LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

Volume 1

2014

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Department of the Army
Longhorn Army Ammunition Plant

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LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX

VOLUME 1

2014

A.	Title:	Report - Final Decision Document for LHAAP-19, LHAAP-56, LHAAP-65 and LHAAP-69 Sites, Longhorn Army Ammunition Plant, Karnack, TX
	Author(s):	U.S. Army Corps of Engineers
	Recipient:	All Stakeholders
	Date:	January 1, 2014
	Bate Stamp:	00189776 - 00189806
B.	Title:	Report - Final (Revised) Environmental Condition of Property VI, Longhorn Army Ammunition Plant, Karnack, TX
	Author(s):	U.S. Army Corps of Engineers
	Recipient:	United States Fish and Wildlife Service
	Date:	January 1, 2014
	Bate Stamp:	00189807 - 00190040
C.	Title:	Meeting Minutes – Longhorn Army Ammunition Plant Monthly Managers' Meeting Minutes
	Author(s):	AECOM Technical Services
	Recipient:	All Stakeholders
	Date:	January 9, 2014
	Bate Stamp:	00190041 - 00190045
D.	Title:	Report - Final Explanation of Significant Differences, Record of Decision for Early Interim Remedial Action at Burning Ground No. 3, Longhorn Army Ammunition Plant, Karnack, TX
	Author(s):	AECOM Technical Services
	Recipient:	U.S. Army Corps of Engineers
	Date:	February 3, 2014
	Bate Stamp:	00190046 - 00190065
E.	Title:	Meeting Minutes – Longhorn Army Ammunition Plant Restoration Advisory Board (RAB) Meeting Minutes
	Author(s):	AECOM Technical Services
	Recipient:	All Stakeholders
	Date:	February 20, 2014
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F.	Title:	Meeting Minutes – Longhorn Army Ammunition Plant Monthly Managers' Meeting Minutes
	Author(s):	AECOM Technical Services
	Recipient:	All Stakeholders
	Date:	February 20, 2014
	Bate Stamp:	00190126 - 00190154
G.	Title:	Meeting Minutes – Longhorn Army Ammunition Plant Monthly Managers' Meeting Minutes
	Author(s):	AECOM Technical Services
	Recipient:	All Stakeholders
	Date:	March 25, 2014
	Bate Stamp:	00190155 - 00190175
H.	Title:	Memorandum for File - Surface Water Data Transmittal March 2008 - February 2014, Perimeter Well Data Transmittal September 2008 - June 2013, Longhorn Army Ammunition Plant, Karnack, TX
	Author(s):	AECOM Technical Services
	Recipient:	All Stakeholders
	Date:	April 2, 2014
	Bate Stamp:	00190176 - 00190188

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

June 11, 2014

DAIM-ODB-LO

Ms. April Palmie (MC-136)
SSDAT/Superfund Section
Remediation Division
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Decision Document for LHAAP-19, LHAAP-56, LHAAP-65, and LHAAP-69 Sites, Longhorn Army Ammunition Plant, Karnack, Texas, January 2014

Dear Ms. Palmie,

Thank you for your April 23, 2014 letter of concurrence with the above-referenced document. A hard copy of the final document is enclosed for your record.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.zeiler@us.army.mil.

Sincerely,

Rose M. Zeiler

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
R. Mayer, USEPA Region 6, Dallas, TX
P. Bruckwicki, Caddo Lake NWR, TX
A. Williams, USACE, Tulsa District, OK
R. Paul, USAEC, San Antonio, TX
D. Wacker, AECOM, San Antonio, TX (for project files)

FINAL

DECISION DOCUMENT FOR LHAAP-19, LHAAP-56, LHAAP-65 AND LHAAP-69 SITES LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

Prepared by
U.S. Army Corps of Engineers
Tulsa District
1645 South 101st East Avenue
Tulsa, Oklahoma

January 2014

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Acronyms and Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CES	Complete Environmental Service
DNT	Dinitrotoluene
DRMS	Defense Reutilization and Marketing Service
FFA	Federal Facility Agreement
Jacobs	Jacobs Engineering Group, Inc.
LHAAP	Longhorn Army Ammunition Plant
MSC	medium-specific concentration
NPL	National Priorities List
PA	Preliminary Assessment
PCB	polychlorinated biphenyls
POL	Petroleum/Oil/Lubricants
RCRA	Resource Conservation and Recovery Act
SPLP	Synthetic Precipitation Leaching Procedure
SvE	Sverdrup
SVOC	Semi-volatile organic compound
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TNRCC	Texas Natural Resource Conservation Commission
TNT	Trinitrotoluene
TPH	total petroleum hydrocarbons
TRRR	Texas Risk Reduction Rules
TWC	Texas Water Commission
USEPA	U. S. Environmental Protection Agency
USFWS	U. S. Fish and Wildlife Service
UST	underground storage tanks
VOC	volatile organic compound

DECISION DOCUMENT FOR LHAAP-19, LHAAP-56, LHAAP-65 AND LHAAP-69 SITES

LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

1.0 Declaration

1.1 Statement of Basis and Purpose

This document presents the basis for the decision that no further action is necessary for LHAAP-19, LHAAP-56, LHAAP-65, and LHAAP-69 sites at the Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas. The decision was made by LHAAP and the Texas Commission on Environmental Quality (TCEQ) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act, the National Contingency Plan, Resource Conservation and Recovery Act, and AR 200-1, as applicable. Although there are several Superfund National Priorities List (NPL)-listed environmental sites at LHAAP, LHAAP-19, LHAAP-56, LHAAP-65, and LHAAP-69 are not among them. These sites are being addressed under CERCLA as non-NPL environmental sites.

1.2 Description of Selected Remedy

No CERCLA remedial action is necessary for LHAAP-19, LHAAP-56, LHAAP-65, and LHAAP-69. Site investigations were conducted through which it was determined by LHAAP and TCEQ that no significant release had occurred at these sites. It is agreed that no action is necessary because these sites do not present unacceptable risks for the reasonably anticipated future use as part of the Caddo Lake National Wildlife Refuge which is considered a non-residential use scenario. The risk evaluations do not address unrestricted use.

No CERCLA remedial action is necessary for LHAAP-19, a Type IV (C&D) landfill, which was closed in 2010 (ECC, 2010) in accordance with 30 Texas Administrative Code (TAC) §335.566 and more specifically the requirements of 30 TAC §330.463(a). The final closure and assessment report for LHAAP-19 and its supporting documentation demonstrate that, for this site, the threat to human health or the environment is at or below those required for Texas Risk Reduction Rules (TRRR) Standard Number 2. However, due to the fact that Non-hazardous Class 2 waste was left in place, TRRR Standard 3 applies. The post closure care requirements and residential use restrictions are set forth in the industrial solid waste certification of remediation recorded in Harrison County, Texas on the 14th of November 2013 (Appendix A). They include periodic inspections of the landfill cap, cap maintenance, restrictions against intrusive activities, and a restriction against residential use. Residential use includes, but is not limited to, single family or multifamily residences, child care facilities, nursing homes or assisted living facilities, and any type of educational purpose for children/young adults in grades kindergarten through 12. These requirements and restrictions are more fully described in Section 2.6.1.

No CERCLA remedial action is necessary for LHAAP-56, LHAAP-65 and LHAAP-69. The risk evaluations for LHAAP 56, LHAAP-65 and LHAAP-69 were based on the reasonably anticipated future use as part of the Caddo Lake National Wildlife Refuge and did not address unrestricted use. In accordance with 30 Texas Administrative Code (TAC) §335.566, a notification will be recorded in Harrison County stating that the land is suitable for nonresidential use. Because the LHAAP-56, LHAAP-65, and LHAAP-69 sites are entirely

contained within the LHAAP-35A(58) land use control boundary (**Figure 3**) this requirement is being met under LHAAP-35A(58) as is stated in the final Remedial Action Work Plan for LHAAP-35A(58) (AECOM, 2013).

Because LHAAP-19 is a C&D landfill with post closure requirements and because LHAAP-56, LHAAP-65 and LHAAP-69 were not evaluated for unlimited use and unrestricted exposure, five-year reviews will be conducted to ensure protection of human health and the environment. All monitoring and reporting requirements associated with LHAAP-56, LHAAP-65, and LHAAP-69 will be met under LHAAP-35A(58). Although the Army may later pass these procedural responsibilities to the designated transferee, U.S. Fish and Wildlife Service (USFWS), in conjunction with or after the property transfer, the Army shall retain ultimate responsibility for future environmental response actions.

1.3 Statutory Determinations

None of the CERCLA §121 statutory determinations are applicable in this action since no remedies are being selected. No remedial actions are necessary to ensure protection of human health and the environment. Chemicals detected in samples from these sites are considered to be of no further concern for the property's foreseeable use. Therefore, these sites meet the requirements for no further action under USEPA guidance and 30 TAC §335.

1.4 Approval and Signature

No further investigations or actions are necessary for LHAAP-19, LHAAP-56, LHAAP-65, and LHAAP-69. There is no cost associated with this decision beyond the cost for post closure care in the form of inspections of the landfill cap and any maintenance required to maintain the cap integrity for a period of 5 years and for limited monitoring in the form of Letters of Certification every five years certifying proper land use for LHAAP-19. There is no cost associated with this decision beyond that for certification of proper land use every five years for LHAAP-56, LHAAP-65, and LHAAP-69 which will be met under LHAAP-35A(58). The undersigned is the appropriate approval authority for this decision.

APPROVED BY:

Thomas E. Lederle
Chief
BRAC Division, ACSIM
United States Army

2.0 Decision Summary

2.1 Site Name, Location, and Description

LHAAP-19, LHAAP-56, LHAAP-65, and LHAAP-69 are located within LHAAP, a former Army installation that occupied 8,416 acres between State Highway 43 in Karnack, Texas, and the southwestern shore of Caddo Lake. The nearest city is Marshall, Texas, approximately 14 miles to the southwest (**Figure 1**). Locations of the four sites evaluated are shown on **Figure 2**.

LHAAP operated until 1997 when it was placed on inactive status and classified by the U.S. Army Armament, Munitions, and Chemical Command as excess property. In 2003 LHAAP was placed under the administrative control of the Base Realignment and Closure Commission (BRAC) Division as a Non-BRAC Excess property. Environmental activities at LHAAP are conducted in accordance with the CERCLA and funded through the Defense Environmental Restoration Program. Army BRAC is the responsible party for environmental restoration.

LHAAP was placed on the NPL on August 9, 1990, and several environmental sites were listed. Activities to remediate the contamination began in 1990. After LHAAP's listing on the NPL, the U.S. Army, the USEPA, and the Texas Water Commission, currently known as TCEQ, entered into a CERCLA Section 120 Federal Facility Agreement (FFA) for remedial activities at the installation. The FFA became effective December 30, 1991.

Although several environmental sites at LHAAP are NPL-listed, LHAAP-19, LHAAP-56, LHAAP-65, and LHAAP-69 are non-NPL sites. Army is the lead agency for all environmental restoration activities. For non-NPL listed sites such as these, the State of Texas is the lead regulatory agency.

2.2 Site History

LHAAP was established in December 1941 with the primary mission of manufacturing trinitrotoluene (TNT). TNT manufacture (Plant 1) activities ended after World War II. In 1952, the facility began production of pyrotechnic ammunition, such as photoflash bombs, simulators, hand signals, and tracers for 40 mm ammunition at Plant 2 that continued through 1956. In December 1954, a third facility, Plant 3, began production of solid-fuel rocket motors for tactical missiles. From September 1988 to May 1991, LHAAP was also used for the static firing and elimination of Pershing I and II rocket motors in compliance with the Intermediate-Range Nuclear Forces Treaty in effect between the United States and the former Union of Soviet Socialist Republics.

LHAAP-19 (Construction Materials Landfill) is located north of the Ground Signal Test Area. The site is a fenced 400-by-800 foot landfill (**Figure 4**). The landfill was sporadically active from 1985 until closure activities were conducted in 2009. The landfill was permitted by rule to receive non-friable asbestos and other demolition debris. The monthly disposal rate ranged from 35 to 400 cubic yards of waste. The landfill (formerly referred to as LHAAP-26) was evaluated in 1988. A Preliminary Review Unit Checklist, completed in 1988, states that a trench was excavated to receive one week's waste and was covered at the end of each week. The recent operations included the demolition debris from production area buildings that were razed from 1999 to 2006. The materials deposited in this landfill were what is normally classified as Construction and Demolition Debris (C&D) consisting of wood and metal studs, corrugated metal walls and roofs, concrete rubble, steel re-bar, drywall, transite siding, cardboard, Class 2 paper, packing, plastics, foil, wood packaging, wood debris, bricks, cement, and other inert constituents.

Environmental restoration activities at LHAAP-19 (a non-NPL site) have progressed through the site investigation/landfill closure activities, at which point it was agreed by the Army and the regulators that no significant releases had occurred and the site investigation results met the remediation standards for Risk Reduction Standard No. 2. However, due to the fact that Non-hazardous Class 2 waste was left in place, the landfill closure met the standards of 30 TAC §335.8 for Risk Reduction Standard Number 3 – Closure/Remediation with controls and a certificate of remediation as appropriate for this standard. The landfill closure was certified by Professional Engineers licensed and registered in the State of Texas, with signatures provided in the Final Cover Evaluation and Final Landfill Closure Report (ECC, 2010).

The other three environmental sites addressed in this document are located in the Shops Area of LHAAP. LHAAP-56 (Vehicle Wash Rack & Oil/Water Separator Building 744-A) is a 926-square foot Grease Rack used for separation of oil from water in the wash-down of vehicles. LHAAP-65 (Building 209) was a Flammable Materials Storehouse used for storage of chemicals such as paints and solvents. LHAAP-69 (Service Station USTs) was the site of six leaking gasoline USTs.

Environmental restoration activities at LHAAP-56, LHAAP-65, and LHAAP-69 (non-NPL sites) have progressed through the site investigation, at which point it was agreed by the Army and TCEQ that no significant releases had occurred and the sites could be closed under TAC Risk Reduction Rule Standard 2. Concurrence by TCEQ is attached as **Appendix B**.

2.3 Public Participation

The U.S. Army, TCEQ and the Restoration Advisory Board (RAB) have provided public outreach to the surrounding community concerning LHAAP-19, LHAAP-56, LHAAP-65, and LHAAP-69 and other environmental sites at LHAAP. The outreach program has included fact sheets, media interviews, site visits, invitations to attend quarterly RAB and regulatory review meetings, and public meetings consistent with its public participation responsibilities under Sections 113(k)(2)(b), 117(a), and 121(f)(1)(g) of CERCLA.

The decision for no further investigation or action at LHAAP-19, LHAAP-56, LHAAP-65, and LHAAP-69 was discussed at the Restoration Advisory Board meeting on April 4, 2013 at the Karnack Community Center. Reports supporting the no further investigation or action determination for these sites are included in the Administrative Record for LHAAP, which is available for public review at the Marshall Public Library, (903) 935-4465, 300 South Alamo, Marshall, TX 75670. The hours of operation are Monday through Thursday 10:00 a.m. – 8:00 p.m. and Friday through Saturday from 10:00 a.m. – 5:00 p.m.

2.4 Site Characteristics

2.4.1 LHAAP-19

LHAAP-19 (Constuction Materials Landfill) was a fenced 400-by-800 foot landfill (7.91 acre tract) (USACE, 1996). The maximum depth of the landfill is believed to be less than 15 feet below ground surface. As part of the landfill closure activities, an 18-inch thick compacted clay cap with topsoil cover was constructed covering the footprint of the landfill (ECC, 2010.) The topography generally slopes in all directions from the center of the landfill. The steepest slopes are along the north side of the landfill.

2.4.2 LHAAP-56

LHAAP-56 includes Building 744-A and sump 117 and is located within LHAAP-35A(58) Shops Area. LHAAP-56 (Building 744-A) was a 926-square foot Grease Rack built in 1957 (Plexus, 2005). Wash rack effluent went through an oil trap. The oil was picked up by vacuum truck and carried to the burning ground for burning (Horacek, Smith, Painter & Spitz, Inc., 1978a). Two solvent tanks were located west of the two grease

racks (Plexus, 2005). The site had permitted discharge to a drainage ditch. The contaminants of concern were heavy metals.

2.4.3 LHAAP-65

LHAAP-65 (Building 209) was a Flammable Materials Storehouse constructed in 1982 and had 4,930 square feet of floor area (LHAAP, 2000a). The building was used for storage of chemicals such as paint and solvents. The building had a concrete floor with drains connected to sumps. The contaminants of concern were heavy metals.

2.4.4 LHAAP-69

LHAAP-69 (Service Station Underground Storage Tanks) consisted of six gasoline underground storage tanks (USTs) that were leak tested in 1989 and determined to be leaking. The tanks were replaced in 1993 and the site has been remediated. Since the site was still active at the time of the PA, it was not investigated under the ERA. The contaminant of concern was Petroleum/Oil/Lubricants (POL). Petroleum product and its constituents is not a CERCLA hazardous substance.

2.5 Current and Potential Future Site Uses

LHAAP was active from the early 1940s to the late 1990s for the manufacture of explosives, pyrotechnics, and rocket motors for World War II, the Korean War, and the Cold War. LHAAP was placed on inactive status in 1997. Aside from the abundant wildlife, the installation is predominantly unoccupied. All of the production facilities have been demolished. LHAAP now consists of a heavily vegetated landscape with flat to slightly undulating terrain. Nearly 7,000 acres have been transferred to U.S. Fish and Wildlife Service (USFWS) and are operated as the Caddo Lake National Wildlife Refuge. LHAAP-19 will be transferred to the USFWS at the conclusion of restoration activities. LHAAP-56 and LHAAP-69 are located on parcels that are planned for transfer to the USFWS in the future. LHAAP-65 is located on land already transferred to USFWS.

2.6 Site Investigations

2.6.1 LHAAP-19

A Resource Conservation and Recovery Act (RCRA) Facility Assessment was conducted at the site in 1988. The 1988 assessment identified LHAAP-19, Construction Materials Landfill, as LHAAP-26. The 1988 RFA characterized the waste as demolition and construction debris and (inert) empty paint cans. The TWC determined that no further RFA action is recommended for this unit (TWC, 1988). The Army conducted landfill closure activities in 2009 and determined that no releases have occurred and no further action is needed at this site. An assessment of soil and groundwater at LHAAP-19 was initiated in August 2009. A total of ten borings were drilled immediately adjacent to, but outside of the known footprint of the landfill. The soil samples were analyzed for TAL metals, VOCs, VOCs, explosives, and perchlorate. Three temporary monitoring wells were installed and sampled at the perimeter of LHAAP-19. The groundwater samples were analyzed for TAL metals, VOCs, SVOCs, explosives, and perchlorate. The concentrations in soil and groundwater adjacent to the landfill meet the remediation standards for Risk Reduction Standard No. 2 based on residential land use (ECC, 2010.) However, due to the fact that waste was left in place the landfill closure met the standards of 30 TAC §335.8 for Risk Reduction Standard Number 3 – Closure/Remediation with controls and a certificate of remediation as appropriate for this standard. The controls for the closure are compacted soil cap and topsoil cover.

