinking and will not migrate to nearby surface water at levels that may present an unacceptable risk to human health or the environment. Natural attenuation is expected to return groundwater to acceptable quality.

The MNA evaluation will be completed after two years of groundwater monitoring. During these two years, groundwater monitoring data will be collected on a quarterly basis.

• Long-term Monitoring (LTM)/Five-Year Reviews: MNA will be evaluated for two years, and after it is verified to be effective, LTM will begin at a semiannual frequency for the following three years (until the first CERCLA Five-Year Review). In subsequent years, LTM will be performed annually until the next CERCLA Five-Year Review. The LTM associated with this remedy will be used to track the continued effectiveness of MNA. The need for continued monitoring and any reductions in the monitoring frequency will be evaluated every five years during the CERCLA Five-Year Review. However, at a minimum, the LTM will continue once every five years until the cleanup levels are achieved.

Based on the previously performed groundwater modeling for the LHAAP-35A (58) western plume area, MCLs are expected to be met through natural attenuation in approximately 200 years (Shaw, 2011). This timeframe will be re-evaluated as part of the MNA evaluation and periodic reviews. A cleanup time has not been estimated for the eastern plume and will be evaluated following EISB implementation and subsequent data collection.

1.2.3 Land Use Assumption

Although not a remedy, the land use assumption for LHAAP-35A (58) forms the basis for the remedy. The reasonably anticipated future use of LHAAP-35A (58) as part of the national wildlife refuge is consistent with an industrial risk exposure scenario. Notification of the land use assumption of LHAAP-35A (58) has been made in transfer documentation, and has been recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.566. The land use assumption language is included in Appendix A – Land Use Control Recordation Document.

1.2.4 Bioremediation Treatability Study

A laboratory-scale bioremediation Treatability Study (TS) was performed for LHAAP-35A (58) between February and June 2013. The purpose of the TS was to select an appropriate carbon substrate for EISB treatment in the western plume area. One lactate based carbon substrate (e.g. sodium lactate) and one vegetable oil based carbon substrate (e.g. emulsified vegetable oil [EVO]) were evaluated in the TS.

Compared to the EVO-type substrate evaluated in the TS, the lactate-based carbon substrate was relatively faster substrate in reducing the COCs to below cleanup levels, and was selected for use on that basis. Complete details of the TS were provided in the TS Report included as an appendix to the RAWP (AECOM, 2013a).



Path: L:\Group\IT_GIS\GIS Projects\Longhorn\MXDs\LHAAP-58\RACR\2014-Mar-06\Figure 1-1 LHAAP58 Site Location Map.mxd







Figure 1-3 Site Overview Map Remedial Action Completion Report LHAAP-35A(58) Longhorn Army Ammunition Plant Karnack, Texas

Table 1-1: LHAAP-58 Constituents of Concern Cleanup Levels

Constituent of Concern	Concentration (µg/L)	Basis
1,1-Dichloroethene	7	MCL
cis-1,2-Dichloroethene	70	MCL
Tetrachloroethene	5	MCL
trans-1,2-Dichloroethene	100	MCL
Trichloroethene	5	MCL
Vinyl Chloride	2	MCL

Notes and Abbreviations:

µg/L – micrograms per liter

MCL - United States Environmental Protection Agency Maximum Contaminant Level

2 LAND USE CONTROL

The following sections discuss the remedial activities with respect to land use control implemented at LHAAP-35A (58) in accordance with the RAWP (AECOM, 2013a).

2.1 Land Use Control Plan

The US Army or its representatives are responsible for LUC implementation and certification, reporting and enforcement. The US Army will address LUC problems within its control that are likely to impact remedy integrity as soon as practicable. The following sections provide details for the LUC component of the RA.

2.1.1 Land Use Control Implementation

The objectives of LUC at LHAAP-35A (58) are to prevent human exposure to groundwater contamination presenting an unacceptable risk to human health and ensure that there is no withdrawal or use of groundwater beneath the site for anything other than environmental monitoring and testing until the cleanup levels are attained. A restriction against residential use of groundwater will remain in effect until COC concentrations in groundwater allow unrestricted use and unlimited exposure (UUUE). Notification of the groundwater use restriction accompanying all transfer documents has been recorded at the Harrison County Courthouse in accordance with the Texas Administrative Code (TAC) Title 30, §335.566.

The LUC addresses the area of LHAAP-35A (58) that contains shallow zone groundwater contamination.

The US Army has completed the following actions to implement the LUC for groundwater restriction for the LHAAP-35A (58) site:

• Define the Area of the Groundwater Use Restriction

The groundwater analytical baseline data collected as part of the remedial activities in conjunction with the historic data was used to define the LUC boundary at the LHAAP-35A (58) site. A buffer has been provided to address potential uncertainties in the data.

Figure 2-1 depicts the LUC boundary for the LHAAP-35A (58) site.

• Survey the LUC Boundary

Pursuant to concurrence from the USEPA and TCEQ, the LUC boundary (**Figure 2-1**) was surveyed by a Texas state-licensed surveyor. A legal description of the surveyed LUC area was appended to the existing survey plat for the property.

• Record the LUC in Harrison County

The LUC plat, legal description and groundwater use restriction language was recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.566. The LUC recordation document is included in **Appendix A**.

• Notify the Texas Department of Licensing and Regulation of the LUC

The Texas Department of Licensing and Regulation was notified of the groundwater restriction which includes the prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval from the USEPA and TCEQ. The survey plat, legal boundary, and description of the groundwater restriction, in conjunction with a locator map, have been provided to the Texas Department of Licensing and Regulation in hard and electronic copy.

The US Army and regulators will confer to determine appropriate actions should there be a failure of a LUC objective at the site after it has been transferred.

2.1.2 Site Certification and Reporting

The annual inspections and certifications will be completed in compliance with the LUC objectives. The US Army, or the transferee after transfer, will retain the annual LUC inspection/certification documents (Appendix A of this document) in the project files for incorporation into the CERCLA Five-Year Review reports. These reports will be made available to the USEPA and TCEQ upon request. If any violations are found during the annual certification, a separate written explanation will be provided to the USEPA and TCEQ indicating the specific violations found and what efforts or measures have or will be taken to correct the violations. Upon transfer, such responsibilities may shift to the transferee via appropriate provisions placed in the Environmental Condition of Property (ECP) or other environmental transfer document. The need to continue annual certifications will be revisited during CERCLA Five-Year Reviews.

2.1.3 Notice of Planned Property Conveyances

The US Army will provide notice to the USEPA and TCEQ when conveying the LHAAP-35A (58) site acreage. The notice will describe the mechanism by which the LUC will continue to be implemented, maintained, inspected, reported, and enforced. Upon transfer, such responsibilities may shift to the transferee via appropriate provisions placed in the ECP or other environmental document for transfer. The US Army retains the responsibility for remedy integrity and is responsible for addressing substantive violations of the LUC performance objectives that would undermine the CERCLA remedy. The US Army will be responsible for outlining the transferee's LUC obligations into property transfer documents.

2.1.4 Opportunity to Review Text of Intended Land Use Control

The groundwater use restriction notification as recorded in the Harrison County Courthouse is included in **Appendix A**. The US Army will produce an ECP or other environmental document prior to transfer of the LHAAP-35A (58) site and provide a draft to the USEPA and TCEQ.

2.1.5 Notification Should Action(s) which Interfere with Land Use Control Effectiveness be Discovered Subsequent to Conveyance

Should the US Army discover any activity on the property inconsistent with the LUC performance objectives after conveyance of the site, the USEPA and TCEQ will be notified within 72 hours. The US Army, in conjunction with the USEPA, TCEQ, and the transferee,

would correct the problem(s) discovered. This reporting requirement does not preclude the US Army from taking immediate action pursuant to its CERCLA authority to prevent any perceived risks to human health and the environment.

2.1.6 Land Use Control Enforcement

Should the LUC remedy fail, the US Army will coordinate with the USEPA and TCEQ to ensure that appropriate actions are taken to reestablish its protectiveness. The US Army may notify the local agencies with jurisdiction of any LUC violation(s) by future property owners and will work cooperatively with them to restore owner/user compliance with the LUC.

2.1.7 Modification or Termination of Land Use Control

Any significant modification to, or termination of the LUC or a land use change inconsistent with the LUC objectives will be made only with USEPA and TCEQ concurrence, which will be sought prior to commencing actions that may impact remedy integrity.

The LUC will remain in effect until such time as the US Army, USEPA and TCEQ agree that the concentration of COCs have met cleanup levels. When this occurs, the LUC will be terminated consistent with the National Oil and Hazardous Substances Contingency Plan process for post-ROD changes. If the property has been transferred and a determination by the US Army, USEPA and TCEQ has been made to terminate one or more of the LUC objectives, the US Army shall provide to the owner of the property an appropriate release for recordation pertaining to the site and will also advise other local stakeholders of the action in a timely manner.

2.1.8 Comprehensive Land Use Control Management Plan

A copy of the final LUC RA has been included in the Comprehensive LUC Management Plan for LHAAP. The Comprehensive LUC Management Plan figure and table have been updated to reflect the inclusion of LHAAP-35A (58) site.



3 PLUME DELINEATION ACTIVITIES

Plume delineation work was performed as part of the remedial activities between July and September 2013 to refine the extent of contamination in the shallow groundwater zones. The following sections discuss the outcome of this work.

3.1 Direct Push Technology Points Installation and Groundwater Sampling

Direct Push Technology (DPT) points were advanced in both the eastern and western plume areas. If VOC concentrations in a DPT location exceeded cleanup levels, another DPT point was installed as a step-out from the previous DPT point in the down-gradient direction to collect additional VOC data. This procedure was repeated until a DPT location with VOC concentrations less than clean up levels was identified. A total of 20 DPT points, 58DPT10 through 58DPT15, 58DPT15a, and 58DPT15b through 58DPT27 were installed in the shallow groundwater zone to assist in selection of optimal locations for permanent groundwater monitoring wells and delineation of the VOC plumes. The locations of the DPT points are depicted in **Figure 3-1**. The shallow DPT points were advanced to depths between approximately 22.5 to 38 feet (ft) bgs with discrete groundwater samples obtained between 23 and 40 ft bgs. No DPT points were advanced into the intermediate or deep groundwater zones.

Discrete groundwater samples were collected from the DPT points by advancing a stainless steel screen beyond the bottom of the boring and exposing it to the formation. The drilling equipment was decontaminated after each completion of each DPT point to prevent cross-contamination. The groundwater samples from the DPT points were analyzed for VOCs utilizing EPA Method 8260B. Boring logs for the DPT points are included in Appendix C. The VOC data from the DPT points is tabulated in **Table 3-1**.

TCE concentrations observed in the groundwater sample from 58DPT15 location exceeded the MCL, requiring installation of two additional sampling points, 58DPT15a and 58DPT15b (see **Figure 3-1**), prior to finalizing the location of well 35AWW19. Due to equipment availability, however, these two points (58DPT15a and 58DPT15b) were installed with a hollow stem auger drill rig. A 10-foot long 2-inch diameter screen was temporarily placed in the borehole to collect a groundwater sample from each of these points.

3.2 Permanent Groundwater Monitoring Wells Installation and Groundwater Sampling

Fourteen new monitoring wells (35AWW09, 35AWW10, 35AWW11, 35AWW12, 35AWW13, 35AWW14, 35AWW15, 35AWW16, 35AWW17, 35AWW18, 35AWW19, 35AWW20, 35AWW21, and 35AWW22) were installed in the shallow groundwater zone. The locations of these wells were based on the groundwater data from the DPT points, and are generally consistent with the locations proposed in the RAWP, with the exception of 35AWW19 which was moved further to the southeast from its originally proposed location based on the VOC data in groundwater samples obtained from 58DPT15, 58DPT15a and 58DPT15b. **Figure 3-1** depicts the locations of the new monitoring wells. The total depths of the new monitoring wells in the shallow groundwater zone ranged from approximately 29 ft bgs to 40 ft bgs. In addition, monitoring well 35WWW07R was installed as a replacement for well 35AWW07 which had been previously destroyed (see **Figure 3-1**). No wells were installed in the intermediate or deep

groundwater zones. Boring logs for the monitoring wells are included in **Appendix C**. Well construction forms are included in **Appendix D**.

Following well development activities for the new wells, groundwater samples from the wells 35AWW10 (up-gradient), 03WW01 (within source area), 35AWW08 (within source area), and 35AWW09 (downgradient) were collected in August 2013 for analysis of VOCs and key biogeochemical parameters. These wells were sampled prior to EISB treatment to establish baseline conditions as they are located within the eastern plume and provide data useful in evaluation of the EISB treatment. The EISB implementation was performed in September 2013 and is further discussed in Section 4.0. The remaining monitoring wells planned to be part of the MNA remedy were sampled in October 2013. All groundwater samples were analyzed for VOCs to establish baseline conditions. Samples from a subset of monitoring wells were also analyzed for key biogeochemical parameters to assist in evaluation of MNA. Additional discussion on the biogeochemical parameters is provided in **Section 5.0**.

During the baseline groundwater sampling event in October 2013, wells 35AWW04 and 35AWW05 were dry. **Table 3-2** provides a list of wells and analytes for each well collected during the baseline event.

All well installation and sampling activities were performed in accordance with the Draft IWWP (AECOM, 2013b). Groundwater sampling forms are included in Appendix E. Chain of custody forms and the laboratory analytical reports are included in **Appendix F**.

3.3 Site Survey

After completion of the well installation activities, the newly installed monitoring wells were surveyed by a state-licensed land surveyor in the Texas State Plane, NAD 1983 coordinate system. The survey data was used to depict the monitoring well locations on the figures for this document.

3.4 Nature and Extent of Contamination

3.4.1 Shallow Zone

Figures 3-1 through **3-5** present the current plumes for PCE, TCE, cis-1,2-DCE, 1,1-DCE, and VC, in the shallow zone, as defined by their respective cleanup levels. The August 2013 data is also presented on these figures to show changes in VOC levels before and immediately after the EISB treatment in the eastern plume area.

The estimated PCE plume configuration is presented in **Figure 3-1**. The PCE plume is roughly centered at the well 35AWW08, and baseline data indicates PCE in wells 03WW01, 35AWW08, and 35AWW09 exceeds the MCL. **Figure 3-1** is different from that shown in the RAWP for the eastern plume due to additional PCE data collected as part of the plume delineation work. The RAWP also identified a small PCE plume in the western plume, centered at monitoring well location 35AWW06; however, the RA baseline results did not identify PCE exceedances in the western area of the site.

Figure 3-2 presents the two separate TCE plumes (eastern plume and western plume) identified in the shallow zone. The eastern plume is located in the southeast portion of LHAAP-58 (35A) and appears to extend beyond its southern boundary. Wells exceeding the TCE MCL within the

eastern plume were 03WW01, 35AWW08, and 35AWW09. The western plume is located in the southwest portion of LHAAP-35A (58) and extends beyond the southern boundary. Wells exceeding the TCE MCL within the western plume were 35AWW20 and LHSMW07. The configurations of TCE plumes in the shallow groundwater zone shown in **Figure 3-2** appear different than those shown in the RAWP as a result of additional TCE data collected as part of the plume delineation work. The eastern TCE plume remains centered on well 35AWW08; however, it is smaller in areal extent than depicted in the RAWP. Similarly, the western TCE plume is larger in areal extent than depicted in the RAWP, with the highest TCE concentration detected in well 35AWW20, approximately 200 feet north of well LHSMW07 (highest TCE concentration depicted in the RAWP).

The estimated cis-1,2-DCE plume configuration in the shallow zone, as defined by its MCL of 70 μ g/L is presented in **Figure 3-3**. A cis-1,2-DCE plume was identified only in the western plume area shallow zone. It is located within the southwest corner of LHAAP-35A (58). Baseline data indicates 35AWW20 is the only well with cis-1,2-DCE concentrations exceeding the MCL. No cis-1,2-DCE plume was identified in the RAWP document.

The highest concentration of 3.77 μ g/L trans-1,2-DCE was identified in monitoring well 35AWW20 located at the southwest corner of LHAAP-35A (58). There were no exceedances of the trans-1,2-DCE MCL in any of the wells sampled. Although not identified as a COC for the LHAAP-35A (58) site, 1,1,2-TCA and 1,2-DCA were detected in35AWW20 at concentrations exceeding their MCL and GW-Ind, respectively.

The estimated 1,1-DCE plume configuration in the western area shallow zone, as defined by its MCL of 7 μ g/L, is presented in **Figure 3-4**. This plume is located near the southwest corner of LHAAP-35A (58) and extends beyond its south and southeast boundaries. The 1,1-DCE plume is roughly centered at the 58DPT15 location although the highest 1,1-DCE concentration was identified in well 35AWW20. Baseline data indicates 1,1-DCE levels in wells 35AWW06, 35AWW11, 35AWW20, and LHSMW07 exceed the MCL. The 1,1-DCE plume shown in **Figure 3-4** is different from that shown in the RAWP due to additional 1,1-DCE data from the delineation work. In comparison to the RAWP depiction, the 1,1-DCE plume is located farther southeast. The RAWP also depicted a 1,1-DCE plume in the eastern plume area; however, 1,1-DCE was not observed at concentrations exceeding the MCL in the eastern plume area during the baseline sampling event.

The estimated VC plume configuration in the shallow zone, as defined by its MCL of 2 μ g/L, is presented in **Figure 3-5**. Only one VC plume (western plume area) is identified in the shallow zone. The plume is located at the southwest corner of LHAAP-35A (58) and extends beyond its boundary to the south and southeast. The VC plume is roughly centered at the 58DPT15 location although the highest concentration of VC was located at 35AWW20. Evaluation of baseline VOC data indicates VC exceeded the MCL at wells 35AWW20 and LHSMW07. The configuration of the VC western plume in the shallow groundwater zone shown in **Figure 3-5** is different from that shown in the RAWP due to additional VC data gathered as part of the plume delineation work. The VC plume depicted here is larger in areal extent that that depicted in the RAWP, with the plume encompassing the southwestern portion of LHAAP-35A (58) and extending beyond its boundaries to the south and southeast. The RAWP identified a small VC plume in the eastern plume area, centered at the location of temporary monitoring well

1004TWW001. The baseline sampling event did not find VC at concentrations exceeding the MCL in the eastern plume area.

No MCL exceedances of any other VOCs were identified during the baseline sampling event.

The VOC data from the August 2013 and October 2013 events is tabulated in **Table 4-1** and **Table 5-1**, respectively. The associated data validation report is included in **Appendix F**.

3.4.2 Intermediate Zone

As discussed in **Section 3.1**, no intermediate groundwater zone DPT points or new monitoring wells were installed as part of the remedial action work. Monitoring well 35AWW01 and 35AWW05 (previously installed by others) are completed in the intermediate groundwater zone. Baseline monitoring event data from these two wells detected no VOCs. The baseline VOC data from the intermediate zone wells is tabulated in **Table 5-1**. The associated data validation report is included in **Appendix F**.

3.4.3 Deep Zone

As discussed in **Section 3.1**, no deep groundwater zone DPT points or new monitoring wells were as part of the remedial action work. Monitoring well 35AWW02 (previously installed by others) is completed in the deep groundwater zone. Baseline monitoring event data from this well detected no VOCs. The baseline VOC data from the deep zone well is tabulated in **Table 5-1**. The associated data validation report is included in **Appendix F**.

3.4.4 Arsenic Monitoring

Although arsenic has not been designated as a COC, groundwater was monitored for arsenic as described in the RAWP. In November 2008, arsenic was detected in one LHAAP-03 well (03WW01) and five LHAAP-35A (58) wells at concentrations exceeding the 10 μ g/L MCL. Detected arsenic concentrations were within the range observed in groundwater during background studies performed in 1995 and 2008 (AECOM, 2012). As indicated in the RAWP, arsenic monitoring was included to provide additional evaluation of arsenic concentration trends after completion of the LHAAP-03 soil excavation and implementation of the EISB remedy at LHAAP-35A (58).

A total of twelve monitoring wells (03WW01, 35AWW01, 35AWW03, 35AWW06, 35AWW07R, 35AWW08, LHSMW03, LHSMW04, LHSMW06, LHSMW07, 1004TW001, and 1004TW006) were specified by the RAWP for arsenic sampling. Of these, three wells (35AWW03, LHSMW03, and LHSMW04) were dry and no sample could be collected. Temporary well 1004TW001 could not be located in the field. Of the eight wells that were sampled, none contained arsenic concentrations exceeding the MCL.

Arsenic monitoring wells are identified on Figure 3-1. The arsenic data is provided in Table 3-3.

3.4.5 Site Geology and Hydrogeology

3.4.5.1 Geological Description

The site is underlain by the Wilcox Group, a Tertiary-age geologic unit characterized by the extreme variability and discontinuity of its sediments. The depositional environment at the time these sediments were deposited consisted of a flat coastal flood plain with lakes and swamps that were traversed by shifting streams. This depositional environment resulted in the composition of the Wilcox Group consisting of heterogeneous series of sandy lignitiferous littoral clays, cross-bedded river sands, lacustrine or lagoonal clays, lignite lentils and stratified deltaic silts (Townsend, 1954).

Drilling activities during the remedial action implementation extended to a depth of approximately 40 feet bgs. The soils observed reflect the heterogeneity and discontinuity of a depositional environment consistent with a shifting stream on a coastal flood plain. The soil was generally fine grained consisting of interbedded silt, sand and clay.

A review of soil boring logs for wells 35AWW02 and 35AWW05 previously drilled by others to depths of 75.75 ft and 140 ft bgs, respectively, reveals mostly clay soils with occasional silt and sand layers with depth.

3.4.5.2 Groundwater Occurrence

3.4.5.2.1 Definition of Water-Bearing Zone

The lithology and hydrogeology of the study area were reviewed to confirm groundwater occurrence. Historically three groundwater zones (shallow, intermediate, and deep) were reported beneath the LHAAP-35A (58) site. The occurrence of predominantly clay with depth appears to provide aquitards impeding vertical migration of groundwater, and separating the saturated subsurface into multiple groundwater zones, as demonstrated by differences in groundwater elevations between the zones.

3.4.5.2.2 Groundwater Elevation Data

The groundwater sampling event conducted in October 2013 included obtaining static water levels from LHAAP-35A (58) monitoring wells. Groundwater (shallow zone) elevations were observed to range from 175.75 feet above mean sea level (msl) 202.32 feet below above msl.

Groundwater elevations were calculated by subtracting the recorded static water levels from the top of casing elevation for each well where a groundwater level reading could be obtained. If the well was dry, the bottom elevation of the well screen was calculated. Groundwater elevation data is tabulated in **Table 3-4**.

Groundwater elevation data was utilized to develop the potentiometric map for the shallow groundwater zone, provided in **Figure 3-6**. The potentiometric map for the shallow groundwater zone indicates groundwater flows in a southeasterly direction. Gradients ranged from approximately 0.005 feet per foot at a potentiometric high located in the northwestern portion of the site to approximately 0.027 feet per foot in the southeast portion of the site.

No groundwater potentiometric maps were developed for the intermediate and deep groundwater zones due to the small number of wells and lack of contaminant impacts. Groundwater ranged from 177.45 feet above msl to 177.71 above msl in the intermediate zone, and was measured at 175.75 feet above msl in the deep zone.





Legend



Figure 3-1 Shallow Zone PCE Plume October 2013 Event Remedial Action Completion Report LHAAP-35A(58) Longhorn Army Ammunition Plant Karnack, Texas

60256135





















Table 3-1: LHAAP-35A (58) Direct Push Technology Borings Volatile Organic Compounds - August/September 2013

Sample ID: Sample Date:	Units	MCL	58DPT10 (27- 31')-200813 8/20/2013	58DPT11 (20- 24')-210813 8/21/2013	58DPT12 (23- 27')-200813 8/20/2013	58DPT13 (18- 22')-220813 8/22/2013	58DPT13 (18- 22')-220813D 8/22/2013	58DPT14(33- 37)-240813 8/24/2013	58DPT15 (36- 40')-220813 8/22/2013	58DPT15A(28- 38)060913 9/6/2013	58DPT15B(18- 28)170913 9/17/2013	58DPT16(31- 35)130813 8/13/2013	58DPT17(36- 40)130813 8/13/2013
Volatile Organic Compounds (8260B)													
1,1-Dichloroethene	µg/L	7	NA	NA	NA	NA	NA	<1 U	NA	49.6	0.86 J	<1 U	<1 U
cis-1,2-Dichloroethene	µg/L	70	NA	NA	NA	NA	NA	<0.5 U	NA	1.42	<0.5 U	<0.5 U	<0.5 U
Tetrachloroethene	µg/L	5	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
trans-1,2-Dichloroethene	µg/L	100	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Trichloroethene	µg/L	5	NA	NA	NA	NA	NA	<0.5 U	NA	6.82	<0.5 U	<0.5 U	<0.5 U
Vinyl Chloride	µg/L	2	NA	NA	NA	NA	NA	<0.5 U	NA	0.302 J	<0.5 U	<0.5 U	<0.5 U
Volatile Organic Compounds (8260C)													
1,1-Dichloroethene	µg/L	7	11	<0.5 U	790	<0.5 U	<0.5 U	NA	63	NA	NA	NA	NA
cis-1,2-Dichloroethene	µg/L	70	20	<0.5 U	240	<0.5 U	<0.5 U	NA	8.7	NA	NA	NA	NA
Tetrachloroethene	μg/L	5	<1 U	<1 U	0.47 J	<1 U	<1 U	NA	<1 U	NA	NA	NA	NA
trans-1,2-Dichloroethene	µg/L	100	0.39 J	<0.5 U	5.1	<0.5 U	<0.5 U	NA	0.31 J	NA	NA	NA	NA
Trichloroethene	µg/L	5	<0.5 U	<0.5 U	61	<0.5 U	<0.5 U	NA	6	NA	NA	NA	NA
Vinyl chloride	µg/L	2	12	<0.5 U	24	<0.5 U	<0.5 U	NA	11	NA	NA	NA	NA

Blue Highlighting Indicates Analyte Detected Above Regulatory Limit

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - maximum contaminant level

NA - not analyzed

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

Table 3-1: LHAAP-35A (58) Direct Push Technology Borings Volatile Organic Compounds - August/September 2013

Sample ID: Sample Date:	Units	MCL	58DPT18(31- 35)120813 8/12/2013	58DPT19(31- 35)100813 8/10/2013	58DPT20(36- 40)050813 8/5/2013	58DPT21(26- 30)060813 8/6/2013	58DPT22(26- 30)130813 8/13/2013	58DPT23(36- 40)060813 8/6/2013	58DPT24(31- 35)100813 8/10/2013	58DPT25(36- 40)-230813 8/23/2013	58DPT26 (28- 32')-210813 8/21/2013	58DPT27(26- 30)060813 8/6/2013
Volatile Organic Compounds (8260B)												
1,1-Dichloroethene	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	NA	<1 U
cis-1,2-Dichloroethene	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
Tetrachloroethene	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
trans-1,2-Dichloroethene	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
Trichloroethene µ		5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
Vinyl Chloride µg/L 2		2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
Volatile Organic Compounds (8260C)												
1,1-Dichloroethene	µg/L	7	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
cis-1,2-Dichloroethene	µg/L	70	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Tetrachloroethene µg/L		5	NA	NA	NA	NA	NA	NA	NA	NA	<1 U	NA
trans-1,2-Dichloroethene	µg/L	100	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Trichloroethene	µg/L	5	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Vinyl chloride	µg/L	2	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA

Blue Highlighting Indicates Analyte Detected Above Regulatory Limit

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - maximum contaminant level

NA - not analyzed

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

Monitoring Wells and Analytes										
Monitoring Well ID	VOCs	Field Parameters***	MNA Parameters****							
35AWW01 ⁽²⁾	Х	Х								
35AWW02 ⁽³⁾	Х	Х								
35AWW05 ⁽²⁾	Х	Х								
35AWW06	Х	Х	Х							
35AWW07R ⁽⁴⁾	Х	Х								
35AWW08	Х	Х	Х							
35AWW09	Х	Х	Х							
35AWW10	Х	Х	Х							
35AWW11	Х	Х	Х							
35AWW12	Х	Х								
35AWW13	Х	Х								
35AWW14	Х	Х								
35AWW15	Х	Х								
35AWW16	Х	Х								
35AWW17	Х	Х								
35AWW18	Х	Х								
35AWW19	Х	Х								
35AWW20	Х	Х	Х							
35AWW21	X	Х								
35AWW22	Х	X								
LHSMW04 ⁽¹⁾	Х	X	X							

Table 3-2: LHAAP-35A (58) Monitored Natural Attenuation (MNA)

Notes:

⁽¹⁾ This well was included in the sampling/analysis program; however, due to insufficient groundwater volume (dry) it was not sampled.

Х

Х

Х

Х

Х

Х

⁽²⁾ This well is classified as an intermediate zone well.

Х

Х

Х

Х

⁽³⁾ This well is classified as a deep zone well.

⁽⁴⁾ This well is a replacement well for 35AWW07.

*** - Field parameters monitored for all wells: pH, temperature, conductivity, turbidity, ORP, DO

**** - MNA parameters include alkalinity, nitrate, nitrite, sulfate, sulfide, chloride, TOC, dissolved iron and manganese, total phosphorus, carbon dioxide, dissolved gases (methane, ethane, ethene), and total iron. Optional parameters include: hydrogen, volatile fatty acids, and dehalococcoides.

X - Well analyzed for that parameter

LHSMW05⁽¹⁾

LHSMW06

LHSMW07

03WW01

MNA - monitored natural attenuation

VOCs - volatile organic compounds

Sample ID: Sample Date:	Units	Cleanup Level ⁽¹⁾	03WW01F- 012914 01/29/2014	35AWW01F- 013114 01/31/2014	35AWW06- 013014 01/30/2014	35AWW07RF- 020314 02/03/2014	35AWW08F- 012914 01/29/2014	LHSMW06F- 013114 01/31/2014	LHSMW07- 013014 01/30/2014	1004TW006F- 013114 01/31/2014
Arsenic (6020A)										
Arsenic	µg/L	10	0.0762 J	0.000821 J	<0.100 U	0.00148 J	0.16 J	0.00649	<0.100 U	0.0111

Table 3-3: LHAAP-35A (58) Monitoring Wells Arsenic Data - January 2014

Note: Samples were not collected for 35AWW03, LHSMW03, and LHSMW04 as they were dry. 1004TW001 could not be located.

(1) - United States Environmental Protection Agency Maximum Contaminant Level

J - Estimated value; analyte concentration was less than the limit of quantification

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter
\A/~!!	Approximate Well	Loca	ation	Ground Surface	Top of Casing	Depth to Water	Groundwater
weii	(ft from TOC)	Northing	Easting	(ft MSL)	(ft MSL)	(ft from TOC)	Elevation (ft MSL)
35AWW01 ^(b)	72.69	6960171.396	3305092.263	215.34	218.03	40.58	177.45
35AWW02 ^(c)	138.59	6960165.723	3305086.849	215.46	218.05	42.3	175.75
35AWW05 ^(b)	72.41	6959849.641	3304426.136	219.0067	221.4124	43.7	177.7124
35AWW06	29.05	6959701.31	3304382.89	218.38	220.43	21.5	198.93
35AWW07R	31.75	6960277.309	3305913.799	210.26	212.11	27.9	184.21
35AWW08	31.83	6960151.893	3305091.156	215.12	216.95	28.8	188.15
35AWW09	41.99	6960129.516	3305208.701	215.38	217.47	32.21	185.26
35AWW10	32.76	6960205.495	3304857.076	218.7	220.76	20.15	200.61
35AWW11	36.84	6959996.699	3304950.674	217.61	220.15	31.36	188.79
35AWW12	36.77	6960186.155	3305468.392	214.02	215.99	30.05	185.94
35AWW13	39.32	6960332.503	3304998.822	216.6	219.12	25.07	194.05
35AWW14	31.76	6959883.392	3304999.85	216.15	218.41	30.8	187.61
35AWW15	40.37	6960212.192	3304315.448	220.4	222.97	20.65	202.32
35AWW16	36.45	6959920.057	3304286.058	218.83	220.88	19.58	201.3
35AWW17	41.67	6959606.804	3304369.136	219.17	221.44	28	193.44
35AWW18	41.55	6959644.847	3304559.677	219.7	221.75	28.35	193.4
35AWW19	31.39	6959553.806	3304847.027	216.72	219.71	30.65	189.06
35AWW20	35.64	6960002.437	3304438.002	220.41	223.05	21.12	201.93
35AWW21	42.26	6960017.252	3305397.412	216.69	219.05	34.36	184.69
35AWW22	36.77	6960346.102	3305327.622	217.07	219.14	32.13	187.01
LHSMW04	31.11	6960185.99	3305398.12	214.04	216.95	DRY	DRY
LHSMW05	24.08	6960157.585	3305078.933	215.41	217.59	DRY	DRY
LHSMW06	23.32	6960079.99	3304628.53	219.86	223.18	20.97	202.21
LHSMW07	29.73	6959841.17	3304408.12	218.54	221.27	20.55	200.72
03WW01	31.53	6960156.891	3305144.783	214.76	216.29	29.51	186.78

Table 3-4: LHAAP-35A (58) Groundwater Elevations and Monitoring Well Information

Notes:

Groundwater Elevation Data is from the October 2013 (Baseline) Sampling Event.

Coordinate system is Texas State Plane, NAD 1983

ft bgs - feet below ground surface

ft MSL - feet mean sea level

TOC - top of casing

^aApproximate Depth is the bottom of the screen interval

^bIntermediate well

^cDeep well

Dry - Insufficient or not water in well. No sample collected.

NA = Not Available

4 ENHANCED IN-SITU BIOREMEDIATION

This section discusses the details of EISB implementation at the LHAAP-35A (58) site.

EISB treatment was specified to treat COCs in the eastern plume area to enhance their biological degradation and create subsurface conditions favorable for MNA after completion of the EISB treatment. EISB implementation included selection of carbon substrate, mixing and injection procedures, a baseline sampling event, bioaugmentation (injections of microbial culture), post-injection monitoring and analysis of data. Prior to the EISB treatment, an underground injection control substantive requirements notification was submitted to the TCEQ in September 2013, to comply with the substantive requirements for construction, operation, and closure under 30 TAC §331, Subchapters A, C, and H (the Applicable or Relevant and Appropriate Requirements for underground injection control).

The following sub-sections provide details of the EISB treatment.

4.1 Substrate Selection

A laboratory-scale TS was performed to assist in selection of appropriate carbon substrate and obtain other design parameter information for EISB application. During the TS, a lactate-based carbon source was able to achieve complete dechlorination of chlorinated VOCs in groundwater from the site at a relatively faster rate than the EVO-based substrate. Thus, a lactate-based carbon substrate was selected for the EISB treatment.

Various formulations of lactate-based carbon sources for groundwater remediation are commercially-available. The specific formulation evaluated in the TS and used for the EISB treatment was Wilclear Plus, manufactured by JRW Bioremediation, LLC. Wilclear Plus is a proprietary blend of neutral pH fatty acids and fermentable substances providing a range of material helping promote growth of an assortment of dechlorinating microbial populations. Wilclear Plus contains approximately 30 - 40% lactates, and 40 - 45% carboxylates, along with other nutrients and metabolites.

4.2 Substrate Loading

The mass of Wilclear Plus required for the target treatment area was calculated based on site characteristics (e.g., target area, depth of the shallow zone etc.), TS data, stoichiometric demand exerted by the native (e.g., dissolved oxygen, sulfate, etc.) and anthropogenic electron acceptors. The quantity of Wilclear Plus estimated using stoichiometric calculations was provided in the LHAAP-35A (58) RAWP (AECOM, 2013). The actual quantities of Wilclear Plus solution used during EISB treatment were adjusted based on TS data and to account for unknown conditions during field application. A total of approximately 9,680 pounds (lbs) (880 gallons) of 60 percent (%) sodium lactate solution was injected during the EISB treatment.

4.3 Target Treatment Area

The area of elevated COC concentrations in the eastern plume (**Figure 3-1** and **3-2**) was considered the target treatment area for the EISB and was estimated to be approximately 3,600 square feet. The RAWP planned ten injection points (EISB-1 through EISB-10) for injection of the substrate solution into the treatment area. Injection locations EISB-1 through EISB-10 were

first staked in the field using coordinates obtained from the RAWP. During the injection activities at locations EISB-6 and EISB-7, the injected solution came to the surface (daylighted) nearby, likely due to some nearby impervious obstructions (e.g. concrete footing or foundation). Therefore, two additional injection locations (EISB-7A and EISB-11) were used to complete injection of the required volume of substrate solution. The twelve injection points were staked and later surveyed by a Texas licensed surveyor and are shown on **Figure 4-1**.

The injections targeted the depth interval of approximately 23 to 30 feet bgs at each point. The injection flow rates ranged from 4 to 6 gallons per minute (gpm) and the injection pressures were between 25 and 30 pounds per square inch (psi).

4.4 Injection Procedure

As discussed previously, approximately 9,680 lbs of sodium lactate as 2,200 gallons of solution with water (approximately 21% volume/volume [v/v]) was injected via twelve injection points. The sodium lactate solution with water was prepared in the field using a polyvinyl mixing tank, centrifugal pump, and recirculation. Water used to prepare the solution was obtained from the pump house serving the LHAAP Groundwater Treatment Plant.

The injections were performed by a Texas licensed drilling contractor, Best Drilling, LLC (Best) under the supervision of AECOM between September 23, 2013 and September 25, 2013. Injection rates, pressures, and volumes are summarized in the injection logs included as **Appendix C**. Best injected the solution in 180-gallon to 225-gallon batches via direct-push injection rods, generally at depths between 23 and 30 feet (ft) below ground surface (bgs). A "bottom-up" injection technique was used, injecting through bottom of the direct-push rod string. Real time information in the form of injection flow rates and pressures were used to guide the injections into the targeted depths of the subsurface. Injection boreholes were appropriately abandoned after completion of each injection, using bentonite chips and water.

4.5 Baseline Groundwater Sampling

Four monitoring wells; 03WW01, 35AWW08, 35AWW09 and 35AWW10 were sampled and analyzed for VOCs and key biogeochemical parameters in August 2013 to obtain baseline groundwater conditions prior to EISB. Two of these wells (35AWW08 and 03WW01) are in the target treatment area and will be referred to as the "treatment area wells" in the subsequent sections of this report, while well 35AWW10 serves as the well up-gradient of the treatment area, and well 35AWW09 serves as the downgradient well.

In October 2013, the remaining site monitoring wells in the eastern and western plume areas were sampled and analyzed for VOCs. A subset of these wells were also sampled and analyzed for key biogeochemical parameters. The VOC and biogeochemical data collected from site wells in support of the MNA component of the remedy are discussed in **Section 5.0** of the document. The four EISB performance monitoring wells (03WW01, 35AWW08, 35AWW09 and 35AWW10) were also sampled in October 2013 along with the other wells.

4.5.1 EISB Performance Monitoring Results

EISB performance can be evaluated by examination of aquifer conditions that directly indicate or facilitate reductive dechlorination of COCs. These conditions include reductions in VOC

concentrations; reduction/elimination of competing electron acceptors molecular oxygen (O_2), nitrate (NO_3^-), manganese (IV) [Mn(IV)], ferrous iron [Fe(III)], and sulfate ($SO_4^{2^-}$); the presence of metabolizable organic carbon; and favorable microbial growth conditions (neutral pH, low salinity, warm temperature). For efficient (metabolic) dechlorination to occur, dehalorespiring bacteria and geochemical conditions to support microbial respiration must also be present.

4.5.1.1 Discussion of August 2013 Data

The baseline data indicated PCE and TCE in wells 03WW01, 35AWW08, and 35AWW09 exceeded the MCLs. No other COCs were detected at concentrations exceeding MCLs in these wells. The highest concentrations of PCE (1,640 μ g/L) and TCE (544 μ g/L) were detected in well 35AWW08. The COCs were not detected in well 35AWW10. The August 2013 VOC data for wells is tabulated in **Table 4-1** and depicted on **Figures 3-1** through **3-5**. The associated data validation report is included in **Appendix F**.

The baseline (August 2013) field parameter data indicate fairly aerobic conditions with high dissolved oxygen (DO) (greater than 9 milligrams per liter [mg/L]) and positive oxidation-reduction potential (ORP) (between 100 and 250 millivolts [mV]) in the treatment area wells (03WW01 and 35AWW08). The groundwater was near neutral pH (between 6 and 7 standard units) and the conductivity was low (between 3 and 9 millisiemens per centimeter (mS/cm).

Among other electron acceptors, nitrate and nitrite were found at concentrations less than the laboratory reporting limits. The sulfate levels in the four wells ranged between 209 mg/L (well 35AWW10) and 1,480 mg/L (well 35AWW08). Iron, manganese, and sulfide levels were relatively low in all four wells.

The total organic carbon (TOC) levels in the wells were also low (ranging from 3.84 mg/L to 16.5 mg/L) indicating limited supply of metabolizable organic carbon before the EISB treatment. Carbon dioxide levels ranged from 61,000 μ g/L (well 35AWW10) to 143,000 μ g/L (well 03WW01 and 35AWW08). The other dissolved gases (methane, ethane, and ethene) were mostly less than the laboratory reporting limits during the baseline event.

The August 2013 field parameter and biogeochemical data for wells is tabulated in **Table 4-2**. The associated data validation report is included in **Appendix F**.

4.5.1.2 Discussion of October 2013 Data

The October 2013 VOC data indicates significant reductions in PCE and TCE in the treatment area wells after the EISB treatment, with the PCE concentration being 603 μ g/L (J-flagged estimated value) and TCE being 149 μ g/L (J-flagged estimated value) in well 35AWW08. Similarly, PCE (172 μ g/L) and TCE (42.1 μ g/L) (both J-flagged, estimated values) in well 03WW01; were significantly lower than the baseline concentrations. Any detections of other COCs in these wells remained at concentrations less than laboratory reporting limits. COC concentrations in well 35AWW10 were also less than laboratory reporting limits. The October 2013 groundwater VOC data is tabulated in **Table 5-1** and depicted on **Figures 3-1** through **3-5**. The associated data validation report is included in **Appendix F**.

The October 2013 data indicate reductive dechlorination of chlorinated VOCs is occurring in the EISB treatment area. The ORP readings in well 03WW01 (-235 mV) and well 35AWW08 (-100

mV) indicate strong reducing conditions were established in the treatment area. The DO levels in these wells still indicated high readings (greater than 9 mg/L), but may reflecting a faulty DO probe. The pH remained near neutral, and the conductivity (39.2 mS/cm to 47.7 mS/cm) in the two treatment area wells increased slightly compared to the baseline (August 2013) conditions.

Among the other electron acceptors, nitrate and nitrite levels were mostly at concentrations less than laboratory reporting limits. Sulfate levels in well 03WW01 reduced from a baseline of 534 mg/L in August 2013 to 487 mg/L in October 2013; and in well 35AWW08 reduced from a baseline of 1,480 mg/L in August 2013 to 703 mg/L. Manganese and iron levels remained relatively low in the treatment area wells.

TOC concentrations increased in wells 03WW01 (to 49,200 mg/L) and 35AWW08 (to 66,400 mg/L). These levels are significantly higher than the baseline conditions due to carbon substrate injections and were increased to sufficiently high levels to support microbial activity. The increased levels of lactic acid observed in the treatment area wells is another indicator that the injected sodium lactate substrate is present within the treatment area of the aquifer and has not yet been consumed or migrated down-gradient. Phosphorus levels also increased in the treatment area wells after the substrate injections compared to the baseline data, important because phosphorus is an essential nutrient supporting microbial activity. Most of the dissolved gases remained at very low concentrations or at less than the laboratory reporting limits.

The October 2013 field parameter and biogeochemical data for wells is tabulated in **Table 5-2**. The associated data validation report is included in **Appendix F**.

In summary, the initial EISB performance monitoring data indicates that aquifer conditions in the eastern plume treatment area provide are conducive to degradation of COCs, and this is supported by reduced concentrations of PCE and TCE in the treatment area wells. Data from subsequent monitoring events will further document the progress of the EISB treatment.

4.6 Bioaugmentation Injections

The TS indicated that augmenting the treatment microcosms with KB-1® Plus accelerated the biodegradation rate of target VOCs in the microcosms. KB-1® Plus is a proprietary microbial culture comprised of a mix of Dehalococcoides ethenogens (DHC) (bacteria well-known for degradation of PCE/TCE, cis-1,2-DCE, and VC) and Dehalobacter (DHB) (bacteria well-known for degradation of TCA and DCA).

During the August 2013 baseline event, the groundwater samples from the four EISB performance monitoring wells (03WW01, 35AWW08, 35AWW09, and 35AWW10) were analyzed to quantify DHC and DHB population along with the functional genes. The population count of both DHC and DHB in the samples ranged from low $(31.1 \times 10^3 \text{ cells equivalent per liter [CEQ/L]})$ to less than the laboratory reporting limit. Typically, DHC concentrations greater than 1 x 10⁷ CEQ/L are required for sufficiently high rates of EISB and ethene production (Lu, 2006). The baseline conditions indicated that native DHC and DHB population in the subsurface environment in the treatment area are several orders of magnitude lower than concentrations necessary to sustain complete biological reductive dechlorination.

To address this condition, bioaugmentation was performed in the eastern plume target area as provided for in the RAWP. As the microbial culture will persist only in an anaerobic

environment (redox conditions of -75 mV or lower), the bioaugmentation injections were performed after anaerobic conditions were established in the aquifer. The bioaugmentation event was performed in November 2013, approximately six weeks after the EISB carbon substrate injections.

Based on experience with field bioaugmentation for similar EISB remedies with similar lithologies, and using technical recommendations provided by the microbial culture manufacturer (Sirem), a quantity of approximately three liters of KB-1® Plus culture was injected per injection point in the target treatment area. The KB-1® Plus culture was procured from the manufacturer and was delivered to the site in the form of a liquid solution pressurized under a compressed gas (argon or nitrogen).

Bioaugmentation involved injecting the microbial culture (KB-1® Plus) via the direct push points within the target treatment area. The DPT injection points for the KB-1® Plus culture were located generally adjacent to the EISB DPT injection points. At each location, the injection tubing was advanced into the drive point at the desired injection depth and purged with nitrogen gas to displace oxygen from the column. The culture was then injected into the drive point via compressed gas in the same target depth interval (23 ft bgs to 30 ft bgs) as the carbon substrate solution.

Field and analytical data collected in subsequent monitoring events will be used to assist in evaluation of bioaugmentation.



Legend



Figure 4-1 EISB Treatment Area Remedial Action Completion Report LHAAP-35A(58) Longhorn Army Ammunition Plant Karnack, Texas

60256135

March 2014

Table 4-1: LHAAP-35A (58) Monitoring Well Volatile Organic Compound Data - August 2013

Sample ID: Sample Date:	Units	MCL	03WW01- 082013 8/20/2013	35AWW08- 082013 8/20/2013	35AWW09- 082913 8/29/2013	35AWW10- 082913 8/29/2013
Volatile Organic Compounds (8260B)						
1,1-Dichloroethene	ug/L	7	<2 U	<10 U	<1 U	<1 U
cis-1,2-Dichloroethene	ug/L	70	0.978 J	9.35 J	<0.5 U	<0.5 U
Tetrachloroethene	ug/L	5	368	1640	21.9	<0.5 U
trans-1,2-Dichloroethene	ug/L	100	<1 U	<5 U	<0.5 U	<0.5 U
Trichloroethene	ug/L	5	94.8	544	11.9	<0.5 U
Vinyl Chloride	ug/L	2	<1 U	<5 U	<0.5 U	<0.5 U

Blue Highlighting Indicates Analyte Detected Above Regulatory Limit

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - maximum contaminant level

NA - not analyzed

 ${\sf U}$ - Analyte was not detected. The concentration is below the reported limit of detection.

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

Sample ID:		03WW01-	35AWW08-	35AWW09-	35AWW09F-	35AWW10-	35AWW10F-
	Units	082013	082013	082913	082913	082913	082913
Sample Date:		8/20/2013	8/20/2013	8/29/2013	8/29/2013	8/29/2013	8/29/2013
Water Quality Parameters							
Temperature	°C	26.19	23.44	27.7	NA	26.77	NA
рН	pH Units	6.18	6.05	6.32	NA	6.92	NA
Conductivity	mS/cm	3.64	8.23	7.2	NA	1.39	NA
Dissolved Oxygen	mg/L	9.11	9.84	1.62	NA	5.69	NA
Turbidity	NTU	33	26.9	20.8	NA	1.3	NA
Oxidation Reduction Potential	mV	240	112	108	NA	96	NA
Ferrous Iron, Field	mg/L	0.78	0.52	NA	NA	NA	NA
Alkalinity (310.2)							
Alkalinity, Total	mg/L	142	174	250	NA	379	NA
Nitrogen (353.2)							
Nitrogen, Nitrate-Nitrite	mg/L	NA	NA	0.201	NA	0.455	NA
Phosphorus (365.4)							
Phosphorus	mg/L	<0.2 U	0.178 J	0.351 J	NA	0.412	NA
Sulfide (376.1)							
Sulfide	mg/L	<1 U	1.2 J	1.75 J	NA	<1 U	NA
Total Organic Carbon (415.1)							
Total Organic Carbon (TOC)	mg/L	10.5	16.5	5.77	NA	3.84	NA
Metals (6010C)							
Iron	mg/L	<0.1 U	4.2	<0.1 U	NA	<0.1 U	NA
Dissolved Metals (6010C)							
Iron	mg/L	<0.1 U	4.75	NA	<0.1 U	NA	<0.1 U
Metals (6020A)							
Manganese	mg/L	0.0589	5.67	0.361	NA	0.0814	NA
Dissolved Metals (6020A)							
Manganese	mg/L	0.0561	5.71	NA	0.341	NA	0.0739
Volatile Fatty Acids (830-MBA)							
Acetic Acid	mg/L	<1 U	<1 U	<1 U	NA	<1 U	NA
Butyric Acid	mg/L	<1 U	<1 U	<1 U	NA	<1 U	NA
Lactic Acid	mg/L	<1 U	<1 U	<1 U	NA	<1 U	NA
Propionic Acid	mg/L	<10 U	<10 U	<10 U	NA	<10 U	NA
Pyruvic Acid	mg/L	<0.1 U	<0.1 U	<0.1 U	NA	<0.1 U	NA

Table 4-2: LHAAP-35A (58) Field Parameters and Biogeochemical Data - August 2013

Sample ID: Sample Date:	Units	03WW01- 082013 8/20/2013	35AWW08- 082013 8/20/2013	35AWW09- 082913 8/29/2013	35AWW09F- 082913 8/29/2013	35AWW10- 082913 8/29/2013	35AWW10F- 082913 8/29/2013
Anions (9056)							
Chloride	mg/L	892	2510	1970	NA	135	NA
Nitrate	mg/L	<1 U	<4 U	<1 U	NA	<1 U	NA
Nitrite	mg/L	<1 U	<4 U	<1 U	NA	<1 U	NA
Sulfate	mg/L	534	1480	1070	NA	209	NA
Dechlorinating Bacteria							
Dehalococcoides	CEQ/mL	1.2	<0.9	10.4	NA	31.1	NA
tceA Reductase	CEQ/mL	<0.5	<0.9	<0.5	NA	<0.5	NA
BAV1 Vinyl Chloride Reductase	CEQ/mL	<0.5	<0.9	<0.5	NA	<0.5	NA
Vinyl Chloride Reductase	CEQ/mL	<0.5	<0.9	<0.5	NA	0.2 J	NA
Dehalobacter spp.	CEQ/mL	0.4 J	<5.3	0.3 J	NA	1.8 J	NA
Dissolved Gases (RSK-175)							
Carbon Dioxide	ug/L	143000	143000	150000	NA	61000	NA
Ethane	ug/L	<2 U	<2 U	<2 U	NA	<2 U	NA
Ethene	ug/L	<2 U	<2 U	<2 U	NA	<2 U	NA
Methane	ug/L	<2 U	<2 U	31.5	NA	<2 U	NA
Ferrous Iron (SM3500FE)							
Ferrous Iron	mg/L	<0.04 U	<0.04 U	<0.04 U	NA	<0.04 U	NA

Table 4-2: LHAAP-35A (58) Field Parameters and Biogeochemical Data - August 2013

Note: Samples were not collected for LHSMW04 as it was dry.

°C - degrees celsius

CEQ/ml - cells equivalent per milliliter

J - Estimated value; analyte concentration was less than the limit of quantification

mg/L - milligram per liter

mS/cm - millisiemens per centimeter

mV - millivolt

NA - not analyzed

NTU - Nephelometric turbidity unit

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

5 MONITORED NATURAL ATTENUATION

This section discusses the implementation details of the MNA program under the RA.

The nature and extent of shallow zone groundwater contamination at the LHAAP-35A (58) site is discussed in **Section 3.4**.

MNA in the western plume and portions of the eastern plume of the LHAAP-35A (58) site has been implemented to monitor COCs and ensure protection of human health and the environment. Performance monitoring to evaluate remedy effectiveness includes groundwater and surface water monitoring. The groundwater monitoring program is designed to evaluate and monitor natural attenuation of COCs in shallow zone groundwater. The surface water monitoring program is designed to evaluate potential migration of groundwater to surface water.

The combined monitoring program shall meet the following objectives (USEPA, 1999):

- Demonstrate that natural attenuation is occurring according to expectations;
- Detect changes in environmental conditions (e.g. geochemical, hydrogeological, etc.) that may reduce the efficacy of any of the natural attenuation processes;
- Identify potentially toxic and/or mobile transformation products;
- Verify that the plumes are not expanding;
- Verify no unacceptable impact to down-gradient receptors;
- Detect new releases of contaminants to the environment that could impact effectiveness of the natural attenuation remedy; and,
- Verify attainment of the remediation objectives.

5.1 MNA Groundwater Monitoring Program

Groundwater monitoring is essential to demonstrate effectiveness of the MNA remedy at the LHAAP-35A (58) site. Eighteen monitoring wells (in addition to the four wells included in the EISB treatment performance monitoring program) are included in the MNA monitoring program for collection and analysis of VOCs. These wells are depicted on **Figure 5-1** and **Table 3-2**. Two of these wells are screened in the intermediate groundwater zone. These wells have been selected for their placement relative to the VOC plumes to monitor effectiveness of remedial actions at the LHAAP-35A (58) site. After completion of the EISB performance monitoring (six quarters of monitoring are anticipated after the EISB treatment), two EISB performance monitoring wells (35AWW08 and 35AWW10) will be added to the MNA performance monitoring program.

Current and historical groundwater data indicate monitoring wells 35AWW20 and LHSMW07 in the western plume, and wells 35AWW08 and 35AWW09 in the eastern plume will be the primary focus of trend analysis as they contain relatively highest COC concentrations. The presence of cis-1,2-DCE, 1,1-DCE, and VC in wells in the western plume area indicates that natural attenuation is occurring in the western plume. VOC and biogeochemical data from these wells will continue to facilitate evaluation of the MNA remedy.

5.1.1 Water Quality and Biogeochemical Parameter Data

Groundwater quality and biogeochemical parameters (cumulatively, MNA parameters) are used in evaluating natural attenuation at the site. MNA parameter data will be collected and analyzed over time for trends that may be used to demonstrate whether MNA is effective. This evaluation includes determination of whether or not the groundwater environment is aerobic or anaerobic (reducing). Reducing conditions are favorable for reductive dechlorination of chlorinated VOCs and are typically characterized by low DO and low to negative ORP values. Depending on the phase of anaerobic respiration, absence of nitrate and presence of nitrite, ferrous (dissolved) iron, dissolved manganese, sulfide, and methane are indicative of progressively greater reducing conditions. Typically, aerobic conditions are indicated by high DO (greater than 2 milligrams per liter [mg/L]), high ORP (greater than 50 to 100 millivolts [mV]), nitrate, ferric iron, manganese, and sulfate. The following section provides a brief discussion of the constituents of interest and biogeochemical environment in the groundwater underlying the site.

Prior to collecting groundwater samples during the October 2013 baseline event, each well was purged and general water quality parameters (temperature, pH, specific conductivity, DO, ORP, and turbidity) were collected to ensure samples collected were representative of groundwater in the formation. The field water quality parameter and natural attenuation parameter data are tabulated in **Table 5-2**. The discussion below excludes the four EISB performance monitoring wells discussed in the summary of the EISB treatment. The following is a summary of the field water quality parameter data:

- The DO values in wells in both areas (western and eastern plumes) ranged widely (0.67 mg/L to 9.72 mg/L), but generally indicated aerobic conditions.
- Similar to the DO, the ORP values also ranged widely (-99 mV to 441 mV) in the shallow zone wells in both plumes.
- Mean temperature values in the wells ranged from 18 degrees Celsius (°C) to 26°C.
- pH values for most of the wells were between 6 and 7 standard units (su), indicating near neutral groundwater.
- Conductivity values were also relatively low (less than 40 mS/cm) in all the measured wells at the site.

Groundwater samples collected from shallow zone monitoring wells 35AWW11, LHSMW04, 35AWW06, 35AWW20, and LHSMW07 were analyzed for the following natural attenuation parameters as discussed in the RAWP: alkalinity, common anions (chloride, sulfate, nitrate, nitrite), sulfide, TOC, dissolved iron and manganese, total phosphorus, carbon dioxide, dissolved gases (methane, ethane, and ethene), and total iron. The natural attenuation parameters are tabulated in **Table 5-2**. The following is the summary of the MNA parameter data for wells excluding 03WW01, 35AWW08, 35AWW09, and 35AWW10 (which are discussed separately in Section 4.5.1.1):

• Alkalinity – There is a positive correlation between zones of microbial activity and increased alkalinity (USEPA, 1998). Alkalinity levels in the shallow zone groundwater at the site ranged between 392 mg/L (35AWW11) and 786 mg/L (35AWW20). The evidence of highest alkalinity levels in well 35AWW20 (western plume) suggests

presence of microbial activity in the western plume area. This observation is also supported by other data (e.g. presence of degradation products) in the western plume area.

- Chloride During biodegradation of chlorinated hydrocarbons in groundwater, chloride is released in groundwater. This results in higher chloride concentrations in the contaminant plume as compared to background levels or down-gradient wells (USEPA, 1998). Chloride levels in the shallow zone ranged between 1,120 mg/L (well 35AWW06) and 2,670 mg/L (well LHSMW07). Relatively high level of chloride in well LHSMW07 in the western plume supports biodegradation (biological activity) in this area. Well 35AWW20, also in the western plume, also depicted relatively high chloride level (2,360 µg/L).
- Nitrate and Nitrite After dissolved oxygen has been depleted in the zone of microbiological activity, nitrate may be used as an electron acceptor for anaerobic biodegradation of organic carbon via denitrification. In order for reductive dechlorination to occur, nitrate concentrations in the contaminated portion of the aquifer must be less than 1.0 mg/L (USEPA, 1998). Nitrite is generated when nitrate is reduced during anaerobic dechlorination. In the shallow zone wells, nitrate and nitrite levels were generally less than the laboratory reporting limits, indicating nitrate levels are not currently inhibiting reductive dechlorination.
- Sulfate After dissolved oxygen and nitrate, sulfate may be used as an electron acceptor for anaerobic biodegradation. This process is termed as 'sulfate reduction' and results in production of sulfide (USEPA, 1998). Concentrations of sulfate greater than 20 mg/L may cause competitive exclusion of dechlorination (USEPA, 1998). However, in many plumes, reductive dechlorination has been observed despite high sulfate concentrations (USEPA, 1998). Sulfate concentrations in the shallow zone groundwater ranged between 1,360 mg/L (35AWW11) and 2,630 mg/L (LHSMW07). These relatively high levels can exert additional demand on the substrate and potentially slow down MNA progress.
- Sulfide Sulfide is generated when sulfate is reduced during reductive dechlorination. Sulfide levels were less than the laboratory reporting limit in the sampled wells. Indicating the current conditions in the aquifer are not sulfate reducing.
- Phosphorus Phosphorus in groundwater is a nutrient available to microbes for their metabolic processes during reductive dechlorination. Phosphorus levels in the sampled wells were generally detected at low levels or were less than the laboratory reporting limit indicating that groundwater does not have naturally available phosphorus for biological degradation.
- TOC measurements in the shallow zone wells were very low (not greater than 17 mg/L) indicating a limited supply of organic carbon. TOC levels are used to estimate microbial abundance for biological degradation of chlorinated VOCs. TOC levels are used to estimate conditions for biological degradation of chlorinated VOCs. Limited organic carbon can indicate that conditions for biological activity are not optimal in the aquifer.

Organic substrate (monitored in terms of TOC) can stimulate microbial growth, creating an anaerobic environment for reduction of COCs.

 Dissolved gases – Methanogenesis occurs in highly reducing conditions with ethane, and ethene being the end products of reductive dechlorination of chlorinated VOCs. Concentrations of dissolved gases (ethane and ethene) were generally less than laboratory reporting limits or detected at low concentrations in the sampled wells, indicating limited biological activity in the sampled wells. The absence of ethane and ethene suggests complete dechlorination is not occurring in the groundwater at this time. Methane was detected in the western plume wells 35AWW20 and LHSMW07 at concentrations of 118 µg/L and 204 µg/L indicating some level of methanogenic conditions.

Data on the above MNA parameters, collected over several quarterly sampling events, are expected to allow trend analysis for evaluation of MNA effectiveness.

5.1.2 Surface Water Sampling

As per the RAWP, one surface water sample was collected from the ditch that runs parallel to 4th Street, at a location near well 35AWW18. The location of surface water sample 35ASW03 is presented on **Figure 3-1**. For the baseline event, surface water sample 35ASW03 was collected in October 2013 and analyzed for VOCs using USEPA Method 8260B. The VOC data for the surface water sample is included in **Table 5-1**. COCs were not detected in the surface water sample at concentrations exceeding laboratory reporting limits.

5.1.3 Long-term Monitoring

The data from the first two years of quarterly groundwater monitoring will be used to perform an MNA evaluation at the site. If the evaluation determines MNA is effective, and will likely lead to the achievement of RAOs, the LTM will begin at a semiannual frequency for the following three years (until the first CERCLA Five-Year Review). The suite of analyses performed will also be limited to VOCs for ongoing confirmation of declining concentration trends. In subsequent years, LTM will be performed annually until the next CERCLA Five-Year Review. The LTM associated with this remedy will be used to track the continued effectiveness of MNA. The need for continued monitoring and any reductions in the monitoring frequency will be evaluated every five years during the CERCLA Five-Year Review. However, at a minimum, the LTM will continue once every five years until the cleanup levels are achieved.

5.1.4 Site Health and Safety Plan/Procedures

Field work was conducted in compliance with the health and safety procedures described in the LHAAP HASP and draft IWWP (AECOM, 2013b). The field work was performed in modified Level D personal protective equipment (PPE) that included a hard hat, safety glasses, steel-toed boots, and nitrile gloves. Additional PPE utilized depending on the location and type of field activities included bug spray, Tyvek® suits, poison ivy/oak block, and reflective safety vests.

5.1.5 Quality Assurance/Quality Control (QA/QC)

All work was performed in accordance with the IWWP in place at the time field work was conducted. The IWWP provides information on QA/QC procedures for this project, identifies

personnel, procedures, controls, instructions, tests, verifications, documents, and forms to be used and the types of records to be maintained. The IWWP also addresses quality control requirements specific to each major feature of work.



Table 5-1: LHAAP-35A (58) Monitoring Well Volatile Organic Compound Data - October 2013

Sample ID: Sample Date:	Units	MCL	03WW01- 101013 10/10/2013	35ASW03- 101713 10/17/2013	35AWW01- 101113 10/11/2013	35AWW02- 102213 10/22/2013	35AWW05- 101613 10/16/2013	35AWW06- 101513 10/15/2013	35AWW07R- 101613 10/16/2013	35AWW08- 101013 10/10/2013	35AWW09- 101013 10/10/2013	35AWW10- 101013 10/10/2013	35AWW11- 101513 10/15/2013
Volatile Organic Compounds (8260B)													
1,1-Dichloroethene	ug/L	7	<5 U	<1 U	<1 U	<1 U	<1 U	15.8	<1 U	<10 U	<1 UJ	<1 U	7.7
cis-1,2-Dichloroethene	ug/L	70	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.709 J	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Tetrachloroethene	ug/L	5	172 J	<0.5 U	0.586 J	603 J	57.6 J	<0.5 U	<0.5 U				
trans-1,2-Dichloroethene	ug/L	100	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Trichloroethene	ug/L	5	42.1 J	<0.5 U	1.03	149 J	8.97 J	<0.5 U	<0.5 U				
Vinyl Chloride	ug/L	2	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	0.442 J

Note: Samples were not collected for LHSMW04 and LHSMW05 as they were dry. 35ASW03-101713 is a surface water sample.

Blue Highlighting Indicates Analyte Detected Above Regulatory Limit

FD - field duplicate

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - maximum contaminant level

NA - not analyzed

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

Table 5-1: LHAAP-35A (58) Monitoring Well Volatile Organic Compound Data - October 2013

Sample ID: Sample Date:	Units	MCL	35AWW12- 101813 10/18/2013	35AWW12FD- 101813 10/18/2013	35AWW13- 101113 10/11/2013	35AWW13FD- 101113 10/11/2013	35AWW14- 101813 10/18/2013	35AWW15- 101613 10/16/2013	35AWW15FD- 101613 10/16/2013	35AWW16- 102213 10/22/2013	35AWW17- 101813 10/18/2013	35AWW18- 101813 10/18/2013	35AWW19- 102213 10/22/2013
Volatile Organic Compounds (8260B)													
1,1-Dichloroethene	ug/L	7	<1 U	<1 U	<1 U	<1 U	1.63 J	<1 U	<1 U	<1 U	<1 U	<1 U	6.45
cis-1,2-Dichloroethene	ug/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	2.04	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Tetrachloroethene	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
trans-1,2-Dichloroethene	ug/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Trichloroethene	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.663 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.379 J
Vinyl Chloride	ug/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.272 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

Note: Samples were not collected for LHSMW04 and LHSMW05 as they were dry. 35ASW03-101713 is a surface water sample.

Blue Highlighting Indicates Analyte Detected Above Regulatory Limit

FD - field duplicate

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - maximum contaminant level

NA - not analyzed

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

Table 5-1: LHAAP-35A (58) Monitoring Well Volatile Organic Compound Data - October 2013

Sample ID: Sample Date:	Units	MCL	35AWW20- 101513 10/15/2013	35AWW21- 101613 10/16/2013	35AWW22- 102213 10/22/2013	LHSMW06- 101713 10/17/2013	LHSMW07- 101513 10/15/2013
Volatile Organic Compounds (8260B)							
1,1-Dichloroethene	ug/L	7	3230	<1 U	<1 U	1.23 J	396
cis-1,2-Dichloroethene	ug/L	70	110	<0.5 U	<0.5 U	4.01	6.1
Tetrachloroethene	ug/L	5	1.65	<0.5 U	<0.5 U	0.663 J	<0.5 U
trans-1,2-Dichloroethene	ug/L	100	3.77	<0.5 U	<0.5 U	<0.5 U	0.282 J
Trichloroethene	ug/L	5	513	<0.5 U	<0.5 U	1.87	23.9
Vinyl Chloride	ug/L	2	105	<0.5 U	<0.5 U	0.627 J	15.9

Note: Samples were not collected for LHSMW04 and LHSMW05 as they were dry. 35ASW03-101713 is a surface water sample.

Blue Highlighting Indicates Analyte Detected Above Regulatory Limit

FD - field duplicate

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - maximum contaminant level

NA - not analyzed

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

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Sample ID: Sample Date:	Units	03WW01- 101013 10/10/2013	03WW01F- 101013 10/10/2013	35AWW01- 101113 10/11/2013	35AWW02- 102213 10/22/2013	35AWW05- 101613 10/16/2013	35AWW06- 101513 10/15/2013	35AWW06F- 101513 10/15/2013	35AWW07R- 101613 10/16/2013	35AWW08- 101013 10/10/2013	35AWW08F- 101013 10/10/2013	35AWW09- 101013 10/10/2013	35AWW09F- 101013 10/10/2013
Water Quality Parameters	•												
Temperature	°C	17.4	NA	25.58	22.72	21.05	21.39	NA	20.83	16.82	NA	19.67	NA
pH	pH Units	6.55	NA	7.08	8.12	6.95	6.56	NA	7.54	6.7	NA	5.43	NA
Conductivity	mS/cm	39.2	NA	0.576	0.875	3.05	6.73	NA	0.205	47.7	NA	7.68	NA
Dissolved Oxygen	mg/L	9.72	NA	0.85	1.3	0.67	1.05	NA	8.86	9.57	NA	1.53	NA
Turbidity	NTU	10	NA	131	7.3	16.9	0	NA	197	4.1	NA	40.5	NA
Oxidation Reduction Potential	mV	-235	NA	23	98	-141	96	NA	108	-100	NA	182	NA
Alkalinity (310.2)													
Alkalinity, Total	mg/L	39700	NA	NA	NA	NA	592	NA	NA	35600	NA	235	NA
Nitrogen (353.2)													
Nitrogen, Nitrate-Nitrite	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus (365.4)													
Phosphorus	mg/L	243	NA	NA	NA	NA	<0.2 U	NA	NA	361	NA	<0.2 U	NA
Sulfide (376.1)													
Sulfide	mg/L	<1 U	NA	NA	NA	NA	<1 U	NA	NA	<1 U	NA	<1 U	NA
Total Organic Carbon (415.1)													
Total Organic Carbon (TOC)	mg/L	49200	NA	NA	NA	NA	6.33	NA	NA	66400	NA	9.83	NA
Metals (6010C)													
Iron	mg/L	36.6	NA	NA	NA	NA	0.159 J	NA	NA	29.7	NA	NA	<0.1 U
Dissolved Metals (6010C)													
Iron	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (6020A)													
Manganese	mg/L	60.4	NA	NA	NA	NA	0.278	NA	NA	45.8	NA	NA	0.23
Dissolved Metals (6020A)													
Manganese	mg/L	NA	65.2	NA	NA	NA	NA	0.191	NA	NA	40.7	NA	0.234
Volatile Fatty Acids (830-MBA)													
Acetic Acid	mg/L	946	NA	NA	NA	NA	NA	NA	NA	776	NA	<1 U	NA
Butyric Acid	mg/L	<100 U	NA	NA	NA	NA	NA	NA	NA	<100 U	NA	<1 U	NA
Lactic Acid	mg/L	97100	NA	NA	NA	NA	NA	NA	NA	89700	NA	<1 U	NA
Propionic Acid	mg/L	<1000 U	NA	NA	NA	NA	NA	NA	NA	<1000 U	NA	<10 U	NA
Pyruvic Acid	mg/L	61.5	NA	NA	NA	NA	NA	NA	NA	61.7	NA	<0.1 U	NA
Anions (9056)	-									-			
Chloride	mg/L	398	NA	NA	NA	NA	1120	NA	NA	905	NA	1730	NA
INITATE	mg/L	<20 U	NA	NA	NA	NA	<4 U	NA	NA	12.3 J	NA	<2 U	NA
Sulfate	mg/L	<20 U 107		NA NA			<4 U 1660	NA NA		<20 U 702		<2 U 1170	
Juliale	my/∟	407	INA	INA	INA	INA	1000	INA	INA	103	INA	1170	INA

Sample ID:	Units	03WW01- 101013	03WW01F- 101013	35AWW01- 101113	35AWW02- 102213	35AWW05- 101613	35AWW06- 101513	35AWW06F- 101513	35AWW07R- 101613	35AWW08- 101013	35AWW08F- 101013	35AWW09- 101013	35AWW09F- 101013
Sample Date:		10/10/2013	10/10/2013	10/11/2013	10/22/2013	10/16/2013	10/15/2013	10/15/2013	10/16/2013	10/10/2013	10/10/2013	10/10/2013	10/10/2013
Dechlorinating Bacteria													
Dehalococcoides	CEQ/mL	<2.1	NA	NA	NA	NA	NA	NA	NA	3.6	NA	4	NA
tceA Reductase	CEQ/mL	<2.1	NA	NA	NA	NA	NA	NA	NA	2.65	NA	0.3 J	NA
BAV1 Vinyl Chloride Reductase	CEQ/mL	<2.1	NA	NA	NA	NA	NA	NA	NA	<2.2	NA	<0.5	NA
Vinyl Chloride Reductase	CEQ/mL	<2.1	NA	NA	NA	NA	NA	NA	NA	<2.2	NA	<0.5	NA
Dehalobacter spp.	CEQ/mL	15.7 J	NA	NA	NA	NA	NA	NA	NA	1300	NA	<4.7	NA
Dissolved Gases (RSK-175)													
Carbon Dioxide	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethane	ug/L	<2 U	NA	NA	NA	NA	<2 U	NA	NA	<2 U	NA	<2 U	NA
Ethene	ug/L	<2 U	NA	NA	NA	NA	<2 U	NA	NA	<2 U	NA	<2 U	NA
Methane	ug/L	<2 U	NA	NA	NA	NA	<2 UJ	NA	NA	<2 UJ	NA	<2 U	NA
Ferrous Iron (SM3500FE)													
Ferrous Iron	mg/L	35.4 J	NA	NA	NA	NA	<0.04 U	NA	NA	52.4 J	NA	<0.04 U	NA

Note: Samples were not collected for LHSMW04 and

LHSMW05 as they were dry.

°C - degrees celsius

CEQ/ml - cells equivalent per milliliter

J - Estimated value; analyte concentration was less than the limit of quantification

mg/L - milligram per liter

mS/cm - millisiemens per centimeter

mV - millivolt

NA - not analyzed

NTU - Nephelometric turbidity unit

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

Sample ID: Sample Date:	Units	35AWW10- 101013 10/10/2013	35AWW10F- 101013 10/10/2013	35AWW11- 101513 10/15/2013	35AWW11F- 101513 10/15/2013	35AWW12- 101813 10/18/2013	35AWW13- 101113 10/11/2013	35AWW14- 101813 10/18/2013	35AWW15- 101613 10/16/2013	35AWW16- 102213 10/22/2013	35AWW17- 101813 10/18/2013
Water Quality Parameters		10/10/2010	10/10/2010	10/10/2010	10/10/2010	10/10/2010	10/11/2010	10/10/2010	10/10/2010	10/22/2010	10/10/2010
Temperature	°C	25 41	NA	21 17	NA	20.93	22 45	19.37	21.88	19.32	17 69
рН	pH Units	6.1	NA	6.12	NA	6.05	6.5	6.89	6.39	6.39	6.64
Conductivity	mS/cm	0.322	NA	9.75	NA	2.6	1.66	6.73	14.9	10.7	10.4
Dissolved Oxygen	mg/L	5.36	NA	4.24	NA	1.29	0.96	10.5	0.65	5	1.72
Turbidity	NTU	5.1	NA	25.8	NA	17.3	22.5	6	19	37.1	12.1
Oxidation Reduction Potential	mV	420	NA	125	NA	153	-68	1	-99	58	74
Alkalinity (310.2)											
Alkalinity, Total	mg/L	128	NA	392	NA	NA	NA	NA	NA	NA	NA
Nitrogen (353.2)											
Nitrogen, Nitrate-Nitrite	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus (365.4)											
Phosphorus	mg/L	<0.2 U	NA	0.22 J	NA	NA	NA	NA	NA	NA	NA
Sulfide (376.1)											
Sulfide	mg/L	<1 U	NA	<1 U	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (415.1)											
Total Organic Carbon (TOC)	mg/L	5.42	NA	17	NA	NA	NA	NA	NA	NA	NA
Metals (6010C)											
Iron	mg/L	0.155 J	NA	NA	1.16	NA	NA	NA	NA	NA	NA
Dissolved Metals (6010C)											
Iron	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (6020A)											
Manganese	mg/L	0.0811	NA	NA	1.07	NA	NA	NA	NA	NA	NA
Dissolved Metals (6020A)											
Manganese	mg/L	NA	0.0681	NA	1.01	NA	NA	NA	NA	NA	NA
Volatile Fatty Acids (830-MBA)											
Acetic Acid	mg/L	<1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	mg/L	<1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	mg/L	<1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propionic Acid	mg/L	<10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
	mg/L	<0.1 0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions (9056)			• • •							• • •	
Chloride	mg/L	16.5	NA	2350	NA	NA	NA	NA	NA	NA	NA
	mg/L	0.11 J	NA NA	<4 UJ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
Sulfate	ma/L	<u><0.2 0</u> 66 2	NA	<u> </u>	NA	NA	NA	NA	NA	NA	NA
Ounato	ing/⊏	00.2	11/1	1000		11/7	11/1	11/1	1 11/1	11/1	1 1/1

Sample ID: Sample Date:	Units	35AWW10- 101013 10/10/2013	35AWW10F- 101013 10/10/2013	35AWW11- 101513 10/15/2013	35AWW11F- 101513 10/15/2013	35AWW12- 101813 10/18/2013	35AWW13- 101113 10/11/2013	35AWW14- 101813 10/18/2013	35AWW15- 101613 10/16/2013	35AWW16- 102213 10/22/2013	35AWW17- 101813 10/18/2013
Dechlorinating Bacteria											
Dehalococcoides	CEQ/mL	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
tceA Reductase	CEQ/mL	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAV1 Vinyl Chloride Reductase	CEQ/mL	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride Reductase	CEQ/mL	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dehalobacter spp.	CEQ/mL	3.4 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Gases (RSK-175)											
Carbon Dioxide	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethane	ug/L	<2 U	NA	<2 U	NA	NA	NA	NA	NA	NA	NA
Ethene	ug/L	<2 U	NA	<2 U	NA	NA	NA	NA	NA	NA	NA
Methane	ug/L	<2 U	NA	<2 UJ	NA	NA	NA	NA	NA	NA	NA
Ferrous Iron (SM3500FE)											
Ferrous Iron	mg/L	<0.04 U	NA	<0.04 U	NA	NA	NA	NA	NA	NA	NA

Note: Samples were not collected for LHSMW04 and

LHSMW05 as they were dry.