None of the CERCLA §121 statutory determinations are necessary in this action because no remedial action is necessary to ensure protection of human health and the environment. A certificate of remediation (Appendix A) has been filed in the Harrison County records, as required by 30 TAC §335.556, stating that future use of the

parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. Residential use includes, but is not limited to, single family or multifamily residences, child care facilities, nursing home or assisted living facilities, and any type of educational purpose for children/young adults in grades kindergarten through 12. Institutional controls placed on the property to ensure appropriate future use include: (1) Use must remain non-residential as described above; and (2) No activity shall be conducted or permitted that would damage the integrity of the landfill cover (i.e. unauthorized digging or disturbing the existing cover or contents of the landfill). In accordance with 30 TAC §335.566 and more specifically as required by 30 TAC §330.463(a), limited monitoring will take place in the form of inspections of the landfill cap and any maintenance required to maintain the cap integrity for a period of 5 years. The Army shall correct, as needed, erosion of cover material, lack of vegetative growth, and subsidence or ponding of water. If any of these problems occur after the end of the five-year post-closure period or persist for longer than the first five years of post-closure care, the owner or operator shall be responsible for their correction until all problems have been adequately resolved.

Limited monitoring will be conducted in the form of Letters of Certification transmitted every five years from the Army or the Transferee to TCEQ certifying that the use of this site remains consistent with the industrial/recreational exposure scenario and the requirements of the Certificate of Remediation recordation.

2.6.2 LHAAP-56

LHAAP-56 has been investigated as part of larger sampling events. The soils in vicinity of Building 744-A were investigated as part of LHAAP-35A(58), while sump 117 was investigated as part of a larger sump investigation under LHAAP-35. The Sump 117 associated with site LHAAP-56 was investigated under LHAAP-35 (Shaw, 2008). Building 744-A associated with LHAAP-56 is located within LHAAP-35A(58) Shop Area.

In 1993 one surface soil sample and one subsurface soil sample were collected in association with Sump 117 and in 2008 one surface soil sample and two subsurface soil samples were collected in association with Sump 117. The 1993 samples were analyzed for metals, SVOCs and VOCs and the 2008 samples were analyzed for metals and VOCS. All chemicals except manganese have concentrations below the Risk Based Screening Value, and were removed from further consideration. The manganese concentration was applied to Jacobs (2003) risk assessment and is within acceptable risk range, therefore no further action is required for soil associated with sump 117 at LHAAP-35A(58) (Shaw, 2008).

The investigation for LHAAP-35A(58) included soil and groundwater sampling around Building 744-A. The conclusion for soil was that cancer risks and non-cancer hazards posed by soil fall within the acceptable range and that groundwater contaminants are being addressed with remedial actions for LHAAP-35A(58) (Shaw, 2009). The groundwater below the site is considered to be LHAAP-35A(58). Therefore, no further action is required for LHAAP-56.

None of the CERCLA §121 statutory determinations are necessary in this action because no remedial action is necessary to ensure protection of human health and the environment. Since the LHAAP-56 Site is small and entirely contained within the LHAAP-35A(58) land use control boundary (**Figure 3**), all monitoring and reporting requirements associated with the five year reviews will be met under LHAAP-35A(58). The restriction in place that encompasses LHAAP-56 is a groundwater restriction LUC which will remain in place until the LHAAP-35A(58) cleanup levels are met. A notification will be recorded in Harrison County records for LHAAP-35A(58), stating that the site is suitable for nonresidential use. Further information on the restriction and notification can be found in the September 2010 LHAAP-35A(58) Record of Decision(ROD) (Shaw, 2010). The groundwater below LHAAP-56 is considered to be LHAAP-35A(58) and monitoring of the

groundwater is included in the LHAAP-35A(58) Remedial Action Work Plan. No ongoing administrative or response action will be required at LHAAP-56.

2.6.3 LHAAP-65

There was some confusion about this site (LHAAP-65) early in the listing process. LHAAP-65 was not identified in the RCRA Facility Assessment (TWC, 1988) and there were no sumps identified at LHAAP-65 (Building 209) in the Environmental Site Assessment Report (Plexus, 2005). The site description in the Defense Environmental Restoration Program/Management Information System (DERPMIS) document (USACE, 1996) referenced sumps connected to the floor drains of the building and stated that the sumps are being investigated under LHAAP-35. However, because the Environmental Site Assessment Report did not identify sumps at Building 209, the sumps were not investigated under LHAAP-35. The sumps were investigated by USACE in 2010 and no further action was recommended based on data presented in the Final Data Evaluation Report for LHAAP-65 (USACE, 2011).

The 2010 site investigation sampling included the collection and analysis of 4 surface soil samples (2 at each of the northeast and southwest sumps) and 2 surface water samples (1 at each of the northeast and southwest sumps). Samples were analyzed for volatile organic compounds (VOC), semivolatile organic compounds (SVOC), perchlorate, explosive compounds, and metals. There was no indication of VOC, SVOC, perchlorate, or explosive contamination in soil or water. Only mercury was detected in one surface soil sample above the MSC. A risk evaluation was conducted for the mercury detection and risk was determined to be acceptable (USACE, 2011). LHAAP-65 (Building 209) was included in ECOP III (Shaw, 2005) as part of the Northwest Block/Production Area and transferred to the USFWS.

None of the CERCLA §121 statutory determinations are necessary in this action because no remedial action is necessary to ensure protection of human health and the environment. Since the LHAAP-65 Site is small and entirely contained within the LHAAP-35A(58) land use control boundary (**Figure 3**), all monitoring and reporting requirements associated with the five year reviews will be met under LHAAP-35A(58). The restriction in place that encompasses LHAAP-65 is a groundwater restriction LUC which will remain in place until the LHAAP-35A(58) cleanup levels are met. A notification will be recorded in Harrison County records for LHAAP-35A(58), stating that the site is suitable for nonresidential use. Further information on the restriction and notification can be found in the September 2010 LHAAP-35A(58) Record of Decision (ROD) (Shaw, 2010). The groundwater below LHAAP-65 is considered to be LHAAP-35A(58) and monitoring of the groundwater is included in the LHAAP-35A(58) Remedial Action Work Plan. No ongoing administrative or response action will be required at LHAAP-65.

2.6.4 LHAAP-69

In 1992/1993 the 6 USTs were removed/disposed along with removal of contaminated soil (TCEQ, Central Registry). USACE-Fort Worth faxed documentation for removal/disposal for 4 of the 6 USTs and removal of contaminated soil (LHAAP, 1994a). The Environmental Site Assessment Phase I and II Report included sampling of surface soil and a monitoring well located at Bldg 744, the former service station (Plexus, 2005). Samples were analyzed for VOCs, SVOCs, TPH and metals. Investigation resulted in no petroleum products identified as COCs. Results support no further action for LHAAP-69.

None of the CERCLA §121 statutory determinations are necessary as §121 is not applicable to petroleum product releases. Since the LHAAP-69 Site is small and entirely contained within the LHAAP-35A(58) land use control boundary (**Figure 3**), all monitoring and reporting requirements associated with the five year reviews will be met under LHAAP-35A(58). The restriction in place that encompasses LHAAP-69 is a groundwater restriction LUC which will remain in place until the LHAAP-35A(58) cleanup levels are met. A

notification will be recorded in Harrison County records for LHAAP-35A(58), stating that the site is suitable for nonresidential use. Further information on the restriction and notification can be found in the September 2010 LHAAP-35A(58) Record of Decision (ROD) (Shaw, 2010). The groundwater below LHAAP-69 is considered to be LHAAP-35A(58) and monitoring of the groundwater is included in the LHAAP-35A(58) Remedial Action Work Plan. No ongoing administrative or response action will be required at LHAAP-69.

3.0 References

PRIMARY BACKGROUND DOCUMENTS FOR LHAAP-56, LHAAP-65 AND LHAAP-69 SITES

AECOM, 2013, *Final Remedial Action Work Plan, LHAAP-35A(58), Shops Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas,* August. Administrative Record Bates Stamp 00120302 – 00120453.

ECC, 2010, *Final Cover Evaluation and Landfill Closure Report Construction & Demolition Debris Landfill (LHAAP-19),* Located at Longhorn Army Ammunition Plant, Karnack, Texas, September 2010.

Horacek, Smith, Painter & Spitz, Inc., 1978a, *Air and Water Pollution Survey*, Longhorn Army Ammunition Plant, Marshall, Texas. Prepared for USACE Ft. Worth District. April 21. Administrative Record Bates Stamp 000033-000077.

LHAAP, 1994a, *FAX – Subject: Underground Storage Tank Certificate of Disposal, Longhorn Army Ammunition Plant*, February. Administrative Record Bates Stamp 00113609 – 00113637.

Plexus Scientific, 2005, *Environmental Site Assessment Phase I and II Report, Production Areas, Longhorn Army Ammunition Plant, Karnack, Texas*, Houston, Texas, February. Administrative Record Bates Stamp 035132 – 035649.

Shaw, 2005, *Final Environmental Condition of Property III (ECOP) for the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas*, Aug. Administrative Record Bates Stamp 00113741 – 00113777.

Shaw, 2008, *Final Data Evaluation Report, Chemical Concentrations in Soil Samples Associated with LHAAP-35/36 Sumps, Volume I of III, Longhorn Army Ammunition Plant, Karnack, Texas, Houston, Texas*, January. Administrative Record Bates Stamp 00065806-00065901.

Shaw, 2009, *Final Feasibility Study, LHAAP-35A(58), Longhorn Army Ammunition Plant, Karnack, Texas*, December. Administrative Record Bates Stamp 00079300 – 00082348.

Shaw, 2010, *Final Record of Decision, LHAAP-35A(58), Shops Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas*, September. Administrative Record Bates Stamp 00098701 – 00098797.

TCEQ, Central Registry, Petroleum Storage Tank Registration 5555, located at http://www12.tceq.state.tx.us/crpub/index.cfm?fuseaction=iwr.pgmdetail&addn_id=763650132003073&lgcy_sys_cd=PST&program=PETROLEUM%20STORAGE%20TANK%20REGISTRATION&reg_ent_id=936717702002008&new=new&lessdisp=Y

TWC (Texas Water Commission), 1988, *RCRA Facility Assessment Conducted by Texas Water Commission.* April 8. Administrative Record Bates Stamp 001252-0019009.

USACE, 1996, *Final DERPMIS/RMIS Resolution Document, Longhorn Army Ammunition Plant*, April. Administrative Record Bates Stamp 00047932 – 00048112.

USACE (U.S. Army Corps of Engineers), 2011, *Final Data Evaluation Report for LHAAP-65, Former Flammable Materials Storehouse, Longhorn Army Ammunition Plant, Karnack, Texas*, June. Administrative Record Bates Stamp 00111802 – 00112667.

PUBLIC INFORMATION REPOSITORIES FOR
LONGHORN ARMY AMMUNITION PLANT

Marshall Public Library,
300 S. Alamo
Marshall, Texas 75670
Telephone: 903-935-4465

Hours of Operation:
Monday – Thursday (10:00 a.m.–8:00 p.m.)
Friday – Saturday (10:00 a.m.–5:30 p.m.)

Figures

OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		FILE PATH
Houston, TX	P. Page	09/27/04	A. Maida	10/28/04		06/30/05	

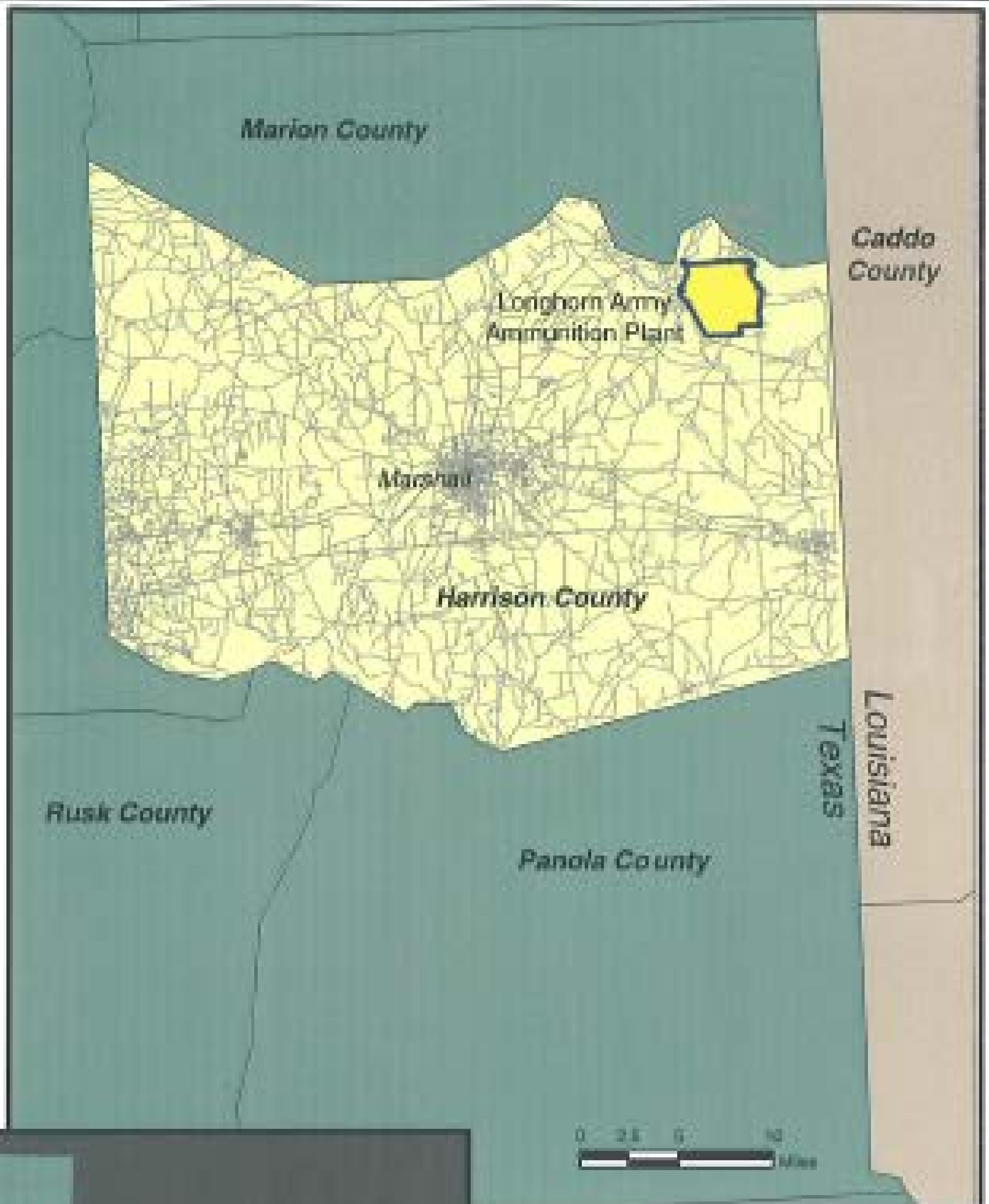


Figure 1
Location of Longhorn Army Ammunition Plant, Harrison County, Texas

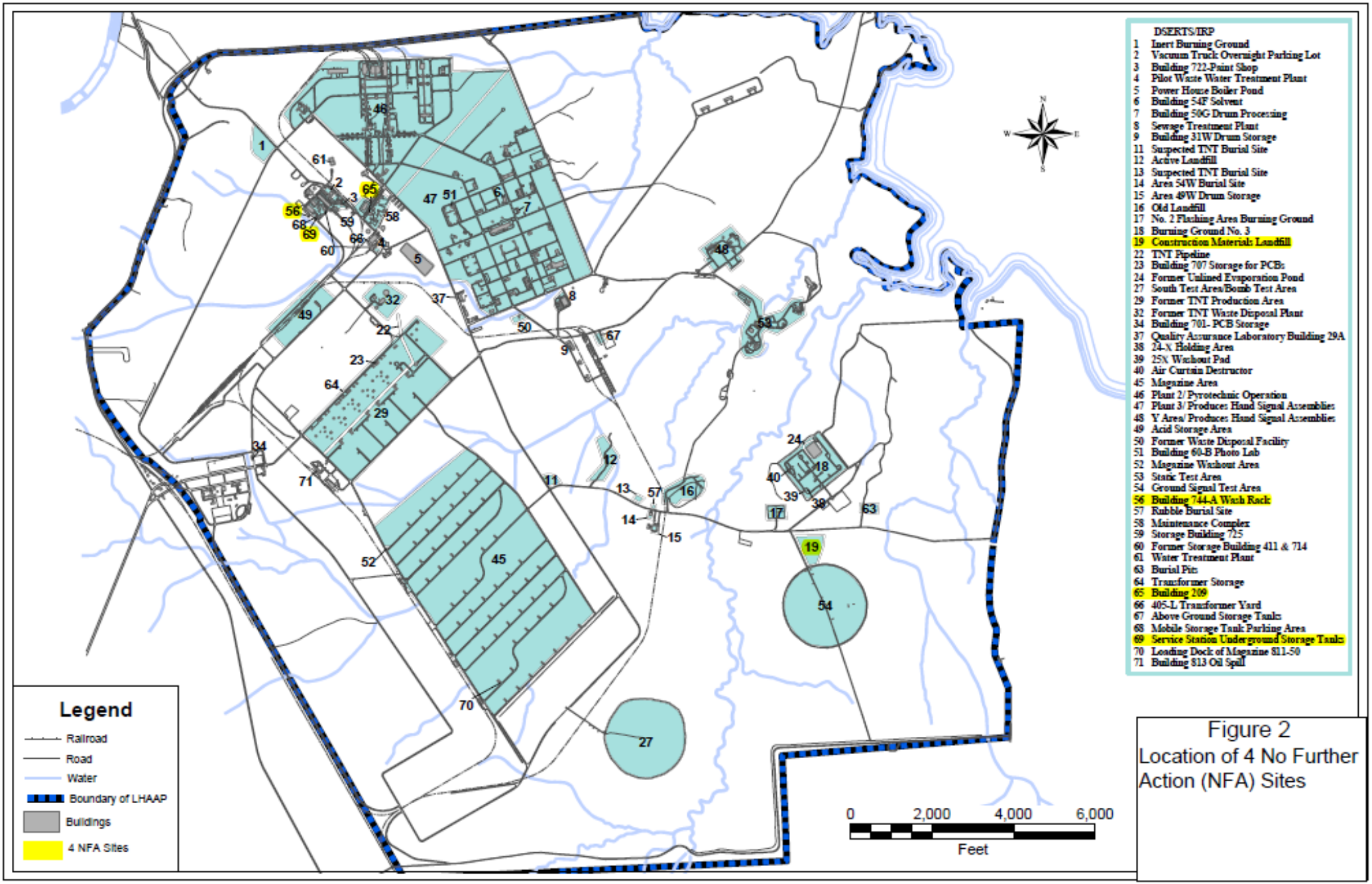


Figure 2
Location of 4 No Further Action (NFA) Sites

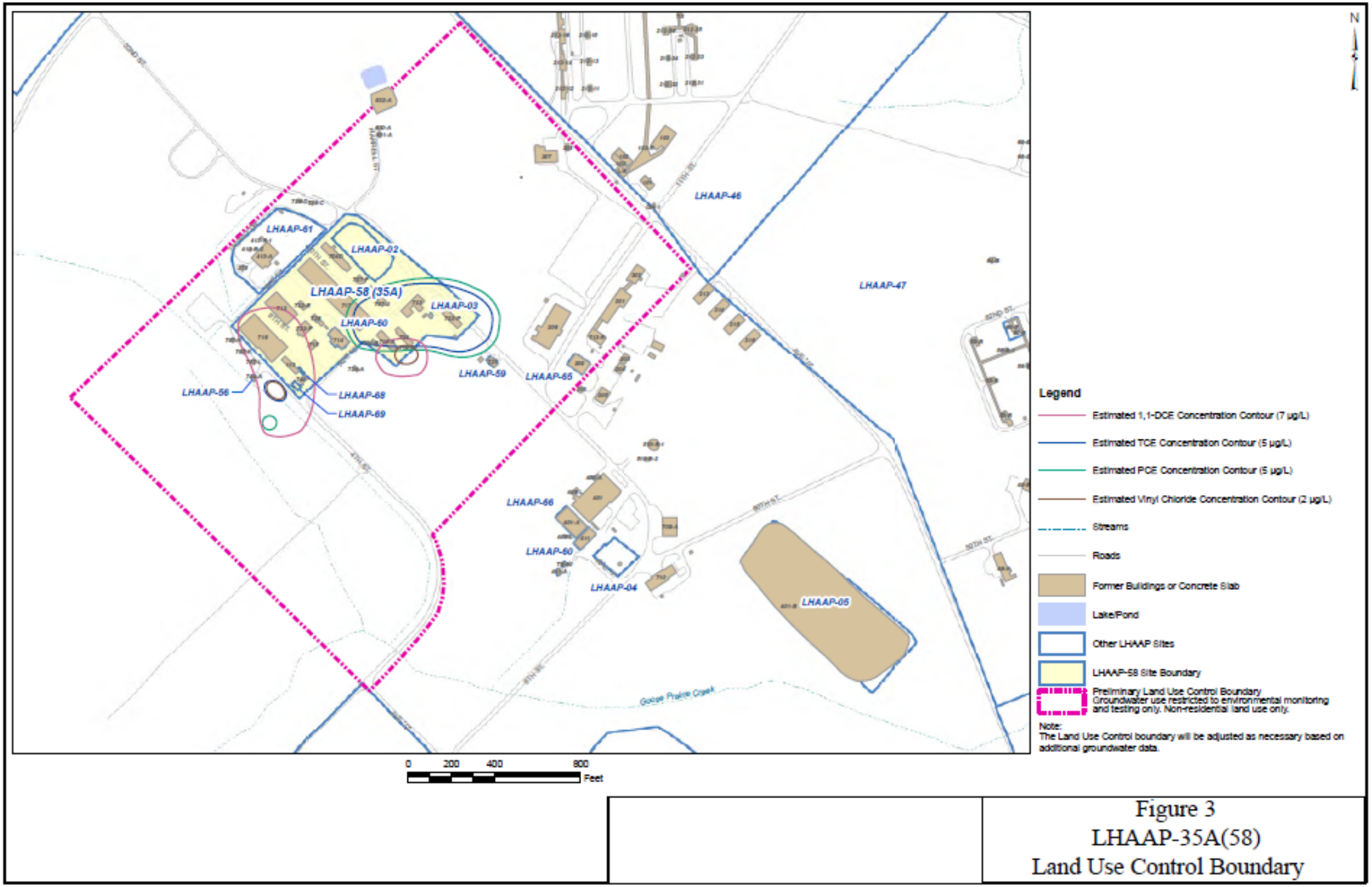


Figure 3
LHAAP-35A(58)
Land Use Control Boundary

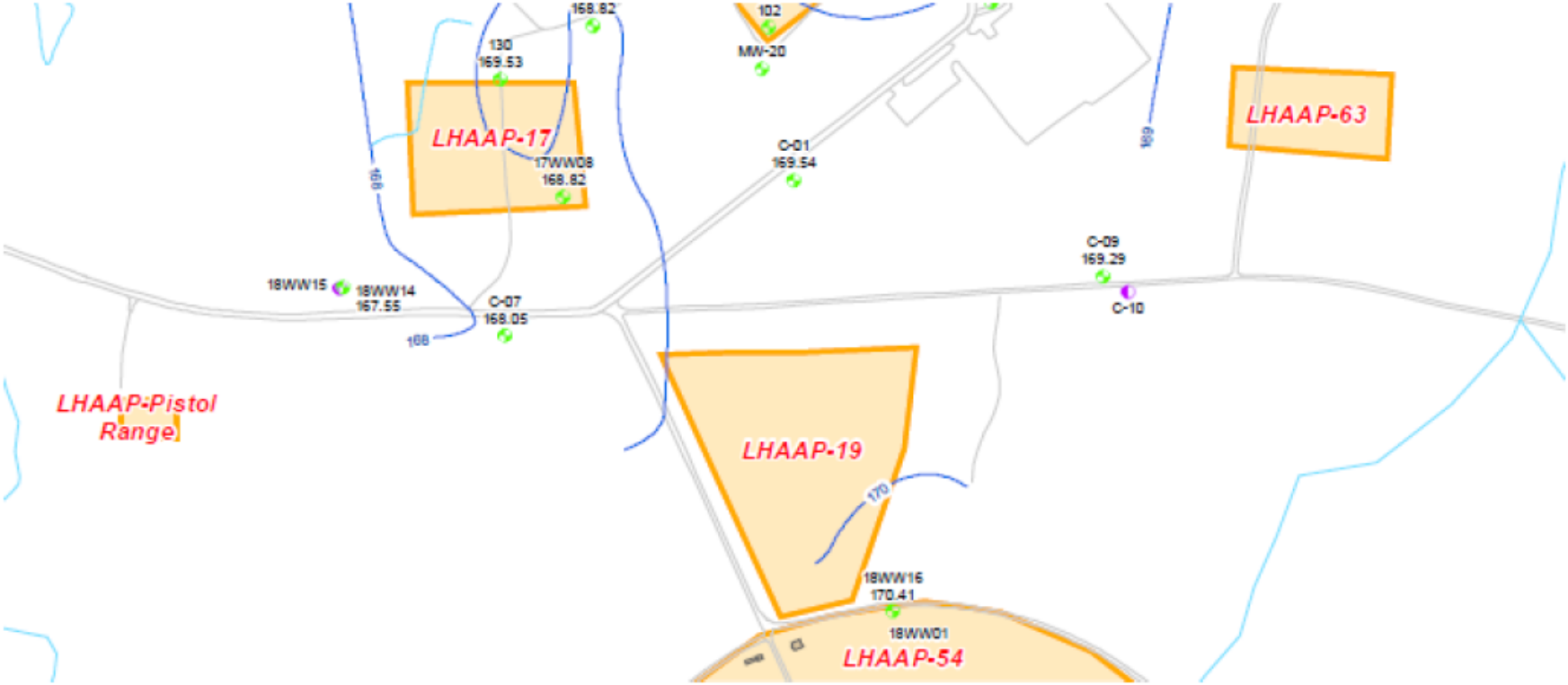


Figure 4
LHAAP-19 Site

Appendix A

Certification of Remediation Recordation, LHAAP-19

2013-000013785

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

5 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 11/14/2013 04:23 PM **Document Number:** 2013-000013785 **Receipt No:** 1313735 **Amount:** $ 28.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

AARON WILLIAMS
1645 SOUTH 100 FIRST EAST AVE

TULSA, OK 74128

STATE OF TEXAS
HARRISON COUNTY

INDUSTRIAL SOLID WASTE
CERTIFICATION OF REMEDIATION

KNOW ALL MEN BY THESE PRESENT THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality 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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The site, LHAAP-19, is a C&D Landfill located within the former Longhorn Army Ammunition Plant (LHAAP) in the northeast corner of Harrison County, Texas approximately 14 miles northeast of Marshall, Texas, and approximately 40 miles west of Shreveport, Louisiana. LHAAP was placed on the National Priorities (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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-19 is not itself considered an NPL site. The TCEQ, the lead regulatory agency concurs that the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 3.

The C&D landfill, designated LHAAP-19, covers a 7.91 acre tract of land. The maximum depth of the landfill is believed to be less than 15 feet below ground surface. The C&D landfill was sporadically active from 1985 until recent closure activities were conducted. The C&D landfill was permitted by rule to receive non-friable asbestos and other demolition debris. During periods of activity, the monthly disposal rate ranged from 35 to 400 cubic yards of waste. The C&D landfill (formerly referred to as LHAAP-26) was evaluated in 1988. From the landfill evaluation dated 1988, and the buildings description dated 2004, it is concluded that all of the materials deposited in this landfill were what is normally classified as Construction and Demolition Debris (C&D) consisting of wood and metal studs, corrugated metal walls and roofs, concrete rubble, steel re-bar, dry-wall, transite (non-friable asbestos) siding, cardboard, Class 2 paper, packing, plastics, foil, wood packaging, wood debris, bricks, cement and other inert constituents. Records provided by the site manager indicate that hazardous materials such as friable asbestos were disposed of in other permitted landfills. Based on this information and certification of process knowledge by the owner, this landfill is classified as Non-Hazardous Class 2. The final closure assessment report and its supporting documentation demonstrate that the threat to human health or the environment is at or below those required for Risk Reduction Standard Number 2. However, due to the fact that waste was left in place, a cap was constructed to cover the footprint of the landfill and closure of the landfill meets Risk Reduction Standard Number 3.

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 Texas Commission on Environmental Quality requires certain persons to provide certification and/or recordation in the real property records to notify the public of the conditions of the land and/or the

occurrence of remediation. This certification is not a representation or warranty by the Texas Commission on Environmental Quality of the suitability of this land for any purpose.

II

Being a 7.91 acre tract of land situated in Harrison County, Texas, being out of and a part of a 8,493 acres tract of land known as the former Longhorn Army Ammunition Plant, situated between Highway 43 at Karnack, Texas, and the southwestern shore of Caddo Lake, and being more particularly described by metes and bounds as follows:

(All coordinates shown here on are NAD 83, Texas State Plane North Central Zone 4202, based on GPS Static Processing verified with OPUS).

Beginning at the northwest corner of the herein described tract with coordinates of North: 6951971.54, East: 3316288.74, from which an iron pin set for a GPS Base Point with coordinates of North 6951987.74, East 3316281.35 bears N 24-31-50 E a distance of 17.81 feet;

Thence N 78-23-54 E, 504.61 feet to a point for an angle point with coordinates of North: 6952073.02, East: 3316783.04

Thence S 52-47-27 E, 137.20 feet to a point for an angle point with coordinates of North: 6951990.05, East: 3316892.31;

Thence S 44-12-24 E, 108.04 feet to a point for an angle point with coordinates of North: 6951912.60, East: 3316967.64;

Thence S 01-33-58 W, 110.10 feet to a point for an angle point with coordinates of North: 6951802.55, East: 3316964.63;

Thence S 11-28-04 W, 121.11 feet to a point for an angle point with coordinates of North: 6951683.85, East: 3316940.56;

Thence S 17-11-28 W, 349.04 feet to a point for the southeast corner of the herein described tract with coordinates of North: 6951350.41, East: 3316837.39;

Thence N 89-11-23 W, 294.12 feet to a point for the southwest corner of the herein described tract with coordinates of North: 6951354.57, East: 3316543.30;

Thence N 22-57-01 W, 332.88 feet to an angle point with coordinates of North: 6951661.10, East: 3316413.50;

Thence N 21-53-42 W , 334.57 feet to the place of beginning and containing 7.91 acres of land according to a survey made on the ground on November 12, 2009 by Ace Surveying, Inc.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-19 site and the TCEQ concluded that no further investigation or remedial action is required for LHAAP-19.

Limited monitoring will take place in the form of inspections of the landfill cap and any maintenance required to maintain the cap integrity for a period of five years. The Army shall correct, as needed, erosion of cover material, lack of vegetative growth, and subsidence or ponding of water. If any of these problems occur after the end of the five-year post-closure period or persist for longer than the first five years of post-closure care, the owner or operator shall be responsible for their correction until all problems have been adequately resolved. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. 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.

Institutional controls placed on the property to ensure appropriate future use include: (1) Use must remain non-residential as described above; and (2) No activity shall be conducted or permitted that would damage the integrity of the landfill cover (i.e. unauthorized digging or disturbing the existing cover or contents of the landfill). These restrictions will be placed in the deed transferring any part of the property out of federal ownership.

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 14th day of December 2013.

STATE OF TEXAS
COUNTY OF Gregg

BEFORE ME, on this the 14th day of Nov, 2013, personally appeared Rose M. Zeiler, of The 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 14th day of Nov, 2013.

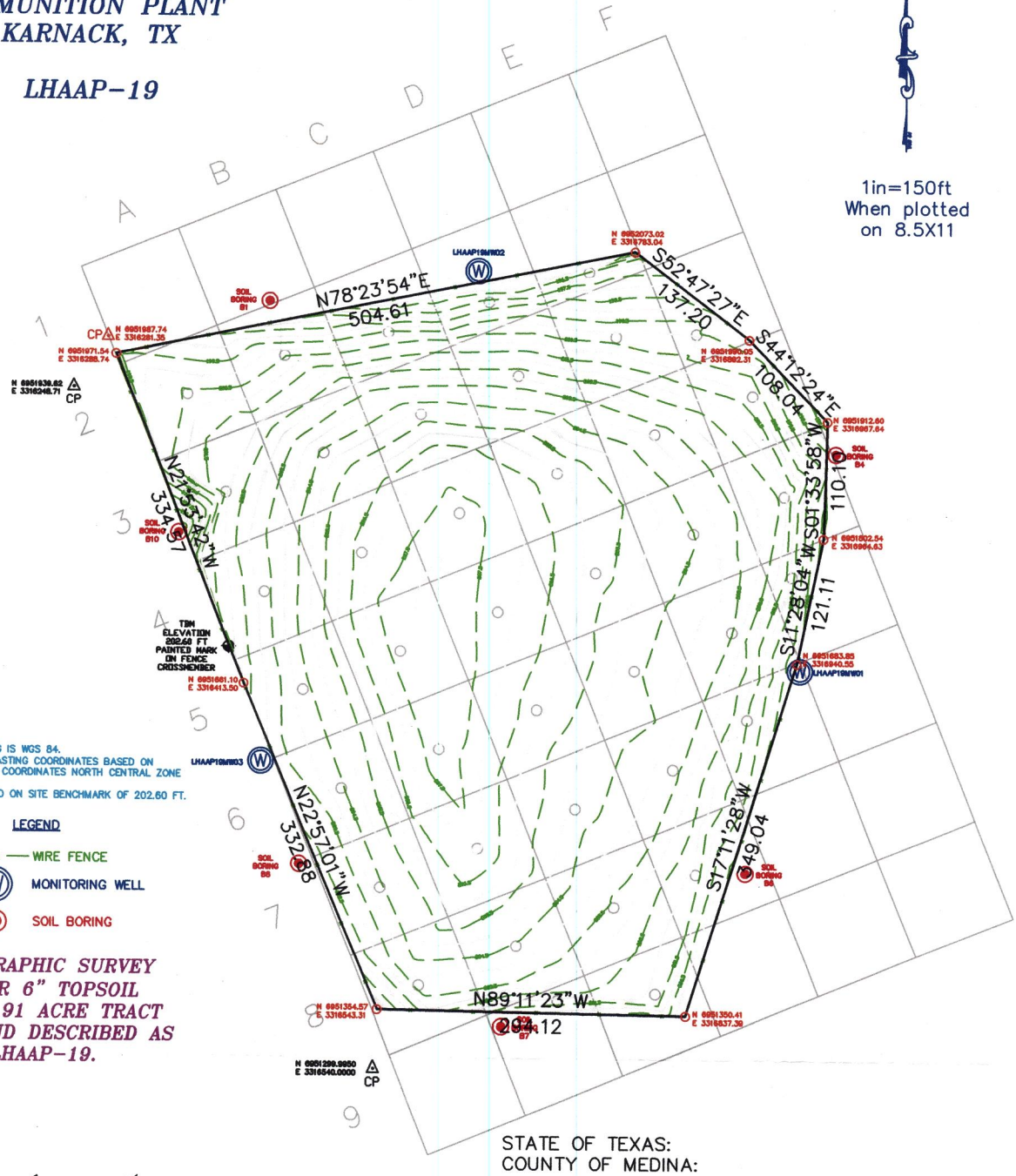
Notary Public in and for the State of Texas,

County of Harrison

BRENDA McBRIDE
Notary Public State of Texas
COMM. EXP. 5-4-2014

LONGHORN ARMY AMMUNITION PLANT KARNACK, TX

LHAAP-19



NOTES:
1) BASIS OF BEARING IS WGS 84.
2) NORTHING AND EASTING COORDINATES BASED ON TEXAS STATE PLANE COORDINATES NORTH CENTRAL ZONE #4202, NAD83.
3) ELEVATIONS BASED ON SITE BENCHMARK OF 202.60 FT.

LEGEND

— x — WIRE FENCE

MONITORING WELL

SOIL BORING

TOPOGRAPHIC SURVEY AFTER 6" TOPSOIL OF A 7.91 ACRE TRACT OF LAND DESCRIBED AS LHAAP-19.

Ace Surveying, Inc.
P. O. BOX 597
DEVINE, TEXAS 78016
830-334-7264
830-665-5796 FAX
acesurveying@sbcglobal.net

STATE OF TEXAS
REGISTERED
RHONDA K. BUTLER
5409
PROFESSIONAL
LAND SURVEYOR

STATE OF TEXAS:
COUNTY OF MEDINA:

I, RHONDA K. BUTLER, DO HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM AN ACTUAL SURVEY MADE ON THE GROUND BY MEN WORKING UNDER MY SUPERVISION.