°C - degrees celsius

CEQ/ml - cells equivalent per milliliter

J - Estimated value; analyte concentration was less than the limit of quantification

mg/L - milligram per liter

mS/cm - millisiemens per centimeter

mV - millivolt

NA - not analyzed

NTU - Nephelometric turbidity unit

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

Sample ID: Sample Date:	Units	35AWW18- 101813 10/18/2013	35AWW19- 102213 10/22/2013	35AWW20- 101513 10/15/2013	35AWW21- 101613 10/16/2013	35AWW22- 102213 10/22/2013	LHSMW06- 101713 10/17/2013	LHSMW07- 101513 10/15/2013	LHSMW07F- 101513 10/15/2013
Water Quality Parameters						1			
Temperature	°C	18.7	18.75	26.17	20.7	18.67	20.46	23.04	NA
pH	pH Units	6.67	6.44	6.55	5.72	6.2	6.82	6.48	NA
Conductivity	mS/cm	10.1	6.95	11.4	1.05	9.85	3.65	12.5	NA
Dissolved Oxygen	mg/L	1.4	9.67	1.55	1.44	9.67	10	0.75	NA
Turbidity	NTU	22.9	475	6.7	21.3	25	1	1.8	NA
Oxidation Reduction Potential	mV	104	106	441	213	170	157	79	NA
Alkalinity (310.2)									
Alkalinity, Total	mg/L	NA	NA	786	NA	NA	NA	597	NA
Nitrogen (353.2)									
Nitrogen, Nitrate-Nitrite	mg/L	NA							
Phosphorus (365.4)									
Phosphorus	mg/L	NA	NA	<0.2 U	NA	NA	NA	<0.2 U	NA
Sulfide (376.1)									
Sulfide	mg/L	NA	NA	<1 U	NA	NA	NA	<1 U	NA
Total Organic Carbon (415.1)									
Total Organic Carbon (TOC)	mg/L	NA	NA	13.1	NA	NA	NA	9.22	NA
Metals (6010C)									
Iron	mg/L	NA	NA	0.339	NA	NA	NA	1.55	NA
Dissolved Metals (6010C)									
Iron	mg/L	NA							
Metals (6020A)									
Manganese	mg/L	NA	NA	2.8	NA	NA	NA	0.101	NA
Dissolved Metals (6020A)									
Manganese	mg/L	NA	NA	2.54	NA	NA	NA	NA	0.0961
Volatile Fatty Acids (830-MBA)									
Acetic Acid	ma/L	NA							
Butyric Acid	mg/L	NA							
Lactic Acid	mg/L	NA							
Propionic Acid	mg/L	NA							
Pyruvic Acid	mg/L	NA							
Anions (9056)									
Chloride	mg/L	NA	NA	2360	NA	NA	NA	2670	NA
Nitrate	mg/L	NA	NA	<4 U	NA	NA	NA	<4 UJ	NA
Nitrite	mg/L	NA	NA	<4 U	NA	NA	NA	<4 UJ	NA
Sulfate	mg/L	NA	NA	2290	NA	NA	NA	2630	NA

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Sample ID: Sample Date:	Units	35AWW18- 101813 10/18/2013	35AWW19- 102213 10/22/2013	35AWW20- 101513 10/15/2013	35AWW21- 101613 10/16/2013	35AWW22- 102213 10/22/2013	LHSMW06- 101713 10/17/2013	LHSMW07- 101513 10/15/2013	LHSMW07F- 101513 10/15/2013
Dechlorinating Bacteria									
Dehalococcoides	CEQ/mL	NA							
tceA Reductase	CEQ/mL	NA							
BAV1 Vinyl Chloride Reductase	CEQ/mL	NA							
Vinyl Chloride Reductase	CEQ/mL	NA							
Dehalobacter spp.	CEQ/mL	NA							
Dissolved Gases (RSK-175)									
Carbon Dioxide	ug/L	NA							
Ethane	ug/L	NA	NA	1.19 J	NA	NA	NA	<2 U	NA
Ethene	ug/L	NA	NA	<2 U	NA	NA	NA	<2 U	NA
Methane	ug/L	NA	NA	118	NA	NA	NA	204	NA
Ferrous Iron (SM3500FE)									
Ferrous Iron	mg/L	NA	NA	<0.04 U	NA	NA	NA	<0.04 U	NA

Note: Samples were not collected for LHSMW04 and

LHSMW05 as they were dry.

°C - degrees celsius

CEQ/ml - cells equivalent per milliliter

J - Estimated value; analyte concentration was less than the limit of quantification

mg/L - milligram per liter

mS/cm - millisiemens per centimeter

mV - millivolt

NA - not analyzed

NTU - Nephelometric turbidity unit

U - Analyte was not detected. The concentration is below the reported limit of detection.

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6 MNA PERFORMANCE EVALUATION AND REPORTING

Typical natural attenuation processes include adsorption, dispersion, dilution, volatilization and biodegradation. Adsorption, dispersion, and dilution are controlled by the physical characteristics of the aquifer (e.g., particle grain size, groundwater flow velocity, recharge, etc.). Volatilization of the compound of concern is generally controlled by compound chemistry and aquifer characteristics (i.e., temperature, pH, etc.). Biodegradation can be estimated indirectly by monitoring the daughter products and other MNA parameters discussed in the previous section.

The available data indicates that the aquifer outside of the eastern plume EISB treatment area is moderately aerobic. The presence of cis-1,2-DCE, 1,1-DCE, and VC in wells in the western plume area indicates that biological degradation is occurring, albeit limited. In the eastern plume, outside of the EISB treatment area, current data does not indicate biological degradation. However, over time, the effect of the EISB treatment is expected to be observed down-gradient from the treatment area. The baseline data does not provide sufficient information to properly assess MNA effectiveness at the site. Additional data collected during subsequent monitoring events, along with baseline data, will be used to evaluate progress of the remedy. Annual reports will be completed at the end of each calendar year and a formal technical evaluation of MNA effectiveness will be performed after the first eight quarters (two years) of groundwater monitoring. After the first two years, LTM will be continued and CERCLA Five-Year Reviews will be conducted until clean up goals are achieved.

6.1 MNA Reporting Plan

The MNA performance criteria listed in **Table 6-1** and discussed below will be used during formal evaluation of MNA as the remedy. The MNA Evaluation Report will include:

- Figures of the site, wells, and groundwater elevation contours;
- Groundwater and surface water analytical results;
- Plume extent and concentrations over time;
- Consideration of the first and second lines of evidence for MNA (see Section 6.1.2 and Section 6.1.3); and,
- An evaluation of the effectiveness of MNA at the site.

6.1.1 Migration/Expansion

The MNA evaluation should demonstrate a stable or decreasing plume size if the MNA remedy is to be considered effective at the LHAAP-35A (58) site. A groundwater plume is stable when the pollutant concentrations and plume footprint are relatively unchanged over time. A stable plume shows that pollutant migration in groundwater is under control. A decreasing plume is decreasing in contaminant concentrations and/or its footprint is not migrating or expanding. This situation occurs when the attenuation rate of dissolved-phase pollutants exceeds their generation rate from all sources.

Monitoring must occur over a period of time sufficient to demonstrate plume stability or decrease under natural conditions. This may take up to several years, depending on site-specific

conditions such as monitoring data trend analysis, potential threats to beneficial uses, and other uncertainties. The non-parametric Mann-Kendall statistic will be used to evaluate solute plume stability. If monitoring data do not indicate plume stability or decrease, additional plume remediation activities may be necessary.

6.1.2 First Line of Evidence

The first line of evidence relies upon comparison of current and historical groundwater data from appropriate monitoring or sampling points that demonstrates a trend of stable or decreasing contaminant mass and/or COC concentrations over time or with distance traveled from the source. Decreasing concentrations should not be solely the result of plume migration, so performance wells will be evaluated to determine if the plume is migrating. COC concentrations in individual wells can be evaluated to calculate a time-based attenuation rate or across multiple wells through the centerline of a plume to calculate distance-based attenuation rate. These calculations will be performed using the methods contained in the *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater* (USEPA, 1998).

The trends of PCE and TCE for wells in the EISB treatment area (03WW01, 35AWW08, 35AWW09, and 35AWW10) are depicted in Appendix G. The other wells in the shallow zone have limited VOC data exceeding their cleanup levels, and hence, no trend graphs were created for this document.

Time-based attenuation rates will be calculated for any monitoring well that shows consistent COC concentrations exceeding cleanup levels. Distance-based attenuation rates will be calculated using wells with the highest concentrations parallel to the direction of groundwater flow. According to October 2013 sampling data, monitoring wells 35AWW20 and LHSMW07 (western plume area) and wells 03WW01 and 35AWW08 (eastern plume area) are expected to be the primary focus of analysis at the LHAAP-35A (58) site, as they contain the greatest COC concentrations.

6.1.3 Second Line of Evidence

The second line of evidence uses chemical analytical data in mass balance to show that decreases in contaminant and electron acceptor/donor concentrations can be directly correlated to increases in metabolic end products or daughter compounds. The evidence can be used to show groundwater conditions are sufficiently favorable to natural attenuation so that degradation of chlorinated solvent contaminants can occur. The second line of evidence also evaluates biogeochemical parameters such as nitrates, sulfates, chloride, TOC, etc. The results of these analyses will continue to be interpreted using the *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater* (USEPA 1998) to determine whether conditions are favorable for continued MNA.

6.1.4 Third Line of Evidence

If the first two lines of evidence for MNA are deemed inadequate or inconclusive and/or if the need for a contingency remedy is evaluated, data from field or additional microcosm studies will be necessary to establish the third line of evidence for MNA. The need for any additional studies will be deferred until the initial two-year groundwater monitoring program is concluded.

The third line of evidence, if necessary, consists of predictive modeling studies and other laboratory/field studies that demonstrate an understanding of the natural attenuation processes occurring at the site and their effectiveness in controlling plume migration and decreasing COC concentrations. For the MNA evaluation, the presence of microorganisms in the groundwater capable of degrading the COCs will be considered the favorable condition supporting continued MNA. Additional analyses (e.g. DHC, hydrogen, VHA) related to general laboratory and microcosm studies will be deferred until such time as the initial two-year groundwater monitoring program is concluded and such a study is found necessary.

6.1.5 MNA Performance Evaluation Report

The MNA Performance Evaluation Report will review data for the initial eight quarters of monitoring to determine whether MNA is functioning as intended and will continue to be the remedial action applied at the LHAAP-35A (58) site.

The first and second lines of evidence will be evaluated for decreasing COC concentrations and suitable geochemical conditions to demonstrate MNA. The MNA Performance Evaluation Report will also include recommendations for future LTM and well abandonments.

6.2 Long-term Monitoring Annual Reports

An annual report will be prepared at the end of each year of LTM with the following information:

- Present groundwater monitoring results, a description of field activities, and to document other relevant information that may be considered useful for the CERCLA Five-Year Review;
- Evaluation of perimeter well data for plume migration and data from wells within the plume areas for evaluation of MNA performance;
- Present monitoring well conditions and maintenance required, if any; and
- Recommendations, if possible, for reducing the number of monitoring wells to be included in the monitoring program and/or frequency of monitoring events.

6.3 CERCLA Five-Year Review Reports

CERCLA Five-Year Reviews will be performed for the LHAAP-35A (58) site. The Five-Year Review report will present summaries of information from the annual reports, information from the five-year sampling event, and recommend the future course of action. The progress towards cleanup levels will be evaluated in the Five-Year Review report.

Table 6-1: LHAAP-35A (58) MNA Evaluation Performance Criteria

Performance Criteria	Туре	Expected Performance	Commentary
Migration/Expansion	Qualitative	Stable or decreasing plume footprint, stable footprint position	An expanding or migrating plume footprint indicates MNA should not be continued.
Concentrations	Quantitative	Declining concentrations or total CVOC mass in a majority of performance monitoring wells	First Line of Evidence
Aquifer Conditions	Quantitative	Conditions favorable for natural attenuation	Second Line of Evidence
Microcosm Studies or Modeling (if necessary)	Quantitative	Detectable presence of appropriate microorganisms	Third Line of Evidence (if necessary)

7 SCHEDULE

Periodic sampling events for the MNA remedy will be continued for the first two years of remedy implementation. Reporting will consist of formal annual reports, supplemented by the sharing of validated data as it becomes available to shorten the time between sampling and data receipt by the regulators. An initial MNA evaluation report will be completed after the first two years of sampling are complete. Annual LTM reports containing annual MNA evaluations will be prepared at the end of each calendar year thereafter. The CERCLA Five-Year Reviews will be conducted and reports prepared until clean up levels are achieved.

8 COMMUNITY RELATIONS

The overall goal of the community involvement program is to promote two-way communication between local residents and other stakeholders, and to provide opportunities for meaningful and active involvement by the community in the cleanup process. Periodic public meetings provide updates about the ongoing remedial activities and progress toward clean up, and the public's concerns, if any, are addressed.

9 CONCLUSION

In accordance with the RAWP, remedial activities were implemented at LHAAP-35A (58) to mitigate risks to human health from groundwater impacted with VOCs. The LUC boundary for the site, upon concurrence from USEPA and TCEQ, was surveyed and the formal survey plat and LUC recordation document was recorded with the Harrison County Courthouse.

Remedial action activities conducted in accordance with the RAWP included installation of temporary DPT points and permanent groundwater monitoring wells to refine the extent of shallow zone groundwater contamination in the eastern and western plume areas. Groundwater monitoring indicates contamination is restricted to shallow groundwater zone.

Groundwater monitoring was performed to establish baseline conditions. Groundwater COCs (PCE, TCE, cis-1,2-DCE, 1,1-DCE, and VC) were detected in shallow zone wells at concentrations exceeding cleanup levels. Bioaugmentation was performed in the eastern plume area in November 2013, approximately six weeks after the EISB treatment.

Key findings from the RA include the following:

- Presence of two separate shallow zone plumes (eastern plume area and western plume area) was confirmed, as previously described in the RAWP;
- The eastern plume extent appears smaller in areal extent than depicted in the RAWP;
- The western plume appears to extent farther southeasterly direction than depicted in the RAWP document;
- It was confirmed that the intermediate and deep groundwater zones are not impacted with COCs;
- The EISB treatment performance monitoring in the eastern plume area demonstrated that reductive conditions have been established in the treatment zone, further supported by reduced concentrations of PCE and TCE in treatment area wells after EISB treatment.
- The presence of cis-1,2-DCE, 1,1-DCE, and VC in wells in the western plume area indicates that natural attenuation is occurring in the western plume. Data from the eastern plume area outside of the EISB treatment is limited and currently indicates aerobic conditions not conducive to MNA.

The current data set is limited in effective assessment of MNA. Additional data will be collected over the next two years with cumulative data used to monitor progress of the MNA remedy. An annual report will be prepared in 2014 summarizing the sampling data collected over the first year and will provide a limited evaluation of MNA.

10 REFERENCES

- AECOM, 2013a. Final Remedial Action Work Plan, LHAAP-35A (58), Chemical Laboratory, Longhorn Army Ammunition Plant, Karnack, Texas, August.
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- Jacobs Engineering Group, Inc. (Jacobs), 2002, Final Remedial Investigation Report for the Group 4 sites, Sites 35A, 35B, 35C, 46, 47, 48, 50, and 60, and Goose Prairie Creek, Longhorn Army Ammunition Plant, Karnack, Texas, Oak Ridge, TN, January.
- Lu, Xiaoxia, Wilson, J.T., Kampbell, D. H., 2006, *Relationship between Dehalococcoides DNA in groundwater and rates of reductive dechlorination at field scale*, Water Research 40 (2006) 3131-3140, August 2006
- Shaw Environmental, Inc. (Shaw), 2009, *Final Feasibility Study, LHAAP-35A (58), Shop Area, Group 4, Karnack, Texas,* December.
- Shaw, 2010, Record of Decision, LHAAP-35A (58), Shops Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas, September.
- Shaw, 2011, Final Remedial Design, LHAAP-35A (58), Shop Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas, September.
- Townsend Jr., John V, 1954, *The generalized geology of the Wilcox Group of northeast Texas. Gulf Coast Association of Geological Societies Transactions*, Vol. 4, Pages 69-74.
- United States Army Corps of Engineers (USACE), 1998, Technical Protocol for Evaluating natural Attenuation of Chlorinated Solvents in Groundwater, EPA/600/R-98/128, September.
- USACE, 1999, Use of monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites, Directive 9200.4-17P, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC.

APPENDIX A: Land Use Control Recordation Document

STATE OF TEXAS HARRISON COUNTY

INDUSTRIAL SOLID WASTE NOTICE OF LAND USE CONTROL AT LHAAP-35A (58)

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

Ι

The U.S. Army, Department of Defense, has performed remedial activities at the land described herein. The remediation site is in a former industrial area, located on the Former Longhorn Army Ammunition Plant (LHAAP) and is designated as LHAAP-35A (58) (Shops Area). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Remedial activities at LHAAP-35A (58) were performed in accordance with the FFA requirements.

The Shops Area now designated as LHAAP-35A(58) was established in 1942 as part of the installation's initial construction (Shaw, 2011). The facility was used to provide plant-operated laundry, automotive, woodworking, metalworking, painting, refrigeration, and electrical services. The site was active throughout LHAAP's mission and was deactivated along with the rest of the installation in 1996-1997. A Record of Decision (ROD) for LHAAP-35A (58) was signed by the USEPA in 2010 establishing the final remedy which is separated into two areas: 1) eastern plume; and 2) western plume. The eastern plume remedy includes land use control (LUC); enhanced in-situ bioremediation (EISB) in the area of highest levels of constituents of concern (COCs) followed by monitored natural attenuation (MNA). The western plume remedy consists of LUC and MNA.

The site was not remediated to levels suitable for unrestricted use. The LUC at

LHAAP-35A (58) is required to prevent human exposure to contaminated groundwater. MNA will be implemented to establish confidence in attenuation trends and verify that the COCs are stable or shrinking and will not migrate to nearby surface water at levels that may present an unacceptable risk to human health or the environment. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

Π

The LHAAP-35A (58) parcel is a 11-acre tract, more or less, located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A. Associated with the LHAAP-35A (58) parcel is designated a LUC boundary which is a X-acre tract, more or less, as described in Exhibit A. The LUC boundary is also presented in the attached Figure 1.

Future use of the parcel is intended as a national wildlife refuge consistent with non-residential use. For purposes of this certification, residential use includes, but is not limited to, single family or multifamily residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12. The United States Department of the Army has undertaken careful environmental study of the LHAAP-35A (58) site and concluded that the LUC set forth below is required to ensure protection of human health and the environment.

(1) Groundwater Restriction. The groundwater use restriction boundary consists of the X acre tract, more or less. Groundwater underlying this land is contaminated with tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethene (1,1-DCE), cis-1,2-DCE), trans-1,2-DCE, and vinyl chloride (VC) and shall not be accessed or used for any purpose without the prior written approval of the U.S. Army, the USEPA, and the TCEQ. A LUC restricting the use of groundwater has been established for the protection of human health. The U.S. Army has notified the Texas Department of Licensing and Regulation of the groundwater restriction which includes prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval by the U.S. Army, the USEPA, and the TCEQ. The LUC will remain in place until applicable or relevant and appropriate requirements (ARARs) as established in accordance with the National Oil and Hazardous Substance Pollution Contingency Plan (40 Code of Federal Regulation 300) are met. Due to the potential for groundwater
contaminated with the COCs to migrate, monitored natural attenuation will be implemented to assure that contaminated groundwater will not migrate to nearby surface water at levels that may present an unacceptable risk to human health and the environment. The monitoring and reporting associated with this remedy will continue until ARARs are achieved.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler) Post Office Box 220 Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management ATTN: DAIM-BDO (T. Lederle) 600 Army Pentagon Washington D.C. 20310-0600

Rose M. Zeiler Longhorn AAP Site Manager

EXECUTED this the _____th day of ______, 2014.

BEFORE ME, on this the ____th day of _____, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the ____day of _____, 2014.

Notary Public in and for the State of Texas, County of Harrison

EXHIBIT A LEGAL SURVEY PLAT TO BE ADDED

APPENDIX B: Annual Land Use Control Compliance Certification Documentation

Annual Land Use Control Compliance Certification Documentation

In accordance with the Remedial Action Work Plan dated August 2013 for LHAAP-35A (58) a certification of site was conducted by _____ [indicate transferee] on

A summary of land use control mechanisms is as follows:

- No residential use or residential development of the property.
- Groundwater restriction restriction of the use of groundwater to environmental monitoring and testing until cleanup levels are met. The restriction against residential use of groundwater will remain in effect until the levels of the COCs in groundwater allow unrestricted use and unlimited exposure (UUUE). [Indicate whether groundwater restrictions are still required at LHAAP-35A (58)]

A summary of compliance with land use and restriction covenants is as follows:

- No residential use or residential development of the property.
- No use of groundwater, installation of new groundwater wells, or tampering with existing wells at LHAAP-35A (58).

I, the undersigned, do document that the certification was performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name/Title:

Signature:

Annual compliance certification forms shall be completed no later than March 1 of each year for the previous calendar year.

APPENDIX C: Direct Push Technology/Monitoring Well Boring Logs and EISB Injection Logs

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Drilling Contractif: Turno Ground Elevation: Date Time Finished: Siging Water Level: 00 00 00 00 00 00 00 00 00 21 00 00 00 00 00 00 00 00 22 00 00 00 00 00 00 00 00 22 00 00 00 00 00 00 00 00 23 00 00 00 00 00 00 00 00 24 00 00 00 00 00 00 00 00 24 00 00 00 00 00 00 00 00 25 00 00 00 00 00 00 00 00 26 00 00 00 00 00 00 00 00 26 00 00 00 00 00 00 00 00 27 00 00 00 00 00 00 00 00 28 00 00 00 00 00 00 00<	Drilling Contract (i) (i) (i) (i) (i) (i) 21 (i) 22 (i) 23 (i) 24 (i) 25 (i) 26 (i) 27 (i) 28 (i) 29 (i) 30 (i) 31 (i) 32 (i) 33 (i) 34 (i) 35 (i) 36 (i)	Sample Depth (#) Sample Depth (#)	Blows per 6"	Recovery (inches)	Gro	Headspace (ppm)	Elevation S: US: D	1: MATI minor c maxin 20'-a Su try r(CO to br 24'-25" 25'-27' ADOC 1/2 25'-27' durk Micuk	Date/Time Fi ERIALS: Color, omponent(s), mon num grain size, of 15 ' Cove ing to reme reveal of come es once as nel noted. of derleaves, s' si Hy company day, he gray day, he	inished: 5/20/ size, range, M visture conten odor, and Geo boarnel came try manageo y sanchy c manageo y sanchy c manageo y sanchy c manageo y sanchy c manageo y sanchy c	Is IAIN CON It, structur plogic Unit Sleeve trenely sle, av compte 	Water Level: MPONENT, re, angularity, t (if known) - Stick Compacted oart 1' Compacted oart 1' Co	Lab Sample ID	Lab Sample
Image: State of the state o	Qi Qi Qi 21	Sample Depth (ft)	Blows per 6"	Recovery (inches)		Headspace (ppm)	U.S.C.S.	MATI minor c maxin 200' - 20 Su try (TCO to bot 34'-25" ADOC 1/2 25'6' - 20 Party o 26'-27' durk Micu	ERIALS: Color, omponent(s), mon num grain size, o 15 ' Cove ing to reme reveal of con c some as ncl noted. 6' derle grap build south , s' si Hy c chieffy Su gray Clay, he	size, range, M isture conten odor, and Geo barrel came tx m Samp prede(so s above y sanely c have, dry ncl, trace () Thick () D	IAIN CON It, structur plogic Unit sleeve trenely sle, av compte - so loy re- , mical clay, 1 a prese madu	MPONENT, re, angularity, t (if known) - Stick r Compacted oont 1' Compacted oont 1' Compacted oont 1' Compacted oont 1' Compacted preaves y file ground precent	Lab Sample ID	Lab Sample
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36	serrer 27' to 31'						20'-2 50 try 10 bor 2000 ye 2000 ye 20	15 ' Cove impte bec ing to reme reveal of com e some as nel noted. derleaves, s' sitty company day, he gray day, he	barrel came ex samp predel so s above y sanely c i have, dry nel, trace	sleeve trenely olt, an compte - so loy ve mica aprese	- stick compacted oont 1' appravs me increase y file grander present timegrained whi	- [
37	37							27'-28 bro-	end of	sit very Dry, m Storing	Ardis fretof ich pr	mpletstrzin regram estit.		
Date Time Depth to groundwater while drilling Image: Checked by: Date: Image: Date: Image: Date:	37 38 39 40								ā.					
Checked by: Date:	NOTES:									Date	Time	Depth to groun	dwater whil	e drilli
Checked by: Date: Date:														
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	Checked by:						Date:							
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		Clie	nt:								
		Pro	ject Num	ber: (0256	135			BORING ID:	58 DP	T/I
ATC	M	Site	Locatio	n: 58	DRTI	LHA	HAP Six 58				
		Coo	rdinates	:			Elevation		Sheet 1 of S	2	
		Dril	ling Mel	hod: De	ect Kis	sh	D D	0.1	Monitoring We	ell Installe	ed: NO
Vaathau		Sam	ple Type	2(S):	6.00,		Boring Diameter:	21	Screened Inter	val: 24-	18
willing Cont	Smy	903		Crownd	By: K	-	Date/Time Started:	8/29/13 /630	Depth of Borin	ig: 25	
		rago	r!	Ground		1.	Date/Time Finished		water Level:	r	r
Depth (ft) Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATE minor co maxin	ERIALS: Color, size, ra omponent(s), moisture o num grain size, odor, ai	nge, MAIN C(content, struct) ad Geologic Ur	MPONENT, ure, angularity, iit (if known)	Lab Sample ID	Lab Sample Depth (ft)
			°.,	diges	0-21	reddishte Very f. 2-5' lighto loose	sown Silt, tri regrain Sroy, Silty Clay, , mzd. plastizity	very fire g	bry, loose grain, by		
			60"			5-66 motilin hord, v Cerron 7'-10' 1 bionn Poory	dark brown clay my, troce organized rery fine grained hard gray clay, nothing, hard, de graded, med.	few silts s, trace live i many i many y, Very fiv P lastici	gray gritz, Dry, end witz, Dry, mitz,	plasher	**
						Stuck	in care and	101- t,	151		
			60"			15-16'6" Broymoth 16:16"-171 grain, F 17'6"-9 MOIST,	list boon Sondy ting, medium, moiss the boom clayey too ly grad-cl, low med placturcity,	day, very fr r, Imai plastic scand, very pplasticity gray sitty fine grai	sity five before medium clay, medium		
)TES.				I			Г	ate Time	Depth to group	dwater while	e drilling
JIE9:								1 mile		WILLING WILLING	aB
									-		
ecked by:					Date:			1 2 2			
ecked by:					Date:						
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1			Clie	ent:									
			Pro	ject Num	ber: 6	0256	135	10 11 5-			BORING ID:	58DP	r IJ
		$\mathbf{O}N$	Coc	rdinates	<i>I.</i> D	SDAL	11 44	Flovation			Shoot 2 of C		,
			Dri	lling Met	hod: D	unt D	- 14	Lievation			Monitoring We	ll Installe	d· A D
			San	ple Type	(s):	Gin	510	Boring Diamete	er: ol		Screened Inter	val: 24-)x'
Weath	ner:	Sumy	905		Logged	By: R	-	Date/Time Star	ted: 8/20/	13 160	Depth of Borin	g: 25	,
Drilli	ng Contra	actor:	Furgro		Ground	Elevation	1:	Date/Time Fini	shed:		Water Level:	A.C	
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATE minor co maxin	CRIALS: Color, siz omponent(s), moist num grain size, odd	e, range, M ture content or, and Geo	IAIN CO t, structu logic Un	MPONENT, re, angularity, it (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23 24 25		Server 24'			6s"		20-21 6 very fire 21 6"-c hard, d 21 - 6"- to de hard,	" blight brown grein i highplas 22/61 light of 23' tronsitu 45' tronsitu wisht, hich	silly c silly c silly c sy man high pla high pla menor	, troce astrait moth oun in	silt, moist silt, moist y helgroy shelgroy		
26 27 28 29 30	X	10 28'			50			end of b	oring	e	25'		
31 32 33													
34 35 36													
37													
38 39													
40 -													
NOTE	S:								Date	Time	Depth to ground	lwater while	drilling
Checke	ed by:					Date:		2					

			Clie	nt:		000						
_			Proj	iect Num	ber: 60	D2561	55			BURING ID:	R DD	r 17
			Sue	LOCUIION	. 50	UPIL		Flevation		Sheet 1 of d	DFI	IN
			Dril	ling Met	hod: D.	at D. a		Dievation		Monitoring We	ll Installe	d:
1			Sam	ple Type	(s): 6	.W		Boring Diameter:	2"	Screened Inter	val: 23-	17
Weathe	er: So	nov			Logged L	By: RL	-	Date/Time Started: 🐔	5/20/13 822	Depth of Borin	g: 24	
Drillin	g Contra	ictor: Fu	50		Ground I	Elevation	1:	Date/Time Finished:		Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATH minor co maxin	ERIALS: Color, size, rang omponent(s), moisture co num grain size, odor, and	ge, MAIN CC ntent, structi I Geologic Ur)MPONENT, ure, angularity, iit (if known)	Lab Sample ID	Lab Sample Depth (ft)
1 2 3 4 5 6				0-5' 38''			brass m-rd. brown brown brown troce 72".	Plastre Plastre n si'H, dry, lo clay, moist, sand + brann -78" mica pro-	increas	15ty, ins plast,2		
7 8 9 10 11				60 ^{°°}			78"-8 In 13ynt Morth Mcc	groy soundy cla insi shynty m	increand acc some ay, lig	mottling 1, decrease me nt brown ashre	6 mu	
12 13 14 15	e.			60''			13' 4" durk grown 13' 4	d, maist, rom, col	ndi veryfi isinc, mi	ne- to-fine a present finegrain, mat	sind	
16 17 18 19 20				45''			15'-16'5'' 15'-16'5'' 16'6''-17' 16'6''-17' 100000 17-20'010 0	y sity day, with in My mich prove son	Initap m, grayn ncl, fire y forgen, ter-disperse	sunt, med p formed, med p formed p	on (Vo estre, m m:ca pire p boun	c smell) vicupe motor vicupe motor
NOTE	ed by:			1		Date:			ate Time	Depth to grou	ndwater whil	e drilling

			Clier Proj	nt: ect Num	ber: (-0	2561	35			BORING ID:		
A !			Site	Location	1: 581	SPTIZ		1			58 D P	T12
		JN	Cool	rdinates:	5.0			Elevation		Sheet 2 of 2		
			Drill	ling Met	hod: "D	wort PL	sh			Monitoring We	ll Installe	ed:
			Sam	ple Type	(s):	G.W.		Boring Diameter	r:	Screened Interv	al: 23-	27
Weathe	r: 5	unny			Logged I	By: RL	-	Date/Time Starte	ed:	Depth of Borin	<u>г: Ә</u> ү	
Drilling	g Contra	ctor: 1	avo		Ground	Elevation	1.	Date/Time Finis	hed:	Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6" (Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxin	ERIALS: Color, size omponent(s), moistu num grain size, odor	e, range, MAT are content, st r, and Geolog	N COMPONENT, iructure, angularity, ic Unit (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23 24	$\overline{\langle}$	scarr 23'				48	20'-24 stugh 21->> '11 22-24' plustro water p	bran, clay la plestreity stre, littlerosst bran sendy , wet, min	ley vey t nasi, n ley vey t vic, mice x cloy, v	fine grain me to firegrain present ery Sve - to Sveg	-	
25 26 27 28 29 30 31	Å	27'						end	א אישייר ואיז	5 241		
32												
NOTE	S: d by:					Date:	1			Time Depth to grour	dwater whi	le drilling

			Clie	ent: Num	her: 6	DASCI	35				BORING ID:	58DPT	13
			Site	Location	1: LH	AAP S	ite So				Domino idi e		
			Co	ordinates:				Elevation			Sheet 1 of 2		
			Dri	lling Met	hod: Dr	ect PL	sh				Monitoring We	ll Installe	d: 10
III d			San	nple Type	(s): G	ander	ter	Boring Diamete	r: <u>a'</u>		Screened Inter	val:29-2	.8
Weathe	r: <u>s</u>	-hay	10-5		Loggea I Ground	Flevation		Date/Time Start	ea.	\$ 1340	Water Level	8 dd	
Dritting	z Comra	cior.		2 1	Ground		ŕ	Duter Time Time	mea.		muler Level.		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Ruh S Blowsper 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxii	ERIALS: Color, siz omponent(s), moist mum grain size, odo	e, range, N ure conten or, and Geo	IAIN CO t, structu dogic Uni	MPONENT, re, angularity, it (if known)	Lab Sample ID	Lab Sample Depth (ft)
	RL 1/8	<u></u> 5'	١	100		CL CL	Grap de Grae trace ligni Sandy trans trace	bilty Clay (O. y mottling, ma Sounds very for te noduales press Clay (1,8'-S nitruning to red c regenice, trace m	-1.8") d tohigh icont icont i indepi icont ic	f, mois tonig	try, brocn, city c nica, true t, brown mottling, hplasticity	e orgenve	5
6 7 8 9 10		6' 4' 10'	2	100		CL	Sam Sam H gri Sam	me as above (was above (any with litge ne as above	e (5-0 10-81 + brown re (8-) col	orchange ling dry	-	
11 12 13 14 15	1	<u>) , 8 </u>	3	100		cı cı	SiltyCl light SandyC light b Broy. Placto	ay (10-11.8) i orown mottling lay (11.8-15) m bioun mottling, evagoor ite sat	nedium, g, medi rediumjr fracture t@14	maist, umpla noist, sincla . me	gray sticity. gray; y colored dicm	7	
16 17			4	100		CL	Clarges Fine g	and (15-17,5 rain, postly of	s mrd	1 lar	olasticity		-
18			5	100		CL	Sam	re as abo	ove	w/ma	l plasticily		
NOTE	l				J				Date	Time	Depth to grour	ndwater whil	le drilling
NOTE	5:										1		
Checke	d by:					Date:							

			Clie	nt:									12
			Pro	ect Num	ber:	60256	5135				BORING ID	:58 071	IS
		O)M	Site	Location	LAP	AY Si	2 58	Floration			Sheet 2 of	2	
			Dril	ling Met	hod: Die	ers Pie	~	Lievation			Monitoring W	Vell Installe	d: NO
			Sam	ple Type	(s): (5.W.		Boring Diameter	: a"		Screened Inte	erval: 21-	28'
Weath	er:	Sinny	90'5		Logged L	3y: 2.1	-	Date/Time Starte	ed: sbills	1340	Depth of Bor	ing: 22.	5
Drillin	g Contra	ictor: F	UGRO	l	Ground I	Elevation	l:	Date/Time Finis	hed. \$/1/ 0	1450	Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	RUN Blowsper 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxii	ERIALS: Color, size omponent(s), moistu num grain size, odor	, range, M/ ire content, r, and Geol	AIN CO , structu ogic Uni	MPONENT, re, angularity, t (if known)	Lab Sample ID	Lab Sample Depth (ft)
21		20.5'	6	100		SP	Sand (Five gr	ao-aois) loo win, poorly an	raded,	sand	, brown		
22		me	0	100		a	Silty Cla Diah E	146+121 ty	ft, mois	r, broc	su'		
23		00.5						/			F1 5	- 1 ₁₄	
24		Screen						end of bi	oringle	JON .	5'		
25	/	24'											
26	V	10											
27	$ \wedge $	201											
28	1	90											
29													
30													
31													
32													
33													
34													
$\begin{vmatrix} 35 \\ 26 \end{vmatrix}$		l.											
30										ç			
38													
39													
40 -													
NOTE	ES:								Date	Time	Depth to gro	oundwater wh	ile drilling
Check	ed by:					Date:							

			Clie	ent:	IS AC	E (025	6125				BORING ID: 4	SOND	ты
			Site	Location	1: 1	LAAD	2 5:10	58			bonnito ibi ç	38 01	ריי
			Cod	ordinates:		PATUR		Elevation			Sheet 1 of	2	
			Dri	lling Meti	hod: D	isect PL	sh				Monitoring We	ll Installe	ed:
L			San	nple Type	(s): (G.W.		Boring Diamete	er: a "	1710	Screened Interv	val:	
Weathe	er: 🔤	Smny	905		Logged	By: R.L	_	Date/Time Star	ted: 8/22]	13 100	Depth of Boring	g:	
Drillin	g Contro	actor: 'F	uger	2	Ground	Elevation	1.	Date/Time Finis	shed: 8 bs	1 1015	Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Runs Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxir	ERIALS: Color, siz omponent(s), moist num grain size, odo	e, range, N ure conten or, and Geo	IAIN CO ot, structu ologic Un	MPONENT, are, angularity, it (if known)	Lab Sample ID	Lab Sample Depth (ft)
		2.5	- 1	Ą		ML	Sandy Want organ	silt with clay	(0-2, brown mice	nottin	ose, dry ng, trace > plostrai ty		
		4	l			CL	Sandy d	wy (2.5-4.0) 1.	ause, di	1 ibrou	n with plasticity		
5		5				ML	sandy si	14-5) 34141	moist, F	eddish.	bran, fra	chures	
6 7 8 9			2	pos		CL- ML	Silly C Drown nodue	$mice, \pm \dots$ $mice, \pm \dots$ mothing, 1 mothing, 1 mothing, 1	rodarch med. pla .S-101) root	(@12. (@12. mpl	a clays, bro st, moved a') iron astrzity	>-n +g	rcy mottle
		10,5	•			a-m-	Sam	nr asabo	re (io	-10.5	>		
12 13		are	3	100			Forcy &	five tofine grand low	e, dry, odns, i ~ plas	brow poorly (traty	pradad, 1(105-14.5)		
14		1465				CL-ML	billy c	hy with sand (14,5-15	iccmic	moist, A		
16		16		IND		CL-ML	SiltyCl reddrs Medpla	ay (15-16) me Worken and stricity	dimores	h $broitting$	why inunstaining	?	
18			9			mL	Sandy Si w/bro anowc	itt with clay wn nottling	medica , (mi s, mi	m, mài	it, gray with vscnt		
20		ao											
NOTES	S:								Date	Time	Depth to ground	lwater while	e drilling
Checke	d by:					Date:							

			Clie	ent: US	ACE	6 0 × 1	120				BOBING ID	24007	
			Site	Location	oer: 6	0256	155	0			BORING ID:	58 PP1	9
	-C(JN	Coo	rdinates:	LH	MAT	SICO	Elevation			Sheet 2 of	2	
1			Dril	lling Meth	hod: Di	rect PL	sh				Monitoring We	ell Installe	d:
			Sam	ple Type	(s):	6.0	5	Boring Diameter	r: a	1)	Screened Inter	val: 36 -	40
Weathe	er:	Empy	805		Logged I	By: 21	•	Date/Time Start	ed: 8/22	1710	Depth of Borin	g: 37.	5
Drillin	g Contra	ctor: 'F	YGRO	<u></u>	Ground	Elevation		Date/Time Finis	hed:845	1015	Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Ku AS Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATE minor co maxin	ERIALS: Color, size omponent(s), moistu num grain size, odo 24.5)	, range, M ire conten r, and Geo	IAIN CO t, structur logic Uni	MPONENT, re, angularity, t (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23 24		24.5	5	100	9	ML ark & Groy	Sitt + dark grown Savely S dark y thinly	brown to specied and pour ye bilt (24,5-25 prown) fineo laminuted sa	scieday, usance gracted, sciedad nels, t	stift il lensi trac iff, mi iff, mi iff, mi	, moist, is, fine ic micu, sist graded, nica, trace		
25 26 27		25.0	6	100			Sam	easabore anoxic facto	(asn mes	37.5)	, prown	sttlened	
28 29 30		29	7	100		CL	Clay (27.5-2 plastic Sanctys:1	with thinly lai 9) Stiff, mois ity, man pres + (29-50) thinly	minated t. dark Cat	brown Helclay	and Sands ~, medium s, shedium		
31 32		32.5	4				Stuck Cutting bottor	- m core, dr s out of me n are (Sam	riller 1 crocort Las a	nanda Cut bove	1 plashirity ugersome tings from	mica	
33 34 35 36 37		Screen 36 1					enc	t of buring	@ 32	.5		-	÷
38 39 40	X	to 40'			оц.			is.					
NOTE	S:								Date	Time	Depth to grour	dwater while	e drilling
Checke	ed by:					Date:							

}			Clie	ent: U	SACE								
			Pro	ject Num	ber: 6	0256	5135				BORING ID:	58DP7	15
		$\mathbf{O}M$	Site	e Location	n: Lf	AAP	site 58						
			Dri	orainaies Ilino Met	: hod:			Elevation			Sheet 1 of a	ell Installe	od.
			San	nple Type	e(s):			Boring Diamete	r: 2'	1	Screened Inter	val: 36	-40
Weather	r: 3	unny a	10'5	1	Logged	By: R	1_	Date/Time Star	ted: SIAI/I	3/750	Depth of Borin	1g: 3	7
Drilling	Contro	actor! F	UGRO		Ground	Elevation	1.	Date/Time Fini	shed: 862	13/00	Water Level:	8 0	
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Run Blowsper 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxir	ERIALS: Color, siz omponent(s), moist num grain size, odd	e, range, N ure conten or, and Geo	AAIN CO at, structu ologic Un	MPONENT, are, angularity, it (if known)	Lab Sample ID	Lab Sample Depth (ft)
I 2 3 4 5		5'	}	100		CL	Sanchy With trace moist	<u>Clay w/silt</u> reddish bro organics, from 4-5'	, bost, own me trace	otting mi	broan ča, micipias	teily	
6 7 8 9 10		6' <u>6</u> .< 10'	2	100		a SC cl	Sanayal Ard + le Mica Clayeys Drown trace Sam	ay (5-6') me prown mottlin (meciplastrei band(6-65) , finegrain mica, redt v as (5-6')	medium medium medium med , p	rdium, ce orge n, mois oorly a httling	gray w/ inves,trace st, rectish sected,	•	
11 12 13 14		10	3			CL	Sandy C Irogna trace Mediu	sray, light gray, light mica, tro mplastrolity	brown	to mot Mot	, moist; ting tcs,		
15 16 17 18 19 20		20'	4			cc	Si Hy gray broc possil	Clay (15-2 clay, with- on mottlin ply from voc	ao') m trace s g. bh s. hi	edium j bands, ack s- yn pla	moist, light taining sticity	VOC S	smells
				L	1		I		Date	Time	Denth to group	l ndwater whil	l le drilling
NOTES	:								Date	Tune			o or nung
													~~~~~
Checked	l by:					Date:					-		

		Clie Pro	iect Num	BACE	N2561	3<			BORING ID:	SEDETIS	_
A =/		Site	Location	: LA	AAP	Siter	«				
<b>A_</b>		Coo	rdinates:	~~~~~			Elevation		Sheet 2 of	2	
		Dril	ling Meti	hod: Di	(ect PLA	h			Monitoring W	ell Installe	d:
111 17		Sam	ple Type	(s): <u>G</u>	<u>.</u>		Boring Diameter	·:	Screened Inter	val: 36	-40
Weather:	Sunny	90'>		Logged	Elevention		Date/Time Starte	ea: 8/21/15 /	KO Depth of Bori	ng: 3/	
Drilling Con		GEO	l	Grouna		r. 	Duter Time Tims	neu. 8/24/15	dug water Level.	1	<u> </u>
Depth (ft) Geologic Sample ID	Sample Depth (ft)	RUNS Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxii	ERIALS: Color, size omponent(s), moistu num grain size, odoi	, range, MAII ire content, sti r, and Geologi	N COMPONENT, ructure, angularity, c Unit (if known)	Lab Sample ID	Lab Sample
21 22	2.5	5	100		cı	Sancy ( with Ogray med	ium plastics	) medium a Canovicy trace li ty	gnite.		
24	23.5	6	100		u	San	it as above clay (23.7-25	(no high medium	nik) moist mess	one si ll	
26	27.5	7	100		a	Same Stain With	as above (25 ing present staining below	-27.5) Sand ter	15 from 26.3-2	6151	
28	28.5	\$			CL	Son	neasabore	(27.5-28	5)		
29	30	a	-100		CL	Sandya Veryfin Plas	they (28.5-30) + regress , pour y g traity ) mice	nedium, r radiclisanch present	noist, brown, s, meel to high		
31 32 33	33	9.	WO		CL	Sav decr decr	ne as abov easily sand ork	c (30-33 content	s) with with		
34 35	35	10	100		CL	Silty C med-1	lay (33-30) o-hugh plast	medium, m	oist, bioun, i capresent,		
	7 31.5		100		CL	Samea Sclark ( Plesh	sabove (35-3) claytens @ 3	5.5) - 5.5 - 598 	, moist , ned to high	-	
38 39	Sciena St'					sanci I de	end of b	mect to - 1 mect to - 1	Bish plasteity 37'	2	
40 -/	V uo'										
NOTES:								Date 7	ime Depth to grou	ndwater whi	le dri
01 1 11					Data		-				

			Clie Proj	nt: ( ect Numl	JSAC ber: 6	E 02561	35				BORING ID	-	
			Site	Location	L L	8					58DPI	1154	
			Coo	rdinates:				Elevation			Sheet 1 of		
			Dril	ling Meth	hod:	HSA					Monitoring V	Well Installe	d:
			Sam	ple Type	(s): Co	re Barre	U	Boring Diamete	er: 4"		Screened Inte	erval:	1
Weath	er:	SUNNU	950		Logged I	By: RO.	SKEID	Date/Time Star	ted: 9/5/13	1410	Depth of Bor	ring:	
Drillir	ng Contra	ctor: '	-UGRO		Ground	Elevation	:	Date/Time Fini	shed:		Water Level:		
	e la	(lt)		les)	(m							e	4
Depth (ft)	て」かど Geologic Sampt	Sample Depth	RUN Blowsper 6	Recovery (inch	Headspace (pp	U.S.C.S.	MAT minor c maxi	ERIALS: Color, siz omponent(s), moist mum grain size, ode	e, range, M ture conten or, and Geo	1AIN CC t, structi ologic Un	MPONENT, ure, angularity, iit (if known)	Lab Sample 1	Lab Sample Depth (ft)
1 2 3	1416		١	70%	2.5'	ML- ML- ML-C	A Reccin	n tellaw - u f fire sand mes slayey	sith n 2 - Pou s.H at	2.51	amounts - dry		
4 5 6 7	1423		2	190%	3-5 6	CL-SP	Sandy Been (tet	Clay - shft, -40% NoryFin on and hight splottes- day @ 7	non plas e Sarc - Gray - Son 11	nc dre	lay with strong eroots eroots		
8 9 10 11 12 13	AL CONTRACT		3	il i	יי או צ	KL-SP	- II- Scm	11.5 SAND, to fine e as abour	Poorty S subrod	inded ,	Verfine		
14    15    16    17    18	144		Ч	1000 000	16 16 18	SP CL-SP	Sandy Sandy Y	- Fine Grained, dark vellow clay, non plag ellow - shff,	powly so sh brow the - his dry	201 w/2	ray and		
19 20	257		5	Cby		58	sine.	Fine grain bitel - light	gray -	Slight	ly moist		
NOTI	ES:								Date	Time	Depth to gro	oundwater whi	le drilling
												H A	
			a										
Charl	ad have					Data			1				
LUNECK	cu oy:					Date:				.L			

			Clie Pro	nt: ject Numl	USAG	6025	6135			BC	ORING ID:		
А	-		Site	Location	: 1	58					S'8DPT	15H	
		JM	Coo	rdinates:				Elevation		Sh	eet 2 of		
			Dril	ling Meth	nod:	454)				Ma	onitoring Wel	l Installed	d:
	00	ů c	Sam	ple Type	(s):	Lose Pro	rcel	Boring Diameter:	Lalaha H	Sci	reened Interv	al:	
Weath	er: 48	<u>Sum</u>	<u> </u>		Logged I	Elevation	DERKO	Date/Time Starte	ad.	W	nter Level	•	
Druin	lg Comra	cior. v	rdee	<u> </u>	Ground			Dute/Time Timish	<i>си.</i>				
Depth (ft)	TIME Geologic Sample II	Sample Depth (ft)	R UNS Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT: minor c maxi	ERIALS: Color, size, component(s), moistur mum grain size, odor,	range, MAIN e content, str and Geologi	COMP ucture, c Unit (i	'ONENT, angularity, f known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23	11.5%		5	10070		58	Some	e as above nak dopth. rev	- Slight ones me at 22	000 21.0m c . 31	isening fraine?		
24 25				- 01			moisi	r at 251	Ð				
26 27 28	IS03		\$	7010	-26.5	cı	Clau	Nov plastic	shif you	e sone	- moist		
29 30 31 32 33	S'S'		7	100%	30	CL-ML	S 114 S	vi clay - mois yellow - st ome mua po 30'	A - gra A - noi rseat b	y and n plas	brownish stic		
34 35 36 37 38	1531 P B B B B B B B B B B B B B B B B B B					cl	Clay	- Laminatel w Str At - law P brown and ONE 1/21' Soulle	12 6 35=2 12 7 7 12 7 12 7 12 7 12 7 12 7 12 7 12 7 12 7	10-20% - V83 - 999 - 999	o) moist dark an		
39 40	ES:								Date	ſime	Depth to groun	dwater whil	e drilling
											,		
Check	ked by:					Date:							

	<b>ICO</b>	Site Co	e Location ordinates:	: Site 58		Elevation	Sheet	1 of 2		
		Dr	illing Meth	od: HSA		· · · · · · · · · · · · · · · · · · ·	Monit	oring We	ell Installe	ed:
		Sar	mple Type(	(s):		Boring Diameter: 🗻 🖌	" Screet	ned Inter	val:	
Weather	" Sunny			Logged By: M1	Law	Date/Time Started: 9/16	118 855 Depth	of Borin	g:	
Drilling	Contractor.	turgo		Ground Elevatic	on:	Date/Time Finished: 9/1	6/13 1023 Water	Level:		
Depth (ft)	Geologic Sample ID	Run # Blowsper 6	Recovery ( <del>Inche</del> s) X	Headspace (ppm) U.S.C.S.	MATI minor c maxir	ERIALS: Color, size, range, omponent(s), moisture conte num grain size, odor, and Go	MAIN COMPON nt, structure, ang cologic Unit (if kn	ENT, ularity, own)	Lab Sample ID	Lab Sample
1 2 3 4	-1	-		AL CL	SILT ( Soft, B SALD, LEAN Stiff Yell aim	PAL) Pry, Pole Brown, writely PAN-plestic CLAY(CL) to very Stiff, Dry, 1 h red and Brown part in the	Sult, the very	, tin , with lig		
5 6 7 8 9 10	- 7	2	~ 100%	-	- Incre Igh Poorto Denso Yellow Tow C true	Ly GRADNED SAND to Jony with reddict One 4 Jony with reddict One Ly GRADNED SAND to loose, Wry, pele ye his clays. Mostly Fire clay, Slightly plustics toots.	Low plassing	yollowith a P) is ish 5:14; ML	torn .	
11 12 13 14	- 12		~ 100%	- 5p	SAME forse yellow below	Ar ABAVIS , Pog, light yeldwich B. , brostly fire seal, lin 12° Bs where edder the	form grading to the 50th, trace inger. Arclay 1	Rowhh mica either		
15 16 17 18	-15	4	~ 100 %		Rory, Se mostly how po mich.	ELAY with SILT (C) off, light yellow Brown, clay, little Silt, few lasticity, Silts are la	to trace fine , minuted thinks	mo Ales, send. Y, Tracc		
19 20		5	~ 100%	SP	POORLY loose u Sill, n	GRADORD SAND L maist, Pijintgrog, mos.	THE SILT (S	e) h:H/e		
NOTES:	tempour Back-fill	y swell	Screen to 34 -	set © 18°- with Bentan:	-28 Bys te Chep			n to ground	iwater while	; arillinj

			Clie	ent:			- 4					
			Pro	ject Num	ber: 60-	256135				BORING ID: -	SEDPTI	58
		OM	Sile	LOCATION	: Site	58		Flavation		Shaat 2 of 1		
			Dri	ling Mot	hod			Dievation		Monitoring Wa	Il Installa	d.
			San	inle Type	(s):			Boring Diamet	er.	Screened Inter	val:	4.
Weathe	er:		1	1	Logged	By: M.	Law	Date/Time Star	ted:	Depth of Borin	g:	
Drilling	g Contro	actor: Fu	0		Ground	Elevation	18	Date/Time Fini	shed:	Water Level:	0	
	Q		1									
Depth (ft)	Geologic Sample I	Sample Depth (ft	Blows per 6"	Recovery (inches	Headspace (ppm)	U.S.C.S.	MAT) minor c maxin	ERIALS: Color, siz omponent(s), moisi mum grain size, od	æ, range, MAIN lure content, sti or, and Geologi	N COMPONENT, ructure, angularity, c Unit (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23			 5	~ 101%.		(Sp)	POOR toose, Isttle s	LY GRANNEH Moist, light Silk, non-ple	SAND WI gray, mos	HA SILT (SP)		
23 24 25 26 27		- 23 -	ufa	~ 900%		EL	EEA, Soft, Mostly Mediu	N ECAY WINH immist, lighton , clay, Few to m plasticity.	EAND (EL) my with li like Fine	ight Braun Molthes, Sind, Low to		
28 29 30	1	-27.5'-	6			SP EL	POOKL Trore, Clay, LEAI	y GRAMATIN S Maist, light g Slighti, pless	ANN wirth	CLAY (50) Fine said, 1:44		
31      32      33      34		6	 7 	~ 100 %	_		modium Fine tine winth 1.5hk	Stiff, Dig, Sank, Fen S. Low plastick Very this Pine gray. (I man the	Brown, mi it, trace b , clays are sand in p ).	wich in sands. thinky laminated theres, sand is	(2-5 mm)	
35			8	^/ 190 %		CL	SAI Ver	The AS ABAUL	=, +rece 1	ignite @ 35'gs		
39 40								ne +1 arrivy				
NOTES	s: d by:					Date:			Date T	ime Depth to groun	dwater while	drilling

			Clie. Proj	nt: US/	4 <b>(E</b> ber: <b>60</b> 2	56175	<b>6</b> 7			BORING ID:		
		O	Site	Location	C MAR	y She	38	Elmation		Storie Shart 1 of	•	
			Duil	rainales.	had DA	7		Elevation		Monitoring W	ll Installa	d. A
			Drill	nla Tuna	(a):	(		Rowing Diamotor	211	Soreaned Inter	val: <b>2</b>	4.770
Weath		1 .1	Sam	pie Type	(S).	Duri Bl	-[	Doring Diameter.	1.8/2 /0 110	Denth of Boriv		0
Duillin	c Contro	Man St j	sumy	-	Ground	Elmation		Date/Time Started	ad & ha 10 th 11	Water Lovel:	8.30	
Drillin	g Conira	icior:	ra		Grouna.	T	1.	Dute/Time Timsh	eu.s/4/3/8/	mater Level.		<u> </u>
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (methes)	Headspace (ppm)	U.S.C.S.	MAT) minor c maxin	ERIALS: Color, size, component(s), moistur mum grain size, odor,	range, MAIN C e content, struc and Geologic U	OMPONENT, ture, angularity, Init (if known)	Lab Sample ID	Lab Sample Depth (ft)
1 2 3 4 5				80%	0.7	SP	0-11/2 1/2-5 1/2-5 1/2-5 0-10-	- soft to va y nottled, for - soft to va y sandy cla astrosty, nottle epth stiff to han	brown, se me sand, Y still, h Y science, h Y feisber ed, bree so	ty send ( trace grace Sport to cla low to my ind, I stable to clark g.	se) che. l. crs. an/	5 
6 7 8 9 10			·	100%	6.0		946 540 10 - 12 2	the stresty, mobile	damp. " d w/ hema	to blan-g	inc .	
11    12    13    14    15			*	85%	6.9	u	san noi 12% - 1 554 high 15 - 26	by day (cl), Hech- force on 5 modium to by chay (cl), plasticity, m	mosste mo unystelle noist to ottoit, he stille, blue	I plasticity , blac-gray deng, mode on solt control -gray to be	to bro. to t	
16      17      18      19      20				r00%	0 • D		510 7 17/2 5. 17/2 5.	oft, Light b.	al very for	y, med glad	e Her , Low	<
NOTE	ed by:					Date:			Date Tim	e Depth to grou	ndwater whil	le drilling

			Clie	nt: USI	kE,				N				
_	-	_	Proj	ect Num	ber: 602	1135					BORING ID:		
Δ		<b>DM</b>	Site	Location	LHAA	Site 5	8				SBDPTI	6	
			Coo	rdinates.				Elevation			Sheet 2 of 2		
			Dril	ling Met.	hod: DP						Monitoring W	ell Installe	d: 1/2
			Sam	ple Type	(s): Me	acore		Boring Diam	eter: 2"		Screened Inter	val: <b>3/-</b>	5
Veathe	er: <b>1000</b> ,	Lanio	sum	1	Logged I	By: DBla	ch	Date/Time St	arted 3/12/1	1615	Depth of Borin	ng: 70'	_
Drillin	g Contra	ctor: 🖊	10 ml		Ground I	Elevatior	n:	Date/Time F	inished:8/n/	3 185	Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxir	ERIALS: Color, omponent(s), mo num grain size,	size, range, M pisture conten odor, and Geo	AIN CO t, structu logic Uni	MPONEŃT, re, angularity, it (if known)	Lab Sample ID	Lab Sample Denth (ft)
		ſ		20- NR Care in	24 fach sangle	MR	- 24 - 2	ch? looked to	(top and be send	to the	of core	dy sil	K w/.
5 6 7	į			100%	0.0	me	da. 6-	le gray, m same -> 81/2 - very s	olst, ver	y lon -1 1"c	plasticit bay conses,	r. han nel gla	stort
8 9				100%			5:- 90 28/2-3 chy fan	thy clay ( ton Jed. 1 D - hard, (CL), d.	(Le), me ittle sitt durk for 1. melis occasion	diman .	physicity,	y site	rio 1444
	4	58D	TIL (31 0805 VOCS	- 35)/3	o <del>6</del> 13			Endo	of barring			70	
4    5    6    7		1)				. H S	3 3	ж а ¹ м	ал — А - А - Я				
8 9 0		-											
<b>NOTE</b>	S:								Date	Time	Depth to grou	ndwater whit	e arining

Almates: ing Method: <u>Die</u> ing Method: <u>Die</u> Logged Ground (inches) Headsbace (bblu) Headsbace (bblu) G.O. Headsbace (bblu) G.O.	By: VB/ac/ Elevation: SP CC SP CC	Elevation    Sneet 1 of Monitoring Well Installed: Monitoring Depth of Boring: 201      Date/Time Started: 8/1/2 1530    Depth of Boring: 201      Date/Time Finished: 6/1/2 1530    Depth of Boring: 201      MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (if known)    If the graph of the
He adspace (pp.) Headspace (pp.) Heads	By: VBlack Elevation: SP SP CL SP	Boring Diameter: 2" Screened Interval: 31-35 Date/Time Started: 84/2 1530 Depth of Boring: 30' Date/Time Finished: 8/1/2 1530 Depth of Boring: 30' Date/Time Finished: 8/1/2 1530 Water Level: MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (if known) 5 - looge to very loose, dark to light breen, Sandy still (SP), day to damp- method, fore Sand 5-0 - still to very stibb, light to damp- method, fore Sand 5-0 - loose to donse, light gay to light breen, sandy clay (Cl), damp, mediam plantinsky modified, benetic concerbies. foresal groo-loose to donse, light gay, to light breen, silly sund (SP), damp, mediam plantinsky 10-11/k - mediam, light gmy, sandy clay (Cl), low to med platteety, clamp, medica (Cl), low to medica (Cl)
Headspace (pp. 1.4.6) Headspace (pp. 1.4.6) Headspace (pp. 1.4.6) Headspace (pp. 1.4.6) Headspace (pp. 1.4.6)	By: DElack Elevation: S: S: S: S: S: S: S: S: S: S: S: S: S:	Date/Time Started: 1 Streened Interval. 1 - 1 Date/Time Started: 1/2 1530 Depth of Boring: 70' Date/Time Finished: 1/2 1530 Water Level: MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (if known) 5 - looge to very loose, dark to halt been, Sandy cill (SP), day to damp mothed, fore sand 5-g - stiff to very stiff, light to damp mothed, fore sand 5-g - stiff to very stiff, light to damp mothed, fore sand 5-g - loore to donse, light gay to light to men solly sund (SP), damp, willed, fine sund 10-11/2 - melsion, light gay, to light former low to med plasteesty, damp, which former 10-11/2 - melsion, light gay, sandy clay (CL), low to med plasteesty, damp, which former
Headspace (ppm)	Elevation: Elevation: SP SP CL SP II CL	Date/Time Finished: (1/1) 0707 Water Level: Date/Time Finished: (1/1) 0707 Water Level: MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (if known) 5 - looge to very loose, dark to halt been, Sandy cill (SP), day to damp mothed, fore sand 5-9 - still to very still, light to dark your, sandy clay (cl), damp, median plattacty mothed, hematete canceles. foresal gro-loore to donse, light you to light to men silly sund (SP), damp, median plattacty mothed, fore sand 10-11/k - median, light you, sandy clay (cl), low to med platteety, damp, media for such to the media for such for the form
0.0 % 01 Headspace (ppm)	SP CL SP CL	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (if known) ⁵ - looge to very loose, dark to light bren, Sandy soft (SP), dry to dump motiled, fine sand ⁷ - stiff to very stiff, light to dump motiled, fine sand ⁷ - optimized (SP), dry to dump motiled, fine sand ⁷ - optimized (SP), dry to dump motiled, fine sand ⁷ - optimized (SP), dry to dump motiled, benetic canerchas, for sand or optimized (SP), damp, medium plasticity, motiled, benetic canerchas, for sand ⁷ - loose to donse, light gray to light braven softy sund (SP), damp, motiled, fine sand 10-11/k - medium, light gray, sandy clay (Cl), low to med plasticity, damp, motiled, fine sandy clay (Cl), damp, motiled, fine sandy clay (SP), damp, motiled, fine sand
0.0 % 01 Headspace (ppm)	n CCS CCC SP CCC SP CCC	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (if known) -5 - looge to very loose, dark to light bren, Sandy side (SP), dry to dump- method, fine sand -9 - stiff to very stiff, light to dump- method, fine sand -9 - stiff to very stiff, light to dump- method, benette canerchas. for sand andy clay (Cl), damp, medrum plasticity, mothod, benette canerchas. for sand -10 - loose to donse, light you, to light braven sidty sund (SP), damp, mothed, fine sand 10 - 11/k - medium, light you, sandy clay (Cl), low to med plasticity, damp, method, fine sandy clay (cl), damp, method, fine sandy clay (SP), damp, method, fine sandy clay (SP), damp, method, fine sandy clay (SP), damp, method, fine sandy clay (cl), light you, sandy clay (Cl), low to med plasticity, damp, method, fine sand
70% 0.0 100% 0.0	SP SP CL SP II CL	-5 - looge to very loose, dark to hight breen, Sandy silt (SPS, dry to downg. mottled, fine sand -9 - still to very still, light to down gray, sandy clay (Cl), damp, medera plastersty mottled, benetite concretions. foresand gro-loope to dowse, light gray to light breases silty sund (SP), damp, mottled, fine sund 10-111/2 - malium, light gray, sandy clay (Cl), low to wed plastersty, damp, mottled, fine second
10.1/ 0.2	CL 5P CL	sandy clay (cl), damp, medan plasticity, molded, bematete concretions. foresand g-10 - loose to donse, light gray to light braves, silty sund (SP), damp, mottled, fine send 10-11/2 - medium, light gray, sandy clay (cl), low to wed plasticity, damp. mottled, fine
6, 1	CL	low to wed plasticity, damp. no Hicol. france
8° ( · D-D	50	solly sand (SP), clamp, lamined, mothed bre sand
67% 0.2	- 19 	g-20, median, light gray to light brown, sundy clay (cl), most, low platecty, 426
		fine 'sand' contract
		Date Time Depth to groundwater while drilling
	Date:	
	67% 0.2	67% 0.2 CL

. 12

			Clier Proj Site	nt: US ect Num Location	HCE ber: 60	256/38 2P 51	658			_	BORING ID:	27	
	=((		Coo	dinates:	-tion	<u>-</u>		Elevation			Sheet 2 of 2		
			Dril	ing Meth	hod: De	7					Monitoring W	ell Installe	d: No
			Sam	ple Type	(s): mar	POLONE		Boring Diame	ter: 24		Screened Inter	rval: 31'-:	51
Weath	er: ~ 7	June	,		Logged	By: DB	lack	Date/Time Sta	rted: alon II	Gr	Depth of Bori	ng: 731	
Drillin	g Contra	ctor: 7	2.0		Ground	Elevation	1:	Date/Time Fin	ished	905	Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxii	ERIALS: Color, si omponent(s), mois num grain size, od	ze, range, MAl sture content, s lor, and Geolog	IN COI tructur gic Unit	MPONENT, re, angularity, t (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23 24 25				60%	0,0	me	21-25	- medium d ist, nottled	Light of		silty de	silf(a y (cc), photo	· ()
26				60%	0.0	sP cl	9314 28%	y sand(st), 30- very st. (cl). damp Had, fore sa	most, -	not dy h and	thed, fins	sand sandy hotasty,	
31      32      33      34      35      36      37      38		DRY	<b>uš /u /</b> /	3			ß	ad of bo	*~ <b>?</b>			-	
39 40							42		* 3°	8	-	×	
NOTE	ES:								Date	Time	Depth to grou	undwater whi	le drilling
Check	ed by:					Date:							

	Clie	ent: US	ACE							
	Pro	ject Num	ber: 60	156136				BORING ID:		
ATCOM	Site	Location	n: LHAA	P Site S	8			SODAL	18	
	Coc	ordinates		-		Elevation		Sheet 2 of Z		
	Dri	lling Met	hod: UP	1				Monitoring We	ell Installe	d: 🖊
We ath any and a set	San	iple Type	e(s): Macr	PLDCe .	u	Boring Diamete	er: <b>C</b>	Screened Inter	val: 3/- 3	\$
Weather:			Logged	By:		Date/Time Star	ted:8/4/17	Depth of Borin	ıg: 🍤	
Druing Contractor:	1	I	Grouna	Lievation	1.' T	Date/Time Fini.	shed:	Water Level:		
Depth (ft) Geologic Sample ID Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxir	ERIALS: Color, siz omponent(s), moist num grain size, odd	ze, range, MA ture content, s or, and Geolo	IN COMPONENT, structure, angularity, gic Unit (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23 24 25		62%.	0.0	cL	20-25	- AS & DOUE	. lansne	ted , very fin a	nd low	
26 27 28 29 30		NR		4?	chay	of core				
31 32 33 34 35 36 37 38 39 40	31-33)	٠.				Endo	6 13000	3		
NOTES:							Date	Time Depth to groun	dwater while	drilling
Checked by:				Date:						

			Clie	nt: US	ACE	nellec			14		POPINC ID.		
			Site	Location	n: LIHA	4P 5:6	st				BURING ID:	78	
			Coo	rdinates				Elevation			Sheet 1 of		
			Dril	ling Met	hod: DP	r		***			Monitoring W	ell Installe	dNo
		-	Sam	ple Type	e(s): Ma	irs core		Boring Diamete	er: <b>2 *</b>		Screened Inter	rval: 🌮 🤧	5
Weath	er: 85°,	harid			Logged	By: DR	ade	Date/Time Start	ed: 8/1/17	2	Depth of Bori	ng: <b>Io</b>	-
Drillin	ig Contra	ctor: 7	10		Ground	Elevation	1:	Date/Time Finis	shed:		Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxin	ERIALS: Color, siz omponent(s), moist num grain size, odo	e, range, M ure content or, and Geo	IAIN CO t, structu logic Un	MPONENT, re, angularity, it (if known)	Lab Sample ID	Lab Sample Depth (ft).
1 2 3 4 5				807.	0.0	SP	0-2% to g. 5000 2%-5 GAC 5-10-	- loose to my, solly so , sandy clay - medium + dy clay (ch) sand As ACONE,	very s	13, Lo 20, Lo 20	trace gra	trown l. 6° m plaste : 1 plaste : 1	×,
6 7 8 9 10		1000 F1 8 (3135) 1000		<i><b>%0</b>7.</i>	0.0	دد	10 - 12	- Dunze, Ly	il dop ti	K (	to cand	1 class (s	
11    12    13    14    15	900074 544			10 ^{/.}	0.0	57	dam 12-15 men 552	tion to Legh by sand less	playtons light	blace- sty, 17	o Hech . for Jorg, Sam no Hich , for	Sand by classe re soul	(eL); 34
16      17      18      19      20			÷	(75%)	0.0	<i>cL</i>	, her	xees \$ 1/8"		đ.			
NOTE	S:								Date	Time	Depth to grou	ndwater while	e drilling
								540					2
													D.e.
Check	ed by:					Date:							-

			Clie	ent: us	ACE	а з						
			Pro	ject Num	ber: 602	56135				BURING ID:	<b>V</b> i 10	
		O	Sile	Locano		AT 25	F= 5 T	Flavation		Sheat 1 of	<i>c</i> /7	
			Dri	lling Mot	hod to P	T		Lievation		Monitoring Wa	ll Installe	d No
			San	nle Tvn	(s) · Ma	1		Boring Diameter		Screened Inter	val· •	301
Weathe	P: 1 900	hand	Dun	pic type	Logged	By:DBL	.h	Date/Time Started: 8/10/	Bloks	Depth of Borin	19: <b>21</b>	
Drillin	g Contra	ictor:	0		Ground	Elevation	1.	Date/Time Finished:	10 1145	Water Level:	<u>e</u> .	
	•											
Depth (ft)	Geologic Sample II	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT) minor c maxin	ERIALS: Color, size, range, M omponent(s), moisture conten num grain size, odor, and Geo	1AIN CO at, structe blogic Ur	DMPONENT, ure, angularity, nit (if known)	Lab Sample ID	Lab Sample Depth (ft)
1 2 3 4 5 6			_	85%	0.0	CL	0-24 che 24 -5 86 6 - 74	- Soft to very soft + (ce), dry, low per - Hard, clark gray stresty, trace fore s - AS ABOVIS (	light footicst , sid Samel, CL>	to ay to gr y, nothed, by clay, clay , mottled	y. Sm bloc se t, hgh (CL)	les V
0				<del>4</del> 1.	0.0		71/2 - 10 54- mo	- stiff to very st dy clay (ct), d. Hlad, fine sand	46. Y.	light gra median s	Y . Instrait	1 y .
11 12 13 14 15				<b>5</b> 0 %	0.7	sp	10-16 Sil San	- Lorse to medin ty same (Si), d i occursoral (2) 1	amp. " ch	mo Hled,	t gruy. Brie	
16 17 18 19 20				6=%	0.0		15-20	- AS ABOVE, hern rom 18 1/2 - 20, no	chy	concention Lensor, Kin	s body	AP
NOTE	S:							Date	Time	Depth to grou	ndwater whil	e drilling
												_
Chaster	d bu					Data						
CHECKE						Date:						

			Clier Proj	nt: US	HCE ber: 60	56/35	<b>^</b>				BORING ID:		
			Site	Location	LHAA	P Sote	58			1	SS DPT 19	- 254	
			Coo	rdinates:				Elevation			Sheet 2 of 2		
1			Dril	ling Meti	hod: <b>PP</b>	r					Monitoring We	ll Installe	d:n6
			Sam	ple Type	(s):	NOAL	-1-	Boring Diamet	ter: <b>L</b> "		Screened Inter	val: <b>26'-</b>	30'
Weath	er: 70	hraze	<u> </u>		Loggea I	Sy: <b>D</b>	act .	Date/Time Star	ishad	1114	Water Level	8. 6.	
Druun	g Conira	ctor:		r	Ground			Dute/Time Tim	isnea.	07170	mater Devet.		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT) minor c maxii	ERIALS: Color, si omponent(s), mois mum grain size, od	ze, range, MA sture content, lor, and Geolo	AIN CO structu ogic Uni	MPONENT, re, angularity, t (if known)	Lab Sample ID	Lab Sample Depth (ft)
21      22      23      24      25      26      27      28      29      30      31      32      33      34      35      36	Ge	58 De 1910 (31-3 VUL)		×	0.0	SP CL SP	20 -2 (5 23% chan 24% -3 mo	3% AS A p) AS A np, medown at the concre 5 - dense, ist. laming End	ABOVE , Enon, Log photicsly tions Log Le g Jed. no of tors	Ltor ray, not	Hed, domp	chay (c ?, moth ral (s) sand	
38 39													"
40				1	1		I		Date	Time	Depth to grou	ndwater whi	le drilling
NOT	ES:												
											1		
Check	ed by:					Date:							

		7.		Client:	11	SAC	F			1	1		
_			-	Project	t Numbe	r:					BORING IL	):	
		OA	1	Site Lo	cation:	14	AAP Sitss	2		1.127	580PT	20	
				Coordi	nates:		E	Elevation:			Sheet: 1-077	052	
				Drillin	g Metho	d: DP	T T				Monitoring Well	Installed	
				Sample	Type(s)	: m	2010 CONP B	Boring Diameter:	2 .	~/	Screened Interva	l:	
Weather	. <	Sum	1 9	5	-27-1-2		Larged By: MU	ate/Time Started	11/215		Depth of Boring		
Drilling	Contra	ctor:	Fugn	al a			Ground Elevation:	Date/Time Finisher	l:		Water Level		
27 ming	A	2	1	120		1	S. Sume Distantion.				L.C. MILL LIGTON	_	
Depth (ft)	Geologic sample	Sample Depth (f	Blowspare	Recovery (inche	Headspace (ppm	U.S.C.S	MATERIALS: Color, component(s), moisture con odor, an	, size, range, MAl tent, structure, a nd Geologic Unit	N COM ngularity (If Know	PONE 7, maxi 7n)	NT, minor imum grain size,	Lab Sample ID	Lab Sample Depth (Ft.)
1 2 3 4 5 6		<b>*</b>	l L	60	0	sm CL CL	SILTY FINE SAN SILTY CLAY, DOULD, MUHIIN dull to Slightly 4-7' SILTY CLAS WI Vers Stift	9 Dog wit 9 nog wit 8 dag 5 Shing 14L SAND	DRY Lles Cohe SM , dry	0- sen siv ean,	neddish neddish verg st neg s	13A.	
7 7 8 9 10			Z	60	0	CL.	7-11' SZLTY CZNY DOWN ALOH 9.5-10 MENJE	sgrag i Ing .c	mor May	ned st.	Idisk , taining.		
11 12 13			3	56		SM	H-14.5 Fine SELTY SAND grog Mo Hling	, reddisk , muist		in N	WIAL		•
14 15 16 17				56	0	5P 5451	14.5-15 PODRL 1.925 grey, mui SECTY CLOS Reddish brown Moist	y GRADER H. SANOG N Rund gra	SI SI	0 5 234	CLAY Hed,		
18 19 20		2	4	992 NH	0		Her far War Con	or oxide	51	8-	18.2	ł	
									Date	Time	Depth to groundwater	while drilling	
NOTES:								E					
								F					
								F					
													c - Miller of a
								Ļ					
	C	necked by				Date:							

INSACE Client: BORING ID: Project Number: AECOM S.t. 58 580pt 20 LHAAP Site Location: Sheet: 10112012 Coordinates: Elevation: Monitoring Well Installed: NA-Drilling Method: DPI Sample Type(s): Marab Boring Diameter: 2 ) N Screened Interval: CON Logged By: M Hart S Date/Time Started: 1.41.5 Weather: Depth of Boring: Date/Time Finished: Drilling Contractor: Ground Elevation: Water Level: Geologic sample ID Sample Depth (ft) Headspace (ppm) Recovery (inches) 9 Lab Sample Depth (Ft.) Depth (ft) MATERIALS: Color, size, range, MAIN COMPONENT, minor ab Sample U.S.C.S component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known) 21.7 21.5-29 cemented sand. Dark Red, 4_1 SM SILTY FINE SAND, Light gray and 1-2 42 5 reddist mown moist 23  $\mathcal{O}$ SP POORLY GRADED SAND, light brown 215 SILTY CLAY with zomes of Ench oxide gravel size". Dark Red moist, there the will 28-5 - " Speanchet IONS 6 1 CL. 21 48 6 SELSY CLAY, light grey with Sitty Sand Seam -29-29.2 - wet moist 19  $\bigcirc$ BIO SZLJY CLAY WILL Five Sand laminotions and occasions CL 212 60-Ve in fine sand seams, light grag (31-33 readist mourn), moist, pissible wet in sime sand seams No obvious F+3 7 314 0 35 Later pruducing Zowes detected IN Seil Sample 316 Push SP-16 Groundwalt sample 317 318 519 Total Depil 40' Date Time Depth to groundwater while drilling NOTES: Checked by Date