RHONDA K. BUTLER
REGISTERED PROFESSIONAL LAND SURVEYOR #5409

SURVEYED: NOVEMBER 12, 2009
FILE NO: ALAMO 1, KARNACK

Appendix B

Correspondence of Regulatory Concurrence

From: Fay Duke
To: Williams, Aaron K SWT
Cc: Lambert, John R SWT; Rose Ms CIV USA OSA Zeiler
Subject: RE: TCEQ comment on draft Data Evaluation for LHAAP-65
Date: Friday, May 27, 2011 1:54:58 PM

Rose/Aaron,

We have reviewed the proposed risk evaluation to be incorporated into the Data Evaluation Report for LHAAP-65. Based on the result, the TCEQ concur with your recommendation that no further action is needed at LHAAP-65.

Fay Duke (MC-136)
Remediation Division, TCEQ
PO Box 13087
Austin, Texas 78711-3087

512-239-2443
512-239-2450 (Fax)

>>> On 5/6/2011 at 3:39 PM, <Aaron.K.Williams@usace.army.mil> wrote:

Fay,

A risk evaluation has been conducted for LHAAP-65 applying calculations from the LHAAP-49 BHHRA. The results are Hazard Indices below 1. Attached for your consideration are proposed language to add to the Data Evaluation Report, detailed calculations and supporting documentation.

Attachment 1 (Risk Evaluation)- Proposed language to be included in the Data Evaluation Report for LHAAP-65

Attachment 2 (Risk)- Detailed calculations of LHAAP-49 and LHAAP-65 exposure doses and HQ/HI for a trespasser and future maintenance worker (included LHAAP-49 calculations just to show the math is good)

Attachment 3 (Pages from BHHRA)- Support documentation from LHAAP-49 BHHRA- formulas

Attachment 4 (RfD)- Support documentation from LHAAP-49 BHHRA- RfDs

Thanks,

Aaron K. Williams
Environmental Engineer, ARMY/FUDS Section
HTRW Design Center
Tulsa District
U.S. Army Corps of Engineers
918-669-4915

-----Original Message-----

From: Fay Duke
To: Rose Zeiler; Williams, Aaron K SWT
Cc: Stephen Tzhone; Lambert, John R SWT
Subject: LHAAP 56 and LHAAP-69 Documentation
Date: Wednesday, September 02, 2009 12:22:49 PM

Rose/Aaron,

We have reviewed the documentation supporting "no further action required" for site LHAAP-69 and we concur.

The supporting documentation for LHAAP-56 is in error. My review of the past reports suggest that site LHAAP-56, vehicle wash rack and oil water separator area is located in Building 744-A not Building 744. So the sump that is associated with Building 744-A is probably Sump 117 and not Sump 113. After reading the description in the DERMIS report, I'm also a bit concern with the reason that it was not being addressed. It stated that the "site will require further investigations, response is complete under DERA since the site is still active. The sumps on this site is being investigated under LHAAP#35." So here's my question. Other than action taken on Sump 117, what investigation or closure activities have been performed since the closure of this unit?

Please let me know if you should have any questions or concerns.

Fay Duke (MC-136)
Remediation Division, TCEQ
PO Box 13087
Austin, Texas 78711-3087

512-239-2443
512-239-1212 (Fax)

From:	April Palmie
To:	Williams, Aaron K SWT
Cc:	Zeiler, Rose Ms CIV USA OSA; Lambert, John R SWT; Lanier, Wendy SWT; "Plitnik, Marilyn A CIV (US)"; Paul, Robin E CIV (US); Mayer.Richard@epamail.epa.gov
Subject:	LHAAP 56 Documentation (UNCLASSIFIED)
Date:	Monday, March 11, 2013 5:02:04 PM

Aaron,

Thank you for sending the additional information on LHAAP-56, which includes Building 744-A and Sump 117. TCEQ agrees that this site is appropriate to include in the Draft Decision Document. We have reviewed the documentation supporting "no further action required" for site LHAAP-56 and we concur.

Please let me know if you have any questions or concerns.

Sincerely,

April Palmie
Texas Commission on Environmental Quality
Superfund Section, Remediation Division, MC-136
P.O. Box 13087
Austin, TX 78711-3087
(512) 239-4152

From: April Palmie
To: Zeiler, Rose M CIV (US)
Cc: Williams, Aaron K SWT; Smith, Richard P SWT; April Palmie
Subject: [EXTERNAL] RE: LHAAP-19 (UNCLASSIFIED)
Date: Wednesday, October 30, 2013 11:51:17 AM

Rose,

My attorney concurs with the revised language; please prepare to file the notice. I would prefer if the Decision Document included the copy of notice, as filed.

April Palmie
Project Manager
Superfund Section
Remediation Division
Texas Commission on Environmental Quality
Phone: (512) 239-4152
Email: April.Palmie@tceq.texas.gov

-----Original Message-----
From: Zeiler, Rose M CIV (US) [mailto:rose.m.zeiler.civ@mail.mil]
Sent: Wednesday, October 30, 2013 9:43 AM
To: April Palmie
Cc: Williams, Aaron K SWT; Smith, Richard P SWT
Subject: RE: LHAAP-19 (UNCLASSIFIED)

April,

Longhorn concurs that the substantive standards under the "permit by rule" is an ARAR for LHAAP-19 which is being addressed by Army under the CERCLA. The TCEQ proposed language is acceptable (with the exclusion of the reference to the satisfaction of the executive director):

"Limited monitoring will take place in the form of inspections of the landfill cap and any maintenance required to maintain the cap integrity for a period of five years. The Army shall correct, as needed, erosion of cover material, lack of vegetative growth, and subsidence or ponding of water. If any of these problems occur after the end of the five-year post-closure period or persist for longer than the first five years of post-closure care, the owner or operator shall be responsible for their correction until all problems have been adequately resolved."

I am providing a pdf of all the markups made to the certification since we began this process, so that all changes are transparent to the reviewer.

Please provide your concurrence and we will proceed with finalization of the decision document and recordation.

Thanks,
Rose

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 23, 2014

Mr. Thomas E. Lederle
Chief, ACSIM BRAC Division
2530 Crystal Drive, Room 5000
Taylor Building / NC3
Arlington, Virginia 22202

Re: Decision Document for LHAAP-19, LHAPP-56, LHAAP-65, and LHAAP-69 Sites at the Longhorn Army Ammunition Plant Federal Superfund Site in Karnack, Harrison County, Texas. EPA ID: TX6213820529, TCEQ ID: SUP126

Dear Mr. Lederle:

The Texas Commission on Environmental Quality (TCEQ) received the Final Decision Document for LHAAP-19, LHAPP-56, LHAAP-65, and LHAAP-69 sites at the Longhorn Army Ammunition Plant Federal Superfund Site on February 28, 2014. The TCEQ has completed the review of the above referenced document and concurs that the described action is appropriate.

If you have any questions or need additional information, please feel free to contact me at (512) 239-2526 or April Palmie at (512)239-4152.

Sincerely,

Beth Seaton

Beth Seaton, Director
Remediation Division

BS/AP/cw

cc: Mr. Richard Smith, U.S. Army Corps of Engineers, EC-ER, 1645 S 101st East Ave, Tulsa, OK 74128
Ms. Rose Zeiler, Army / BRAC Site Manager, Longhorn Army Ammunition Plant, Post Office Box 220, Ratcliff, AR 72951
Mr. Richard Mayer, U.S. Environmental Protection Agency Superfund Division (6PD-F), 1445 Ross Avenue, Suite 1200, Dallas, TX 75202-2733
Mr. Paul Bruckwicki, U.S. Fish and Wildlife Service, P.O. Box 230, Karnack, TX 75661

bcc: Ms. April Palmie, MC 136
Mr. Cullen McMorrow, MC 175

FINAL
(Revised)

ENVIRONMENTAL CONDITION OF PROPERTY VI
(ECP VI)

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

January 2014

Table of Contents

List of Tables

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Acronyms and Abbreviations

ACM	Asbestos-Containing Material
AEDB-R	Army Environmental Database-Restoration
AST	aboveground storage tank
BERA	Baseline Ecological Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLNWR	Caddo Lake National Wildlife Refuge
CFR	Code of Federal Regulations
DMM	Discarded Military Munitions
DNT	Dinitrotoluene
DoD	Department of Defense
DOI	Department of the Interior
ECP	Environmental Condition of Property
ECP	DoD Environmental Condition of Property (classification of an area)
EE/CA	Engineering Evaluation/Cost Analysis
ESA	Environmental Site Assessment
FFA	Federal Facility Agreement
HHRA	Human Health Risk Assessment
INF	Intermediate Range Nuclear Forces
IRP	Installation Restoration Program
LBP	Lead-based paint
LHAAP	Longhorn Army Ammunition Plant
LUC	Land Use Control
MC	munitions constituents
MEC	munitions and explosives of concern
MMRP	Military Munitions Response Program
MRS	munitions response site
MSC	medium-specific concentration
MSSL	Medium-Specific Screening Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No Further Action
NPL	National Priority List
NRHP	National Register of Historic Places
PA	Preliminary Assessment
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	Royal Demolition Explosive
RI	Remedial Investigation

ROD	Record of Decision
SARA	Superfund Amendment and Reauthorization Act
SI	Site Investigation
SPLP	Synthetic Precipitation Leaching Procedure
TCEQ	Texas Commission on Environmental Quality
TNT	Trinitrotoluene
TRRR	Texas Risk Reduction Rule
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
UXO	Unexploded Ordnance
WP	white phosphorous

FINAL

ENVIRONMENTAL CONDITION OF PROPERTY

(ECP VI)

Longhorn Army Ammunition Plant, Karnack, Texas

January 2014

1.0 PURPOSE

The purpose of this Environmental Condition of Property (ECP) is to document the environmental condition of the described land (the Property) which comprises part of Longhorn Army Ammunition Plant (LHAAP) for transfer. The property has been determined to be suitable for nonresidential use. The Property for transfer consists of three tracts of land (the Former Sewage Treatment Plant Tract, the Former TNT Waste Disposal Plant Tract, and the Former Acid Storage Area Tract) which comprise a portion of the Production Area Parcel, plus two distinct parcels of land (the Y-Area and Static Test Area) (**Figure 1**).

The transfer is consistent with the Department of Defense (DoD) and U.S. Army Policy. The determination of the suitability for nonresidential use is based primarily upon the results of six documents. The first is the Environmental Site Assessment, Phase I and Phase II Report, a document which meets the requirement of an Environmental Baseline Survey (Plexus, 2005). The final five documents are decision documents that presented no further action (NFA) decisions for eight environmental sites located on the Property (Shaw, 2008, 2008a, 2008b, 2009, and 2010)

2.0 PROPERTY DESCRIPTION

LHAAP is located in central-east Texas in the northeastern corner of Harrison County, between State Highway 43 at Karnack, Texas and the western shore of Caddo Lake **(Figure 1)**. The facility is approximately 40 miles west of Shreveport, Louisiana. The former U.S. Army installation occupied 8,416 acres between State Highway 43 at Karnack, Texas, and the southwestern shore of Caddo Lake. Access to the facility is by State Highway 43 and 134. As shown on **Figure 2**, the Property for transfer consists of approximately 112 acres distributed among five separate tracts of land. Three of the tracts are located in the Production Area Parcel and include approximately four acres in and around the Former Sewage Treatment Plant and approximately 20 acres in and around the Former TNT Waste Disposal Plant, and approximately 31 acres in and around the Former Acid Storage Area. Two of the remaining tracts are transfer parcels, the Y-Area, also known as the Former Igniter Production Area, consisting of approximately 17 acres and the Static Test Area, consisting of approximately 40 acres. With the exception of the north boundary of the Former Sewage Treatment Plant tract and a portion of the Former TNT Waste Disposal Plant, the Property is surrounded by an area that has already been transferred to USFWS for management as the Caddo Lake National Wildlife Refuge (CLNWR).

The proposed reuse for the Property is as a wildlife refuge under the administration of the U. S. Fish & Wildlife Service.

2.1 Production Area Parcel – Former Sewage Treatment Plant Tract

The Former Sewage Treatment Plant is located in the central portion of LHAAP and covers an area of 3.82 acres **(Figure 2** and **Figure 3)**. This site is bounded on the east and south by an area transferred by the U.S. Department of the Army to the USFWS for management as the CLNWR. To the north is the former Plant 3 of the Production Area. The Former Sewage Treatment Plant tract is the site of an Installation Restoration Program (IRP) site, LHAAP-08.

The Former Sewage Treatment Plant was in operation from 1942 to 1997 (Plexus, 2005). The plant was modified over time to handle hydraulic capacity of 0.5 million gallons per day. Historical information on physical site characteristics is sourced in the Final Remedial Investigation Report Addendum for the Group 4 Sites Remedial Investigation Report, Sites 04, 08, 67 and Hydrocarbon Study at the Longhorn Army Ammunition Plant, Karnack, Texas (Jacobs, 2002b). There are no sumps, waste rack sumps, or septic tanks associated with this site.

Table 1 contains a description of the Former Sewage Treatment Plant processes and the results of investigations conducted at LHAAP-08, the Former Sewage Treatment Plant.

2.2 Production Area Parcel - Former TNT Waste Disposal Plant Tract

The Former TNT Waste Disposal Plant is a 19.43-acre site situated in the west-central portion of LHAAP **(Figure 2** and **Figure 4).** This site is surrounded by acreage already transferred by the U.S. Department of the Army to USFWS, with the exception of southeast corner of the site which is contiguous with the Former TNT Production area. The Former TNT Waste Disposal Plant is a National Priority List and IRP site, LHAAP-32. The Former TNT Waste Disposal Plant was constructed in 1942 to treat and dispose of wastewater generated at the Former TNT Production Area (LHAAP-29). The plant was in operation from April 1943 until August 1945 (Plexus, 2005). There are no sumps, waste rack sumps, or septic tanks associated with this site.

Table 1 contains a description of the Former TNT Waste Disposal Plant activities and the results of investigations conducted at LHAAP-32, the Former TNT Waste Disposal Plant.

2.3 Production Area Parcel - Former Acid Storage Area Tract

The Former Acid Storage Area is a 31.63 acre site located in the northwest portion of LHAAP (**Figure 2** and **Figure 5).** This site is surrounded by an area (approximately 7,000 acres) that was transferred by the U.S. Department of the Army to the USFWS for management as the CLNWR.

The Acid Storage Area was used from 1942 to 1945 for the formulation and storage of acids and acid mixtures in support of TNT production during World War II (Plexus, 2005). Former facility structures included process buildings and several ASTs located in the central portion of the site. Building foundations and several concrete saddles and platforms for support of ASTs are all that remain at the site.

Table 1 contains a description of the Former Acid Storage Area activities and the results of investigations conducted at LHAAP-49, the Former Acid Storage Area.

2.4 Y-Area Parcel

The Y-Area, also referred to as the Former Igniter Production Area, is located in the east-central portion of LHAAP **(Figure 2, Figure 6, and Figure 7)** at the intersection of Yoakum Drive and Starr Ranch Road. It covers an area of 17.24 acres. This site is completely surrounded by an area (approximately 7,000 acres) that was transferred by the U.S. Department of the Army to the USFWS for management as the CLNWR. The Y-Area Parcel is the location of three IRP sites, LHAAP-35/36, LHAAP-48, and LHAAP-55.

The Former Igniter Production Area was built during the construction of Plant 3, from 1953 through 1955 (Plexus, 2005). This area was used for the production of igniter parts used in pyrotechnic and illumination devices, and was also used for the production of some illuminating devices. This site was active until about 1997 (Jacobs, 2003). There were nine waste process sumps and three waste rack sumps and two septic tanks associated with this area.

Table 1 contains a description of the Former Igniter Production Area activities and the results of investigations conducted at environmental sites located on this Parcel.

2.5 Static Test Area Parcel

The Static Test Area Parcel covers an area of 40.37 acres in the east-central portion of LHAAP **(Figure 2**, **Figure 6, and Figure 7)**. This site is surrounded by an area (approximately 7,000 acres) that was transferred by the U.S. Department of the Army to the USFWS for management as the CLNWR. The Static Test Area Parcel is the site of four environmental restoration sites, LHAAP-35/36, LHAAP-55, and LHAAP-35C (53), IRP sites, and LHAAP-002-R, a Military Munitions Response Program (MMRP) site.

The Static Test Area was used for testing of illumination devices and static test firing of rocket motors (Plexus, 2005). There were five waste process sumps and six septic tanks associated with this area (Jacobs, 2002a). The site contains several buildings nominated for the National Register of Historic Places due to their use for Intermediate Range Nuclear Forces (INF) Treaty activities. Structures for this site included a test tunnel and a data acquisition system for flares, rocket motor test stands of earth and concrete, and conditioning facilities for reproducing arctic and tropical temperatures. The site was active through 1998.

Table 1 contains a description of the Static Test Area activities and the results of investigations conducted at environmental sites located on this Parcel.

3.0 ENVIRONMENTAL CONDITION OF PROPERTY

The U.S. Army has determined the Property's environmental condition through information obtained during the course of a series of environmental investigations that commenced at LHAAP in 1988. These investigations have included: Resource Conservation and Recovery Act (RCRA) Facility Assessment, Remedial Investigation, and Phase I and Phase II Site Assessments. The conditions of the Property are comprehensively presented in a February 2005 document entitled: Environmental Site Assessments, Phase I and II Report (ESA), Production Areas, Longhorn Army Ammunition Plant (Plexus, 2005). The ESA meets the requirements of an Environmental Baseline Survey. A comprehensive list of the documents reviewed in determining the environmental condition of the Property is listed in **Attachment 1.** The DOD Environmental Condition of Property (ECP) category for the property is as follows:

ECP Category 3: Approximately 53 acres as follows: Former Sewage Treatment Plant - Site 08, 3.82 acres; Former Acid Storage Area – Site 49, 31.63 acres; Y- Area – Site 48, 17.24 acres (including the appropriate sumps and waste rack sumps of LHAAP-35/36 located within LHAAP-48, and two of the septic tanks listed in LHAAP-55 located within LHAAP-48).

ECP Category 3 is defined as areas where release, disposal, and/or migration of hazardous substances have occurred, but at concentrations that do not require a removal or remedial response.

ECP Category 4: Approximately 60 acres as follows: Former TNT Waste Disposal Plant - Site 32, 19.43 acres; Static Test Area – Site 53, 40.37 acres (including the co-located LHAAP-002-R, the appropriate sumps and waste rack sumps of LHAAP-35/36 within LHAAP-35C (53), and six of the ten septic tanks listed in LHAAP-55 within LHAAP-35C (53).

ECP Category 4 is defined as areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions to protect human health and the environment have been taken.

Mercury and lead were detected within a building foundation at the Former TNT Waste Disposal Plant above groundwater protection standards. The contaminated sediment was removed and backfilled with clean soil in 2003 (CES, 2003).

There is evidence of a release from a polychlorinated biphenyls (PCB)-containing transformer at the Static Test Area, Building 23-T in February 1984. The leaking transformer at 23-T was moved to proper storage and the area was covered on 22 February, 1984. Cleanup of the spill was planned for March 1984. No confirmation of cleanup of the spill has been located. However, PCBs were not detected in either soil or groundwater samples analyzed during various phases of investigation (post-1984) at the Static Test Area (Shaw, 2008a). Thus no evidence of a release from PCBs remains at the Static Test Area.

A list of the seven ECP Categories is shown on **Attachment 2**.
A detailed description of the property is provided in **Table 1** – Description of Property.

4.0 ENVIRONMENTAL SITES AND INFORMATION

Discussion of the eight environmental sites located on the Property is provided in Section 4.1 and the locations are shown on **Figures 3 through 7.** Other environmental information related to the parcels is presented in Sections 4.2 through 4.10.

4.1 Environmental Sites

Of the eight environmental sites on the Property, all are no further action sites; four of the sites, LHAAP-32, LHAAP-35C(53), LHAAP-002-R, and LHAAP-48 are suitable for

unrestricted use, and four of the sites, LHAAP-08, LHAAP-35/36, LHAAP-49, and LHAAP-55 are suitable for nonresidential use. The environmental sites are described in the following text.

4.1.1 LHAAP-08, Former Sewage Treatment Plant

LHAAP-08, the Former Sewage Treatment Plant, is located in the central portion of LHAAP within the approximately four acre Former Sewage Treatment Plant Tract of the Production Area Parcel **(Figure 3)**. This site is bounded on the east and south by an area transferred by the U.S. Department of the Army to the USFWS for management as the CLNWR. To the north is the former Plant 3 of the Production Area.

The Former Sewage Treatment Plant was in operation from 1942 to 1997. The plant was modified over time to handle hydraulic capacity of 0.5 million gallons per day. Historical information on physical site characteristics is sourced in the Final Remedial Investigation Report Addendum for the Group 4 Sites Remedial Investigation Report, Sites 04, 08, 67 and Hydrocarbon Study at the Longhorn Army Ammunition Plant, Karnack, Texas (Jacobs, 2002b). There are no sumps, waste rack sumps, or septic tanks associated with this site.

Table 1 contains a description of the Former Sewage Treatment Plant processes and the results of investigations conducted at LHAAP-08, the Former Sewage Treatment Plant. The assessment of risk to current trespassers and future industrial maintenance workers from exposure to chemicals in soil and groundwater at LHAAP-08 indicated that potential human health risks are within the acceptable range established by the USEPA. Therefore, no remedial action is necessary at LHAAP-08 (Shaw, 2008a). The risk evaluation for LHAAP-08 did not address unrestricted use, but was based on the reasonably anticipated future nonresidential use (Jacobs, 2003). The installation-wide BERA (Shaw, 2007c) concluded that no unacceptable risk was present in LHAAP-08, therefore no action was needed for the protection of ecological receptors.

LHAAP-08 was included with LHAAP-48, LHAAP-35C (53), and LHAAP-002-R in a no action Decision Document (Shaw, 2008a). The USEPA and TCEQ concurred with the decision that no CERCLA action was necessary. Documentation in the Administrative Record file for LHAAP-08, Former Sewage Treatment Plant, that support the NFA decision includes, but is not limited to, remedial investigation (RI) and baseline risk assessment reports (Jacobs 2002a, 2002b, 2003), the installation-wide baseline ecological risk assessment (BERA) report (Shaw, 2007c), Final Proposed Plan for LHAAP-08, Former Sewage Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas(U.S. Army, 2008a), and other LHAAP-08 related documents. Limited monitoring in the form of Letters of Certification to the State of Texas every five years will be conducted to verify that the use of LHAAP-08 remains nonresidential. In accordance with Texas Administrative Code §335.566, a notification has been recorded in Harrison County records stating that the site is suitable for nonresidential use only (Shaw, 2008a), a copy of which will be included in the Comprehensive LUC Management Plan (U.S. Army, 2007).

4.1.2 LHAAP-32, Former TNT Waste Disposal Plant

LHAAP-32, the Former TNT Waste Disposal Plant, is located within the approximately 19-acre Former TNT Waste Disposal Plant Tract of the Production Area Parcel situated in the west-central portion of LHAAP **(Figure 4).** This site is surrounded by acreage already transferred by the U.S. Department of the Army to USFWS, with the exception of southeast corner of the site which is contiguous with the Former TNT Production Area. The Former

TNT Waste Disposal Plant is a National Priority List and IRP site, LHAAP-32. The Former TNT Waste Disposal Plant was constructed in 1942 to treat and dispose of wastewater generated at the Former TNT Production Area (LHAAP-29). The plant was in operation from April 1943 until August 1945 (Plexus, 2005). There are no sumps, waste rack sumps, or septic tanks associated with this site.

Table 1 contains a detailed description of the Former TNT Waste Disposal Plant activities and the results of investigations conducted at LHAAP-32, the Former TNT Waste Disposal Plant.

Mercury and lead were detected within a building foundation at the Former TNT Waste Disposal Plant above groundwater protection standards. The contaminated sediment was removed and backfilled with clean soil in 2003 (CES, 2003). LHAAP-32 now does not have contaminated soils requiring remediation nor does the underlying groundwater contain contamination requiring remediative measures based on conclusions from the Final Site Evaluation Report (Shaw, 2005). The risk evaluation conducted for LHAAP-32 determined that the site was suitable for unrestricted use (Shaw, 2005). The installation-wide BERA (Shaw, 2007c) concluded that no unacceptable risk was present in LHAAP-32, therefore no action was needed for the protection of ecological receptors.

LHAAP-32 was the subject of a no action record of decision (Shaw, 2008b). This document was issued by the U.S. Army, the lead agency for this installation and co-signed by USEPA.

TCEQ concurred with the selected No Action decision. The recommendation for no action is consistent with the criteria required under CERCLA. Documentation in the Administrative Record files for LHAAP-32, Former TNT Waste Disposal Plant that supports the NFA decision includes, but is not limited to, remedial investigation (RI) and baseline risk assessment reports (Jacobs 2001, 2002), site evaluation report, and installation-wide baseline ecological risk assessment (BERA) report (Shaw, 2005, 2007c), and other LHAAP-32 related documents.

4.1.3 LHAAP-35/36, Sumps and Waste Rack Sumps

The 145 sumps and waste rack sumps which comprise LHAAP-35/36 are located within other environmental sites including LHAAP-04, LHAAP-18, LHAAP-29, LHAAP-39, LHAAP-46, LHAAP-48, LHAAP-35C (53), LHAAP-35A (58), LHAAP-59, and LHAAP-66. Seventeen of the 125 sumps and 20 waste racks are located in two of the parcels addressed in this document. Nine of the sumps and three of the waste racks are in the Y-Area Parcel and occur inside the boundary of LHAAP-48. Five of the sumps are in the Static Test Area Parcel and four are located within the LHAAP-35C (53) boundary. The sumps and waste rack sumps located on the property are listed in **Table 2** and shown on **Figure 7**.

LHAAP-48 contains nine sumps and three waste rack sumps; LHAAP-35C (53) includes five sumps (Shaw, 2008c) (**Table 2)**. Based on the Site Evaluation Report, LHAAP-48 (Former Igniter Production Area) and LHAAP-35C (53) (Static Test Area), Longhorn Army Ammunition Plant, Karnack, Texas (Shaw, 2006b), no further investigation is required at these sites (**Table 3**). The installation-wide BERA (Shaw, 2007c) concluded that no unacceptable ecological risk was present in the Low Impact and Industrial Sub-Areas. Ecological risk was identified at the Waste Sub-Area and is being addressed by a soil remedial action at LHAAP-17. Therefore, no action was needed at the LHAAP-35/36 sumps for the protection of ecological receptors.

Table 1 contains a description of LHAAP-35/36, Sumps and Waste Rack Sumps activities and the results of investigations conducted at LHAAP-35/36, Sumps and Waste Rack Sumps. The

Decision Document for LHAAP-35/36 (Shaw, 2010) presents the basis for the decision that no CERCLA action is necessary. Documentation in the Administrative Record file for LHAAP-35/36, Sumps and Waste Rack Sumps, that support the NFA decision include, but is not limited to, remedial investigation (RI) and baseline risk assessment reports (Jacobs 2002, 2002a, 2003), installation-wide baseline ecological risk assessment (BERA), site evaluation reports (Shaw, 2007c, 2008c) and other LHAAP-35/36 related documents.

Because the sumps and waste racks were evaluated for industrial use and not unrestricted use, the TCEQ requires that a notification be filed in the Harrison County, Texas records, in accordance with Texas Administrative Code §355.566, stating the land is considered suitable for nonresidential use. A copy of the recordation will be included in the Comprehensive LUC Management Plan (U.S. Army, 2007). Limited monitoring in the form of Letters of Certification every five years from the Army or the transferee to TCEQ will document that the use of land associated with LHAAP-35/36 sumps is consistent with the nonresidential use scenarios evaluated in the risk assessment.

4.1.4 LHAAP-35C (53), Static Test Area

LHAAP-35C (53), the Static Test Area, is located within the approximately 40-acre Static Test Area Parcel in the east-central portion of LHAAP **(Figure 6 and Figure 7)**. This site is surrounded by an area (approximately 7,000 acres) that was transferred by the U.S. Department of the Army to the USFWS for management as the CLNWR. LHAAP-53 is co-located with three other environmental restoration sites, LHAAP-35/36, LHAAP-55, and LHAAP-002-R.

The Static Test Area was used for testing of illumination devices and static test firing of rocket motors. Structures for this site included a test tunnel and a data acquisition system for flares, rocket motor test stands of earth and concrete, and conditioning facilities for reproducing arctic and tropical temperatures. The site was active through 1998.

Table 1 contains a description of the Static Test Area activities and the results of investigations conducted at this site. LHAAP-53 does not have contaminated soils requiring remediation nor does the underlying groundwater contain contamination requiring remediative measures (Jacobs, 2003). A detailed account of the residential baseline human health risk assessment (HHRA) Process for LHAAP-53 is included in **Attachment 1** of the Final Site Evaluation Report (Shaw, 2006). Risk evaluations conducted at LHAAP-35C (53) determined that the site is suitable for unrestricted use (Shaw, 2008a). The installation-wide BERA (Shaw, 2007c) concluded that no unacceptable risk was present in LHAAP-53, therefore no action needed for the protection of ecological receptors.

LHAAP-35C (53) was included with LHAAP-08 and LHAAP-48 in a no action decision document (Shaw, 2008a). This document was issued by the U.S. Army. The USEPA and TCEQ concur with the decision for no action. Documentation in the Administrative Record file for LHAAP-35C (53), Static Test Area, that supports the NFA decision includes, but is not limited to, remedial investigation (RI) and baseline risk assessment reports (Jacobs 2002a, 2003), site evaluation report (Shaw, 2007b) installation-wide baseline ecological risk assessment (BERA) report (Shaw, 2007c), proposed plan, (U.S. Army, 2008b), and other LHAAP-35C (53) related documents.

4.1.5 LHAAP-48, Y-Area

LHAAP-48, the Former Igniter Production Area, lies within the 17-acre Y-Area Parcel and is located in the east-central portion of LHAAP **(Figure 6 and Figure 7)** at the intersection of Yoakum Drive and Starr Ranch Road. This site is completely surrounded by an area (approximately 7,000 acres) that was transferred by the U.S. Department of the Army to the USFWS for management as the CLNWR. LHAAP-48 is co-located with two other IRP sites, LHAAP-35/36 and LHAAP-55.

The Former Igniter Production Area was built during the construction of Plant 3, from 1953 through 1955. This area was used for the production of igniter parts used in pyrotechnic and illumination devices. This site was active until about 1997 (Jacobs, 2003).

Table 1 contains a description of the Former Igniter Production Area activities and the results of investigations conducted at LHAAP-48. The site does not have contaminated soils requiring remediation nor does the underlying groundwater contain contamination requiring remediation measures (Jacobs, 2003). A detailed account of the residential baseline HHRA process for LHAAP-48 is included in **Attachment 1** of the Final Site Evaluation Report (Shaw, 2006). Risk evaluations conducted at LHAAP-48 determined that the site is suitable for unrestricted use (Shaw, 2008a). The installation-wide BERA (Shaw, 2007c) concluded that no unacceptable risk was present in LHAAP-48, therefore no action needed for the protection of ecological receptors.

LHAAP-48 was included with LHAAP-08 and LHAAP-35C (53) in a no action decision document (Shaw, 2008a). This document was issued by the U.S. Army. The USEPA and TCEQ concurred with the No Action decision. Documentation in the Administrative Record file for LHAAP-48 that supports the NFA decision includes, but is not limited to, remedial investigation (RI), baseline human health and risk assessment reports, (Jacobs 2002a, 2003), environmental site assessment, (Plexus, 2005), site evaluation report, (Shaw, 2007b), basewide ecological risk assessment (Shaw, 2007c), proposed plan (U.S. Army, 2008b) and other LHAAP-48 related documents.

4.1.6 LHAAP-49, Former Acid Storage Area

LHAAP-49, the Former Acid Storage Area, lies within the approximately 31-acre Former Acid Storage Area Tract of the Production Area Parcel in the west-central portion of LHAAP (**Figure 5**). This site is completely surrounded by an area (approximately 7,000 acres) that was transferred by the U.S. Department of the Army to the USFWS for management as the CLNWR.

The Former Acid Storage Area was used from 1942 to 1945 for the storage and formulation of acids and acid mixes in support of TNT production during World War II (Plexus, 2005). Nitric acid and sulfuric acid were manufactured and handled in large quantities in this area. No known releases of chemicals have been documented. Mercury and lead are the primary soil contaminants detected at LHAAP-49. The locations where lead was detected at the highest concentrations can be correlated with the historic layout of process facilities and acid storage tanks previously used at the site. All tanks have been removed as have all process equipment and buildings.

Table 1 contains a description of the Former Acid Storage Area activities and the results of investigations conducted at LHAAP-49, the Former Acid Storage Area. The risk evaluation conducted for LHAAP-49 determined that the site is suitable for nonresidential use (Shaw, 2009a). The LHAAP-49 risk evaluation, based on the reasonably anticipated future

nonresidential use, does not address unrestricted use.

A voluntary removal action was conducted by the contractor at the site in response to a TCEQ concern over mercury in soil (Shaw 2009a). The Record of Decision Document for LHAAP-49 (Shaw, 2010a) presents the basis for the decision that no CERCLA action is necessary. Documentation in the Administrative Record file for LHAAP-49, Former Acid Storage Area, that support the NFA decision include, but is not limited to, Installation Base-wide Ecological Risk Assessment, Longhorn Army Ammunition Plant, Karnack, Texas (Shaw, 2007c), Site Evaluation Report, LHAAP-49, Longhorn Army Ammunition Plant, Karnack, Texas (Shaw, 2009a), Draft Final Record of Decision, LHAAP-49, Former Acid Storage Area, Longhorn Army Ammunition Plant, Karnack, Texas (Shaw, 2010a), and other LHAAP-49 related documents.

Limited monitoring in the form of Letters of Certification to the State of Texas every five years will be conducted to certify proper land use. In accordance with Texas Administrative Code §355.566, a notification will be recorded in Harrison County records stating the site is suitable for nonresidential use (Shaw, 2010a), a copy of which will be included in the Comprehensive LUC Management Plan (U.S. Army, 2007).

4.1.7 LHAAP-55, Septic Tanks

LHAAP-55 consists of ten septic tanks located in outlying areas that could not be originally connected to the plant sanitary sewer system. Eight of the 10 septic tanks included in LHAAP-55 are located on the Property **(Figure 7)**, with two septic tanks located within the Y-Area Parcel and six septic tanks located within the Static Test Area Parcel. In 1991, the septic tanks were tied to the sewage treatment plant. **Table 4** lists the septic tanks on the Property.

No chemicals were detected in soil at LHAAP-55 except beryllium and lead, which were detected above the applicable TCEQ medium-specific concentration (MSC) risk-based screening levels in samples from one location. An additional sample from this location underwent Synthetic Precipitation Leaching Procedure (SPLP) analysis as provided in 30 TAC 335.559(g)(2)(B). The results for all chemicals in soil, including beryllium and lead, were below the applicable MSC, passing the SPLP test (Shaw, 2007d). Therefore, no further investigation or action was required at LHAAP-55.

Table 1 contains a description of LHAAP-55, Septic Tanks activities and the results of investigations conducted at LHAAP-55, Septic Tanks. The risk evaluation, based on the reasonably anticipated future nonresidential use, does not address unrestricted use (Shaw, 2008). LHAAP-55 was included with LHAAP-06, LHAAP-07, LHAAP-51, LHAAP-64, LHAAP-66 and LHAAP-68 in a no action Decision Document (Shaw, 2008). The USEPA (USEPA, 2007) and TCEQ (TCEQ, 2008) concurred with the no action decision for LHAAP-55. Documentation in the Administrative Record file for LHAAP-55(ten septic tanks) that support the decision that no further investigation or action is required at LHAAP-55 include, but not limited to, environmental site assessment (Plexus, 2005), site investigation (Shaw 2006a), environmental site assessment (Plexus, 2005), and other LHAAP-55 related documents.

Limited monitoring in the form of Letters of Certification transmitted every five years from the Army or the transferee to TCEQ certifying that the use will remain consistent with the industrial/recreational exposure scenario evaluated in the risk evaluation.

The TCEQ (TCEQ, 2008) required notification be filed in the Harrison County records, as required by 30 TAC §335.560(b), stating that the land is considered suitable for future nonresidential use. A copy of the recordation will be included in the Comprehensive LUC Management Plan (U.S. Army, 2007).

4.1.8 LHAAP-002-R, Static Test Area

LHAAP-002-R, the Static Test Area, is located within the approximately 40-acre Static Test Area Parcel in the east-central portion of LHAAP **(Figure 6 and Figure 7)**. This site is surrounded by an area (approximately 7,000 acres) that was transferred by the U.S. Department of the Army to the USFWS for management as the CLNWR.