				Client: Project	Number	7CE 60	56135		BORING ID:
		<u>UN</u>	4	Site Lo	cation:	CHA	AP site SP		JEDNIZI
				Coordi	nates:	, DF	Elevatio	on:	Sheet: 1 of 1
				Sample	Type(s)	· VI	Boring	Diameter: 2"	Monitoring Well Installed: No
Weather	101	· SL	nav .	Jumple	J	1 190	Logged By: Dolack Date/Til	me Started 13 1450	Denth of Boring:
Drilling	Contra	tor: F	00000	A			Ground Elevation: Date/Til	me Finished \$/6/13 /600	Water Level:
Depth (ft)	Geologic sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, r component(s), moisture content, s odor, and Geo	range, MAIN COMPONE tructure, angularity, maxi ologic Unit (If Known)	NT, minor mum grain size, Debth (Lt.)
1 2 3 4 5 6 7 8 9	×			75%	0.D	<i>с</i> с	5-10 - very still Gamely clay, Sandy Light gray, Sandy Lo 4" fore sand	tight brown, fine grained sa hight brown to have plastsesty to hand, light clay, dry, mi drogs & sand wy of lance Q ~ 8	sandy Isgh govy, - Bor savel ht brown to clown platarty lath - not 41.0 2/2 for ally
10      11      12      13      14      15      16      17				98%	0.0	sP cz	10-12% - stiff to a dry, low plasticity ( 12% - 15 million d sand (SP). dry f: 15-16% - Hard, back b dry, median plastic 16% - 20 - loose to	modian, light g hype sand contant lanse to loose, little ne snal, little hear to light gray lesty, fore sand, nodsom class	rey, sandy clay (22) i) mottled set gmy, sithy silt, mothed ( sandy clay (22), mothed mothed sendy clay (22), mothed
17 18 19 20 NOTES:			5	75%.	Ø.D	mz	damp, fine sand,	Date Time I	Depth to groundwater while drilling
						1	*		
	C	hecked by		3	1	Date:			

- 1

L

	=/	<b>`</b> OA	A	Client: Project	Number	7.CE	25 6/35 AD G4 50		BORING ID.	
				Coordi	nates	-117	Florentian		Sheat: 2 of 1	
				Drilling	a Motho	+ 121	T Elevation,	· · · · · · · · · · · · · · · · · · ·	Monitoring Wall	matalladi Ada
				Sample	Tuna/el	· m.	Boring Diameter	211	Monitoring well I	26-20
Waathar	. /2	1 · 50	have	Joumpie	Type(s)	. / 146	Logard Bur Dalach Data Time Stanlad	1/10/100	Dowth of Powiese	251
Drilling	Contro	ctor:	maria				Crowd Elevation: Date/Time Starled.	5/1/12 1/10	Depin of Boring:	<u>c</u> ,
Druung	A		V			1	Ground Elevation: Date/Time Pinished:	016/18 1000	water Level:	
Depth (ft)	Geologic sample I	Sample Depth (ft	Blows per 6"	Recovery (inches	Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAI component(s), moisture content, structure, an odor, and Geologic Unit (1	N COMPONEN gularity, maxin lf Known)	VT, minor num grain size,	Lab Sample ID Lab Sample Depth (Ft.)
20      21      22      23      24      15      26      27      28      29      310      71      72      73      74      75      16      17      18      10	Geol	551 (1 (2 8/	PT2( Tor 6-36) C/13	Kee Kee	· . D	mi SP Z	20-23/ median danse, 1 w/ clay (ml), moist we most, wolded, totto sitt 29%-30% of the sitt 29%-35 - thele gray, cla high plasticity motiled End of loor ang	toght go y low plan t brown, y w/sau	ay, sends tresty most selly san cl. clang	
_										
20   NOTES:	1	]		1	l			Date Time D	Pepth to groundwater w	tile drilling
	C	hecked by			r	Date:				

			Clie Proi	nt: USA	tcE ber: Lo	296/35	5				BORING ID:		
			Site	Location	1: SHA	AP SI	6.58				58 DETZZ		
		JM	Coo	rdinates.	1			Elevation			Sheet 1 of 2		
			Dril	ling Met	hod: De	Г					Monitoring We	ell Installe	d:No
			Sam	ple Type	(s): Meer	10/0/1		Boring Diamet	er: 2 💙		Screened Inter	val: <b>26 –</b>	30
Weathe	er: 910	hanvel,	clandy	1	Logged I	By: PB la	ch	Date/Time Star	rted.s/n/r	3 1025	Depth of Borin	ıg: <b>29</b>	
Drilling	g Contra	ctor: 7	10		Ground	Elevation	1.5	Date/Time Fin	ished:8/0/	1 155	Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT minor c maxin	ERIALS: Color, si omponent(s), mois num grain size, od	ze, range, M ture conten or, and Geo	IAIN CC it, structi blogic Un	MPONENT, ire, angularity, it (if known)	Lab Sample ID	Lab Sample Depth (ft)
1 2 3 4 5				75%	0.•	SP	0-14 - d- 11/2-41/2 clas moti 4/2-5 Acom 5-9 -	very longe, 1 y. Give sand, - Soft, 10 (CC). dry, Hed - as above, tota - meclium t	trace of trace of tow pl tow pl noist	y do la astres clarb	ty sand ( ght brown Y - Bric su cand conta to hight	sp) sandy a d, at, any,	-
6 7 8 9 10	1.5	- 		100%	0.0	CL	sand high 9-10 c Band mott	tense to me	lin da-	dense.	Light gray	r, silt	
10 11 12 13 14 15				65%	0.6	CL SP CL	10-12, Low 12-13, moto Swind mother	stiff to m y lasticity , 1 million de stiff to m y clay (CL) d, fone same As ABOVE,	ted motiled	offed, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, black, bl	and alty sand ( Little ssli gray to light to mal plase ch)	1, and 225, 4 group 100 by,	· / ³ ,
16 17 18 19 20				86%	0.0	3P LL	17 - 174 59-6 17% - 2 5and Sand	medsum de ity sund, m o medsum t y day (cl), l, mottled	nse, ligh oist, no o stiff; demp,	torney the	to light bri line send (5) ray to byld clasticity, fo	burger, burger, burger,	
NOTE	S:								Date	Time	Depth to grou	ndwater whi	le drilling
						12				Monitoring Well Installed M Screened Interval: 26-30 8/17/5 1025 Depth of Boring: 29 d.8/0/1 157 Water Level: ange, MAIN COMPONENT, content, structure, angularity, and Geologic Unit (if known) 4 born, 55/44 Sand (SP), content, structure, angularity, and Geologic Unit (if known) 4 born, 55/44 Sand (SP), content, structure, angularity, and Geologic Unit (if known) 4 born, 55/44 Sand (SP), content, structure, angularity, and Geologic Unit (if known) 4 born, 55/44 Sand (SP), content, structure, angularity, anges, MAIN COMPONENT, content, structure, angularity, ange, MAIN COMPONENT, content, structure, angularity, ange, MAIN COMPONENT, content, structure, angularity, ange, MAIN COMPONENT, content, structure, angularity, ange, Astheward (SP), content, structure, angularity, ange, structure, angelastics, content, structure, angularity, ange, Structure, angelastics, content, structure, angelastics, structure, blac, Structure, angelastics, structure, ange, multiplestics, structure, blac, Time Depth to groundwater while drilling Date Time Depth to groundwater while drilling			
						17.							
Checke	ed by:					Date:							

			Clier	nt: USA	KF						BOBINC ID.		
			Proj	ect Num	ber: Col	56135	100				BURING ID:	2	
		O/N	Cool	Location		40 <u>2</u> 31	6 > 8	Flavation			Sheet 2 of	2	
			Dril	ling Met	hod De	r		Licration			Monitoring We	ell Installed	d: Na
			Sam	nle Type	(s): Mar			Boring Diameter	r: 2*		Screened Inter	val: <b>26-3</b>	
Weath	er: 90.	hansel d	anda		Logged L	By: DB/	ck	Date/Time Start	ed: Polo	1025	Depth of Borin	ıg: <b>29</b>	
Drillin	ig Contro	ictor: 2	ro	_	Ground I	Elevation	1.	Date/Time Finis	hed:8/13/	NST	Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxin	ERIALS: Color, size omponent(s), moistu num grain size, odo	e, range, M ure content r, and Geol	AIN CO , structu logic Uni	MPONENT, re, angularity, t (if known) samely cla	Lab Sample ID	Lab Sample Depth (ft)
21 22 23 24 25				i 5%	0.0		dum 1. 25-29	p, medsun gla viry low stuck in to viry stepp.	recover necover a be	for s	and Les aterna	1, 2010 s:lty	
26 27 28		570977 (26-30 13 413 Usc" (627	22	40%.	0.6		elay Las	(CL) damy	e to close c sand L'/L"	, me not	lan plasta Hed	. <del></del>	
29		DRY			AND A REAL PROPERTY OF A			Endo	f bore	7			
NOT		L							Date	Time	Depth to grou	ndwater whil	e drilling
	-C12												
Check	ed by:					Date:							

<b>A</b> Weather Drilling		OA · he	niel, s	Client: Project Site Lo Coordi Drillin, Sample	Number cation: nates: g Methor Type(s)	4 CE 1: 68 LHA d: Pl	S 6/35 A P 9.4 58 Elevation: T Boring Diameter: 3" Logged By: P. [Slack Date/Time Started: 5/6/13 08 Ground Elevation: Date/Time Einiched: 5/6/13 08	BORING ID Stopped Sheet: 1 of Monitoring Well Screened Interval Depth of Boring: Water Level	2: 23 Installed: 1: 36 - 35 1	N 90	
Depth (ft)	Geologic sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inohes)	Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPON component(s), moisture content, structure, angularity, ma odor, and Geologic Unit (If Known)	ENT, minor ximum grain size,	Lab Sample ID	Lab Sample Depth (Ft.)	
1 2 3 4				95%	0.0	me	0-1/2 - very losse, ton, sindy 5 600 sand, dry 1/2-5- very stiff, darle to light be clay (CL), fine sand, necls. high plasticity. orang- moff.	it (me), rown, sancf m to ing, dry			
5 6 7	ň				0.0	ce	5- 5% Hard, light gray, son A fine said content, by, med mottled, concretion Q - 6'	by clayte	ty ty		
8 9 10				1007.		SP CC	5%-10 Mclium donse, hybergan Gre sand, clamp, mottled 10-11, Havel, darke brown, Samo Gre sand, day, meetium plastee:	ly chy cet	-d (5	r!	
12 13 14	-			80%	00	se	14-15 Vense r light gray, 5:14 same champ, viry los phasticity, motile	langer - / det langer - / det la clay (l da ( conce	noist official	), (512),	
5 6 7				90%	0.0		16-20 - As above a fast east concre 16-20 - Still to medium, Elight clamp to moist, medium to higo mottled, sund & plasticity & up	tions, nothing gray, sund chapther the	he clap	e (eL)	
9 0			19			4		12			
NOTES:							Date Time	Depth to groundwater v	while drilling		
	c	hecked by				Date:			-		
	=0			Client Projec	t Numbe	7. 60	25 6/35			BORING ID:	
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				Sile Lo	calion:	Chin	HU SITE DE			Source	
ł.				Coord	inales:		21	Elevation:		Sheet: Z of Z	
				Druim	g Metho	d: 1/1			-//	Monitoring Well Insta	lled:
	0	-2 0		Sample	e Type(s)	: Mg	cro cort	Boring Diameter		Screened Interval: 3	6.40
Weathe	<u>r:</u>	- 1	- AY				Logged By: VOICOL	Date/Time Starte	d: 8/6/13 08 45	Depth of Boring: J	· · · · · · · · · · · · · · · · · · ·
Drilling	Contra	clor: )	10000	1		1	Ground Elevation:	Date/Time Finis	ned:0/6/13/270	Water Level:	
Depth (ft)	Geologic sample II	Sample Depth (f)	Blows per 6"	Recovery (mokes)	Headspace (ppm)	U.S.C.S	MATERIALS: Cold component(s), moisture co odor,	or, size, range, M ontent, structure, and Geologic Un	AIN COMPONE , angularity, maxi it (If Known)	NT, minor imum grain size,	Lato Sample 1.1 Lab Sample Depth (Ft.)
21 22 23 24 25 6	Ŧ			65%	0.2	CL ML CL ML	20-23 - As a 23-24 - Meds very low plass 24-25 - Stiff. A fine sand mo. 25-26 - Median	and clense theity mottle light gray ist, low l a (2'18")	, silt w/ to gray so lasticity, lightome,	clay (me) mo candy clay (c mo Alad, make	84, 2) 500001 20001
29 29 20		08		95%.	0.0	CL	forc sand, noise 26-27 - stiff to noist, 60-0 san 28-30 - As abon	to motilid, very stiff I must t e, Hard, I	little gans , light gray brief ele dry, high	y, savely etc. slicity plast	Y (= 2 ),
<b>7</b> ¹ <b>3</b> ² <b>3</b> ³ <b>7</b> ⁴ <b>7</b> ⁵				ЛR	0.0		As above, , clay (CL), s	ns recover huch in se	Y- very	havel, dry	•
96 77 78 79 79 40		5804 1130 8767 VOC (36-	128 13 (5 10)		D.0		End of	bong	35 '		
NOTES:									Date Time I	Depth to groundwater while d	rilling
										and the second	
	C	hecked by				Date:					

			Clie	nt: USAC	er: 60	256/35	- A			Ξ,	RORING ID:		
			Site	Location	SPO	LUMAR	Site .	57			SPOPTZ	4	
			Coo	rdinates:				Elevation		S	heet 1 of 🕻		
			Dril	ling Meth	nod: D	7				Λ	Aonitoring We	ell Installe	d: 🖊
			Sam	ple Type	(s): me	ro cor L		Boring Diamete	r: 💶 🗖	S	creened Inter	val: <b>26</b> • 1	10'
Weathe	er: ~ 80	· humid			Logged	By: PBA	ack	Date/Time Start	ed:8/10/13 0		Depth of Borin	g: <b>25'</b>	
Drillin	g Contra	ictor: 📿	20		Ground	Elevation	<b>!;</b>	Date/Time Finis	hed: \$/10/13	ŀ	Vater Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxii	ERIALS: Color, siza omponent(s), moista num grain size, odo	e, range, MAI ure content, s r, and Geolog	N COM tructure jc Unit	IPONENT, e, angularity, (if known)	Lab Sample ID	Lab Sample Depth (ft)
				94%	0.0	(mz)	dry tan dry tan sh.s.	to have la to have gray to moist. sand, lette median, o by elay, da	is to m , shay very lo i day, . last bro	solt of the	~ dense ~ lecy. desty. d, "g~~ babgag trity, by	(mc) 1 4	
5 6 7 8 9	a s			75%	0.0	4	5-9 1231 8'10" 9 9'-10'-	- As a bave, a - As a bave, a het grage mostle real lense medana to g ly elegets,	to mother	tota tota	concretion Sand of cl my to br hostaity.=	s, by (sp) war, atthe	
10 11					-	sp sp	10-114e dry	nelson el	ne, ta	san.	time good		
				75%	0.9	e	dami tor a	fine sand co.	high 16	stat	y, sanly	dey, (	() ()
							15-20	- lon. to a	redia m	dens	c, light	bram	
17 18 19				60%	D	57	then	y bedled m	otthed	~~ [ 5	P), most /	a cont	
20 NOTE	S:								Date	Time	Depth to groun	dwater whil	e drilling
Checke	ed by:					Date:			II				

			Clier	nt: USA	ACE her: 60	256/35				_	BORING ID:		
			Site	Location	LAA	AP 5:-	. 58			-	SEDETZS	1	
		JM	Coor	dinates:		16 001		Elevation			Sheet 2 of 2		
			Drill	ing Meth	hod: DP	PT					Monitoring We	ll Installe	d:No
			Sam	ple Type	(s): Mac	tocar &		Boring Diameter	2"	-	Screened Interv	al: 26-	20'
Weath	er: ~10	, hannie	ł		Logged	By:		Date/Time Starte	ed: 8/11/1 a	40	Depth of Boring	g: <b>25 '</b>	
Drillin	ig Contra	ctor:	~2		Grouna	Elevation		Date/Time Finis	nea: 6/16/13 0	775	water Level.		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT. minor c maxi	ERIALS: Color, size component(s), moistu mum grain size, odoi	, range, MAII re content, st ', and Geologi	N CO ructu ic Uni	MPONENT, re, angularity, it (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23 24 25				60%	0.0	s?	201 23 04 M	s - As - bour	clay bed	- 038 - (A	light gay h	of. pla t	)
26		Dity Sto	7729 (71'-35 1525	08/10/ -1) V	(13 (5) (5)			Endo	6 boring	Time	Denth to group	dwater whi	e drilling
NOTI	ES:		0.00						Date	Time	Depth to groun	dwater whi	e drilling
			- and										
		945	r										
		1											
Check	ed by:					Date							_
LUNCOR	Ju UY.					L'utv.				-			

			Clie	nt:	USACE	0-11-					BOBINC ID.	-	~
			Proj	Location	per: 60	25613	SS ER				DURING ID:	580010	x5
		<b>J</b> M	Coo	rdinates	. LIP	HHT C	20 2110	Elevation			Sheet 1 of 2		
			Dril	ling Met	hod: Dia	estes	r				Monitoring We	ell Installed	d:
			Sam	ple Type	(s): 6.	W,		Boring Diameter:	2	P I	Screened Inter	val: 36-	40"
Weathe	er: S	Sunny	905		Logged I	By: R		Date/Time Starte	d:802]	3/115	Depth of Borin	g: 37.	51
Drilling	g Contra	ctor: '	UGRO		Ground	Elevation	1	Date/Time Finish	ed:8122	1580	Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	RULS Blowsper 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxii	ERIALS: Color, size, omponent(s), moistu num grain size, odor,	range, M e conten and Geo	IAIN CO t, structu ologic Un	MPONENT, ire, angularity, it (if known)	Lab Sample ID	Lab Sample Depth (ft)
1 2 3	4 5' 100 11 2 3 4 5' 100 11 100 11 100 11 100 11 100 11 100 11 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 10												
4 5 5' CL Siltyclay U/sand (4-5)' stiff, onot brown + red mottling, troccargan											es, truce min	ca	
6		631				CL	Sar	neasabov	e			2	
7 8 9	G.31 C.31 CL Same as above Silt (63-10) very strift, SI gray, with brown moth mice, low plasticity									slign Hirn	tly moist, ), trace		
10		10 -01				CL	Silty Cla	y (10-1015") 100	54.51	inter me	orst, annel	Druned	_
11 12 13 14		13'	3	100		CL	Silty C Silty C With at II', Sand ( fine g	irenceme lay (10 15-0-15" medplastrc11 13-15") 10050, rain, poory gra	) me mott	d, noi ling, : noist noun, ore clo	nedplactrzity ist, gray staining veryfine two		
15       16       17       18       19       20			4	(00	Silty S	andy ay CL	grey Som Plast	e staing from	-20') brow n 15	madi n mot	Pumy moist thing, t', med		
NOTE	s.				diama di seconda di se				Date	Time	Depth to grou	ndwater whil	e drilling
TOLE	1.7+							F	_				
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Checke	ed by:					Date:				1	-		

			Clier Proj	nt: ect Numb	USACI	E 25613	5				BORING ID:	Fata	(AF
<b>^</b>			Site	Location	: LHAF	S S	1258					DADL	125
<b>A</b> .			Cool	rdinates:				Elevation			Sheet 2 of	2	J.
			Drill	ling Meth	iod: Dice	er Rsh		Daning Diamatan			Monitoring We	val: 21	a:
W41		/ /	Sam	ple Type	s): 61	$\mathcal{O}$		Data/Time Starte	dicimili	1.6	Denth of Borin	a. 22.4	40
Drilling	r. Contra	Sing	10-		Ground	Elevation		Date/Time Finish	ed sho	1580	Water Level:	5. 2011	
	s Comru		10000				1	Durch Time Time	cai ona	1000			
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6	Recovery ( <del>inches</del> )	Headspace (ppm)	U.S.C.S.	MATE minor co maxin	RIALS: Color, size, omponent(s), moistu num grain size, odor	range, Ma re content, and Geol	AIN CO , structu logic Un	PMPONENT, ire, angularity, it (if known)	Lab Sample ID	Lab Sample Depth (ft)
21		215	6	ລ		CL	Same	as above (20-	215')				
22		aus	5	12		CL	siltycl med-	ey (21.5-22.5) to-high plas	stiff	, moi	st; gray		
23		าน		a		CL	Same a	sabore (22.5-	24.0) 1	14100	larkstaining.	Ĩ	
24		<u>ay</u>	6	12	0.	Ch	201. Sand	tracemica,	5.) me n-d-3	dim o-hrz	, moist plasticity,		
26			7			<u>.</u>	Siltycl med-h	wy (25-27)	Stift,	mosi	st, gray	•	
27		27		100		<u>C</u> L	SANDYC Very-free	AY (27-275)	Hist, mulech som	ets, m	brown, ed plasticity,	mag	resent
28						A.	Sam	re as above	e (27.	-30'	)	Ī	
29		30'	8	100		2-							
30							core our	stuck in 1 rus	ormel	5 W	nutcane		
32							Sen	meascoove	-				
33							E	nel of bosing	C 36	1.51			
34													
35													
$\begin{vmatrix} 36 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ $	7	scircen											
37	$\bigvee$	40						7.	4			S.	
39	$\wedge$	40'							ALL -	-			
40 -	/ \	0								-			
NOTE	S:								Date	Time	Depth to grou	ndwater whi	le drilling
										-			
Check	ed by:					Date:							

			Clier	nt:	USACE	05/	21	<u>\</u>		RORING ID- 1	S& DPT	21
			Site	Location	0er. 6	AAD 4	)) IN KE	/		BUILING ID.	01130	×76
		)//	Coo	rdinates:	<u>. LN</u>	MAP 3	5,70 35	Elevation		Sheet 1 of	2	
			Dril	ling Met	hod: Du	ect Pu	sh			Monitoring We	l Installe	d: 🖊
			Sam	ple Type	(s): C	and	rater	Boring Diameter:	a"	Screened Interv	al: 28-	52
Weathe	r: <b>5</b>	inny 8	0'5		Logged I	By: RL		Date/Time Started	: 8/11B 0920	Depth of Boring	: a7.	5
Drilling	contra	ictor.	NOT		Ground	Elevatior	1:	Date/Time Finishe	ed:	Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blowsper 6" C	Recovery <del>(inclics)</del>	Headspace (ppm)	U.S.C.S.	MATI minor c maxii	ERIALS: Color, size, r omponent(s), moisturc mum grain size, odor, s	ange, MAIN C content, struct and Geologic U	OMPONENT, .ure, angularity, nit (if known)	Lab Sample ID	Lab Sample Depth (ft)
		5				01	Silty Clo	4 (0-15") bruw	m, loose, d	ry, midium		
$\begin{array}{c}1\\\\2\\\\3\end{array}$		2'		1016		a	Sittycka Hoom	y(15-21) loose - mottling, modu 2-51) stiff, de	ndry, light m plasticity f durk biew	torny, motting		
4		51				CL	red st	raining, med-	h.yh plast	icity		
5 6 7 8 9 10		.5'	2	100		a	Clay( gray to his prese Start	(5-151) med. , hightbourn the plasticity - nti trace light ting at 81 w	mast metting phile pit	light mich sent aswell		
11 12 13 14 15		15'	3	100		LL	22	<i>]',-,5</i> ,"				
16 16 17 18 19 20		161 16.21 17.01 NR 201	4	45		CL	Sciay (1 hrogh ( Sandy C Uith Plustr	Ame as a bor 16-16.2) stift, plasticity no lay(16.2-17) sti light brown ma zity, micu pr	e micup Fidarka ist, mic ffimoist, 1 Hing, me rsent,	resent proy, mech to prosent hightgray d to high		
NOTE	S: Le	o (LOV	ery	1-20	, J			-	Date Time	e Depth to groun	dwater whi	le drilling
Checke	ed by:				-	Date:						

			Clie Proj	nt: ject Num	USA ber: G	CE 025613	35				BORING LD:	ST 26	
Δ	-6		Site	Location	1: LH	MAP S	ite 58						
			Coo	rdinates:		0		Elevation			heet 2 of 2	11 Installa	d. ID
			Dril	ling Meti	noa: Dy	at rus	n	Powing Diamata			Cornanad Inter	al installe	321
Weath		1	Sam	ple Type	(S): Gra	Dungla	567	Doring Diameter	ad chila	020 1	Danth of Boring	$\frac{\partial u}{\partial r}$	57
Dwillin	er.	Sunny	80-2		Ground	Floration		Date/Time Starte	hod.	-1~ 1	Voter Level	5. <b>d</b> N	
Druun	g Comra		-UGKU				· · · · ·	Dute Time Times	neu.	/	ruici Levei.		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	PUNS Blows per-6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT) minor c maxi	ERIALS: Color, size omponent(s), moistu mum grain size, odol	e, range, M ire content r, and Geo	AIN COM , structur logic Unit	1PONENT, e, angularity, (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22		a2.5'	5	1002		CL	Sandy Drou- medic	Clay (20-22,) on with light areas in, moist, med	s) ven vr gray 1 tomgy	Five gr Sand C' Dooteit	ainsands, lay lonses, y i Mi a pra	sent	
$\begin{vmatrix} 23 \\ -24 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25 \\ -25$		<u>२</u> ५ २५		100		CL	Clay ( Mottlin Moist	24-25') med o y, trocc fineg	gray cla rain sa plastr	y, redeh hels, m city, tr	th brocks eclium, oce mica		
26 27	21- 27.5'	NR 27 27,5	•	20		Ci	No r moist	ecovery Sandy clay (27-2 med tohigh pla	eticity	thin live	clay, med.	is pres	int
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\left \right\rangle$	60100n 281 30 32					hit (	etucal with	ng ot c	sourge surch	252'		
33 34 35													
36 37 38										2)			
39 40											Death		lo drilli-r
NOTI	ES:												ie orming
Check	ed by:					Date:							

				Client: Projec	t Number	7-CE	256/35	17		BORING ID	:
			1	Coord	inates:	CHA	HE SITE SK	Elevation:		Sheet: 1 of L	5.1
				Drillin	g Method	t: P	7			Monitoring Well	Installed:
	Comb	~	-1-	Sample	e Type(s)	Ma	ro core	Boring Diameter:	2"	Screened Interval	. 26-
Weather.	Contra	Junay	hum	81			Logged By: DSle.cle	Date/Time Started.	8/6/17 1115	Depth of Boring:	25
Depth (ft)	ologic sample ID	mple Depth (ft)	Blows per 6"	scovery (inches)	cadspace (ppm)	U.S.C.S	MATERIALS: Color component(s), moisture con odor, a	r, size, range, MA ntent, structure, a and Geologic Unit	IN COMPONE ngularity, maxi (If Known)	NT, minor mum grain size,	ab Sample ID
1 2 3 4	0	Ø	265	70%	0,0	mL	U- 41 Loose to no light brown to	colian clan brown, dry	sc sandy to dan	silt (mc), ne, mothed	
5 6 7 8 9 10	2			967.	0.0	cl sp cl	dry, low plastic 5-6, very des silty sand (SP), 6-10-very still dry, how to me Lo occasional ().	to still. plastice	sand, -	no Hlad light bion mothlad and , san ch thad w/ he ases, dry, p light gr	n, I clary ratedo motile
11 12 13 14 15		Ĺ	/	( 00%.	0.0	57	10-15- Very doo dry to clamp, Lo occasiona mod. plas 15-20 As above	mo H/ol f (2) 1218 ka: ty	" clay de	to loose, a	oist.
	<,		2	<b>\$</b> 0 %	Ð.0		(7 me 1	" clay long	e C ~ 19	", hand, .	mel p
NOTES:		I			l			-	Date Time (	Depth to groundwater v	vhile drilling
					+	1		1			
		-					iei i				
		and the		1.1		. 2		×			
	U	NUNCU DY				7410:	2	I		Protocolitica destruction	

Δ	=0	0	4	Client: Project	Number	CE 60	256/35 AD 94 50		BORING ID:	
				Coordi	nales:	-10-1	Elevation:		Sheet: 2 of 7	
				Drilling	Method	: DP	T		Monitoring Well Installed:	10
	17.1			Sample	Type(s):	Mai	Boring Diameter: 2"		Screened Interval: 26-30	>
Weather	95	top s	anny,	hyni	d		Logged By: Dokak Date/Time Started: 8/6/	10 115	Depth of Boring: 25'	
Drilling	Contrac	ctor: F	somes.		_		Ground Elevation: Date/Time Finished: 8/6/	13 1200	Water Level:	
Depth (ft)	Geologic sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN CO component(s), moisture content, structure, angular odor, and Geologic Unit (If Kn	MPONEN rity, maxis lown)	NT, minor num grain size, rap	Depth (Ft.)
	1			75%	9. <b>6</b>	SP CL	20-24 - Loose to malin de eilty sand (SP), high s. mottled 24-25 - vary stible laght gas moist to damp, low plasticity	ense, for silt co	whent, most,	
- 1			1			~	- herefite concretions			
2.6		-	Dares			12	15011			-
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			Clie	nt: 🕻	ISAC	E						0.1	~
			Proj	ect Num	ber: 6	0256	133				BORING ID:	35 AW	WO9
Δ		<b>DM</b>	Site	Location	ı: <u>S</u> .	0 58	( <u> </u>				Charles I C C	,	
			Coo	rdinates:	110	1		Elevation			Sheet I of L	-11 Torret -11 -	1.
			Dril	ling Met	hod: H>	17			8		Monitoring W	ell Installe	a:
III II	0.1		Sam	ple Type	<u>e(s): Sp</u>	1 T SP	400	Boring Diametel	r: O	0.0	Screened Inter	vai:	-
Weath	ercland	de Hill	mid 1	18.4	Logged	El mation	~7401g	Date/Time Starte	had	5 815	Water Level:	21 7.	2
Druu	ig Contra	istor:		I	Grouna	Lievation.	_	Dute/Time Finis	neu.		maler Level.	30:73	
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT) minor c maxin	ERIALS: Color, size omponent(s), moistu num grain size, odo	e, range, M ire conten r, and Geo	IAIN CO t, structu logic Uni	MPONENT, re, angularity, t (if known)	Lab Sample ID	Lab Sample Depth (ft)
1 2 3 4 5			2 2 6 7 2 6 9 9 7 7	48	0.0	SP	Poere dark dary salty Most	y canoto s yellowish i them s. it can redding	-, medi	Sand 5 b un da	moist now mist y re gros , yell z stiff	elles, elles, es) mu	H6J
6 7 8 9 10 11			7674212233707334713	41	0.1	CL 38	SILT to Oli Malu Note Fini Mac	y clay u ue yellow, n a increasor pt s sand, n sict, very	HE Fin noist, j fia noist, den	re Si Stift R S Pob	yelloir)	ist in	964 J.
12 13 14 15			14 15 15 15 19 16 16	48	0.1	5P	13 FINE 27.060	Sond, Moi 181 yellow 1855 Fine 4 Fine Sim	st, de , der coass	x-k ise isa	there s	brows i lot ande	-to nedele
16 17 18 19		1 12	10712 10 12 12 15 14	50	0.7	sp/ sw Sp	Fine .	to Colan S to Colan S to , da-k y. Sand, muis	3-6 and c ellumi 1, 6/11	inchi with sh Inco wa yel	in Fine inon on in un to all Hand, they HAND	Sand dr. Nr.a we ye	and ilas 1/02
20		L			4	+			Date	Time	Denth to grou	I Indwater whi	le drilling
	ES:								Date	Tune	Deptit to gibt	and mater will	is arming
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CHUCK	uuuy.					Date.		and the second se					

			Clien	nt: ect Numi	USF	CE	35			R	ORING D	D: 3501	MAING
			Site 1	Location		5. 5	58					551109	
A			Coor	dinates:			20	Elevation		S	heet 2 of	2	_
			Drill	ing Meth	hod: 🖊	SA				A	lonitoring	Well Install	ed:
			Sam	ole Type	(s): 50	lit S.	andr	Boring Diame	eter: 🗸	S	creened In	terval:	
Weather:					Logged I	By: Har	Fford	Date/Time Sta	rted:		epth of Bo	oring: 40.	5
Drilling (	Contracto	r:			Ground	Elevation	ı:	Date/Time Fil	nished:	И	Vater Level	l:	
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxin	CRIALS: Color, s omponent(s), mo num grain size, o	ize, range, M sture conten dor, and Geo	IAIN COM t, structure llogic Unit	PONENT, ., angularity (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23 24 25 26		.1	7es 16 51 51 20 26 25 20 4	55	2:2	SP SW CL	Alter Fine With dark SILT SILT Yello	rating e Sand a irum o jellowish h i clay 2 clay 24 r.Hard	19 4 10 Fin 21 0 N 10 N La ( 14-24.2 17 -27.5 - Tay R	-Sin is du le sale ge well Bi yellowin igen al	icher Warnes Muin, di nuter A traces Ha 150	iand 15 5 5 5 5 1 2 4.2 5 5 5 1 2 4.2 5 5 1 2 4.2 5 1 2 4.2 5 1 2 4.2 5 1 2 4.2 5 1 2 4.2 5 1 2 4.2 5 1 2 4.2 5 1 2 4.2 5 1 2 5 1 2 5 1 2 5 1 2 1 2 1 2 1 2 1	2-24 ge
27 28 29 30 31	•		15 16 19 21 24 24 24 24 24 24 24 25 31 5 5	60	sn sn 0:1	с- сг	27.5-2 27.7-2 5 Z L T 28.5-2 28.8-2 5 Z L T MUIN Lami	4.8 SILIY CLAY WE A.8 SILIY CLAY W HAND Noted S S. Hy SC	Shand Hisond Hisond Hisond Hisond Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Shand Sh	olive, grog , grog , ye clog l ms a	yrllow mors llowisk with so 23	ment t, HAr mush and wi and 3	and g
32 33 34 35 36		/ 2	622 -530 52 711	54	0.2	CL in som	Muiss n. Lami	ro Ed Sc	ecte c	د سرمالا د مرما	ind gr	ca, HAI	5
37 38 39 40			19 25 31 39 7 5 83	60	0.6	CL WHL SM SPARM	San	d Slam I slam	Date	tine to	Depth to 9	AND, DE	ile drilling
NUTES:	Cua	ep at	\$ 33	17	m.v	×D	RY -	=+=1	8-14	1150 1320	33.7 30,72		
a 1 1	()	24	0-	som	mig	- Nu	sa 70	) 10 Set					
Checked	by:		_			Date:							

Neon 35ALWO8 4/29/13 TO 333 JUL 28.78 BIEL 5/14/13 26.20 DEW BEV.

	=0		A	Client: Project	La Number:	15A	CE 256135 Σ50135 Ζ501	): 	
				Sile Lo	callon:	5.6	238 Flavation: Sheet: Loft	0010	
				Drilling	Method	. 4	SA Monitoring Well	Installed:	
1				Sample	Type(s)	A1/	Boring Diameter: Screened Interva	l:	
Weather		lon		1	10 P		Logged By: Harten Date/Time Started: Depth of Boring:		
Drilling	Contra	ctor:	HAGR U		**		Ground Elevation: Date/Time Finished: Water Level:		
Depth (ft)	Geologic sample ID	Sample Depth (ft)	Blows per 6*	Recovery (inches)	Headspace (ppm)	U.S.C.S	MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known)	Lab Sample ID	Lab Sarnple Depth (Ft.)
1         2         3         4         5         6         7         8         9         10         11         12         13         14         15         16         17         18         19         20				24			Spa lug for 58DPTZZ Completed 8/13/13. HSA - G - 31.5 <u>Dete Time Depti to groundwater</u>	while drilling	
									_
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A = C		Proj Site	ect Num Location	ber: (	30256 3. t 5	135	BORING ID:	35AWW	1/
AS	<b>UM</b>	Coor	dinates:	;		Elevation	Sheet 1 of	7_	
	¢1	Drill	ing Met	hod: 🖊	SA		Monitoring W	ell Installed:	
		Sam	ple Type	(s)CME	CONTINU	Boring Diameter: 8-	Screened Inter	val:	
Weather:				Logged i	By:M. Ha	there Date/Time Started: 8-23-	13 10 Depth of Borin	ıg:	
Drilling Contr	ractor: Fu	GAU		Ground	Elevation	Date/Time Finished: §-2'	343 15 Water Level:		
Depth (ft) Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATERIALS: Color, size, range, M minor component(s), moisture conten maximum grain size, odor, and Geo	1AIN COMPONENT, it, structure, angularity, ologic Unit (if known)	Lab Sample ID	Lab Sample Depth (ft)
					ŞM	SZLTY Fine sand, O dry, there schounds	live browns, I gravel war	scalau	Ļ
5 >			30	2.2	sc/sm	Silly Class, gray & reda Salty Class, gray & reda Salty Five Sond , ohve Clayey/Silly Sand, m gray : muss, b locksy	list brown and brown 3-in bi with lad, reddish	eds prour	and
3 7 10 11			60	0.4	Sc. ML ML	CLIAges fine sand , by 10-10 5 SANNY SELT, Yellowith Sandflat and & booling	ned, moist	10.5-11.5	ŕ
12 13 14			60	0.0	ML MIG CL	Sandy SILT, yelluwish Elastic SILT, gris, mu SANDY CLAS, Olive yel Blocky 13-14 (mu-e San	brown min st ist imedium plass (104 on a grag	11.5-12.	5-1: 
16 17 18 19					sm	SILTY CLAY WITL VERY ONVE JEINUN , MUIST 16.5 FINE SELTY SAND, ONVE DUW	thin silly san	1 Rasin 1 Possib 2017	ls. b u ft
20			60	0,6		\$-			
NOTES:	уř					Date	Time Depth to grou	indwater while d	lrilling
						1.			
Checked by:					Date:				

			Clie Proj	nt: ect Num	US ber: 6	ACE 02561	35				BORING ID:	35A W	wt(
		<b>MC</b>	Site	Location	r: S,	ta 58						0	
			Cool	rdinates:				Elevation			Sheet 2 of		1
			Dril	ling Met	hod: MS	4		D	~		Monitoring We	ell Installe	a: yer
III al			Sam	ple Type	(S):CME	Contin	usus	Boring Diameter		384	Screened Inter	val: 19.7-	34.7
Weathe	r:				Loggea I	Sy: M. H c	s-ttv rd	Date/Time Starte	20: 1 45-0	2 1013	Water Lavel	18:2217	
Druing	<u>z Contra</u>	ctor:	16RU	rl	Grouna			Date/Time Finis	neu. <b>T</b>	91313	muter Levet.		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxii	ERIALS: Color, size omponent(s), moistu num grain size, odo	e, range, M ire conten r, and Geo	IAIN CON t, structur logic Unit	MPONENT, re, angularity, t (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23 24				60	05	ML SM CC-ML	Fine Olive thin!	Sandy STLT brown, m s lamineto	and uist diviti	5.14 ! . Conil ! gra	500 d , to touch 5 5.14 cl		
25         26         27         28         20						MB	Elast Olive	he SILF; he busin, m	gne41 prist/C	sl m sol,	own br blocky		
23 30 31 32 33				60	0.0	mL	=9- 50ms 31-3 5IL We	y , Ve , Ve T 32-	ng di sz. 5	more ark q - C	cohesive gregisk Mive bruk	mon how	) -
34 35 36			35.3-	Ano	0.0	CL-ML	24-3 5 219~. 35 5 I	a Black, LTY CLA Total Dept	Black. 4. dan 2 3.	1×900	+ to chy		
37 38 39					-					6			r.
40									-			1	
NOTE	S:								Date	Time	Depth to grou	indwater whi	le drilling
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											5		
Checks	d by					Date							

AECON       Project Number: $b_{12} \leq b_{13} \leq \cdots$ BORING UP:       35 MUW 12         Definition       State 1 of 2       State 1 of 2       State 1 of 2         Weather       Longel Dimeter       9 - p. Screened Hundled; 19       State 1 of 2         Drilling Connector:       File GRU       Coordinates:       Descreened Hundled; 19       State 1 of 2         Drilling Connector:       File GRU       Ground Elevation:       Date Time State(4):19:19:13:10       State 1 of 2         Drilling Connector:       File GRU       Ground Elevation:       Date Time State(4):19:19:13:10       State 1 of 2         Drilling Connector:       File GRU       Ground Elevation:       Date Time State(4):19:19:13:10       State 1 of 2         Drilling Connector:       File GRU       Ground Elevation:       Date Time State(4):19:19:13:10       State 1 of 2         Drilling Connector:       File GRU       Ground Elevation:       Date 1       Date 1       State 1 of 2         Drilling Connector:       State 1       Ground Elevation:       Date 1       Date 1       State 1 of 2         Drilling Connector:       State 1       Ground Elevation:       Date 1       State 1 of 2       State 1 of 2         Drilling Connector:       State 1       State 1       State 1 of 2       State 1 o				Clie	ent:	Us	ACE						
AECOM       Stel Location:       St. G. S. S.       Elevation       Sheet 1 of 2.         Drilling Method:       HSA       Associates:       Elevation       Sheet 1 of 2.         Drilling Method:       HSA       Boring Diameter:       Screend Hirver 201-34.9         Weather:       Logged By: HAARCARA, Date Time Started Strip 15.15       Dotting Commactor:       Screend Hirver 201-34.9         Dotting Commactor:       Frid GA: Commactor:       Frid GA: Commactor:       Screend Hirver 201-34.9         Ogg By:       Boring Diameter:       Screend Hirver 201-34.9         Dotting Commactor:       Frid GA: Commactor:       Screend Hirver 201-34.9         Dotting Commactor:       Frid GA: Ground Elevation:       DateTime Finished Strip 15.15       Screend Hirver, S				Pro	ject Num	ber: 6	0256	135			BORING ID:	- 0	12
Coordinates:       Lotration       Mell of Mell       Mell of Mell       Instantial Mell         Diffing Contractor:       For the Diameter:       Second Mellow (Mellow)       Data 24.3         Weather:       Longed Mellow       Data 7006 (Street Charling)       Data 24.3         Weather:       Longed Mellow       Data 7006 (Street Charling)       Data 7006 (Street Charling)       Data 7006 (Street Charling)         Drilling Contractor:       Full of A       Ground Elevation:       Data 7006 (Street Charling)       Data 7006 (Street Charling)         Of       Ground Elevation:       Data 7006 (Street Charling)       Data 7006 (Street Charling)       Mater Level:         Of       Ground Elevation:       Data 7006 (Street Charling)       Data 7006 (Street Charling)       Mater Level:         Of       Ground Elevation:       Data 7006 (Street Charling)       Mater Level:       Ground Elevation:         O       Ground Elevation:       Data 7006 (Street Charling)       Mater Level:       Ground Elevation:         O       Ground Elevation:       Data 7006 (Street Charling)       Mater Level:       Ground Elevation:         O       Ground Elevation:       Data 7006 (Street Charling)       Ground Elevation:       Data 7006 (Street Charling)         1       24       PL       PL       Stree Charling) <td></td> <td></td> <td></td> <td>Site</td> <td>Locatior</td> <td>1. 4</td> <td>5,6</td> <td>58</td> <td></td> <td></td> <td><u> </u></td> <td>RWW</td> <td>12</td>				Site	Locatior	1. 4	5,6	58			<u> </u>	RWW	12
$\begin{array}{c c c c c c c c c c c c c c c c c c c $				Coo	ordinates.				Elevation		Sheet I of 2	11 7 4 . 11 .	1. 111
Weather:       Isompte Type (Sic The Conjunction Decomposition of Date Time River def (Sis (1) S) Depth of Date Time Started (Sis (1)				Drit	lling Met	hod:	ISA		D · D·	01	Monitoring We	ell Installe	240
Weather:       Degree aby FMATERAL       Degree aby FMATERAL       Degree aby FMATERAL       Degree aby FMATERAL         Drilling Contractor:       FMAGRA       Ground Elevation       Date Time Finished/Sign S. Marcaces, SALN Component, Salar       Image State				San	iple Type	(s):Cme	Contin	now.	Boring Diameter.	-12"	Screenea Inter		21.0
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Weathe	er:	at any C		,	Logged	By: HAN	FURS	Date/Time Starte	a. 1/11/15 1.57	Water Level	18. 22.1	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Drillin	g Contra	ctor: Fo	AGICC	1 1	Ground	Lievation	·	Dule/Time Finish	ea. 9 19 1 . 30	mater Levet.		1
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT minor c maxi	ERIALS: Color, size, omponent(s), moistur mum grain size, odor	range, MAIN C( re content, struct , and Geologic U	OMPONENT, ure, angularity, nit (if known)	Lab Sample ID	Lab Sample Depth (ft)
$\begin{array}{c c c c c c c c c c c c c c c c c c c $					24		ML CL-ML	5an 2.5- 5an Muis	9 9 9 9 10 11 11 11 11 11 11 11 11 11	into hum	mouse , pos	nst de	graz,
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	5 6 7 8 9 10 11				60	0.0	- CL-ML	San San 9-11 SIL MOS	ty clas, a ty clas, a ty hard, a	, blockg no Hbul bro nt bluckg	, crumbler, wrist yell	eas <del>g</del> iou to g	ag,
17     18     42     42     42       19     0.0     0.0     0.0       NOTES:     Date     Time     Depth to groundwater while drilling       0     0     0.0     0.0	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$				48	6.0	SM SM	SA. Mic Mic Mic Mic Mic Mic Mic Mic Mic Mic	SILTY SANS	sand,	t, brown yellowisk	s yello	low to
Date:         Date:	17 18 19 20	28.			42	0.0		Jo 9	neg / morr	Date Time	e Depth to grou	undwater whi	le drilling
Checked by:         Date:		£S:											
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			Clie	ent:	US.	ACE				-	
			Pro	ject Num	ber: 🍐	0256	175		BORING ID:	Childe H	7
			Site	Location	n:	5.6	58		25	HWW	
			Coo	ordinates	:		Elevation		Sheet 2 of 2	11 Teact -11	d
			Dril	lling Met	hod:				Monitoring We	u installe	u:
	10		Sam	iple Type	2(S):	D	Boring Dian	neter:	Depth of Borin	val:	
Weathe	er:	-			Logged	DY: Flavation	Date/Time S	iurieu. Tinishad	Water Level	5.	
Drillin	g Contra	ctor:		1 J	Grouna	Lievation	Date/Time F	inisneu.	maler Level.		1
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATERIALS: Color, minor component(s), m maximum grain size,	, size, range, M oisture conten odor, and Geo	IAIN COMPONENT, t, structure, angularity, ologic Unit (if known)	Lab Sample ID	Lab Sample Depth (ft)
21         22         23         24         25         26         27         28         29         30         31         32         33         34         35         36         37         38         39         40				54	0.0	the SP UML SM/ML SM/ML	21.5-22.5 FINA SAND, 4 SILTY SAND, Yellow, Murs 24.5-2 Not blo 25- FINA MUNT, Coll of 100 plastics 28-5 Gint SILTY Sand of 9nayish brown 30.5-31 yellow Remains the Coll to tobay	ellow, m cley, li t, block indy i Fi roy sect to foact Sam to gell wish mon invis la L. 1. 350	st grayist b ght grayist b in grayist bro in grayist bro in maind. c. the sact, thinky use sact, thinky use sact y sail minated and 5	lamin t	olin y
NOTE	ES:				- dia -	1		Date	Time Depth to grou	ndwater whi	ile drilling
Check	ed by:					Date:					AL

Depth (ft) Depth (ft) Meather: Blows per 6"	Client: U Project Number: 6 0 Site Location: Coordinates: Drilling Method: 1 Sample Type(s): PC- 9 5 CISCIS	Elevation:	BORING ID: 35AWWI3 Sheet: 1 of 2 Monitoring Well Installed: Screened Interval: Depth of Boring: Water Level: NT, minor mum grain size, age of the state
g     g       1	2 ± CL-ML 42 0 cL-ML 56 CL-ML 56 CL-ML 56 0.3 CL-ML (L-M 42 0	Silty Clay with Fine San and yellowish mobility, Suft love to mad plasticity 4-4.2 CLRYEY SAND, clive b 4.2-5.5 SELTY CLAY with Fine Sand, and dank rid, moist, Suft 5.5- SELTY CLAY, mothlod gras and firm. -8.1-5-2 Clayes Sam - Let 8.2-9.5 SELTY CLAY, muthlod gras and moist, hard 9.5-17 SELTY CLAY with Fine Sand, gra browst staining, mussl, hard; Il	g, gres musst nuch, sigt nuch, sigt nother grey dark and -, moist yellowist brown, but my plasticy in to my plasticy
	t8 U U	Fine Sand, brownish 9=5 1 18-20,5 CLAGET FINE SEND, MOLINISH Sift	qellul, maist
NOTES: Ground neve Pavement & bas ground will be	nena 13 8 L'have been 81N -1-	cleaned Survey	ири ю groundwater while dhiling

			Clie Pro	ent: ject Num	USA ber: 60	CE 02561	35		-11	BORING ID:	35AU	11/13
		$\mathbf{O}$	Site	LOCALIO	n:	516 5	8	Elevation		Sheet 2 of 7	/	
			Dril	ling Met	hod: []	SA		Lievation		Monitoring We	ell Installe	<i>d</i> :
			Sam	ple Type	e(s): CC	PATTING A	1.0	Boring Diamete	er:	Screened Inter	val:	
Weath	er:		Clean	/	Logged	By: HAN	TFORM	Date/Time Star	ted:	Depth of Borin	ıg:	
Drillin	ig Contr	actor: 🖌	UGRU	2	Ground	Elevation	n:	Date/Time Fini	shed:	Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT minor c maxi	ERIALS: Color, siz component(s), moist mum grain size, odd	e, range, MAIN ure content, stru or, and Geologic	COMPONENT, acture, angularity, Unit (if known)	Lab Sample ID	Lab Sample Depth (ft)
21         22         23         24         25         26         27         28         29         30         31         32         33         34         35         36         37         38         39         40	S:	White Hard o	dull: 24 35	60 60 60 41 236	0.5 0.0 0.0 4 3 5	SC SM SC SM SC SM CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME CLIME	20.5- SILT 215- CLAY MOIS INOL 24.5- 100 25-2 SILT MOIS SILT MOIS SILT MUIS 736- SILT MUIS 736- SILT MUIS 736- SILT MUIS	21.5 Fine Sand 23.5 EY SAND, Y CKLOL COME SICTY CLA FINE SICA FINE SICA TOTE - I 34.8	, clive yel rellowist k rellowist k rulin 20 g, yellou y chay i sheit g i hay and a five brow plastice page and saury S saury S ry - l wden d rul 40	How, muist mow and on 3.5-24 Moist ist brown, gres and or 5. Fi- live gellow gellowish l and seems ist t- ng me Depth to groun	es moth mois a ve gen , mois , het , het , het	e drilling
Checke	ed by:					Date:				S.		
										14		

		(	Clie	nt:	USA	CE							4
			Proj	ject Num	ber:	6025	6135			B	ORING ID:	SALUN	12
		DM	Site	Location	<u>1. 51</u>	2 58		Flavation	1	S	heet 1 of	o marche	7
			Dril	ling Mot	hod /	5A		Lievation		1	Ionitoring W	ell Installe	diven
			Sam	nlo Tuna	(c). (-)	214 A. J.		Boring Diameter		S	creened Inter	val: 4. 8	-245
Weathe			Dum	pie Type	Logged	By Ung	i Guno	Date/Time Starte	d: 8-24-1	G'10	Depth of Bori	19:30-2	5/10
Drillin	a Contra	ctor E	Suc a c	1	Ground	Elevation	1:	Date/Time Finis	hed: 10	Lo K	Vater Level:	0	
Dram	<u> </u>		UIGING		T	1							
Depth (ft)	Geologic Sample II	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxin	ERIALS: Color, size component(s), moistu mum grain size, odor	, range, M re content ; and Geo	AIN COM , structure logic Unit	IPONENT, e, angularity, (if known)	Lab Sample ID	Lab Sample Depth (ft)
						SM	SIL	TY SAN	0,1	ight	olve b	OUN,	
5 6 7 8				36	13,7	sc	4.5 SA MOL 6-9 CLA Gras	NDY CLAY NN, chy, YEY, SAN N, MOIST,	, mos hara o, m block	H (o Ø 1 10 H (o d 2	grayish Yellow	to no	ddisl d <del>10</del>
9 10 11 12 12			_	42	0.0	Sm SP	9-1 SZC 92000 12-1 FIN	I Fine S y Aard De 3 e Sand,	and ense pale	; bnu Yello	wrisk 4 w , ma,	e 1/0115	
13 14 15 16	× .			60	0.1	3M	13- 534 Mor	Ty Fire S ST	ard.	40110	wish hi	acent to	72.5
17 18 19 20				48	0.0	SM SM	COASE Stran 18-19. SELT 944	GRADED S GRADED S GOINS ON IS MOWN AN Y Fine San , moint	Ama l inan noist -d, 4	oxid	si / t ana e, the a She besu	estrific to	
NOTE	ES:	Co	9	Bar	1				Date	Time	Depth to gro	unuwater wh	ne untiling
11	0.0.0	0	n.	JUKE	0	<i>.</i>	20						
10	HICD	nil	IN.	1 -	02	to .							
			1	/									
	11												
Check	ed by:					Date:							

			Clie	nt: iect Num	USI	ACE					RORING ID:		
A :			Site	Location	1: _	it's	-8				3	5AWU	114
		JM	Coo	rdinates	:			Elevation			Sheet 2 of		
			Dril	ling Met	hod: 诸	15A			at	3	Monitoring We	ell Installe	d.190
			Sam	ple Type	(S)CME	Contin	Moin	Boring Diamete	r: 8		Screened Inter	val: 14 😵	-29.5
Weather	r:				Logged	By: HAn	Trons	Date/Time Start	ed: 8-2-4-1	18.30	Depth of Borin	g: 30-2	
Drilling	contra	ctor:f-uc	oru	I	Grouna	Elevation	l:	Date/Time Finis	nea: <mark>5-14-1</mark>	2 10:24	vater Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxir	ERIALS: Color, siza omponent(s), moista num grain size, odo	e, range, M ure content r, and Geol	AIN COM , structur logic Unit	APONENT, e, angularity, (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23 24 25 26				60	0.0	SC SM SC	CLAL gnal SZLI NUM 24.5	1 Ey FINE 1, Moist 24.5 7 Fine S de well, C 26.5 Layey Fine	Sand Gand God Fu E SAN	, bro light touc	t yellow	ish h	UWZ
27 28 29 30 31 32 33				48	0.0	SM SP SW-SM ML	Si Hy Eine Well G MIL SI LI Tota	fine sard sand, light Sand, light Sand, light Sand, light Sand Sang Fing Ltolin april 30-	At gran	t gring	net 28- , reddisk monst	26.5-2 28.5 brown	728 Wet
34													10
					I	I			Date	Time	Depth to grour	ndwater whil	e drilling
NOTES	5:								Date	. uno	Bopin to grout	Stratet Will	
í						-							

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		1.000	Clie Proj	nt: ect Num	US ber: G	ACE 0025(	6135				BORING ID:		
		OM	Site	Location	1: '	SITE	58				354W	$w_{15}$	
			Cool	rdinates:		150	CAAF	Elevation		-	Sheet I of 2	ll Lantalla	1.1/25
			Sam	nla Typa	hoa: H	514	CME	75 Boring Diameter	. 07C		Monitoring we Screened Inter	u installe	a: 1 - 5 Si 7 z 1
Weathe	er:		Dum		Logged I	BV: KA	Qu)	Date/Time Start	ed: 8/25/13 1	30	Depth of Borin	g: 38.	3
Drillin	g Contro	ictor:		-	Ground	Elevation	1	Date/Time Finis	hed: 5/25/13 16	:49	Water Level:	30'	1
1 (ft)	ample ID	epth (ft)	per 6"	(inches)	ce (ppm)	C.S.	MAT	ERIALS: Color, size	e, range, MAIN		MPONENT,	aple ID	ample h (ft)
Depti	Geologic S	Sample D	Blows	Recovery	Headspa	U.S.	minor c maxi	omponent(s), moisti mum grain size, odo	r, and Geologic	uctur c Unit	e, angularity, t (if known)	Lab Sar	Lab S. Depti
1							Sce	58 DPT	26	,			
2							For	l; tho log	ly from	P	to 21,5		
$\begin{vmatrix} 3 \\ 4 \end{vmatrix}$													
5													
6													
7													
8 9					- 5								
10													
14													
10													
18													
19													
20 <b>NOTE</b>	S:								Date T	ime	Depth to grour	idwater whil	e drilling
											. 4		
Checke	d by:					Date:							

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			Clie Proj	nt: ect Numl	1951 ber: 6	+CE 0025	6135	194		BORING ID:		
		DM	Site	Location	: <	SITE	58			354 W	W 15	
			Coo	rdinates: ling Math	and 11	= 0	CME	Elevation		Sheet 2 of 2	- all Installa	1. 400
			Sam	nle Type	(s):	SH	CHE	Boring Diameter	. 8.25	Screened Inter	val: 77.5	1. (PS
Weathe	r:		Dun		Logged	By: K	Aw	Date/Time Starte	ed: 8/25/1393	Depth of Borin	ıg: 38.	3
Drilling	g Contra	ctor:			Ground	Elevation	ı:	Date/Time Finis	hed: 8/25/13	Water Level:	30'	
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery <del>(inches)</del> स्रित्	Headspace (ppm)	U.S.C.S.	MAT) minor c maxin	ERIALS: Color, size omponent(s), moistu mum grain size, odoi	, range, MAIN C rre content, struc r, and Geologic U	''' OMPONENT, ture, angularity, nit (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23 24 25							SEE For	58 DPT Lithology	26 , from 9	5-27.5'		
26				<u>1009</u> 90%	2	Lignite CL	Ligina clay, 3:1ty	te, black, 10 dark grayes caminal of you sand, gray	deg ili brown, ellouriel k gish brow	fissle, w/ rown silty 20	mes wet	
32 33 34 35 36 27				1009		SM SS CL SM CL SM CL SM CL/SM	Sands Clay. Silty Clay Silty. Silty.	tone - silty- silty, lighgra - VF Sand, m It gray, silt Fn Sand mo - Su sand an	fn grained oist, gray y w/ thin : ist of Clay in	l, hard, itgri ish brown ilty sand lo leiteddad	y nnae n6ist	
38 39 40 NOTE	<b>S:</b> нга Ці	ter go t har	TD inged d 5p	38.3 in ho ot as	le az	CL t 32 5-35	clay,	groy to dar dry et, had to	Date Tim	e Depth to grou	indwater whit	e drilling
Checke	dr re d bv:	ill th cover	ed h	and s	pot i	w <b>o</b> 'th e n nep Date:	out samp	mplex le (Sandsten				
Checke	d by:					Date:						

58DPT13

	_		Clier Proj	nt: ect Num	USF ber: 60	2561	35				BORING ID:	250	
		ОM	Site	Location	n: 5	165	8	Elmention			Thank 1 of	22 AUN	116
			Dril	rainaies: ling Mati	hod /	ICA		Elevation			Monitoring W	all Installa	dinas
			Sam	nlo Tuno	(s) · [ mf	131T	4	Roring Diamete	··· 0		Screened Inter	val. 19.1-	344
Weath	r. OL	2	76-05	- I	Logged	By Llon	Cobo	Date/Time Start	red con	2 1	Denth of Rorig	10.35	- <u>1</u> , 1
Drillin	g Contro	ctor: E	GRA		Ground	Elevation	1 -0720	Date/Time Start	shed 8 24-1	3 1	Water Level:	- <u>-</u>	
	0		UNCO					2 414 1 114					
Depth (ft)	Geologic Sample II	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATH minor co maxir	ERIALS: Color, siz omponent(s), moist num grain size, odo	e, range, M ure conten or, and Geo	IAIN CON t, structur logic Unit	1PONENT, e, angularity, (if known)	Lab Sample ID	Lab Sample Depth (ft)
1         2         3         4         5         6         7         8         9         10         11         12         13         14         15         16         17         18         19         20	0						For	- 0-20 / SDPT 13	li the	log Ly	See		
NOTE	S:								Date	Time	Depth to grou	ndwater whil	e drilling
Chaster	dhu					Data							
CHECKE	u uy.					Dale.							

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			Clie	nt: ect Num	USI	ACE	25			BORING ID:		-
			Site	Location		ito S	-8			35	AWW	16
			Coo	rdinates:	8			Elevation		Sheet 2 of	2	
10			Dril	ling Meti	hod: M	ISA				Monitoring We	ell Installe	ed: vos,
			Sam	ple Type	(S)CME	CONTI.	NUDLA.	Boring Diamete	r: 8	Screened Inter	val: [9.7	-34.4
Weathe	r: C	lean	76-	95	Logged I	By: HAR	FAR7	Date/Time Start	ed: 8-26-13 9:11	Depth of Borin	ig: 35	
Drilling	g Contra	actor:Fu	SRU		Ground	Elevation		Date/Time Finis	snea: 8-26-13	Water Level.		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT minor c maxi	ERIALS: Color, siz omponent(s), moist mum grain size, odo	70 4 e, range, MAIN C ure content, struc or, and Geologic U	OMPONENT, ture, angularity, init (if known)	Lab Sample ID	Lab Sample Depth (ft)
21          22          23          23          24          25          26          27          28			α Υ	60	0.0	5 1 M Élime 0 H Clime	SILT 21.5 SILT 21.5 SILT SILT Mediu Same 27.5-	TY FINE Sa -23.4 1 CLAY, O 4 , Black, 2 1 CLAY, Very plasticity 28 SECTY CL 5 28-28.2	No polive hve yelluw -3.4-23.8 m dark grad acyist brock	yellow, m elvet, me led plastin yist brown	yellow	plasticity
29 30 31 32				60	0.0	sm cume sm	SILT Grong	Y FINE Sand Icminated	and SIL moist to	in CLAY, C.	wet	New to
33 34 35 36 37				60	0.0	CL-ML SM	520 9003	sy Fine Si , Mussr stal Oppil 3	and, and	silty cla	2 , d	anh
38 39 40	0								Date Tim	e Depth to grou	indwater wh	ile drilling
	is: f	Retnei of Z	ved 8-f-	geop H	nubl	Paint	IN	Cone		2 Separa Bloc		
Checke	ed by:		÷			Date:						

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Same on 580PT14

			Clier	nt: ect Num	USA	AZ56	125		BORING ID:		
			Site	Locatior	n: 5	, to 5	8		3	5 AWU	117
			Coo	rdinates.			Elevation		Sheet 1 of 2		
ļ			Dril	ling Met	hod: H:	SA-		~~~~	Monitoring Wel	l Installe	d:Ye
111 .7			Sam	ple Type	e(s): (ME	CONTIN	Boring Diameter	1 Cha and 2014	Screened Interv	al:	
Weathe	er: TContro	aton T	93		Logged E	Sy: 11 FAR	Date/Time Starte	ea: * 2.5-13 1376	Water Level	: 40	
Dritting	g Comra	1010r. v-2	IGRO			Stevation		neu.	Water Level.		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATERIALS: Color, size minor component(s), moistu maximum grain size, odor	, range, MAIN CC irc content, struct r, and Geologic Ui	DMPONENT, ure, angularity, nit (if known)	Lab Sample ID	Lab Sample Depth (ft)
1         2         3         4         5         6         7         8         9         10         11         12         13         14         15         16         17	ğ	S			H		Fur 0-30 1 58 DPT 14	inthelogy completed	5ex 18-22-13		
18								0			
20					I			Date Time	Denth to group	dwater whil	e drilling
NOTE	s: 7	ag g	eopo	be ho	le pr	in to	duilling -				
	2	1'dez	y zD	ky -	•		1 1 1 2 2 2 2				
	Glo	pube	Wale	5	angel	coll	lected 33-37				
Checke	ed by:	<b>I</b> .			,	Date:					

			Clier Proj	nt: Ú ect Numl	ISACI	0256	135			BORING ID:		
Δ			Site	Location	Š	: ta :	59			35	HWW	7
			Cool	dinates:	nd Ik	- 1		Elevation		Sheet 2 of Z	oll Installe	d. VA
			Sam	nle Type	(s):	24		Boring Diameter	8	Screened Inter	val: 24.7	- 3 3
Weather	r:	Part	( Ids	97	Logged I	By: Hari	furd	Date/Time Starte	ed: 8-25-13	Depth of Borin	18: 4C	
Drilling	Contra	ctor: FL	16RO		Ground I	Elevation		Date/Time Finis	hed: *	Water Level:		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxii	ERIALS: Color, size omponent(s), moistu num grain size, odor	, range, MAI ire content, s r, and Geolog	IN COMPONENT, tructure, angularity, gic Unit (if known)	Lab Sample ID	Lab Sample Depth (ft)
21         22         23         24         25         26								For	0-30 58.	DPT14	(*	
27         28         29         30         31         32         33         34         35				60	0.0	ML	SI Fin gro low bloc	e Sand c e Sand c muist plasticity	c Silt live b this - Tu nbles	, Silt with now to uly laminol uns gray at 30-33	e 34	1
36 37 38 39 40				60	0.0		Sam 7	e an aber D 40.0	Date	Time Depth to grou	ndwater whi	le drilling
NOTES	s: d by:					Date:						

			Clie Proj	nt: iect Num	US. ber: 6	RCG 02561	3.5				BORING ID:		â
Δ		OM	Site	Location	n: 5	·t 5	8				35	AWW	18
			Coo Dril	rdinates.	had 11	- 4		Elevation		-	Sheet 1 of		1
1			Sam	nle Type	(s): ( 40 F	Cardia	to ala T	Roring Diamet	or. </td <td>-</td> <td>Screened Inter</td> <td>al Instatte</td> <td>ayen</td>	-	Screened Inter	al Instatte	ayen
Weathe	er: 2	the plan	de 9	s	Logged	By: Llan	GING	Date/Time Star	ted: 8-24-17 M	30	Depth of Boring	e: 40	-37.5
Drillin	g Contr	actor: F	GRO		Ground	Elevation	l.	Date/Time Fini	shed stars		Water Level:	32	
	8	5			-				8-25-13 9	00			
Depth (ft)	Geologic Sample ]	Sample Depth (f	Blows per 6"	Recovery (inches	Headspace (ppm	U.S.C.S.	MATI minor c maxir	ERIALS: Color, siz omponent(s), moist num grain size, od O - 3 L	ze, range, MAIN turc content, str or, and Geologic	CO uctu Un	MPONENT, ire, angularity, it (if known)	Lab Sample ID	Lab Sample Depth (ft)
1          2          3          4          5          6          7          8          9          10          11          12          13          14          15          16          17          18          19          20							Fa	0-31 r "lithor 8 DPT 25 8-22-1-3	logy 3 Co	e en	e pleted		
NOTES	S:	In-	1 do	:11.		0	-th.	20	Date Ti	me	Depth to ground	lwater while	e drilling
	1	1 GE 7 OC	6.74 1	C'IN	2 .		- 10 -						
				,	•								
										- 014			
Checke	d by:					Date:							

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Client: USACE BORING ID: 35 A WIWI 8 60256135 Project Number: S. te 58 Site Location: Elevation Sheet 2 of 2 Coordinates: Monitoring Well Installed: HSA Drilling Method: Sample Type(s): CME Cantinuos Screened Interval: **Boring Diameter:** Date/Time Started: 8-27 +3 Depth of Boring: Logged By: Hartford Weather: Partly Cloud 95 Date/Time Finished Water Level: Drilling Contractor: FUGRO Ground Elevation: 8/25/13 8 Recovery (inches) Sample Depth (ft) Headspace (ppm) Geologic Sample 1 ab Sample ID Lab Sample Depth (ft) 3 Depth (ft) U.S.C.S. per MATERIALS: Color, size, range, MAIN COMPONENT, minor component(s), moisture content, structure, angularity, Blows maximum grain size, odor, and Geologic Unit (if known) For 0-30 Lithology 21 See 58 DPT 25-22 completed 8-22-13 23 24 Cutting ball up during drilling o Possihlyindicating Water. 25 26 27 28 29 Fine 30-Sawdy Silt and Fine Silty Fine Sand Olive brown, thinky laminated & moist 30 31 ML ション 32 321 - Vin cemented Sand 33 5M Some laminations and silt, Elastic silt or silty class Some an above more silt than 60 34 0.0 35 36 ML Sand. No aparrent Water 20 37 SM 38 Colon charge to gray of -40 38 39 LD 0.0 Jutal Depil 40' 40 Depth to groundwater while drilling Date Time Dry of 35 during divilling **NOTES:** 824 1.615 035 8/24/13-Stop at 35 Will Tag 8-25 750 water insthe AM ATT The Silt in the 30-40 zone one elsewhere When must a day Behaven month like a silt Date: Date: Checked by:

than a clay

		Lat								351	AWN	119
1 172 - 22		Pre	oject Num	ber: 60	25613	2				BORING ID:	58 DPT	-15B
	$^{\circ}OM$	Sit	e Location	n: Site	- 58	5 						
		Co	ordinates	:			Elevation			Sheet 1 of 2		
		Dr	illing Met	hod: HS	A					Monitoring W	ell Installe	ed:
*** .1	~	Sar	mple Type	?(s):	201 OAT		Boring Diame	ter: ~ 8	"	Screened Inter	val:	
Weather:	Sunny			Logged I	By: $M_1$	Law	Date/Time Sta	rted: 9/16	12 859	Depth of Borin	ıg:	
Drilling Cor	ntractór: f	wgo		Ground	Elevatio	n:	Date/Time Fin	ished: 9/1	16/13 1023	Water Level:		
Depth (ft) Geologic Sample ID	Sample Depth (ft)	Run #	Recovery (Inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxin	ERIALS: Color, si omponent(s), mois num grain size, od	ze, range, l sture conte lor, and Ge	MAIN CO nt, structu eologic Un	OMPONENT, rre, angularity, it (if known)	Lab Sample ID	Lab Sample
					ML	SILT	m()					
-	-1-					- Soft, 0	ry. Pele Brews,	meetly	5:14, 7	in very Fin		
2		1	25%		CL	I SALd,	MAN-plattic			/		
			1			LEAN	CLAMINIS					
3		li		_		SIA						
		× .					stift from a	, Dig , I	ight pale	yollow, with		
ч —	_					" " "	set and B.	then mar	Hes, mi	itly cling		
5		Japa	span			tow t	ind scal, trace	· Silt	Low pla	stictly .		
									·			
6			~ 100%			- Thore	asing scort con	ntent -	-			
		s.				1.31.	gay with re	defit Brun	m mattles	southing to yoltowich a	From	
7	- 7'-								-		S	
8		1 4			510	POOR	Y GRANNED	SAND	GOTH S	ILT (SP)		
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9						YEllow	tin clays my	it for	Secol	hele on the		
			1			tew a	lay, Slinkel	alistus	1	ALL STA		
10		w	ann			true	roots	partici	1 - 70	a planter		
!! =={			100%			SAMP	Ar ABAVIE					
12		ļ	100/1			luesa	Pry light y	elhwich P.	Prine And	the to P		
	-12'-			1	SP	yellaw	, mistle fine s	and lin	1 - 11	ing to mowith		
13	8	3			- 1	belew	12° Par where	chi.	te Silt,	first mica		
	1 1	1		-				the the	myer. no	clay sitten		
14	-14'-			-				مىرىتىت				
15 -					2L	LEAND	LAT with SI	ir (a)	1			
· · · ·		-	alle			Pry, Se	Ft, light yellow	N Brown .	with li	to some molles		
16						mostly	clay, little S.	the few	to taxa			
			~ 100 /h			how p	lesticity Silts	i Fic la	minated	thingh in		
17		×				mixe.				"FIREL		
18		Ĩ.										
	-18-						2					
19		1			-	POORLY	GRANNED .	SANA L	NEH S	112 (50)		
		5	2/00%		31	Tonse 4	maist, linhan	Nen. Mor	1/2 Fine	Send, hikle		
20		_1				Sill, n	on-plastic.					
NOTES:	Seu						4	Date	Time	Depth to groun	dwater while	e drilling
/	an bank	swell	Screen	set e	18'-	28 8.5						
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		7		with 1	CWYAN,	re caeps						
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8											35AW	W19	
			Clier	nt:									
			Proj	ect Num	ber: 60	256135					BORING ID: 2	SEDPTI	5\$
Λ-			Site	Locatior	: Site	58							
			Cool	rdinates.				Elevation			Sheet 2 of Z		,
			Drill	ling Met	hod:				0		Monitoring We	ll Installe	1:
717 .1			Sam	ple Type	(s):	D		Boring Diameter	r:		Screened Interv		
Weather	Contra	atom E			Loggea	Elevation	-66	Date/Time Start	ea. had		Water Level	8	
Druing	Comra	cior. ru	yo		Ground	Lievation		Dute Time Times	пси.		Water Dever.		
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT minor max	ERIALS: Color, size component(s), moisti imum grain size, odo	e, range, M ure content r, and Geo	IAIN CO t, structu logic Uni	MPONENT, re, angularity, t (if known)	Lab Sample ID	Lab Sample Depth (ft)
21 22 23			 5	~ 101%.		(Sp)	1001. 1005 e. 1: 14/e	LY GRANNEY , Moist, light ; Silk, non-plan	SAND	with mostly	SILT (SP) Fine send,		
23 24 25		- 23 -	what		-	EL	EEA Soft, MOSH Medic	innist, light gr by Clay. Four to	SAND (B ay with likile 7	ight , Fine Ski	Brann Markles, ucl, Low to		
26 27		- 27.5'-	6	~ 9003	6	<b>5</b> #	17						
28 29 30 31		-29'-	ha	2 /101 %	-	t.	Those, Clay, LEA Media Fina	Slighting plest	Brown,	mos ty	elay, ter		
32 33 34 35			7		-		wink 1-shi	Low plasticity, very the fine gray (1 mm that	Eliys sourt , .).	tre sh. 2 polace	"14 Sands, "My / Eminoted 5, Soul is	(2-5mm)	
36 37 38			8	~ 180 %		CL	_ <u></u>	Mis AS ABAUG		- light	<i>кс</i> 35'₿5		
39 40								End of Baing	E 36	<i>7</i> 55 -			
NOTES	5:					Deter				Time	Depth to groun	ndwater whi	le drilling
Checke	a oy:					Dale:			1	1	<u>, ()</u>		

				Clie	nt:	USAC	E.	(190			BOBING ID.		
			044	Site	Location	. Co	OZ JE	8155			35 A LUL	20	
	A			Coo	rdinates:	. ).	10 9	0	Elevation		Sheet 1 of Z	20	
				Dril	ling Meth	hod: 1-1	SA O	CME	75		Monitoring We	ell Installe	d:
				Sam	ple Type	(s):			Boring Diameter	: 8,25	Screened Inter	val: 33.0	-/8.3
	Weathe	er:				Logged I	By: KA	the	Date/Time Start	ed: 8/26/13 8:2	7 Depth of Borin	g: 33,8	7
	Drilling	g Contra	ctor:			Ground	Elevation	1:	Date/Time Finis	hed: 8/26/13	Water Level:	22.5	
		9	æ		+	$\sim$				13:23	<b>-</b>		
	Depth (ft)	Geologic Sample ]	Sample Depth (fi	Blows per 6"	Recovery <del>(inches</del>	Headspace (ppm	U.S.C.S.	MATI minor c maxii	ERIALS: Color, size omponent(s), moisti num grain size, odo	, range, MAIN Co ire content, struct r, and Geologic U	OMPONENT, sure, angularity, nit (if known)	Lab Sample ID	Lab Sample Depth (ft)
8129	1 2 3			8	100		c.	L Clay	lister brain	ale brown a	of yellout bin 1 voots 1 black inclus	i i	
0, -	4 5 6				100	3	> <b>K</b> t	clay 2. the	silty from a	rounish ted	gray		2
F : 37	7 8 9					. મ.ા	CL	Clay 31	ty It gray, " mottley, ye to ustrang	lour his vo	mis Silly		•
				10AW	100	5,3	5M, 15P	Sand	silt-v-5, 14	gray & ye	dlach burn	~	
43	¹⁴						LL	oc	c. black is	relieven,	plasti "	2	
	$     15 \\     16 \\     17   $				100	ş.	CL	Clay	pale brown silty - to v.	+ light gre silty w/ so	ne ve que	let .	
8:5	18 9 19 20						3m CL Sm/sc	Sand Clay, M	"It yelloush " ale boon + -clayer V5	brown, moi lifet gray is	st sterhedder ah 4 ram		,
	NOTE	l				I		t		Date Time	Depth to groun	idwater while	e drilling
	TOTES	3.											
	Checke	d by:	· · · · · ·	an an de la			Date:					4.000	

			Clie	nt: U	SACE							
			Proj	ect Num	ber: G	0256	135			BORING ID:		
			Site	Location	n: 5	ite s	58			35AU	W 20	5
			Coo	rdinates:				Elevation		Sheet 2 of Z		7
			Dril	ling Met	hod: H	SA C.	ME 75		10-	Monitoring We	II Installe	1:
Weedle	175.V		Sam	ple Type	<u>(s):</u>	D 11 A	. 1	Boring Diameter	: 8,25	Screened Inter	val: 33.0	-1813
Drillin	r: a Contro	ctor.			Ground	Sy: KA Elevation	u .	Date/Time Starte	hed 8/2/ 4:2	Water Level:	22,5	-
Dritting	g Comit			I				Duic/ I line I linisi	13:25	-	A = 1 3	
Depth (ft)	Geologic Sample II	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxir	ERIALS: Color, size omponent(s), moistu num grain size, odor	, range, MAIN C re content, struc , and Geologic U	OMPONENT, ture, angularity, Init (if known)	Lab Sample ID	Lab Sample Depth (ft)
						CL	esm-	silt-vf sand	It gray, mo.	ist		
21         22         23         24         25         26         27         28         29         30         31         32         33         34         35         36         37				100% 100% Drilled WR 100% NR 100% 70 33,	8	CL SM SP CL CL CL	Clay, Clay, Clay, Clay, Clay, Clay, Clay,	s grand Saud, 22.5 If - fn grained darkgray to he - gray silty to vf = darkgray, h dorkgray, k	1+ grayish bi 1+ grayish bi 1+ brown shbrown , hand sandy, 1+ y w/ silty law brown, moi blocky - fil	ellowish bro nimat: can of 1 st ssle texture	en t gray	
38												
39												
NOTE	S: h		ot ad	1 261	1.1	60 40	have 1	43/2	Date Tim	e Depth to grou	ndwater whil	e drilling
	n a	ra Jr	ora	1	arill	ca M	rough	~/0				
		a	Samp	iler								
Checke	ed by:					Date:						