The Static Test Area was designated a munitions response site (MRS) because of the rocket motor static test firing and red phosphorous smoke wedge and illuminating candle testing conducted at the site (Plexus, 2005). Based on the reported presence of Munitions and Explosives of Concern, MEC (trip flares) at the site and the presence of Munitions Constituents (MC) (explosives, perchlorate, and lead), the site was identified as a MEC and MC area of concern. Analysis of aerial photographs of the MR Site revealed scarred and stained areas that may indicate three possible burial or burn areas in the vicinity of buildings used for ordnance manufacturing and storage (E2M, 2005).

Table 1 contains a description of the Static Test Area activities and the results of investigations conducted at LHAAP-002-R. No MEC items were identified or recovered at LHAAP-002-R. Accordingly, the MEC density, ordnance-type hazard, and sensitivity factors are all assigned a value of 0. Therefore, there is no MEC risk identified at LHAAP-002-R (Cape, 2007). No MEC was found during the EE/CA investigation, and environmental sampling results at the site indicated by the Department of Defense Explosives Safety Board on April 3, 2008 supports the no action decision of the action memorandum. Site LHAAP-002-R is suitable for unrestricted use. The risk associated with MC was not evaluated since no MC was present at an unacceptable concentration (Cape, 2007), resulting in an incomplete exposure pathway.

LHAAP-002-R does not have MEC or MC related soil contamination requiring remediation nor does the underlying groundwater contain MEC or MC related contamination requiring remediation measures (Cape, 2007).

LHAAP-002-R was included with LHAAP-08, LHAAP-48, and LHAAP-35C (53) in a no action decision document (Shaw, 2008a). This document was issued by the U.S. Army. The USEPA and TCEQ concurred with the no action decision. Documentation in the Administrative Record file for LHAAP-002-R, Static Test Area, that support the NFA decision include, but is not limited to, site inspection report (E2M, 2005), engineering evaluation/cost analysis (EE/CA) (Cape, 2007), and other LHAAP-002-R related documents.

4.2 Storage, Release, or Disposal of Hazardous Substances

The storage, release, or disposal of hazardous substances is recorded in **Table 5**. **Table 5** contains a detailed list (by parcel) of the storage, release, or disposal of hazardous substances, including the product name, approximate date, quantity and remedial action, if required.

Hazardous substances were released in excess of 40 CFR 373 reportable quantities at the Static Test Area Parcel. Details of these releases are to be found in **Tables 1 and 5**. Hazardous substances were released in unknown quantities at the Former Sewage Treatment Plant, the

Former TNT Waste Disposal Plant, the Former Acid Storage Area, and the Static Test Area. **Table 5** details chemicals stored, released or disposed at each parcel.

Hazardous substances were stored for one year or more and released or disposed of on the property in excess of reportable quantities specified in 40 CFR Part 373 at the Static Test Area only. Three hazardous substance ASTs were located at the Static Test Area. One AST, containing 10,000-gallons methylene chloride, was located at the former building 16-T. Two ASTs, both located at building 25-T, contained 7.050 gallons acetone when removed. Exact date of removal of these ASTs is not documented. All hazardous substances storage operations have been terminated on the property.

Mercury and lead were detected within a building foundation at the Former TNT Wastewater Plant above groundwater protection standards. The contaminated sediment was removed and backfilled with clean soil in 2003 (CES, 2003). TNT was detected in a single soil sample in 2002 (Jacobs, 2002), but confirmation sampling did not replicate the original results (Shaw, 2005). No further action is required at this site (Shaw, 2008b).

The storage and release of propellant, PEP dusts, and solvents from wastewater sumps was reported for the Y-Area. The quantity of the release is unknown. The HHRA (Jacobs, 2003) and BERA (Shaw, 2007c) concluded that no unacceptable cancer and noncancer risk was present for the protection of human health and the environment, with the TCEQ concurring that no action is required.

Detections of mercury and lead in the Former Acid Storage Area of the Production Area Parcel indicate that a release has occurred. Mercury was detected in a small area near the former laboratory facilities. Lead contamination was associated with lead sheeting and lining of vessel operations. No environmental action is required at this site (Shaw, 2010a). Mercury-contaminated soil was removed and replaced with clean fill during a voluntary removal action by Shaw Environmental, Inc. in 2008.

The Former Acid Storage Area was used for the storage and formulation of acids and acid mixes. Nitric acid and sulfuric acid were manufactured and handled in large quantities in this area. As large quantities of acids were required, this parcel contained numerous storage tanks. There are no known process releases that took place at the acid storage area.

A release of 3,125 pounds (1,417 kilograms) nitric acid was reported at Building 23-T in 1991. The release to air was due to an equipment failure and resulted in an explosion which rose approximately 1,300 feet into the air. The incident was reported as required (Thiokol, 1992a). **Attachment 5** contains a copy of the EPA Accidental Release Information Program form prepared by Thiokol Corporation for the Administrative Contracting Officer and a copy of personal communication between the Environmental Coordinator and the Environmental and Safety Manager, Longhorn Army Ammunition Plant. These are scanned documents and not included in the Administrative Record.

A Decision Document, including the Static Test Area, presenting a no action decision for the Static Test Area was presented in 2008 (Shaw, 2008a)

4.3 Petroleum and Petroleum Products

4.3.1 Underground and Above-Ground Storage Tanks (UST/AST)

Current UST/AST Sites -There are no underground and/or aboveground petroleum storage tanks (UST/AST) remaining on the Property. There is no evidence of petroleum releases from these sites.

Former UST/AST Sites -There were one underground and four aboveground storage tanks (UST/AST) on the Property; all have been removed. The Sewage Treatment Plant had one 280-gallon UST, containing diesel fuel, located at former building 12G/15-G. This UST was removed in 1993. One petroleum AST was located at the Static Test Area. The AST was located at Building 30-T, contained 20,000 gallons diesel, out of use in 1998, and removed prior to 2003. There is no evidence of petroleum releases from these sites.

4.3.2 Non-UST/AST Storage, Release, or Disposal of Petroleum Products

There is no evidence that non-UST/AST petroleum products in excess of 55 gallons were stored for one year or more on the Property.

Table 6 presents the petroleum products storage, release, or disposal of petroleum products on the Property.

4.4 Polychlorinated Biphenyls

There is evidence of a release from a polychlorinated biphenyls (PCB)-containing transformer at the Static Test Area, Building 23-T in February 1984. A transformer containing 536 ppm PCBs reportedly leaked approximately 75 gallons of oil (Plexus, 2005). The leaking transformer at 23-T was moved to proper storage and the area was covered on 22 February, 1984. Cleanup of the spill was planned for March 1984. No confirmation of cleanup of the spill has been located. However, Sverdrup, 2000, in a Phase III Remedial Investigation and Feasibility Study of group 4 Sites including LHAAP-35C (53) at the Static Test Area, collected soil samples from 0-0.5 feet, 1-3 feet, and 3-5 feet in July 1998. No detectable concentrations of PCBs were identified in any sample. The Phase II ESA at the Static Test Area found only one sample, collected in November 2003, detecting PCBs. This sample detected Aroclor 1260 at a concentration of 35 µg/Kg, well below the industrial outdoor worker medium-specific screening level (MSSL) of 830 µg/Kg. PCBs were not detected in groundwater (Plexus, 2005). Groundwater samples were collected from seven monitoring wells at LHAAP-35C (53) during the Phase III Investigation, with no detectable concentrations of PCBs identified in any sample. PCBs were not detected in either soil or groundwater samples analyzed during various phases of investigation at the Static Test Area (Shaw, 2008a). Thus no evidence of a release from PCBs remains at the Static Test Area.

4.5 Asbestos

Only five historic buildings and the concrete structure remnants of two demolished buildings remain on the Property. The five historic buildings (34-T, 36T-1, 36T-2, 36T-3, and 36T-4) are located in the southern portion of the Static Test Area Parcel and are eligible for National Register of Historic Places (NRHP). NRHP eligibility mandates that no demolition of these properties will be permitted to occur, and that the NRHP eligible district boundary will be clearly marked and identified to installation personnel and other contractors in order to prevent any inadvertent impacts (Communication between the U.S.

Army and the Texas Historical Commission, August, 2000). The communication between the U.S. Army and the Texas Historical Commission is included in **Attachment 4**. The five historic buildings are in a current state of disrepair with noted sections of ceiling falling down. Since the buildings remain, there is potential for friable asbestos-containing material (ACM) (e.g. within the building insulation or roofing). Warning signs for ACM along with a locked fence surround the historical buildings.

Although all other buildings have been demolished, some monolithic concrete walls and slabs remain. Therefore, a potential for concealed ACM remains associated with buildings and underground thermal pipe insulation that may be present (e.g. within the building expansion joints and cavities of the remaining monolithic concrete walls and/or underground piping). A March 2009 visual inspection of the Property revealed that in addition to concrete walls and slab, two former buildings in the Y-Area Parcel have concrete roofs; Buildings 38-Y and 40-Y. These buildings' roofs are covered with a tar-like substance and gravel. The tar-like substance would need to be assumed to be asbestos-containing material (ACM) until sampled and analyzed.

The appropriate asbestos notice and covenant for inclusion into the transfer is provided in the Environmental Protection Provisions **(Attachment 3)**. A summary of the asbestos survey for the buildings in the Plexus (2005) ESA is presented in **Table 7**.

4.6 Lead-Based Paint

Five historic buildings remain on the Property, all constructed prior to 1978. The five are historic buildings located in the Static Test Area; 34-T, 36T-1, 36T-2, 36T-3, and 36T-4. All five buildings are in disrepair, and all remaining painted surfaces should be presumed to contain one or more coats of lead-based paint (LBP).

All other buildings have been demolished. Slabs and monolithic concrete walls and the concrete roofs of two additional buildings in the Y-Area (38-Y and 40-Y) remain on the property and may still contain some paint on the surfaces of these structures. All remaining painted surfaces should be presumed to contain one or more coats of LBP until tested and determined otherwise.

In accordance with the Residential Lead-Based Paint Reduction Act of 1992, the Army does not intend to abate the LBP presumed to be present on these structures because they are not intended to be used as residences. No sampling related to LBP in soil has occurred on the property. In conformance with DoD policy, the subject property is to be transferred "as is" regarding any LBP contained in buildings and associated structures. The appropriate LBP notice and covenant for inclusion into the transfer letter is provided in the Environmental Protection Provisions (**Attachment 3**).

4.7 Radiological Materials

There is no evidence that radioactive material or sources were stored on the Property.

4.8 Radon

Radon surveys were conducted in 1991 and 1992 in 50 buildings at LHAAP, including buildings on the property. Radon was not detected at or above the USEPA residential action level of 4 picocuries per liter (pCi/L). Additionally, the USEPA assigned Harrison County, Texas as a Radon Zone 3 county as it is within an area identified as a low potential for radon. Zone 3

indicates the average short-term radon measurement is expected to be less than 2 pCi/L in a building without implementation of radon control methods.

4.9 Munitions and Explosives of Concern (MEC)

Munitions and Explosives of Concern (MEC), which distinguishes categories of military munitions that may pose unique explosives safety risks, means: (A) unexploded ordinance (UXO), as defined in 10 U.S.C. §101(e)(5); (B) discarded military munitions (DMM), as defined in 10 U.S.C. §2710(E)(2); or (C) munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. §2710(e)(3), present in high enough concentrations to pose an explosive hazard.

No MEC items were identified or recovered at LHAAP-002-R, the MRS located in the Static Test Area Parcel. Accordingly, the MEC density, ordnance-type hazard, and sensitivity factors are all assigned a value of 0. Therefore, there is no MEC risk identified at LHAAP-002-R (Cape, 2007).

An inspection of the buildings at LHAAP for contamination from energetic compounds used during the production of weapons and explosives was completed prior to demolition activities (Plexus, 2005). The static rocket motor firing stands in the Static Test Area were also decontaminated for explosives when they were taken out of use (CES, 1998 and Plexus, 2005).

Table 8 lists the remaining buildings on the Property which were involved in the production of weapons and explosives or static rocket motor firing and subsequently decontaminated of explosives hazards.

The letter of transfer will contain the notice for the potential presence of MEC provided in the Environmental Protection Provisions **(Attachment 3).**

4.10 Other Property Concerns

There are no other hazardous conditions on the Property that present an unacceptable risk to human health and the environment.

5.0 ADJACENT PROPERTY CONDITIONS

The Y Area and Static Test Area parcels are completely surrounded by property previously transferred to the USFWS. There are no hazardous conditions adjacent to these sites that present an unacceptable risk to human health and the environment.

The Former Sewage Treatment Plant Tract of the Production Area Parcel is in proximity to the Production Area and LHAAP-47 (Plant 3/Hand Signal Assemblies) on the northernmost side as shown in **Figure 3**. LHAAP-47 is an ECP Category 5. LHAAP Property to the northeast, east, and southeast of the Property has previously been transferred to the USFWS. To the west and northwest of the Former Sewage Treatment Plant Tract is property owned by the U.S. Army.

ECP Category 5 is defined as areas where release, disposal, and or migration of hazardous substance has occurred, and the removal or remediation actions are underway, but all required remedial actions have not yet been taken.

A list of ECP Categories is shown on **Attachment 2**.

A portion of the Former TNT Waste Disposal Plant Tract of the Production Area Parcel is contiguous to a portion of LHAAP-29 (Former TNT Production Area) as shown in **Figure 4**.

LHAAP-29 is an ECP Category 5. The Former TNT Waste Disposal Plant Tract is upgradient of LHAAP-29, and there is no indication that potential contamination has migrated from the adjacent LHAAP-29 to the Property. All remaining property adjacent to the Former TNT Waste Disposal Plant Tract has been previously transferred to the USFWS. A list of adjacent environmental sites with corresponding ECP categories is presented in **Table 9.**

6.0 ENVIRONMENTAL REMEDIATION AGREEMENTS

The LHAAP Federal Facilities Agreement (FFA), effective as of December 30, 1991, by and between the LHAAP, the Texas Water Commission (currently known as the TCEQ), and the USEPA Region 6 applies to two of the environmental sites on the Property, LHAAP-32 and LHAAP-49. No further investigation or remedial action is required for the Property proposed for transfer. The Letter of Transfer will include a provision reserving the Army's right to conduct remediation activities if necessary in the future.

7.0 GROUNDWATER MONITORING WELLS

The property proposed for transfer contains 24 monitoring wells as shown on **Figures 3, 4, 5, and 6.** A list of monitoring wells including survey information is provided in **Table 10.** The letter of transfer will include the groundwater monitoring well notice and covenant provided in the Environmental Protection Provisions **(Attachment 3)**.

8.0 POTENTIAL WETLANDS

Although an official wetland survey has not been conducted, an unofficial wetland delineation obtained from the USFWS National Wetlands Inventory (USFWS, 2011) indicates there may potentially be wetlands on some of the parcels. There have been no requests to exercise jurisdiction over potential wetlands (i.e. for redevelopment of the property) on the property and therefore there has been no official wetland survey conducted by the U.S. Army Corps of Engineers.

9.0 ENDANGERED OR THREATENED SPECIES

No federally endangered species have been confirmed on the Property proposed for transfer. Following is a list of federally threatened species that are known or suspected to occur in the vicinity of LHAAP (species that have been confirmed are listed in *italics*);

Federal Listed Threatened Species:
Bald Eagle
Louisiana Black Bear

Following is a list of State threatened species that are known or suspected to occur in the vicinity of LHAAP. Two State endangered species (in *italics*) have been confirmed on Longhorn and are potentially present on the Property proposed for transfer:

State Listed Threatened Species:

Louisiana Black Bear
Rafinesque Big-Eared Bat
Alligator Snapping Turtle

Timber Rattlesnake
Bluehead Shiner

Some evidence is available regarding presence of the Timber Rattlesnake at Longhorn. This State-listed species is described in historical site documents as being confirmed present on the site on a visual observation documented in 1993. Wildlife experts familiar with the site have indicated that potential habitat suitable for the Timber Rattlesnake is present on the LHAAP site and LHAAP is within this species' historical range. However, there is no recent documented evidence of this species being present on site and it has not been observed by USFWS wildlife personnel stationed at the installation. It is assumed that the Timber Rattlesnake is potentially present (Shaw, 2007c).

10.0 HISTORICAL, CULTURAL, AND ARCHEOLOGICAL PROPERTIES

Two sites on the Property fall into an "undetermined" category for archaeological significance, justifying protection pending further investigation (Perttula and Nelson, 1999). A small number of lithic artifacts were found in shovel tests at Sites 41HS817 and 41HS818 (Static Test Area Parcel). Another study, Geo-Marine, 1996, either did not investigate the Property or found no cultural concerns.

The Property contains the only buildings at LHAAP eligible for inclusion in the National Register of Historic Places (NRHP). These five building (34-T, 36T-1, 36T-2, 36T-3, and 36T-4) are located at the Static Test Area. The five buildings referenced are the site of the 1988 destruction of Pershing 1A and Pershing II missiles under the Intermediate Nuclear Forces (INF) Treaty. No other remaining buildings at LHAAP are eligible as they are not related to a specific cold war event (Texas Historical Commission, 2000). Correspondence between the Texas Historical Commission and the Fort Worth District, United States Army Corps of Engineers is located in **Attachment 4.**

11.0 REGULATORY COORDINATION

LHAAP-08, LHAAP-32, LHAAP-48, LHAAP-49 , LHAAP-53, LHAAP-002-R, LHAAP-55 (septic tanks located on LHAAP-48 and LHAAP-35C (53)), and LHAAP-35/36 (those sumps and waste rack sumps included in LHAAP-35/36 that are located on the Property) were included in No Action Decision documents (Shaw, 2008, 2008a, 2008b, 2010, 2010a). These documents were issued by the U.S. Army, the lead agency for this installation. USEPA Region 6 and the Texas Commission on Environmental Quality (TCEQ) are the regulatory agencies providing technical support, project review and comment, and oversight of the U.S. Army cleanup programs. The USEPA and TCEQ concur with the No Action decisions. The recommendation for no action is consistent with the criteria required under CERCLA. None of the CERCLA §121 statutory determinations are necessary in this action since no remedy is being selected. No remedial action is necessary to ensure protection of human health and the environment.

The No Further Action decisions were chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300.

12.0 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE

The environmental impacts associated with the proposed transfer of the Property have been analyzed in accordance with the National Environmental Policy Act. The results of this analysis have been documented in the Categorical Exclusion and Record of Environmental Consideration (U.S. Army, 2014) which is supported by the Final Environmental Site Assessment Phase I and II Report for the Production Areas, prepared by Plexus Scientific Corporation, February 2005. Other than notification of the historical site (five buildings) in the Static Test Area Parcel, there were no encumbrances or conditions identified in the NEPA analysis as necessary to protect human health or the environment.

13.0 ENVIRONMENTAL PROTECTION PROVISIONS

On the basis of the above results from the Environmental Baseline Survey and other environmental studies, and in consideration of the intended use of the Property as a wildlife refuge under the Administration of the U. S. Fish & Wildlife Service, certain terms and conditions are required for the proposed transfer. These terms and conditions will be set forth in the Environmental Protection Provisions **(Attachment 3)** and will be included in the Letter of Transfer. In the event that the Property or any part thereof, is sold, conveyed, transferred, leased, or otherwise disposed of, the notices, covenants, and restrictions contained in the Environmental Protection Provisions **(Attachment 3)** shall be inserted in any instrument of conveyance.

14.0 CONCLUSIONS

Based on the above, the Property is determined to be suitable for transfer to the U. S. Fish & Wildlife Service for nonresidential use.

Thomas E. Lederle
Chief
ACSIM BRAC Division
United States Army

Tables

TABLE 1 – DESCRIPTION OF PROPERTY
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
KARNACK, TEXAS

Parcel	Property Description	ECP Category	Remedial Actions
Production Area Parcel, Former Sewage Treatment Plant Tract	**Former Sewage Treatment Plant Tract**, 3.82 acres, consisted of an Imhoff tank, a sand filter, and three sludge beds. Sludge was dried on sand beds, and then shipped to Landfill 16. The wastewater collection system was comprised of 6-inch to 15-inch pipelines, which transported the influent to the Sewage Treatment Plant. The Sewage Treatment Plant received domestic wastewater, storm water, boiler blowdown, laundry wastes, vehicle wash rack wastes, and effluent from film development at the X-ray facility. Operation of the site began in 1942; it was closed in 1999 in accordance with the requirements of the TNRCC-approved closure plan. Although this site was identified as a SWMU in the RFA, the TNRCC (Texas Commission of Environmental Quality, TCEQ) determined that there were no additional investigations required.	3	**LHAAP-08, Former Sewage Treatment Plant,** is the only environmental site located within this transfer parcel (**Figure 3**). LHAAP-08 covers most of the transfer parcel. There are no other environmental sites located within this transfer parcel. A release, disposal, and/or migration of hazardous substances have occurred, but at concentrations that do not require a removal or remedial action. The Sewage Treatment Plant was closed in 1999 in accordance with the requirements of the TNRCC-approved closure plan. Although this site was identified as a SWMU in the FRA, the TNRCC determined that no additional investigations were required. No measurable concentrations of SVOCs, explosive compounds, pesticides, or PCBs were detected in any soil sample collected in 2000. One VOC, methylene chloride, was detected in one soil sample at a low concentration near its detection limit. Lead, mercury, and silver were detected with concentrations evenly distributed among the soil samples, with the exception of one elevated silver concentration measured near the Dunbar filters, which processed waste from the X-ray film development laboratory. The concentration of silver decreased considerably in the 3- to 5-foot interval of the sampling location. Two dioxin compounds (octochlorodibenzo-p-dioxin and hexachlorodibenzo-p-dioxin) were detected at low concentrations in seven of eight samples analyzed (Jacobs, 2002b). Four soil samples were collected in 2000 for perchlorate analysis only. One of the samples taken from the 1 to 2 foot interval contained detectable perchlorate at a concentration of 32 micrograms per kilogram (Jacobs, 2002b). No detectable concentrations of SVOCs, explosive compounds, pesticides, or PCBs were detected in groundwater. Acetone, a common laboratory contaminant, was detected the only VOC detected in groundwater samples. Fourteen metals were detected in groundwater at low concentrations. Eight dibenzodioxins or dibenzofuran compounds were detected at low levels (Jacobs, 2002b). Two groundwater monitoring wells were sampled for perchlorate during a 2001 sampling event. Perchlorate was detected at a concentration of 10 ug/L (STEP, 2003). In 2005, additional groundwater sampling was conducted. Four dibenzodioxins and perchlorate were detected in groundwater at low levels. Metals were not detected in the 2005 sampling event. LHAAP-08, proposed for transfer, does not have contaminated soils requiring remediation nor does the underlying groundwater contain contamination requiring remediative measures (Jacobs 2003). Limited monitoring in the form of Five-Year Reviews is required for LHAAP-08, because the risk evaluation, which was based on the reasonably anticipated future nonresidential use, does not address unrestricted use. The Five-Year Reviews will serve to document that the use of the site continues to be consistent with the industrial/recreational exposure scenario evaluated in the risk assessment. LHAAP-08 was included with LHAAP-48, LHAAP-35C (53), and LHAAP-002-R in a no action decision document (Shaw, 2008a). This document was issued by the U.S. Army, the lead agency for this installation. USEPA Region 6 and the Texas Commission on Environmental Quality (TCEQ) are the regulatory agencies providing technical support, project review and comment, and oversight of the U.S. Army cleanup program. The USEPA and TCEQ concur with the selected No Action decision. The recommendation for no action is consistent with the criteria required under CERCLA. None of the CERCLA §121 statutory determinations are necessary in this action since no remedy is being selected. No remedial action is necessary to ensure protection of human health and the environment.

`Parcel	Property Description	ECP Category	Remedial Actions
Production Area Parcel, Former TNT Waste Disposal Plant Tract	**Former TNT Waste Disposal Plant Tract,** 19.43-acres, was established in 1941, with production of TNT began in 1942 continuing through August 1945 (**Figure 4**). The facility was placed on standby status from August 1945 until February 1952. The facility was reactivated and production of pyrotechnic ammunition, simulators, hand signals, and tracers continued through 1956. Wastewater generated from the TNT Waste Disposal Plant was transferred to the disposal area through 6-inch wooden pipeline and stored in holding tanks until treated In 1959, most of the buildings and tanks used in the disposal process were removed and the debris burned at Burning Ground No. 2/Flashing Area (Site 17).	4	**LHAAP-32**, **Former TNT Waste Disposal Plant,** is the only environmental site located within this transfer parcel (**Figure 4**). LHAAP-32 covers most of the transfer parcel. There are no other environmental sites located within this transfer parcel. A release, disposal, and/or migration of hazardous substances have occurred, but removal or remedial actions to protect human health and the environment have been taken. Starting in 1959, all the buildings associated with the Former TNT Waste Disposal Plant were demolished and all of the tanks have been removed from the site. The results of installation-wide investigations, site-specific investigations were conducted in a phased approach between 1988 and 2005, to establish the nature and extent of contamination at LHAAP-32 (Jacobs, 2001; Jacobs, 2002; Plexus, 2005). The initial investigations indicated elevated levels of metals at one sampling location and high levels of explosive constituents in the upper 0.5 feet of soil at another sampling location. In 2002 a human health risk assessment (HHRA) was conducted (Jacobs, 2003) which indicated unacceptable risk to a maintenance worker primarily from a high concentration of TNT detected in the former settling pond. In 2004 the Army re-sampled that location and the area around it. The re-sampling of the settling pond did not replicate the high detection of TNT with only one soil sample located within the former settling pond having a low detection of TNT. The TNT concentration was three orders of magnitude lower than previously detected in the area, and was not considered in the later risk assessment (Shaw, 2005). There are no chemicals of concern for exposures of potential residents to the soil at LHAAP-32; therefore no action for soil is necessary at LHAAP-32. Initial groundwater sampling results indicated antimony, arsenic, and lead in concentrations above maximum contaminant levels (MCLs). These chemicals are not related to past operations at LHAAP-32. These chemicals were suspected to be related to turbidity of the groundwater samples. Re-sampling results confirmed that elevated metals levels were associated with high turbidity and not representative of groundwater conditions at the site. Non-cancer and cancer risk were acceptable for groundwater (Jacobs, 2002). Mercury and lead were detected within a building foundation at the Former TNT Waste Disposal Plant above groundwater protection standards. The contaminated sediment was removed and backfilled with clean soil in 2003 (CES, 2003). TNT was detected in a single soil sample in 2002 (Jacobs, 2002), but confirmation sampling did not replicate the original results (Shaw, 2005). No further action is required at this site (Shaw, 2008b). The BERA (Shaw, 2007c) concluded that no unacceptable risk was present at the site, therefore no action is needed at LHAAP-32 for the protection of ecological receptors LHAAP-32, proposed for transfer, does not have contaminated soils requiring remediation nor does the underlying groundwater contain contamination requiring remediative measures The Army submitted the draft version of the Final Site Evaluation Report to USEPA Region 6 in October 2005, and written concurrence with the recommendation of no action was received November 2005. The letter of concurrence from the USEPA Region 6 to the Army was received November 21, 2005 (USEPA, 2005). LHAAP-32, proposed for transfer, does not have contaminated soils requiring remediation nor does the underlying groundwater contain contamination requiring remediative measures. LHAAP-32 was the subject of a no action record of decision document (Shaw, 2008b). This document was issued by the U.S. Army, the lead agency for this installation. USEPA Region 6 and the Texas Commission on Environmental Quality (TCEQ) are the regulatory agencies providing technical support, project review and comment, and oversight of the U.S. Army cleanup program. The USEPA and TCEQ concur with the selected No Action decision. The recommendation for no action is consistent with the criteria required under CERCLA. None of the CERCLA §121 statutory determinations are necessary in this action since no remedy is being selected. No remedial action is necessary to ensure protection of human health and the environment. Risk evaluations for LHAAP-32 determined that the site is suitable for unrestricted use.

Parcel	Property Description	ECP Category	Remedial Actions
Y-Area Parcel, Former Igniter Production Area	**Former Igniter Production Area ,** also referred to as the Y-Area, is 17.24-acres, and was built during the construction of Plant 3 from 1953 through 1955. This site is completely surrounded by an area (approximately 7,000 acres) that was transferred by the U.S. Department of the Army to the USFWS for management as the CLNWR. The Igniter Production Area was a small production area that was active until recently. It was used for the production of igniters used in pyrotechnic and illuminating devices, along with production of some illuminating devices themselves (Jacobs, 2002i). In 1966, the last of the hand-held signal manufacturing operations were removed from Plant 2 (LHAAP, 1967a). As of 1970, the area was used to produce a variety of illuminating and smoke signal flares. The area facilities included an assembly building, a star consolidating building, a star assembly building, and various support buildings (Kaiser Engineering, 1970). Buildings and equipment at this area were periodically washed down with water to reduce PEP dusts, which would otherwise collect and pose a safety hazard. Chlorinated solvents were also used to dissolve difficult binders. These solvents and PEP compositions were washed into sumps with large volumes of water. The waste sumps typically collect a large volume of water and PEP sludge from building washdown (Sverdrup, 1997b)	3	**LHAAP-48, Y-Area Parcel,** contains a total of three environmental sites located within this transfer parcel, LHAAP-48 (The Igniter Production Area), LHAAP-35/36 (sumps and waste rack sumps) and LHAAP-55 (Septic tanks). LHAAP-48 covers most, but not all, of the transfer parcel (**Figure 6 and Figure 7**). This area was used for the production of igniter parts used in pyrotechnic and illumination devices, and was also used for the production of some illuminating devices. This site was active until about 1997 (Jacobs, 2003). A release, disposal, and/or migration of hazardous substances have occurred, but at concentrations that do not require a removal or remedial action. Previous investigations were conducted by Jacobs and others from 1982 through 2002 (Jacobs, 2002a) culminating in the Final Baseline Human Health and Screening Ecological Risk Assessment (Jacobs, 2003). Between 1991 and 2005, soil and groundwater were sampled using a phased approach to determine the nature and extent of contamination. Soils samples were collected at several locations and depths including areas around sumps at LHAAP-48. Detected compounds in soils included VOCs, SVOCs, metals, PCBs, pesticides, and dioxins/furans. A human health risk assessment (HHRA) conducted in 2003 indicated no unacceptable cancer risk or non-cancer hazard to a future maintenance worker or trespasser from detected compounds in the soil. Six monitoring wells were installed at the site. Five wells were installed in 1994 with stainless screen in the shallow groundwater-bearing zone. One well was installed in 2004 in the intermediate zone with PVC screen. Groundwater samples were collected from 1994 through 2005. Thallium and dioxins were detected in the early sampling events. Metals, including arsenic, antimony, chromium, and lead were detected in the initial sampling event above their respective MCL (Jacobs, 2003). Pre-2003, samples were collected in turbid water. Post-2003 sampling using low flow sampling method to reduce turbidity. Metals detected above their MCL prior to 2004 were not detected or were below their associated MCLs in subsequent sampling events in both filtered and unfiltered samples using the low-flow technique, with the exception of chromium (Shaw, 2007a, 2007b). Corrosion of the stainless steel screen was determined to elevate chromium concentrations. A well using a PVC screen was installed in the same zone. Chromium concentrations in groundwater with a PVC screen were below the MCL (Shaw, 2007b). SVOCs, explosive compounds, pesticides, and PCBs were not detected in or detected at low concentrations in groundwater samples in all sampling events. The only detected VOC exceeding the MCL was trichloroethene (TCE) in a 1996 sampling event, with a concentration of 9ug/L, above the MCL of 5ug/L. TCE has not been detected since 1998. Dioxin/furan compounds were detected in all sampling events. Dioxin/furans are a family comprising individual compounds called congeners. All calculated toxicity equivalence quotients based on sampling data were below the MCL (Shaw, 2007b). The installation-wide BERA (Shaw, 2007c) concluded that no unacceptable risk was present in LHAAP-48, therefore no action needed for the protection of ecological receptors. LHAAP-48, proposed for transfer, does not have contaminated soils requiring remediation nor does the underlying groundwater contain contamination requiring remediative measures. The lead agency determined that no CERCLA action is necessary to protect public health or environment at LHAAP-48. Risk evaluations conducted for LHAAP-48 determined that the site is suitable for unrestricted use (Shaw, 2008a).

Parcel	Property Description	ECP Category	Remedial Actions
Y-Area Parcel, Former Igniter Production Area (continued)	**Former Igniter Production Area,** also referred to as the Y-Area, is approximately 17.24-acres more/less, and was built during the construction of Plant 3 from 1953 through 1955. This site is completely surrounded by an area (approximately 7,000 acres) that was transferred by the U.S. Department of the Army to the USFWS for management as the CLNWR. The Igniter Production Area was a small production area that was active until recently. It was used for the production of igniters used in pyrotechnic and illuminating devices, along with production of some illuminating devices themselves (Jacobs, 2002i). In 1966, the last of the hand-held signal manufacturing operations were removed from Plant 2 (LHAAP, 1967a). As of 1970, the area was used to produce a variety of illuminating and smoke signal flares. The area facilities included an assembly building, a star consolidating building, a star assembly building, and various support buildings (Kaiser Engineering, 1970). Buildings and equipment at this area were periodically washed down with water to reduce PEP dusts, which would otherwise collect and pose a safety hazard. Chlorinated solvents were also used to dissolve difficult binders. These solvents and PEP compositions were washed into sumps with large volumes of water. The waste sumps typically collect a large volume of water and PEP sludge from building washdown (Sverdrup, 1997b)	3	**Sumps and Waste Rack Sumps (LHAAP-35/36)** Sumps and Waste Rack Sumps at Longhorn Army Ammunition Plant are physically located within sites LHAAP-04, LHAAP-18, LHAAP-29, LHAAP-39, LHAAP-46, LHAAP-47, LHAAP-48, LHAAP-35C (53), LHAAP-35A (58), LHAAP-59, and LHAAP-66, and have been collectively designated as LHAAP-35 (sumps) and -36 (waste rack sumps). Sumps were typically associated with production buildings and collected washdown water. Waste rack sumps collected water where containers were cleaned and stored. There are a total of 125 sumps and 20 waste rack sumps located at the facility (Shaw, 2006b), of which 14 sumps and three waste rack sumps are located within the transfer parcels. The Igniter Production Area contains nine sumps (LHAAP-35), and three waste rack sumps (LHAAP-36). Sumps located on the transfer parcel include SUMP094, SUMP095, SUMP096, SUMP097, SUMP098, SUMP099, SUMP100, SUMP101, and SUMP123. Waste rack sumps located on the transfer parcel are WRSUMP001, WRSUMP002, and.WRSUMP003. All sumps and waste rack sumps located within the transfer parcel were classified as requiring no further action (**Table 3**). Locations of sumps and waste rack sumps located within the transfer parcel are depicted on **Figure 7.** The BERA (Shaw, 2007c) concluded that no unacceptable cancer and noncancer risk was present and therefore, no action was needed at LHAAP-35/36 sumps and waste rack sumps for the protection of ecological receptors. TCEQ concurs that no action is required for LHAAP-35/36 (Shaw, 2010). Because the sumps and waste rack sumps were evaluated for industrial use and not unrestricted use, the TCEQ required that a notification be filed in the Harrison County records stating that the land is considered suitable for non-residential use. Limited monitoring in the form of Letters of Certification transmitted every five years from the Army or the transferee to TCEQ will be conducted to document that the use of the land associated with LHAAP-35/36 sumps is consistent with the non-residential use scenarios (Shaw, 2010). **Septic Tanks (LHAAP-55)** LHAAP-55 consists of 10 septic tanks with outfalls to ditches, which served outlying areas of the installation. Two septic tanks are located within the transfer parcel (**Figure 7**). In 1991 the nine septic tanks (Septic Tanks -02 through -10) were tied to the sewage treatment plant. A National Pollutant Discharge Elimination System (NPDES) permit TX0060836 was associated with this septic tank. There is no history of industrial waste being placed into these septic tanks (Plexus, 2005). Contents of septic tanks were pumped out and transferred to the sewage treatment plant as needed. The effluent was chlorinated prior to discharge. The Igniter Production Area Parcel contains two septic tanks, ST-02 and ST-03. Locations of the septic tanks within the transfer parcel are depicted on **Figure 7**.Both septic tanks were associated with toilets/shower of their respective buildings. No chemicals were detected in soil at LHAAP-55 except beryllium and lead, which were detected above applicable TCEQ MSCs in samples from one location. An additional sample from this location underwent SPLP analysis, with the results indicating all chemicals in soil were below the applicable MSC or passed the SPLP test, indicating beryllium and lead concentrations in soil are of no further concern (Shaw, 2006a). Therefore, no further investigation or action is required at LHAAP-55. The USEPA (2007) and TCEQ (2008) concur that no further investigation or action is required for LHAAP-55. The TCEQ (2008) required notification be filed in the Harrison County records stating that the land is considered suitable for non-residential use. Limited monitoring in the form of Letters of Certification transmitted every five years from the Army or transferee to TCEQ will be conducted to document that the use of land associated with LHAAP-55 septic tanks is consistent with the non-residential use scenarios (Shaw, 2008).