			Clie Pro	nt: iect Num	ber: /	SALE	535			BORING ID:-	2	.21
Δ			Site	Location	1: 6	5.45	8				55 AW	NL1
A		JM	Coo	rdinates.	v			Elevation		Sheet 1 of 2	e	
			Dril	ling Met	hod: 🖊	SA				Monitoring We	ell Installe	d: Wag
			Sam	ple Type	e(s).CME	Canti	Mi di '	Boring Diameter.	8-12	Screened Inter	val: 25.2	39.9
eathe	er: C	lear 9'	4		Logged	By: Har	t ford	Date/Time Starte	1.8-22-13-1331	Depth of Born	ig: 40.	
illing	g Contra	ctor:	IGRO	<u> </u>	Grouna	Elevation	1: 1	Date/Time Finish	ea: 1-22-13 153	In aler Level.	I	
Depth (It)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT minor c maxin	ERIALS: Color, size, omponent(s), moistur num grain size, odor,	range, MAIN C re content, struct and Geologic U	OMPONENT, ture, angularity, nit (if known)	Lab Sample ID	Lab Sample Depth (ft)
			)	48	0.0	SM MIF	SIL TO POR 3.5 Claye Yellou	5.5 y SELT WE	L fine e grafish	sand mo	Hbed	
				60	0.0	SC CL-ML SC CL-ML	5.5- CLAY MOISS BROW 9-10 SIC 9004 CLAY 11-14 SIC E G	Hard, moist	ttled, yes	Howisk bri Fineto n Hod brock How & gray, 1 muttled b	abort & c adium anist ye moist auist 18	1000 5 1000 5 10-1 40
				60-	00	SC SM SE SM SP	CLAS MUISS S.T.C. Kalay S.J.C. Fin	EY SAND; STY SAND; SY SAND I SY Sand; E Sand d	motiled b brownist 7-17.5; b brownist light yell	yellows, p yellows, p yellows ye	noist Nois Mois	t unt
оте	S:					10		-	Date Time	e Depth to grou	ndwater whi	le drilling
								-				
								-				
						1.00		ŀ				

			Clier	nt:	U	SACE	17-					
			Site	ect Nume Location	per: 6	5.5	58				35HW	WZ)
		JM	Cool	rdinates:	8	di u		Elevation		Sheet 2 of	2	
			Dril	ling Meth	hod: 🖊	ISA				Monitoring	Well Installe	d:
			Sam	ple Type	(s):CME	Contract	ivin	Boring Diamete	er: 8-11	Screened In	terval:	
Weathe	er: C	Ren	94		Logged	By / An	Trunp	Date/Time Start	ted: 5-22-13	1960 Depth of Bo	ring:	
Drillin	g Contra	ctor:	y m	GRO	Ground	Elevation	l: 	Date/Time Finis	snea:	water Level		
Depth (ft)	Geologic Sample D	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MAT minor c maxis	ERIALS: Color, siz omponent(s), moist mum grain size, odd	e, range, MA ture content, s or, and Geolo	IN COMPONENT, structure, angularity gic Unit (if known)	, Lab Sample ID	Lab Sample Depth (ft)
21 22 23 24 25				36	0.5	SP	Fin Seur 1211 125-26	Je Sano eraf Trurd J fhick. + Tilly Cloy S	l, yel. oxide 23. Pangs	low, moist Nudule KZENES 5 an 24.5		
26 27 28 29 30				60	0.2	SU SAA CLAR	Vod Vari 26-24.5 SECTY 26.5 Salty block	s oxide Som in -well b s brown, mo SAND, brou SAND, brou SAND, brou SAND, brou	AF; Oh	ind wing	, moist	2
31         32         33         33         34         35         36				60	0.5	SM/ ML	31-3 STC 9_TC 9_ellb 4h1	2 Fine LTY SAND TY SAND W ond olin why Tamin	ond te broy s ated	sandy SIII	moist , brown to we	et.
37 38 39 40 NOTE	S:			60	0.1	s my me	SGA SAN TH	no as abu id Stamp d Repth 4	lo S Date	Ft Time Depth to g	roundwater whi	le drilling
Check	ed by:					Date:				6		

USACE Client: 60256135 BORING ID: Project Number: AECOM 35AWWZZ 5.658 Site Location: Sheet: 1 of Coordinates: Elevation: Drilling Method: 45A Monitoring Well Installed: Sample Type(s): CME CONTINUEUR Screened Interval: 20.2 34.7 Boring Diameter: Clean Date/Time Started: 8/2/113 Weather: 88 Logged By: LARIGUNS Depth of Boring: 75. 5 FUGRO Drilling Contractor: Ground Elevation: Date/Time Finished: Water Level: A Sample Depth (ft) Recovery (inches) Headspace (ppm) Beologic sample ß Blows per 6" Lab Sample Depth (Ft.) Sample I Depth (ft) MATERIALS: Color, size, range, MAIN COMPONENT, minor U.S.C.S component(s), moisture content, structure, angularity, maximum grain size, odor, and Geologic Unit (If Known) ,ab SILTY FINE Sand, pale yellow, dry 1 SM 2 42 0.0 6.5"9.5 FINE SILTY CLAY WITH SAND & Irun Oxide CONCRETIONS, midled, yellowish ned, yellowish mowed & grey, moist, Firm 6m 68 9.5-11 1.3 SELTY I clarge Five Sand, Moist, hard M. HUJ Yellowix mown & greg SELTY'SAND, Yellowish mouse & gregish multiply Moist, That is clayes send zone bitsien 10 11 SM 12 12/2 13 1 13 60 14 0.0 15-20 FINE 15 SM Pale yellow, marst En The SAMO, yellowist known to 16 Ben Iron concretions at 17 P 17 18 60 19 0.0 20 Date Time Depth to groundwater while drilling NOTES: Checked by Date

А			Clie Proj Site	nt: iect Num Location	U ber: 6	5ACE 6025. 5.te	6135		BORING ID: 35AW	w 22
			Coo	rdinates:		110 1		Elevation	Sheet 2 of 2	
			Dril	ling Meth	nod:	HONT			Monitoring We	ell Installed:
YTT		21	Sam	ple Type	(s): <u>( M</u>	· Cont	wyun	Boring Diameter:	Screened Inter	val.
Weathe	er:	C192	-	91	Logged	By: Hart	to .	Date/Time Startea:	Depth of Borin	ig:
Druin	g Contra	ctor: M	gni	L	Grouna	Lievation		Date/Time Finisnea:	water Level:	
Depth (ft)	Geologic Sample ID	Sample Depth (ft)	Blows per 6"	Recovery (inches)	Headspace (ppm)	U.S.C.S.	MATI minor c maxin Z W	ERIALS: Color, size, range, MA omponent(s), moisture content, s mum grain size, odor, and Geolog	IN COMPONENT, structure, angularity, gic Unit (if known)	Lab Sample ID Lab Sample
21 22	1					SP	FI	ive Sand, pa	le yellow	
23 24				54		SM	SIL	.TY FINE SENd, st	olive yell	ow,
25 26	-9				0.0	ci-mi	S Z Yell	ery cly will d low e groups the	ine Sand, whimpist	0/102
27 28		-		60	<b>.</b>		SIL	yellow & grand	we soud, brown, m.	pist
29 30					0.0	CLANDER	SAL	Dog CLAS , clive D - WHR Silty	yellow & gre fine sons	g.st Seam
31 32 33 33				0		MH	Sicr yelloi	» Egryist brow,	beg SILF. Norst	olive blocks
34 35				*	0,0	SM	SIL	TY SAND, alive;	nom, LIULI pro	ist P
37 38							To	Stal Depth-3	5.5	
39 40										
NOTE	S:								Time Depth to grour	nawater while drill
# Field Injection Logs (Wilclear Plus Injections) LHAAP-35A(58) Site, Shops Area Karnack, TX

Injection Point	Date	Start Time	End Time	Depth Interval (ft.)	Approximate Flow Rate (gpm)	Approximate Injection Pressure (psig)	Amount Injected (gal.)	Comments
	9/23/2013	10:48/11:04	11:36	24-30	5.0	25	185	used approximately 1.5 drum of sodium lactate
EISB-1				30-28			60	Grouted hole with bentonite/water slurry
24 - 30				28-26			60	used one bag of 50-lb bentonite
				26-24			60	pellets to grout
	9/23/2013	1:30/1:58	2:14	23-30	6.0	25	180	used approximately 1.5 drum of sodium lactate
FISB-2								
23' - 30'				30-28			~60	
20 00				28-25			~60	used one bag of 50-lb bentonite
				25-23		-	~60	pellets to grout
	9/23/2013	3:23/3:53	4:20	23-50	5.0	25	180	Drill rig stopped working due to
FISB-4				30-28				short on kill switch
23' - 30'				28-25				
20 00				25-23				used approximately 0.75 bag of 50-lb of
						-		bentonite pellets to grout
	9/24/2013	8:39/9:00	9:27	30-23	4.0	25	225	1.5 drums of sodium lactate
EISB-3				30-28				Increased the amount of water
30' - 23'				28-25				
				25-23		-		used one bag of 50-lb bentonite
	9/24/2013	10:30/11:00	11:27	30-23	4.0	25	225	1.5 drums of sodium lactate
EISB-5				30-28				Increased the amount of water
30' - 23'				28-25				
				25-22				used one bag of 50-lb bentonite
	9/24/2013	1:00/1:15	1:40	30-22	5.0	25	80	some daylighting of solution at 1:25pm
								started at 180 gal, stopped at 100 gallons
EISB-6								
30' - 22'								Moved the rig to EISB-7 location
								used approximately 0.75 bag of 50-lb
								of bentonite pellets to grout

# Field Injection Logs (Wilclear Plus Injections) LHAAP-35A(58) Site, Shops Area Karnack, TX

Injection Point	Date	Start Time	End Time	Depth Interval (ft.)	Approximate Flow Rate (gpm)	Approximate Injection Pressure (psig)	Amount Injected (gal.)	Comments
	9/24/2013	2:00/2:25	2:45	33-26	5.0	25	120	injected 100 gallons remaining from EISB-6
				33-31				daylighting of solution; stopped at 2:45pm
EISB-7				31-29				restarted at 3:15pm
33' - 26'				29-27				
55 - 20				27-26				
								Moved to EISB-7A location
								used one bag of 50-lb bentonite
	9/24/2013	4:00/4:15	4:45	33-26	5.0	25	180	Injected 180 gallons solution
FISB-74				33-31				EISB-7A at 10 feet from EISB-7
33' - 26'				31-29				No daylighting.
55 - 20				29-27				
				27-26				used one bag of 50-lb bentonite
	9/25/2013	8:50/9:06	9:54	33-26	5.5	25	200	Injected 200 gallons of solution
23' - 26'								no daylighting, no leaks
33 - 20								used 1 - 50 lb bag for grouting
	9/25/2013	10:32/10:45	11:02	33-26	5.5	20	200	injected 200 gal. 33-26
22' 26'								no daylighting, no leaks
33 - 20								used one bag of 50-lb bentonite
EISP 10	9/25/2013	1:18/1:36	2:05	33-26	5.5	30	225	injected 225 gal 33-26'
22' 26'								no daylighting, no leaks
33 - 20								used one bag of 50-lb bentonite
	9/25/2013	2:50/3:05	4:00	33-26	5.5	30	125	EISB-11 at 10' upgradient of 35AWW08
22' 26								used one drum of sodium lactate solution
33 - 20-								used one bag of 50-lb bentonite

Notes:

EISB - Enhanced In-situ Bioremediation

ft - feet

gal - gallons

psig - pounds per square inch gauge

lb - pounds

gpm - gallons per minute

**APPENDIX D: Monitoring Well Construction Logs and Development Forms** 

WELL ID: Replacement **Client:** USACE 35AWWOTR 60256135 **Project Number:** 8-26-13 to Date Installed: 5 AECOM Site Location: Coords: **Borehole Diameter:** 8 Well Location: Contractor: FUGRU HSA Method: MONITORING WELL CONSTRUCTION DETAIL Aluminum Steel Well Protector Depth from G.S. (feet) Well Cap T **Concrete Pad** Ground Surface Surface Casing: NA Length Inside Diameter (ID) NA **Type of Material** Partland Bentonite 35-409ap < Grout: Туре Amount Used Well Casing ZNIN SCLYUPUC Inside Diameter (1D) Type of Material **Top of Bentonite:** 3/8in Chips Bentonite Type Amount Used 17.4 Top of Sand 19.7 Top of Screen Screen: 9.7 Length 2.0 iN Inside Diameter (ID) 0.010 -12 Slot Size SCL YOPUL Type of Material UNIMIN 20/40 Type/Size of Sand Sand Pack Thickness 1.5 Bags **Amount Used** 29.4 **Bottom of Screen** 29.9 **Bottom of Well Casing** Bottom of Borehole  $\mathcal{Q}$ Borehole Diameter: Comments: Replacement well Not logged . Originially logged 11/14/08 Installation Observed By: Mitta & ford

STATE OF TEXAS WELL REPORT for Tracking #352602								
Owner:	Lon	ghorn AAP - USACE	Owner Well #:	35AWW07R				
Address:	High Karı	nway 43 nack , TX  75661	Grid #:	35-23-6				
Well Location:	High Karı	nway 43 nack , TX  75661	Latitude:	32° 41' 10" N				
Well County:	Harr	rison	Longitude:	094° 09' 06" W				
Elevation:	211	ft.	GPS Brand Used:	No Data				
Type of Work:	Rep	lacement Well	Proposed Use:	Monitor				
Drilling Date:		Started: 8/26/2013 Completed: 8/26/2013						
Diameter of Hole	le:	Diameter: 8 in From Surface To 30 ft						
Drilling Method:	:	Hollow Stem Auger						
Borehole Completion:		Gravel Packed From: <b>30 ft to 17.4 ft</b> Gravel Pack Size: <b>20 / 40</b>						
Annular Seal Data:		1st Interval: From 30 ft to 17.4 ft with 7.5 (#sacks and material) 2nd Interval: From 17.4 ft to 15 ft with 1 (#sacks and material) 3rd Interval: From 15 ft to 0 ft with 3 (#sacks and material) Method Used: Tremie Cemented By: Donald Edwards Distance to Septic Field or other Concentrated Contamination: No Data Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data						
Surface Completion:		Surface Slab Installed						
Water Level:		Static level: <b>No Data</b> Artesian flow: <b>No Data</b>						
Packers:		No Data						
Plugging Info:		Casing or Cement/Bentonite left in well: <b>No Data</b>						
Type Of Pump:		No Data						
Well Tests:		No Data						
Water Quality:		Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate any strata which contained undesirable constituents: <b>No Data</b>						
Certification Data:		The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.						
Company Information:		Fugro 6105 Rookin St. Houston , TX  77074						
Driller License Number:		56013						

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking number (Tracking #352602) on your written request.

# Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description Gray / Brown clay with sand layers Dia. New/Used Type Setting From/To 2in new pvc screen 30ft to 19.7ft .010 slot 2in new pvc casing 19.7ft to 0

	Client: ASACE	WELL ID:						
	Project Number: 60256135	358000 35AWW09						
A=COM	Site Location: STR 37 SITE 58	Date Installed: 8-14-13						
	Well Location: Coords:	Borehole Diameter: 8 1						
	Method: 45A	Contractor: FUGRO						
MONITORING WELL CONSTRUCTION DETAIL								
	St. UN-19 Backster	Depth from G.S. (feet)						
	Steel weu Protector							
	Well Cap							
	A							
	2.5-67							
Concrete Pad	Ground Surface							
<b>_</b>								
	Surface Casing:							
	Length							
	Inside Diameter (ID)							
	Type of Material							
	Grout: Ractland Bowton	. t						
	Type 60 GRP							
	Well Casing							
	Inside Diameter (ID)							
	Type of Material	191 54						
	Top of Bentonite:							
	Bentonite Type							
	Amount Used	227 St						
	горогонии							
	- Top of Screen 5/4+	24.6						
	Screen:							
	Length 14.6 +4							
	Inside Diameter (ID)							
	Slot Size Type of Material							
	Type/Size of Sand 20/40							
	Sand Pack Thickness 17.8 - f							
	Amount Used 10 Bag							
	- Bottom of Screen Stat	39.2-64						
Rivets	+ Bottom of Well Casing	39.9-51						
	Bottom of Borchole	40.5 - Ft						
	Borehole Diameter: 871							
Comments: Meas	Resert Experies and ge post inst	allation Observed By: Mark						
0.11	anove	Hartford						

STATE OF TEXAS WELL REPORT for Tracking #352597								
Owner:	Longhorn AAP - USACE	Owner Well #:	35AWW09					
Address:	Highway 43 Karnack , TX  75661	Grid #:	35-23-6					
Well Location:	Highway 43 Karnack , TX  75661	Latitude:	32° 41' 09" N					
Well County:	Harrison	Longitude:	094° 09' 06" W					
Elevation:	215 ft.	GPS Brand Used:	No Data					
Type of Work:	New Well	Proposed Use:	Monitor					
Drilling Date:	Started: <b>8/14/2013</b> Completed: <b>8/14/2013</b>							
Diameter of Hole	e: Diameter: 8 in From Surface To	40.5 ft						
Drilling Method:	Hollow Stem Auger							
Borehole Completion:	Gravel Packed From: <b>40.5 ft to 2</b> Gravel Pack Size: <b>20/40</b>	2.7 ft						
Annular Seal Da	<ul> <li>ta: 1st Interval: From 40.5 ft to 22.7 2nd Interval: From 22.7 ft to 19.1 3rd Interval: From 19.1 ft to 0 ft v Method Used: tremie Cemented By: Donald Edwards Distance to Septic Field or other ( Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data</li> </ul>	1st Interval: From 40.5 ft to 22.7 ft with 10 (#sacks and material) 2nd Interval: From 22.7 ft to 19.1 ft with 1.75 (#sacks and material) 3rd Interval: From 19.1 ft to 0 ft with 3 (#sacks and material) Method Used: tremie Cemented By: Donald Edwards Distance to Septic Field or other Concentrated Contamination: No Data Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data						
Surface Completion:	Surface Slab Installed	Surface Slab Installed						
Water Level:	Static level: <b>26.20 ft. below land</b> Artesian flow: <b>No Data</b>	Static level: 26.20 ft. below land surface on 8/14/2013 Artesian flow: No Data						
Packers:	No Data	No Data						
Plugging Info:	Casing or Cement/Bentonite left in	Casing or Cement/Bentonite left in well: <b>No Data</b>						
Type Of Pump:	No Data	No Data						
Well Tests:	No Data	No Data						
Water Quality:	Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Dat</b> a Did the driller knowingly penetrate	Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate any strata which contained undesirable constituents: <b>No Data</b>						
Certification Dat	a: The driller certified that the driller supervision) and that each and all understood that failure to complet completion and resubmittal.	The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.						
Company Information:	Fugro 6105 Rookin St. Houston , TX  77074							
Driller License Number:	56013	56013						

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking number (Tracking #352597) on your written request.

# Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description Gray / Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 39.9ft to 24.6ft .010 slot 2in new pvc casing 24.6 to 0



STATE OF TEXAS WELL REPORT for Tracking #352614								
Owner:	Lon	ghorn AAP-USACE	Owner Well #:	35AWW10				
Address:	Hig Kar	hway 43 nack , TX  75661	Grid #:	35-23-6				
Well Location:	Hig Kar	hway 43 nack , TX  75661	Latitude:	32° 41' 10" N				
Well County:	Har	rison	Longitude:	094° 09' 18" W				
Elevation:	218	ft.	GPS Brand Used:	No Data				
Type of Work:	Nev	v Well	Proposed Use:	Monitor				
Drilling Date:		Started: <b>8/20/2013</b> Completed: <b>8/20/2013</b>						
Diameter of Hole	e:	Diameter: 8 in From Surface To 31.5 ft						
Drilling Method:		Hollow Stem Auger						
Borehole Completion:		Gravel Packed From: <b>31.5 ft to 13.4 ft</b> Gravel Pack Size: <b>20 / 40</b>						
Annular Seal Data:		1st Interval: From 31.5 ft to 13.4 ft with 10.5 sand (#sacks and material) 2nd Interval: From 13.4 ft to 10.4 ft with 1.75 bentonite (#sacks and material) 3rd Interval: From 10.4 ft to 0 ft with 2 Portland (#sacks and material) Method Used: Tremie Cemented By: Donald Edwards Distance to Septic Field or other Concentrated Contamination: No Data Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data						
Surface Completion:		Surface Slab Installed						
Water Level:		Static level: <b>No Data</b> Artesian flow: <b>No Data</b>						
Packers:		No Data						
Plugging Info:		Casing or Cement/Bentonite left in well: <b>No Data</b>						
Type Of Pump:		No Data						
Well Tests:		No Data						
Water Quality:		Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate any strata which contained undesirable constituents: <b>No Data</b>						
Certification Data:		The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.						
Company Information:		Fugro 6105 Rookin St Houston , TX  77074						
Driller License Number:		56013						

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

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Please include the report's Tracking number (Tracking #352614) on your written request.

# Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description Gray / Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 30.7ft to 16.1ft .010 slot 2in new pvc casing 16.1ft to o



STATE OF TEXAS WELL REPORT for Tracking #352610								
Owner:	Longhorn AAP- USACE	Owner Well #:	35AWW11					
Address:	Highway 43 Karnack , TX  75661	Grid #:	35-23-6					
Well Location:	Highway 43 Karnack , TX  75661	Latitude:	32° 41' 08" N					
Well County:	Harrison	Longitude:	094° 09' 17" W					
Elevation:	218 ft.	GPS Brand Used:	No Data					
Type of Work:	New Well	Proposed Use:	Monitor					
Drilling Date:	Started: <b>8/23/2013</b> Completed: <b>8/23/2013</b>							
Diameter of Hole	Diameter: 8 in From Surface To 35.5 ft							
Drilling Method:	Hollow Stem Auger							
Borehole Completion:	Gravel Packed From: <b>35.5 ft to 16.9 ft</b> Gravel Pack Size: <b>20 / 40</b>							
Annular Seal Da	<ul> <li>ta: 1st Interval: From 35.5 ft to 16.9 ft with 9 2nd Interval: From 16.9 ft to 13.7 ft with 3rd Interval: From 13.7 ft to 0 ft with 2 P Method Used: Tremie Cemented By: Donald Edwards Distance to Septic Field or other Concent Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data</li> </ul>	1st Interval: From 35.5 ft to 16.9 ft with 9.5 (#sacks and material) 2nd Interval: From 16.9 ft to 13.7 ft with 1.5 (#sacks and material) 3rd Interval: From 13.7 ft to 0 ft with 2 Portland (#sacks and material) Method Used: Tremie Cemented By: Donald Edwards Distance to Septic Field or other Concentrated Contamination: No Data Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data						
Surface Completion:	Surface Slab Installed	Surface Slab Installed						
Water Level:	Static level: <b>No Data</b> Artesian flow: <b>No Data</b>	Static level: <b>No Data</b> Artesian flow: <b>No Data</b>						
Packers:	No Data	No Data						
Plugging Info:	Casing or Cement/Bentonite left in well: N	Casing or Cement/Bentonite left in well: <b>No Data</b>						
Type Of Pump:	No Data	No Data						
Well Tests:	No Data	No Data						
Water Quality:	Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate any str	Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate any strata which contained undesirable constituents: <b>No Data</b>						
Certification Dat	a: The driller certified that the driller drilled the supervision) and that each and all of the sunderstood that failure to complete the recompletion and resubmittal.	The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.						
Company Information:	Fugro 6105 Rookin St Houston , TX  77074							
Driller License Number:	56013							

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

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Please include the report's Tracking number (Tracking #352610) on your written request.

# Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description Gray / Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 34.9ft to 19.7ft .010 slot 2in new pvc casing 19.7ft to 0



STATE OF TEXAS WELL REPORT for Tracking #352620								
Owner:	Longhorn AAP- US/	ACE	Owner Well #:	35AWW12				
Address:	Highway 43 Karnack , TX 75661		Grid #:	35-23-6				
Well Location:	Highway 43 Karnack , TX 75661		Latitude:	32° 41' 10" N				
Well County:	Harrison		Longitude:	094° 09' 11" W				
Elevation:	214 ft.		GPS Brand Used:	No Data				
Type of Work:	New Well		Proposed Use:	Monitor				
Drilling Date:	Started: <b>8/22/20</b> Completed: <b>8/22</b>	13 2/2013						
Diameter of Hole	: Diameter: 8 in F	rom Surface To 35.5	ft					
Drilling Method:	Hollow Stem A	uger						
Borehole Completion:	Gravel Packed F Gravel Pack Siz	⁻ rom: <b>35.5 ft to 18 ft</b> e: <b>20 / 40</b>						
Annular Seal Da	ta: 1st Interval: Fro 2nd Interval: Fro 3rd Interval: Fro Method Used: T Cemented By: D Distance to Sep Distance to Prop Method of Verific Approved by Va	1st Interval: From 35.5 ft to 18.0 ft with 8 20/40 sand (#sacks and material) 2nd Interval: From 18.0 ft to 15.0 ft with 1.5 bentonite (#sacks and material) 3rd Interval: From 15 ft to 0 ft with 3 Portland (#sacks and material) Method Used: Tremie Cemented By: Donald Edwards Distance to Septic Field or other Concentrated Contamination: No Data Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data						
Surface Completion:	No Data							
Water Level:	Static level: <b>No</b> Artesian flow: <b>N</b> o	Data o Data						
Packers:	No Data	No Data						
Plugging Info:	Casing or Ceme	Casing or Cement/Bentonite left in well: <b>No Data</b>						
Type Of Pump:	No Data	No Data						
Well Tests:	No Data	No Data						
Water Quality:	Type of Water: I Depth of Strata: Chemical Analys Did the driller kn	Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate any strata which contained undesirable constituents: <b>No Data</b>						
Certification Dat	a: The driller certifi supervision) and understood that completion and	The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.						
Company Information:	Fugro 6105 Rookin St Houston,TX  7	7074						
Driller License Number:	56013	56013						

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

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Please include the report's Tracking number (Tracking #352620) on your written request.

# Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description Gray / Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 34.8ft to 20.2ft .010 slot 2in new pvc casing 20.2ft to 0



STATE OF TEXAS WELL REPORT for Tracking #352625				
Owner:	Longhorn AAP-USACE	Owner Well #:	35AWW13	
Address:	Highway 43 Karnack , TX  75661	Grid #:	35-23-6	
Well Location:	Highway 43 Karnack , TX  75661	Latitude:	32° 41' 10" N	
Well County:	Harrison	Longitude:	094° 09' 11" W	
Elevation:	217 ft.	GPS Brand Used:	No Data	
Type of Work: New Well		Proposed Use:	Monitor	
Drilling Date:	Started: <b>8/20/2013</b> Completed: <b>8/20/2013</b>			
Diameter of Hole	e: Diameter: 8 in From Surface To 40 f	t		
Drilling Method:	Hollow Stem Auger			
Borehole Completion:	Gravel Packed From: <b>40 ft to 19.8 ft</b> Gravel Pack Size: <b>20 /40</b>			
Annular Seal Da	<ul> <li>I Data: 1st Interval: From 40 ft to 19.8 ft with 11 20/40 sand (#sacks and material) 2nd Interval: From 19.8 ft to 17.3 ft with 1.5 Bentonite (#sacks and material) 3rd Interval: From 17.3 ft to 0 ft with 3 Portland (#sacks and material) Method Used: Tremie Cemented By: Donald Edwards Distance to Septic Field or other Concentrated Contamination: No Data Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data</li> </ul>			
Surface Completion:	Surface Slab Installed			
Water Level:	Static level: <b>34.8 ft. below land surfa</b> Artesian flow: <b>No Data</b>	ce on 8/20/2013		
Packers:	No Data	No Data		
Plugging Info:	Casing or Cement/Bentonite left in we	ell: No Data		
Type Of Pump:	No Data			
Well Tests:	No Data			
Water Quality:	<ul> <li>Type of Water: No Data</li> <li>Depth of Strata: No Data</li> <li>Chemical Analysis Made: No Data</li> <li>Did the driller knowingly penetrate any strata which contained undesirable constituents: No Data</li> </ul>			
Certification Dat	a: The driller certified that the driller drille supervision) and that each and all of t understood that failure to complete the completion and resubmittal.	The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.		
Company Information:	iny Fugro ation: 6105 Rookin St Houston , TX 77074			
Driller License Number:	56013			

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

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Please include the report's Tracking number (Tracking #352625) on your written request.

# Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description Gray / Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 40ft to 22.2ft .010 slot 2in new pvc riser 22.2 to 0

	Froject Number. 60256775	751100011
AICOM	Site Location: Site 58	Date Installed: 8-24-13
	Well Location: Coords:	Borehole Diameter: 🔗
	Method: H SVA	Contractor: FUGEO
	MONITORING WELL CONSTRUCT	ION DETAIL
	Alumi Num Steel Well Protector	Depth from G.S. (feet)
	Wen Cap	
Concrete Pad	Ground Surface	
	ר וו ווביייייייייייייייייייייייייייייייי	
	Surface Casing:	
	Length	
	True of Material	
	Grout:	IR to it
	Type I Official	D DENONIG
	Amount Used	•
	Well Casing	
	Inside Diameter (ID)	
	Type of Material Sch 40 8-4	he ol
	Top of Bentonite: 3/8 M C	7.1
	Bentonite Type	
	Amount Used	ails
	Top of Sand	
		8+4 101
	Top of Screen	_17.8
	Screen: 14.7	
	Length 7. 0 + 1.	7
	Inside Diameter (ID)	-
	Type of Material Sock 40 PUC	-
	Type/Size of Sand (INI M. w?)	140
	Sand Pack Thickness 17.8	4
	Amount Used 10 Bags	-
4		7.4 5
	Bottom of Screen	20
	Bottom of Well Casing	30.2
	borenore Diameter:	

STATE OF TEXAS WELL REPORT for Tracking #352630			
Owner:	Longhorn AAP- USACE	Owner Well #:	35AWW14
Address:	Highway 43 Karnack , TX  75661	Grid #:	35-23-6
Well Location:	Highway 43 Karnavck , TX  75661	Latitude:	32° 41' 07" N
Well County:	Harrison	Longitude:	094° 09' 18" W
Elevation:	216 ft.	GPS Brand Used:	No Data
Type of Work:	New Well	Proposed Use:	Monitor
Drilling Date:	Started: <b>8/24/2013</b> Completed: <b>8/24/2013</b>		
Diameter of Hole	e: Diameter: 8 in From Surface To 30.2 ft		
Drilling Method:	Hollow Stem Auger		
Borehole Completion:	Gravel Packed From: <b>30.2 ft to 12.4 ft</b> Gravel Pack Size: <b>20/40</b>		
Annular Seal Da	nular Seal Data:1st Interval: From 30.2 ft to 12.4 ft with 10 20/40 sand (#sacks and material) 2nd Interval: From 12.4 ft to 9.1 ft with 1.5 Bentonite (#sacks and material) 3rd Interval: From 9.1 ft to 0 ft with 2 Portland (#sacks and material) Method Used: Tremie Cemented By: Donald Edwards Distance to Septic Field or other Concentrated Contamination: No Data Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data		
Surface Completion:	Surface Slab Installed		
Water Level:	Static level: <b>No Data</b> Artesian flow: <b>No Data</b>		
Packers:	kers: No Data		
Plugging Info:	Casing or Cement/Bentonite left in well: No	Data	
Type Of Pump:	Type Of Pump: No Data		
Well Tests:	No Data		
Water Quality:	Water Quality: Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate any strata which contained undesirable constituents: <b>No Data</b>		
Certification Dat	a: The driller certified that the driller drilled this supervision) and that each and all of the sta understood that failure to complete the requ completion and resubmittal.	The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.	
Company Information:	Company Fugro Information: 6105 Rookin St Houston , TX 77074		
Driller License Number:	56013		

1/30/2014

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

## IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking number (Tracking #352630) on your written request.

# Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description Gray /Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 30ft to 14.8ft .010 slot 2in new pvc casing 14.8ft to 0



10 V 112 Val 10 Val 120

STATE OF TEXAS WELL REPORT for Tracking #352631			
Owner:	Longhorn AAP-USACE	Owner Well #:	35AWW15
Address:	Highway 43 Karnack , TX  75661	Grid #:	35-23-6
Well Location:	Highway 43 Karnack , TX  75661	Latitude:	32° 41' 06" N
Well County:	Harrison	Longitude:	094° 09' 17" W
Elevation:	218 ft.	GPS Brand Used:	No Data
Type of Work:	New Well	Proposed Use:	Monitor
Drilling Date:	Started: <b>8/25/2013</b> Completed: <b>8/25/2013</b>		
Diameter of Hole	e: Diameter: 8 in From Surface To 38.3 ft		
Drilling Method:	Hollow Stem Auger		
Borehole Completion:	Gravel Packed From: <b>38.3 ft to 20.3 ft</b> Gravel Pack Size: <b>20/40</b>		
Annular Seal Da	Annular Seal Data: 1st Interval: From 38.3 ft to 20.3 ft with 10 sand (#sacks and material) 2nd Interval: From 20.3 ft to 16.7 ft with 1 bentonite (#sacks and material) 3rd Interval: From 16.7 ft to 0 ft with 3 Portland (#sacks and material) Method Used: Tremie Cemented By: Donald Edwards Distance to Septic Field or other Concentrated Contamination: No Data Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data		
Surface Completion:	Surface Slab Installed		
Water Level:	Level: Static level: <b>30 ft. below land surface on 8/25/2013</b> Artesian flow: <b>No Data</b>		
Packers:	No Data		
Plugging Info:	Casing or Cement/Bentonite left in well: No	Data	
Type Of Pump:	e Of Pump: No Data		
Well Tests:	Vell Tests: No Data		
Water Quality:	Water Quality: Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate any strata which contained undesirable constituents: <b>No Data</b>		
Certification Dat	a: The driller certified that the driller drilled this supervision) and that each and all of the sta understood that failure to complete the required completion and resubmittal.	The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.	
Company Information:	Company Fugro nformation: 6105 Rookin St Houston , TX 77074		
Driller License Number:	56013		

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

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Please include the report's Tracking number (Tracking #352631) on your written request.

# Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description Gray / Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 37.8ft to 23.1ft .010 slot 2in new pvc casing 23.1ft to 0



STATE OF TEXAS WELL REPORT for Tracking #352638				
Owner:	Longhorn AAP-US	ACE	Owner Well #:	35AWW16
Address:	Highway 43 Karnack , TX 7566	51	Grid #:	35-23-6
Well Location:	Highway 43 Karnack , TX 7566	51	Latitude:	32° 41' 08" N
Well County:	Harrison		Longitude:	094° 09' 25" W
Elevation:	219 ft.		GPS Brand Used:	No Data
Type of Work:	New Well		Proposed Use:	Monitor
Drilling Date:	Started: 8/26/2 Completed: 8/2	013 26/2013		
Diameter of Hole	e: Diameter: 8 in	From Surface To 35	ft	
Drilling Method:	Hollow Stem	Auger		
Borehole Completion:	Gravel Packed Gravel Pack S	l From: <b>35 ft to 17.4 ft</b> ize: <b>20/40</b>		
Annular Seal Da	Seal Data: 1st Interval: From 35 ft to 17.4 ft with 10 sand (#sacks and material) 2nd Interval: From 17.4 ft to 14 ft with 1.5 bentonite (#sacks and material) 3rd Interval: From 14 ft to 0 ft with 3 Portland (#sacks and material) Method Used: Tremie Cemented By: Donlad EDwards Distance to Septic Field or other Concentrated Contamination: No Data Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data			
Surface Completion:	Surface Slab	Installed		
Water Level:	Static level: <b>No</b> Artesian flow: I	o Data No Data		
Packers:	No Data			
Plugging Info:	Casing or Cerr	nent/Bentonite left in w	ell: No Data	
Type Of Pump:	No Data			
Well Tests:	No Data			
Water Quality:	Water Quality: Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate any strata which contained undesirable constituents: <b>No Data</b>			sirable constituents: <b>No Data</b>
Certification Dat	a: The driller cert supervision) ar understood tha completion and	The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.		
Company Information:	Fugro 6105 Rookin S Houston , TX	St 77074		
Driller License Number:	56013			

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking number (Tracking #352638) on your written request.

# Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description Gray / Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 34.9ft to 19.7ft .010 slot 2in new pvc casing 19.7ft to 0



STATE OF TEXAS WELL REPORT for Tracking #352642				
Owner:	Longho	orn AAP-USACE	Owner Well #:	35AWW17
Address:	Highwa Karnac	ny 43 k , TX 75661	Grid #:	35-23-6
Well Location:	Highwa Karnac	ny 43 k , TX 75661	Latitude:	32° 41' 04" N
Well County:	Harriso	n	Longitude:	094° 09' 24" W
Elevation:	219 ft.		GPS Brand Used:	No Data
Type of Work:	New We	ell	Proposed Use:	Monitor
Drilling Date:	Sta Co	arted: <b>8/25/2013</b> mpleted: <b>8/25/2013</b>		
Diameter of Hole	le: Dia	ameter: 8 in From Surface To 40 ft		
Drilling Method:	Но	llow Stem Auger		
Borehole Completion:	Gra Gra	avel Packed From: <b>40 ft to 22.3 ft</b> avel Pack Size: <b>20/40</b>		
Annular Seal Da	ular Seal Data: 1st Interval: From 40 ft to 22.3 ft with 9.5 sand (#sacks and material) 2nd Interval: From 22.3 ft to 18.5 ft with 1.5 bentonite (#sacks and material) 3rd Interval: From 18.5 ft to 0 ft with 3 Portland (#sacks and material) Method Used: Tremie Cemented By: Donald Edwards Distance to Septic Field or other Concentrated Contamination: No Data Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data			
Surface Completion:	Su	rface Slab Installed		
Water Level:	Sta Art	atic level: <b>No Data</b> tesian flow: <b>No Data</b>		
Packers:	No	Data		
Plugging Info:	Ca	sing or Cement/Bentonite left in well:	No Data	
Type Of Pump:	Type Of Pump: No Data			
Well Tests:	No	Data		
Water Quality:	Water Quality: Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate any strata which contained undesirable constituents: <b>No Data</b>			
Certification Dat	ta: Th suj un coi	The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.		
Company Information:	Company Fugro Information: 6105 Rookin St Houston , TX 77407			
Driller License Number:	56	013		

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

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Please include the report's Tracking number (Tracking #352642) on your written request.

# Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description Gray / Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 39.9ft to 24.7ft .010 slot 2in new pvc casing 24.7 to 0



STATE OF TEXAS WELL REPORT for Tracking #352646					
Owner:	Long	ghorn AAP-USACE	Owner Well #:	35AWW18	
Address:	High Karn	nway 43 nack , TX  75661	Grid #:	35-23-6	
Well Location:	High Karn	nway 43 nack , TX  75661	Latitude:	32° 41' 05" N	
Well County:	Harr	ison	Longitude:	094° 09' 22" W	
Elevation:	220 1	ft.	GPS Brand Used:	No Data	
Type of Work:	New	Well	Proposed Use:	Monitor	
Drilling Date: Started: 8/24/2013 Completed: 8/25/2013					
Diameter of Hole:		Diameter: 8 in From Surface To 40 ft			
Drilling Method:		Hollow Stem Auger			
Borehole Completion:		Gravel Packed From: <b>40 ft to 22.2 ft</b> Gravel Pack Size: <b>20/40</b>			
Annular Seal Data:		1st Interval: From 40 ft to 22.2 ft with 10 sand (#sacks and material) 2nd Interval: From 22.2 ft to 18.6 ft with 1.5 bentomite (#sacks and material) 3rd Interval: From 18.6 ft to 0 ft with 3 Portland (#sacks and material) Method Used: Tremie Cemented By: Donald Edwards Distance to Septic Field or other Concentrated Contamination: No Data Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data			
Surface Sompletion:		Surface Slab Installed			
Water Level:		Static level: <b>32 ft. below land surface on 8/24</b> , Artesian flow: <b>No Data</b>	/2013		
Packers:		No Data			
Plugging Info:		Casing or Cement/Bentonite left in well: <b>No Data</b>			
Type Of Pump:		No Data			
Well Tests:		No Data			
Water Quality:		Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate any strata which contained undesirable constituents: <b>No Data</b>			
Certification Data: The driller certified that the driller drilled this well (or the well was drilled supervision) and that each and all of the statements herein are true and understood that failure to complete the required items will result in the lo completion and resubmittal.		d under the driller's direct d correct. The driller log(s) being returned for			
Company Information:		Fugro 6105 Rookin St Houston , TX  75661			
Driller License Number:		56013			

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

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Please include the report's Tracking number (Tracking #352646) on your written request.

# Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description Gray / Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 39.5ft to 24.8ft .010 slot 2in new pvc casing 24.8ft to 0
	Client: USACE	WELL ID:									
	Project Number: 60256135	510 35AWW19									
AECOM	Site Location: Site 58	Date Installed: 9/19/13									
	Well Location: Coords:	Borehole Diameter: 8 "									
	Method: HSA	Contractor: Fygro									
MONITORING WELL CONSTRUCTION DETAIL											
	Steel Well Protector	Depth from G.S. (feet)									
Concrete Pad	Ground Surface										
	Surface Casing:         Length         Inside Diameter (ID)         Type of Material         Grout:         Type         Amount Used	*									
	Well CasingInside Diameter (ID) $2''$ Type of Material $5CI+$ 40 10VCTop of Bentonite:Bentonite Type $3/8^-$ ChipsAmount Used $4.5 \times 50/6.66$ JTop of Sand	9' 									
	- Ton of Screen Screen: 1.en $\sigma$ th Inside Diameter (ID) Slot Size Type of Material Type/Size of Sand Sand Pack Thickness Amount Used - Ton of Screen 14.1' 14.1' 2.'' 0.010'' Slot Size 20/40 Sand Sand - 20/40 Sand Sand - 20/6. 64gs	<u> </u>									
т.	Borchole Diameter:8 ^ /	<u>28,4</u> <u>29, ^</u> 									
Comments: Back fi Telto st	led up Bentanik Chips From 38 7031 Bgs we from 31 to 11 Par	allation Observed By: 									

	STATE OF TEXAS WELL REPOR	RT for Tracking #3	52655
Owner:	Longhorn AAP-USACE	Owner Well #:	35AWW19
Address:	Highway 43 Houston , TX  75661	Grid #:	35-23-6
Well Location:	Highway 43 Karnack , TX  75661	Latitude:	32° 41' 04" N
Well County:	Harrison	Longitude:	094° 09' 18" W
Elevation:	217 ft.	GPS Brand Used:	No Data
Type of Work:	New Well	Proposed Use:	Monitor
Drilling Date:	Started: <b>9/19/2013</b> Completed: <b>9/19/2013</b>		
Diameter of Hole	e: Diameter: 8 in From Surface To 38 ft		
Drilling Method:	Hollow Stem Auger		
Borehole Completion:	Gravel Packed From: <b>38 ft to 11 ft</b> Gravel Pack Size: <b>20/40</b>		
Annular Seal Da	<ul> <li>ta: 1st Interval: From 38 ft to 11 ft with 9 sand 2nd Interval: From 11 ft to 9 ft with 1 bento 3rd Interval: From 9 ft to 0 ft with 2 Portlan Method Used: Tremie Cemented By: Donald Edwards Distance to Septic Field or other Concentral Distance to Property Line: No Data Method of Verification: No Data Approved by Variance: No Data</li> </ul>	d (#sacks and material) onite (#sacks and materia nd (#sacks and material) ted Contamination: No Dat	al) a
Surface Completion:	Surface Slab Installed		
Water Level:	Static level: <b>No Data</b> Artesian flow: <b>No Data</b>		
Packers:	No Data		
Plugging Info:	Casing or Cement/Bentonite left in well: No	Data	
Type Of Pump:	No Data		
Well Tests:	No Data		
Water Quality:	Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate any strate	a which contained undesira	able constituents: <b>No Data</b>
Certification Dat	a: The driller certified that the driller drilled this supervision) and that each and all of the sta understood that failure to complete the required completion and resubmittal.	well (or the well was drille tements herein are true an ired items will result in the	d under the driller's direct d correct. The driller log(s) being returned for
Company Information:	Fugro 6105 Rookin St Houston , TX  77074		
Driller License Number:	56013		

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

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#### Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description 0 to 38ft Gray / Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 28.4ft to 13.9ft .010 slot 2in new pvc casing 13.9 to 0

US ACE Client: WELL ID: 35AWW20 602 56135 **Project Number:** Date Installed: 8/26/13 Site Location: SITE 58 ACOM Borehole Diameter: 8,25 Well Location: Coords: HSA Contractor: FUBRO Method: CME 75 MONITORING WELL CONSTRUCTION DETAIL Depth from G.S. (feet) Steel Well Protector - Well Cap T4 Concrete Pad-Ground Surface Surface Casing: NA Length Inside Diameter (ID) NA Type of Material T<u>KI Portland Coment + Quickrete Portland</u> + Baroi'd <u>+0 9 gallons</u> (2 bags Quickrete Portland Quick Gel 1 bag TXI Portland 14 bag Quick gel ) <u>2⁴</u> <u>5 che dule 40 PVC</u> Graut: Туре Amount Used Well Casing Inside Diameter (ID) Type of Material 12.3 Top of Bentonite: Buroid Hole Plug (3/5+) 1 bag (50 lla) Bentonite Type Amount Used 16.0 Top of Sand 18,3 - Top of Screen Screen: 14.7 Length Inside Diameter (ID) 0.010 Schedule 40 PVC Slot Size Type of Material Unimin Silica Sand 20/40 Type/Size of Sand Sand Pack Thickness ______ 1 7, 8 10 bags ( Solly/long ) Amount Used Bottom of Screen Bottom of Well Casing Bottom of Borehole 8.25 Borehole Diameter: Installation Observed By: Kuit Webber Comments:

dist 1

	STATE OF TEXAS WELL	REPORT for Tracking #3	52673
Owner:	Longhorn AAP-USACE	Owner Well #:	35AWW20
Address:	Highway 43 Karnack , TX  75661	Grid #:	35-23-6
Well Location:	Highway 43 Karnack , TX  75661	Latitude:	32° 41' 08" N
Well County:	Harrison	Longitude:	094° 09' 23" W
Elevation:	220 ft.	GPS Brand Used:	No Data
Type of Work:	New Well	Proposed Use:	Monitor
Drilling Date:	Started: <b>8/26/2013</b> Completed: <b>8/26/2013</b>		
Diameter of Hole	e: Diameter: 8 in From Surface To	33.80 ft	
Drilling Method:	Hollow Stem Auger		
Borehole Completion:	Gravel Packed From: <b>33.8 ft to 1</b> Gravel Pack Size: <b>20/40</b>	6.0 ft	
Annular Seal Da	<ul> <li>ta: 1st Interval: From 33.8 ft to 16 ft</li> <li>2nd Interval: From 16 ft to 12.3 f</li> <li>3rd Interval: From 12.3 ft to 0 ft w</li> <li>Method Used: Tremie</li> <li>Cemented By: Donald Edwards</li> <li>Distance to Septic Field or other of</li> <li>Distance to Property Line: No Dat</li> <li>Method of Verification: No Data</li> <li>Approved by Variance: No Data</li> </ul>	with 10 sand (#sacks and material it with 1 bentonite (#sacks and mat with 2 Portland (#sacks and materi Concentrated Contamination: No Dat Ita	i) erial) al) a
Surface Completion:	Surface Slab Installed		
Water Level:	Static level: <b>22.5 ft. below land s</b> Artesian flow: <b>No Data</b>	surface on 8/26/2013	
Packers:	No Data		
Plugging Info:	Casing or Cement/Bentonite left i	in well: <b>No Data</b>	
Type Of Pump:	No Data		
Well Tests:	No Data		
Water Quality:	Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Dat</b> Did the driller knowingly penetrate	t <b>a</b> e any strata which contained undesira	able constituents: <b>No Data</b>
Certification Dat	a: The driller certified that the driller supervision) and that each and al understood that failure to complet completion and resubmittal.	drilled this well (or the well was drille Il of the statements herein are true an te the required items will result in the	d under the driller's direct d correct. The driller log(s) being returned for
Company Information:	Fugro 6105 Rookin St Houston , TX  77074		
Driller License Number:	56013		

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

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Please include the report's Tracking number (Tracking #352673) on your written request.

#### Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description 0 to 33.8ft Gray /Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 33.8ft to 18.3ft .010 slot 2in new pvc casing 18.3ft to 0



	STATE OF TEXAS WELL	REPORT for Tracking #3	52675				
Owner:	Longhorn AAP- USACE	Owner Well #:	35AWW21				
Address:	Highway 43 Karnack , TX  75661	Grid #:	35-23-6				
Well Location:	Highway 43 Karnack , TX  75661	Latitude:	32° 41' 08" N				
Well County:	Harrison	094° 09' 12" W					
Elevation:	217 ft.	GPS Brand Used:	No Data				
Type of Work:	New Well	Proposed Use:	Monitor				
Drilling Date:	Started: <b>8/22/2013</b> Completed: <b>8/22/2013</b>						
Diameter of Ho	le: Diameter: (No Data) in From Sur	face To 40.5 ft					
Drilling Method:	Hollow Stem Auger						
Borehole Completion:	Gravel Packed From: <b>40.5 ft to 22</b> Gravel Pack Size: <b>20/40</b>	2.8 ft					
Annular Seal Data: 1st Interval: From 40.5 ft to 22.8 ft with 11 sand (#sacks and material) 2nd Interval: From 22.8 ft to 19.2 ft with 1.5 Bentonite (#sacks and material) 3rd Interval: From 19.2 ft to 0 ft with 3 Portland (#sacks and material) Method Used: Tremie Cemented By: Donald Edwards Distance to Septic Field or other Concentrated Contamination: No Data Distance to Property Line: No Data Method of Verification: No Data							
Surface Completion:	Surface Slab Installed						
Water Level:	Static level: <b>No Data</b> Artesian flow: <b>No Data</b>						
Packers:	No Data						
Plugging Info:	Casing or Cement/Bentonite left ir	n well: <b>No Data</b>					
Type Of Pump:	No Data						
Well Tests:	No Data						
Water Quality:	Type of Water: <b>No Data</b> Depth of Strata: <b>No Data</b> Chemical Analysis Made: <b>No Data</b> Did the driller knowingly penetrate	a any strata which contained undesir	able constituents: <b>No Data</b>				
Certification Da	ta: The driller certified that the driller of supervision) and that each and all understood that failure to complete completion and resubmittal.	drilled this well (or the well was drille of the statements herein are true ar e the required items will result in the	ed under the driller's direct ad correct. The driller log(s) being returned for				
Company Information:	Fugro 6105 Rookin St Houston , TX  77407						
Driller License Number:	56013						

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

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Please include the report's Tracking number (Tracking #352675) on your written request.

#### Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description 0 to 40.5ft Gray/Brown clay with layers of sand Dia. New/Used Type Setting From/To 2in new pvc screen 39.9ft to 25.2ft .010 slot 2in new casing 25.2ft to 0



	ST	TATE OF TEXAS WELL REPORT	for Tracking #35	2681
Owner:	Longh	orn AAP-USACE	Owner Well #:	35AWW22
Address:	Highw Karnad	/ay 43 ck , TX  75661	Grid #:	35-23-6
Well Location:	Highw Karnad	/ay 43 ck , TX  75661	Latitude:	32° 41' 11" N
Well County:	Harris	on	Longitude:	094° 09' 12" W
Elevation:	217 ft.		GPS Brand Used:	No Data
Type of Work:	New W	Vell	Proposed Use:	Monitor
Drilling Date:	St Co	tarted: <b>8/21/2013</b> completed: <b>8/21/2013</b>		
Diameter of Hole	e: Di	iameter: 8 in From Surface To 35.5 ft		
Drilling Method:	H	ollow Stem Auger		
Borehole Completion:	G G	iravel Packed From: <b>35.5 ft to 17.9 ft</b> iravel Pack Size: <b>20/40</b>		
Annular Seal Da	ata: 1s 2r 3r M Cu Di Di M Al	st Interval: From 35.5 ft to 17.9 ft with 10 san nd Interval: From 17.9 ft to 14.8 ft with 1.5 Be rd Interval: From 14.8 ft to 0 ft with 3 Portlan lethod Used: Tremie eemented By: Donald Edwards vistance to Septic Field or other Concentrated C vistance to Property Line: No Data lethod of Verification: No Data pproved by Variance: No Data	nd (#sacks and materia entonite (#sacks and r d (#sacks and materia Contamination: No Data	al) naterial) al)
Surface Completion:	S	urface Slab Installed		
Water Level:	St Ai	tatic level: <b>No Data</b> rtesian flow: <b>No Data</b>		
Packers:	N	o Data		
Plugging Info:	C	asing or Cement/Bentonite left in well: <b>No Dat</b>	а	
Type Of Pump:	N	o Data		
Well Tests:	N	o Data		
Water Quality:	Ty Di Cl Di	ype of Water: <b>No Data</b> lepth of Strata: <b>No Data</b> chemical Analysis Made: <b>No Data</b> id the driller knowingly penetrate any strata wh	nich contained undesira	ble constituents: <b>No Data</b>
Certification Dat	ta: Tł su ur co	he driller certified that the driller drilled this wel upervision) and that each and all of the statem nderstood that failure to complete the required ompletion and resubmittal.	II (or the well was drilled ents herein are true and items will result in the I	d under the driller's direct d correct. The driller og(s) being returned for
Company Information:	Fu 61 He	ugro 105 Rookin St Iouston , TX  77407		
Driller License Number:	56	6013		

Licensed Well Driller Signature:	Donald Edwards
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

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#### Texas Department of Licensing & Regulation P.O. Box 12157 Austin, TX 78711 (512) 463-7880

**DESC. & COLOR OF FORMATION MATERIAL** 

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description 0 to 35.5ft Gray clay with layers of sand. Dia. New/Used Type Setting From/To 2in new pvc screen 39.7ft to 20.2ft .010 slot 2in new pvc casing 20.2ft to 0

### MONITORING WELL DEVELOPMENT FORM

	Site:	5	8			LOCID: 35AWW07R				Date: 9-4-13						
LUCATION	Project Name	e: Longhorn	Army Ammuniti	ion Plant		Project #:						Recorded By: RCTRO Checked By:				
1	Water Quality	y Meter Type	/ID#: 1-	foriba 1	1-52 -	# 21	191		Water Level	Indicator Typ	e/ID#: 5	"linst "	2120	50		
EQUIPMENT	Equipment G	iroup:					Equpment Group:									
	Development	t Equipment:	Mai	hsoon S	system	£ .02	3834		Equipment D	econ.: A	conix ]	N/D	I Rins	P		
	Casing I.D. (in) [a]:     Z     Unit Casing Volume (gal/lin ft) [b]:     Initial Depth to Water (ft) [c]:     Z 4 · 9 5															
WELL	Total Well Depth (ft) [d]: 32.15 + 28 - 32, 43 Water Column Thickness (ft) [d-c]: 5.20 Well Volume (gal) {[d-c] x b}: 0.83															
	Ground Cond	dition of Well:	OK	NOT	comple	ted			Remarks:	Repla	cement	i well	_			
CASING	Casing I.D. (	in) [a]:	2"			1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0	
INFO	Unit Casing	Volume (gal/l	in ft) [b]:			0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6	
		Mathad									AND					
	Time	methoa (pump.	Water	Volume	Pumping	Temp.		Conduc-	DO	Turb.	-60d.	Radiation		Remarks		
Date	(24 hr)	surge,	Level (FTOC)	Removed (gal)	Rate (gpm)	(C)	рН	(mS/cm)	(mg/L)	(NTU)	(mL/L)	( )	(0	odor, clarity, e	etc.)	
11	12.0	bail)	(···/	(3.7)	101 /	0.00	0.77		11.00	- 1000	<i>Q</i> •			0	1 Lun Ch	
114/13	1330	Sivie			Xoom/ n	25.42	8.32	0.423	4-93	71000	72		I'm Cl	andy us	fer/ 100 Fro	
1	1378	BRIL	-	512		24.36	831	0.330	371	21000	109		Notio	wcey		
	1410	Rung		10-totel		28.58	8.46	0.260	2.8>	7000	122		No Fl	ow Ce	4	
	1415	1				2653	8.39	0.244	2.91	21000	114		(1 0	(		
	1420		-	+1.5		2/5.73	7.25	0.243	1.24	21000	93	۷	VFION	John	Cell	
	1425					24.28	636	0.233	1.07	21000	86					
	1430		38.02	+2		23.03	6.25	0.734	1.11	623	88		Tan/	clearin	s up	
	1435		>	-		22.80	6.15	0,225	0.96	256	G2			`	<b>)</b>	
	1440			+3		22.87	6.09	155.0	0.84	98,9	91		Turb	idity	up i down	
	1445		28.14	+1		22.81	6.04	6.219	0.75	43.3	92			L	<b>v</b>	
	1450	Road	2 Deire	priest	200mm	111	0 11						•			
Le la		1		11.5	gallon	2 Do ge	KV	plume	-		<					

**Development Criteria:** 

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND



	Site:	\$58	24			LocID: 34	5 Aww	09		Date: 8-27-13						
LOCATION	Project Name: Longhorn Army Ammunition Plant Project #: 60256135 -										Recorded By	r. Pc	Checked B	y:		
												<u></u>				4
	Water Qualit	y Meter Type	/10#: Ha	riba -	452	# 2119	27	Water Level	Indicator Typ	oe/ID #: ุ	3. limst	- 212	050		h	
EQUIPMENT	Equipment C	Group:							Equpment Group:							
	Developmen	t Equipment:	Bailer	& Mon.	soon Sl	stem			Equipment D	Decon.: Al	conox ?	Water /	DE Riv	Se		
	Casing I.D. (	in) [a]:	2"			Unit Casing	Volume (gal/l	in ft) [b]: *	DIG		Initial Depth	to Water (ft) [c]:	31.5	8		1
WELL	Total Well D	epth (ft) [d]:	41.817	+.28' =	42.09	Water Colum	nn Thickness	(ft) [d-c]:	10.5	1	Well Volume	(gal) {[d-c] x b}	1.65	25-1		
	Ground Con	dition of Well:	OK P	AD/Inco	omplete				Remarks:	Initial.	14 SA	4 Botton	nof w	e// .		
											4					1
CASING	Casing I.D. (	(in) [a]:	2"			1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0	4
INFO	Unit Casing	Volume (gal/l	in ft) [b]:			0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6	1
		Method														1
Date	Time (24 hr)	(pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	Radiation ()	(0	Remarks odor, clarity, e	etc.)	
8/27/12	1250	Railer									NA	NA	Comma	red S	urgine	
1	1300	Bailer		398/5		23-88	6.49	6.64	6-31	71080		1	Tan ve	my Sith	, , ,	
	1215	Relea		Carlo		22.00	6.40	6.72	3.13	353			Remove	la lot	FSiH	-
	1770			<u></u>		-							Curre	Well	aggin	10,
	1500	Puna		lacate	-	21.67	1.47	7.10	4.57	> \$200			Rice	Pumo	W/ Flow	J
	1410	Stopp	O Pu	7.5	1.	P.C.	1. brit	+ Ho	ibs 4	-52-	SB		thosy	ch.	_/	1
	1420	Pump	<i>a</i> . <i>j o</i> .	1Zgal	1.ZXPL	21.04	5.76	6.91	3.12	0-0			Clearin	ns up	Good.	
	1420	Pump		17ack	1. Ogals.	21.53	5.82	6.55	1.75	632			Surco	Los'T	)own w/	Pu
	1440	Pump	39.50	22 gale	1.521/m	21.73	5.84	6.69	2.49	458				1	20	
	1450	Puno		ZJals	9.8%1/m	21.13	5.84	6.87	3.39	ø			Issues	w/T	urb.	
	1500	Pump		27.5	0.5gals	21.11	5-88	6.85	4.35	272			Slight	- 1y Tu	-bill.	_
4	150	Pump		29.0	3	21.13	5.88	6.85	4.66	233	N			ie n		

**Development Criteria:** 

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

4) remove water added during drilling and construction Casing I volumes removed. Strange how water was pumping constant then stopped Spritty quick is

-* ) well

LOCATION	Site:	6 B ne: Longhorn /	Army Ammunit	ion Plant			LocID: 35 AWW 69 Project # 607,56135						
	1												
Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	Radiation ()	Remarks (odor, clarity, etc.)
8/27/13	1513	Pump	2	30.5	0.4gpm	21.10	5.89	6.86	4.92	Z20			Clearing Running out
	1516	Pump		32.0	0.4gpm	21.12	5.88	6.88	4.85	210			Water
	1519	$\sim$	Wel	1 Cavi	tated	Dry			1.50				
	1					- /							
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**Development Criteria:** 

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

Page 1 of /

### MONITORING WELL DEVELOPMENT FORM

	Site: 2	Site: 58 LocID: 357									Date: 8	127/13			
LUCATION	Project Nam	e: Longhorn /	Army Ammuniti	ion Plant		Project #:	60250	135			Recorded By	: PC	Checked B	By:	
	Water Qualit	y Meter Type/	ID#: How	iba u-	52 #	21191			Water Level	Indicator Typ	oe/ID #: <	Solihst	212	2050	
EQUIPMENT	Equipment G	Group:							Equpment G	roup:					
	Developmen	t Equipment:	Baile	s' M	onsion	Syster	m		Equipment D	Decon.:	Conor	s' Whiter	1DT	Rinse	
													<u> :::::::::</u>	- Ar	
	Casing I.D. (	in) [a]:	2"			Unit Casing	Volume (gal/l	in ft) [b]:	Z·ZY	,	Initial Depth	to Water (ft) [c]:	33	65-19,	63
	Total Well D	epth (ft) [d]:	33.6	1		Water Colum	nn Thickness	(ft) [d-c]:	19-63	13.98	Well Volume	(gal) {[d-c] x b}:			
	Ground Con	Ground Condition of Well: OK Ded not complete					pleted Yet. Remarks:								
CASING	Casing I.D. (	in) [a]:	2"			1.5	2.0 *	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
INFO	Unit Casing	Volume (gal/li	in ft) [b]:			0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.0
Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	Radiation ()	(0	Remarks odor, clarity, e	tc.)
8/27/12	1550	Backer	Commence	ed Si	var w	Bail	er B	lock			NA	NA			
I	1600	5 gals	Took	Water	Qualit	426.52	6.67	1.55	6.81	761	1	1	Comme	ncolF	ailing 559
	1610	Bailer	6 60/5			24.41	6.72	1.40	7.01	697			t. Ke	move	an w/Sitt
	1615	Bailer	7 sals			24.79	6-32	1.31	7.49	488			Waler	DOKS S	Slightly To
	1620	Pump	rogals			24.58	6.20	1.56	6.87	764					- U
	1625		12 sals			25.53	6.43	2.24	4.49	89.5			Cleari	ing Goog	$l, \downarrow$
	1630		15 sak			25.39	6.45	2.29	4.56	87.0			Well	carsi to	ted Dy
	1635		Maak	17gale	Total	L'D	RY.		÷				Water	Looks	Verafte
4-	1645				Di	part	Site	58	$\mathbf{D}$				Sliht	-Fy Ti	which.
					-										
						1	P->								
	1														
						-					1001 - 0 1 0				

Development Criteria:

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

75 casing volumes removed. (This well will Low Flow Sample.)

Page 1 of <u>L</u>

### MONITORING WELL DEVELOPMENT FORM

	Site: 58					LocID: 3	SAWW	11			Date: 9	15/13			
LOCATION	Project Nam	e: Longhorn	Army Ammunit	ion Plant		Project #:	6025	6135	.0002	ZGA	Recorded By	Re	Checked B	iy:	
	Water Qualit	y Meter Type	/ID #:	211	91				Water Leve	Indicator Typ	e/ID #:	212	050		
EQUIPMENT	Equipment G	Group:							Equpment (	Group:					
	Developmen	it Equipment:	C	2382	1				Equipment I	Decon.:	Alcon-K	DE /	DIR	ince	
	Casing I.D. (	(in) [a]:	2 "			Unit Casing	Volume (gal/l	in ft) [b]:	1+05 ga	ls	Initial Depth	to Water (ft) [c]:	31.4	8	
WELL	Total Well D	epth (ft) [d]:	57.75+.	28 = 38.0	03	Water Colum	nn Thickness	(ft) [d-c]:	6.55		Well Volume	(gal) {[d-c] x b}:	:16		
	Ground Con	dition of Well:	OK/	PAD NO	T Comp	leted			Remarks:	NOT	Sump	used h	tre.		
CASING	Casing I.D. (	(in) [a]:	z"			1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
INFO	Unit Casing	Volume (gal/l	in ft) [b]:			0.09	0.16	0.20	0.37	0.65	0.75	1.0	1 1.5	2.0	2.0
Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP -Sed. (mL/L)	Radiation ()	(0	Remarks odor, clarity, e	etc.)
9.5.13	6920	Surce	AFTER	NA	NA								Initi	al Sug	ing.
t	0930	Bail	Bail.	1		21.40	6.59	7.87	5.08	>1000	50		NO FL	w cel	
	0945	Rui	36.22	3.5 gals	)	21.07	6.80	7.61	5.00	> 1000	32		Derk	Brack	ish Witer
	1025	Beiled	37.07	3.0 64/2	ļ	Z1.54	6.70	7.28	3.19	>1000	7		NO FI.	w cell	used Beak
	1055												Seens	to rech	age to go
	1110	Britad	37.13	2.5	NA	21.90	6.59	7.22	3.37	>1000	0		about	lvery	40 mins
	1125	Br	exk										10 11	br.	
	1225	Bailed	36.48	3 jets	NA	27.46	6.65	7.60	4.94	681	- 44		Weter	is bette	r does se
	1345	Billed	36.90	2.5 hale	NA	29.69	6.30	7.25	1.59	76.0			First 1	Bailer /	See The Kit
	Mar	lto.	Next 1	Vell.											
	1654	Bailed	INA	SOONL	NA	24.31	6.49	7.08	1.77	31.0	-19		Clear L	Slight	bint of tan
				1.4										A:	

**Development Criteria:** 

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

(14.5 gals fotal Purge)

LOCATION	Site:	58	)			LociD:	35A	ww	12		Date: §	2/31/1	3		
	Project Nam	ne: Longhorn	Army Ammunit	ion Plant		Project #:	60251	2135	0007	2HA	Recorded By	r. Beesing	Checked	By:	
	Water Quali	ity Meter Type	MD#: 40	RIBA	12-52	2	21191		Water Level	Indicator Typ	e/ID#: S	olinst	mod	e/ 101	····
EQUIPMENT	Equipment (	Group:		-			F 150	• S	Equpment G	Sroup:					
	Developmen	nt Equipment:							Equipment f	Decon.:					
MATCH 1	Casing I.D.	(in) [a]:	211			Unit Casing	Volume (gal/	lin ft) [b]:	1.25	5	Initial Depth	to Water (ft) [c]:	29.	8/ 1	OC
INFO	Total Well D	)epth (11) [d]:	37.	65 7	-0C	Water Colum	nn Thickness	(ft) [d-c]:	7,81	4	Well Volume	e (gai) { <b>[d-c]</b> x b}:	8		
	Ground Con	dition of Well	:						Remarks:						
CASING	Casing I.D.	(in) {a]:				1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
INFO	Unit Casing	Volume (gal/	lin ft) [b]:			0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6
		Wathod													
	These	Method	Water	Volume	Pumping	-		Conduc-						_	
Date	(24 hr)	(pump, surge, bail)	Level (FTOC)	Removed (gal)	Rate (gpm)	temp. (C)	pН	tivity (mS/cm)	DO (mg/L)	TURD. (NTU)	Sed. (mL/L)	Radiation ()	(	Remarks odor, clarity, (	etc.)
Date 8-3 -13	(24 hr)	(pump, surge, bail)	Level (FTOC) 33.65	Removed (gal)	Rate (gpm)	1emp. (C) 21.27	рн 6.27	tivity (mS/cm) Z.09	DO (mg/L) 5-28	(NTU)	Sed. (mL/L)	Radiation ()	(	Remarks odor, clarity, e	etc.)
Date 8-3 -13 8-3 -13	(24 hr) /0_50 /(00	(pump, surge, bail) Dupp	Level (FTOC) 33.65 34.00	Removed (gal)	Rate (gpm)	1 emp. (C) 21.27 21.08	рн 6.27 6.24	tivity (mS/cm) 2.09 1.95	DO (mg/L) 5-28 4.79	(NTU) (NTU) 608 379	Sed. (mL/L)	Radiation ( )	(	Remarks odor, clarity, (	etc.)
Date 8-31-13 8-31-13 8-31-13	$1000 \\ (24 hr) \\ 1050 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000 \\ 1000$	(pump, surge, bail) Pupp Pump	Level (FTOC) 33.65 34.00 35.11	Removed (gal) <b>0</b> , 0 <u>8.5</u> 11.0	Rate (gpm)	1 emp. (C) 21.27 21.08 21.48	рн 6.27 6.24 6.36	tivity (m\$/cm) 2.09 1.95 1.82	DO (mg/L) 5-28 4.79 3,93	1015. (NTU) 608 379	Sed. (mL/L)	Radiation ( )	(	Remarks odor, clarity, (	etc.)
Date 8-31-13 8-31-13 8-31-13 8-31-13	$1000 \\ (24 hr) \\ 1050 \\ 1(00) \\ 1(10) \\ 1(15) \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 $	(pump, surge, bail) Purp Purp Purp	Level (FTOC) 33.65 34.00 35.11 36.00	Removed (gal) <b>6</b> , 0 <u>8.5</u> 11.0 13.5	Rate (gpm) .5 .5 .5	1 emp. (C) 21.27 21.08 21.48 21.20	рн 6.27 6.24 6.30 6.25	tivity (mS/cm) Z.09 1.95 1.82 L.85	DO (mg/L) 5.28 4.79 3.93 4.01	1010. (NTU) 608 379 101 583	Sed. (mL/L)	Radiation ( )	(	Remarks odor, clarity, (	etc.)
Date 8-31-13 8-31-13 8-31-13 8-31-13 8-31-13	$\frac{100}{(24 hr)}$ $\frac{10.50}{1(00)}$ $\frac{100}{1(15)}$ $\frac{1120}{1120}$	(pump, surge, bail) Pump Pump Pump Pump	Level (FTOC) 33.65 34.00 35.11 36.00 36.82	Removed (gal) <b>6</b> , 0 <u>8.5</u> 11.0 13.5 16.0	Rate (gpm)	1000 11.27 21.08 21.48 21.20 21.20 21.7	рн 6.27 6.24 6.36 6.25 6.22	tivity (m8/cm) 2.09 1.95 1.82 1.85 1.85	DO (mg/L) 5.28 4.79 3.93 4.01 4.01	(NTU) 608 379 101 583 22.5	Sed. (mL/L)	Radiation ()	(	Remarks odor, clarity, (	etc.)
Date 8-31-13 8-31-13 8-31-13 8-31-13 8-31-13 8-31-13	$\frac{100}{(24 hr)}$ $\frac{10.50}{1(00)}$ $\frac{1(00)}{1(15)}$ $\frac{112.0}{112.5}$	(pump, surge, bail) Pump Pump Pump Pump Pump	Level (FTOC) 33.65 34.00 35.11 36.00 36.82 37.43	Removed (gal) <b>6</b> , 0 8.5 11, 0 13, 5 16, 0 18, 5	Rate (gpm) .5 .5 .5 .5	100 (C) 21.27 21.08 21.48 21.20 21.17 21.17	pH 6.27 6.24 6.32 6.25 6.22 6.21	tivity (m8/cm) 2.09 1.95 1.82 1.85 1.85 1.83	DO (mg/L) 5.28 4.79 3.93 4.01 4.08 4.11	(NTU) (NTU) 608 379 101 583 32,5 72,2	Sed. (mL/L)	Radiation ( )		Remarks odor, clarity, (	etc.)
Date <u>8-3 -13</u> <u>8-3 -13</u> <u>8-3 -13</u> <u>8-3 -13</u> <u>8-3 -13</u> <u>8-3 -13</u>	$\frac{100}{(24 hr)}$ $\frac{10.50}{1(00)}$ $\frac{1(00)}{1(15)}$ $\frac{1(15)}{1(120)}$ $\frac{1120}{1(25)}$	(pump, surge, bail) Purp Purp Purp Purp Purp Purp	Level (FTOC) 33.65 34.00 35.11 36.00 36.82 37.43	Removed (gal) <b>10</b> , 0 <b>8</b> .5 11.0 13.5 16.0 18.5	Rate (gpm) .5 .5 .5 .5 .5	100 (C) 21.27 21.08 21.48 21.48 21.20 21.15	рн 6.27 6.24 6.25 6.25 6.22 6.21	tivity (ms/cm) 2.09 1.95 1.82 1.82 1.85 1.83 1.83	DO (mg/L) 5.28 4.79 3.93 4.01 4.08 4.11	(NTU) 608 379 101 583 32,5 72,2	Sed. (mL/L)	Radiation ( )		Remarks odor, clarity, (	etc.)
Date 8-31-13 8-31-13 8-31-13 8-31-13 8-31-13	$\frac{100}{(24 hr)}$ $\frac{10.50}{1(00)}$ $\frac{1(00)}{1(15)}$ $\frac{1(15)}{1(12.0)}$ $\frac{112.5}{1(12.5)}$	(pump, surge, bail) Pump Pump Pump Pump Pump	Level (FTOC) 33.65 34.00 35.11 <b>36.00</b> 36.82 37.43	Removed (gal) <b>6</b> , 0 8.5 11.0 13.5 16,0 18.5	Rate (gpm) .5 .5 .5 .5 .5	1 emp. (C) 21.27 21.08 21.48 21.20 21.17 21.15	рн 6.27 6.24 6.32 6.25 6.22 6.21	tivity (m8/cm) 2.09 1.95 1.82 1.85 1.83 1.80	DO (mg/L) 5.28 4.79 3.93 4.09 4.08 4.11	(NTU) 608 379 101 58.3 32.5 72.2	Sed. (mL/L)	Radiation ( )		Remarks odor, clarity, (	etc.)
Date 8-3 -13 8-3 -13 8-3 -13 8-3 -13 8-3 -13 8-3 -13	$\frac{100}{(24 hr)}$ $\frac{10.50}{1(00)}$ $\frac{1(00)}{1(15)}$ $\frac{1120}{1125}$ $\frac{1125}{1125}$	(pump, surge, bail) Pump Pump Pump Pump Pump	Level (FTOC) 33.65 34.00 35.11 <b>36.00</b> 36,82 37.43	Removed (gal) <b>10</b> , 0 <b>8</b> .5 11.0 13.5 16,0 18,5	Rate (gpm) .5 .5 .5 .5 .5	1 emp. (C) 21.27 21.08 21.48 21.48 21.20 21.15	pH 6.27 6.24 6.25 6.25 6.22	tivity (m8/cm) 2.09 1.95 1.82 1.85 1.85 1.83 1.80	DO (mg/L) 5.28 4.79 3.93 4.01 4.08 4.11	(NTU) 608 379 101 583 32,5 72,2	Sed. (mL/L)	Radiation ()		Remarks odor, clarity, e	etc.)
Date 8-31-13 8-31-13 8-31-13 8-31-13 8-31-13	$\frac{100}{(24 hr)}$ $\frac{10.50}{1(00)}$ $\frac{1(00)}{1(15)}$ $\frac{1(15)}{1(2.5)}$ $\frac{112.5}{1(2.5)}$	(pump, surge, bail) Pump Pump Pump Pump Pump	Level (FTOC) 33.65 34.00 35.11 36.00 36.82 37.43	Removed (gal) 8.5 11.0 13.5 16.0 18.5	Rate (gpm) .5 .5 .5 .5 .5	1 emp. (C) 21.27 21.08 21.48 21.20 21.15	рн 6.27 6.24 6.25 6.25 6.22	tivity (m8/cm) 2.09 1.95 1.82 1.85 1.83 1.80	DO (mg/L) 5.28 4.79 3.93 4.09 4.08 4.11	(NTU) 608 379 101 58.3 32.5 72.2	Sed. (mL/L)	Radiation ( )		Remarks odor, clarity, e	etc.)

Development Criteria:

1) sediment <0.75 mL/L, 2) turbldity within 10 NTU range for 30 minutes, 3) +/-0.5 C, +/-0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

4) remove water added during drilling and construction



	Site:	LociD:
Loonion	Project Name: Longhorn Army Ammunition Plant	Project #:

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	Radiation ( )	Remarks (odor, clarity, etc.)
										_			
-													
						r.							
		-											

Development Criteria:

1) sediment <0.75 mL/L, 2) turbldity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

Page 1 of

### MONITORING WELL DEVELOPMENT FORM

	Site:	8				LocID:	35 AW	W 13			Date: 🌱	14/13			
LUCATION	Project Name	e: Longhorn A	Army Ammuniti	on Plant		Project #:					Recorded By	REEDO	Checked B	y:	
	1000000														
	Water Qualit	y Meter Type/	ID#: H	miba 4	-52 #	211	<b>२</b> ।		Water Level	Indicator Typ	xe/ID #:	Solinst -	# 212	50	
EQUIPMENT	Equipment G	Group:							Equpment G	Group:		,			
	Developmen	t Equipment:	Me	in coon	Sycten	# 023	834		Equipment [	Decon.: M	Conor >	J. DT	Piles		
										<u> 10000</u>					
	Casing I.D. (	in) [a]:	Z"			Unit Casing	Volume (gal/l	in ft) [b]:	.16		Initial Depth	to Water (ft) [c]:	24.55		
WELL	Total Well D	epth (ft) [d]:	39.90	+.285	40.18	Water Colum	n Thickness	(ft) [d-c]:	15.63		Well Volume	e (gal) {[d-c] x b}:	2.5	Ogal =	10+1
INFO	Ground Con	dition of Well	Ar /3	DAD NO	Dine				Remarks [.]					-	
				HD /0-1		<u>;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;</u>									
CASING	Casing I.D. (	in) [a]:	"S			1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
INFO	Unit Casing	Volume (gal/li	n ft) [b]:			0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6
	1						$\sim$			r					
Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	OK P -Sed -(mL/L)-	Radiation ( )	(o	Remarks dor, clarity, e	tc.)
9/4/13	14.55	Surge			1000mlm	27.21	7.80	1.27	Y-16	71000	21	Olach	Duk (-	aray or /	Fines
., .,	1515	Rino			1-0	27.43	7.60	1.71	2.14	71000	64	Durgher	No Po	Jail	
	1520	Pump			+7.5	26.69	7.22	1.79	2.73	> 1000	19		NOF	low cell	
	1525	Pumpo			+1.0	26.29	7.65	1.75	2:21	7 1000	27		Cloudy	Gray	water.
* 16min	1825	Pumo	-	-	+ 3.0	27.76	7.20	1.77	2.35	> /000	-52		7.5	gals n	moved
	1545	Pum	28.31	-		28.40	6.51	2.08	2.82	>1000	13		Flow	through	connect
	1600	Pump	-	~	+ 3.0	75.20	6.52	7.01	1.85	>/000	-9			<u> </u>	
	1605	Pump		-	+ 2.5	24.72	6.51	2.22	1.67	7/000	-14				
	1610	Punn			+ 2.0	24.60	6.54	2.60	0.42	7/000	- 30		14.5	sals run	roul,
	1415	Pinno			+1.5	24.77	6.51	2.70	0.40	825	-29				
	1620	Pumo		~	+ 1.5	24.80	6.51	2.72	0.41	351	- 2.3	*			
	1625	Puma		_	+1.5	24.93	6.51	2.73	0.44	199	-16	(	18 50/0	)tota	1 venoue

Development Criteria:

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive reasings, AND

Page 1 of <u>}</u>

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C

#### MONITORING WELL DEVELOPMENT FORM

	Site:	58				LociD: 3	SAWW	14			Date: C	7.5.13	5		
LUCATION	Project Nam	e: Longhorn	Army Ammuniti	on Plant		Project #:	6025	6135	. 000	265	Recorded By		Checked E	By:	
	Water Qualit	ty Meter Type	/ID #:	2110	71				Water Level	Indicator Ty	pe/ID #:	21205	50		
EQUIPMENT	Equipment C	Group:							Equpment G	Group:					
	Developmen	nt Equipment:	#	0	2383	4			Equipment D	Decon.:	4 Iconox	DI / D	I Rin.	50	
											<u>;;;;;;;;;</u> ;			<u> 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919</u>	
	Casing I.D.	(in) [a]:	2 "			Unit Casing	Volume (gal/li	in ft) [b]:	0.30		Initial Depth	to Water (ft) [c]:	30.55	to To	۵
	Total Well D	epth (ft) [d]:	32.13 +.	28 = 32	2 . 41	Water Colur	nn Thickness	(ft) [d-c]:	1.86	×	Well Volume	(gal) {[d-c] x b}:	·K		
	Ground Con	dition of Well:	OK/	NOT CO	mplater	J			Remarks:	NOTE .	Water	Hot (1	VO WA	ER)	Sailed
CASING	Casing I.D.	(in) [a]:	2 ¹			1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
INFO	Unit Casing	Volume (gal/l	in ft) [b]:			0.09	0.16	0.20	0.37	0.05	0.75	1.0	1.5	2.0	2.0
Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	Radiation ())	(1	Remarks odor, clarity, d	etc.)
9.5.13	0805	Surge	30.55	NA	NA	21.50	5.92	4-48	4.58	>100KC	-45-				1
1	0815	Bail	31.56	1 Builer	NA	21.50	5.92	4.48	4.58	>1000	95		Tan Ci	loudy vi	Fine Sa
	1040	Bail	30.90	1 Buler	NA	21.29	6.40	4.39	5.75	>1000	107		Silt	1.Int	al Phit
													15000	at remo	sed
	0900	with	Return	Perio	dicalla	1 10 1	emov-e	a Cou	ple of	1/3 7	all D	is possible	e		
		Buile	rs Inl	<i>/</i> .											
	0950	Brifer	31.96	1580 me		20.75	6.90	5.04	5.73	71000	117		Tun	Cloudy	does
	105	Builter	31.33	1000 mL	NA	22.42	6.86	5.43	5.30	71000	88		Settle	out.	
	1258	Beter	30.55	1500m	NA	25.95	7.20	5.37	4.12	1000	84		Lisht	er Tan	water,
	1340	Bater	30.85	1200m	MA	25.65	7.04	5.57	4.09	829	88		11	4	13
	1635	Bader	30.88	1580m	NA-	1940	- Same								
4	11.45	Bailer	A)A	500mL	NB	25.100	203	5.70	4,90	105	103		light	tar	

**Development Criteria:** 

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings AND

Page 1 of Z

### MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: 58 LocID: 35 Aww 13							115			Date: 9	16/13			
LOOAHON	Project Nam	ne: Longhorn	Army Ammunit	tion Plant		Project #:	6 0250	135.	0002G/	1	Recorded B	y: RC	Checked	By:	
	Water Quali	ity Meter Type	/ID #:	2119	1				Water Level	Indicator Typ	pe/ID #:	21205	ъ		
EQUIPMENT	Equipment	Group:							Equpment (	Group:					
	Developmer	nt Equipment:	Mons	oon sys	for #	623	824		Equipment	Decon.: A	1 conor	PE/I	ER RI	hse	
	Casing I.D.	(in) [a]:	2 11			Unit Casing	Volume (gal/	lin ft) [b]:	Z.68	sal sal	Initial Depth	to Water (ft) [c]:	20.	98 (	Toe)
INFO	Total Well D	Depth (ft) [d]:	37.46 .	+ . 28 = 1	37.74	Water Colur	nn Thickness	(ft) [d-c]:	16.70	¢	Well Volume	e (gal) {[d-c] x b}:	.10	,	
	Ground Cor	ndition of Well:	I DK/ Well not completed.					Remarks:							
CASING	Casing I.D.	(in) [a]:	Zü			1.5	/ 2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
INFO	Unit Casing	Volume (gal/l	in ft) [b]:			0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6
Date	Time (24 hr)	Method (pump, surge,	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP - <del>Sed:</del> (mL/L)	Radiation ( )	(	Remarks odor, clarity,	etc.)
8-6212	AGAK					77.71	2.14	1.00	1.36	>/000	-16		11 0	100	1
1	0800	P.I.A		V. Sel	NA	28.10	6.70	9 63	1.27	Diana	-17	NO FION	Very C	The la	ing water
	BOU -	puter	-	1 545		23.10	0.10	7.59	1.71	-1000	1	Sell	ph/kc	1 haven	Water
	0845	Delle X		4 S gels	NA	23.01	6.64	7.48	1.11	7/000		NO FRO	Stall	MITK	thick
	0900	Duilped	K. 88	4.5 gele	DA	23.54	6.92	1100	2.(1	765			Gord	SIGNWE	the Jurbiel
	Alla	he to	riches	<u>ج</u>			1					N.O.C.+-		. 0	
	0950	Terub	28,77	-		24.35	6.74	7.60	0.96	71000	- 15	FLOW (P)	Clou	dy B.	ray with
	0955	-		~		25.61	6-64	7-16	0.45	7100	- 77		Fine	Sands	- Silt
	1000	<u>~</u>	~	4.50015	>1000	25,68	6.62	7.40	0.73	7100	-109		Susp	rended	Cloud.
		Incre	as Do	to	Pump 1	ell 2	N								
	1050		1	4.0	71000	25.44	6.45	8.58	1.32	>1000					
	1055	-	-			25.58	6,65	8.83	1.42	71000	- 48				
9-6-12	1100	Pum				25-38	6.41	9.14	1.08	>1000	-67				

**Development Criteria:** 

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

Page _____ of _____

### MONITORING WELL DEVELOPMENT FORM

	Site:	58							LocID:	357	twa 1	5	
LOOATION	Project Nam	e: Longhorn	Army Ammunit	ion Plant					Project #:	60	102561	35.00	ODZGA
	r		r			r	r	1			L é		
Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	0/2 P - <del>Sed</del> . (mg/L)	Radiation ( )	Remarks (odor, clarity, etc.)
9/8/3	1105	Pump	35.25		600me	25.44	6.38	9.34	0.70	640	-100	2	Slightly chuded.
	1110	Pump.			1c	25.76	6.37	9.15	0.61	231 -	118		cleaning, up.
	1115	10			u u	25.78	6.37	9.07	0.65	221 -	117		
	1120	11			No. 18	26.01	6.38	9.10	0.70	150 -	1/1		
	1125	N1			.41 h	26.05	6.37	9.11	0.72	179-	- 108		
	1135	C-n	plated	Pa	×0 -				-				Alot cleaver.
			7		pc								

**Development Criteria:** 

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

LOCATION	site: 58	LocID:	35A	ww	16		Date: 8	131/12	Ś			
	Project Name: Longhorn Army Ammunition Plant	Project #:	60256	135	,0007	HA	Recorded B	Basis	Checked E	By:		
								d				
	Water Quality Meter Type/ID #: U-52 HORIBI	4 211	91		Water Level	Indicator Ty		linst	made	1101		
EQUIPMENT	Equipment Group:	9-94 	Equpment Group:									
	Development Equipment:		Equipment Decon.:									
SATEL 1	Casing I.D. (in) [a]: 2	Unit Casing	Volume (gal/l	in ft) [b]:	2.97	3	Initial Depth	to Water (ft) [c]:	19.	17_		
INFO	Total Well Depth (11) [d]: 37,48	(ft) [d-c]:	: 18.36 Well Volume (gal) {[d-c] x b]:									
	Ground Condition of Well:		Remarks:									
CASING	Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0	
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6	

ter Volume Pumping Rate (C) PH Conductivity (mg/L) DO Turb. Sed. Radiation (ML/L) (Odor, clarity, et al. (C) Conductivity (mg/L) (MTU) (ML/L) (C) Conductivity (mg/L) (ML/L) (C) Conductivity (mg/L) (MTU) (ML/L) (C) Conductivity (mg/L) (ML/L) (C) Conductivity (mg/L) (ML/L) (C) Conductivity (mg/L) (ML/L) (ML/L) (ML/L) (C) Conductivity (mg/L) (ML/L) (ML/	c.)
ibs 11 1 21.60 6.74 7.50 1.71 1000+	
25 121 1 21.21 6.69 8.22 1.99 748	
36 326.53 21.34 6.72 7.18 1.03 464	
00 15 21.18 6.74 6.16 0.73 319	
30 36 ,5 20,926.77 5.79 0.75 187	
45 41 ,5 20,97 6.84 4.85 0.41 113	
2 46 .5 21.00 6.84 4.55 0.38 97.3	
40 51 ,5 21.10, 6.86 4.27 0.35 40,1	
11 56 15 21.166.87 4,20 0.32 24.3	
77 61 15 21.21 6.86 4,11 0,30 22,1	
33 66 ,5. 21,25 6,87 4,02 0,28 22,5	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	

1) sediment <0.75 mL/L, 2) turbldity within 10 NTU range for 30 minutes, 3) +/-0.5 C, +/-0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND



	Site:	LociD:
LOCATION	Project Name: Longhorn Army Ammunition Plant	Project #:

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	Radiation ( )	Remarks (odor, clarity, etc.)
							(#)						
										_			
					÷								

Development Criteria:

1) sediment <0.75 mL/L, 2) turbldity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

LOCATION	site: 58	LocID:	35A	WW	7		Date:	8/30/13	\$		
	Project Name: Longhorn Army Ammunition Plant	Project #:	6025	6135	0002	HA	Recorded B	. Reasing	er Checked I	By:	
								1			
	Water Quality Meter Type/ID #: Hon IBA U-52	Z	-4191		Water Level	Indicator Ty	pe/ID #: S	olinit	Mode	el 101	1
EQUIPMENT	Equipment Group:			• 8	Equpment G	iroup:					
	Development Equipment:				Equipment D	)econ.:					
	Casing I.D. (in) [a]: 2 ¹¹	Unit Casing	Volume (gal/	ín ft) [b]:	2.02	/	Initial Depth	to Water (ft) [c]:	29	.65	
INFO	Total Well Depth (11) [d]: 42.28	Water Colur	nn Thickness	(ft) [d-c]:	12.67	3	Well Volume	e (gal) {[d-c] x b}:			
	Ground Condition of Well:				Remarks:						
CASING	Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	Radiation ( )	Remarks (odor, clarity, etc.)
83013	1315	SURGE	30.30	2		2438	7.14	7.16	3.76	784			
8/30/13	1340	Pumo.	35.40	\$7	19pm	22.54	7.3	8.03	2.81	760			
8130/13	1350	Pring	36.80	17	.Sapm	22.90	6.97	8.34	1.66	161			
\$30/13	1355	Press	37.00	20	.Sopn	23.00	7.09	7.53	1.53	93.1			
2/30/13	1400	Punas	37.91	23	.Sgm	2390	7.02	7.09	1.25	60.0			
2/30/13	1405	Rup	38.25	25	Sam	23,50	7.05	7.11	1.30	26.1			
8/30/13	infi0	Para	38,91	27	المحي	83.45	7.08	7.20	1.31	20,2			
8/30/13	1415	Pino	39.50	30	,5	23.51	7.06	7.23	1.35	18,3			
		. 0											
					j.	-							
											-		

Development Criteria:

1) sediment <0.75 mL/L, 2) turbldity within 10 NTU range for 30 minutes, 3) +/-0.5 C, +/-0.1 pH, +/-3 % conductivity, +/-10% DO for 3 consecutive readings, AND



LOCATION	Site:	LociD:	
	Project Name: Longhorn Army Ammunition Plant	Project #:	

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	Radiation ()	Remarks (odor, clarity, etc.)
							()						
12													
					+								

Development Criteria:

1) sediment <0.75 mL/L, 2) turbldity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

LOCATION	site: 58	LocID:	35A	WWI	18		Date:	8/30/	13		
	Project Name: Longhorn Army Ammunition Plant	Project # (	00256	135	1000	2HA	Recorded By	Bresing	e (Checked E	By:	
	Water Quality Meter Type/ID #: HORDBA 19-5	22	-1191		Water Level	Indicator Ty	ipe/ID#. S	olinst	m	odul	100
EQUIPMENT	Equipment Group:				Equpment G	Sroup:					
	Development Equipment:				Equipment £	Decon.:					
								1111111111111			
SATER 1	Casing I.D. (in) [a]: こい	Unit Casing	Volume (gal/	in ft) [b]:	2.20	7	Initial Depth	to Water (ft) [c]:	28.	05	
INFO	Total Well Depth (ft) [d]: 42.0	Water Colu	nn Thickness	(ft) [d-c]:	14.0	3	Well Volume	(gal) {[d-c] x b}:	352		
	Ground Condition of Well:				Remarks:			~			
								*********			101010101010
CASING	Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	Radiation ( )	Remarks (odor, clarity, etc.)
8-30-13	1335	Pump	34,60	6	lapm	2530	7.29	4.92	2.79	1000-+-			
8-30-13	1545	Remp	36.55	16	T'	22.89	7.08	5.39	2.23	852			
830-13	1555	Rup	36.97	Z1	1	23:39	7.03	6.00	1.04	800			
8-30-13	1605	Remo	37.54	23.5	.5	24.08	7.02	6.46	0.67	736			÷
8-30-13	1615	Ring	37,91	26	15	24.33	7,00	6,40	0.47	601			
8-20-13	1625	Run	38.70	28.5	.5	DH. 60	7.05	6.25	0.30	459			
8-30-13	1635	Puint	38,99	31	,5	24,69	7.08	6.20	0,28	127.3			
830-13	1645	Deup	29.29	33,5	15	24,75	7.04	6.17	0.27	15.5			
8-30-12	1655	Rowp	39.78	36	15	24.80	7.02	6.13	0.25	60.2			
8-30-13	1705	Rup	40.50	38.5	īJ	24.85	7.01	6.10	0.25	40.1			
						·							
											_F		

Development Criteria:

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

LOCATION	Site:								LociD:				
	Project Nam	e: Longhorn	Army Ammuni	tion Plant					Project #:				
Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рн	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	Radiation ( )	Remarks (odor, clarity, etc.)
													·
							1						
			1										
							4						

**Development Criteria:** 

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

4) remove water added during drilling and construction

Page ____ of ___

Page 1 of <u>3</u>

# MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: 58	LocID: 3	1574h	Wis	?		Date:	122/	13		
	Project Name: Longhorn Army Ammunition Plant	Project #:	0020	5613	35		Recorded By	GH	Checked E	By:	
	Water Quality Meter Type/ID#: Hori 3A				Water Level	Indicator Ty	pe/ID#.	Jolins	4		
EQUIPMENT	Equipment Group: NA				Equpment G	Group: 人	(A				
	Development Equipment: Monscord Pu	mp			Equipment D	Decon.:	HCONI	s e c	SI W	fer	
											11111111
	Casing I.D. (in) [a]: 2 (1	Unit Casing	Volume (gal/	lin ft) [b]:			Initial Depth	to Water (ft) [c]:	30,5	Ô	<u> </u>
INFO	Total Well Depth (fl) [d]: 32.15 - 0.27 = 3	t. 88 Water Colum	nn Thickness	(ft) [d-c]:			Well Volume	(gal) {[d-c] x b}:			
	Ground Condition of Well:				Remarks:						
CASING	Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP Set: (mLt) mV	R <del>adiatio</del> n ()-	Remarks (odor, clarity, etc.)	
9/22/13	0835	BAIL	30.50	1 top		18.21	5.93	6.67	2.74	>1000	51	~		
	1520	•	30.51			*							Surgeo for Smy	
	1540			3.0		22.03	6.42	6.41	5.14	71000	87			
	16-15	1	30.80										REWARLS RATE S. ST	Min.
	1818		30.58									$\rightarrow$	RECAMONS	
	183	BAIL	31.91	4.5		71.81	6.5%	6.66	5.54	71000	28			
9/23/13	0845		30.52										Surges Fon 5mm	
												/	-	

Development Criteria:

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

# Page $\underline{Z}$ of $\underline{3}$

### MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: 5	8							LocID: 3	STAWL	219		
LooAnon	Project Nam	e: Longhorn	Army Ammuni	tion Plant					Project #:	602	561	35	
				(400)11	K FLOW T	nerova	1 core	;					
Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed	Pumping Rate	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	- <del>Sed.</del> - <del>(mg/L</del> )	ORP Badiation (LV)	Remarks (odor, clarity, etc.)
9/23/3	0945	Rup	30.65	300-2	325	19.94	6.04	6.72	7.44	71000		99	Perismine Purp
	0950	~4	30.68	450	20	20.41	6.11	6.42	6.68	71000		90	
	0955	- 11	30.70	650		29.87	6.14	6.56	6.11	71000		88	
	1000	4	30.76	1000		20.84	6.13	6.73	5.82	>1000		87	
	1005	11	NA	1600		20.71	6.11	6.93	5.76	21000	_)	86	
	1010	16	30.85	2150		29.71	6.10	7.02	2.5B	>1000		87	
	10.5	4	30.90	2700		20.74	6.09	6.99	2.63	855		87	SLOWED DOWN POR
	1020	41	30.82	3250		20.90	6.08	6.94	2.52	319		88	
	1025	4	NA	3650		21.03	6.09	7.02	2.53	i34		87	
	1030	61	31.00	4100		21.34	6.07	6.98	2.42	77		88	SLOWED DOWN POMP
	1035	1(	31.01	4500		21.58	6.04	6.95	2.64	61		89	
	1040	и	31.02	4900		21.88	6.07	7.02	5.55	56		90	
	1045	FL.	31.03	5250		22.17	6.05	7.03	5.28	48		93	
				+400	For FL	ou TH	novau	CGI	_				STOPPED TO CLEAR
	1050	Ame	31.01	En of	400							STATE	OUT FOR THAT
	1057	11	NA	0		22.87	6.8	6.92	2.97	33		105	
	1102	÷.	31.02	350		22,97	6.06	6.86	6.08	25		104	
	1107	n	31.02	600		23.22	6.04	6.94	5.73	19		105	
	1112	E E	31.02	900		23.62	6.02	6.98	5.41	17	I.	107	6
	1117	13	31.02	1250		24.06	6.01	7.00	699	13		109	

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND Development Criteria:

4) remove water added during drilling and construction

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#### MONITORING WELL DEVELOPMENT FORM

1.000	TION	Site: S	5P							LociD:	35AL	101	9	
LOGA		Project Nam	e: Longhorn	Army Ammunit	ion Plant					Project #	602	5613	35	
Da	ate	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal) ~ L	Pumping Rate _ <del>(gpm) -</del>	Temp. (C)	pH	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTV)	Sed. (mg)L)	ORP -Radiation (Inv)	Remarks (odor, clarity, etc.)
9 2	3/13	1122	for	31.02	15002	eŭ	24.35	6.01	6.98	281	10.5		(10	
	1	1127	4	3100	1800		24.42	6.01	7.01	2.86	8.8	_)_	111	
		1132	n	31.02	2000		25.07	5.98	6.97	3.14	10.0	_(	((2	
		1137	n	31.02	2300		25.35	5.98	6.96	2.70	6.5		(14	
		1142	Ľ	31.02	2575		25.45	5.97	6.94	5.77	4.7		115	
										-		_(		
					+400	For	- Fre	wT	1200	air C	tory	$\rightarrow$		
				0		,				0		_/		
			Tom	- Puna	m g/	23/13	-	06	25m	R				
							=	8.62	56	Tons	2	2).3	gal	
			TOTA	2 Pur	ain	9/22	/13	- 4	.5 su	e		7		
				GRAN	n Tot	m	6.	75	l.	Ru	nas			
Develop	ment Cri	iteria:	1) sediment	<0.75 mL/L, 2)	turbidity within	10 NTU range	e for 30 minute	es, 3) +/- 0.5	C, +/- 0.1 pH	, +/- 3 % cond	ductivity, +/- 1	0% DO for 3	consecutive read	ings, AND

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

Page 1 of ____1

### MONITORING WELL DEVELOPMENT FORM

	Site: 58 LocID: 35AWW 20								Date: 9-5-13								
LOCATION	Project Name: Longhorn Army Ammunition Plant Project #: 60256/35-									Recorded By: PC Checked By:							
	Water Qualit	y Meter Type	/ID #: Ho	wibh 4	-52		Water Level Indicator Type/ID# Solivest 212050										
EQUIPMENT	Equipment G	Group:						Equpment Group:									
	Development Equipment: Monsoor Suscher Beiler Equipment										loonor	DE / J	SE Ri	158			
	Casing I.D. (	in) [a]:	Zu			Unit Casing	Volume (gal/li	n ft) [b]: 🛛 🛛	2,425	e _	Initial Depth	to Water (ft) [c]:	20.67				
INFO	Total Well D	epth (ft) [d]:	35.82	Toc	,	Water Colum	n Thickness	(ft) [d-c]: 🖊	5.15'		Well Volume	(gal) {[d-c] x b}:					
	Ground Con	dition of Well:	OK	1 NOT	C.nel	ek.			Remarks:	35AWN	uzo is	Juste	i Pipe	out of	the grace		
														70			
CASING	Casing I.D. (	in) [a]: Volume (col/	Z	, u		1.5	(2.0)	2.2	3.0	4.0	4.3	5.0	6.0	7.0	2.6		
	Unit Casing	volume (gal/l	in it) [D].			0.09	0.10	0.20	0.57	0.05	0.75	1.0	1.0	2.0	2.0		
Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	02 P -Sed:- (mL/L)	Radiation ()	(	Remarks odor, clarity,	etc.)		
9.5.13	1435	Surge	NA	NA	MA	27.96	7.03	10.8	4.94	>1000	87		Bray C	landy i	uter.		
ľ	1510	Pinn	29.68	loget but u									1	•			
	1540	Pump			700ml/m	25.71	7.10	11.6	11.6	295	45		Slight	ly Gray			
	1545	1			800 N/m	25.14	1.78	12.0	4.44	177	64		Shielt Q	is class	1 to Clear		
	1550		28.54		1.54 - 1 - 1	25.05	6.66	12.1	4.74	198	72		Sticht	Guy Ch	bud		
	1555			4 gal pung		24.97	6,63	12.2	4.77	149	76		Very SI	lisht an	is cloud		
	1600		29.07			2496	1010	12:2	3.66	96.8	77		Slight	Glen C	Isuel		
	1605		0.7.01			25.51	6,55	12.1	2.50	53.)	81		Slicht	ang C	bud		
	ILAD		19.28			25.49	6.55	12.2	2.87	32.2	83		Vac. S	Tist + ai	w claud		
	1115		19.39	1 pala		25.49	1052	12.3	8.87	12,9	87		Vera	Stidt a	an dend		
			a ne j	1 7 15		00 .1		10.0					10.12	y g	7		
					I												

Development Criteria:

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

18 total Gals Puzzed.

Page 1 of ____

	Site: 58	LOCID: 35AWW21		Date: 09/04/13 D002CA Recorded By: RC FRO Checked By:							
LOCATION	Project Name: Longhorn Army Ammunition Plant	Project #: 60256135	. 0002GA								
	Water Quality Meter Type/ID #: Nor. bq USZ	21191	Water Level Indicator Type/ID # Sol nst 212050								
EQUIPMENT	Equipment Group:		Equpment Group:								
	Development Equipment: MonSOOn # 02	3834	Equipment Decon.: Alcinor Witer / DI Ribse								
						<u></u>	<u>:.:.:::::::</u>				
	Casing I.D. (in) [a]: 2 *	Unit Casing Volume (gal/lin ft) [b]:	1.39 0.16	1.16							
WELL	Total Well Depth (ft) [d]: 42=83	Water Column Thickness (ft) [d-c]:	8-67 Well Volume (gal) {[d-c] x b}: 1.39								
INFO	Ground Condition of Well: New		Remarks: No P	AO YET							
					<u></u>	<u> </u>	80				
CASING	Casing I.D. (in) [a]: 2"	1.5 / 2.0 2.2	3.0 4.0	4.3	10 15	20	2.6				
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.09 0.16 0.20	0.37 0.65	0.70 1.0 1.0 2.0 2.0							

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	ORV <del>Radiation</del> ( )	Remarks (odor, clarity, etc.)
9. 9. 12	0910	Surre	34.16	NA	NA	S	wing	Proce	ss				Very Gray Silty
110	0933	Surge	-			24.35	551	1.25	5.54	1000+			61055 Btr
	0948	Bedor	= 40.61	62574		23.55	5.91	1.12	5.90	1000+		193	NO Flow Cell
	1075	Sur	35.00	NA	NA	Sur	sine	Proces	5	71000			
	1070	R	-	4 sals		23.69	5.74	0-992	6.47	71000		Z58	NO Flow Cell
	1115	Prince	35.24	Igal	600m/2	~							Hard B Hom
	1120	ling		-		27.39	7.08	0.905	4-21	71000		121	NO Flow Cell
	1125	Rund		-		27.08	8.04	0.935	2.80	71000		131	No Flow Cell
	1130	Pimp	-	1901		24.66	6.33	1-15	3.32	21000		157	Flow Cell
	1125	Ring	37.11	-		23.48	5.79	1.16	3.11	981		167	
N.	LI HO	Ring	-	lact	V	24.88	5.75	1.14	2.71	978		166	
9-4-12	1145	Dung	-	100	(m) la	23.91	5.80	1.15	2.44	860		155	V

Development Criteria:

Õ

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

14.5 gal)

Page 2 of 2

	Site:		58				LocID:	35 A 4	iw21	L.			
LUCATION	Project Nam	e: Longhorn /	Army Ammunit	ion Plant					Project #:				
		,	TOC	/					· · · · · · · · · · · · · · · · · · ·				
Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	Radiation ()	Remarks (odor, clarity, etc.)
9-4-13	1150	Pume	38.19	(	0.6	22.95	5.84	1.13	7.07	440		152	
1	1155	Rimo	-	Igal	6-6	22.28	5.94	1-07	270	NA		157	
	1200	Rimo			06	22.47	600	1-06	2-30	NA		156	/
V	1205	Rump	)	Igal	0.60	22 49	6.03	1-03	2,33	NA		157	
9-4-13	1208	Dei	elon	tos	Comol	tt		-				-	
				MA	hllons	tit	20	Remo	ed				Fairly Clear fook
									<u>.</u>				phito.
													U

**Development Criteria:** 

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

LOCATION	Site: 58	LocID:	LOCID: 35AWW22				Date: 8/30/13					
	Project Name: Longhorn Army Ammunition Plant	0002HA Recorded By: Beesing Checked By:										
	Water Quality Meter Type/ID #: Solvest	Water Level Indicator Type/ID #. Solinst Model 101										
EQUIPMENT	Equipment Group:	Equpment Group:										
EQUIPMENT WELL INFO	Development Equipment: MONSCON OUND		Equipment Decon.:									
14751	Casing I.D. (In) [a]: Z 11	Unit Casing	Unit Casing Volume (gal/lin ft) [b]:				Initial Depth to Water (ft) [c]: 31.95 TOC					
INFO	Total Well Depth (11) [d]: 37,73 To L	(ft) [d-c]:	5,78 Well Volume (gal) ([d-c] x b):									
	Ground Condition of Well:	Remarks:										
CASING	Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0	
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6	

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTV)	Sed. (mL/L)	Radiation ( )	Remarks (odor, clarity, etc.)
8-30-13	0850	SVER	33.03	1.5		21.93	6.52	9.38	5.32	63)			
8-30-13	0835	bail	34.10	3.5		22.41	6.50	9.47	5.11	282.5			
8-30-13	1000	buil	34.95	4.5		33.0	6.46	9.47	4.59	250,0			
8-31-13	0835	Puns	3250	9.5	1	21.10	6.14	9.78	4.58	133.8			(e)
8-31-13	0845	Punp	36.50	12	15	21.00	6.20	9.70	4.50	45,1			
8-31-13	0855	Puno	31.25	14.5	15	21.08	6,17	9.65	4.47	21.2			
8-31-13	0900	Puno	37.40	17.0	15	21.15	6.15	9.68	4.40	22.0			
8-31-13	0905	Rug	37.50	19,5	.15	21.06	6.18	9.62	4.36	20,9			
	( <b>3</b> )-						÷						
Development Crit	l teria:	1) sediment	<0.75 mL/L, 2)	urbidity within	10 NTU range	for 30 minute	es 3) +/-0.5	C +/- 0 1 pH	+/- 3 % 0000	Luctivity +/- 1		consocutive read	

1) sediment <0.75 mL/L, 2) turbldity within 10 NTU range for 30 minutes, 3) +/-0.5 C, +/-0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

4) remove water added during drilling and construction

. age 1 of ____


### MONITORING WELL DEVELOPMENT FORM

1 OCATION	Site:	LociD:	
	Project Name: Longhorn Army Ammunition Plant	Project #:	

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	рН	Conduc- tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	Radiation ( )	Remarks (odor, clarity, etc.)
						1							
							-						
					M								

Development Criteria:

1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND

4) remove water added during drilling and construction

**APPENDIX E: Groundwater Sampling Forms** 

# MONITORING WELL SAMPLE COLLECTION FORM

Page 1 of ____

	Site: 58					LociD: 35AV	VW08	2			Date: 2	81201	12		
LOCATION	Project: Longho	orn Army Ammun	ition Plant			Project No. 6	60274185.0002	HA			Recorded By:	Beesinger	-	Checked By:	
						harden lederfor	- Dreho:	Mater Lough In	dicator I D #	611/ces/ceur	Min Recharge	level = (TD-D)	TW(0.80)) - T	D	
	Water Quality Me	ter Type/ID #:	Horiba U-52			vvater internac	e Probe.	Desisteltis/Diad	der/Poiler				111(0.00)/		
	Unit #	21191				Sampling Equ	ipment	Peristaltic/Blad	del/baller	IU#. D	Aller		-		
		. 21				Statia Water I	ovol Reading (	(f) (c):	9.00		Weather Conditions: CIGAR 720F				
WELL	Casing I.D. (in) [a		270	0		State Water Lover reading (i/ 6).				Condition of W	ell/Remarks:	A144	NS OF	2 int	
	Total Well Depth	(ft) [d]: >	5.50	)		Screened mite	avairump plac		- 20		Condition of 14		0 4 4 4	p2 020	2 11/2
CASING	Casing I.D. (in) (a	al:			0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
INFO	Unit Casing Volu	me (gal/lin ft) [b]:			0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6
					1	T				1					
		Water	Pumping					Test	000	Tatal Ca	Formation Fo	Eorrio Eo		_	
	Time	-11	Cond		IURD. (NITLI)	(mv)	(mg/l)	(ma/L)	(ma/L)		Rema (odor, cla	arks rity, etc.)			
Date	(24 hr)	(FIOC)	(mt/min)	(*C)	рп	(µə/cm)	(ilig/L)	(110)	(),,,,	(	(	(3/			
2-20-13	0800	29.00											Bail	(1) [.	75 11/10
5-20-13	0810	33.25										DHIT	ep [ ]	S Gerian	
													oct	N DRY	
									_					1	
530							-								
3-20-13	(130	29.00		23.44	6.05	8.23	9.84	26.9	112		0.52				
	A CONTRACTOR														
													ļ		
		i ii	·												
							1								
										1	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.				
D-( 0.1	E Limin Derunder		remente: 2.5 min	Stabilization	+/-10% C +/-0	1 pH, +/-3% C/	ond, +/-10% DC	), +/-10%Turb(<	=10 NTU Ideal	), for 4 consecu	I utive readings		1		
Imp Kate: <=0.		M. SU JOIN MOUSU		· 1/5	No Contain	ars//olumo/T	/ne		Preserv.	Filter (Y/N)	Pump OR Ba	ailer	Parameter	(s)	
AMPLEID:	SHWWE	0-0820		1130	No. Contalli	ciarvolume/1	160			1					
		0													
ATDIX ODIKE		NO													
ATRIX SPIKE	(NIS): TES/NU	NONO													
AT KIA DUPLIL	DATE (NID): TEO/														
	co-	I E1 =	OXY=	H2S=											
		LLL-	0/1-	1120-	1						-				Page

#### MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58	LocID: 35AWW09	Date: 8/29/2013				
LOOATION	Project: Longhorn Army Ammunition Plant	Project No. 60256135,0002HA	Recorded By: Beesinger Checked By:				
		and inte					
FOLUPMENT	Water Quality Meter Type/ID #: Horiba U-52	Water Interface Probe: Water Level Indicator I.D.#	Min Recharge Level = (TD-DTW(0.80)) - TD				
	Unit # 21191	Sampling Equipment: Peristaltic/Bladder/Bailer ID#: MP	-BOIK-YP				
			Contract AUXER Law 115 1				
WELL	Casing I.D. (in) [a]: 2"	Static Water Level Reading (ft) [c]: 42.18	Weather Conditions: CIGAR 93°F				
INFO	Total Well Depth (ft) [d]: 3].85	Screened Interval/Pump placement: 24.6 - 39.2 35.02	Condition of Well/Remarks: NGW WALL NEGDS PA into				
CASING	Casing I.D. (in) [a]: 0.75	1.5 <b>2.0</b> 2.2 3.0 <b>4.0</b>	4.3 5.0 6.0 7.0 8.0				
INFO	Unit Casing Volume (gal/lin ft) [b]: 0.023	0.09 0.16 0.20 0.37 0.65	0.75 1.0 1.5 2.0 2.6				

	Time	Water	Pumping	T			50	Turk	000				
Date	(24 hr)	(FTOC)	(mL/min)	(°C)	pН	Cona (μS/cm)	(mg/L)	(NTU)	(mv)	(mg/L)	Ferrous Fe (mg/L)	Ferric Fe (mg/L)	Remarks (odor, clarity, etc.)
8-29-13	1025	31.87	100	32.79	7.32	6.51	2.88	73.7	104				
8-29-13	1030	31.88	100	30.88	6.38	6.83	2.57	67.1	99				
8-29-13	1035	31.89	100	29.40	6.35	6.90	2.11	59.4	100				
8-29-13	1040	31.90	100	29.16	6.32	6.98	1.89	52.9	106				
8-29-13	1045	31.91	100	2935	6.30	7.08	1.85	38.1	108				
8-29-13	1050	31.92	100	28.43	6.29	7.14	1.80	27.5	109				
8-29-13	1055	31.93	100	28.35	6.29	7.16	1.75	23.2	109				
8-29-13	1100	31.94	100	28.25	6.29	7.17	1.74	19.4	109				
8-29-13	1105	31.95	100	28.13	6.31	7.20	1.71	21.0	109				
8-29-13	1110	31.96	100	27.83	6.31	7.20	1.67	21.0	109				
8-29-13	1115	31,97	100	27.80	6.32	7.20	1.65	21.2	108				
8-29-13	1/20	31.98	100	\$7.75	6.32	7.21	1.64	20.9	108				
8-29-13	1325	31.99	(00)	27.73	6.32	7.20	1.63	20.8	108				
8-29-13	1130	32.00	100	27.70	6.32	7.20	1.62	208	108				
9-24-13		-		<b>—</b>	0				- CAR				

SAMPLE ID: 35AWW09-082913	TIME: 130	No. Containers/Volume/Type	Preserv. Filter	r (Y/N) Pump OR Bailer	Parameter(s)
		4- 500 and Plastic	NA N	1 Punp	DHC & DHB
		1-Soom Plastic	TALACE NADAL	N Pup	Suffice
		1-250 mil Am BER	173P04 1	V Pup	VFA
MATRIX SPIKE (MS): YES/NO		1-250 ml AMBER	NA A	V Pup	FARROUS JEW.
MATRIX DUPLICATE (MD): YES/NO		1-250ml plastic	HN03	Y Puns	Dissopras metals
		1-250 ml plastic	ANO3 Y	Y Puip	TOTAL metals
CO= LEL=	OXY= H2S=	1-250 ml plastie	NAX	V pup	ALKATINITY
AECOM	MO	NITORING WELL SAMPLE COL	LECTION FC	ORM	Page 2 of 2
			SEE	e back	

N pup TOCA TOTAL phonphoreous N pup Anions 1-250 ml plastic H2504 1-250 ml plastic NA N pup N pup VOC HCL 3-40ml glass GASES v bmb 3-20ml glass NA Carbon DioxiDa pap 3= 20 mlglass N MA

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### MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58	LocID: 35AWW10		Date: 8/29/2013					
	Project: Longhorn Army Ammunition Plant	Project No. 60256135	DOODHA	Recorded By: Beesinger	r (	Checked By:			
		CASSING SA			COLON /	AR LARA S			
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52	Water Interface Probe: Water Level Indicato	I.D.# Solins	Min Recharge Level = (TD-DTW(0.80)) - TD					
	Unit # 21191	Sampling Equipment Peristaltic/Bladder/Ba	iler ID#: No. 5	ok.4P					
						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
WELL	Casing I.D. (in) [a]: 2"	Static Water Level Reading (ft) [c]: 19.75		Weather Conditions: (L4AV 80 F					
INFO	Total Well Depth (ft) [d]: 33.6/	Screened Interval/Pump placement: 16.1 - 30.7	24.00	Condition of Well/Remarks:	WALL	NIGEDS DOLL			
							No cos perio		
CASING	Casing I.D. (in) [a]: 0.75	1.5 2.0 2.2	3.0 4.0	4.3 5.0	6.0	7.0	80		
INFO	Unit Casing Volume (gal/lin ft) [b]: 0.023	0.09 0.16 0.20 0	37 0.65	0.75 1.0	1.5	2.0	2.6		

Page 1 of ____

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (µS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Total Fe (mg/L)	Ferrous Fe (mg/L)	Ferric Fe (mg/L)	Remarks
8-29-13	0830	19.80	100	27.19	6.71	1.34	6.70	2.9	133				
8-29-13	0835	19.83	100	26,59	6.61	1.34	6.58	3.2	128				
8-29-13	0840	19,85	100	26.01	6.T1	1.35	6.41	2.5	114				
8-29-13	0845	19.87	100	25.98	6.88	1.35	5.86	2.2	99				
8-29-13	0850	19.89	100	26.18	6.93	1.34	5.84	2,1	96				
8-29-13	0855	19.91	100	26.51	6.91	1.37	5.74	1.9	97				
8-29-13	0900	19.93	100	26.67	6.92	1.38	5.65	1.7	97	1			
8-29-13	0 905	19.95	100	24.74	6.92	1.39	5.68	1.5	96				
8-29-13	0910	19.97	100	24.77	6.92	1.39	5.69	113	910				

SAMPLE ID: 35AWW	10-082913	TI	ME: DGID	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
				4- SOO nal plastic	NA	N	Pump	DHC & DHB
				1- Soo me plastic	THACE NA	OH N	Pup	Sulfide
DUPLICATE (D): YES/NO	00			1-250 ml puber	H3PO 4	N	Pup	VEA
MATRIX SPIKE (MS): YES/	NO NO			1-250 mil Amber	NA	N	Punp	Ferrous
MATRIX DUPLICATE (MD):	YES/NO NO			1-250 ml plastic	NN03	Y	Pup	Piscolved metals
				1-2001 plastic	NA .	N	Pup	TOTAL metals
CO=	LEL=	OXY=	H2S=	1-250WI plastic	172504	0	Pu	TYPE & TETAL Phenchorous
AECOM			MON	NITORING WELL SAMPLE (	OLLECTION	FORM	0	Page 2 of 2

N Pup ANIONS 1-250 ml plastie NA N pup VOC N pup GASAS N pup CANDON DIOXIDA 3- 40 ml glass Hel 3- 20 m) glass NA NA 3- 20ml glass

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#### MONITORING WELL SAMPLE COLLECTION FORM

Page	1	of	
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	Site: 58					LocID: LHSMW04					Date: 🔰	3120	15		
LOCATION	Project: Longho	orn Army Ammu	nition Plant			Project No. 6	60274185.000	2HA			Recorded By:	Beesinger		Checked	I Ву:
	r									0441	L.C. Destant	Level - (TD D	TM(0.00))	rD.	
EQUIPMENT	Water Quality Me	eter Type/ID #:	Horiba U-52			Water Interfac	e Probe:	Water Level Indi	cator I.D.#	b11/ces/cevr					
	Unit #	21191		_		Sampling Equ	iipment:	Peristaltic/Bladd	er/Baller		1000				
	Casing LD. (in) is					Static Water I	evel Reading	(ft) [c]: D	0.1		Weather Conditions: CIGAR 70°F				
INFO	Total Well Denth	(ff) [d]: 2	0.15			Screened Inte	rval/Pump pla	cement:	-9		Condition of W	ell/Remarks:	X16	4DS	DAINT
	Total Weil Deput	(14) [0].	0115	1. 11. Sal								N.C.	00 -		
CASING	Casing I.D. (in) [	a]:			0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
INFO	Unit Casing Volume (gal/lin ft) [b]: 0.023					0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6
	1				1	1				1					
	Time		Cond		Turb	ORP	Total Fe	Ferrous Fe	Ferric Fe			D			
Date	(24 hr)	(FTOC)	(mL/min)	(°C)	pH	(μS/cm)	(mg/L)	(NTU)	(mv)	(mg/L)	(mg/L)	(mg/L)		(od	tor, clarity, etc.)
	(=,	(		<u> </u>											
		N													
			$\cap$	1		1.15.17									
					1)7										
							-								
	6												Í.		
	1		1												
	1														
				· · · · · · · · · · · · · · · · · · ·											
Pump Rate: <=0.	.5 L/min Drawdow	/n: <0,33 ft Measu	rements: 3-5 min	Stabilization:	+/-10% C, +/-0.	1 pH, +/-3% Co	ond, +/-10% DC	), +/-10%Turb(<=1	IO NTU ideal	), for 4 consecu	itive readings		5		
SAMPLE ID:			TIME:		No. Containe	ers/Volume/Ty	pe	F	Preserv.	Filter (Y/N)	Pump OR Ba	iler	Parameter	s)	
DUPLICATE (D)	): YES/NO								_					_	
MATRIX SPIKE	(MS): YES/NO														
MATRIX DUPLI	CATE (MD): YES	NO													
	<u> </u>	+ = 1 -	077-	H2S-										_	
				120-			SAMD		ECTIO	NEODM	1		1		Page 2

#### MONITORING WELL SAMPLE COLLECTION FORM

Page	1	of	_
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	Site: 58					LocID: 03W	W01				Date:	8/20	13		
LOCATION	Project: Longh	iorn Army Ammu	nition Plant			Project No. 60274185.0002HA Recorded By: Bees					: Beesinger		Checked B	y:	
EQUIPMENT	Water Quality M	eter Type/ID #:	Horiba U-52			Water Interface Probe: Water Level Indicator I.D.# 611/ces/cevr						Levei = (TD-I	OTW(0.80)) -	TD	
	Unit #	21191				Sampling Equ	Sampling Equipment: Peristaltic/Bladder/Bailer ID#: TAAILEF								
	Cosing I.D. (in)					Chatia Water	ousl Deadles	(A) (a)	4.02		little ath an Onne	ne	160.0	-1-	0-
INFO	Total Woll Dopth					Static Water	_ever Reading	(it) [C]: ~	1105		Ceedition of M		PAR	15	P
			5.35			Screened inte	aivai/rump pia	idement.	1.1			ven/rtemarks.	WEU	D> 120	imt
CASING	Casing I.D. (in) [	[a]:			0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
INFO	Unit Casing Volu	ume (gal/lin ft) [b]:			0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6
	1			r			r			1	r		í		
		Water	Pumping												
Date	(24 hr)	Level (ETOC)	Rate (ml./min)	Temp.		Cond	DO (mg/l.)	Turb.	ORP (m)()	Total Fe	Ferrous Fe	Ferric Fe		Re	emarks
A 2012			(me/mm)		рп	(µorcin)	(mg/c)	(110)	(1114)	(ingre)	(ing/c)	(ing/iii)		(odor,	clarity, etc.)
O Dolly	OR ST	29.05											D.	1.1.1	Dealling
gon;	1000	22,20									-		P	len	2 quillans
													10	TN PI	n
											-				
							1								
8-20-12	1445	70.25	-	26.10	6.18	3.64	9.11	33.0	240		0.78				
0019		4.22			VII V	12.01	- · · · ·	27.0			0110				
	abr -														
									L					8	
						L									
Pump Rate: <=0	5 L/min Drawdow	n: <0,33 ft Measur	ements: 3-5 min	Stabilization:	-/-10% C, +/-0.	1 pH, +/-3% Co	nd, +/-10% DO	, +/-10%Turb(<	=10 NTU Ideal) I_	, for 4 consecu	itive readings		1-		
SAMPLE ID: C	Suno	1-08201		1445	No. Containe	rs/Volume/Ty	pe		Preserv.	Filter (Y/N)	Pump OR Ba	iler	Parameter(	s)	
	: YES/NO														
MATRIX SPIKE	(MS): YES/NO														
	CATE (MD): YES/	NO													
	CO=	LEL=	OXY=	H2S=											
AECO	м			MON	ITORIN	<b>G WELI</b>	SAMP	LE COL	LECTIO	<b>VFORM</b>					Page 2 of

### MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58	LociD: 35Aww01 Date: 101113	Date: 10 113 Recorded By: Scott Beesinger Checked By:					
	Project: Longhorn Army Ammunition Plant	Project No. 60256135.0002HA Recorded By: Scott Beesinger Checked By:						
2 / A A3			1.00					
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52	Water Interface Probe: Water Level Indicator ID# Solinist 101 Min Recharge Level = (TD-DTW(0.80)) - TD	-					
	Unit # 21191	Sampling Equipment: Peristaltic/Bladder/Bailer ID#:						
	trained and the second s		1					
WELL	Casing I.D. (in) [a]:	Static Water Level Reading (ft) [c]: 40,58 Weather Conditions: CIGAR 71°F						
INFO	Total Well Depth (ft) [d]: 72,58	Screened Interval/Pump placement: 62.45-72.45 67.50 Condition of Well/Remarks: NEEDS PAINT						
CASING	Casing I.D. (in) [a]: 0.75	1.5 2.0 2.2 3.0 4.0 4.3 5.0 6.0 7.0 8.0	_					
INFO	Unit Casing Volume (gal/lin ft) [b]: 0.023	0.09 0.16 0.20 0.37 0.65 0.75 1.0 1.5 2.0 2.6						

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/mln)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor.clarify.atr.)
10-11-13	0955	40.58	100	22,49	6.87	0.612	2.55	862	145	(cost) and (cost)
10-11-3	1000	40.59	100	22.74	6.87	0.606	1,62	766	106	
10-11-12	1005	40.60	100	23.05	6.98	0.602	1.34	452	70	
10-11-13	1010	40.61	100	23.29	7.02	0.597	1.20	336	52	
10-11-13	1015	40.61	100	23.58	7.04	0.594	1.15	266	41	
10-11-13	1020	40.61	100	23.90	7.06	0.591	1.10	216	36	
10-11-13	1025	40.62	100	24.28	7.06	0.589	1.06	197	33	
10-11-13	1030	40,62	100	24.56	7.07	0.585	1.01	180	31	
10-11-13	10 35	40.62	100	24.98	7.07	0.584	0.97	167	30	
10-11-13	10 40	40.62	100	25.19	7.08	0.581	0.93	160	29	
10-11-13	1045	40.63	100	25.46	7.08	0.578	0.88	131	27	
10-11-13	1050	40.63	100	25.50	7.08	0580	0.87	132	26	
10-11-13	1055	40.63	(00)	25.55	1.08	0.577	0.87	130	24	
10-11-13	1100	40,63	100	25,58	7.08	Q576	0.85	131	23	
-	-									

SAMPLE ID: 35AWW01-10113		No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Baller	Parameter(s)
	·	3- 40 ml glass	HEL	N	Run	BROWS VOC
DUPLICATE (D): YES/NO NO		0			U	
MATRIX SPIKE (MS): YES/NO NO MATRIX DUPLICATE (MD): YES/NO NO					0	
CO= LEL= OXY=	H2S=					

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#### MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58	LocID:	35A1	NWOJ	-		Date:	Date: 10/22/13					
LOOKIION	Project: Longhorn Army Ammunition Plant		Project No. 60256135.0002HA						Recorded By: Scott Beesinger Checked By:				
									cultur seles		12		
FOUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	Solinist 101	Min Recharg	e Level = (TC	)-DTW(0.80))	- TD					
	Unit # 21191		Sampling Equ	ID#:									
		-									307 I.	- THE CONTRACTOR	
WELL	Casing I.D. (in) [a]: 4 ··	Static Water L		Weather Conditions: CIERR 650F									
INFO	Total Well Depth (ft) [d]: 139, 83		Screened Inte	131.00	Condition of Well/Remarks: NEEDS PAINT								
					Sec. Sec.	June 100			Land E.				
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0	
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6	

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor, clarity, etc.)
10-22B	1300	42.31	100	23.78	7.76	1.00	4.14	4.7	120	
10-22-13	1305	42.33	100	22.96	8.10	0.962	1.31	8.5	112	
10-22-12	1310	42.35	100	22.85	8.13	0.955	2.04	28.1	109	¥.
10-22-13	1315	42.36	100	22.78	8.13	0.911	1.73	9.0	107	
10-22-13	1320	42.37	100	22.72	8.14	0.878	1.54	9.9	102	
10-22-13	1325	42.38	100	22,81	8.13	0.877	1.36	7.7	100	
10-22-13	1330	42.39	100	22,79	8.12	0.876	1.35	7.9	99	
10-22.13	1335	42.40	100	22.75	8.12	0.876	1.32	7.1	98	
10-22-13	1340	42.41	100	22.72	8.12	0.875	1.30	7.3	98	
17.a - 27						10.07.00	10.00			

SAMPLE ID: 354 WW02-107-12TIME: 1340	No. Containers/Volume/Type	Preserv.	Fliter (Y/N)	Pump OR Bailer	Parameter(s)
	3-40 ml glass	ACL	N	Pup	SECON-GHUS VD /
DUPLICATE (D); YES/NO VOO MATRIX SPIKE (MS); YES/NOVOO					
MATRIX DUPLICATE (MD): YES/NO NO					
CO= LEL= OXY= H2S=					

### MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58		LocID:	354	WW	05		Date: 10/16/13						
	Project: Longhorn Army Ammunition Plant		Project No.	60256135.0	0002HA			Recorded By: Scott Beesinger Checked By:						
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52	the second second	Water Interfac	ce Probe:	Water Level Ir	ndicator ID#	Solinist 101	Min Rechard	ie Level = (T	D-DTW(0.80)) -	TD			
	Unit # 21191		Sampling Equ	ipment:	Peristaltic/Blac	dder/Bailer	íD#:							
WELL	Casing I.D. (in) [a]:	28	Static Water L	evel Reading	(ft) [c]:	13.70		Weather Co	nditions:	Raid	120F			
INFO	Total Well Depth (ft) [d]: 71.75		Screened Inte	erval/Pump pla	cement: 6)	-71	66.00	Condition of	Well/Remark	s: Nee	dspa	int		
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	2.2	3.0	4.0	4.3	50	60	70	80		
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6		

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рH	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP	Remarks
10-16-13	1305	43.75	100	20.13	7.30	2.70	2.29	43.1	-127	(odor, clenty, etc.)
10-16-13	1310	43.76	100	20.48	7.21	273	1.57	21.8	-145	
10-16-13	1315	43.77	100	20.60	7.19	2.74	1.33	29.4	-148	4
10-16-13	1320	43.78	100	20.71	7.17	2.76	1.16	285	-149	
10-16-13	1325	43.79	100	20.75	7.15	2.80	1.05	26.3	-148	
10-16-13	1330	43.80	100	20.79	7.12	2.84	0.94	31.2	-147	
10-16-13	1335	43.81	100	20.89	7.09	2.87	0.89	31.4	-146	
10-16-13	1340	43.82	100	20.90	7.07	2.91	0.83	29.8	-145	
6-16-13	1345	43.83	100	20.88	7.04	2.94	0.80	27.7	-143	
10-16-13	1350	43.84	100	21.01	7.01	2.98	0.75	24.3	-143	
10-16-13	1355	43.85	100	21.04	6.99	3.00	0.72	21.4	- 142	
10-16-13	1400	43.86	100	21.03	6.97	3.02	0.70	16.5	- 140	
10-16-13	1405	43.87	100	20.96	6.96	3.03	0.69	16.8	-140	
10-16-13	1410	43.88	100	20.96	6.96	3.04	0168	16.3	-140	
10-16-13	1415	43.89	100	21.05	6.95	3.05	0.67	16.9	-141	
			_						10000	

SAMPLE 10: 35700005-101613	TIME: 1415	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Baller	Parameter(s)
		3-40mlaless	HCL	N	Pump	SECONS VDC
		0	2		V	
MATRIX SPIKE (MS): YES/NO NO						
CO= LEL= OXY=	H2S=					

### MONITORING WELL SAMPLE COLLECTION FORM

Page 1 of	_
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	Site: 58	LociD: 3	S5HI	NUMO	6		Date: 1	Date: 10/15/13						
LOOKIION	Project: Longhorn Army Ammunition Plant		Project No. 60256135.0002HA						Recorded By: Scott Beesinger Checked By:					
		2010				24 S S S S	with flatter 3	a Sava						
FOUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	e Probe:	Water Level I	ndicator ID#	Solinist 101	Min Recharg	e Level = (TD	DTW(0.80))	- TD			
	Unit # 21191	Sampling Equ	ipment:	Peristaltic/Bla	dder/Bailer	ID#:								
						dille		-Xelline	14.448	10.00	1.000	an a she and the spice		
WELL	Casing I.D. (in) [a]: 4 🔨	Static Water L	evel Reading	(ft) [c]: 1	1.50		Weather Cor	nditions: /	low	1Dain-1	e 8100			
INFO	Total Well Depth (ft) [d]: 30,33	Screened Inte	ed Interval/Pump placement: 17-27 24.00					Condition of Well/Remarks: Needs against						
and the			and the						ve	1.1.1.1		ter a P		
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0		
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6		

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (ml./min)	Temp.	nH	Cond	DO (mg(l.)	Turb.	ORP	Remarke
10 10-17	0075		(112)010	22.11		(morein)		(NIU)	(mv)	(odor, clarity, etc.)
10-13-13	0465	31-54	100	02.11	4.14	6.41	4.20	2.8	140	
10.15-15	0450	31.56	100	21.47	6-68	6.84	2.55	0.5	101	
10-15-13	0435	21.58	100	21.15	6.61	6.88	1.73	0.0	84	
(0.15·B	0940	21.60	100	21.03	6.57	6.84	1.44	0.0	86	
10-15-13	0945	21.63	100	21.03	6.55	6.79	1.26	0.0	89	
10-15-13	0450	21.65	100	21.02	6.54	6.77	1.19	0.0	9Ż	
10-15-13	0955	21.67	100	21.22	6.54	6.75	1.13	0.0	94	
10-15-13	1000	21.69	100	21.33	6.56	6.72	1.08	0.0	96	
10-15-13	1005	21.72	100	21.37	6.56	6.73	1.07	0.0	97	
10-15-13	1010	21.74	100	21.39	6.56	6.73	1.05	0.0	96	

SAMPLE ID: 35740006-101513		513	TIME: 10 10	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Baller	Parameter(s)
				3-40 ml glass	HEL	N	Rup	B260B SIMS UP C
	No			3-20 ml glass.	Her	N	N.	GASES.
DUPLICATE (D): YES/NO				1-500 m1 plastic	ZA ACEMOOI	IN	- N	SULFide
MATRIX SPIKE (MS): YESINO 杺 🕅 MATRIX DUPLICATE (MD): YESINO 🔊			1-250 M Amber	NA	N	in in its	Ferrous IRON	
			1-250 ml plastio	HN03	V	L K	Dissolved metals	
				1-250 mlplastic	HN03	Ň	61	total metals
CO=	LEL=	OXY=	H2S=	1-250 mplastic	PocsH .	N	×v.	TOC. & TOTAL DUESDALE TOUS
				1-250 mi plastic	MA	N	J.	ANIONS
				1-250 n1 plastru	NA	N	V _V	Alkalimity

ASCOM

# MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58	LocID: 2	SAW	w 07	R		Date:	0/16	13					
	Project: Longhorn Army Ammunition Plant		Project No.	60256135.0	0002HA			Recorded By: Scott Beesinger Checked By:						
. U. HE WE		2	1 30 St.		nie witch i	HZ CONTROL								
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	ce Probe:	Water Level In	dicator ID#	Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD						
	Unit # 21191		Sampling Equ	uipment:	Peristaltic/Blac	lder/Bailer	D#:							
		400					100		DILL STOR		164	All and a start of the		
WELL	Casing I.D. (in) [a]: 311	Static Water I	evel Reading	(ft) [c]: 2	7,90		Weather Conditions: PAINT 1-40F							
INFO	Total Well Depth (ft) [d]: 🔧 3こ・33		Screened Inte	erval/Pump pla	cement: 19,	7-29.4		Condition of Well/Remarks: GOOD						
		Lynnine in	EL SY	and Billie.				Late 1						
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0		
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0,75	1.0	1.5	20	26		

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor, clarity, etc.)
10-15-13	0755	27.90	NA							Only 4.4 ft water BAIling well
10-16-13	0808	32.28	NA							Bailed 3gallons RANDRY
10-16-13	1455	27.90	NA	20,83	7.54	0.205	8.86	197	108	
						7				

AMPLE ID: 35 AWW 07R-10163	TIME: 1455	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
		3-40 ml glass	Her	N	Bailer	82608-81MG_VOL
DUPLICATE (D): YES/NO NO MATRIX SPIKE (MS): YES/NO NO MATRIX DUPLICATE (MD): YES/NO NO						
CO= LEL= OXY	= H2S=					

### MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58		LocID:	35Au	WO8			Date: 10 / 9/13 Recorded By: Scott Beesinger Checked By:						
LOOATION	Project: Longhorn Army Ammunition Plant		Project No.	60256135.0	002HA									
		1 1 1												
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	ce Probe:	Water Level Ir	dicator ID#	Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD						
	Unit # 21191		Sampling Equ	lipment:	Peristaltic/Bla	dder/Bailer	1D#:							
					11.1	200		in the second	916 m 1	1.1	- 66° (1			
WELL	Casing I.D. (in) [a]:		Static Water L	evel Reading	(ft) [c]:	8.20		Weather Cor	ditions: 🥐	IGAR	Mag	P		
INFO	Total Well Depth (ft) [d]: 33, 30		Screened Inte	erval/Pump pla	cement: 20	-30		Condition of Well/Remarks: Need & OB and						
	24-1										-			
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0		
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6		

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/mln)	Temp. (°C)	pН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor, clarity, etc.)
10-9-13	335	29.80	NA					P-11		Only 3.5 Hudder Bailing well
10-4-13	1395	33.20	NA							BRILED 1.5 GULLONG RAN DDY WATER is BLACK IN COLOR
10-10-13	0800	29.80	NA	16.82	6.70	47.7	9.57	4.1	-100	water is Black in color

SAMPLE ID: 35AWW	MPLE ID: 35AWW08-101013		TIME: 0800	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
				3-40ml glass	HCL	N	Bail	122000 SINS \/D C
	NO			3-20 ml glass	Hel	N	1 0	GAASES
DUPLICATE (D): YES/NO	PLICATE (D): YES/NO			2-1 Liter plastic	NA	54	N	DHCEDHB
MATRIX SPIKE (MS): YES/I				1-500 ml plassic	ZNAGENADH	N	11	Sul tide
MATRIX DUPLICATE (MD):				1-250 ml plastic	HND3	1	- VV	Dissolved metals
				1-250 ml plastic	HN03	N	ч	POTO/ metals
CO=	LEL=	OXY=	H2S=	1-250 ml 1-2+5410	H2504	N	st	TPC & TOTAL PHOSPHOROUS
				+250 mi plastic	NA	N	U'L	Anionis.
				1-250 ml plastic	NA	N	N. W.	ALKATINKY

### MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58	LocID;	35A	wwo			Date: 1	Date: 10/10/13						
	Project: Longhorn Army Ammunition Plant	Project No	o. 60256135.0	0002HA			Recorded B	y: Scott B	eesinger		Checked By:			
EQUIDMENT	Water Quality Meter Type/ID #: Horiba U-52	Water Inte	rface Probe:	Water Level In	idicator ID#	Solinist 101	Min Rechard			TD				
EQUIPIRENT	Unit # 21191	Sampling I	Equipment:	5-0100(0.00))	- 10									
WELL	Casing I.D. (in) [a]: 7.1	Static Wate	er Level Reading	(ft) [c]: 32	71		I Wasther Cor	attioner.	C 16 0	2	7005			
INFO	Total Well Depth (ft) [d]: 42.00	Screened	- 36.0	Condition of Well/Remarks: 6 190D										
CASING	Casing I.D. (in) [a]:	75 15	20	22	30 1	4.0	1 42 1	5.0			a di Maji			
INFO	Unit Casing Volume (gal/lin ft) [b]: 0.	023 0.09	0.16	0.20	0.37	0.65	0.75	5.0	6.0 1.5	7.0	8.0			

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/mln)	Temp. (°C)	рH	Cond (mS/cm)	DO (ma/L)	Turb. (NTU)	ORP (mv)	Remarks
10-10-13	1010	32.23	100	18.87	5.51	7.47	2.98	211	164	(dadr, clanty, etc.)
10-10-13	1015	32.24	100	19.03	5.41	7.51	1.51	113	170	
10-10-13	1020	32.25	100	19.18	5,43	7.67	2.17	83.4	176	1
10-10-13	1025	32.26	100	19.29	5.43	7.70	2.03	65.5	179	
10-10-13	10 30	32.27	100	19,40	5.42	7.72	1.86	58.5	181	
10-10-13	1035	32.28	100	19.41	5.42	7.73	1.72	53.3	182	
10-10-17	1040	3229	100	\$9.51	5.42	7.72	1.64	51.8	183	
10-10-13	10 45	32:20	100	19.57	5.42	7.71	1.59	40.1	183	
10-10-13	1050	32.31	100	19.61	5,43	7.69	1.57	40.3	182	and a second
10-10-13	1055	32.32	100	19.66	5.43	7.69	1.55	40.6	182	
10-10-13	1100	32.33	100	19.67	5,43	7.68	1.53	40.5	182	
					- 14 - 14 - 14 - 14 - 14 - 14 - 14 - 14				· · · · · · · · · · · · · · · · · · ·	

SAMPLE ID: 35AWW09-101013	TIME: 1100	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
		3-40 ml glass	HLL	R	Rup	SZEGERALIWS VOC
110		3-20ml glass	NU	N	11	GASES
		2-1 Liter Flastic	NA	て	11	DHLYDHR
MATRIX SPIKE (MS): YES/NO N'U		1- Somni plastic	ZNACEN ADOI	+ +3		sulfide
		2-250 ml Ambur	NA /NSPOY	N		Ferrous / VFA
		1-250 ml plasti	HN03	y	N	Rissolved Netals
CO= LEL= OXY	′= H2S=	não miplestiu	12NO3	1.4	11	Torpi nutale
		1-25Unipurstic	\$2304	N	¢(	tor & JETHI Dhosphorus
		1-2 SOME DIESTIC	NA	AI	V.	PtKiletin fu

### MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58		LocID:	35AU	NWID			Date:	0/10	113			-	
	Project: Longhorn Army Ammunition Plant		Project No.	60256135.0	002HA			Recorded By: Scott Beesinger Checked By:						
	Water Quality Mater Type//D# Horiba 11.52		Mater Interfer	- Decker							li e			
EQUIPMENT	Unit # 21191		Sampling Fou	inment:	Peristaltic/Blac	Idicator ID#	Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD						
			Teambung Edo	aprilent.	T GHALAILO/DIAC		L/#.	the second	"Indiana"	e i de la come			_	
WELL	Casing I.D. (in) [a]: 2 11		Static Water L	evel Reading (	(ft) [c]: 🏼 🌙	0.15	73	Weather Cor	ditions:	CIGA	2 80	OF		
INFU	Total Well Depth (ft) [d]: 33, 18		Screened Inte	erval/Pump plac	cement: 1 6.	1-30,7	2	Condition of	Well/Remarks	600	D			
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	70	80	1	
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6	_	

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor, clarity, etc.)
10-10-13	1315	20.10	100	25.73	6.47	0.423	7.51	22.3	212	
10-10-13	1320	20,12	100	25,27	6.24	0.381	6.23	13.3	325	
10-10-17	1325	20.14	00	25,19	6.20	0.362	6.00	1.1	364	3
10-10-13	1330	20.16	100	25.24	6.15	0.341	5.86	12.8	392	
10-10-13	1335	20.18	100	25.23	6.11	0.326	5.62	6.4	409	
10-10-13	1340	20,20	100	25.28	6.09	0.319	5.40	6.8	418	
[0-10-13	1345	20.22	100	25.30	6.09	0.320	5.38	5.9	418	
10-10-13	13.50	20,24	100	25,38	6.0	0.321	5.39	5.7	419	
10-10-13	1355	20.25	100	25.39	6.10	0.321	5.37	5.4	420	
10-10-13	1400	20.28	100	25.41	6.10	0.322	5.36	5.1	420	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 3-5 min Stabilization: +/-10% C, +/-0.1 pH, +/-3% Cond, +/-10% DO, +/-10% Turb(<=10 NTU ideal), for 4 consecutive readings

SAMPLE ID: 35A WON	SAMPLE 10: 354 WW 10-10101			No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Baller	Parameter(s)
				3- yo ml glass	HeL	N	Rmp	SECOND STEVE VOC
				3-20ml glass	Her	N	110	GALLS
DUPLICATE (D): YES/NO				2-250 ml Amber	NA/NJROY	N	N	Ferrous / VFA
MATRIX SPIKE (MS): YES/NO	TRIX SPIKE (MS): YES/NO V (V			2-1 Liter plastic	NA	N		DHC/DHB
MATRIX DUPLICATE (MD): YE	s/no/VV			1.500 ml plastil	ZNACENAOH	N	LV.	Sulfide
				1-2.50ml plastic	HN43	Y	N	Rissolved Netals
CO=	LEL=	OXY=	H2S=	1-250 ml plastic	HW03	N.	N	TOTAL metals
				1-250m plastic	NA	222	in the	TPL, & JOTAL PROSPRETERS

Page 1 of ____

#### MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58	LocID;	35 AV	UWII			Date: 10/15/13						
LOOMIDA	Project: Longhorn Army Ammunition Plant	Project No.	60256135.0	002HA			Recorded By: Scott Beesinger Checked By:						
100 B 10 B				List Ling S			11160.30263	112		2			
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52	Water Interfa	ce Probe:	Water Level In	dicator ID#	Solinist 101	Min Recharg	e Level = (TC	DTW(0.80)	) - TD			
	Unit# 21191	Sampling Equ	uipment:	Peristaltic/Blac	lder/Bailer	1D#:							
							- Seriel			Contraction of the second			
WELL	Casing I.D. (in) [a]: 2 1	Static Water	Level Reading	(ft) [c]: 3	1.36	8	Weather Co	nditions: C	an	DRIZZI	1 73°F		
INFO	Total Well Depth (ft) [d]: 37.08	Screened Inte	erval/Pump pla	cement: 19.	7-34,3	32,50	Condition of	Well/Remark	600	D			
		and the second	16-711			La una lu			1. 2.5.0				
CASING	Casing I.D. (in) [a]: 0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0		
INFO	Unit Casing Volume (gal/lin ft) [b]: 0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6		

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	pН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor, clarity, etc.)
10-15-13	0755	31,33	100	23.68	7.12	8.64	4.01	85.2	231	
10-15-13	0800	31.35	100	21.59	6.06	9.71	4.20	77.9	189	
10-15-13	0805	31.37	100	21.29	6.07	9.75	4.61	74.3	170	
10-15-13	0810	31.39	100	21.10	6.09	9.77	4.96	71.0	159	
10-5-13	0815	31.41	100	21.09	6.09	9.78	4.80	65,6	153	
10-15-13	0820	31.42	100	21.12	6.10	9.80	4.78	57.4	149	
10-15-13	0825	31.43	100	21.09	6.11	9.79	4.60	46.7	146	
10-15-13	0830	31.44	100	21.14	6.11	9.78	4.31	26.1	136	
10-15-13	0835	31.45	100	21.12	6.12	9.77	4.30	26.5	129	
10-15-13	0840	31.47	100	21.14	6.12	9.76	4.27	24.0	127	
10-15-13	0845	31.49	100	21.17	6.12	9.75	4,24	25.8	125	
			1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 19				1.4			
			_							

SAMPLE ID: 35AW	W11-1015	12		No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
			0.0	3-40ml alass	HCL	N	Puno	82600-SIME VAC
				3-20ml glass	NCL	N		GASES
DUPLICATE (D): YES/NO	NØ			1-500 ml plastic	ZNIAGE NADA	N		Sulfide
MATRIX SPIKE (MS): YES/	$NO \mathcal{N} \rho$			1-250ml Amber	AVA	N	L	FOTODUS IRON
MATRIX DUPLICATE (MD):	YESINO NO			1-250m/ plastic	HN03	Y		Dissolved metals
				1-250ml plastic	HNOT	0	LV .	TOTAL metals
CO=	LEL= (	)XY=	H2S=	1-250ml plasfic	172504	N	V\	TOCI TOTAL Phoyohorous
				1-250ml plastic	NA	N	U U	Amons
				1-250 ml plastic	NA	N	й	ACKALINITY

### MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58			LociD:	35744	JUIZ			Date:	0115	2/12	_	and a second second		
	Project: Longhorn Army	Ammunition Plant		Project No.	60256135.0	002HA			Recorded By: Scott Beesinger Checked By:						
	And the second second				d a	V.01		1.1.24		11 100		1.1	W. Shirt States		
EQUIPMENT	Water Quality Meter Type/i	D#: Horiba U-52		Water Interfac	ce Probe:	Water Level In	ndicator ID# 8	Solinist 101	Min Rechard	ge Level = (TC	D-DTW(0.80))	- TD			
	Unit #	21191		Sampling Equ	uipment:	Peristaltic/Bla	dder/Bailer I	D#:							
w II – u										tt n. esti	1	- 6. TP			
WELL	Casing I.D. (in) [a]:	211		Static Water L	evel Reading	(ft) [c]: 💈 🗸	.05		Weather Co	nditions: /	IGA	2 7.	2°C		
INFO	Total Well Depth (ft) [d]:	37.58		Screened Inte	erval/Pump pla	cement: 20	2-34.2	3 32.0	Condition of	Well/Remark	SI GO	OD			
					n - 1	ALC: NO.									
CASING	Casing I.D. (in) [a]:	C	0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0		
INFO	Unit Casing Volume (gal/lin	ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6		

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarke (oder claffs, etc.)
10-18-13	1340	30.03	100	21,54	6.65	2.73	3.45	38.2	147	fassi neuti ant
10-18-13	1345	30.05	100	21.40	6.11	2.70	1.94	31.7	147	
10-18-B	1350	30.07	100	21.09	6.06	2.66	1.67	30.1	147	
10-18-13	1355	30.08	60	20.97	6.06	2.62	1.60	29.3	147	
10-18-13	1400	30.09	00	21.00	6.05	2.61	1.46	29.0	148	
10-18-13	1405	30.00	100	21.00	6.05	2.61	1.39	28.5	149	
10-14-13	1410	30.11	100	21.04	6.04	2.61	1.34	17.4	150	
10-18-13	1415-	30,12	100	21.03	6.04	2.61	1.32	17.1	150	
10-18-13	1420	30,13	100	20.97	6.05	2.60	1.30	17.3	152	
10-18-13	1425	30.14	100	20.90	6.04	2.60	1.24	17.2	153	
10-18-13	1430	30.15	100	20.93	6.05	2.60	1.29	17.3	183	
			1.2		10 AC2					
							1			

SAMPLE ID: 3574WW12-601813 TIME: 1430	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
	6-40 m glass	HUL	N	Puns	8200EBIMAS UDC
Val				V	
DUPLICATE (D): YESINO YES					
MATRIX SPIKE (MS): YES/NO NO					
MATRIX DUPLICATE (MD): YESINO NO					
LCO= LEL= OXY= H2S=					

#### MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58	LOCID: 35AWW	13	Date: 10/11/13					
LOOKING	Project: Longhorn Army Ammunition Plant	Project No. 60256135.0002HA		Recorded By: Scott Beesinger Checked By:					
		HALL IN FIGURE STATISTICS							
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52	Water Interface Probe: Water L	evel Indicator ID# Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD					
	Unit # 21191	Sampling Equipment: Peristal	tic/Bladder/Bailer ID#:						
WELL	Casing I.D. (in) [a]: 2.11	Static Water Level Reading (ft) [c]:	25.07	Weather Conditions: CLEAR 589F					
INFO	Total Well Depth (ft) [d]: 40, 23	Screened Interval/Pump placement:	22,2-36.8 29.5	Condition of Well/Remarks: 6000					
			we have been and the						
CASING	Casing I.D. (in) [a]: 0.75	1.5 2.0 2.	2 3.0 4.0	4.3 5.0 6.0 7.0 8.0					
INFO	Unit Casing Volume (gal/lin ft) [b]: 0.023	0.09 0.16 0.2	0 0.37 0.65	0.75 1.0 1.5 2.0 2.6					

Date	Time (24 hr)	Water Level (FTQC)	Pumping Rate (mL/min)	Temp.	nH	Cond (mS(cm)	DO (mg/l.)	Turb.	ORP	Remarks
10-11-13	0735	15.04	LOD	20.25	7.32	1.11	522		1/12	(odor, clanty, etc.)
10-11-13	0740	25.06	100	1122	176	1 #2	212	697	175	
10-11-13	0745	15.08	100	71,73	6.78	1.50	2.20	87.4	-15	E Contraction of the second seco
1011-13	0750	25,10	100	21.93	6.34	1.51	1.82	67.8	-28	
10-11-13	0755	25.12	100	72,04	6.40	1.53	1,46	51.5	-36	
10-11-13	0800	25.14	100	22.10	6.42	1.33	1.31	41.6	-37	
10-11-13	0805	25.16	100	22,15	6.44	1.53	1.14	29.5	-41	
10-11-13	0810	25.18	100	22.21	6.45	1.56	1.04	26.0	-46	
10-11-13	0815	25.18	100	22.28	6.47	1.59	1.04	24.3	-57	
10-11-13	0820	25.19	100	22.38	6.48	1.63	1.00	22.9	-63	
10-11-13	0825	25.20	100	22.39	6.49	1.64	0.98	22.8	-65	
10-11-13	0830	25.21	100	22.41	6.49	1.65	0.97	22.7	-67	
10-11-13	0835	25.22	100	22.45	6.50	1.66	0.96	22.5	-68	

SAMPLE ID: 35 WW13-101113	TIME: 0835	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
		B- 40 ml class	HUL	N	Pup	REGERENTE VOC
					V	
MATRIX SPIKE (MS): YES/NO NO			-			
CO= LEL= OXY=	H2S=					

# MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58		LociD:	254	NIN I	L		Data	010		2			
LUCATION	Project: Longhorn Army Ammunition Plant		Project No.	60256135.0	002HA	1		Recorded By: Scott Beesinger Checked By:						
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52	10 /14=	Water Interfac	e Probe:	Water Level 1	ndicator ID#	Solinist 101	Min Rechard	e level = (Tf		- TD			
	Unit # 21191	-	Sampling Equ	ipment:	Peristaltic/Bla	idder/Bailer I	D#:	init i toolidig	6 E6961 - (1E	-5111(0.00))	-10			
WELL	Casing I.D. (in) [a]: 211	-	Static Water L	evel Reading	(ft) [c]:	30.80		Weather Cor	aditions:	(11)	0	SARE		
INFO	Total Well Depth (ft) [d]: 32.28	_	Screened Inte	rval/Pump pla	cement: 14	8-29.5		Condition of	Well/Remark	Ge	DOD	50-1		
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	22	1 30 T	40	1 43	50	6.0	70			
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6		

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/mln)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor.clarity.etc.)
10-18-13	0727	30,80	NA							1.5 ff water Bailing well
10-18-13	9737	32,20	NA							
10-18-13	1300	30.80	NĄ	19.37	6.89	6.73	10.50	6.0	1	
										-
Duran Data a d										

SAMPLE 10: 35 AW W (4-101813		TIME: 1300	No. Containers/Volume/Type	Preserv.	Fliter (Y/N)	Pump OR Bailer	Parameter(s)
		-	3-40 miglass	Hu	N	Bailer	BEETERS VOL
DUPLICATE (D): YES/NO NO MATRIX SPIKE (MS): YES/NO NO MATRIX DUPLICATE (MD): YES/NO	NO						
CO= LE	L= OXY	= H2S=					

### MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58		LociD;	35AU	1121	5		Date:	olu	112				
COONTION	Project: Longhorn Army Ammunition Plant	Project No.	60256135.0	0002HA			Recorded	Recorded By: Scott Beesinger Checked By:						
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	ce Probe:	Water Level Ir	ndicator ID#	Solinist 101	Min Rechar	ne Level = (Ti		TD			
	Unit # 21191	Sampling Equ	uipment:	Peristaltic/Bla	dder/Bailer I	D#:	init i contai	Ju 20101 - (12	5-0111(0.00))	- 10				
WELL	Casing I.D. (in) [a]: 2 1		Static Water L	Level Reading	(ft) [c]: 2	0.65		Weather Co	nditions:	20:0	1700	an Nagara M		
INFO	Total Well Depth (ft) [d]: 41.33		Screened Inte	erval/Pump pla	cement: 27	3.1 - 37.	8 30.5	Condition of	Well/Remark	s Goe	6 PP			
CASING	Casing I.D. (in) [a]:	0.75	1 15	20	22	20 1		1 14						
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	4.0	4.3	5.0	6.0 1.5	7.0	8.0		

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor. clarity. etc.)
10-16-13	1005	20.62	100	21.73	6.31	14.6	1.40	78.9	-76	
10-16-13	1010	20.63	100	21.85	6.33	14.9	1.07	77.5	-93	
10-16-13	1015	20.64	100	21.90	6.35	15.0	0.91	68.4	-101	
10-16-13	1020	20.65	100	21.96	6.35	15.0	0.88	57.9	-105	
10-16-13	10 25	20.66	100	22.00	6.36	15.0	0.86	48.8	-109	
10-16-13	1030	20.67	100	21.99	6.37	15.0	0.79	37.4	-109	
10-16-13	1035	20.68	100	22.02	6.37	15.0	0.75	27.2	-107	
10-16-13	1040	20.69	100	22.00	6.38	15.0	0.70	19.3	-103	
10-16-13	1045	20.70	100	21.89	6.38	14.9	0.67	19.5	-102	
10-10-13	1050	20.71	100	21.87	6.38	14.9	0.66	19.1	-100	
10-16-13	10.55	2072	100	21.88	6.39	14.9	0.65	19.0	-99	

SAMPLE ID: 35AU	JN 15-	1016/37	ME: 1055	No. Containers/Volume/Type	Preserv.	Fliter (Y/N)	Pump OR Baller	Parameter(s)
				6-40 mi glass	HIL	N	Pump	BROOTENSE VOC
DUPLICATE (D): YES/NO MATRIX SPIKE (MS): YES/NO MATRIX DUPLICATE (MD): Y	125 DWD ESINO ND							
CO=	LEL=	OXY=	H2S=					

### MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58	LociD:	35Au	w16			Date: 10/27/13							
LOOAHOR	Project: Longhorn Army Ammunition Plant		Project No.	60256135.0	0002HA			Recorded By: Scott Beesinger Checked By:						
IN U.S. J			an an an an ann an an an an an an an an			ing the	1	1.11			10.5			
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	e Probe:	Water Level Ir	dicator ID#	Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD						
	Unit # 21191		Sampling Equ	ipment:	Peristaltic/Blac	dder/Bailer	1D#:							
				and Al			1. S. S.		tina C.A.	7a1.01.10"				
WELL	Casing I.D. (in) [a]:		Static Water L	evel Reading	(ft) [c]:	1.58		Weather Cor	iditions: 🦯	14AR	6201	F		
INFO	Total Well Depth (ft) [d]: 37.38		Screened Inte	rval/Pump pla	acement: 19	7-34,4	27.00	Condition of	Well/Remarks	600	D	2		
CACINO	Carling I D. /in) fait	1 0.75	1 10		1				الأحبيبية					
INFO	Unit Casing Volume (asl#in fi) [b]:	0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0		
INFO	Louir cased Aorona (Baneur) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6		

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/mln)	Temp. (°C)	pН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor, clarity, etc.)
10-22-13	0915	19.55	100	17.68	5.47	10.4	4.05	45.0	188	
10-22-13	0920	19.57	ioo	18.65	6.21	10.5	6.52	44.3	70	
10.22.13	0925	19.59	100	18.89	6.31	10.6	6.74	42.7	60	1
10-22-13	0930	19.61	100	19.01	6.35	10.7	6.26	41.3	60	
10-22-13	0935	19.63	100	19.07	6.3b	10.7	6.00	40.1	59	
10-22-13	0940	19.64	00	19,15	6.38	10.7	5.62	38.6	57	
10-22-13	0945	19.65	100	19.22	6.38	10.7	5.20	37.7	56	
10-22.13	0950	19.66	100	19.24	6.38	10.7	5.10	37.0	57	
10-22.13	0455	19.107	100	19.28	6.39	10.7	5.05	36.9	57	
(0-22-13	1000	19.68	100	19.32	6.39	10.7	5.00	37.1	58	

SAMPLE ID: 35AWW16-1012-13	TIME: 10 00	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Baller	Parameter(s)
		3- 40 ml alass	HLL	N	Pup	82000-SIMG UP (
DUPLICATE (D): YES/NO NO MATRIX SPIKE (MS): YES/NO NO MATRIX DUPLICATE (MD): YES/NO NO						
CO= LEL= OXY=	H2S=					

### MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58		LocID:	35 AU	NWIT	1		Date: /	0/18/	13				
	Project: Longhorn Army Ammunition Plant		Project No.	60256135.0	002HA			Recorded By: Scott Beesinger Checked By:						
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	ce Probe:	Water Level In	dicator ID#	Solinist 101	Min Rechard	e Level = (TC	-DTW(0.80))	- TD			
	Unit# 21191	Sampling Equ	lipment:	Peristaltic/Blac	lder/Bailer	D#:		A.5	2777(0.00 <i>)</i> )	10				
WELL.	Casing I.D. (in) [a]:		Static Water L	evel Reading (	ft) [c]:	18.00	1.01 15	Weather Cor	nditions:	2 14 0	0 55	- 12		
INFO	Total Well Depth (ft) [d]: 42.33		Screened Inte	erval/Pump plac	ement:	7-39.4	320	Condition of	Well/Remarks	Go	D			
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	70	80		
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	20	26		

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	pН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor. clarity. etc.)
104842	0900	27.9	3 100	15.67	6,48	10.3	3.39	13.6	210	()
10-18-13	0905	28.00	100	16.45	6.52	10,4	2,50	14.0	125	
10-18-13	0910	28.02	100	16.74	6.56	10.4	2.35	13.9	90	ý
10-18-13	0415	28.04	100	16.95	6.59	10.4	2.29	14.1	79	
10-18-13	0920	28.05	100	17.10	6.61	10.4	2,19	13.5	76	
10-18-3	0425	28.06	(00	17.29	6.62	10.4	2.10	13,3	76	
10-18-13	0930	28.07	100	17,48	6.63	10.4	1.99	13.0	75	
10-18-13	0935	28.08	100	17.58	6.64	10.4	1:81	12.1	76	
10-18-13	0940	28.09	100	17.63	6.64	10.4	1.78	12,2	76	
10-18-17	0945	28.10	100	17.65	6.64	10.4	1.75	12.0	75	
10-18-13	0450	28.11	(00)	17.69	6.64	10.4	1.72	12.1	74	
						Sec. 1.	- 1.3	121	6664	
	(									

SAMPLEID: 35AW417-101813 TIME: 0950	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
	2-40 ml glass	HCL	N	Pup	8250E-SIMS VOC
DUPLICATE (D): YES/NO K				V	
MATRIX SPIKE (MS); YES/NO NO MATRIX DUPLICATE (MD): YES/NO N NO					
CO= LEL= OXY= H2S=		_			

# MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58		LocID:	3.574 W	W18			Date:	11810	3			-	
LOOAHON	Project: Longhorn Army Ammunition Plant		Project No.	60256135.0	002HA			Recorded By: Scott Beesinger Checked By:						
		005	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	1 12 12	des 1 pér	1207 - CO - 108 - 1	15 wore"		r intensis	El asti				
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	e Probe:	Water Level In	dicator ID# S	iolinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD						
	Unit # 21191		Sampling Equ	ipment:	Peristaltic/Blac	Ider/Bailer 10	D#:						Ī	
			-tree	ROLL IN			10 C		엔이 가지?	10	The second	the second s		
WELL	Casing I.D. (in) [a]: 🡌 🛝		Static Water L	evel Reading (	(ft) [c]: 👌	8.35		Weather Cor	nditions:	GAR	700+	2	-	
INFO	Total Well Depth (ft) [d]: 42.08		Screened Inte	32.00	Condition of Well/Remarks: GOOD									
	Design (D. A.V.A.V.		110			Anna Al	iting iting			in the second	-			
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0	1	
INFO Unit Casing Volume (gal/lin ft) [b]: 0.0			0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6	1	

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/mln)	Temp. (°C)	pН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (my)	Remarks (oder almöst als.)
10-18-13	1020	78.32	100	17.97	6.65	lo, l	3.67	24.1	167	(ouu, viany, au.)
10-18-13	1025	28.34	100	18.30	6.56	10.4	2.05	25.0	135	
10-18-13	1030	38.36	100	18.42	6.60	10.4	1.49	25.2	121	
10-18-13	1035	28.38	100	18.47	6.62	-10.5	1.37	24.1	114	
10-18-13	10 40	28.40	100	18.53	6.63	10.4	1.34	23.2	110	
10-18-13	1045	28.42	100	18.61	6-65	10.4	1.34	23.1	108	
10-18-13	10.50	28.44	100	18.65	6.66	10.2	1.37	23.1	107	
0-18-13	10.55	28.46	100	18:68	6.67	10.	1.38	23.0	105	
10-18-13	1100	28.50	(00	18.70	6.67	10.1	1,40	229	104	
Dump Batas d=0.51										

SAMPLE ID: 354WW18 - 101813 TIME: 1100	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
	7- 40 ml glass	HCL	N	Pmp	0200B SIMS_VOC
DUPLICATE (D): YES/NO PO MATRIX SPIKE (MS): YES/NO YES					
MATRIX DUPLICATE (MD): YES/NO Y 25					
CO= LEL= OXY= H2S=					

#### MONITORING WELL SAMPLE COLLECTION FORM

										1				
	Site: 58		LocID:	35Au	JWIG			Date: {0/22/13						
LOOAHON	Project: Longhorn Army Ammunition Plant	Project No.	60256135.0	002HA			Recorded By: Scott Beesinger Checked By:							
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	e Probe:	Water Level In	dicator ID# S	Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD						
	Unit # 21191	Sampling Equ	ipment:	Peristaltic/Blac	der/Bailer I	D#:								
		1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.								Sec. 19				
WELL	Casing I.D. (in) [a]: 2 1		Static Water L	evel Reading	(ft) [c]: 30	0.65		Weather Cor	nditions: (	lear	- 63	°F		
INFO	Total Well Depth (ft) [d]: 32,50		Screened Inte	irval/Pump plac		Condition of Well/Remarks: GOOD								
							1. S. S. S. S.							
CASING	Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0			
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6			

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor, clarity, etc.)
10.22.13	0815	30.65	NA							ONLY 1.85 ft water ZAiling well
10-22-13	2580	32,46	NA							Bailed Igallon RAr Day
10-22-13	1025	30.65	NA	18.75	6.44	6.95	9.67	475	106	

SAMPLE ID: 3570019-102213	TIME: 1025	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
		3-40 ml alass	HUL	N	Bailer	8260BSIMS VOC
		0.0				
MATRIX SPIKE (MS): YES/NO 💫 🛇						
MATRIX DUPLICATE (MD): YES/NO NO						
CO= LEL= OXY=	H2S=					

#### MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58	Locid: 354 ww 20 Date: 10 15/13	Date: 10 15/13					
COORTION	Project: Longhorn Army Ammunition Plant	Project No. 60256135.0002HA Recorded By: Scott Beesinger Checked By:	-					
FOUIPMENT	Water Quality Meter Type/ID #: Horiba U-52	Water Interface Probe: Water Level Indicator ID# Solinist 101 Min Recharge Level = (TD-DTW(0.80)) - TD						
	Unit # 21191	Sampling Equipment: Peristaltic/Bladder/Bailer 1D#:	_					
WELL	Casing I.D. (in) [a]:	Static Water Level Reading (ft) [c]: 2), 12 Weather Conditions: Kain 75%						
INFO	Total Well Depth (ft) [d]: 36.08	Screened Interval/Pump placement: 18.3 - 330 25.50 Condition of Well/Remarks: Good						
1.2.2			il i					
CASING	Casing I.D. (in) [a]: 0.75	1.5 2.0 2.2 3.0 4.0 4.3 5.0 6.0 7.0 8.0						
INFO	Unit Casing Volume (gal/lin ft) [b]: 0.023	0.09 0.16 0.20 0.37 0.65 0.75 1.0 1.5 2.0 2.6						

Data	Time (24 br)	Water Level	Pumping Rate	Temp.	nU	Cond	DO	Turb.	ORP	Remarke
Date	(24 m)	(FIOC)	(mc)min)	('()	рп	(ma/cm)	(mg/L)	(010)	(mv)	(odor, clarity, etc.)
10-15-13	1355	21.14	100	26.68	6.58	11.4	2.46	4.2	386	
10-15-13	1400	21.16	100	26.14	6.57	11.5	1.89	5.7	447	
10-15-13	1405	21.18	100	26.07	6.56	11.4	1.75	6.3	463	9
10-15-13	1410	21.20	100	26.07	6.55	11.4	1.63	7.2	461	
10-15-13	1415	21.22	100	26.22	6.55	11.4	1.61	7,2	449	
10-15-13	1420	21.23	100	26.26	6.55	11.4	1.59	6.8	444	
10-15-13	1425	21.24	100	26.19	6.55	11.4	1.57	6.9	442	
10-15-13	1430	21.26	100	26.17	6.55	11,4	1.55	6.7	441	
										2 · · · · · · · · · · · · · · · · · · ·

SAMPLE ID: 3	SAW	w20-101	512	TIME:	1430	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Baller	Parameter(s)
			515			3-40ml glass	ACL	N	Pup	82808-SIMS V.O C
						3-20ml glass	HLL	N	1	GASES
DUPLICATE (D):	: Yes/No 🤳	00				1- 500 ml plastic	Thate MAD !	N	- N	Sulfide
MATRIX SPIKE	(MS): YES/N	io ~~ 0				1-250 ml Amber	MA	N	- M	Ferrous I Rom
MATRIX DUPLIC	CATE (MD): `	YES/NO 🔨 🔿				1-250 ml plastic	HNO3	Y	11	Dissolved metals
						1-250 ml plastic	HN03	Ň	11	Josn metals
	CO=	LEL=	OXY=		H2S=	1-250 ml sussie	172504	N	N	TOL & TOTAL PROCONDERS
						1-250 ml plastic	NA	N	2)	Portion 5
						1-250 ml 0/25+16	NA	N	15	Alkali Nity

#### MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58	LOCID: 35AWWZ)	Date: 10 16/13						
LOOKIION	Project: Longhorn Army Ammunition Plant	Project No. 60256135.0002HA	Recorded By: Scott Beesinger Checked By:						
	1F. 192								
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52	Water Interface Probe: Water Level Indicator ID# Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD						
	Unit # 21191	Sampling Equipment: Peristaltic/Bladder/Bailer ID#:							
WELL	Casing I.D. (in) [a]: 2 11	Static Water Level Reading (ft) [c]: 34-36	Weather Conditions: RAIN 65 F						
INFO	Total Well Depth (ft) [d]: 42,93	Screened Interval/Pump placement: 25, 2-39.9 3 4.	Condition of Well/Remarks: GOOD						
		#							
CASING	Casing I.D. (in) [a]: 0.75	1.5 2.0 2.2 3.0 4.0	4.3 5.0 6.0 7.0 8.0						
INFO	Unit Casing Volume (gal/lin ft) [b]: 0.023	0.09 0.16 0.20 0.37 0.65	0.75 1.0 1.5 2.0 2.6						

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/mln)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor. clarity, etc.)
10-16-13	0845	34.34	100	21.28	6.50	0.887	3.81	102	271	(ever) starty ( ever)
10-16-13	0850	34.37	100	21.08	5.67	1.04	2.30	51.4	250	
10-10-13	0855	34.39	100	20.95	5.64	1.06	2.17	38.4	236	4
10-16-13	0900	34.41	100	20.87	5,64	1.08	2.01	82.3	227	
10-16-13	0905	34.43	100	20.83	5.66	1.09	1.86	28.1	224	
10-16-13	0910	34.45	100	20.79	5.68	1.08	1.68	25.3	221	
10-16-13	0915	34.47	100	20.76	5.69	1.08	1.50	21.7	219	
10-16-13	0920	34.49	100	20.72	5.70	1.07	1.47	21.1	217	
10-16-13	0925	34.51	100	20.72	5.72	1.06	1.45	21.5	215	
10-16-13	0930	34.53	100	20,70	5.72	1.05	1.44	21.3	213	
				1						

SAMPLE ID: 35AWW21-101613 TIME:	0930	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
		9-40ml glass	Hel	N	Amp	B2000 CHAS_ VOC
		- 0. 2			V	
DUPLICATE (D): YES/NO						
MATRIX SPIKE (MS): YES/NO Yes						
MATRIX DUPLICATE (MD): YES/NO						
CO= LEL= OXY=	H2S=					

# MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58	LocID: 3	59 4	waa			Data:	0/22	112			
LOOAHON	Project: Longhorn Army Ammunition Plant	Project No.	60256135.0	0002HA			Recorded By: Scott Beesinger Checked By:					
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	ce Probe:	Water Level Ir	dicator ID# 8	Solinist 101	Min Rechard	ie Level = (TC	-DTW(0.80))	- TD	
	Unit # 21191	Sampling Equ	uipment	Peristaltic/Blac	lder/Bailer í	D#:						
WELL	Casing I.D. (in) [a]: 2.11		Static Water L	evel Reading	(ft) [c]: 3	2,13		Weather Co	nditions:	Clan	0 6	DOF
INFO	Total Well Depth (ft) [d]: 36, 40		Screened Inte	erval/Pump pla	cement 20.	2-34.7		Condition of	Well/Remarks	Go	D D	
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	2.2	3.0	4.0	43	50	6.0	70	
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr) 0835	Water Level (FTOC) 32.13	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarke (odor, clarity, etc.) ONHY 4.3 Ft. water Builing well
10-72-13	0845	36.31	NA							BAILEd 2 gallows RANDRY
10-22-13	1055	32.13	NA	18.67	6.20	9.85	9.67	25.0	170	

SAMPLE ID	38AW	22-1022	13	time: 1055	No. Containers/Volume/Type 3 - 40 ml glass	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
DUPLICATE MATRIX SPI MATRIX DU	: (d): Yes/No 🔰 Ike (MS): Yes/N Plicate (Md): `	し 10 VES/NO NO							
	CO=	LEL= (	)XY=	H2S=					

### MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58	LOCID: LHSMW04	Date: 10 9 13						
	Project: Longhorn Army Ammunition Plant	Project No. 60256135.0002HA	Recorded By: Scott Beesinger Checked By:						
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52	Water Interface Probe: Water Level Indicator ID# Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD						
	Unit # 21191	Sampling Equipment: Peristaltic/Bladder/Bailer ID#:							
WELL	Casing I.D. (in) [a]:	Static Water Level Reading (ft) [c]:	Weather Conditions: CIGAR 770F						
INFO	Total Well Depth (ft) [d]: 30, 90	Screened Interval/Pump placement: 18.2-28.2	Condition of Well/Remarks: NG &DC Paint						
and the second									
CASING	Casing I.D. (in) [a]: 0.75	1.5 2.0 2.2 3.0 4.0	4.3 5.0 6.0 7.0 8.0						
INFO	Unit Casing Volume (gal/lin ft) [b]: 0.023	0.09 0.16 0.20 0.37 0.65	0.75 1.0 1.5 2.0 2.6						

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	pН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor, clarity, etc.)
				$\cap$		0	1	1		
				1		1)0	.			
				24	U		20			

SAMPLE ID:	MPLE ID:		ME:	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
								8260B-SIMS
DUPLICATE (D); YES/NO	_							
MATRIX SPIKE (MS): YES/N MATRIX DUPLICATE (MD): Y	es/No							
CO=	LEL=	OXY=	H2S=					

#### MONITORING WELL SAMPLE COLLECTION FORM

									7				
	Site: 58		LociD:	LHSW	nwos			Date:	0/0/1	3			
LOOATION	Project: Longhorn Army Ammunition Plant		Project No.	60256135.0	002HA			Recorded B	y: Scott Be	eesinger	Check	ed By:	
11 N. S.		10											
FOUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	ce Probe:	Water Level In	ndicator ID#	Solinist 101	Min Recharg	e Level = (TD	D-DTW(0.80))	- TD		
	Unit # 21191		Sampling Equ	vipment:	Peristattic/Bla	dder/Bailer I	D#:						
			and the second								10.8, 11,	- (1000 1815	
WELL	Casing I.D. (in) [a]:		Static Water L	evel Reading	(ft) [c]: 🅦	RY		Weather Cor	nditions:	GAAR	- 78°F		
INFO	Total Well Depth (ft) [d]:		Screened Inte	erval/Pump pla	cement: /).	9-21.9		Condition of	Well/Remarks	SINOI	de na	mt	
					8					Picc	- pre-		
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0	
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6	

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor, clarity, etc.)
					1		1, 1			
				X/		AAI	4/4			
				ALA	A	$\sqrt{}$	V			
				Z1-						
		1 3 m · · · · · · · · · · · · · · · · · ·								
							n n			

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 3-5 min Stabilization: +/-10% C, +/-0.1 pH, +/-3% Cond, +/-10% DO, +/-10% Turb(<=10 NTU Ideal), for 4 consecutive readings

SAMPLE ID:	TIME:	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
(2) ·						8260B-SIMS
DUPLICATE (D): YES/NO						
MATRIX SPIKE (MS): YES/NO						
MATRIX DUPLICATE (MD): YES/NO						
CO= LEL= OXY=	H2S=					

#### MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	LOCATION Site: 58						Z LHS	smu	06		Date:	10/11	0/13					
	Project: Longi	norn Army Ammur	ltion Plant			Project No.	60256135.0	002HA			Recorded E	By: Scott B	eesinger	Chea	cked By:			
EQUIPMENT	Water Quality M Unit #	leter Type/ID #: 21191	Horiba U-52	ينين المكانية. محمد المكانية		Water Interfa	ce Probe: uipment:	Water Level II Peristaltic/Bla	ndicator ID# dder/Bailer	Solinist 101 ID#:	Min Recharge Level = (TD-DTW(0.80)) - TD							
WELL INFO	WELL INFO Casing I.D. (in) [a]: 4 ч   Total Well Depth (ft) [d]: 2.3 , 5 ]   CASING Casing I.D. (in) [a]: 0.75						Static Water Level Reading (ft) [c]: 20,97 Screened Interval/Pump placement: 10 - 20						Weather Conditions: Rain 63°F Condition of Well/Remarks: Needs paint					
CASING INFO	CASING INFO Casing i.D. (in) [a]: 0.7   Unit Casing Volume (gal/lin ft) [b]: 0.0						2.0 0.16	2.2 0.20	3.0 0.37	4.0	4.3 0.75	5.0 1.0	6.0 1.5	7.0	8.0 2.6			
Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)				Remarks odor, clarity, etc.	) •				
10-16-13	1435	20.97	NA							ONLY	2:5	44	B	sailin	quell			
10-18-3	D-11-12-12-12-12-12-12-12-12-12-12-12-12-									Baile	1 2 gi	allon	s F	RAND	py			
10/12/13	146.5	20.47	NA	20.46	6.82	3.65	10,00	1.0	157									
											1 - 11 1							
												11-1-1-1-1-						

SAMPLE ID: 350 0000 R TIME: 140	No. Containers/Volume/Type	Preserv.	Fliter (Y/N)	Pump OR Bailer	Parameter(s)
LHSMW06-101713	3-40 ml glass	ALL	N	Bailer	8289BSIMS VDC
DUPLICATE (D): YES/NO NO MATRIX SPIKE (MS): YES/NO NO MATRIX DUPLICATE (MD): YES/NO NO					
CO= LEL= OXY= H2S=					

# MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58	LocID:	HSN	1007	V.		Date:	0/15	112		and the second second second	
LUCATION	Project: Longhorn Army Ammunition Plant	Project No.	60256135.	0002HA			Recorded By: Scott Beesinger Checked By:					
							Construction of the local distance	1,04,90		01100		-
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52	Water Interfac	e Probe:	Water Level Ir	dicator ID#	Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD					
	Unit # 21191	Sampling Equ	ipment:	Peristaltic/Blac	der/Bailer	1D#:		1.				
		NALEY R				No. of the other	a construction	110101	1 · · · ·	10-11-11-1		-
WELL	Casing I.D. (in) [a]:	Static Water L	evel Reading	(ft) [c]: Z	0.55		Weather Conditions: Claused DP 14 8000					
INFO	Total Well Depth (ft) [d]: 30, 48	Screened Interval/Pump placement: 17-27 23.00					Condition of Well/Remarks: Needs paint					
CASING	Casing I.D. (in) [a]: 0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	60	70	8.0	-
INFO	Unit Casing Volume (gal/lin ft) [b]: 0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6	-

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/mln)	Temp. (*C)	pН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (oder clarity of )
10-15-13	1050	20.58	100	24.01	651	12.2	2.37	116	111	(coacr, cianty, etc.)
10-15-13	10.55	20.60	100	23.37	6.49	12.4	1.33	8.0	QZ	
10-15-13	00 61	20.61	100	23.23	6.49	12.4	1.15	9.1	87	
10-15-13	1105	20.62	100	23.19	6.49	12.4	0.95	4.7	84	
10-15-13	1110	20.63	100	23.13	6.49	12.5	0.85	4.3	87	
10-15-13	1115	20.64	100	23.07	6.48	12.5	0.80	3.5	81	
10-15-13	1120	20.65	100	23.07	6.48	12.5	0.77	2.8	81	
10-15-13	1135	20.66	100	23.02	6.48	12.4	0.76	2.7	80	
10-15-13	130	20.67	100	23.04	6.48	12.5	0.75	1.8	79	
								—	-	
						1				
						_				
		-								
Burno Patas c=0.51	I finin Denudarum									

SAMPLE ID: LHSMW 07-101513			TIME: 1135	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)	
				3-40ml glass	Hel	N	Pup	8280B-SIMSVO C	
	90			8-20ml class	1462	N	11	GALLS	
			1-500ml plastic	ZAALL NAO U	N	× × ×	Sulfide		
MATRIX SPIKE (MS): YES/N	MATRIX SPIKE (MS): YESINON			1-250 ml AnBer	NA	N	1	Ferrous JRAN	
MATRIX DUPLICATE (MD): '	resino NV			1-250 plactic	HN03	Y	4	Pissolued nutals	
				1-250 ml plastic	HN03	N	4	TOTAL nutals	
CO=	LEL=	OXY=	H2S=	1-250 ml plastic	# acst 1	N	u u	TOCS, JOIN! Phenohered	
				1-200ml plasfic	NA	2		ANIONS	
				1-200 ml plastic	NA	$\sim$		Blkatenity	

### MONITORING WELL SAMPLE COLLECTION FORM

Page 1 of _____

	Site: 58		LociD:	DZWG	101			Date:	0191	13				
LOOAHOR	Project: Longhorn Army Ammunition Plant	Project No. 60256135.0002HA							Recorded By: Scott Beesinger Checked By:					
		. E .				thay the sou	a the second	In Constant	The second second	1. 1. 1.	18 - 19 - 19 - 19 - 19 - 19 - 19 - 19 -			
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD									
	Unit # 21191		Sampling Equ	ipment:	Peristaltic/Blac	der/Bailer	ID#:							
i i i fi							511128	174.38 I	11.525	1 1 1 3	15,1,5,2	1 - 24 - C - 14 - 14 - 14 - 14 - 14 - 14 - 14		
WELL	Casing I.D. (in) [a]: 2 1		Static Water L	evel Reading	(ft) [c]: 2 (	1.51		Weather Cor	iditions: 🤇	16DG	2800	C		
INFO	Total Well Depth (ft) [d]: 33.30		Screened inte	rval/Pump pla	cement: Ac	-30		Condition of	Well/Remarks	Nep	IS DO	11 ×		
SUNS		-	2.1		1.000							- my		
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0		
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6		

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/mln)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor, clarity, etc.)
10-7-13	1558	L4.51	NA							only 3.8 to water Bo, Ing well
10-9-13	1407	33.20	NA							Bailed 1.25 gallons RAN Day water is Black
¢0-10-13	0920	29.51	NA	17,40	6.55	39.2	9.72	10.0	-235	water is Black in color

SAMF	LE ID: 03WW	51-101013		TIME: DAZO	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
					3-40 ml glass	HUL	N	Bhiler	8980B-SIMS VOC
					2-20 ml glass	Her	N	i N	GASES
DUPL	ICATE (D): YES/NO 🦒	30			2-1 Liter Plastic	NA	N		DHCLDHB
MATE	lix spike (MS): Yes/N				1-500 ml plastic	ZNACKNACH	N	- N	Sulfide
MATE	XIX DUPLICATE (MD): Y	resino NV			1-250 mi plastic	HN03	Y	LV	Dissoled netals
					2-250ml Ambor	NA	N	vV	TOTAL TOTAL VELD . PLAND
	CO=	LEL=	OXY=	H2S=	1-250ml plastic	HN03	N	φN	TOTAL WELAS,
					1250ml plessic	#2504	2	Yy	TOC- TOTAL PHOSPHOLOUS
					1-250ml Plastic	NR	2		Porcent

### MONITORING WELL SAMPLE COLLECTION FORM

Page 1 of_

LOCATION	Site: 58					LocID: O	3WW	01			Date: / /	201	Int				
Leonanda	Project: Long	horn Army Ammu	Inition Plant			Project No.	60256135.00	02HA		Recorded By: Scott Receiptor							
	Engline.		10000			10 10 10	- An Inda	dinne te 19.	hillin y o ra	refit: Tool And	1		recompet	Olle	ukeu by:		
EQUIPMENT	Water Quality M	leter Type/ID #:	Horiba U-52			Water Interfa	ce Probe:	Water Level	Indicator ID#	Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD						
	Unit #					Sampling Eq	uipment:	Peristaltic/Bla	adder/Bailer	'1D#:							
المعالم ومكتم	1		0.00	1	-112411_24	at 1			¥ Ф. – ""		The second	5		1	A		
WELL	Casing I.D. (in)		1			Static Water	9.86		Weather Conditions: CAAR COM 209								
INFO	Total Well Dept	h (ft) [d]: 🛛 🍝	3.43			Screened Int	erval/Pump pla	acement: Z	0-30		Condition of Well/Remarks: New S Danst						
CASING	Casing I D. (in)	[a]:	P 11		0.75	1 15	1					6. T. DI					
INFO	Unit Casing Vol	ume (gal/lin ft) (b);			0.023	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0		
		10			0.020	1 0.00		0.20	0.37	0.00	0.75	1.0	1.5	2.0	2.6		
Dațe	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	pH	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (my)				Remarks				
129/14	0836	29.86	NA							PNIV	3.04	-	(obd, clanty, etc.)	Rail	1. 1.0.11		
1/29/14	0847	33,40	NH							Road		- wa	TCO D	1041	ing well		
4 17.1	1 Cal	0011	100					-		DATIEN	1 yar	UN	KI	AN VIL	4		
1 11																	
1/29/14	1420	29.99	NA	16.92	6.5R	20.2	5.37	256	-158						1		
		- 1100 S.															
		1															
			in the second														
					+												
Pump Rate: <=0.5	/min Drawdowi	n: <0.33 ft Massura	amante: 3.5 min	Stabilization: +/ 1	0% C +/ 0.4 pH	1 1/ 20/ Ocerd 1	( 40% DO										
			TIME		No Containe	reVolume/Ter		10%1Un0(<=10	NIU Ideal), for 4	a consecutive readin	lgs						
	500001-	012914		TTLD	2-40 m	al a la	(		Preserv,	Finer (Y/N)	Pump OR Ball	er	Parameter(s				
					3-700	1 0/46	2		Mal	N	SAIV	F_	VOC	10.1			
DUPLICATE (D):	YES/NO NO	)			2.16	thro	Incha	m	AND				BALS	ICALDO	v Dioxide		
MATRIX SPIKE (I	MS): YES/NO 🔨	10			1-5	Domlo	last.	70	ACLANDO IL	N	1		Part	Lennot	uchi (		
MATRIX DUPLIC	ATE (MD): YES/N	NON			2-250	mIA	mber	- Uz	OCH NA	2	1		VEA	Gen	0.16		
					1-2501	MPIGE	til	100	NN03	4	N		Discol	in l			
	CO=	LEL=	OXY=	H2S=	1-250	mplay	stic		MAO3	4	1 IN		TATA	metil	- mg		
					1-250	m Biert	ie i		12104	A	11		ARSEN	ile cha	la Dala d		
					1-250	WPLAN	1.1		NA	2			TRAK	Ster Pro-P	and a start of the		

# MONITORING WELL SAMPLE COLLECTION FORM

Page 1 o	f
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LOCATION	Site: 58					LociD:	250	14441	21		Datas	112.	1. 1				
	Project: Long	horn Army Ammu	inition Plant			Project No. 60256135.0002HA											
	hu e e e							記録書を	differences		recorded	By: Scott I	Beesinger	Ch	ecked By:		
EQUIPMENT	Water Quality N	leter Type/ID #:	Horiba U-52			Water Interfa	ce Probe:	Water Level	Indicator ID#	Solinist 101	Min Recharge Level - (TD DTIAVA son) TO						
1111115		Total and	-			Sampling Eq	uipment:	Peristaltic/Bl	adder/Bailer	D#:		90 LOVEI - (1	D-D199(0.00)	)-10			
WELL	Cooling I.D. (in)	-1-	11	1991 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 -	ulti.			3. I. W.	er Site	THE THE A	11.128	2.80.000	THE REAL PROPERTY OF	S. Mitter			
INFO	Total Wall Dentil		2 10			Static Water	Level Reading	g (ft) [c]:	10.21		Weather Conditions: Clours 1 296						
		n (ii) [o]:	2148	CH CONTRACTOR		Screened Int	erval/Pump pl	acement: 62	45-72.4	5 67.5	Condition o	f Well/Remar		4	2/1		
CASING	Casing I.D. (in)	fal:	-			1 15	1			10			1940	cp2 p	regn T		
INFO	Unit Casing Volu	ume (gal/lin ft) [b]:	2		0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0		
					0.020	0.08	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6		
		Water	Pumping			1			ТТ								
	Time	Level	Rate	Temp.		Cond	DO	Turb									
Date	(24 hr)	(FTOC)	(mL/min)	(°C)	рН	(mS/cm)	(mg/L)	(NTU)	(mv)				Remarks				
31/14	1500	40.22	100	20.82	7.67	1,28	6.59	204	27				odor, clarity, etc.)		1		
31/14	1505	40,24	100	20.61	7.02	1.14	1 41	724	-21			-	_				
31/14	1510	40.25	100	20.61	7.10	0.830	0.81	2.05	-42					_			
31 14	1515	40.26	100	20.62	7.18	B.699	0.50	100	-50								
31/14	1520	40.27	100	20.53	7.18	0.183	0.35	175	-1.1								
31/14	1525	40.28	100	20.46	7.19.	0.674	0.79	11.1.	-67								
31/14	1530	40.29	100	20.48	7.19	0.665	P. 25	180	-63								
31/14	1535	40.30	100	20.49	7.19	0.662	0.20	147	64		-						
31/14	1540	40.3)	100	20.51	7.18	0.659	0.18	130	15								
31/14	1545	\$40.32	100	20.46	7.18	0.608	0.17	116	-45								
31/14	1550	40.33	100	20.41	7.19	0,657	0.15	103	-65								
31/14	1555	40.34	100	20.37	7.19	0.656	A.15	88.9	-1.4								
31114	1600	40.35	100	20.38	7.19	0.656	0.15	88.0	-45								
31 14	1605	40.36	100	20.35	7.18	0.655	0.14	SR.C	-15					- 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10			
31/14	1610	40.37	100	20.36	7.18	0.655	0.14	88.1									
		-		· · · · · ·			- 17	00.1	- • • •								
											_						
Rate: <=0.5 i	Jmin Drawdown:	<0.33 ft Measurer	ments: 3-5 min \$	Stabilization: +/-109	% С, +/-0.1 рН, +		10% DO; +/-10	//////////////////////////////////////	TU (deal), for 4 cor	Beritive readles							
	SAWWO	1-0311	U TIME:	1610	No. Containers	Nolume/Type					ja 1-						

5510001-013114 11112. [010	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Baller	Parameter(s)
DUPLICATE (D): YES/NO X-CS	2. 250 m plast, 6	HCC HN03	N Y	Pup Pup	ARSENIL
CO= LEL= OXY= H2S=					
### MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58		LocID:	SCAW	WD3			Date:	21.1	12			-		
	Project: Longhorn Army Ammunition Plant		Project No.	60256135.000	2HA			Recorded By: Scott Beesinger Checked By:							
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	e Probe:	Water Level I	ndicator ID#	Solinist 101	Min Rechard	ie Level = (Ti		- TD		9		
	Unit#		Sampling Equ	ipment:	Peristaltic/Bla	dder/Bailer 'I	ID#:								
WELL.	Casing I.D. (in) [a]: 41		Static Water L	evel Reading (	(ft) [c]:	Ry		Weather Conditions: Church Raine 11095							
INFO	Total Well Depth (ft) [d]: 22,02	11	Screened Inte	rval/Pump plac	cement: 9	.19		Condition of	Well/Remark	s: Na	G.D.S	Drimt	-		
CASING	Casing I.D. (in) [a]:	0,75	1.5	2.0	2.2	3.0	4.0	1 43	50	6.0	70	V			
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0,75	1.0	1.5	7.0	8.0	_		

Date	Timə (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor, clarify, etc.)
		Contraction of								
				$\gamma$			1			
		N	7	Lel		1)9				
				8	0					
		_								

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 3-5 min Stabilization: +/-10% C, +/-0.1 pH, +/-3% Cond, +/-10% DO; +/-10%Turb(<=10 NTU ideal), for 4 consecutive readings

SAMPLE ID:		т	IME:	No. Containers/Volume/Type	Preserv.	Fliter (Y/N)	Pump OR Baller	Parameter(s)
								( diameterite)
DUDUCATE (D), VECINO								
MATRIX SPIKE (MS) VES/NO								
MATRIX DUPLICATE (MD):	YES/NO							
CO=	LEL=	OXY=	H2S=					

т

т

# MONITORING WELL SAMPLE COLLECTION FORM

	Site: 58		L oclD:	200	1.10	/			1-	1					
LOOATION	Project: Longhorn Army Ammunition Plant		D. J. J.	2317	www	6		Date:	1130	114					
SUX 1			Project No.	60256135.00	02HA			Recorded By: Scott Beesinger Checked By:							
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfa	ce Probo:	Michael aveille			1.1.1		254	лс III.	1. Calcielle			
	Unit#		Water Intella	ce rioue.	water Level in	idicator ID#	Solinist 101	Min Recharg	e Level = (T	D-DTW(0.80))	- TD				
		All and a second second	Sampling Equ	uipment:	Peristaltic/Blad	Ider/Bailer	*ID#:								
WELL	Casing I.D. (in) [a]: 4 11		Static Water I	evel Reading	(#) fol:	. 14				1.	1.20	e de como esta			
INFO	Total Well Depth (ft) [d]: 30, 40		Screened Inte	novel Nedulity		17	011	Weather Co	nditions: (	-14AR	-/COLT	> 27°F			
and a start				avan unp pia	ivernent.	61	24.00	Condition of	Well/Remark	S: NEG	DS C	Daint			
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	2.2	3.0	1 40	1 42			1				
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	4.0	4.3	5.0	6.0	7.0	8.0			
					0.20	0.07	0.65	0.75	1.0	1.5	2.0	2.6			

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	pH	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Remarks (odor, clarity, etc.)
1/30/14	0810	21.17	100	14.12	6.81	626	(17)	221	177	
1/30/14	0815	21.19	100	14.75	6.81	6.42	0.80	19.5	159	
1130/14 180/14	0820	21.27	100	15,22	18.0	6.46	0.47	17.4	154	
1/30/14	0830	21,25	100	15.75	6.83	6.44	0.33	9.6	153	
1/30/14	0835	21,27	100	15 79	6.82	6.45	0.31	4.2	154	
1/30/14	-6840	21.29	100	15.83	6.81	6.45	0.30	0.5	154	
						-				
Pump Rate: <=0.5 L	/min Drawdown	<0.33 ft Measure	menter 2 E min D					-		

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 3-5 min Stabilization: +/-10% C, +/-0.1 pH, +/-3% Cond, +/-10% DO; +/-10% Turb(<=10 NTU Ideal), for 4 consecutive readings

35 HWW06-0130 14 TIME: 0840	No. Containers/Volume/Type	Preserv. Filter (Y/	N) Pump OR Baller	Parameter(s)
	3- 40ml slass	HCL N	Pup	VOC
DUPLICATE (D): YES/NO	3-20 ml glass	JHLL N	11	GASES / car bon Dioxida
MATRIX SPIKE (MS): YES/NO	1-250 ml Druger	CNACENAOH N	11	Su Hidu
MATRIX DUPLICATE (MD): YES/NO	1-250 ml plastic	UNDE V		FULLOUS IRON
	1-250ml plestic	ITNO3 M		Dissolved wetals
LCO=LEL=OXY=H2S=	1-250 mplestic	HW03 N	1 11	ARY mil
	1-250 ml pland ic	TOBSOH N	1	FOCT TRAZ Phospicarou
	1-100 mil alactic	NA N		Anvions ;

## MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58		Date:	7171	1.1											
	Project: Longhorn Army Ammunition Plant	C. S. S.	Project No.	60256135.00	D2HA	<u>~</u>		Recorded By: Scott Beesinger Checked By:								
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52 Unit #		Water Interfa	ce Probe:	Water Level I	ndicator ID#	Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD								
WELL	Casing I.D. (in) [a]: 2 11 Total Well Depth (ft) [d]: 32,48		Static Water L Screened Inte	evel Reading	(ft) [c]:	-8.90 .7 -2.94		Weather Conditions: Cloupy 639F								
Casing Info	Casing I.D. (in) [a]: Unit Casing Volume (gal/iin ft) [b]:	0.75	1.5 0.09	2.0 0.16	2.2 0.20	3.0 0.37	4.0 0.65	4.3	5.0 1.0	6.0 1.5	7.0	8.0				

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	pН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (my)	Remarks
23/14	1157 1207	28.90	NA							ONLY. 4.5 ft water Bailing will BAILED Z. Sgallons Ran Dry
2/3/14	1400	28.90	NA	18.89	5.16	0.232	6.27	463	163	
			<i>ħ</i>							

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 3-5 min Stabilization: +/-10% C, +/-0.1 pH, +/-3% Cond, +/-10% DO; +/-10% Turb(<=10 NTU Ideal), for 4 consecutive readings

WIN CE DE 3577 WWW 112-020314 IME: 1400	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Baller	Parameter(s)
DUPLICATE (D): YES/NO Y & S MATRIX SPIKE (MS): YES/NO N O MATRIX DUPLICATE (MD): YES/NO N O					
CO= LEL= OXY= H2S=					

# MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58					LocID:	35A1	12/10/0	8		Datas 1/2	atur		
_	Project: Long	ghorn Army Amm	unition Plant			Project No	60256135.0	002HA	0		Date:	9/14		
	1.				Stars alla		10 G 1 7 7			NAME OF STREET	Recorded By: So	ott Beesinger	Checked B	<i>I</i> :
EQUIPMENT	Water Quality	Meter Type/ID #:	Horiba U-52			Water Inter	ace Probe:	Water Leve	el Indicator ID#	Solinist 101	Min Bashama Laus			
100	Unit#					Sampling E	quipment:	Peristalfic/	Bladder/Bailer	*ID#·	Will Recharge Leve	f = (1D-DTW(0.80))	) - TD	
	1						1.1			Юп.	the second second	100 000 000		
WELL	Casing I.D. (in)	[a]:	121			Static Water	Level Reading	g (ft) [c]:	9.30		Woothes Condition	alera	1	
	Total Well Dep	th (ft) [d]: 33	3:38			Screened In	terval/Pump pl	acement: 7	0-20		Condition of Mullions	CleAR	- Vang co	17 16
010000	Instanto CA								- 50	nistri i reneg	Condition of Well/Re	emarks: NGG	DS paint	
INFO	Lipit Casion Vo	[a]:			0.75	1.5	2.0	2.2	3.0	4.0	4.3 50	0 60	70	
	John Gashig VO	ionie (gavin it) [o]:			0.023	0.09	0.16	0.20	0.37	0.65	0.75 1.0	0 1.5	20	8.0
Date	Time (24 br)	Water Level	Pumping Rate	Temp.		Cond	DO	Turb.	ORP					2.0
20/11/	(24 111)	(FIUC)	(mL/min)	(°C)	рН	(mS/cm)	(mg/L)	(NTU)	(mv)			Remarks		
20114	0015	04,30	NA							ONIU 5	+ Ct under	- Bou	The second	1
129/14	0826	53.32	NA							Bohal	1 ward	Qui	Ting auf	/
										1en rea	1ga IION	ICHN	prof	
	No. 1	-									-			
29/14	1320	29.30	NA	12,99	6.68	23.4	6.57	79.8	-127					
1.0	-			Earlie a					100					
							-							
-														
									-					
										-				
												2		
							-							
Pater <-0.5	(min Denuelau													
		I. C.SS IL Measure	ments: 3-5 min S	stabilization: +/-10	% C, +/-0.1 pH,	+/-3% Cond, +	/-10% DO; +/-1	0%Turb(<=10	NTU ideal), for 4	4 consecutive reading	ngs			
55	HWINDS	-012910	T TIME:		No. Container	s/Volume/Typ	e		Preserv.	Filter (Y/N)	Pump OR Baller	Parameter(e)		
					3-40	mala	55		Her	N	BALLE			
ICATE (D) V	ESINO NO	)			3-201	n gla	55		Her	N	11	Game	LOOR D	
RIX SPIKE /M	SI VECINON	Ň			2-14-	ter pla	154.6		NA	N		Duct	CHEDON P	DADE
		0010		ļ	1-500	m pla	stiv	ZN	ACC NAO H	N		SIC	maia Dacte	<u> </u>
UNIT DUFLICA	IE (MU): TES/N				2-250	mA	mbur	HS	04/NA	N		VEAT	Ferraur	
		-			1-250	mpl.	257.2		HNDB	Y		Diciel	renous	
(	-0=		)XY=	H2S=	1-250	m pk	stic		NAM 3	Y	1 11	10101	en netal	S
					1-250	m pla	54.0		HES04	N	1	TOCITO	TOI ONTON	FDUS
					1-250	MIDIAS	FIC		ND	- 2	- 15 X	ANIO	ns;	
					-2.50/	M DIQU			10		1.	A 11/2		0 0

## MONITORING WELL SAMPLE COLLECTION FORM

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LOCATION	Site: 58	LocID:	35A	NWOG			Date:	Dell	11							
	Project: Longhorn Army Ammunition Plant	La service and the	Project No.	60256135.000	2HA			Recorded By: Scott Beesinger Checked By:								
FOUIPMENT	Water Quality Meter Type/ID #: Horiba U-52		Water Interfac	ce Probe:	Water Level in	dicator (D# 5	Solinist 101	Min Rechar	ne i evel - /T		TD					
	Unit #		Sampling Equ	uipment:	Peristaltic/Blac	der/Bailer 1	D#:	(15-5) (15-5) ((0.00)) - 15								
WELL	Casing I.D. (in) [a]: ZII	بالليكين بيبا	Static Water L	Level Reading	(ft) [c]: 37	.27		Weather Co	unditione:	1000	laux	2200				
INFO	Total Well Depth (ft) [d]: 48-28		Screened Inte	erval/Pump pla	cement: 24	6-39.	2 35.	Condition of	Well/Remark	S GOO	D	Jor				
CASING	Casing I.D. (in) [a]:	0.75	1.5	2.0	22	30	40	43	60		7.0					
INFO	Unit Casing Volume (gal/lin ft) [b]:	0.023	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	8.0				

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	pН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (my)	Remerks
1/29/14	0910	32.30	100	12.03	6.37	6.44	2.01	208	200	(odoř, cianty, etc.)
1/29/14	0915	32.32	100	13.31	6.37	6.47	7.00	7.21	IGE	
1/29/14	0920	32.34	100	14.06	6.37	6.50	1.19	2.43	187	
1/29/14	0925	32-36	ION	14.67	6.37	6.61	0.90	201	193	
1/29/12	0930	32.38	100	14.99	6.37	6.69	0.79	143	195	
129/14	0935	32.40	100	15.43	6.36	671	0.70	91.6	200	
129/14	0940	32.42	100	15.78	6.36	6.73	0.66	71.9	202	
1/29/14	0945	32.44	100	15.85	6.36	6.74	0.64	55.5	210	
1/29/14	0450	32-46	100	15.43	6.36	6.74	6.63	42.8	216	
1/29/14	0955	32.48	100	16.00	6.36	6.74	0.62	30.1	220	
129/14	1000	3250	100	16.04	636	6.75	0.61	30.9	221	
1/29/14	1005	32.52	100	16.09	6.35	6.74	0.60	30.5	292	
1/29/14	1010	32.54	100	16.12	6.35	6.74	0.59	30.2	223	
Pump Pater <=0.5	/min_Denurdourn	1 <0 33 Å Manaura	mantes 0.5 min 0							

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 3-5 min Stabilization: +/-10% C, +/-0.1 pH, +/-3% Cond, +/-10% DO; +/-10% Turb(<=10 NTU ideal), for 4 consecutive readings

17

SAMPLE ID: 350WI	w09-0/21	114	TIME: 1010	No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)
				3-40-1 9/955	HLL	N	Pup	NOC
DUDUCATE (D): VESINO	No			3-20m/ glass	442	N		GAS45 (02
MATRIX SPIKE (MS): YES/N	IN NO			2-1 Liter plast.U	NA	N	11	DHC/ Dehulabooter
MATRIX DUPLICATE (MD):				1-500 hal plastic	CAHL NATH	N		Sulfide
				1=250 ml Amolin	1 DOT NH	N		VFH / FERTOUS FROM
CO=	LEL=	OXY=	H2S=	1-250 mil place	HNU 3	- Y		Discolved metals
				1-250 ml plastic	#12104	N		Tac 1 years a here build
				1-250 Ml Alastic.	NR	2	ÀN -	ANENO

### MONITORING WELL SAMPLE COLLECTION FORM

Page 1 of

LOCATION	Site: 58	Loc	D: 3	SA	WWW)10			Data	1 DAI			
	Project: Longhorn Army Ammunition Plant	Proj	ect No. 6025	6135.00	D2HA			Recorded I	By: Scott B	eesinger	Che	cked By:
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52	Wate	er Interface Pro	obe:	Water Level In	dicator ID#	Solinist 101	Min Rechar	ne l evel = (Ti		TD	
	Unit #	Sam	pling Equipme	ent:	Peristaltic/Blac	der/Bailer 'I	D#:		go Lover (II)	0-0111(0.00))	- 10	
WELL INFO	Casing I.D. (in) [a]: 2 II Total Well Depth (ft) [d]: 33.72	Stati	c Water Level	Reading	(ft) [c]:	8.85		Weather Co	nditions: (	IGAR	LEOCD	3795
	• • • • • • • • • • • • • • • • • • •		ened intervalut	-unip pia	cement 10	1-30-1	03.1	Condition of	Well/Remark	s: 80	0D	
CASING INFO	Casing I.D. (in) [a]: Unit Casing Volume (gal/lin ft) [b];	0.75	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
		NOLO	0.09	0.10	0.20	0.37	0.65	0.75	1.0	1.5	2.0	26

Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	pН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP	Remarks
1/29/14	1140	18.87	100	1515	5.55	0707	7 21	112 -	774	(odor, clarity, etc.)
129114	1145	1884	100	16.02	CI.I	0.200	2.60	450	234	
1/20/14	1150	1886	100	216.62	FIS	0.202	218	43.0	209	
1120/14	1155	18 0 4	180	B10.90	2.60	0.081	0.61	48.8	059	
1/20/14	1200	10.00	100	11.60	5.14	0.266	2.45	50.6	239	
129114	1200	009	- IVV	18.21	5.65	0.256	2,34	54.5	244	
129119	12903	18,90	100	18136	5.60	0.253	2.26	61.2	246	
1129/14	1210	18.91	100	18.99	5.67	0.253	2.21	62.1	252	
1/29/14	1215	18.92	100	19.43	5.66	0.251	2.18	61.9	254	
1/29/14	1220	18.94	IOD	19.54	5.65	0.250	2.20	61.7	256	
1/24/14	1225	18.46	100	19.57	5.65	0.249	2.20	61.5	158	
1/29/14	1230	18.98	100	19,61	5.65	0249	7.14	61.14	150	
·					0.00	0.011	6.17	41.7	007	
			-							
Pump Rate: <=0.5 L	/min Drawdown:	<0.33 ft Measure	ments: 3-5 min S	tabilization: +/-109	% C. +/-0.1 pH.	+/-3% Cond. +/	-10% DO-+/-10	%Turb/c=10 N	Thildeel) for the	

SAMPLE ID: 35 AWW10 -0/29/4 TIME: 1230 No. Containers/Volume/Type Preserv. Filter (Y/N) Pump OR Baller Parameter(s) 3-40ml class HL mo VOL N 3-20 ml alass 5 HLL GASIS/ CARben DIOXIDA  $(\mathbf{N})$ DUPLICATE (D): YES/NO NO Liter plestic NA 2 11 DHL/ Dehalaposter MATRIX SPIKE (MS): YES/NO 🔊 🕅 1-500 m) pla6t. L ZNACEN POH N Sulfide 11 MATRIX DUPLICATE (MD): YES/NO Z-250m Amber 17:304/NA N VFA / Ferrous 11 1-250 ml plastic HN03 V 11 Dissolved in Aala CO= LEL= OXY= H2S= 1-250mlplastil 19203 11 TOTAL metals 1-250 ml plastic TOL TOTAL PHOSPHOFIUS N H2304 11 1-250-W/ plastis N NA 11 A)

# MONITORING WELL SAMPLE COLLECTION FORM

Page	1	of
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LOCATION	Site: 58					LocID:	14sr	nu107			Data	10	1		
	Project: Long	horn Army Amm	unition Plant			Project No.	60256135.0	002HA			Date:	-13 /	14		
	Luci -								en and	1	Recorded	By: Scot	t Beesinger	Che	cked By:
EQUIPMENT	Water Quality	/leter Type/ID #:	Horiba U-52			Water Interf	face Probe:	Water Level	Indicator ID#	Solipist 404	10.0				
	Unit #					Sampling E	quipment:	Peristaltic/BI	adder/Bailor	30iinist 101	Min Recharg	je Level =	(TD-DTW(0.80	)) - TD	
	and I'						1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	T UNStatecy DI	auder/Daller	ID#:					
WELL	Casing I.D. (in)	[a]: 4	-n			Static Water	Level Reading	a (ff) [c]:	1.00	Caller Caller State	here as	DR W		1 .	
	Total Well Dept	h (ft) [d]:	35,20			Screened In	terval/Pump nl	acomont:	100	1.0	Weather Co	nditions:	Cloudy	IRAWY,	160°F
	1					Terrentant	torrain unp pi	avement	4.8-3	1.8	Condition of	Well/Rem	arks: 🔨	4405	Daint
CASING	Casing I.D. (in)	[a]:			0.75	1.5	2.0	1 22	1 30	1 11	- starter	10 J			Places
INFO	Unit Casing Vol	ume (gal/lin ft) [b]:			0.023	0.09	0.16	0.20	0.27	4.0	4.3	5.0	6.0	7.0	8.0
								0.20	0.37	0.65	0.75	1.0	1.5	2.0	2,6
Date	Time	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/l )	Turb.	ORP				Remarks		
2314	1 1	31.00	NA			(	(	(110)	(mv)	-	1		(odor, clarity, etc.)	2	
23114		35.15	AFA							only 4	tt. was	kr	Bai	ing we	21
	0730		N				1			Bailed	3.5	aall	DAIG	Panit	0.01
												2	212/	11100	nog
															/
Juluk	07/10	211 0 -													
514119	0140	34,00	NA	- la	101	Dio		- 0	1						
					1411	DID	NOT	141	har	se to	)	_			
					UI TA	Q	01-	P		1					
					6. 1 M	00	10	24 0	-AIN	1 Def	oth				
					IN	34	Ho	107	0	111					
					m	01	110	0123	Jul	nine	15 70	6 T			
					Be	CA	114	D	Da	/					
								10	Ping						
									1						
		~													
			1	$\cap$	(	001									
				101		19.0									
			10	100	- V		C. C. C.								
mp Rate: <=0.5 L/	min Drawdown:	<0.33 ft Measurer	nents: 3-5 min S	tabilizations + / 40											
MPLE ID:			Titer		/% C, +/-0.1 pH, +	+/-3% Cond, +/	-10% DO; +/-10	%Turb(<=10 N	TU Ideal), for 4	consecutive readly	ngs				
			IIME:		No. Containers	Nolume/Type	9	F	reserv.	Filter (Y/N)	Pump OR Ball	er	Parametor(c)		
													raiameter(s)		
	200														
TRIVATE (U): TE	:5/NO														
TRIX SPIKE (MS)	): YES/NO														
I KIX DUPLICATI	e (MD): Yes/No	i -									-				
											-				
~	<u> </u>			F F											

# MONITORING WELL SAMPLE COLLECTION FORM

P	age	1	o
	-0-		

LOCATION	Site: 58					LocID:	LHS	MW	04		Date:	12.11	()		
111110-1113	Project: Longi	norn Army Amm	unition Plant			Project No.	60256135.00	02HA	~		Recorded Por	13	4		
	Water Quality M	otor Turne/ID #	Hadha H. Co				0.1.51				Intecorded By,	Scott Beesi	nger	Che	cked By:
EQUIPMENT	Unit #	erel Typelin #:	Honda U-52			Water Interfa	ace Probe:	Water Leve	Indicator ID#	Solinist 101	Min Recharge	Level = (TD-DT	W(0.80)) - 1	0	
	1			41		Sampling Eq	uipment:	Peristaltic/B	ladder/Bailer	'ID#:		(10.01	(0.00))*		
WELL	Casing I.D. (in) I								10.00 GA				1000	1919	
INFO	Total Well Depth	(ft) [d]: 2	101			Static Water	Level Reading	(ft) [c]:	DRY	8	Weather Condition	tions: CL	DID DI	1 5	LOF
		1.4 1.41.	1.04		100	Screened Int	erval/Pump pla	acement:	5.2-	28.2	Condition of We	ell/Remarks:	MIGG	DI	Oc 1
CASING	Casing I.D. (in) [	a]:			0.75	1 15	1 20	1 20	1				194.4	-07	paint
INFO	Unit Casing Volu	me (gal/lin ft) [b]:			0.023	0.09	0.16	0.20	3.0	4.0	4.3	5.0	6.0	7.0	8.0
						1 0.00	1 0.10	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6
Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp. (°C)	рН	Cond (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (my)			Ren	narks		
												(odor, clu	arity, etc.)		
		F													
				$\left( \right)$				01							
				1/2				6							
				V-		V									
					-										
			-												
					~									-	
														-	
n Rate: <=0.51	/min_Droundarum														
	/man Drawdown:	<0.33 ft Measure	ments: 3-5 min Sta	abilization: +/-10%	6 C, +/-0.1 pH, +	-/-3% Cond, +/-	10% DO; +/-10	%Turb(<=10 N	ITU Ideal), for	4 consecutive readin	08				
IPLE ID;			TIME:	1	No. Containers	/Volume/Type			Preserv.	Filter (Y/N)	Pump OR Baller	Daram	ator(a)		
				-							t unp ett banet	Fardin	eter(s)		
	SINO														
RIX SPIKE (MS	SINO			L											
	F (MD): VESINO			F											
				-											

# MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58					LocID:	1110					-	1				
	Project: Long	ghorn Army Amm	unition Plant			Project No.	60256425 0	NOU	0		Date:	Date: 1/30/14					
			91 NE			THOJECTING	00236135.0	PUUZHA	A Stationer of the		Recorded By: Scott Beesinger Checked By:						
EQUIPMENT	Water Quality	Meter Type/ID #:	Horiba U-52			Water Interf	are Prohe-	Minter Law			and the second s						
	Unit#					Complian C	ace Floge.	water Leve	el Indicator ID#	Solinist 101	Min Recharge Level = (TD-DTW(0.80)) - TD						
			TANG P			Toamping E	quipment:	Penstaltic/l	Bladder/Bailer	'ID#:							
WELL	Casing I.D. (in)	[a]: 41	1			Challes Marker							-12-1				
INFO	Total Well Depl	th (ft) [d]: 13	.52			Static vvaler	Level Readin	g (ft) [c]: 🧧	10,50	>	Weather C	Conditions:	Clouby	Insindu	15400		
	11月 11				1.00	Screened In	terval/Pump p	lacement: /	05-0		Condition	of Well/Rema	irks: N	66 DCD	in it		
CASING	Casing I.D. (in)	[a]:			0.75	1 15	1 20	1		A second second				ocosp	any		
INFO	Unit Casing Vol	lume (gal/lin ft) [b]:			0.023	0.00	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0		
	-					0.03	0.10	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6		
		Water	Pumping		1		1	1	1	1							
	Time	Level	Rate	Temp		0	1										
Date	(24 hr)	(FTOC)	(mL/min)	(°C)	DH	(mS/cm)		Turb.	ORP				Permette				
130 14	16:08	20.50	AL Q			(morein)	(ing/c)		(mv)		0		(odor, clarity, etc.)	×			
13014	16:14	22,44	NEA		-					ONLO	3 +7	· w	ater	Reil	In a least		
	1	-2.11	1011							BALLO	ED 2.	75 0	al. 6.	2 mill	Ing wer		
					-							9		SAN U	ing		
1/21/4	091	20.00	-														
112111	0050	20.50	NA	17.61	6.83	3.58	9.11	34,9	134								
			-						101								
										-							
										-			-				
			-	10.000				-									
				1	+		-										
					-												
							·										
Imp Pater and T										1							
mp Rate: <=0.5 [	/min Drawdown:	< 0.33 ft Measurer	ments: 3-5 min \$	Stabilization: +/-1	0% C, +/-0.1 pH, -	+/-3% Cond, +/	-10% DO; +/-10	)%Turb(<=10	NTU Ideal), for	4 consecutive read	Ince						
	HSMUT	06-0131	TIME:		No. Containers	Nolume/Type	)		Preserv	Filter (V/AD	Inga						
					3-40	ma	ASC		Jack		Pump OR Ba	ailer	Parameter(s)				
					1-25	O ml	do ut	10	4100	- N	Bar	ler	you	-			
PLICATE (D): Y	ES/NO VV	0					plast		TNUS	7	241	11r	HRS	evic			
ATRIX SPIKE (M	s): Yes/No N'	V									-						
TRIX DUPLICA	TE (MD): YES/NC	NO															
C	:0= L	.EL= O	XY=	H2S=													

Page 1 of

# MONITORING WELL SAMPLE COLLECTION FORM

LOCATION	Site: 58 Project: Longhorn Army Ammunition Plant		LocID: Project No.	60256135.0	002HA	?		Date:	//30/ By: Scott B	14 eesinger	Che	cked Bv:	
EQUIPMENT	Water Quality Meter Type/ID #: Horiba U-52 Unit #	7	Water Interfa Sampling Equ	ce Probe: uipment:	Water Level i Peristaltic/Bla	ndicator ID#	Solinist 101 "ID#:	Min Rechar	ge Level = (Ti	D-DTW(0.80)	- TD		
WELL INFO	Casing I.D. (in) [a]: 4 11 Total Well Depth (ft) [d]: 30.50		Static Water L Screened Inte	evel Reading	g (ft) [c]: 20	0.25	24,00	Weather Co Condition of	nditions: C	14AR	WINDY	/COLD 3	329
Casing info	Casing I.D. (in) [a]: Unit Casing Volume (gal/lin ft) [b]:	0.75 0.023	1.5 0.09	2.0 0.16	2.2 0.20	3.0 0.37	4.0	4.3 0.75	5.0 1.0	6.0	7.0	8.0 2.6	

Date 1 30 1 4 1 30 1 4	Time (24 hr) 0930 0935 0940 0945 0955 0955 1000 1005	Water Level (FTOC) 20.29 20.35 20.35 20.35 20.37 20.39 20.4/	Pumping Rate (mL/min) 100 100 100 100 100 100	Temp. (°C) 12.64 13.81 14.70 14.54 14.30 14.22 14.17 14.13	рн 6.76 6.74 6.73 6.67 6.67 6.67 6.67 6.67 6.67	$\begin{array}{c} \text{Cond} \\ (mS/cm) \\ 11 \cdot 1 \\ 11 \cdot 1 \\ 11 \cdot 2 \\ 11 \cdot 4 \\ 11 \cdot 4 \\ 11 \cdot 4 \\ 11 \cdot 4 \\ 11 \cdot 5 \\ 11 \cdot 4 \\ 11 $	DO (mg/L) 1.33 0.77 0.50 0.35 0.27 0.25 0.26 0.26	Turb. (NTU) 12.9 11.8 11.0 8.5 7.3 6.4 4.6 4.2	ORP (mv) 153 139 126 117 116 115 115	Remarks (odor, clarity, etc.)	
Pump Rate: <=0.5 L SAMPLE ID: LH	/min Drawdown: MWW07-	<0.33 ft Measurer 0/30(4	ments: 3-5 min St TIME:	tabilization: +/-109	6 C, +/-0.1 pH, +/	/-3% Cond, +/-	10% DQ; +/-10	%Turb(<=10 N	TU (deal), for .	4 consecutive readings	

				INO (CONTRIDATE) (Olympol Type)				
	5017		- 1005	> dl	Preserv.	Filter (Y/N)	Pump OR Baller	Parameter(s)
1				5- 40ml glass	HUL	N	Pup	201
DUPLICATE (D): YES/NO NO				3- Bom Glass	HUL	N	- un	Pour Captor D
MATRIX SPIKE (MS): YES/NO NP				1- Sal SOD ml place	tic ENACEMAD	A N		Culling a Diox DA
MATRIX DUPLICATE (MD): YESINO N	2			1-250 ml Amber	NA	N		Ferral Toon
. ,				1-250ml plastic	HNOS		11	Distaling hadal
CO= LEL=	0.224	_	L100-	1-250ml plastic	House	N	55	Tornel
	0/(1-		П20-	1-250ml plastic	NW03	N	NY NY	AD WILL
				1- est m plastic	42204	2	310	TOLITOTAL DLOGOLOGOUS
				1-250 ml plastic	NA	2	et v	Anipus 1

Page 1 of_

# MONITORING WELL SAMPLE COLLECTION FORM

Page	1	of_
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LOCATION	Site: 58					LocID:	1004	THIO	06		- In-		/	
100	Project: Long	ghorn Army Ammi	unition Plant			Project No.	60256135.0	002HA			Pagerded Dur	5119		
EQUIPMENT	Water Quality	Meter Type/ID #:	Horiba U-52			Water Interf	ace Prohe:	Water Lev	al te dia atau 10 //		Recorded By: So	ott Beesinger	Cł	hecked By:
	Unit#					Sampling E	uinment	Periotaltic/	Pladdor/Relles	Solinist 101	Min Recharge Leve	= (TD-DTW(0.8	0)) - TD	
	ist U.				A. Theo	10000	quipment.	renstatuczt	biauder/Baller	ID#:				
WELL	Casing I.D. (in)	[a]:				Static Water	Level Reading	a (ft) [c]:	10.17		har a m	- 1		Q. S
	Total Well Dep	th (ft) [d]: 2	5,00			Screened In	terval/Pump pl	acement:	1111		vveather Conditions	Clou	DY S	STOF
CASING	Casing ID (in)	[a]:						STOC OF		A COLOR	Condition of Well/Re	marks: 6	OOD	
INFO	Unit Casing Vol	ume (cal/lin ft) lb1:			0.75	1.5	2.0	2.2	3.0	4.0	4.3 5.0	0 60	70	
		(3			0.023	0.09	0.16	0.20	0.37	0.65	0.75 1.0	1.5	2.0	8.0
Date	Time (24 hr)	Water Level (FTOC)	Pumping Rate (mL/min)	Temp.	DH	Cond	DO	Turb.	ORP					
31 14	0725	19.17	ALA	1.07	- P11	(morem)	(mg/L)	(UTV)	(mv)	-		(odor, clarity, etc	.)	
31114	0734	24,95	NA							SAIL	ne well			
										BALLE	1.5 gullon	5 RX	FN DD	(/
								<u> </u>		_	0			/
				-					_					P
31 14	1640	19.17	NA	22.86	5,83	8.14	0.00	02 11	05	-				
			1.1		0.01	0.10	8.08	23.7	45					
			1. Contraction (1. Contraction)											
							- 11 - 11 - 11 - 11 - 11 - 11 - 11 - 1							
p Rate: <≃0.5 L	min Drawdown:	< 0.33 ft Measuren	nents: 3-5 min S	tabilization: +/-109	% C, +/-0.1 pH	+/-3% Cond +/	-10% DO-+/ 10							
PLE ID: 101	47000	6-MIZIL	TIME:	li	No. Containere	Nolume/Type	-10% DU;+/-10	17% I UND(<=10	NTU ideal), for	4 consecutive read	Ings			
		NIJII	Т	f	1-200		alast	^	Preserv.	Filter (Y/N)	Pump OR Bailer	Parameter(s)		
				F	1 051	1.01	prasti	U	PNO)		Bailer	AP.	senic	
LICATE (D): YE	es/no NU			F										
RIX SPIKE (MS	s): Yes/No N	V												
RIX DUPLICAT	'e (MD): Yes/NC	$\nabla^{N}$		Ē										
	_													
0	∩- ı			-							-			

APPENDIX F: Chain of Custody Forms, Data Validation Reports, Analytical Data Tables and Laboratory Reports

COC No. A 36454			158 Sta	arlite Drive OH 45750	СН	AIN	-of-	ficr cus	ob tod	ac y re	CO	۶D						Phc Fax	one: :	740 740	-373 -373	8-407 8-483	71 35
Project Contact:	V. Ja Ho en Ti duo	1 _ Ko u=1 m N	Contact P 2/0- Location: AT Signature MR/Rendy	hone #: 296-20 1AAP 5 1Mym/gc	00 8 Uch:MRAmull	UMBER OF CONTAINERS	old	10CS 8262B														DTAL # (LAB USE)	Program CWA CWA RCRA DOD AFCEE Other ADDITIONAL REQUIREMENTS
I.D. No. TR-057)813	Ŭ	G	Date	lime	Matrix"		Ĭ															F	·
58 DPTZO (36-40)05081	3	X	08-05-13	1823	GW.	3		$\hat{\chi}$															
58DPT23(36-40)0608	3	X	08-06-13	1130	GW	3		X															
580PT 27 (26-30)06081	7	X	08-06-13	1455	GW	3	?	X															
58DPT=1(26-30)060813		X	08-06-13	1708	GW	3		X															
									1														
-																							
						1																	
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Relinquished by: (Signature)	,		Date 08/01/13	Time Reco 1700 (Sign	l eived by: nature)			ŧ	Rel (Sig	linquis gnatu	shed re)	by:				Da	ate	T	ime	Re (Si	ceiveo gnatu	d by: re)	
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COC No. A 36463	158 Starlite D Marietta, OH 45	rive 750 CH		Micro <mark>f-cust</mark>	ody re	CORD				Phone: Fax:	740-37 740-37	73-40 ⁻ 73-48:	71 35
Company Name: <u>ALOM</u> Project Contact: <u>Dav/d/Dat/Per/L/nda Raab</u> Turn Around Requirements: Contact <u>NSTANDARC Loda Rea</u> Project ID: <u>CO256135</u> Sampler (print): <u>Condy Morgan/ali</u> Smile Sample	Contact Phone #: 2/0-296- F Location: E Z/HAAP Signature: M Signature:	2000 58 um ///J.H	UMBER OF CONTAINERS	IDC'S 8262B								DTAL # (LAB USE)	Program CWA RCRA DOD AFCEE Other ADDITIONAL REQUIREMENTS
TBIDO813	Date III	water		X								F	
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58 DPT24 (31-35) 100813 X	08-10-13 15.	25 GW	3	X					1				
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			Marietta,	OH 457	750	CH	IAIN	-OF-	cus	TOD	Y RE	ECO	RD					Fax:		740	-373	-483	35
Company Name: AECOI	N	7																					Program
Project Contact:	Ra	ah	Contact P	hone #:	-20	000			8														
Turn Around Requirements:	7100		Location:		~	2	L SH		Sa														
Standard			LH	AAP	50	3	AN		3														
60256134	5						I NO		00													JSE)	Other
Sampler (print): Rondy Morgon			Signature	no	qar	~	ER OF C		C'S													# (LAB L	
Sample I.D. No.	Comp	Grab	Date	Tim	e	Matrix*	NUMB	ploH	NON													TOTAL	new0ineMeivi 3
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			Marietta,	OH 457	'50	СН	AIN	OF-	CUS	TOD	Y RE	COF	RD						Fa	ax:	74	0-37	3-48	35
Company Name: AECOM									6											Ĩ				Program
Project Contact: DAVE WACKER LIND Turn Around Requirements:	E RA	in r F	Contact P 210-2 Location:	hone #: 76 20	Ø		SF		Brave															
Project ID: (+02.51+135	72	hr	LHAA	P 58			ONTAINE		8260												l.,		JSE)	AFCEE     Other
Sampler (print): R BERT LEWIS		/	Signature	BX	~		ER OF C		rs (														- # (LAB (	
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630PT26(28-32)-210813	1	X	68-21-13	154	0	W	3		X															
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Company Name: Project Contact:	ND		Contact F	hone #:	2471																			Program
Turn Around Requirements:	12	HR	Location:	alu: . #HAP	-16 15P	-2000- 1	ONTAINERS														-		ŞE)	DOD     AFCEE     Other
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Company Name: AECOM Project Contact: David Contact: David Contact: David Contact: David Contact: David Contact: AECOM Turn Around Requirements: AECOM Turn Around Requirements: AECOM Sampler (print): Bab Contact Ka	-	mb	Contact F (210) Location:	Phone #: 6 AAA AAA	- 20 Р-	58 58	A OF CONTAINERS		s 8260B														-	(LAB USE)	Program CWA RCRA DOD AFCEE Other
Sample I.D. No.	Comp	Grab	Date	Time	e	Matrix*	NUMBE	Pold	VOC															TOTAL #	REQUIREMENTS
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Company Name: <u>AECOM</u> Project Contact: <u>David Watter</u> Turn Around Requirements: <u>24</u> H ₆ Project ID: <u>60256135</u> Sampler (print): <u>McTure Law</u>	nals.	Ka	Contact P	hone #: 10 - 2 L H A A	96 - 1 p	-2000 58	ER OF CONTAINERS		2 (S260B)														- # (LAB USE)	Program CWA RCRA DOD AFCEE Other BEOLIBEMENTS
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Relinquished by: (Signature)			Date	Time	Reco (Sign	eived for Laborato nature)	ory by	/:			Date	)		Tir	ne		F	ema	rks:					

### **Chain of Custody Record**

COC Number:

Laboratory:	Microbac POC: Tony Long			Project N	Manager.	:	Dav	e Wa	cker									Mail to:	1	Linda Des		
Address:	158 Starlite Drive			Phone/F	ax Numb	oer:	210	-296-	2000											112 East	Deens OTC	400
	Marietta, OH 45750			Sampler	(print):		Sco	tt Bee	sina	er	114									Son Anton	ecan SIE	2. 400
Phone:	1-800-373-4071																			210-296-2	000	205
Client:	AECOM			Signatur	e: 🤇 .		5	0	•						-			Fed Ex	Airbill N	lo:		-
Address:	112 East Pecan Ste. 400			1	ð	ALO	E	ees	-	~							- 9					
	San Antonio, TX 78205								r"		Y		L					Program	<b></b>			
Turn Around T	ime: 14-day			pH:					g		RSI	ō	RSH		010		5	lingia				
Project Name/L	Location: Longhorn								tain			Cart		10.1	SW6	6010	non					
Project Numbe	60274185.0002HA			1					of Con	C 826	Gases 175	Janic ( 415.1	oxde 175	ity E3	Iron (	NS uc	ospho		ERPI	MS REQUI	RED FIELI	DS
Site Name	Sample ID// section ID					4	Q	ž	mber	\$	pen	al Org	on Dio	Ikalin	olved	otal In	tal Ph	B	9	LOT CO	ONTROL NU	MBERS
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SITE 58																						
telinquished by Signature) telinquished by: Signature)	Seets Beesey	Da 8/2 Da	ete 0//3	Time I (600) Time I	Received	l by: (S	Signat	ure) ory by:					Recei	ved by	r: (Sigi	nature		Date	Time	Relinquished I Remarks:	oy: (Signature	)

Homogenize all composite samples prior to analysis

## Chain of Custody Record

Laboratory:				-															CO	C Number:		
Address:	Microbac POC: Tony Long			Project	Manager	:	Da	ve Wa	acker						1.0		M	ail to:	ŝ	Linda Raa	abe	
	158 Starlite Drive			Phone/F	ax Num	ber:	210	)-296-	-2000	)										112 East	Pecan STI	= 400
<b>D</b> L	Marietta, OH 45750			Sample	(print):		Sco	ott Be	esing	er										San Antor	nio TX 78	205
Phone:	1-800-373-4071																-			210-296-2	2000	
Addroso:	AECOM			Signatu	re:	-	1	>	-								F	ed Ex	Airbill	No:		
Auuress.	112 East Pecan Ste. 400				2	600	54	ees	m	n												
Turn Around T	San Antonio, TX 78205								1	0				1	1		Pr	ooran	n:			-
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Project Name/L	Longhorn								a la	SW	gan	Aci	5									
Project Numbe	60274185.0002HA								of Cor	anese	Man v6020	Fatty	ous Ir	lifide	lions		F		ERP	IMS REQU	RED FIEL	DS
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		1			Signature	=)																

Homogenize all composite samples prior to analysis



COC Number:

Laboratory:	Microbac POC: Robert Brooks			Project I	Manager		Dav		cker	-		-					Mai	I to:				
Address:	505 E. Broadway Ave.			Phone/F	ax Numi	per:	210	296	2000											Linda Raa	be	
	Marvville, TN, 37804			Sampler	(print):		210	# Boo	2000								-			112 East H	'ecan STE	. 400
Phone:	865-977-1200			1			000		singe	er										San Anton	io, TX 782	:05
Client:	AECOM			Signatur	re:		-	-	-		-					-	Fee	I Ex /	Airbill N	210-230-2		
Address:	112 East Pecan Ste. 400				3	Let	न् र	See	Su	s-												
	San Antonio, TX 78205							-	T			1	1	İ			Pro	oram				
Turn Around T	ime: 14-day			pH:					g									g	•			
Project Name/L	Location: Longhorn								ntain	ides												
Project Numbe	r: 60274185.0002HA								of Co	locco									ERPI	MS REQUI	RED FIELI	DS
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(Signature)					(Signatur	e)																

Homogenize all composite samples prior to analysis

REPORT TO: Name:	LINDA RAARS	INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided) Name:	mi
Company:	Atcom	Company:	microbialinsights
Address:	112 E. PARAN, Suita 400	Address:	in order and in the grade
	SAN ANTONIO, TY. 78205		10515 Research Dr
a maile			Knoxville, TN 37932
emaii:	linda range alartom. com	email:	865-573-8188
Phone:	210-253-7518	Phone:	www.microbe.com
Fax:		Fax:	
Project Manager:	DAVE WACKER	Purchase Order No.	Please Check One:
Project Name:	LHAAP SIBS8	Subcontract No.	More samples to follow
Project No.:	60274185.0002HA	MI Quote No.	No Additional Samples

 Report Type:
 Dr Standard (default)
 Image: Microbial Insights
 Microbial Insights
 Level IV (25% surcharge)

 EDD type:
 Image: Microbial Insights
 Standard (default)
 Comprehensive Interpretive(15%)

Historical Interpretive (30%)

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

	Sample Informat	lion				Ana	lyse	5		CE	NSU	S: Pl	eas	e se	lect	the t	arge	t orș	gani	sm/	gene												
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	PLFA	DGGE+3ID	DGGE+5ID	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes bvc, tce, vcr)	DHBt (Dehalobacter)	DSM (Desulturomonas)	DSB (Desufftobacterium)	EBAC (Tolal)	SRB Sulfale Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Dentrifiers-nirS and nirK)	AOB ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenoi Hydroxylase)	NAH (Napthalene-aerobic)	BSSA Toluene/Xylen <del>e-</del> Anæerobic)	add. qPCR:	add, qPCR:	NA Expression Option)*	)ther:	Other:	Whee:
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It is vital that chain of custody is filled out correctly & that all relative information is provided.

Failure to provide sufficient and/or correct information regarding reporting, Invoicing & analyses requested information may result in delays for which MI will not be liable.

#### **Chain of Custody Record**

COC Number:

Laboratory:	Microbac POC: Tony Long			Project N	lanager:		Dav	e Wa	cker									Mail to:		Linda Raa	be	
Address:	158 Starlite Drive			Phone/Fa	ax Number:		210	-296-2	2000									1		112 East F	Pecan STE	. 400
	Marietta, OH 45750			Sampler	(print):		Sco	tt Bee	sing	эг								1		San Anton	io, TX 782	205
Phone:	1-800-373-4071																			210-296-2	000	
Client:	AECOM			Signature		1			)		1							Fed Ex	Airbill N	lo:		
Address:	112 East Pecan Ste. 400				0	ee	62	Z	sel	5		n	2									
_	San Antonio, TX 78205			1							²	~	SK		0			Program	n:			
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Project Name/L	Longhorn			1					ntai	09	8	1 Ca		310	NS I	W60	horo					
Project Numbe	60256135.0002HA								ů ř	C 82	Gasi 175	Janio 415.	175	lity E	<u>P</u>	on S	dsoi		ERPI	MS REQUI	RED FIELI	DS
Site Name	Sample ID/Legation ID	680	850	Data	Time	-de	ą	ž	umber	\$	olved	al Org	on Di	Alkalir	solved	otal Ir	otal PI	ODE	0	LOT C	ONTROL NUI	WBERS
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-Homogenize all composite samples prior to analysis

### Chain of Custody Record

COC Number:

Laboratory:	Microbac POC: Tony Long			Project N	Manager:		Dav	e Wa	cker								Mail to	o:	Linda Raa	he	
Address:	158 Starlite Drive			Phone/F	ax Numb	er:	210	-296-:	2000	)							-		112 East I	Pecan STF	= 400
	Marietta, OH 45750			Sampler	(print):		Sco	tt Bee	sing	er							-		San Antor	to TX 782	205
Phone:	1-800-373-4071			1								5 K							210-296-2	2000	.00
Client:	AECOM			Signatur	e:	$\bigcirc$	-		0			-					Fed E	x Airbill I	No:		
Address:	112 East Pecan Ste. 400					2	sel	D	Ba	2es	ing	m	-	94) 1							
	San Antonio, TX 78205									0			Γ	T			Progra	am:			
Turn Around T	ime: 14-day			] pH:				1	r B	602	939	5					-				
Project Name/I	Longhorn								ntain	e SV	ngan	Aci	E S								
Project Numbe	#: 60256135.0002HA			1					L Col	anes	Mar 602(	Fatty	i sno	Iffide	ions			ERP	IMS REQU	RED FIEL	DS
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Site Name	Sample IU/Location U	SBD	SED	Date	Time	Com	Gra	Matu	Ž	Total	Dist	>					SA CC	Coolei	ABLOT	EBLOT	TBLOT
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(Signature)					(Signatur	e)															

-Homogenize all composite samples prior to analysis



COC Number:

Laboratory:	Microbac POC: Robert Brooks			Project N	lanager:		Dave	e Wa	cker								Mail to:		Linda Raa	be	
Address:	505 E. Broadway Ave.			Phone/Fa	ax Numb	er:	210-	296-2	2000								1		112 East F	Pecan STE	. 400
	Maryville, TN. 37804			Sampler	(print):		Scot	t Bee	singe	ər							1		San Anton	io, TX 782	05
Phone:	865-977-1200								•										210-296-2	000	
Client:	AECOM			Signatur	e:	0	-	- (+	2		•	1		· · ·			Fed Ex	Airbill N	lo:		
Address:	112 East Pecan Ste. 400				50	0	Col	AL	Sel	2	T	~									
	San Antonio, TX 78205																Program	m:			
Turn Around Ti	ime: 14-day			pH:					es S	Ł							1				
Project Name/L	Location: Longhorn								ntain	ng vc gene											
Project Numbe	r: 60256135.0002HA								of Co	cludi								ERPI	MS REQUI	RED FIELI	DS
Site Name	Comula ID/I a soften ID					à	ą	ź	mber	HC in redu							BE	8	LOT C	ONTROL NU	BERS
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(Signature)		1			(Signatu	re)															

Homogenize all composite samples prior to analysis

REPORT TO:	· 0	INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided)	
Name:	LINDA KAABE	Name:	
Company:	A Ecom	Company:	microbialinsiabts
Address:	112 E. Pacan Suite 400	Address:	in signa
		8 B	10515 Research Dr
			Knoxville, TN 37932
email:	Linda. raabe Daecon.com	email:	865-573-8188
Phone:	210-253-7518	Phone:	www.microbe.com
Fax:		Fax:	
Project Manager:	DANG WARKER	Purchase Order No.	Place Chack One
Project Name:	1 HARD SITE SP	Subcontract No.	
Project No :	605(175 000 WA	MI Quete No.	
Project NO.:	10025 6155. 000 HA		No Additional Samples

Report Type: Standard (default) Microbial Insights Level III raw data(15% surcharge) EDD type: Microbial Insights Standard (default) All other available EDDs (5% surcharge) Specify EDD Type:

□ Comprehensive Interpretive(15%) □ Historical Interpretive (30%)

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

	Sample Informat	tion				Ana	lyses	3		CEI	NSUS	S: Pl	ease	e se	lect	the t	arge	et or	gani	sm/	gene	8											
MI ID (Leboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	PLFA	DGGE+3ID	DGGE+5ID	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes bvc, ica, vcr)	DHBt (Dehalobacter)	DSM (Desulturomonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB Sultate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Dentrifiers-nirS and nirk)	AOB ammonia oxidīzing bacteria)	PM1 (MTBE aerobic)	(MO (Toluene Monooxygenase)	(DEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	VAH (Napthalene-aerobic)	3SSA Toluene/Xytene-Anaerobic)	dd. qPCR;	dd. qPCR:	NA Expression Option)*	ther:	ther:	ther:
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Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

REPORT TO; Name: Company: Address:	LINDA RA AGLOM 112 E. PE SAN ANTO	ABE CAN,	Suit:	£ 40	01-	INVO Name: Comp Addre	DICE 1 : any: ss:	Г <b>О</b> : (	(For I		es paid	d by a	third	party	it is in	nperati	ve the	t all in	forma	tion b	a prov	ided) 		108	515 R	esear	Сh Dr	al	lin:	sig	ht	S	
email: Phone: Fax:	linda. Faabo	20ae	518	con	a 	email: Phone Fax:	e:																	Kno 865 ww	oxville 5-573- w.mic	e, TN : -8188 :robe.	37932 com						
Project Manager: Project Name: Project No.:	DAVE WE LHAAPS 60256135	ita.	R 58 0241	9		N Purcha Subco MI Quo	ase Or Intract Inte No.	der N No.	о.													-		Ple:	Mor No	heck e sa Addi	One: mples ional (	to fc Sam	ollow ples	1			
Report Type: EDD type: Please contact us wi	Standard (default) Insights St th any questions about the anal	Microb andard (de yses or filling	ial Insights Lev fault) out the COC .	/el III raw □ AII at (865) 5	data(1) other 73-818	5% surcha availat 18 (9:00 i	arge) ble ED am to (	Ds (1 5:00 p	vilcroi 5% s m ES	blal Ir surch ST, M	nsight: arge) I-F). A	s Lev Spa After h	el IV ( ecify nours	(25% s EDI emai	urcha D Ty I: cus	rge) pe: tomer	servic	□ æ@n	Con	nprei e.con	hens	ive lı	nterp	oretiv	/e(15	%)	01	listo	rical	Inter	preti	ve (3	0%)
	Sample Informa	tion			_	Ana	alyse	8		CE	NSU	S: P	leas	e se	lect	the	targ	et or	gan	ism	gen	e									Γ		
Mf ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	PLFA	DGGE+3ID	DGGE+5ID	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoldes)	DHC Functional genes bvc, tre, vcr)	DHBt (Dehalobacter)	DSM (Desulturomonas)	DSB (Desuffitobacterium)	EBAC (Total)	SRB Sultate Reducino Bactaria-APS/	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Dentrifiers-nirS and nirk)	AOB ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthakene-æerobic)	BSSA Toluene/Xylene-Anaerobic)	add. qPCR:	add. qPCR:	WA Expression Option)*	ther.	ther;	ther:
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It is vital that chain of custody is filled out correctly & that all relative information is provided. Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.



COC Number:

Laboratory:	Microbac POC: Kathy Albertson	7		Project	Manager		Day		akor						-	-	Mail to				
Address:	158 Starlite Drive			Phone/F	ax Numb	er:	240	e vva	cker										Linda Raa	be	
	Marietta OH 45750			Sampler	(print):		210	-290-2	2000								-1		112 East I	ecan STE	E. 400
Phone:	1-800-373-4071			-			300	u dee	sing	er									San Antor	io, TX 782	205
Client:	AECOM			Signatu	re:	1		0	-	4					-		End En		210-296-2	000	
Address:	112 East Pecan Ste. 400				2	Sae	The	53	ee	Se	up	1					Fed E	K AIRDIN P	4O:		
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Turn Around T	ime: STANDARD			1 pH					é	F	N a						Progra	m:			
Project Name/	Location: Longhorn			1					Itaine	E	Na C										
Project Numbe	er: 60256135.0002HA			1					of Col	30	3						-	ERP	MS REQU	RED FIEL	DS
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Homogenize all composite samples prior to analysis

### Chain of Custody Record

COC Number:

Laboratory:	Microbac POC: Kathy Albertson	l		Project N	lanager:		Dav	e Wa	cker							-		Mail to:		Linda Raa	be	
Address:	158 Starlite Drive			Phone/Fa	ax Numb	er:	210-	-296-2	2000											112 East F	Pecan STE	400
	Marietta, OH 45750			Sampler	(print):		Sco	tt Bee	singe	er										San Anton	io. TX 782	05
Phone:	1-800-373-4071											2								210-296-2	000	
Client:	AECOM			Signatur	e: (	1	~	D		-								Fed Ex	Airbill N	lo:		
Address:	112 East Pecan Ste. 400				0	Dù	200	B	æ	in	5	V			S							
	San Antonio, TX 78205										30				10		2	Program	n:			
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Project Name/L	Longhorn								ntair		Q	イ		Q	80	23	1+					
Project Numbe	r: 60256135.0002HA			1					of Co		101	12,	22	10	100	2 0 M	50		ERP	MS REQUI	RED FIELD	)S
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Homogenize all composite samples prior to analysis



COC Number:

Laboratory:	Microbac POC: Kathy Albertson			Project	Manager		De	- 141			-						Mail 6		Transon		
Address:	158 Starlite Drive			Phone/F	ax Num	per:	Dav	ve vva	CKer						_			):	Linda Raa	ibe	
	Marietta OH 45750			Sampler	(print):		210	-290-	2000	,					-		_		112 East	Pecan STE	E. 400
Phone:	1-800-373-4071			- *	M ( ) ( )		300	n Bee	esing	er									San Antor	110, TX 782	205
Client:	AECOM			Signatu	re:			0	-	~						_	EndE	. A !	210-296-2	2000	
Address:	112 East Pecan Ste. 400				5	Ge	th	Be	S	y	2						Fear	X AIRDIII I	NO:		
	San Antonio, TX 78205								T	1	T	T							_		
Turn Around T	ime: STANDARD								2	3							Progra	ım:			
Project Name/L	Location: Longhorn								taine	184											
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-Homogenize all composite samples prior to analysis



COC Number:

Laboratory:	Microbac POC: Kathy Albertson			Project	Manager:		Day	IO MO	cker		-							Mailto				
Address:	158 Starlite Drive			Phone/F	ax Numb	per:	210	206	2000							_		-	4.	Linda Raa	be	
	Marietta, OH 45750		and the same of	Sampler	(print):		500	+290-	2000	0r							_	1		112 East I	Pecan STE	E. 400
Phone:	1-800-373-4071			1			SUL		sing	er										San Antor	io, TX 782	205
Client:	AECOM			Signatur	re:	-		~	-		-			-	-	-		Ford Ex	Airbill	210-296-2	.000	
Address:	112 East Pecan Ste. 400				2	re	t	Be	5.	10								Feu E)		140:		
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-Homogenize all composite samples prior to analysis

## Chain of Custody Record

Laboratory:		-		Droject	Manager	_												COC	C Number:		
Address:	Microbac POC: Kathy Albertson			Project	Manager	:	Dav	ve Wa	cker								Mail to	:	Linda Raa	abe	
	Mariatta OH 45750	- A		Sampler	ax Num	per:	210	)-296-	2000		_				_				112 East	Pecan STI	E. 400
Phone:	1-800-373-4071				(print):		Sco	ott Bee	esing	er									San Antor	nio, TX 782	205
Client:	AECOM		_	Signatu	ra' (		- (a) - (a)		_			\$							210-296-2	2000	
Address:	112 East Pecan Ste 400				2	100	A	-+	Ror	C							Fed Ex	Airbill N	No:		
	San Antonio, TX 78205				~	140	V		I		OT		-								
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Homogenize all composite samples prior to analysis



COC Number:

Laboratory:	Microbac POC: Kathy Albertson			Project	Manager	:	Day		akar								Indall to				
Address:	158 Starlite Drive	Phone/Fax Number: 210-296-2000														5:	Linda Raabe				
	Marietta OH 45750	Sample	r (print):		210	-296-	2000	)	_				_		_		112 East Pecan STE. 400				
Phone:	1-800-373-4071	-			900	n Bee	esing	er									San Antonio, TX 78205				
Client:	AECOM	Signatu	re:	$\cap$	-	-		-		1							210-296-2	.000			
Address:	dress: 112 East Pecan Ste. 400				Scott Boos												Feat	X AIRDIII (	10:		
	San Antonio, TX 78205			<u> </u>				1	T		F	L	<u> </u>				-	-			
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-Homogenize all composite samples prior to analysis



COC Number:

Laboratory:	Microbac POC: Kathy Albertson	1		Project I	Manager:		Dav		cker	10012-114	-		and the second				Mail to	:	Linds D	-	A Constitution of the
Address:	158 Starlite Drive	Phone/Fax Number: 210-296-2000													-	•	Linda Raabe				
	Marietta, OH 45750	Sampler (print): Scott Beesinger												-		112 East Pecan STE. 400					
Phone:	1-800-373-4071	-			000	u Dee	sing										San Anton	10, TX 782	205		
Client:	AECOM	Signatur	Signature:												Fod Ex	Airbill	210-290-2	000			
Address:	112 East Pecan Ste. 400				Statts Beeging																
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Homogenize all composite samples prior to analysis



COC Number:

Microbac BOC: Kathy Alberton			Project	Manager		-		-	-						-		50	C Number:		
158 Starlite Drive	Phone/Fax Number: Dave Wacker													Mail to: Linda Raabe						
Marietta OH 45750	210-296-2000 Sampler (print): 22-44 D													ł.		112 East Pecan STE 400				
1-800-373-4071	Scott Beesinger															San Anton	nio, TX 78	205		
AECOM	Signature:															210-296-2	2000			
Address: 112 East Pecan Ste 400					TOOLA BOOK													No:		
San Antonio, TX 78205					$\geq$				10	K	2			_						
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	Microbac         POC: Kathy Albertso           158 Starlite Drive         Marietta, OH 45750           1-800-373-4071         AECOM           112 East Pecan Ste. 400         San Antonio, TX 78205           ime:         STANDARD           -ocation:         Longhorn            60256135.0002HA           Sample ID/Location ID         Sample ID/Location ID           25A WW 0 AF-012914         SAWW08 F - 012914           35A WW 0 I F - 012914         SAWW 0 I F - 012914           Saww 0 I F - 012914         Saww 0 I F - 012914	Microbac       POC: Kathy Albertson         158 Starlite Drive         Marietta, OH 45750         1-800-373-4071         AECOM         112 East Pecan Ste. 400         San Antonio, TX 78205         Ime:       STANDARD         .occation:       Longhorn         r:       60256135.0002HA         Sample ID/Location ID       SBD         25A WW 0 AF-012914       35A WW08 F - 012914         35A WW08 F - 012914       03WW01 F - 012914         03WW01 F - 012914       03WW01 F - 012914         Comments:       STANDARD TAT	Microbac         POC: Kathy Albertson           158 Starlite Drive           Marietta, OH 45750           1-800-373-4071           AECOM           112 East Pecan Ste. 400           San Antonio, TX 78205           Ime:         STANDARD           .ocation:         Longhorn           r:         60256135.0002HA           Sample ID/Location ID         SBD         SED           25A WW 0 QF-012 Q 1 4         35AWW10 F - 012 91 4           35A WW 0 QF - 012 91 4         35AWW08 F - 012 91 4           03WW 01 F - 012 91 4         10           10         10           11         10           11         10           11         10           11         10           11         10           11         10           11         10           11         10           11         10           12         10           13 </td <td>Microbac         POC:         Kathy Albertson         Project           158 Starlite Drive         Phone/F         Phone/F           Marietta, OH 45750         Sample           1-800-373-4071         Sample           AECOM         Signatu           112 East Pecan Ste. 400         Signatu           San Antonio, TX 78205         pH:           .occation:         Longhorn           .ccation:         Longhorn           .coate         Date           .coate         Liza/n           .coate         Liza/n           .coate         Liza/n           .coate         Liza/n           .coate         Liza/n           .coate         Liza/n           .coa</td> <td>Microbac         POC:         Kathy Albertson         Project Manager           158 Starlite Drive         Phone/Fax Num         Marietta, OH 45750         Sampler (print):           1-800-373-4071         AECOM         Signature:         Implementation           112 East Pecan Ste. 400         Signature:         Implementation         Implementation           San Antonio, TX 78205         Implementation         Implementation         Implementation         Implementation    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1-800-373-4071         AECOM         Signature:         Signature:           112 East Pecan Ste. 400         San Antonio, TX 78205         pH:        </td> <td>Microbac         POC:         Kathy Albertson         Project Manager:         Date           158 Starite Drive         Phone/Fax Number:         210           Marietta, OH 45750         Sampler (print):         Soc           1-800-373-4071         Signature:         Soc           AECOM         Signature:         Soc           112 East Pecan Ste. 400         Signature:         Soc           San Antonio, TX 78205         pH:            ime:         STANDARD         pH:           -ccation:         Longhorn         pH:           -ccation:         Longhorn         pH:           **         60256135.0002HA         Date         Time         §         g           25A WW 0 QF-012 Q1 V         1/24/14         1/24/14         V         V           35A WW 0 QF - 012 Q1 4         1/24/14         1/24/14         V           Signative 0   F- 012 Q1 4         1/24/14         1/24/14         V           Signative 0   F- 012 Q1 4         1/24/14         1/24/14         1/24/14           I         I         I         I         I         I           I         I         I         I         I         I         I</td> <td>Microbac         Project Manager:         Dave Watcher           158 Startite Drive         Phone/Fax Number:         210-296-           Marietta, OH 45750         Sampler (print):         Scott Bee           1-800-373-4071         AECOM         Signature:         Scott Bee           112 East Pecan Ste. 400         Signature:         Signature:         Scott Bee           112 East Pecan Ste. 400         Signature:         Scott Bee           .ocation:         Longhorn         pH:        </td> <td>Microbac         Project Manager:         Dave Wacker           158 Startite Drive         Phone/Fax Number:         210-296-2000           Marietta, OH         45750         Sampler (print):         Scott Beesing           1-800-373-4071         AECOM         Signature:         Scott Beesing           112 East Pecan Ste. 400         Signature:         Scott Beesing           Sample ID/Location ID         SBD         SED         Date         Time         B         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g</td> <td>Microbac       PCC:       Kathy Albertson       Project Manager:       Dave Wacker         158 Starlite Drive       Phone/Fax Number:       210-296-2000         Marietta, OH 45750       Sampler (print):       Scott Beesinger         1-800-373-4071       AECOM       Signature:       Scott Beesinger         12 East Pecan Ste. 400       Signature:       Journal Project Manager:       Dave Wacker         San Antonio, TX 78205       Ine:       Starlite Print):       Scott Beesinger         Ine:       STANDARD       Dave       PH:       Starlite Print):         coation:       Longhorn       Fi       60256135.0002HA       PH:       Starlite Print):       Scott Beesinger         25/A WW 0 Ar-0 12 q 1 4       J/24 / J4 / J2 30       V       W       Z       V         35/A WW 0 Br - 0 12 q 1 4       J/24 / J4 / J2 30       V       W       Z       V         35/A WW 0 Br - 0 12 q 1 4       J/24 / J4 / J2 30       V       W       Z       V         QBW 0 1 F - 0 12 q 1 4       J/24 / J4 / J2 0       V       W       Z       V         QBW 0 1 F - 0 12 q 1 4       J       J       J       J       J       J         I       I       I       I       I       I&lt;</td> <td>Microbac       PCC:       Kathy Albertson       Project Manager:       Dave Wacker         158 Starlite Drive       Phone/Fax Number:       210-296-2000         Marietta, OH 45750       Sampler (print):       Scott Beesinger         1-800-373-4071       Signature:       Signature:       Scott Beesinger         12E East Pecan Ste. 400       Signature:       Signature:       Signature:       Signature:         0-2000       Sample (print):       Scott Beesinger       Signature:       Signature:       Signature:         0-2010       Sample (D/Location ID       SBD       SED       Date       Time       Signature:       Signat</td> <td>Microbac       POC:       Kathy Albertson       Project Manager:       Dave Wacker         158 Starlite Drive       Phone/Fax Number:       210-296-2000         Marietta, OH 45750       Sampler (print):       Scott Beesinger         1-800-373-4071       Signature:       Scott Beesinger         AECOM       Signature:       Scott Beesinger         112 East Pecan Ste, 400       Signature:       Stott Beesinger         San Antonio, TX 78205       pH:       Stott Beesinger         Ine:       StanDARD       Stott Beesinger         Jocation:       Longhorn       pH:       Stott Beesinger         Sample ID/Location ID       SBD       SED       Date       Time       Stott Beesinger         SSAWW00 AF-012 A14       //ta//tk//ta//tk/lol0       WW 2       V       V         SSAWW00 F-012 A14       //ta//tk//tk//tk/20       V       W       X       V         SSAWW00 F-012 A14       //ta//tk//tk/20       V       W       X       V         SSAWW00 F-012 A14       //ta//tk//tk/20       V       W       X       V         SSAWW00 F-012 A14       //ta//tk//tk/20       V       W       X       V         SSWW01 F-012 A14       //ta//tk//tk/20       V       <td< td=""><td>Microbac       PCOject Manager:       Dave Wacker         168 Starlite Drive       Phone/Fax Number:       210-296-2000         Marietta, OH 45750       Sampler (print):       Scott Beesinger         1-800-373-4071       Signature:       Scott Beesinger         112 East Pecan Ste. 400       Signature:       Stranbard         Sam Antonio, TX 78205       PH:       Stranbard         Ime:       Stranbard       PH:       Stranbard         .coation:       Longhorn       VU       VU       VU         .coation:       Longhorn       VU       VU       VU       VU         .coation:       Longhorn       VU       VU       VU       VU       VU         .coation:       Longhorn       VU       VU       VU       VU       VU       VU         .coation:       Longhorn       VU       VU       VU       V</td><td>Microbac         PCGet Manager:         Dave Wacker           158 Staritte Drive         Phone/Fax Number:         210-296-2000           188 Staritte Drive         Phone/Fax Number:         210-296-2000           Microbac         PGet Manager:         Dave Wacker           1-800-373-4071         Sompler (print):         Scott Beesinger           AECOM         Signature:         Starter:           358 Attonio, TX 78205         pH:         PH:           ine:         STANDARD         pH:         PH:           .coation:         Longhorm         pH:         PH:         PH:           .coation:         Longhorm         pH:         PH:         PH:         PH:           .coation:         Longhorm         pH:         PH:         PH:         PH:         PH:           .coation:         Longhorm         pH:         PH:         PH:         PH:         PH:           .coation:         Longhorm         pH:         PH:</td><td>Microbac         POC:         Kathy Albertson         Project Manager:         Dave Wacker           158 Starlite Drive         Phone/Fax Number:         210-296-2000         Sampler (print):         Scott Beesinger           1-800-373-4071         Sampler (print):         Scott Beesinger         Phone/Fax Number:         210-296-2000           AECOM         Signature:         Scott Beesinger         Phone/Fax Number:         210-296-2000           San Antonio, TX. 78205         Ime:         Scott Beesinger         Phone/Fax Number:         210-296-2000           San Antonio, TX. 78205         pH:         Scott Beesinger         Phone/Fax Number:         210-296-2000           San Antonio, TX. 78205         pH:         Scott Beesinger         Phone/Fax Number:         210-296-2000           Sample ID/Location ID         SBD         SED         Date         Time         Bg         Bg           25A WW 0 9A+ 912-9 14         J/24/J4/J220         W         2         V         1         1           25A WW 0 8F - 012-914         J/24/J4/J220         W         3         V         V         1           03WW 0 1F - 012-914         J/24/J4/J220         W         3         V         1         1           04         04         04</td><td>Microbac         POC:         Kathy Albertson         Project Manager:         Dave Wacker           158 Starite Drive         Phone/Fax Number:         210-296-2000         Sampler (print):         Scott Beesinger           4ECOM         Signature:         Scott Beesinger         Scott Beesinger           12 East Pecan Ste. 400         Signature:         Scott Beesinger           Sam Antonio, TX. 76205         pH:         Scott Beesinger           ime:         STANDARD         pH:         Scott Beesinger           costion:         Longhorn         pH:         Scott Beesinger           stample ID/Location ID         SBD         SED         Date         Time         Scott Beesinger           25A Ww 0 QAP 012 Q 1 Y         J/14/AP 101 0         YW         Z         YW         J         J           3SRAWW0 F - 012 Q1 4         J/24/J/4/32 O         WW         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         &lt;</td><td>Microbac         POC:         Kathy Albertson         Project Manager         Dave Wacker         Mail to           158 Starlite Drive         Phone/Fax Number:         210-298-2000         Soft Beesinger         Fed Ex           AECOM         Signature:         Soft Beesinger         Fed Ex         Fed Ex           1-800-373-4071         Signature:         Soft Beesinger         Fed Ex           AECOM         Signature:         Soft Beesinger         Fed Ex           San Antonio, TX, 78205         Freqex         Fed Ex         Fed Ex           Ine:         STANDARD         Freqex         Fed Ex         Fed Ex           Sample ID/Location ID         SBD         SED         Date         Time         Big Big Big Big Big Big Big Big Big Big</td><td>Microbac         POC:         Kathy Albertson         Project Manager:         Dave Wacker         Mail to:           168 Starlite Drive         PhoneFax Number:         210-295-2000         Sampler (srint):         Scott Beesinger         Ped Ex Airbiti 1           AECOM         Signature:         Scott Beesinger         Ped Ex Airbiti 1         Ped Ex Airbiti 1           112 East Pecan Ste. 400         Signature:         Scott Beesinger         Ped Ex Airbiti 1           San Antonio, 1X, 78205         pH:         Fed Ex Airbiti 1         Ped Ex Airbiti 1           sample ID/Location ID         SBD         SED         Date         Time         Scott Beesinger           Sample ID/Location ID         SBD         SED         Date         Time         Scott Beesinger         Program:           SSR WW010 F- 012 914         V140 /N         IQI 0         W         Z         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V</td><td>Microbac         POC:         Kathy Albertson         Project Manager:         Dave Wacker         Mail to:         Linda Rase           Marietta, OH         45750         Sampler (print):         Societ Beesinger         112 East         San Antor           1-800-373-4071         Societ Beesinger         Fed Ex Aholil No:         San Antor         San Antor           12 East         Signature:         Societ Beesinger         Fed Ex Aholil No:         San Antor           12 East         San Antor         Signature:         Societ Beesinger         Fed Ex Aholil No:           San Antoria, TX 78205         Inite:         String Stranbard         Fed Ex Aholil No:         ERPIMS REQUIN           Sample ID/Location ID         SSD         SED         Date         Time         Stranbard         V         V         V         V         V         Astor           257 WW 0 GP-012 G1V         I/Ma /µ         [0] 0         V         V         V         V         V         V         V         Astor           357 WW 0 GP-012 G1V         I/Ma /µ         [0] 0         V         V         V         V         V         V         Astor           357 WW 0 GF-012 G1V         I/Ma /µ         [0] 0         V         V         V</td><td>Microbac         PC:         Katry Albertson         Priorifex         Mail to:         Linda Raabe           112 East Prece         Sampler (print):         Social Beesinger         Mail to:         Linda Raabe           1400-373-4071         Scatt Beesinger         Priorifex Number (10-296-2000         Priority:         Scatt Beesinger         Priority:         Priority:         Scatt Beesinger         Priority:         Priority:         Priority:         Scatt Beesinger         Priority:         &lt;</td></td<></td>	Microbac         POC:         Kathy Albertson         Project           158 Starlite Drive         Phone/F         Phone/F           Marietta, OH 45750         Sample           1-800-373-4071         Sample           AECOM         Signatu           112 East Pecan Ste. 400         Signatu           San Antonio, TX 78205         pH:           .occation:         Longhorn           .ccation:         Longhorn           .coate         Date           .coate         Liza/n           .coate         Liza/n           .coate         Liza/n           .coate         Liza/n           .coate         Liza/n           .coate         Liza/n           .coa	Microbac         POC:         Kathy Albertson         Project Manager           158 Starlite Drive         Phone/Fax Num         Marietta, OH 45750         Sampler (print):           1-800-373-4071         AECOM         Signature:         Implementation           112 East Pecan Ste. 400         Signature:         Implementation         Implementation           San Antonio, TX 78205         Implementation         Implementation         Implementation         Implementation           .coation:         Longhorn         Implementation         Implementation         Implementation           r:         60256135.0002HA         Implementation         Implementation         Implementation           Sample ID/Location ID         SBD         SED         Date         Time           25A WW 0 QF-012 Q14         1/2q/14         1/2q/14         Implementation           35A WW 0 F - 012 Q14         1/2q/14         1/2q/14         Implementation           03WW 0 F - 012 Q14         1/2q/14         1/2q/14         Implementation           03WW 0 F - 012 Q14         1/2q/14         1/2q/14         Implementation           03WW 0 F - 012 Q14         1         1         1         1           03WW 0 F - 012 Q14         1         1         1         1	Microbac         POC:         Kathy Albertson         Project Manager:           158 Starlite Drive         Phone/Fax Number:         Sampler (print):           Marietta, OH         45750         Sampler (print):           1-800-373-4071         AECOM         Signature:         Signature:           112 East Pecan Ste. 400         San Antonio, TX 78205         pH:	Microbac         POC:         Kathy Albertson         Project Manager:         Date           158 Starite Drive         Phone/Fax Number:         210           Marietta, OH 45750         Sampler (print):         Soc           1-800-373-4071         Signature:         Soc           AECOM         Signature:         Soc           112 East Pecan Ste. 400         Signature:         Soc           San Antonio, TX 78205         pH:            ime:         STANDARD         pH:           -ccation:         Longhorn         pH:           -ccation:         Longhorn         pH:           **         60256135.0002HA         Date         Time         §         g           25A WW 0 QF-012 Q1 V         1/24/14         1/24/14         V         V           35A WW 0 QF - 012 Q1 4         1/24/14         1/24/14         V           Signative 0   F- 012 Q1 4         1/24/14         1/24/14         V           Signative 0   F- 012 Q1 4         1/24/14         1/24/14         1/24/14           I         I         I         I         I         I           I         I         I         I         I         I         I	Microbac         Project Manager:         Dave Watcher           158 Startite Drive         Phone/Fax Number:         210-296-           Marietta, OH 45750         Sampler (print):         Scott Bee           1-800-373-4071         AECOM         Signature:         Scott Bee           112 East Pecan Ste. 400         Signature:         Signature:         Scott Bee           112 East Pecan Ste. 400         Signature:         Scott Bee           .ocation:         Longhorn         pH:	Microbac         Project Manager:         Dave Wacker           158 Startite Drive         Phone/Fax Number:         210-296-2000           Marietta, OH         45750         Sampler (print):         Scott Beesing           1-800-373-4071         AECOM         Signature:         Scott Beesing           112 East Pecan Ste. 400         Signature:         Scott Beesing           Sample ID/Location ID         SBD         SED         Date         Time         B         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g	Microbac       PCC:       Kathy Albertson       Project Manager:       Dave Wacker         158 Starlite Drive       Phone/Fax Number:       210-296-2000         Marietta, OH 45750       Sampler (print):       Scott Beesinger         1-800-373-4071       AECOM       Signature:       Scott Beesinger         12 East Pecan Ste. 400       Signature:       Journal Project Manager:       Dave Wacker         San Antonio, TX 78205       Ine:       Starlite Print):       Scott Beesinger         Ine:       STANDARD       Dave       PH:       Starlite Print):         coation:       Longhorn       Fi       60256135.0002HA       PH:       Starlite Print):       Scott Beesinger         25/A WW 0 Ar-0 12 q 1 4       J/24 / J4 / J2 30       V       W       Z       V         35/A WW 0 Br - 0 12 q 1 4       J/24 / J4 / J2 30       V       W       Z       V         35/A WW 0 Br - 0 12 q 1 4       J/24 / J4 / J2 30       V       W       Z       V         QBW 0 1 F - 0 12 q 1 4       J/24 / J4 / J2 0       V       W       Z       V         QBW 0 1 F - 0 12 q 1 4       J       J       J       J       J       J         I       I       I       I       I       I<	Microbac       PCC:       Kathy Albertson       Project Manager:       Dave Wacker         158 Starlite Drive       Phone/Fax Number:       210-296-2000         Marietta, OH 45750       Sampler (print):       Scott Beesinger         1-800-373-4071       Signature:       Signature:       Scott Beesinger         12E East Pecan Ste. 400       Signature:       Signature:       Signature:       Signature:         0-2000       Sample (print):       Scott Beesinger       Signature:       Signature:       Signature:         0-2010       Sample (D/Location ID       SBD       SED       Date       Time       Signature:       Signat	Microbac       POC:       Kathy Albertson       Project Manager:       Dave Wacker         158 Starlite Drive       Phone/Fax Number:       210-296-2000         Marietta, OH 45750       Sampler (print):       Scott Beesinger         1-800-373-4071       Signature:       Scott Beesinger         AECOM       Signature:       Scott Beesinger         112 East Pecan Ste, 400       Signature:       Stott Beesinger         San Antonio, TX 78205       pH:       Stott Beesinger         Ine:       StanDARD       Stott Beesinger         Jocation:       Longhorn       pH:       Stott Beesinger         Sample ID/Location ID       SBD       SED       Date       Time       Stott Beesinger         SSAWW00 AF-012 A14       //ta//tk//ta//tk/lol0       WW 2       V       V         SSAWW00 F-012 A14       //ta//tk//tk//tk/20       V       W       X       V         SSAWW00 F-012 A14       //ta//tk//tk/20       V       W       X       V         SSAWW00 F-012 A14       //ta//tk//tk/20       V       W       X       V         SSAWW00 F-012 A14       //ta//tk//tk/20       V       W       X       V         SSWW01 F-012 A14       //ta//tk//tk/20       V <td< td=""><td>Microbac       PCOject Manager:       Dave Wacker         168 Starlite Drive       Phone/Fax Number:       210-296-2000         Marietta, OH 45750       Sampler (print):       Scott Beesinger         1-800-373-4071       Signature:       Scott Beesinger         112 East Pecan Ste. 400       Signature:       Stranbard         Sam Antonio, TX 78205       PH:       Stranbard         Ime:       Stranbard       PH:       Stranbard         .coation:       Longhorn       VU       VU       VU         .coation:       Longhorn       VU       VU       VU       VU         .coation:       Longhorn       VU       VU       VU       VU       VU         .coation:       Longhorn       VU       VU       VU       VU       VU       VU         .coation:       Longhorn       VU       VU       VU       V</td><td>Microbac         PCGet Manager:         Dave Wacker           158 Staritte Drive         Phone/Fax Number:         210-296-2000           188 Staritte Drive         Phone/Fax Number:         210-296-2000           Microbac         PGet Manager:         Dave Wacker           1-800-373-4071         Sompler (print):         Scott Beesinger           AECOM         Signature:         Starter:           358 Attonio, TX 78205         pH:         PH:           ine:         STANDARD         pH:         PH:           .coation:         Longhorm         pH:         PH:         PH:           .coation:         Longhorm         pH:         PH:         PH:         PH:           .coation:         Longhorm         pH:         PH:         PH:         PH:         PH:           .coation:         Longhorm         pH:         PH:         PH:         PH:         PH:           .coation:         Longhorm         pH:         PH:</td><td>Microbac         POC:         Kathy Albertson         Project Manager:         Dave Wacker           158 Starlite Drive         Phone/Fax Number:         210-296-2000         Sampler (print):         Scott Beesinger           1-800-373-4071         Sampler (print):         Scott Beesinger         Phone/Fax Number:         210-296-2000           AECOM         Signature:         Scott Beesinger         Phone/Fax Number:         210-296-2000           San Antonio, TX. 78205         Ime:         Scott Beesinger         Phone/Fax Number:         210-296-2000           San Antonio, TX. 78205         pH:         Scott Beesinger         Phone/Fax Number:         210-296-2000           San Antonio, TX. 78205         pH:         Scott Beesinger         Phone/Fax Number:         210-296-2000           Sample ID/Location ID         SBD         SED         Date         Time         Bg         Bg           25A WW 0 9A+ 912-9 14         J/24/J4/J220         W         2         V         1         1           25A WW 0 8F - 012-914         J/24/J4/J220         W         3         V         V         1           03WW 0 1F - 012-914         J/24/J4/J220         W         3         V         1         1           04         04         04</td><td>Microbac         POC:         Kathy Albertson         Project Manager:         Dave Wacker           158 Starite Drive         Phone/Fax Number:         210-296-2000         Sampler (print):         Scott Beesinger           4ECOM         Signature:         Scott Beesinger         Scott Beesinger           12 East Pecan Ste. 400         Signature:         Scott Beesinger           Sam Antonio, TX. 76205         pH:         Scott Beesinger           ime:         STANDARD         pH:         Scott Beesinger           costion:         Longhorn         pH:         Scott Beesinger           stample ID/Location ID         SBD         SED         Date         Time         Scott Beesinger           25A Ww 0 QAP 012 Q 1 Y         J/14/AP 101 0         YW         Z         YW         J         J           3SRAWW0 F - 012 Q1 4         J/24/J/4/32 O         WW         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         &lt;</td><td>Microbac         POC:         Kathy Albertson         Project Manager         Dave Wacker         Mail to           158 Starlite Drive         Phone/Fax Number:         210-298-2000         Soft Beesinger         Fed Ex           AECOM         Signature:         Soft Beesinger         Fed Ex         Fed Ex           1-800-373-4071         Signature:         Soft Beesinger         Fed Ex           AECOM         Signature:         Soft Beesinger         Fed Ex           San Antonio, TX, 78205         Freqex         Fed Ex         Fed Ex           Ine:         STANDARD         Freqex         Fed Ex         Fed Ex           Sample ID/Location ID         SBD         SED         Date         Time         Big Big Big Big Big Big Big Big Big Big</td><td>Microbac         POC:         Kathy Albertson         Project Manager:         Dave Wacker         Mail to:           168 Starlite Drive         PhoneFax Number:         210-295-2000         Sampler (srint):         Scott Beesinger         Ped Ex Airbiti 1           AECOM         Signature:         Scott Beesinger         Ped Ex Airbiti 1         Ped Ex Airbiti 1           112 East Pecan Ste. 400         Signature:         Scott Beesinger         Ped Ex Airbiti 1           San Antonio, 1X, 78205         pH:         Fed Ex Airbiti 1         Ped Ex Airbiti 1           sample ID/Location ID         SBD         SED         Date         Time         Scott Beesinger           Sample ID/Location ID         SBD         SED         Date         Time         Scott Beesinger         Program:           SSR WW010 F- 012 914         V140 /N         IQI 0         W         Z         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V</td><td>Microbac         POC:         Kathy Albertson         Project Manager:         Dave Wacker         Mail to:         Linda Rase           Marietta, OH         45750         Sampler (print):         Societ Beesinger         112 East         San Antor           1-800-373-4071         Societ Beesinger         Fed Ex Aholil No:         San Antor         San Antor           12 East         Signature:         Societ Beesinger         Fed Ex Aholil No:         San Antor           12 East         San Antor         Signature:         Societ Beesinger         Fed Ex Aholil No:           San Antoria, TX 78205         Inite:         String Stranbard         Fed Ex Aholil No:         ERPIMS REQUIN           Sample ID/Location ID         SSD         SED         Date         Time         Stranbard         V         V         V         V         V         Astor           257 WW 0 GP-012 G1V         I/Ma /µ         [0] 0         V         V         V         V         V         V         V         Astor           357 WW 0 GP-012 G1V         I/Ma /µ         [0] 0         V         V         V         V         V         V         Astor           357 WW 0 GF-012 G1V         I/Ma /µ         [0] 0         V         V         V</td><td>Microbac         PC:         Katry Albertson         Priorifex         Mail to:         Linda Raabe           112 East Prece         Sampler (print):         Social Beesinger         Mail to:         Linda Raabe           1400-373-4071         Scatt Beesinger         Priorifex Number (10-296-2000         Priority:         Scatt Beesinger         Priority:         Priority:         Scatt Beesinger         Priority:         Priority:         Priority:         Scatt Beesinger         Priority:         &lt;</td></td<>	Microbac       PCOject Manager:       Dave Wacker         168 Starlite Drive       Phone/Fax Number:       210-296-2000         Marietta, OH 45750       Sampler (print):       Scott Beesinger         1-800-373-4071       Signature:       Scott Beesinger         112 East Pecan Ste. 400       Signature:       Stranbard         Sam Antonio, TX 78205       PH:       Stranbard         Ime:       Stranbard       PH:       Stranbard         .coation:       Longhorn       VU       VU       VU         .coation:       Longhorn       VU       VU       VU       VU         .coation:       Longhorn       VU       VU       VU       VU       VU         .coation:       Longhorn       VU       VU       VU       VU       VU       VU         .coation:       Longhorn       VU       VU       VU       V	Microbac         PCGet Manager:         Dave Wacker           158 Staritte Drive         Phone/Fax Number:         210-296-2000           188 Staritte Drive         Phone/Fax Number:         210-296-2000           Microbac         PGet Manager:         Dave Wacker           1-800-373-4071         Sompler (print):         Scott Beesinger           AECOM         Signature:         Starter:           358 Attonio, TX 78205         pH:         PH:           ine:         STANDARD         pH:         PH:           .coation:         Longhorm         pH:         PH: 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Number:         210-296-2000           San Antonio, TX. 78205         pH:         Scott Beesinger         Phone/Fax Number:         210-296-2000           Sample ID/Location ID         SBD         SED         Date         Time         Bg         Bg           25A WW 0 9A+ 912-9 14         J/24/J4/J220         W         2         V         1         1           25A WW 0 8F - 012-914         J/24/J4/J220         W         3         V         V         1           03WW 0 1F - 012-914         J/24/J4/J220         W         3         V         1         1           04         04         04	Microbac         POC:         Kathy Albertson         Project Manager:         Dave Wacker           158 Starite Drive         Phone/Fax Number:         210-296-2000         Sampler (print):         Scott Beesinger           4ECOM         Signature:         Scott Beesinger         Scott Beesinger           12 East Pecan Ste. 400         Signature:         Scott Beesinger           Sam Antonio, TX. 76205         pH:         Scott Beesinger           ime:         STANDARD         pH:         Scott Beesinger           costion:         Longhorn         pH:         Scott Beesinger           stample ID/Location ID         SBD         SED         Date         Time         Scott Beesinger           25A Ww 0 QAP 012 Q 1 Y         J/14/AP 101 0         YW         Z         YW         J         J           3SRAWW0 F - 012 Q1 4         J/24/J/4/32 O         WW         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         J         <	Microbac         POC:         Kathy Albertson         Project Manager         Dave Wacker         Mail to           158 Starlite Drive         Phone/Fax Number:         210-298-2000         Soft Beesinger         Fed Ex           AECOM         Signature:         Soft Beesinger         Fed Ex         Fed Ex           1-800-373-4071         Signature:         Soft Beesinger         Fed Ex           AECOM         Signature:         Soft Beesinger         Fed Ex           San Antonio, TX, 78205         Freqex         Fed Ex         Fed Ex           Ine:         STANDARD         Freqex         Fed Ex         Fed Ex           Sample ID/Location ID         SBD         SED         Date         Time         Big Big Big Big Big Big Big Big Big Big	Microbac         POC:         Kathy Albertson         Project Manager:         Dave Wacker         Mail to:           168 Starlite Drive         PhoneFax Number:         210-295-2000         Sampler (srint):         Scott Beesinger         Ped Ex Airbiti 1           AECOM         Signature:         Scott Beesinger         Ped Ex Airbiti 1         Ped Ex Airbiti 1           112 East Pecan Ste. 400         Signature:         Scott Beesinger         Ped Ex Airbiti 1           San Antonio, 1X, 78205         pH:         Fed Ex Airbiti 1         Ped Ex Airbiti 1           sample ID/Location ID         SBD         SED         Date         Time         Scott Beesinger           Sample ID/Location ID         SBD         SED         Date         Time         Scott Beesinger         Program:           SSR WW010 F- 012 914         V140 /N         IQI 0         W         Z         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V         V	Microbac         POC:         Kathy Albertson         Project Manager:         Dave Wacker         Mail to:         Linda Rase           Marietta, OH         45750         Sampler (print):         Societ Beesinger         112 East         San Antor           1-800-373-4071         Societ Beesinger         Fed Ex Aholil No:         San Antor         San Antor           12 East         Signature:         Societ Beesinger         Fed Ex Aholil No:         San Antor           12 East         San Antor         Signature:         Societ Beesinger         Fed Ex Aholil No:           San Antoria, TX 78205         Inite:         String Stranbard         Fed Ex Aholil No:         ERPIMS REQUIN           Sample ID/Location ID         SSD         SED         Date         Time         Stranbard         V         V         V         V         V         Astor           257 WW 0 GP-012 G1V         I/Ma /µ         [0] 0         V         V         V         V         V         V         V         Astor           357 WW 0 GP-012 G1V         I/Ma /µ         [0] 0         V         V         V         V         V         V         Astor           357 WW 0 GF-012 G1V         I/Ma /µ         [0] 0         V         V         V	Microbac         PC:         Katry Albertson         Priorifex         Mail to:         Linda Raabe           112 East Prece         Sampler (print):         Social Beesinger         Mail to:         Linda Raabe           1400-373-4071         Scatt Beesinger         Priorifex Number (10-296-2000         Priority:         Scatt Beesinger         Priority:         Priority:         Scatt Beesinger         Priority:         Priority:         Priority:         Scatt Beesinger         Priority:         <

Homogenize all composite samples prior to analysis
# AECOM

# Chain of Custody Record

COC Number:

Laboratory:	Microbac POC: Kathy Albertson	1		Project	Manager		Dav	e Wa	cker									Mail to:		Lindo Dee		
Address:	158 Starlite Drive			Phone/F	ax Numb	oer:	210-296-2000												112 East 6		= 400	
	Marietta, OH 45750			Sample	r (print):		Sco	tt Bee	sina	er										Son Anton	TV 79	2.400
Phone:	1-800-373-4071									•••										210-296-2	000	205
Client:	AECOM			Signatu	re: C	1		2	-						-			Fed Ex	Airbill N	lo:		
Address:	112 East Pecan Ste. 400				2	2tie	15	K	215	4	-											
	San Antonio, TX 78205								T	D	0.6		2		2-3	ST	-	Program	n.		_	
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(Signature) Statt Stessing 1/30/11/1			1300											·								
Relinquished by	0	Da	ate /	Time	Received	for La	aborat	ory by:			-	+	Dat	e		_	+	Tin	ne	Remarks:		
(Signature)					(Signatur	e)																

Homogenize all composite samples prior to analysis

Distribution: White to Laboratory, Canary to Project Manager, Pink QA/QC Manager

AECOM

# **Chain of Custody Record**

COC Number: Laboratory: Project Manager: Microbac POC: Kathy Albertson Dave Wacker Mail to: а. Linda Raabe Address: 158 Starlite Drive Phone/Fax Number: 210-296-2000 112 East Pecan STE, 400 Marietta, OH 45750 Sampler (print): Scott Beesinger San Antonio, TX 78205 1-800-373-4071 Phone: 210-296-2000 Client: AECOM Signature: Fed Ex Airbill No: Address: TKX 015 112 East Pecan Ste. 400 ello San Antonio, TX 78205 Program: Turn Around Time: STANDARD J pH: Number of Containers AUGENI Project Name/Location: Longhorn Project Number: 60256135.0002HA **ERPIMS REQUIRED FIELDS** V 0 CODE LOT CONTROL NUMBERS 9 Comp-Matrix Grab Site Name Sample ID/Location ID SBD SED Date Time Cooler  $\supset$ 8 Ş ABLOT EBLOT TBLOT LHSMW06-013114 1/31 14 0830 w ~ ~ 3 LHSMW06F-0/3114 1/31/11 0830 V w L 1/31 35A WW12-013114 141015 W 3  $\nu$ V 1/31/14/015 3 N 35A WW12 FID-013114 V 1/31/14-1225 35AWW14-013114 w 3  $\checkmark$ 1121 14 1228 35AWW19-013114 N 3 58 1/3/14/305 W 35AWW 22-013114 3 V 1/31/14/19/20 35A WW 16-013114 SITE w V 3 ~ 1/31/14/420 3 357 www.bms-013114 / w **U** 35A WW/ 6MSD-013/14 1/31/14/14/20 W 3 ~ V 35ANW01-013114 131/14/610 B V **S** 35AWWOIFDE013114 w 1/3/10 1010 V 91 V 131/14-1619 W 35AWW01F003114 3 V 31/11/1610 35AWW01F-013114 V N Comments: STANDARD TAT Date Received by: (Signature) Time Relinquished by Received by: (Signature) Date Time Relinquished by: (Signature) 2/3 14 (Signature) 1515 Date Relinquished by: Time Received for Laboratory by: Date Time Remarks: (Signature) (Signature)

Homogenize all composite samples prior to analysis

Distribution: White to Laboratory, Canary to Project Manager, Pink QA/QC Manager



# **Chain of Custody Record**

Laboratory:	Microbac POC: Kathy Albertson			Project	Manager		D	101		-			_	_	_			1	00	C Number:				
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(Signature)					(Signature	e)												-14		inemarks.				

Homogenize all composite samples prior to analysis

Distribution: White to Laboratory, Canary to Project Manager, Pink QA/QC Manager

# QUALITY CONTROL SUMMARY REPORT LHAAP-58 (AUGUST – OCTOBER 2013) FOR LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

**Prepared For:** 



**U.S. Army Corps of Engineers** 

**Prepared By:** 



**AECOM Technical Services** 

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# 1 INTRODUCTION

AECOM reviewed ten data packages from Microbac Laboratory Services, Marietta, OH. One report, for screening direct push samples, was completed by CT Laboratories LLC, Baraboo, WI. Groundwater samples were collected August 5 through October 22, 2013 at Site 58 Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Data were reviewed for conformance to the requirements of the following guidance documents: Automated Data Review by Laboratory Data Consultants (ADR.net), United States Environmental Protection Agency (EPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, (EPA, July 2002), and EPA Contract Laboratory Program National Functional Guidelines for Low Concentration Organic Data Review, (EPA, June 2001).

# 1.1 Intended Use of Data

The objective of this sampling event was to collect data for the Remedial Action Completion Report.

Analyses requested included:

- SW8260 Volatiles by GC/MS
- RSK 175 Dissolved gases (methane, ethane, ethene, CO₂)
- 830MBA Metabolic acids
- E365.4 Total Phosphorus
- E415.1 Total Organic Carbon
- SW6010 Fe (total and dissolved) by ICP
- SW6020 Mn (total and dissolved) by ICP/MS
- SW9056 Common Anions by ion chromatography
- E310.1 Alkalinity
- SM3500 Fe Ferrous Iron
- E376.1 Sulfide
- E353.2 Nitrate-Nitrite

Table 2 lists the sample identifications and their associated laboratory identifications. Table 3 lists qualified results with the associated quality control parameter that was exceeded.

# **1.2 Preservation and Holding Times**

Sample identification data were evaluated for agreement with the chain-of-custody (COC). All samples were received in appropriate containers, within the proper temperature range, in good condition, and with the required signatures.

# 1.3 Calibrations

Initial calibration criteria modification includes RSD < or = to 30%, two compounds allowed up to 40%. If the continuing calibration verification (CCV) compound exceeds 30% drift, the

compound is checked in the LCS, if both are outside recovery limits, the compound is rejected, R. If only the CCV exceeds recovery criteria and is less than  $\pm$  40% drift, then the compound is qualified J or UJ.

# **1.3.1** Continuing Calibration Verifications (CCV)

### 1.3.1.1 SW8260

CCV WG442259-02 has bromomethane at 62.8%, naphthalene at 76.2%, and 1,2,3-trichlorobenzene at 75.8% in SDG L13080637. Associated samples are non-detect and are UJ qualified.

CCV WG442505-02 has Dichlorodifluoromethane at 57.8%, naphthalene at 78%, and 1,2,3-trichlorobenzene at 75.8% in SDG L13080772. Associated samples are non-detect and are UJ qualified.

CCV WG442613-02 has acetone at 79.2% in SDG L13080772. Associated samples are non-detect and are UJ qualified.

CCV WG443303-02 has chloromethane at 69% and dichlorodifluoromethane at 77.6% in SDG L13081083. Associated samples are non-detect and are UJ qualified.

CCV run on 8/29/13 at 8:40 has bromomethane at 71% in SDG L13081193 (subbed to CT labs). Associated samples are non-detect and are UJ qualified.

CCV WG443456-02 has bromomethane at 67% and dichlorodifluoromethane at 79.8% in SDG L13081330. Associated samples are non-detect and are UJ qualified.

CCV WG443657-02 has acetone at 77.6% in SDG L13081599. Associated samples are non-detect and are UJ qualified.

CCV WG443793-02 has chloromethane at 75.8%, acetone at 66.4%, and bromomethane at 72.6% in SDG L13081599. Associated samples are non-detect and are UJ qualified.

CCV WG444204-02 has bromomethane at 61.8%, 2-butanone at 76%, 1,2-dibromo-3-chloropropane at 79%, 2-hexanone at 69%, naphthalene at 72.4%, and 1,2,3-trichlorobenzene at 78.6% in SDG L13090311. Associated samples are non-detect and are UJ qualified.

CCV WG445082-02 has acetone at 73.8% in SDG L13090895. Associated samples are non-detect and are UJ qualified.

CCV WG450703-02 has 1,1,2,2-tetrachloroethane at 79.6%, acetone at 78.8%, bromomethane at 76.2%, 2-butanone at 79.6%, and 1,2-dibromo-3-chloropropane at 77.6% in SDG L13100824. Associated samples are non-detect and are UJ qualified.

CCV WG450356-02 has acetone 76.6% and 2-butanone at 77% in SDG L13101135. Associated samples are non-detect and are UJ qualified.

CCV WG450445-02 has acetone at 77%, 1,2-dibromo-3-chloropropane at 74.8%, 1,2,3-trichloropropane at 79.4% in SDG L13101240. Associated samples are non-detect and are UJ qualified.

CCV WG450449-02 has 1,2-dibromo-3-chloropropane at 78.4% in SDG L13101240. Associated samples are non-detect and are UJ qualified.

CCV WG450559-02 has 1,1,2,2-tetrachloroethane at 77.8%, acetone at 70.8%, 2-butanone at 71.2%, 1,2-dibromo-3-chloropropane at 71.8%, 2-hexanone at 75%, 4-methyl-2-pentanone at 73.4%, and 1,2,3-trichloropropane at 78.6% in SDG L13101240. Associated samples are non-detect and are UJ qualified.

CCV WG450703-02 has 1,1,2,2-tetrachloroethane at 79.6%, acetone at 78.8%, bromomethane at 76.2%, 2-butanone at 79.6% and 1,2-dibromo-3-chloropropane at 77.6% in SDG L13101240. Associated samples are non-detect and are UJ qualified.

CCV WG450746-02 has 2-hexanone at 78.8% in SDG L13101525. Associated samples are non-detect and are UJ qualified.

Table 3 shows qualified analytical data.

# 1.3.2 Blanks

Where contamination by a target analyte of one of the various blanks was found, if the sample result for an associated sample was non-detect or less than 5X (10X for common laboratory contaminants) the analyte concentration in the blank, the corresponding sample result for the analyte was qualified B. Where the sample result for the affected analyte was greater than 5X the amount in the blank, no qualifier was applied.

# 1.3.2.1 RSK 175

Method blank 442474-01 has methane at 3.37 ug/L in SDG L13081083.

Method blank 442584-01 has methane at 3.82 ug/L in SDG L13081083.

Method blank 449106-01 has methane at 3.32 ug/L in SDG L13100824.

Method blank 449305-01 has methane at 3.56 ug/L in SDG L13101135.

# 1.3.3 E376.1

Method blank WG448696-01 has sulfide at 0.960 mg/L in SDG L13100824.

Table 3 shows qualified analytical data.

# 1.3.4 Surrogates

# 1.3.5 SW8260

35AWW08-101013 has 1,2-dichloroethane-d4 at 125%, limit are 70-120% in SDG L13100824. Positive detects are J qualified.

03WW01-101013 has 1,2-dichloroethane-d4 at 123% in SDG L13100824. Positive hits are J qualified.

35AWW20-101513 has dibromofluoromethane at 116% and 4-bromofluorobenzene at 122% in SDG L13101135. Positive hits are J qualified.

Table 3 shows qualified analytical data.

# 1.3.6 Laboratory Control Sample (LCS)

# 1.3.6.1 SW8260

LCS WG441110-02 has 4-chlorotoluene at 74.6% for both the LCS and LCSD in SDG L13080429. Control limits are 75-130%. Associated samples are non-detect and are UJ qualified.

LCS WG444205-02 has 4-chlorotoluene at 72.9% and 78.1% for the LCS and LCSD in SDG L13090311.

LCS WG450357-02 has 1,2,3-trichloropropane at 71.1% for the LCS in SDG L13101135. Associated samples are non-detect and are UJ qualified.

# 1.3.7 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

### 1.3.7.1 SW8260

35AWW15-101613 has 4-chlorotoluene at 73% for the MSD in SDG L13101240. Control limits are 75-130%. Parent sample is non-detect and is UJ qualified.

Table 3 shows qualified analytical data.

# 1.3.8 Field Duplicate Precision

All field duplicates are within control limits.

# 2 DATA USABILITY SUMMARY

The data are usable for the intended purposes of the project. The data quality objectives have been met for the project.

Method	Total Analytes	No. of Rejected Results	% Completeness
SW8260	1876	0	100
SW6010	4	0	100
SW6020	4	0	100
RSK175	16	0	100
830MBA	28	0	100
SW9056	24	0	100
E310.1	4	0	100
SM3500 Fe	4	0	100
E365.4	4	0	100
E376.1	4	0	100
E415.1	4	0	100

 Table 1: Completeness by Method

ClientSampleID	LabSampleID	SW8260	SW6010	SW6020	RSK 175	830 MBA	SW9056	E310.2	SM3500 Fe	E365.4 Phos	E376.1 Sulfi	E415.1
TB-050813	L13080429-01	Х										
58DPT20(36-40)050813	L13080429-02	Х										
58DPT20(36-40)050813	L13080429-03	Х										
58DPT27(26-30)060813	L13080429-04	Х										
58DPT21(26-30)060813	L13080429-05	Х										
TB100813	L13080637-01	Х										
58DPT19(31-35)100813	L13080637-02	Х										
58DPT24(31-35)100813	L13080637-03	Х										
58DPT18(31-35)120813	L13080637-04	Х										
TB130813	L13080772-01	Х										
58DPT16(31-35)130813	L13080772-02	Х										
58DPT17(36-40)130813	L13080772-03	Х										
58DPT22(26-30)130813	L13080772-04	Х										
35AWW08-082013	L13081083-01	Х	Х	Х	Х	Х	Х	Х	Χ	Χ	Х	Х
35AWW08-082013	L13081083-02											
03WW01-082013	L13081083-03	X	Х	Х	Х	Χ	Χ	Χ	Χ	Χ	Х	Х
Trip blank	L13081083-05	Х										
58DPT12(23-27)200813	L13081193-01	Х										
58DPT10(37-31)200813	L13081193-02	Х										
58DPT11(20-24)210813	L13081193-03	Х										
58DPT26(28-32)210813	L13081193-04	Х										
EB-210813	L13081193-05	X										
58DPT13(18-22)220813	L13081193-06	Х										
58DPT13(18-22)220813D	L13081193-07	Х										
58DPT15(36-40)220813	L13081193-08	Х										

 Table 2: Field Sample Identification and Laboratory Identification

ClientSampleID	LabSampleID	SW8260	SW6010	SW6020	RSK 175	830 MBA	SW9056	E310.2	SM3500 Fe	E365.4 Phos	E376.1 Sulfi	E415.1
TB-210813	L13081193-09	Х										
58DPT25(36-40)230813	L13081330-01	Х										
TB-230813	L13081330-02	Х										
58DPT14(33-37)240813	L13081330-03	Х										
35AWW10-082913	L13081599-01	Х	Х	Х	Х	Х	Х	Χ	Χ	Χ	Χ	Χ
35AWW10F-082913	L13081599-02											
35AWW09-092913	L13081599-03	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Χ
35AWW09F-082913	L13081599-04											
Trip blank	L13081599-05	Х										
TB060913-58	L13090311-01	Х										
58DPT15A(28-38)060913	L13090311-02	Х										
58DPT15B(18-28)170913	L13090895-01	Х										
TB170913	L13090895-02	Х										
35AWW08-101013	L13100824-01	Х	Х	Х	Х	Х	Х	Х	Χ	Χ	Χ	Χ
35WW08F-101013	L13100824-02			Х								
03WW01-101013	L13100824-03	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
03WW01F-101013	L13100824-04			Х								
35AWW09-101013	L13100824-05	Х			Х	Х	Х	Х	Χ	Χ	Χ	Χ
35AWW09F-101013	L13100824-06			Х								
35AWW09F-101013	L13100824-07		Х	Х								
35AWW10-101013	L13100824-08	Х	Х	Х	Х	Х	Х	Х	Х	Х	Χ	Х
35AWW13-101113	L13101135-01	Х										
35AWW13FD-101113	L13101135-02	Х										
35AWW01-101113	L13101135-03	Х										
35AWW11-101513	L13101135-04	Х			Х		Х	X	Χ	Χ	Χ	Χ
35AWW11F-101513	L13101135-05		Х									

ClientSampleID	LabSampleID	SW8260	SW6010	SW6020	RSK 175	830 MBA	SW9056	E310.2	SM3500 Fe	E365.4 Phos	E376.1 Sulfi	E415.1
35AWW11F-101513	L13101135-06		Х									
35AWW06-101513	L13101135-07	Х	Х		Х		Х	Х	Х	Х	Х	Х
35AWW06F-101513	L13101135-08		Х									
LHSMW07-101513	L13101135-09	Х	Х		Х		Х	Х	Х	Х	Х	Х
LHSMW07F-101513	L13101135-10		Х									
35AWW20-101513	L13101135-11	Х	Х		Х		Х	Χ	Х	Х	Х	Х
35AWW20-101513	L13101135-12			Х								
Trip blank	L13101135-13	Х										
Equipment rinse	L13101240-01	Х										
35AWW21-101613	L13101240-02	Х										
35AWW21MS-101613	L13101240-03	Х										
35AWW21MSD-101613	L13101240-04	Х										
35AWW15-101613	L13101240-05	Х										
35AWW15FD-101613	L13101240-06	Х										
35AWW05-101613	L13101240-07	Х										
35AWW07R-101613	L13101240-08	Х										
LHSMW06-101713	L13101240-09	Х										
35ASW03-101713	L13101240-10	Х										
Trip blank	L13101240-11	Х										
35AWW17-101813	L13101525-01	Х										
35AWW18-101813	L13101525-02	Х										
35AWW18MS-101813	L13101525-03	Х										
35AWW18MSD-101813	L13101525-04	Х										
35AWW14-101813	L13101525-05	Х										
35AWW12-101813	L13101525-06	Х										
35AWW12FD-101813	L13101525-07	X										

ClientSampleID	LabSampleID	SW8260	SW6010	SW6020	RSK 175	830 MBA	SW9056	E310.2	SM3500 Fe	E365.4 Phos	E376.1 Sulfi	E415.1
Equipment rinse	L13101525-08	X										
35AWW19-102213	L13101525-09	X										
35AWW19-102213	L13101525-10	X										
35AWW22-102213	L13101525-11	X										
Trip blank	L13101525-12	X										
35AWW02-102213	L13101525-13	X										
35AWW17-101813	L13101525-01	X										
35AWW18-101813	L13101525-02	Х										

### Table 3: Qualified Analytical Data

ClientSampleID	LabSampleID	AnalyteName	DVQualOverall	Reason
58DPT20-(36-40)050813	L13080429-02	4-Chlorotoluene	UJ	LCS/LCSD below control limits
58DPT23(36-40)060813	L13080429-03	4-Chlorotoluene	UJ	LCS/LCSD below control limits
58DPT27(26-30)060813	L13080429-04	4-Chlorotoluene	UJ	LCS/LCSD below control limits
58DPT21(26-30)060813	L13080429-05	4-Chlorotoluene	UJ	LCS/LCSD below control limits
58DPT19(31-35)100813	L13080637-02	Bromomethane	UJ	CCV below control limits
		Naphthalene	UJ	CCV below control limits
		1,2,3-Trichlorobenzene	UJ	CCV below control limits
58DPT24(31-35)100813	L13080637-03	Bromomethane	UJ	CCV below control limits
		Naphthalene	UJ	CCV below control limits
		1,2,3-Trichlorobenzene	UJ	CCV below control limits
58DPT18(31-35)120813	L13080637-04	Bromomethane	UJ	CCV below control limits
		Naphthalene	UJ	CCV below control limits
		1,2,3-Trichlorobenzene	UJ	CCV below control limits

ClientSampleID	LabSampleID	AnalyteName	DVQualOverall	Reason
58DPT16(31-35)130813	L13080772-02	Dichlorodifluoromethane	UJ	CCV below control limits
		Naphthalene	UJ	CCV below control limits
		1,2,3-Trichlorobenzene	UJ	CCV below control limits
58DPT17(36-40)130813	L13080772-03	Dichlorodifluoromethane	UJ	CCV below control limits
		Naphthalene	UJ	CCV below control limits
		1,2,3-Trichlorobenzene	UJ	CCV below control limits
58DPT22(26-30)130813	L13080772-04	Dichlorodifluoromethane	UJ	CCV below control limits
		Naphthalene	UJ	CCV below control limits
		1,2,3-Trichlorobenzene	UJ	CCV below control limits
35AWW08-082013	L13081083-01	Chloromethane	UJ	CCV below control limits
		Dichlorodifluoromethane	UJ	CCV below control limits
		Methane	В	Method blank contamination
03WW01-082013	L13081083-03	Acetone	UJ	CCV below control limits
		Chloromethane	UJ	CCV below control limits
		Trichlorofluoromethane	UJ	CCV below control limits
		Methane	В	Method blank contamination
58DPT10(27-31)200813	349148 (L13081193)	Bromomethane	UJ	CCV below control limits
58DPT11(20-24)210813	349144 (L13081193)	Bromomethane	UJ	CCV below control limits
58DPT12(23-27)200813	349143 (L13081193)	Bromomethane	UJ	CCV below control limits
58DPT13(18-22)220813	349146 (L13081193)	Bromomethane	UJ	CCV below control limits
58DPT13(18-22)220813D	349147 (L13081193)	Bromomethane	UJ	CCV below control limits
58DPT15(36-40)220813	349145 (L13081193)	Bromomethane	UJ	CCV below control limits
58DPT26(28-32)210813	349149	Bromomethane	UJ	CCV below control limits

ClientSampleID	LabSampleID	AnalyteName	DVQualOverall	Reason
	(L13081193)			
58DPT25(36-40)230813	L13081330-01	Bromomethane	UJ	CCV below control limits
		Dichlorodifluoromethane	UJ	CCV below control limits
58DPT14(33-37)240813	L13081330-03	Bromomethane	UJ	CCV below control limits
		Dichlorodifluoromethane	UJ	CCV below control limits
35AWW10-082913	L13081599-01	Acetone	UJ	CCV below control limits
		Bromomethane	UJ	CCV below control limits
		Chloromethane	UJ	CCV below control limits
35AWW09-082913	L13081599-03	Acetone	UJ	CCV below control limits
		Bromomethane	UJ	CCV below control limits
		Chloromethane	UJ	CCV below control limits
58DPT15A(28-38)060913	L13090311-02	Bromomethane	UJ	CCV below control limits
		2-butanone	UJ	CCV below control limits
		1,2-dibromo-3-chloropropane	UJ	CCV below control limits
		4-chlorotoluene	UJ	LCS/LCSD below control limits
		2-Hexanone	UJ	CCV below control limits
		Naphthalene	UJ	CCV below control limits
		1,2,3-Trichlorobenzene	UJ	CCV below control limits
58DPT15B(18-28)170913	L13090895-01	Acetone	J	CCV below control limits
35AWW08-101013	L13100824-01	2-Butanone	J	Surrogate above control limits
		Tetrachloroethene	J	Surrogate above control limits
		Trichloroethene	J	Surrogate above control limits
		Methane	U	Method blank contamination
		Sulfide	J	Method blank contamination
03WW01-101013	L13100824-03	2-Butanone	J	Surrogate above control limits
		4-methyl-2-pentanone	J	Surrogate above control limits
		Tetrachloroethene	J	Surrogate above control limits
		Trichloroethene	J	Surrogate above control limits

ClientSampleID	LabSampleID	AnalyteName	DVQualOverall	Reason
		1,2,4-trimethylbenzene	J	Surrogate above control limits
		Sulfide	J	Method blank contamination
35AWW09-101013	L13100824-05	Acetone	UJ	CCV below control limits
		Bromomethane	UJ	CCV below control limits
		2-Butanone	UJ	CCV below control limits
		1,2-dibromo-3-chloropropane	UJ	CCV below control limits
		1,1,2,2-Tetrachloroethane	UJ	CCV below control limits
35AWW11-101513	L13101135-04	Acetone	UJ	CCV below control limits
		2-Butanone	UJ	CCV below control limits
		1,2,3-Trichloropropane	UJ	LCS below control limits
35AWW20-101513	L13101135-11	All positive 8260 hits	J	Surrogate above control limits
35AWW11-101513	L13101135-04	Methane	U	Method blank contamination
35AWW06-101513	L13101135-07	Methane	U	Method blank contamination
35AWW21-101613	L13101240-02	4-Chlorotoluene	UJ	MSD below control limits
		1,2-dibromo-3-chloropropane	UJ	CCV below control limits
35AWW15-101613	L13101240-05	Acetone	UJ	CCV below control limits
		1,2-dibromo-3-chloropropane	UJ	CCV below control limits
		1,2,3-Trichloropropane	UJ	CCV below control limits
35AWW15FD-101613	L13101240-06	Acetone	UJ	CCV below control limits
		1,2-dibromo-3-chloropropane	UJ	CCV below control limits
		1,2,3-Trichloropropane	UJ	CCV below control limits
35AWW05-101613	L13101240-07	Acetone	UJ	CCV below control limits
		1,2-dibromo-3-chloropropane	UJ	CCV below control limits
		1,2,3-Trichloropropane	UJ	CCV below control limits
35AWW07R-101613	L13101240-08	Acetone	UJ	CCV below control limits
		1,2-dibromo-3-chloropropane	UJ	CCV below control limits
		1,2,3-Trichloropropane	UJ	CCV below control limits

ClientSampleID	LabSampleID	AnalyteName	DVQualOverall	Reason
35ASW03-101713	L13101240-10	1,2-dibromo-3-chloropropane	UJ	CCV below control limits
LHSMW06-101713	L13101240-09	Acetone	UJ	CCV below control limits
		Bromomethane	UJ	CCV below control limits
		2-Butanone	UJ	CCV below control limits
		1,2-dibromo-3-chloropropane	UJ	CCV below control limits
		2-hexanone	UJ	CCV below control limits
		4-methyl-2-pentanone	UJ	CCV below control limits
		1,1,2,2-tetrachloroethane	UJ	CCV below control limits
		1.2.3-trichloropropane	UJ	CCV below control limits
35AWW17-101813	L13101525-01	2-hexanone	UJ	CCV below control limits
35AWW18-101813	L13101525-02	2-hexanone	UJ	CCV below control limits
35AWW14-101813	L13101525-05	2-hexanone	UJ	CCV below control limits
35AWW12-101813	L13101525-06	2-hexanone	UJ	CCV below control limits
35AWW12FD-101813	L13101525-07	2-hexanone	UJ	CCV below control limits
35AWW16-102213	L13101525-09	2-hexanone	UJ	CCV below control limits
35AWW19-102213	L13101525-10	2-hexanone	UJ	CCV below control limits
35AWW22-102213	L13101525-11	2-hexanone	UJ	CCV below control limits
35AWW02-102213	L13101525-13	2-hexanone	UJ	CCV below control limits

Sample ID:	Units	Cleanup Level	58DPT10 (27- 31')-200813 8/20/2013	58DPT11 (20- 24')-210813 8/21/2013	58DPT12 (23- 27')-200813 8/20/2013	58DPT13 (18- 22')-220813 8/22/2013	58DPT13 (18- 22')-220813D 8/22/2013	58DPT14(33- 37)-240813 8/24/2013	58DPT15 (36- 40')-220813 8/22/2013	58DPT15A(28- 38)060913 9/6/2013	58DPT15B(18- 28)170913 9/17/2013	58DPT16(31- 35)130813 8/13/2013	58DPT17(36- 40)130813 8/13/2013
Volatile Organic Compounds (8260B)			0/20/2013	0/21/2013	0/20/2013	0/22/2013	0/22/2013	0/24/2013	0/22/2013	5/6/2013	5/17/2015	0/10/2010	0/13/2013
1.1.1.2-Tetrachloroethane	ua/L	110	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1.1.1-Trichloroethane	ua/L	200	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,1,2,2-Tetrachloroethane	ua/L	14	NA	NA	NA	NA	NA	<0.4 U	NA	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1.1.2-Trichloroethane	ua/L	5	NA	NA	NA	NA	NA	<0.5 U	NA	0.368 J	<0.5 U	<0.5 U	<0.5 U
1.1-Dichloroethane	ua/L	10000	NA	NA	NA	NA	NA	<0.25 U	NA	20.9	0.434 J	<0.25 U	<0.25 U
1.1-Dichloroethene	ua/L	7	NA	NA	NA	NA	NA	<1 U	NA	49.6	0.86 J	<1 U	<1 U
1.1-Dichloropropene	ua/L	2.9	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1.2.3-Trichlorobenzene	ua/L	310	NA	NA	NA	NA	NA	<0.3 U	NA	<0.3 UJ	<0.3 U	<0.3 UJ	<0.3 U
1.2.3-Trichloropropane	ua/L	0.0041	NA	NA	NA	NA	NA	<1 U	NA	<1 U	<1 U	<1 U	<1 U
1.2.4-Trichlorobenzene	ua/L	70	NA	NA	NA	NA	NA	<0.4 U	NA	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1.2.4-Trimethylbenzene	ua/L	5100	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1.2-Dibromo-3-Chloropropane	ua/L	0.2	NA	NA	NA	NA	NA	<2 U	NA	<2 UJ	<2 U	<2 U	<2 U
1.2-Dibromoethane	ua/L	0.005	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1.2-Dichlorobenzene	ua/L	600	NA	NA	NA	NA	NA	<0.25 U	NA	<0.25 U	<0.25 U	<0.25 U	<0.25 U
1.2-Dichloroethane	ua/L	5	NA	NA	NA	NA	NA	<0.5 U	NA	11.5	0.518 J	<0.5 U	<0.5 U
1.2-Dichloropropane	ua/L	5	NA	NA	NA	NA	NA	<0.4 U	NA	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1.3.5-Trimethylbenzene	ua/L	5100	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1.3-Dichlorobenzene	ua/L	3100	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1.3-Dichloropropane	ua/L	29	NA	NA	NA	NA	NA	<0.4 U	NA	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1.4-Dichlorobenzene	ua/L	75	NA	NA	NA	NA	NA	<0.25 U	NA	<0.25 U	<0.25 U	<0.25 U	<0.25 U
2.2-Dichloropropane	ua/L	42	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
2-Butanone	ua/L	61000	NA	NA	NA	NA	NA	5.09 J	NA	<5 UJ	4.46 J	<5 U	4.56 J
2-Chlorotoluene	ua/L	2000	NA	NA	NA	NA	NA	<0.25 U	NA	<0.25 U	<0.25 U	<0.25 U	<0.25 U
2-Hexanone	ua/L	6100	NA	NA	NA	NA	NA	<5 U	NA	<5 UJ	<5 U	<5 U	<5 U
4-Chlorotoluene	ua/L	2000	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U
4-Methyl-2-Pentanone	ua/L	8200	NA	NA	NA	NA	NA	<5 U	NA	<5 U	<5 U	<5 U	<5 U
Acetone	ua/L	92000	NA	NA	NA	NA	NA	30.2	NA	<5 U	29.3 J	7.79 J	19.5
Benzene	ua/L	5	NA	NA	NA	NA	NA	<0.25 U	NA	0.393 J	<0.25 U	<0.25 U	1.05
Bromobenzene	ua/L	2000	NA	NA	NA	NA	NA	<0.25 U	NA	<0.25 U	<0.25 U	<0.25 U	<0.25 U
Bromochloromethane	ua/L	4100	NA	NA	NA	NA	NA	<0.4 U	NA	<0.4 U	<0.4 U	<0.4 U	<0.4 U
Bromodichloromethane	ua/L	4.6	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Bromoform	ua/L	36	NA	NA	NA	NA	NA	<1 U	NA	<1 U	<1 U	<1 U	<1 U
Bromomethane	ua/L	140	NA	NA	NA	NA	NA	<1 UJ	NA	<1 UJ	<1 U	<1 U	<1 U
Carbon Disulfide	μg/L	10000	NA	NA	NA	NA	NA	<1 U	NA	<1 U	<1 U	<1 U	<1 U
Carbon Tetrachloride	µg/L	5	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Chlorobenzene	µg/L	100	NA	NA	NA	NA	NA	<0.25 U	NA	<0.25 U	<0.25 U	<0.25 U	<0.25 U
Chloroethane	µg/L	41000	NA	NA	NA	NA	NA	<1 U	NA	<1 U	<1 U	<1 U	<1 U
Chloroform	µg/L	1000	NA	NA	NA	NA	NA	<0.25 U	NA	<0.25 U	<0.25 U	<0.25 U	<0.25 U
Chloromethane	µg/L	220	NA	NA	NA	NA	NA	<1 U	NA	<1 U	<1 U	<1 U	<1 U
cis-1,2-Dichloroethene	µg/L	70	NA	NA	NA	NA	NA	<0.5 U	NA	1.42	<0.5 U	<0.5 U	<0.5 U
cis-1,3-Dichloropropene	µg/L	5.3	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Dibromochloromethane	µg/L	34	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Dibromomethane	µg/L	380	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Dichlorodifluoromethane	µg/L	20000	NA	NA	NA	NA	NA	<0.5 UJ	NA	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U
Ethylbenzene	µg/L	700	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Hexachlorobutadiene	µg/L	20	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Isopropylbenzene	μg/L	1000	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
m,p-Xylene	µg/L	10000	NA	NA	NA	NA	NA	<1 U	NA	<1 U	<1 U	<1 U	<1 U
Methylene Chloride	μα/L	5	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Naphthalene	<u>μ</u> g/L	2000	NA	NA	NA	NA	NA	<0.4 U	NA	<0.4 UJ	<0.4 U	<0.4 UJ	<0.4 U

Sample ID: Sample Date:	Units	Cleanup Level	58DPT10 (27- 31')-200813 8/20/2013	58DPT11 (20- 24')-210813 8/21/2013	58DPT12 (23- 27')-200813 8/20/2013	58DPT13 (18- 22')-220813 8/22/2013	58DPT13 (18- 22')-220813D 8/22/2013	58DPT14(33- 37)-240813 8/24/2013	58DPT15 (36- 40')-220813 8/22/2013	58DPT15A(28- 38)060913 9/6/2013	58DPT15B(18- 28)170913 9/17/2013	58DPT16(31- 35)130813 8/13/2013	58DPT17(36- 40)130813 8/13/2013
n-Butylbenzene	ua/l	/100	ΝΔ	ΝΔ	ΝΔ	ΝΔ	ΝΔ	<0.5.11	ΝΔ	<0.5.11	<0.5.11	<0.5.11	<0.5.11
n-Propylbenzene	µg/∟	4100		ΝA	ΝΔ	NA	ΝΔ	<0.5 0	ΝΔ				
	µg/∟	10000		ΝA	ΝΔ	NA		<0.25 0		<0.25 0	<0.25 0		
n-lsopropyltoluene	<u>μα/Ι</u>	10000	ΝΔ	ΝΔ	ΝΔ	ΝΔ	NA	<0.5 U	NΔ	<0.5 U	<0.5 U		
p-isopropyiloidene	μg/L	4100						<0.5 U		<0.5 U			
Styrepe	<u>μg/L</u>	100		NA	ΝΔ	NA	ΝΔ	<0.5 0	ΝΔ			<0.5 U	
tert-Butylbenzene	<u>μg/L</u> μα/Ι	4100	ΝΔ	ΝA	ΝΔ	ΝΔ	ΝΔ	<0.25 0	NΔ	<0.200	<0.25 U	<0.25 0	<0.25 0
Tetrachloroethene	μg/L	5	ΝΔ	ΝA	ΝΔ	ΝΔ	ΝΔ	<0.5 U	ΝΔ				
Toluene	<u>µg/L</u> ua/l	1000	NA	NA	NA	NA	NA	<0.00	NA	<0.0 0	<0.0 U	<0.0 U	0 711 .1
trans-1 2-Dichloroethene	<u>µg/⊏</u> ua/l	100	NA	NA	NA	NA	NA	<0.00	NA	<0.5 U	<0.5 U	<0.5 U	<0511
trans-1.3-Dichloropropene	<u>µg/L</u> ua/l	29	NA	NA	NA	NA	NA	<0.0 U	NA	<0.0 U	<0:0 0	<0.0 0	<0.0 0
Trichloroethene	<u>µg/⊏</u> ua/l	5	NA	NA	NA	NA	NA	<0.5.U	NA	6.82	<0.5.U	<0.5 U	<0.5.U
Trichlorofluoromethane	ua/l	31000	NA	NA	NA	NA	NA	<0.5 U	NA	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Vinyl Chloride	ua/l	2	NA	NA	NA	NA	NA	<0.5 U	NA	0.302 J	<0.5 U	<0.5 U	<0.5 U
Volatile Organic Compounds (8260C)										0.002 0			
1,1,1,2-Tetrachloroethane	µg/L	110	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
1,1,1-Trichloroethane	µg/L	200	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
1,1,2,2-Tetrachloroethane	µg/L	14	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
1,1,2-Trichloroethane	µg/L	5	1.3	<1 U	13	<1 U	<1 U	NA	1.9	NA	NA	NA	NA
1,1-Dichloroethane	µg/L	10000	42	<0.5 U	250	0.26 J	0.34 J	NA	57	NA	NA	NA	NA
1,1-Dichloroethene	µg/L	7	11	<0.5 U	790	<0.5 U	<0.5 U	NA	63	NA	NA	NA	NA
1,1-Dichloropropene	µg/L	2.9	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
1,2,3-Trichlorobenzene	µg/L	310	<1 U	NA	<1 U	NA	NA	NA	NA				
1,2,3-Trichloropropane	µg/L	0.0041	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
1,2,4-Trichlorobenzene	µg/L	70	<1 U	NA	<1 U	NA	NA	NA	NA				
1,2,4-Trimethylbenzene	µg/L	5100	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
1,2-Dibromo-3-chloropropane	µg/L	0.2	<1 U	NA	<1 U	NA	NA	NA	NA				
1,2-Dibromoethane	µg/L	0.005	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
1,2-Dichlorobenzene	µg/L	600	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
1,2-Dichloroethane	µg/L	5	0.92 J	<1 U	11	<1 U	<1 U	NA	9	NA	NA	NA	NA
1,2-Dichloropropane	µg/L	5	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
1,3,5-Trimethylbenzene	µg/L	5100	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
1,3-Dichlorobenzene	µg/L	3100	<1 U	NA	<1 U	NA	NA	NA	NA				
1,3-Dichloropropane	µg/L	29	<1 U	NA	<1 U	NA	NA	NA	NA				
1,4-Dichlorobenzene	µg/L	75	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
2,2-Dichloropropane	µg/L	42	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
2-Butanone	µg/L	61000	<5 U	NA	12	NA	NA	NA	NA				
2-Chlorotoluene	µg/L	2000	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
2-Hexanone	µg/L	6100	<10 U	NA	<10 U	NA	NA	NA	NA				
4-Chlorotoluene	µg/L	2000	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
4-Methyl-2-pentanone	µg/L	8200	<10 U	NA	<10 U	NA	NA	NA	NA				
Acetone	µg/L	92000	12	5.6 J	<10 U	16	18	NA	81	NA	NA	NA	NA
Benzene	µg/L	5	0.54	<0.5 U	1.6	<0.5 U	<0.5 U	NA	0.76	NA	NA	NA	NA
Bromobenzene	µg/L	2000	<0.5 U	NA NA	<0.5 U	NA NA	NA	NA	NA NA				
Diomocnioromethane	µg/L	4100	<0.5 U	NA NA	<0.5 U	NA NA	NA NA	NA NA	INA NA				
Diomodichioromethane	µg/L	4.0	<0.5 U	NA NA	<0.5 U	NA NA	NA NA	NA NA	NA NA				
Divitiviviti	µg/L	30	<0.5 U		<ul> <li>U C.U&gt;</li> </ul>								
Dromometriane	µg/L	140	<1 UJ		<1 UJ								
Carbon totrochlarida	µg/L	10000	<1 U		<1 U	<1 U	<1 U		<1 U				
	µg/L	0 100	<0.5 U	INA NA	<0.5 U		INA NA		NA NA				
Chiolopenzene	µg/L	100	<0.5 U	INA	<0.5 U	INA	INA	INA	INA				

Sample ID: Sample Date:	Units	Cleanup Level	58DPT10 (27- 31')-200813 8/20/2013	58DPT11 (20- 24')-210813 8/21/2013	58DPT12 (23- 27')-200813 8/20/2013	58DPT13 (18- 22')-220813 8/22/2013	58DPT13 (18- 22')-220813D 8/22/2013	58DPT14(33- 37)-240813 8/24/2013	58DPT15 (36- 40')-220813 8/22/2013	58DPT15A(28- 38)060913 9/6/2013	58DPT15B(18- 28)170913 9/17/2013	58DPT16(31- 35)130813 8/13/2013	58DPT17(36- 40)130813 8/13/2013
Chloroethane	µg/L	41000	<1 U	<1 U	0.63 J	<1 U	<1 U	NA	<1 U	NA	NA	NA	NA
Chloroform	µg/L	1000	<0.5 U	<0.5 U	0.28 J	<0.5 U	<0.5 U	NA	<0.5 U	NA	NA	NA	NA
Chloromethane	µg/L	220	<1 U	NA	<1 U	NA	NA	NA	NA				
cis-1,2-Dichloroethene	µg/L	70	20	<0.5 U	240	<0.5 U	<0.5 U	NA	8.7	NA	NA	NA	NA
cis-1,3-Dichloropropene	µg/L	5.3	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
Dibromochloromethane	µg/L	34	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
Dibromomethane	µg/L	380	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
Dichlorodifluoromethane	µg/L	20000	<1 U	NA	<1 U	NA	NA	NA	NA				
Ethylbenzene	µg/L	700	<0.5 U	<0.5 U	4	<0.5 U	<0.5 U	NA	<0.5 U	NA	NA	NA	NA
Hexachlorobutadiene	µg/L	20	<1 U	NA	<1 U	NA	NA	NA	NA				
Isopropylbenzene	µg/L	1000	<0.5 U	<0.5 U	1.1	<0.5 U	<0.5 U	NA	<0.5 U	NA	NA	NA	NA
m,p-Xylenes	µg/L	10000	<1 U	<1 U	0.65 J	<1 U	<1 U	NA	<1 U	NA	NA	NA	NA
Methylene chloride	µg/L	5	<2 U	NA	<2 U	NA	NA	NA	NA				
Naphthalene	µg/L	2000	<1 U	NA	<1 U	NA	NA	NA	NA				
n-Butylbenzene	µg/L	4100	<0.5 U	<0.5 U	1.2	<0.5 U	<0.5 U	NA	<0.5 U	NA	NA	NA	NA
n-Propylbenzene	µg/L	4100	<0.5 U	<0.5 U	3	<0.5 U	<0.5 U	NA	<0.5 U	NA	NA	NA	NA
o-Xylene	µg/L	10000	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
p-Isopropyltoluene	µg/L	10000	<0.5 U	<0.5 U	0.25 J	<0.5 U	<0.5 U	NA	<0.5 U	NA	NA	NA	NA
sec-Butylbenzene	µg/L	4100	<0.5 U	<0.5 U	0.81	<0.5 U	<0.5 U	NA	<0.5 U	NA	NA	NA	NA
Styrene	µg/L	100	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
tert-Butylbenzene	µg/L	4100	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
Tetrachloroethene	µg/L	5	<1 U	<1 U	0.47 J	<1 U	<1 U	NA	<1 U	NA	NA	NA	NA
Toluene	µg/L	1000	0.57	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U	NA	NA	NA	NA
trans-1,2-Dichloroethene	µg/L	100	0.39 J	<0.5 U	5.1	<0.5 U	<0.5 U	NA	0.31 J	NA	NA	NA	NA
trans-1,3-Dichloropropene	µg/L	29	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
Trichloroethene	µg/L	5	<0.5 U	<0.5 U	61	<0.5 U	<0.5 U	NA	6	NA	NA	NA	NA
Trichlorofluoromethane	µg/L	31000	<0.5 U	NA	<0.5 U	NA	NA	NA	NA				
Vinyl chloride	µg/L	2	12	<0.5 U	24	<0.5 U	<0.5 U	NA	11	NA	NA	NA	NA

#### Blue Highlighting Indicates Analyte Detected Above Cleanup Level

J - Estimated value; analyte concentration was less than the limit of quantification

NA - not analyzed

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

Sample ID: Sample Date:	Units	Cleanup Level	58DPT18(31- 35)120813 8/12/2013	58DPT19(31- 35)100813 8/10/2013	58DPT20(36- 40)050813 8/5/2013	58DPT21(26- 30)060813 8/6/2013	58DPT22(26- 30)130813 8/13/2013	58DPT23(36- 40)060813 8/6/2013	58DPT24(31- 35)100813 8/10/2013	58DPT25(36- 40)-230813 8/23/2013	58DPT26 (28- 32')-210813 8/21/2013	58DPT27(26- 30)060813 8/6/2013
Volatile Organic Compounds (8260B)									I		I	
1,1,1,2-Tetrachloroethane	µg/L	110	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
1,1,1-Trichloroethane	µg/L	200	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	NA	<0.4 U
1,1,2-Trichloroethane	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
1,1-Dichloroethane	µg/L	10000	0.334 J	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA	<0.25 U
1,1-Dichloroethene	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	NA	<1 U
1,1-Dichloropropene	µg/L	2.9	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
1,2,3-Trichlorobenzene	µg/L	310	<0.3 UJ	<0.3 UJ	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 UJ	<0.3 U	NA	<0.3 U
1,2,3-Trichloropropane	µg/L	0.0041	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	NA	<1 U
1,2,4-Trichlorobenzene	µg/L	70	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	NA	<0.4 U
1,2,4-Trimethylbenzene	µg/L	5100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
1,2-Dibromo-3-Chloropropane	µg/L	0.2	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	NA	<2 U
1,2-Dibromoethane	µg/L	0.005	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
1,2-Dichlorobenzene	µg/L	600	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA	<0.25 U
1,2-Dichloroethane	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
1,2-Dichloropropane	µg/L	5	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	NA	<0.4 U
1,3,5-Trimethylbenzene	µg/L	5100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
1,3-Dichlorobenzene	µg/L	3100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
1,3-Dichloropropane	µg/L	29	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	NA	<0.4 U
1,4-Dichlorobenzene	µg/L	75	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA	<0.25 U
2,2-Dichloropropane	µg/L	42	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
2-Butanone	µg/L	61000	4.06 J	<5 U	<5 U	<5 U	<5 U	<5 U	4 J	11.8	NA	<5 U
2-Chlorotoluene	µg/L	2000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA	<0.25 U
2-Hexanone	µg/L	6100	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	NA	<5 U
4-Chlorotoluene	µg/L	2000	<0.5 U	<0.5 U	<0.5 UJ	<0.5 UJ	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	NA	<0.5 UJ
4-Methyl-2-Pentanone	µg/L	8200	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	NA	<5 U
Acetone	µg/L	92000	42.1	3.92 J	4.09 J	7.6 J	4.51 J	<5 U	13.9	90.6	NA	4.24 J
Benzene	µg/L	5	<0.25 U	0.159 J	<0.25 U	0.279 J	<0.25 U	<0.25 U	1.54	0.203 J	NA	<0.25 U
Bromobenzene	µg/L	2000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA	<0.25 U
Bromochloromethane	µg/L	4100	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	NA	<0.4 U
Bromodichloromethane	µg/L	4.6	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
Bromoform	µg/L	36	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	NA	<1 U
Bromomethane	µg/L	140	<1 UJ	<1 UJ	<1 U	<1 U	<1 U	<1 U	<1 UJ	<1 UJ	NA	<1 U
Carbon Disulfide	µg/L	10000	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	NA	<1 U
Carbon Tetrachloride	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
Chlorobenzene	µg/L	100	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA	<0.25 U
Chloroethane	µg/L	41000	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	NA	<1 U
Chloroform	µg/L	1000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA	<0.25 U
Chloromethane	µg/L	220	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	NA	<1 U
cis-1,2-Dichloroethene	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
cis-1,3-Dichloropropene	µg/L	5.3	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
Dibromochloromethane	µg/L	34	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
Dibromomethane	µg/L	380	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
Dichlorodifluoromethane	µg/L	20000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	NA	<0.5 U
Ethylbenzene	µg/L	700	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
Hexachlorobutadiene	μg/L	20	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
Isopropylbenzene	µg/L	1000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
m,p-Xylene	µg/L	10000	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	NA	<1 U
Methylene Chloride	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	<0.5 U
Naphthalene	µg/L	2000	<0.4 UJ	<0.4 UJ	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 UJ	<0.4 U	NA	<0.4 U

Sample ID:	Units	Cleanup	58DPT18(31- 35)120813	58DPT19(31- 35)100813	58DPT20(36- 40)050813	58DPT21(26- 30)060813	58DPT22(26- 30)130813	58DPT23(36- 40)060813	58DPT24(31- 35)100813	58DPT25(36- 40)-230813	58DPT26 (28- 32')-210813	58DPT27(26- 30)060813
Sample Date:		Levei	8/12/2013	8/10/2013	8/5/2013	8/6/2013	8/13/2013	8/6/2013	8/10/2013	8/23/2013	8/21/2013	8/6/2013
n-Butylbenzene	µg/L	4100	<0.5 U	NA	<0.5 U							
n-Propylbenzene	µg/L	4100	<0.25 U	NA	<0.25 U							
o-Xylene	µg/L	10000	<0.5 U	NA	<0.5 U							
p-Isopropyltoluene	µg/L	10000	<0.5 U	NA	<0.5 U							
sec-Butylbenzene	µg/L	4100	<0.5 U	NA	<0.5 U							
Styrene	µg/L	100	<0.25 U	NA	<0.25 U							
tert-Butylbenzene	µg/L	4100	<0.5 U	NA	<0.5 U							
Tetrachloroethene	µg/L	5	<0.5 U	NA	<0.5 U							
Toluene	µg/L	1000	<0.5 U	1.02	<0.5 U	NA	<0.5 U					
trans-1,2-Dichloroethene	µg/L	100	<0.5 U	NA	<0.5 U							
trans-1,3-Dichloropropene	µg/L	29	<1 U	NA	<1 U							
Trichloroethene	µg/L	5	<0.5 U	NA	<0.5 U							
Trichlorofluoromethane	µg/L	31000	<0.5 U	NA	<0.5 U							
Vinyl Chloride	µg/L	2	<0.5 U	NA	<0.5 U							
Volatile Organic Compounds (8260C)												
1,1,1,2-Tetrachloroethane	µg/L	110	NA	<0.5 U	NA							
1,1,1-Trichloroethane	μg/L	200	NA	<0.5 U	NA							
1,1,2,2-Tetrachloroethane	µg/L	14	NA	<0.5 U	NA							
1,1,2-Trichloroethane	µg/L	5	NA	<1 U	NA							
1,1-Dichloroethane	µg/L	10000	NA	<0.5 U	NA							
1,1-Dichloroethene	µg/L	7	NA	<0.5 U	NA							
1,1-Dichloropropene	µg/L	2.9	NA	<0.5 U	NA							
1,2,3-Trichlorobenzene	µg/L	310	NA	<1 U	NA							
1,2,3-Trichloropropane	µg/L	0.0041	NA	<0.5 U	NA							
1,2,4-Trichlorobenzene	µg/L	70	NA	<1 U	NA							
1,2,4-Trimethylbenzene	µg/L	5100	NA	<0.5 U	NA							
1,2-Dibromo-3-chloropropane	µg/L	0.2	NA	<1 U	NA							
1,2-Dibromoethane	µg/L	0.005	NA	<0.5 U	NA							
1,2-Dichlorobenzene	µg/L	600	NA	<0.5 U	NA							
1,2-Dichloroethane	µg/L	5	NA	<1 U	NA							
1,2-Dichloropropane	µg/L	5	NA	<0.5 U	NA							
1,3,5-Trimethylbenzene	µg/L	5100	NA	<0.5 U	NA							
1,3-Dichlorobenzene	µg/L	3100	NA	<1 U	NA							
1,3-Dichloropropane	µg/L	29	NA	<1 U	NA							
1,4-Dichlorobenzene	µg/L	75	NA	<0.5 U	NA							
2,2-Dichloropropane	µg/L	42	NA	<0.5 U	NA							
2-Butanone	µg/L	61000	NA	<5 U	NA							
2-Chlorotoluene	µg/L	2000	NA	<0.5 U	NA							
2-Hexanone	µg/L	6100	NA	<10 U	NA							
4-Chlorotoluene	µg/L	2000	NA	<0.5 U	NA							
4-Methyl-2-pentanone	µg/L	8200	NA	<10 U	NA							
Acetone	µg/L	92000	NA	11	NA							
Benzene	µg/L	5	NA	<0.5 U	NA							
Bromobenzene	μg/L	2000	NA	<0.5 U	NA							
Bromochloromethane	μg/L	4100	NA	<0.5 U	NA							
Bromodichloromethane	µg/L	4.6	NA	<0.5 U	NA							
Bromoform	μg/L	36	NA	<0.5 U	NA							
Bromomethane	μg/L	140	NA	<1 UJ	NA							
Carbon disulfide	μg/L	10000	NA	<1 U	NA							
Carbon tetrachloride	µg/L	5	NA	<0.5 U	NA							
Chlorobenzene	µg/L	100	NA	<0.5 U	NA							

Sample ID Sample Date	: Units :	Cleanup Level	58DPT18(31- 35)120813 8/12/2013	58DPT19(31- 35)100813 8/10/2013	58DPT20(36- 40)050813 8/5/2013	58DPT21(26- 30)060813 8/6/2013	58DPT22(26- 30)130813 8/13/2013	58DPT23(36- 40)060813 8/6/2013	58DPT24(31- 35)100813 8/10/2013	58DPT25(36- 40)-230813 8/23/2013	58DPT26 (28- 32')-210813 8/21/2013	58DPT27(26- 30)060813 8/6/2013
Chloroethane	µg/L	41000	NA	NA	NA	NA	NA	NA	NA	NA	<1 U	NA
Chloroform	µg/L	1000	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Chloromethane	µg/L	220	NA	NA	NA	NA	NA	NA	NA	NA	<1 U	NA
cis-1,2-Dichloroethene	µg/L	70	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
cis-1,3-Dichloropropene	µg/L	5.3	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Dibromochloromethane	µg/L	34	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Dibromomethane	µg/L	380	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Dichlorodifluoromethane	µg/L	20000	NA	NA	NA	NA	NA	NA	NA	NA	<1 U	NA
Ethylbenzene	µg/L	700	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Hexachlorobutadiene	µg/L	20	NA	NA	NA	NA	NA	NA	NA	NA	<1 U	NA
Isopropylbenzene	µg/L	1000	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
m,p-Xylenes	µg/L	10000	NA	NA	NA	NA	NA	NA	NA	NA	<1 U	NA
Methylene chloride	µg/L	5	NA	NA	NA	NA	NA	NA	NA	NA	<2 U	NA
Naphthalene	µg/L	2000	NA	NA	NA	NA	NA	NA	NA	NA	<1 U	NA
n-Butylbenzene	µg/L	4100	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
n-Propylbenzene	µg/L	4100	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
o-Xylene	µg/L	10000	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
p-Isopropyltoluene	µg/L	10000	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
sec-Butylbenzene	µg/L	4100	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Styrene	µg/L	100	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
tert-Butylbenzene	µg/L	4100	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Tetrachloroethene	µg/L	5	NA	NA	NA	NA	NA	NA	NA	NA	<1 U	NA
Toluene	µg/L	1000	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
trans-1,2-Dichloroethene	µg/L	100	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
trans-1,3-Dichloropropene	µg/L	29	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Trichloroethene	µg/L	5	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Trichlorofluoromethane	µg/L	31000	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA
Vinyl chloride	µg/L	2	NA	NA	NA	NA	NA	NA	NA	NA	<0.5 U	NA

#### Blue Highlighting Indicates Analyte Detected Above Cleanup Level

J - Estimated value; analyte concentration was less than the limit of quantification

NA - not analyzed

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

Sample ID:		03WW01-	35AWW08-	35AWW09-	35AWW09F-	35AWW10-	35AWW10F-
	Units	082013	082013	082913	082913	082913	082913
Sample Date:		8/20/2013	8/20/2013	8/29/2013	8/29/2013	8/29/2013	8/29/2013
Water Quality Parameters							
Temperature	°C	26.19	23.44	27.7	NA	26.77	NA
рН	pH Units	6.18	6.05	6.32	NA	6.92	NA
Conductivity	mS/cm	3.64	8.23	7.2	NA	1.39	NA
Dissolved Oxygen	mg/L	9.11	9.84	1.62	NA	5.69	NA
Turbidity	NTU	33	26.9	20.8	NA	1.3	NA
Oxidation Reduction Potential	mV	240	112	108	NA	96	NA
Ferrous Iron, Field	mg/L	0.78	0.52	NA	NA	NA	NA
Alkalinity (310.2)							
Alkalinity, Total	mg/L	142	174	250	NA	379	NA
Nitrogen (353.2)							
Nitrogen, Nitrate-Nitrite	mg/L	NA	NA	0.201	NA	0.455	NA
Phosphorus (365.4)							
Phosphorus	mg/L	<0.2 U	0.178 J	0.351 J	NA	0.412	NA
Sulfide (376.1)							
Sulfide	mg/L	<1 U	1.2 J	1.75 J	NA	<1 U	NA
Total Organic Carbon (415.1)							
Total Organic Carbon (TOC)	mg/L	10.5	16.5	5.77	NA	3.84	NA
Metals (6010C)							
Iron	mg/L	<0.1 U	4.2	<0.1 U	NA	<0.1 U	NA
Dissolved Metals (6010C)							
Iron	mg/L	<0.1 U	4.75	NA	<0.1 U	NA	<0.1 U
Metals (6020A)							
Manganese	mg/L	0.0589	5.67	0.361	NA	0.0814	NA
Dissolved Metals (6020A)							
Manganese	mg/L	0.0561	5.71	NA	0.341	NA	0.0739
Volatile Fatty Acids (830-MBA)							
Acetic Acid	mg/L	<1 U	<1 U	<1 U	NA	<1 U	NA
Butyric Acid	mg/L	<1 U	<1 U	<1 U	NA	<1 U	NA
Lactic Acid	mg/L	<1 U	<1 U	<1 U	NA	<1 U	NA
Propionic Acid	mg/L	<10 U	<10 U	<10 U	NA	<10 U	NA
Pyruvic Acid	mg/L	<0.1 U	<0.1 U	<0.1 U	NA	<0.1 U	NA

LHAAP-58 Field Parameters and Biogeochemical Data - August 2013

Sample ID: Sample Date:	Units	03WW01- 082013 8/20/2013	35AWW08- 082013 8/20/2013	35AWW09- 082913 8/29/2013	35AWW09F- 082913 8/29/2013	35AWW10- 082913 8/29/2013	35AWW10F- 082913 8/29/2013
Anions (9056)							
Chloride	mg/L	892	2510	1970	NA	135	NA
Nitrate	mg/L	<1 U	<4 U	<1 U	NA	<1 U	NA
Nitrite	mg/L	<1 U	<4 U	<1 U	NA	<1 U	NA
Sulfate	mg/L	534	1480	1070	NA	209	NA
Dechlorinating Bacteria							
Dehalococcoides	CEQ/mL	1.2	<0.9	10.4	NA	31.1	NA
tceA Reductase	CEQ/mL	<0.5	<0.9	<0.5	NA	<0.5	NA
BAV1 Vinyl Chloride Reductase	CEQ/mL	<0.5	<0.9	<0.5	NA	<0.5	NA
Vinyl Chloride Reductase	CEQ/mL	<0.5	<0.9	<0.5	NA	0.2 J	NA
Dehalobacter spp.	CEQ/mL	0.4 J	<5.3	0.3 J	NA	1.8 J	NA
Dissolved Gases (RSK-175)							
Carbon Dioxide	ug/L	143000	143000	150000	NA	61000	NA
Ethane	ug/L	<2 U	<2 U	<2 U	NA	<2 U	NA
Ethene	ug/L	<2 U	<2 U	<2 U	NA	<2 U	NA
/ethane ug/L		<2 U	<2 U	31.5	NA	<2 U	NA
Ferrous Iron (SM3500FE)							
Ferrous Iron	mg/L	<0.04 U	<0.04 U	<0.04 U	NA	<0.04 U	NA

LHAAP-58 Field Parameters and Biogeochemical Data - August 2013

*Note:* Samples were not collected for LHSMW04 as it was dry.

°C - degrees celsius

CEQ/ml - cells equivalent per milliliter

J - Estimated value; analyte concentration was less than the limit of quantification

mg/L - milligram per liter

mS/cm - millisiemens per centimeter

mV - millivolt

NA - not analyzed

NTU - Nephelometric turbidity unit

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

Sample ID: Sample Date:	Units	03WW01- 101013 10/10/2013	03WW01F- 101013 10/10/2013	35AWW01- 101113 10/11/2013	35AWW02- 102213 10/22/2013	35AWW05- 101613 10/16/2013	35AWW06- 101513 10/15/2013	35AWW06F- 101513 10/15/2013	35AWW07R- 101613 10/16/2013	35AWW08- 101013 10/10/2013	35AWW08F- 101013 10/10/2013	35AWW09- 101013 10/10/2013
Water Quality Parameters												
Temperature	°C	17.4	NA	25.58	22.72	21.05	21.39	NA	20.83	16.82	NA	19.67
pH	pH Units	6.55	NA	7.08	8.12	6.95	6.56	NA	7.54	6.7	NA	5.43
Conductivity	mS/cm	39.2	NA	0.576	0.875	3.05	6.73	NA	0.205	47.7	NA	7.68
Dissolved Oxygen	mg/L	9.72	NA	0.85	1.3	0.67	1.05	NA	8.86	9.57	NA	1.53
Turbidity	NTU	10	NA	131	7.3	16.9	0	NA	197	4.1	NA	40.5
Oxidation Reduction Potential	mV	-235	NA	23	98	-141	96	NA	108	-100	NA	182
Alkalinity (310.2)												
Alkalinity, Total	mg/L	39700	NA	NA	NA	NA	592	NA	NA	35600	NA	235
Nitrogen (353.2)												
Nitrogen, Nitrate-Nitrite	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus (365.4)												
Phosphorus	mg/L	243	NA	NA	NA	NA	<0.2 U	NA	NA	361	NA	<0.2 U
Sulfide (376.1)												
Sulfide	mg/L	<1 U	NA	NA	NA	NA	<1 U	NA	NA	<1 U	NA	<1 U
Total Organic Carbon (415.1)												
Total Organic Carbon (TOC)	mg/L	49200	NA	NA	NA	NA	6.33	NA	NA	66400	NA	9.83
Metals (6010C)												
Iron	mg/L	36.6	NA	NA	NA	NA	0.159 J	NA	NA	29.7	NA	NA
Dissolved Metals (6010C)												
Iron	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (6020A)												
Manganese	mg/L	60.4	NA	NA	NA	NA	0.278	NA	NA	45.8	NA	NA
Dissolved Metals (6020A)												
Manganese	mg/L	NA	65.2	NA	NA	NA	NA	0.191	NA	NA	40.7	NA
Volatile Fatty Acids (830-MBA)												
Acetic Acid	mg/L	946	NA	NA	NA	NA	NA	NA	NA	776	NA	<1 U
Butyric Acid	mg/L	<100 U	NA	NA	NA	NA	NA	NA	NA	<100 U	NA	<1 U
Lactic Acid	mg/L	97100	NA	NA	NA	NA	NA	NA	NA	89700	NA	<1 U
Propionic Acid	mg/L	<1000 U	NA	NA	NA	NA	NA	NA	NA	<1000 U	NA	<10 U
Pyruvic Acid	mg/L	61.5	NA	NA	NA	NA	NA	NA	NA	61.7	NA	<0.1 U
Anions (9056)												
Chloride	mg/L	398	NA	NA	NA	NA	1120	NA	NA	905	NA	1730
Nitrate	mg/L	<20 U	NA	NA	NA	NA	<4 U	NA	NA	12.3 J	NA	<2 U
	mg/L	<20 U	NA	NA	NA	NA	<4 U	NA	NA	<20 U	NA	<2 U
Suilate	mg/∟	407	INA	INA	INA	INA	1000	NA	INA	703	INA	1170

Sample ID: Sample Date:	Units	03WW01- 101013 10/10/2013	03WW01F- 101013 10/10/2013	35AWW01- 101113 10/11/2013	35AWW02- 102213 10/22/2013	35AWW05- 101613 10/16/2013	35AWW06- 101513 10/15/2013	35AWW06F- 101513 10/15/2013	35AWW07R- 101613 10/16/2013	35AWW08- 101013 10/10/2013	35AWW08F- 101013 10/10/2013	35AWW09- 101013 10/10/2013
Dechlorinating Bacteria												
Dehalococcoides	CEQ/mL	<2.1	NA	NA	NA	NA	NA	NA	NA	3.6	NA	4
tceA Reductase	CEQ/mL	<2.1	NA	NA	NA	NA	NA	NA	NA	2.65	NA	0.3 J
BAV1 Vinyl Chloride Reductase	CEQ/mL	<2.1	NA	NA	NA	NA	NA	NA	NA	<2.2	NA	<0.5
Vinyl Chloride Reductase	CEQ/mL	<2.1	NA	NA	NA	NA	NA	NA	NA	<2.2	NA	<0.5
Dehalobacter spp.	CEQ/mL	15.7 J	NA	NA	NA	NA	NA	NA	NA	1300	NA	<4.7
Dissolved Gases (RSK-175)												
Carbon Dioxide	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethane	ug/L	<2 U	NA	NA	NA	NA	<2 U	NA	NA	<2 U	NA	<2 U
Ethene	ug/L	<2 U	NA	NA	NA	NA	<2 U	NA	NA	<2 U	NA	<2 U
Methane	ug/L	<2 U	NA	NA	NA	NA	<2 UJ	NA	NA	<2 UJ	NA	<2 U
Ferrous Iron (SM3500FE)												
Ferrous Iron	mg/L	35.4 J	NA	NA	NA	NA	<0.04 U	NA	NA	52.4 J	NA	<0.04 U

 $\textit{\textit{Note:}}\xspace$  Samples were not collected for LHSMW04 and

LHSMW05 as they were dry.

°C - degrees celsius

CEQ/ml - cells equivalent per milliliter

J - Estimated value; analyte concentration was less than the limit of quantification

mg/L - milligram per liter

mS/cm - millisiemens per centimeter

mV - millivolt

NA - not analyzed

NTU - Nephelometric turbidity unit

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

Sample ID: Sample Date:	Units	35AWW09F- 101013 10/10/2013	35AWW10- 101013 10/10/2013	35AWW10F- 101013 10/10/2013	35AWW11- 101513 10/15/2013	35AWW11F- 101513 10/15/2013	35AWW12- 101813 10/18/2013	35AWW13- 101113 10/11/2013	35AWW14- 101813 10/18/2013	35AWW15- 101613 10/16/2013	35AWW16- 102213 10/22/2013	35AWW17- 101813 10/18/2013
Water Quality Parameters				•				•				
Temperature	°C	NA	25.41	NA	21.17	NA	20.93	22.45	19.37	21.88	19.32	17.69
pH	pH Units	NA	6.1	NA	6.12	NA	6.05	6.5	6.89	6.39	6.39	6.64
Conductivity	mS/cm	NA	0.322	NA	9.75	NA	2.6	1.66	6.73	14.9	10.7	10.4
Dissolved Oxygen	mg/L	NA	5.36	NA	4.24	NA	1.29	0.96	10.5	0.65	5	1.72
Turbidity	NTU	NA	5.1	NA	25.8	NA	17.3	22.5	6	19	37.1	12.1
Oxidation Reduction Potential	mV	NA	420	NA	125	NA	153	-68	1	-99	58	74
Alkalinity (310.2)												
Alkalinity, Total	mg/L	NA	128	NA	392	NA	NA	NA	NA	NA	NA	NA
Nitrogen (353.2)												
Nitrogen, Nitrate-Nitrite	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus (365.4)												
Phosphorus	mg/L	NA	<0.2 U	NA	0.22 J	NA	NA	NA	NA	NA	NA	NA
Sulfide (376.1)												
Sulfide	mg/L	NA	<1 U	NA	<1 U	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (415.1)												
Total Organic Carbon (TOC)	mg/L	NA	5.42	NA	17	NA	NA	NA	NA	NA	NA	NA
Metals (6010C)												
Iron	mg/L	<0.1 U	0.155 J	NA	NA	1.16	NA	NA	NA	NA	NA	NA
Dissolved Metals (6010C)												
Iron	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (6020A)												
Manganese	mg/L	0.23	0.0811	NA	NA	1.07	NA	NA	NA	NA	NA	NA
Dissolved Metals (6020A)												
Manganese	mg/L	0.234	NA	0.0681	NA	1.01	NA	NA	NA	NA	NA	NA
Volatile Fatty Acids (830-MBA)												
Acetic Acid	mg/L	NA	<1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	mg/L	NA	<1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	mg/L	NA	<1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propionic Acid	mg/L	NA	<10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyruvic Acid	mg/L	NA	<0.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions (9056)												
Chloride	mg/L	NA	16.5	NA	2350	NA	NA	NA	NA	NA	NA	NA
Nitrate	mg/L	NA	0.11 J	NA	<4 UJ	NA	NA	NA	NA	NA	NA	NA
	mg/L	NA	<0.2 U	NA	<4 UJ	NA	NA	NA	NA	NA	NA	NA
Suilale	ing/L	INA	00.Z	INA	1300	INA	INA	INA	INA	INA	INA	INA

Sample ID: Sample Date:	Units	35AWW09F- 101013 10/10/2013	35AWW10- 101013 10/10/2013	35AWW10F- 101013 10/10/2013	35AWW11- 101513 10/15/2013	35AWW11F- 101513 10/15/2013	35AWW12- 101813 10/18/2013	35AWW13- 101113 10/11/2013	35AWW14- 101813 10/18/2013	35AWW15- 101613 10/16/2013	35AWW16- 102213 10/22/2013	35AWW17- 101813 10/18/2013
Dechlorinating Bacteria												
Dehalococcoides	CEQ/mL	NA	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
tceA Reductase	CEQ/mL	NA	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAV1 Vinyl Chloride Reductase	CEQ/mL	NA	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride Reductase	CEQ/mL	NA	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dehalobacter spp.	CEQ/mL	NA	3.4 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Gases (RSK-175)												
Carbon Dioxide	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethane	ug/L	NA	<2 U	NA	<2 U	NA	NA	NA	NA	NA	NA	NA
Ethene	ug/L	NA	<2 U	NA	<2 U	NA	NA	NA	NA	NA	NA	NA
Methane	ug/L	NA	<2 U	NA	<2 UJ	NA	NA	NA	NA	NA	NA	NA
Ferrous Iron (SM3500FE)												
Ferrous Iron	mg/L	NA	<0.04 U	NA	<0.04 U	NA	NA	NA	NA	NA	NA	NA

 $\textit{\textit{Note:}}\xspace$  Samples were not collected for LHSMW04 and

LHSMW05 as they were dry.

°C - degrees celsius

CEQ/ml - cells equivalent per milliliter

J - Estimated value; analyte concentration was less than the limit of quantification

mg/L - milligram per liter

mS/cm - millisiemens per centimeter

mV - millivolt

NA - not analyzed

NTU - Nephelometric turbidity unit

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

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Sample ID: Sample Date:	Units	35AWW18- 101813 10/18/2013	35AWW19- 102213 10/22/2013	35AWW20- 101513 10/15/2013	35AWW21- 101613 10/16/2013	35AWW22- 102213 10/22/2013	LHSMW06- 101713 10/17/2013	LHSMW07- 101513 10/15/2013	LHSMW07F- 101513 10/15/2013
Water Quality Parameters					101102010			10,10,2010	
Temperature	°C	18.7	18.75	26.17	20.7	18.67	20.46	23.04	NA
pH	pH Units	6.67	6.44	6.55	5.72	6.2	6.82	6.48	NA
Conductivity	mS/cm	10.1	6.95	11.4	1.05	9.85	3.65	12.5	NA
Dissolved Oxygen	mg/L	1.4	9.67	1.55	1.44	9.67	10	0.75	NA
Turbidity	NTU	22.9	475	6.7	21.3	25	1	1.8	NA
Oxidation Reduction Potential	mV	104	106	441	213	170	157	79	NA
Alkalinity (310.2)									
Alkalinity, Total	mg/L	NA	NA	786	NA	NA	NA	597	NA
Nitrogen (353.2)									
Nitrogen, Nitrate-Nitrite	mg/L	NA							
Phosphorus (365.4)									
Phosphorus	mg/L	NA	NA	<0.2 U	NA	NA	NA	<0.2 U	NA
Sulfide (376.1)									
Sulfide	mg/L	NA	NA	<1 U	NA	NA	NA	<1 U	NA
Total Organic Carbon (415.1)									
Total Organic Carbon (TOC)	ma/L	NA	NA	13.1	NA	NA	NA	9.22	NA
Metals (6010C)									
Iron	mg/L	NA	NA	0.339	NA	NA	NA	1.55	NA
Dissolved Metals (6010C)			-	-		•			
Iron	mg/L	NA							
Metals (6020A)			-	-	- -	•			
Manganese	mg/L	NA	NA	2.8	NA	NA	NA	0.101	NA
Dissolved Metals (6020A)									
Manganese	mg/L	NA	NA	2.54	NA	NA	NA	NA	0.0961
Volatile Fatty Acids (830-MBA)									
Acetic Acid	ma/L	NA							
Butyric Acid	mg/L	NA							
Lactic Acid	mg/L	NA							
Propionic Acid	mg/L	NA							
Pyruvic Acid	mg/L	NA							
Anions (9056)									
Chloride	mg/L	NA	NA	2360	NA	NA	NA	2670	NA
Nitrate	mg/L	NA	NA	<4 U	NA	NA	NA	<4 UJ	NA
Nitrite	mg/L	NA	NA	<4 U	NA	NA	NA	<4 UJ	NA
Sulfate	mg/L	NA	NA	2290	NA	NA	NA	2630	NA

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Sample ID: Sample Date:	Units	35AWW18- 101813 10/18/2013	35AWW19- 102213 10/22/2013	35AWW20- 101513 10/15/2013	35AWW21- 101613 10/16/2013	35AWW22- 102213 10/22/2013	LHSMW06- 101713 10/17/2013	LHSMW07- 101513 10/15/2013	LHSMW07F- 101513 10/15/2013
Dechlorinating Bacteria									
Dehalococcoides	CEQ/mL	NA	NA	NA	NA	NA	NA	NA	NA
tceA Reductase	CEQ/mL	NA	NA	NA	NA	NA	NA	NA	NA
BAV1 Vinyl Chloride Reductase	CEQ/mL	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride Reductase CEQ/		NA							
Dehalobacter spp.	CEQ/mL	NA	NA	NA	NA NA		NA	NA	NA
Dissolved Gases (RSK-175)									
Carbon Dioxide	ug/L	NA							
Ethane	ug/L	NA	NA	1.19 J	NA	NA	NA	<2 U	NA
Ethene	ug/L	NA	NA	<2 U	NA	NA	NA	<2 U	NA
Methane ug/L		NA	NA	118	NA	NA	NA	204	NA
Ferrous Iron (SM3500FE)									
Ferrous Iron	mg/L	NA	NA	<0.04 U	NA	NA	NA	<0.04 U	NA

*Note:* Samples were not collected for LHSMW04 and

LHSMW05 as they were dry.

°C - degrees celsius

CEQ/ml - cells equivalent per milliliter

J - Estimated value; analyte concentration was less than the limit of quantification

mg/L - milligram per liter

mS/cm - millisiemens per centimeter

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NA - not analyzed

NTU - Nephelometric turbidity unit

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

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# LHAAP-35A (58) Monitoring Well Volatile Organic Compound Data - August 2013

Sample ID:			03WW01-	35AWW08-	35AWW09-	35AWW10-
Sample Date:	Units	MCL	082013 8/20/2013	082013 8/20/2013	082913 8/29/2013	082913 8/29/2013
Volatile Organic Compounds (8260B)		<u> </u>				
1.1.1.2-Tetrachloroethane	ua/L	110	<1 U	<5 U	<0.5 U	<0.5 U
1.1.1-Trichloroethane	ua/L	200	<1 U	<5 U	<0.5 U	<0.5 U
1.1.2.2-Tetrachloroethane	ua/L	14	<0.8 U	<4 U	<0.4 U	<0.4 U
1.1.2-Trichloroethane	ua/L	5	<1 U	<5 U	<0.5 U	<0.5 U
1,1-Dichloroethane	ug/L	10000	1.14 J	<2.5 U	<0.25 U	<0.25 U
1,1-Dichloroethene	ug/L	7	<2 U	<10 U	<1 U	<1 U
1,1-Dichloropropene	ug/L	2.9	<1 U	<5 U	<0.5 U	<0.5 U
1,2,3-Trichlorobenzene	ug/L	310	<0.6 U	<3 U	<0.3 U	<0.3 U
1,2,3-Trichloropropane	ug/L	0.004	<2 U	<10 U	<1 U	<1 U
1,2,4-Trichlorobenzene	ug/L	70	<0.8 U	<4 U	<0.4 U	<0.4 U
1,2,4-Trimethylbenzene	ug/L	5100	<1 U	<5 U	<0.5 U	<0.5 U
1,2-Dibromo-3-Chloropropane	ug/L	0.2	<4 U	<20 U	<2 U	<2 U
1,2-Dibromoethane	ug/L	0.005	<1 U	<5 U	<0.5 U	<0.5 U
1,2-Dichlorobenzene	ug/L	600	<0.5 U	<2.5 U	<0.25 U	<0.25 U
1,2-Dichloroethane	ug/L	5	<1 U	<5 U	<0.5 U	<0.5 U
1,2-Dichloropropane	ug/L	5	<0.8 U	<4 U	<0.4 U	<0.4 U
1,3,5-Trimethylbenzene	ug/L	5100	<1 U	<5 U	<0.5 U	<0.5 U
1,3-Dichlorobenzene	ug/L	3100	<1 U	<5 U	<0.5 U	<0.5 U
1,3-Dichloropropane	ug/L	29	<0.8 U	<4 U	<0.4 U	<0.4 U
1,4-Dichlorobenzene	ug/L	75	<0.5 U	<2.5 U	<0.25 U	<0.25 U
2,2-Dichloropropane	ug/L	42	<1 U	<5 U	<0.5 U	<0.5 U
2-Butanone	ug/L	61000	<10 U	<50 U	<5 U	<5 U
2-Chlorotoluene	ug/L	2000	<0.5 U	<2.5 U	<0.25 U	<0.25 U
2-Hexanone	ug/L	6100	<10 U	<50 U	<5 U	<5 U
4-Chlorotoluene	ug/L	2000	<1 U	<5 U	<0.5 U	<0.5 U
4-Methyl-2-Pentanone	ug/L	8200	<10 U	<50 U	<5 U	<5 U
Acetone	ug/L	92000	<10 UJ	<50 U	<5 UJ	<5 UJ
Bromohonzono	ug/L	C 2000	<0.5 U	<2.5 U	<0.25 U	<0.25 U
Bromoshlaromethana	ug/L	2000	<0.5 U	<2.5 U	<0.25 U	<0.25 U
Bromodichloromethane		4100		<4 0	<0.4 0	<0.4 0
Bromoform		36	<10			
Bromomethane		1/10	<2 U			
Carbon Disulfide		10000	<2		<1 03	
Carbon Tetrachloride	ug/L	5	<1 U	<5 U	<0.5.U	<0.5.U
Chlorobenzene	ua/L	100	<0.5 U	<2.5 U	<0.25 U	<0.25 U
Chloroethane	ua/L	41000	<2 U	<10 U	<1 U	<1 UJ
Chloroform	ug/L	1000	<0.5 U	<2.5 U	<0.25 U	<0.25 U
Chloromethane	ug/L	220	<2 UJ	<10 UJ	<1 UJ	<1 U
cis-1,2-Dichloroethene	ug/L	70	0.978 J	9.35 J	<0.5 U	<0.5 U
cis-1,3-Dichloropropene	ug/L	5.3	<1 U	<5 U	<0.5 U	<0.5 U
Dibromochloromethane	ug/L	34	<1 U	<5 U	<0.5 U	<0.5 U
Dibromomethane	ug/L	380	<1 U	<5 U	<0.5 U	<0.5 U
Dichlorodifluoromethane	ug/L	20000	<1 U	<5 UJ	<0.5 U	<0.5 U
Ethylbenzene	ug/L	700	<1 U	<5 U	<0.5 U	<0.5 U
Hexachlorobutadiene	ug/L	20	<1 U	<5 U	<0.5 U	<0.5 U
Isopropylbenzene	ug/L	1000	<1 U	<5 U	<0.5 U	<0.5 U
m,p-Xylene	ug/L	10000	<2 U	<10 U	<1 U	<1 U
Methylene Chloride	ug/L	5	<1 U	<5 U	<0.5 U	<0.5 U
Naphthalene	ug/L	2000	<0.8 U	<4 U	<0.4 U	<0.4 U
n-Butylbenzene	ug/L	4100	<1 U	<5 U	<0.5 U	<0.5 U
n-Propylbenzene	ug/L	4100	<0.5 U	<2.5 U	<0.25 U	<0.25 U
o-Xylene	ug/L	10000	<1 U	<5 U	<0.5 U	<0.5 U
p-isopropyitoluene	ug/L	10000	<1 U	<5 U	<0.5 U	<0.5 U
Sec-Butyidenzene	ug/L	4100	<1 U	<5 U	<0.5 U	<0.5 U
Styrene	ug/L	100	<0.5 U	<2.5 U	<0.25 U	<0.25 U

### LHAAP-35A (58) Monitoring Well Volatile Organic Compound Data - August 2013

Sample ID: Sample Date:	Units	MCL	03WW01- 082013 8/20/2013	35AWW08- 082013 8/20/2013	35AWW09- 082913 8/29/2013	35AWW10- 082913 8/29/2013
tert-Butylbenzene	ug/L	4100	<1 U	<5 U	<0.5 U	<0.5 U
Tetrachloroethene	ug/L	5	368	1640	21.9	<0.5 U
Toluene	ug/L	1000	<1 U	<5 U	<0.5 U	<0.5 U
trans-1,2-Dichloroethene	ug/L	100	<1 U	<5 U	<0.5 U	<0.5 U
trans-1,3-Dichloropropene	ug/L	29	<2 U	<10 U	<1 U	<1 U
Trichloroethene	ug/L	5	94.8	544	11.9	<0.5 U
Trichlorofluoromethane	ug/L	31000	<1 UJ	<5 U	<0.5 U	<0.5 U
Vinyl Chloride	ug/L	2	<1 U	<5 U	<0.5 U	<0.5 U

Blue Highlighting Indicates Analyte Detected Above Regulatory Limit

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - maximum contaminant level

NA - not analyzed

 ${\sf U}$  - Analyte was not detected. The concentration is below the reported limit of detection.

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

# LHAAP-35A (58) Monitoring Well Volatile Organic Compound Data - October 2013

Sample ID:			03WW01-	35ASW03-	35AWW01-	35AWW02-	35AWW05-	35AWW06-	35AWW07R-	35AWW08-	35AWW09-	35AWW10-	35AWW11-
Sample Date:	Units	MCL	101013 10/10/2013	101713 10/17/2013	101113 10/11/2013	102213 10/22/2013	101613	101513 10/15/2013	101613	101013 10/10/2013	101013	101013 10/10/2013	101513 10/15/2013
Volatile Organic Compounds (8260B)	L			l	l			l					
1,1,1,2-Tetrachloroethane	ug/L	110	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
1,1,1-Trichloroethane	ug/L	200	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
1,1,2,2-Tetrachloroethane	ug/L	14	<2 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<4 U	<0.4 UJ	<0.4 U	<0.4 U
1,1,2-Trichloroethane	ug/L	5	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
1,1-Dichloroethane	ug/L	10000	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	2.27	<0.25 U	<2.5 U	<0.25 UJ	<0.25 U	<0.25 U
1,1-Dichloroethene	ug/L	7	<5 U	<1 U	<1 U	<1 U	<1 U	15.8	<1 U	<10 U	<1 UJ	<1 U	7.7
1,1-Dichloropropene	ug/L	2.9	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
1,2,3-Trichlorobenzene	ug/L	310	<1.5 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<3 U	<0.3 UJ	<0.3 U	<0.3 U
1,2,3-Trichloropropane	ug/L	0.004	<5 U	<1 U	<1 U	<1 U	<1 UJ	<1 U	<1 UJ	<10 U	<1 UJ	<1 U	<1 UJ
1,2,4-Trichlorobenzene	ug/L	70	<2 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<4 U	<0.4 UJ	<0.4 U	<0.4 U
1,2,4-Trimethylbenzene	ug/L	5100	1.39 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
1,2-Dibromo-3-Chloropropane	ug/L	0.2	<10 U	<2 UJ	<2 U	<2 U	<2 UJ	<2 U	<2 UJ	<20 U	<2 UJ	<2 U	<2 U
1,2-Dibromoethane	ug/L	0.005	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
1,2-Dichlorobenzene	ug/L	600	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<2.5 U	<0.25 UJ	<0.25 U	<0.25 U
1,2-Dichloroethane	ug/L	5	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
1,2-Dichloropropane	ug/L	5	<2 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<4 U	<0.4 UJ	<0.4 U	<0.4 U
1,3,5-Trimethylbenzene	ug/L	5100	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
1,3-Dichlorobenzene	ug/L	3100	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
1,3-Dichloropropane	ug/L	29	<2 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<4 U	<0.4 UJ	<0.4 U	<0.4 U
1,4-Dichlorobenzene	ug/L	75	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<2.5 U	<0.25 UJ	<0.25 U	<0.25 U
2,2-Dichloropropane	ug/L	42	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
2-Butanone	ug/L	61000	1250 J	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1440 J	<5 UJ	<5 U	<5 UJ
2-Chlorotoluene	ug/L	2000	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<2.5 U	<0.25 UJ	<0.25 U	<0.25 U
2-Hexanone	ug/L	6100	<25 U	<5 U	<5 U	<5 UJ	<5 U	<5 U	<5 U	<50 U	<5 UJ	<5 U	<5 U
4-Chlorotoluene	ug/L	2000	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
4-Methyl-2-Pentanone	ug/L	8200	12.7 J	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<50 U	<5 UJ	<5 U	<5 U
Acetone	ug/L	92000	1910 J	3.86 J	<5 U	<5 U	<5 UJ	<5 U	<5 UJ	2570 J	<5 UJ	<5 U	<5 UJ
Benzene	ug/L	5	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<2.5 U	<0.25 UJ	<0.25 U	<0.25 U
Bromobenzene	ug/L	2000	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<2.5 U	<0.25 UJ	<0.25 U	<0.25 U
Bromochloromethane	ug/L	4100	<2 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<4 U	<0.4 UJ	<0.4 U	<0.4 U
Bromodichloromethane	ug/L	4.6	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Bromoform	ug/L	36	<5 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<10 U	<1 UJ	<1 U	<1 U
Bromomethane	ug/L	140	<5 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<10 U	<1 UJ	<1 U	<1 U
Carbon Disulfide	ug/L	10000	<5 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<10 U	<1 UJ	<1 U	<1 U
Carbon Tetrachloride	ug/L	5	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Chlorobenzene	ug/L	100	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<2.5 U	<0.25 UJ	<0.25 U	<0.25 U
Chloroethane	ug/L	41000	<5 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<10 U	<1 UJ	<1 U	<1 U
Chloroform	ug/L	1000	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<2.5 U	<0.25 UJ	<0.25 U	<0.25 U
Chloromethane	ug/L	220	<5 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<10 U	<1 UJ	<1 U	<1 U
cis-1,2-Dichloroethene	ug/L	70	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.709 J	<5 U	<0.5 UJ	<0.5 U	<0.5 U
cis-1,3-Dichloropropene	ug/L	5.3	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Dibromochloromethane	ug/L	34	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Dibromomethane	ug/L	380	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Dichlorodifluoromethane	ug/L	20000	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Lthylbenzene	ug/L	700	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Hexachlorobutadiene	ug/L	20	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Isopropylbenzene	ug/L	1000	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
m,p-Xylene	ug/L	10000	<5 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<10 U	<1 UJ	<1 U	<1 U
Methylene Chloride	ug/L	5	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Naphthalene	ug/L	2000	<2 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<4 U	<0.4 UJ	<0.4 U	<0.4 U

### LHAAP-35A (58) Monitoring Well Volatile Organic Compound Data - October 2013

Sample ID:	Units	MCL	03WW01- 101013 10/10/2013	35ASW03- 101713 10/17/2013	35AWW01- 101113 10/11/2013	35AWW02- 102213	35AWW05- 101613 10/16/2013	35AWW06- 101513 10/15/2013	35AWW07R- 101613 10/16/2013	35AWW08- 101013	35AWW09- 101013 10/10/2013	35AWW10- 101013 10/10/2013	35AWW11- 101513 10/15/2013
Sample Date.			10/10/2013	10/17/2013	10/11/2013	10/22/2013	10/10/2013	10/15/2015	10/10/2013	10/10/2013	10/10/2013	10/10/2013	10/15/2015
Volatile Organic Compounds (8260B)													
n-Butylbenzene	ug/L	4100	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
n-Propylbenzene	ug/L	4100	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<2.5 U	<0.25 UJ	<0.25 U	<0.25 U
o-Xylene	ug/L	10000	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
p-Isopropyltoluene	ug/L	10000	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
sec-Butylbenzene	ug/L	4100	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Styrene	ug/L	100	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<2.5 U	<0.25 UJ	<0.25 U	<0.25 U
tert-Butylbenzene	ug/L	4100	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Tetrachloroethene	ug/L	5	172 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.586 J	603 J	57.6 J	<0.5 U	<0.5 U
Toluene	ug/L	1000	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
trans-1,2-Dichloroethene	ug/L	100	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
trans-1,3-Dichloropropene	ug/L	29	<5 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<10 U	<1 UJ	<1 U	<1 U
Trichloroethene	ug/L	5	42.1 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	1.03	149 J	8.97 J	<0.5 U	<0.5 U
Trichlorofluoromethane	ug/L	31000	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	<0.5 U
Vinyl Chloride	ug/L	2	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U	<0.5 UJ	<0.5 U	0.442 J

*Note:* Samples were not collected for LHSMW04 and LHSMW05 as they were dry. 35ASW03-101713 is a surface water sample.

Blue Highlighting Indicates Analyte Detected Above Regulatory Limit

FD - field duplicate

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - maximum contaminant level

NA - not analyzed

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

# LHAAP-35A (58) Monitoring Well Volatile Organic Compound Data - October 2013

Sample ID:	Units	MCL	35AWW12- 101813	35AWW12FD- 101813	35AWW13- 101113	35AWW13FD- 101113	35AWW14- 101813	35AWW15- 101613	35AWW15FD- 101613	35AWW16- 102213	35AWW17- 101813	35AWW18- 101813	35AWW19- 102213
Sample Date:			10/18/2013	10/18/2013	10/11/2013	10/11/2013	10/18/2013	10/16/2013	10/16/2013	10/22/2013	10/18/2013	10/18/2013	10/22/2013
Volatile Organic Compounds (8260B)													
1,1,1,2-Tetrachloroethane	ug/L	110	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,1,1-Trichloroethane	ug/L	200	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,1,2,2-Tetrachloroethane	ug/L	14	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1,1,2-Trichloroethane	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,1-Dichloroethane	ug/L	10000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	3.18	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	1.71
1,1-Dichloroethene	ug/L	7	<1 U	<1 U	<1 U	<1 U	1.63 J	<1 U	<1 U	<1 U	<1 U	<1 U	6.45
1,1-Dichloropropene	ug/L	2.9	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,2,3-Trichlorobenzene	ug/L	310	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U
1,2,3-Trichloropropane	ug/L	0.004	<1 U	<1 U	<1 U	<1 U	<1 U	<1 UJ	<1 UJ	<1 U	<1 U	<1 U	<1 U
1,2,4-Trichlorobenzene	ug/L	70	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1,2,4-Trimethylbenzene	ug/L	5100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,2-Dibromo-3-Chloropropane	ug/L	0.2	<2 U	<2 U	<2 U	<2 U	<2 U	<2 UJ	<2 UJ	<2 U	<2 U	<2 U	<2 U
1,2-Dibromoethane	ug/L	0.005	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,2-Dichlorobenzene	ug/L	600	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
1,2-Dichloroethane	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	1.83
1,2-Dichloropropane	ug/L	5	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1,3,5-1 rimethylbenzene	ug/L	5100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,3-Dichlorobenzene	ug/L	3100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,3-Dichloropropane	ug/L	29	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1,4-Dichlorobenzene	ug/L	/5	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
2,2-Dichloropropane	ug/L	42	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
2-Butanone	ug/L	61000	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
2-Chiorotoluene	ug/L	2000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
2-Hexanone	ug/L	6100	<5 UJ	<5 UJ	<5 U	<5 U	<5 UJ	<5 U	<5 U	<5 UJ	<5 UJ	<5 UJ	<5 UJ
4-Chlorotoluene	ug/L	2000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
	ug/L	8200	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
Acetone	ug/L	92000	<5 U	<5 U	<5 U	<5 U	<5 U	<5 UJ	<5 UJ	<5 U	<5 U	<5 U	<5 U
Benzene	ug/L	C 0000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
Diomobelizerie Promochloromothono	ug/L	2000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
Bromodiableromethane	ug/∟	4100	<0.4 U	<0.4 U	<0.4 U	<0.4 0	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
Bromoform	ug/L	4.0	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 0	<0.5 0			<0.5 U
Bromomethane	ug/L	140		<1 U	<1 U		<1 U						
Carbon Disulfide	ug/L	10000	~1	~1	~111	~1	~1	~1	~111	~1	~1	~1	~111
Carbon Tetrachloride	ug/L	5	<0.5.11		<u></u>	<0.5.11	<u></u>	<0.5.11	<0.5.11		<0.5.11	<0.5.11	
Chlorobenzene	ug/L	100	<0.25 []	<0.25 []	<0.25.11	<0.25 []	<0.25 []	<0.25 []	<0.25 []	<0.25 []	<0.25 []	<0.25 U	<0.25.11
Chloroethane	ug/L	41000	< <u>.</u> .200	< <u></u>	< <u>-</u>	< <u></u>	<pre>&lt;0.20 0</pre>	< <u>&lt;</u> 111	< <u>-</u>	<pre>&lt;0.20 0</pre>	< <u></u>	<pre>&lt;0.20 0 </pre>	< <u>.</u> 200
Chloroform	ua/l	1000	<0.25.11	<0.25.11	<0.25.11	<0.25.11	<0.25.11	<0.25.11	<0.25.11	<0.25.11	<0.25.11	<0.25.11	<0.25.11
Chloromethane		220	<1 U	<u> &lt;1 U</u>	<u>&lt;1 U</u>	<u>&lt;1 U</u>	<1 U	<1U	<1U	<1 U	<1 U	<1 U	<u>&lt;1 U</u>
cis-1.2-Dichloroethene	ug/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	2.04	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
cis-1.3-Dichloropropene	ua/L	5.3	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Dibromochloromethane	ua/L	34	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Dibromomethane	ug/L	380	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Dichlorodifluoromethane	ug/L	20000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Ethylbenzene	ug/L	700	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Hexachlorobutadiene	ug/L	20	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Isopropylbenzene	ug/L	1000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
m,p-Xylene	ug/L	10000	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
Methylene Chloride	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Naphthalene	ug/L	2000	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
## LHAAP-35A (58) Monitoring Well Volatile Organic Compound Data - October 2013

Sample ID: Sample Date:	Units	MCL	35AWW12- 101813 10/18/2013	35AWW12FD- 101813 10/18/2013	35AWW13- 101113 10/11/2013	35AWW13FD- 101113 10/11/2013	35AWW14- 101813 10/18/2013	35AWW15- 101613 10/16/2013	35AWW15FD- 101613 10/16/2013	35AWW16- 102213 10/22/2013	35AWW17- 101813 10/18/2013	35AWW18- 101813 10/18/2013	35AWW19- 102213 10/22/2013
Volatile Organic Compounds (8260B)													
n-Butylbenzene	ug/L	4100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
n-Propylbenzene	ug/L	4100	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
o-Xylene	ug/L	10000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
p-Isopropyltoluene	ug/L	10000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
sec-Butylbenzene	ug/L	4100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Styrene	ug/L	100	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
tert-Butylbenzene	ug/L	4100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Tetrachloroethene	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Toluene	ug/L	1000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
trans-1,2-Dichloroethene	ug/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
trans-1,3-Dichloropropene	ug/L	29	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
Trichloroethene	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.663 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.379 J
Trichlorofluoromethane	ug/L	31000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Vinyl Chloride	ug/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.272 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

*Note:* Samples were not collected for LHSMW04 and LHSMW05 as they were dry. 35ASW03-101713 is a surface water sample.

Blue Highlighting Indicates Analyte Detected Above Regulatory Limit

FD - field duplicate

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - maximum contaminant level

NA - not analyzed

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

## LHAAP-35A (58) Monitoring Well Volatile Organic Compound Data - October 2013

Sample ID:			35AWW20-	35AWW21-	35AWW22-	LHSMW06-	LHSMW07-
	Units	MCL	101513	101613	102213	101713	101513
Sample Date:			10/15/2013	10/16/2013	10/22/2013	10/17/2013	10/15/2013
Volotilo Organia Compounda (8260P)							
1,1,1,2-l etrachloroethane	ug/L	110	<0.5 U				
1,1,1-Trichloroethane	ug/L	200	<0.5 U				
1,1,2,2-I etrachloroethane	ug/L	14	<0.4 U	<0.4 U	<0.4 U	<0.4 UJ	<0.4 U
1,1,2-Irichloroethane	ug/L	5	52.4	<0.5 U	<0.5 U	<0.5 U	0.922 J
1,1-Dichloroethane	ug/L	10000	327	<0.25 U	<0.25 U	2	45.8
1,1-Dichloroethene	ug/L	/	3230	<1 U	<1 U	1.23 J	396
1,1-Dichloropropene	ug/L	2.9	<0.5 U				
1,2,3-1 richlorobenzene	ug/L	310	<0.3 U				
1,2,3-1 richloropropane	ug/L	0.004	<1 U	<1 U	<1 U	<1 UJ	<1 U
1,2,4-1richlorobenzene	ug/L	70	<0.4 U				
1,2,4-1 rimethylbenzene	ug/L	5100	<0.5 U				
1,2-Dibromo-3-Chioropropane	ug/L	0.2	<2 U	<2 UJ	<2 U	<2 UJ	<2 U
1,2-Dibromoethane	ug/L	0.005	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,2-Dichlorobenzene	ug/L	600	3.23	<0.25 U	<0.25 U	<0.25 U	<0.25 U
1,2-Dichloroethane	ug/L	5	20.3	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,2-Dichloropropane	ug/L	5	<0.4 U				
1,3,5-1 rimethylbenzene	ug/L	5100	<0.5 U				
1,3-Dichlorobenzene	ug/L	3100	<0.5 U				
1,3-Dichloropropane	ug/L	29	<0.4 U				
1,4-Dichlorobenzene	ug/L	75	0.637 J	<0.25 U	<0.25 U	<0.25 U	<0.25 U
2,2-Dichloropropane	ug/L	42	<0.5 U				
2-Butanone	ug/L	61000	<5 U	<5 U	<5 U	<5 UJ	<5 U
2-Chlorotoluene	ug/L	2000	<0.25 U				
2-Hexanone	ug/L	6100	<5 U	<5 U	<5 UJ	<5 UJ	<5 U
4-Chlorotoluene	ug/L	2000	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U
4-Methyl-2-Pentanone	ug/L	8200	<5 U	<5 U	<5 U	<5 UJ	<5 U
Acetone	ug/L	92000	<5 U	<5 U	<5 U	<5 UJ	<5 U
Benzene	ug/L	5	4.91	<0.25 U	<0.25 U	<0.25 U	0.303 J
Bromobenzene	ug/L	2000	<0.25 U				
Bromochloromethane	ug/L	4100	<0.4 U				
Bromodichloromethane	ug/L	4.6	<0.5 U				
Bromotorm	ug/L	36	<1 U				
Bromometnane	ug/L	140	<1 U	<1 U	<1 U	<1 UJ	<1 U
Carbon Disulfide	ug/L	10000	<10	<1 U	<1 U	<1 U	<1 U
Carbon Tetrachioride	ug/L	5	<0.5 U				
Chlorobenzene	ug/L	100	<0.25 U				
Chioroethane	ug/L	41000	<1 U	<1 U	<1 U	<1 U	<1 U
Chloroform Chlorosetheres	ug/L	1000	0.762 J	<0.25 0	<0.25 U	<0.25 U	<0.25 U
	ug/L	220	<1 U	0.518 J	<10	<1 U	<1 U
cis-1,2-Dichloroethene	ug/L	70	110	<0.5 U	<0.5 U	4.01	6.1
cis-1,3-Dichloropropene	ug/L	5.3	<0.5 U				
	ug/L	34	<0.5 U				
	ug/L	380	<0.5 U				
	ug/L	20000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
	ug/L	/00	<0.5 U				
	ug/L	20	<0.5 U				
isopropyidenzene	ug/L	1000	<0.5 U				
m,p-луiene Mothylopo Chlorida	ug/L	10000	<1 U	<1 U	<1 U	<1 U	<1 U
	ug/L	5	<0.5 U				
INaphthalene	ug/L	2000	<0.4 U				

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## LHAAP-35A (58) Monitoring Well Volatile Organic Compound Data - October 2013

Sample ID: Sample Date:	Units	MCL	35AWW20- 101513 10/15/2013	35AWW21- 101613 10/16/2013	35AWW22- 102213 10/22/2013	LHSMW06- 101713 10/17/2013	LHSMW07- 101513 10/15/2013
Volatile Organic Compounds (8260B)							
n-Butylbenzene	ug/L	4100	<0.5 U				
n-Propylbenzene	ug/L	4100	<0.25 U				
o-Xylene	ug/L	10000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
p-Isopropyltoluene	ug/L	10000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
sec-Butylbenzene	ug/L	4100	<0.5 U				
Styrene	ug/L	100	<0.25 U				
tert-Butylbenzene	ug/L	4100	<0.5 U				
Tetrachloroethene	ug/L	5	1.65	<0.5 U	<0.5 U	0.663 J	<0.5 U
Toluene	ug/L	1000	0.447 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U
trans-1,2-Dichloroethene	ug/L	100	3.77	<0.5 U	<0.5 U	<0.5 U	0.282 J
trans-1,3-Dichloropropene	ug/L	29	<1 U				
Trichloroethene	ug/L	5	513	<0.5 U	<0.5 U	1.87	23.9
Trichlorofluoromethane	ug/L	31000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Vinyl Chloride	ug/L	2	105	<0.5 U	<0.5 U	0.627 J	15.9

*Note:* Samples were not collected for LHSMW04 and LHSMW05 as they were dry. 35ASW03-101713 is a surface water sample.

Blue Highlighting Indicates Analyte Detected Above Regulatory Limit

FD - field duplicate

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - maximum contaminant level

NA - not analyzed

U - Analyte was not detected. The concentration is below the reported limit of detection.

µg/L - microgram per liter

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

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Laboratory data packages will be included in a separate file.

APPENDIX G: PCE and TCE Concentration Trends in Eastern Plume Shallow Zone Groundwater (EISB Treatment Area)