Parcel	Property Description	ECP Category	Remedial Actions
Production Area Parcel, Former Acid Storage AreaTract.	**Former Acid Storage Area.** The 31.1-acre Acid Storage Area was used from 1942-1945 for formulation and storage of acids and acid mixtures in support of TNT production during World War II. Nitric acid and sulfuric acid were manufactured and handled in this area. There are no known process releases that took place at the Acid Storage Area. The site is primarily bounded by 4th Street to the northwest and 6th Street to the southeast. Former facility structures, no longer present, included process buildings and several ASTs located in the central portion of the site.	3	**LHAAP-49, Former Acid Storage Area,** is the only environmental site located within this transfer parcel (**Figure 5**) and LHAAP-49 covers most of the transfer parcel. A release, disposal, and/or migration of hazardous substances have occurred, but at concentrations that do not require a removal or remedial action. Initial investigations at LHAAP-49 began in 1998 with a Phase III RI conducted by Sverdrup followed by a field investigation conducted by Jacobs in 2000. The results of these investigations are summarized in the Final Remedial Investigation Report Addendum – Group 2 Sites (Jacobs, 2002c). Elevated levels of lead and mercury were detected in soils. No explosives, perchlorate, or SVOCs were detected in any soil samples at LHAAP-49. No PCBs, pesticides, perchlorate, explosives, or SVOCs were detected in groundwater at LHAAP-49 during the 1998 and 2000 investigations. Groundwater detections above their MCLs in one or more samples included antimony, arsenic, chromium, selenium, and nitrate/nitrite. (Jacobs, 2002c). The antimony MCL exceedances occurred in 1998 and were not repeated in subsequent sampling events including low-flow techniques used in 2005 and later. A human health baseline assessment (BHHRA) (Jacobs, 2002) was performed using the data presented in the Group 2 RI (Jacobs, 2002c). This assessment identified metals as COPCs for soil and groundwater at LHAAP-49. Subsequent investigations at LHAAP-49 were conducted by the USFWS (two surface soil samples) in 2002, USACE (13 surface soil samples) in 2004, and by Shaw Environmental & Infrastructure (22 soil samples, four sediment samples, and one surface-water sample). Soil investigations after the BHHRA focused on two metals with elevated concentrations, lead and mercury. The highest concentrations of mercury in soil were localized in a small area northwest of 4th Street near former laboratory facilities. Locations where lead was detected at the highest concentrations in soil can be correlated with the historic layout of process facilities and acid storage tanks previously used at the site. Shaw (2009a) evaluated the potential for contamination to migrate from soil to groundwater. COPCs identified were lead, mercury, and vanadium. Soil contaminants have had over 60 years to potentially migrate to groundwater; however there are no lead, mercury, or vanadium concerns in the groundwater. A computer models examined vertical migration of the chemicals, with results also demonstrating these chemicals would not adversely impact groundwater. The highest concentrations of mercury in soil were localized in a small area northwest of 4th Street near former laboratory facilities. Although the BHHRA (Jacobs, 2002) evaluated overall human health and ecological risks associated with soil at LHAAP-49 to be acceptable, two soil samples locations at LHAAP-49 found mercury concentrations markedly higher than mercury concentrations from samples elsewhere within LHAAP-49. A new BHHRA of LHAAP-49 was conducted in 2009 including the additional data collected after the 2002 risk analysis was completed. The findings of the 2009 evaluation confirmed the results of the 2002 risk assessment that the site was suitable for nonresidential use, and EPA concurred with the results of the evaluation. However, TCEQ expressed a concern that a mercury hot spot existed at the site in the area of the two high mercury detections. The U.S. Army and TCEQ agreed that removal of soil in the vicinity of these two sample locations would eliminate the need for additional evaluation of hot spot risks (Shaw, 2009a). A voluntary removal action was conducted by the contractor at the site (Shaw 2009a). Soil was excavated to a depth of 1.0 feet bgs around the soil sample locations with the high mercury concentrations at LHAAP-49 and backfilled with clean soil in October 2008. Additional groundwater sampling was conducted in May 2005, October 2007, October and December 2008, and February, April, and May 2009 to address metals and nitrates/nitrites concerns. Elevated nitrate/nitrite concentrations were associated with a well that was typically dry. Groundwater samples collected from a replacement monitoring well did not exceed the nitrate/nitrite MCL. Chromium was associated with corrosion of the screen and casing material used to complete the well. The replacement well, using different screen and casing material, did not encounter the chromium problem. Arsenic, manganese, and antimony were found to be naturally occurring and/or associated solid particulates drawn into the samples. Evaluation of groundwater results at LHAAP-49 demonstrate that occurrences of metals and nitrates/nitrites above their MCLs are issues that require further action at the site and where included as COPCs in the risk analysis(Shaw, 2009a). No COCs were identified for the groundwater at LHAAP-49. The LHAAP-49 ROD determined the site to be suitable for nonresidential use and that no remedial action is necessary to ensure protection of human health and the environment (Shaw, 2010a).

			Risk evaluations were based on the reasonably anticipated future nonresidential use, the State of Texas requires that a notification be filed in the Harrison County, Texas records stating that the land is considered suitable for future nonresidential use. Limited monitoring will be conducted to certify that the use of the site remains consistent with the nonresidential use scenarios evaluated in the risk assessment and will be documented in the form of Letters of Certification from the Army or transferee to TCEQ every five years.

Parcel	Property Description	ECP Category	Remedial Actions
Static Test Area Parcel	**Static Test Area Parcel.** The Static Test Area parcel, approximately 40.37 acres more/less, was used for testing and evaluating products produced at LHAAP, including testing illuminating devices and static test firing rocket motors. Structures for these activities include a test tunnel and data acquisition system for flares, rocket motor test stands of earth and concrete and conditioning facilities for reproducing arctic and tropical temperatures. The site was active through 1998 (Jacobs, 2002d). This area used primarily for testing Nike, Sergeant, and Pershing rocket motors (Buildings 25-T and 36-T). Two of the six stands in the area were available for the elimination of Pershing II and Pershing 1a rocket motors pursuant to the INF Treaty. The stands are constructed of steel plate and concrete (EBASCO, 1998c). There were seven support buildings in the area. In addition, two structures, an observation bunker and a metal building for preparing the rocket motors for destruction, were constructed (EBASCO, 1988c). This site is located next to the HMX Area and approximately one mile behind LHAAP-16 Findings of the Army's PA concluded that NFA is necessary (U.S. Army, 2003a).	4	**LHAAP-35C (53), Static Test Area (Figure 6 and Figure 7),** contains a total of four environmental sites located within this transfer parcel, **LHAAP-35C (**53) (The Static Test Area), **MMRP LHAAP-002-R** (Static Test Area) (**Figure 6 and Figure 7**), **LHAAP-35/36** (sumps and waste rack sumps) (**Figure 7**) and **LHAAP-55** (Septic tanks) (**Figure 7**). A release, disposal, and/or migration of hazardous substances have occurred, but at concentrations that do not require a removal or remedial action. The Static Test Area was used for the testing of illuminating devices and static firing of rocket motors. Structures for this site included a test tunnel and a data acquisition system for flares, rocket motor test stands of earth and concrete, and conditioning facilities for reporting arctic and tropical temperatures. The site was active through 1998. <u>LHAAP-53</u> Detected compounds in soil at LHAAP-53 included VOCs, SVOCs, metals, pesticides, and dioxins/furans. An HHRA conducted in 2003 indicated no unacceptable cancer risk or non-cancer hazard to a future maintenance worker from detected compounds in the soil (Jacobs, 2003). Detected compounds in groundwater included metals, VOCs, SVOCs, dioxins/furans, and explosives collected through stainless steel screening material. Metals detected above their respective MCLs included thallium, silver, nickel, aluminum, arsenic, lead, antimony, and chromium. Sampling methods prior to 2003 could result in collecting turbid samples. Due to many of the samples having high turbidity, samples were filtered prior to analysis. Chromium was not detected in these samples. In 2005/2006, low-flow sampling methods were used to reduce turbidity. Results from this sampling event did not detect Thallium above its MCL in filtered or unfiltered samples (Shaw, 2007a, 2007b; Plexus, 2005b). Chromium was detected once in an unfiltered sample at 171ug/L. After filtering, chromium had an estimated value of 3.37ug/L, well below its MCL of 100ug/L. Corrosion of stainless steel is indicated to elevate other metals associated with stainless steel, as nickel. Detection of metals in groundwater samples are sporadic and marginally exceeding MCLs due to turbid groundwater samples. Metals in the groundwater due not pose a current threat to human health (Shaw, 2007b). SVOCs, explosive compounds, pesticides, perchlorate, or PCBs were not detected or detected at low concentrations in groundwater samples in all sampling events. VOCs, including TCE,1,2-dichloroethane, and bis(2-ethylhexyl)phthalate were detected in groundwater in the early sampling events prior to 1998 above their MCLs. Confirmation sampling to verify the presence of VOC contaminants above MCLs did not confirm earlier detections (Plexus, 2005). In later sampling events, VOCs were not detected or were at levels below their MCLs. Dioxin/furan compounds were detected in all sampling events. The calculated 2, 3,7,8-TCDD TEQ based on all sampling data was below the MCL of 30 pg/L (Shaw, 2007b). A residential risk assessment of groundwater and soil at LHAAP-35C was conducted in 2007, which included the additional data collected after the 2003 industrial risk assessment. The residential risk assessment found groundwater and soil at the site do not pose an unacceptable risk to a potential resident (Shaw, 2007a). The installation-wide BERA (Shaw, 2007c) concluded that no unacceptable risk was present in LHAAP-53, therefore no action needed for the protection of ecological receptors. LHAAP-35C (53), proposed for transfer, does not have contaminated soils requiring remediation nor does the underlying groundwater contain contamination requiring remediative measures. LHAAP-35C (53) was included in a no action decision document (Shaw, 2008a). This document was issued by the U.S. Army, the lead agency for this installation. USEPA Region 6 and the Texas Commission on Environmental Quality (TCEQ) are the regulatory agencies providing technical support, project review and comment, and oversight of the U.S. Army cleanup program. The USEPA and TCEQ concur with the selected No Action decision. The recommendation for no action is consistent with the criteria required under CERCLA. None of the CERCLA §121 statutory determinations are necessary in this action since no remedy is being selected. No remedial action is necessary to ensure protection of human health and the environment. Risk evaluations conducted for LHAAP-35C (53) determined that the site is suitable for unrestricted use (Shaw, 2008a).

Parcel	Property Description	ECP Category	Remedial Actions
Static Test Area Parcel (continued)	**Static Test Area Parcel.** The Static Test Area parcel, approximately 40.37 acres more/less, was used for testing and evaluating products produced at LHAAP, including testing illuminating devices and static test firing rocket motors. Structures for these activities include a test tunnel and data acquisition system for flares, rocket motor test stands of earth and concrete and conditioning facilities for reproducing arctic and tropical temperatures. The site was active through 1998 (Jacobs, 2002d). This area used primarily for testing Nike, Sergeant, and Pershing rocket motors (Buildings 25-T and 36-T). Two of the six stands in the area were available for the elimination of Pershing II and Pershing 1a rocket motors pursuant to the INF Treaty. The stands are constructed of steel plate and concrete (EBASCO, 1998c). There were seven support buildings in the area. In addition, two structures, an observation bunker and a metal building for preparing the rocket motors for destruction, were constructed (EBASCO, 1988c). This site is located next to the HMX Area and approximately one mile behind LHAAP-16 Findings of the Army's PA concluded that NFA is necessary (U.S. Army, 2003a).	4	**Sumps and Waste Rack Sumps (LHAAP-35/36)** Sumps and Waste Rack Sumps at Longhorn Army Ammunition Plant are physically located within sites LHAAP-04, LHAAP-18, LHAAP-29, LHAAP-39, LHAAP-46, LHAAP-47, LHAAP-48, LHAAP-35C (53), LHAAP-35A (58), LHAAP-59, and LHAAP-66, and have been collectively designated as LHAAP-35 (sumps) and -36 (waste rack sumps). Sumps were typically associated with production buildings and collected washdown water. Waste rack sumps collected water where containers were cleaned and stored. There are a total of 125 sumps and 20 waste rack sumps located at the facility (Shaw, 2006b), of which 14 sumps and three waste rack sumps are located within the transfer parcels (**Figure 7**). The Static Test Area contains five sumps (LHAAP-35), with no waste rack sumps (LHAAP-36). Sumps located on the transfer parcel include SUMP102, SUMP103, SUMP104, SUMP105 and SUMP800 (SUMP124). All sumps located within the transfer parcel were classified as requiring no further action (**Table 3**). Locations of sumps located within the transfer parcel are depicted on **Figure 7.** Post-2002 sampling contributed negligible increases to previous risk assessments, and as the cancer risk and noncancer values are well within the acceptable ranges, no further action is required for soil associated with sumps and waste rack sumps at LHAAP-35/36 (Shaw, 2008c, 2010). The BERA (Shaw, 2007c) concluded that no unacceptable risk was present and therefore, no action was needed at LHAAP-35/36 sumps and waste rack sumps for the protection of ecological receptors. TCEQ concurs that no action is required for LHAAP-35/36 (Shaw, 2010). Because the sumps and waste rack sumps were evaluated for industrial use and not unrestricted use, the TCEQ required that a notification be filed in the Harrison County records stating that the land is considered suitable for non-residential use. Limited monitoring in the form of Letters of Certification transmitted every five years from the Army or the transferee to TCEQ will be conducted to document that the use of the land associated with LHAAP-35/36 sumps is consistent with the non-residential use scenarios (Shaw, 2010).

Parcel	Property Description	ECP Category	Remedial Actions
Static Test Area Parcel (continued)	**Static Test Area Parcel.** The Static Test Area parcel, approximately 40.37 acres more/less, was used for testing and evaluating products produced at LHAAP, including testing illuminating devices and static test firing rocket motors. Structures for these activities include a test tunnel and data acquisition system for flares, rocket motor test stands of earth and concrete and conditioning facilities for reproducing arctic and tropical temperatures. The site was active through 1998 (Jacobs, 2002d). This area used primarily for testing Nike, Sergeant, and Pershing rocket motors (Buildings 25-T and 36-T). Two of the six stands in the area were available for the elimination of Pershing II and Pershing 1a rocket motors pursuant to the INF Treaty. The stands are constructed of steel plate and concrete (EBASCO, 1998c). There were seven support buildings in the area. In addition, two structures, an observation bunker and a metal building for preparing the rocket motors for destruction, were constructed (EBASCO, 1988c). This site is located next to the HMX Area and approximately one mile behind LHAAP-16 Findings of the Army's PA concluded that NFA is necessary (U.S. Army, 2003a).	4	**Septic Tanks (LHAAP-55)** The Static Test Area contains six septic tanks (**Figure 7**), ST-05, ST-06, ST-07, ST-08, ST-09, and ST-10. ST-05 was associated with a change house; ST-06 was described as being associated with the control house, ST-07, ST-09, and ST-10 were described as being associated with toilets or showers/toilets, and ST-08 was described as being associated with the Administration Building. In 1991 the six septic tanks located within the transfer parcel were tied to the sewage treatment plant. As indicated above, there is no history of industrial waste being placed into these septic tanks. Contents of the septic tanks were pumped out and transferred to the sewage treatment plant as needed. No chemicals were detected in soil at LHAAP-55 except beryllium and lead, which were detected above applicable MSCs in samples from one location. An additional sample from this location underwent SPLP analysis, with the results indicating all chemicals in soil were below the applicable MSC or passed the SPLP test, indicating beryllium and lead concentrations in soil are of no further concern (Shaw, 2006a). Therefore, no further investigation or action is required at LHAAP-55. The USEPA (2007) and TCEQ (2008) concur that no further investigation or action is required for LHAAP-55. The TCEQ (2008) required notification be filed in the Harrison County records stating that the land is considered suitable for non-residential use. Limited monitoring in the form of Letters of Certification transmitted every five years from the Army or transferee to TCEQ will be conducted to document that the use of land associated with LHAAP-55 septic tanks is consistent with the non-residential use scenarios (Shaw, 2008).

Parcel	Property Description	ECP Category	Remedial Actions
Static Test Area	**Static Test Area. MMRP Site LHAAP-002-R,** co-located with IRP Site LHAAP-35C (53).	4	LHAAP-002-R, co-located with LHAAP-35C (53), the Static Test Area, was designated a munitions response Site (MRS) because of the rocket motor static test firing and red phosphorous smoke and illuminating candle testing conducted at the site (**Figure 6 and Figure 7**). A release, disposal, and/or migration of hazardous substances have occurred, but at concentrations that do not require a removal or remedial action. The ECP Category classification is due to the co-location of this MMRP site with the IRP site. LHAAP-35C (53). A SI Report (E2M, 2005) recommended additional investigation for MEC items based on the presence of an expended flare casing noted during the site visit. Field activities conducted by Cape, 2007 neither found nor identified any MEC items at LHAAP-002-R (co-located with LHAAP-53), the Static Test Area. Surface soil sampling did not identify the presence of MC or WP at LHAAP-002-R. Since no MC or WP was detected in any samples collected at LHAAP-002-R, there is not a complete exposure pathway for MC or WP. Therefore the risk associated with MC is not evaluated since no MC is present at an unacceptable concentration (Shaw, 2008a). No MEC removal alternative was evaluated as there is no exposure pathway for MEC at this site. LHAAP-002-R, proposed for transfer, does not have contaminated soils requiring remediation nor does the underlying groundwater contain contamination requiring remediative measures. LHAAP-002-R was included with LHAAP-08, LHAAP-48, and LHAAP-35C (53) in a no action decision document (Shaw, 2008a). This document was issued by the U.S. Army, the lead agency for this installation. USEPA Region 6 and the Texas Commission on Environmental Quality (TCEQ) are the regulatory agencies providing technical support, project review and comment, and oversight of the U.S. Army cleanup program. The USEPA and TCEQ concur with the selected No Action decision. The recommendation for no action is consistent with the criteria required under CERCLA. None of the CERCLA §121 statutory determinations are necessary in this action since no remedy is being selected. No remedial action is necessary to ensure protection of human health and the environment.

TABLE 2
SUMPS AND WASTE RACK SUMPS (LHAAP-35/36) ON THE PROPERTY
NO FURTHER INVESTIGATION REQUIRED
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
KARNACK, TEXAS

Location Code	Parcel	Building	Building Function	Sump Depth (feet)
SUMP094	Y-Area	16-Y	Igniter Assembly Building	2.0
SUMP095	Y-Area	34-Y	Signal Assembly	5.5
SUMP096	Y-Area	34-Y	Signal Assembly	1.5
SUMP097	Y-Area	38-Y	Consolidate and assemble propellants	4.0
SUMP098	Y-Area	38-Y	Consolidate and assemble propellants	2.0
SUMP099	Y-Area	38-Y	Consolidate and assemble propellants	2.0
SUMP100	Y-Area	45-Y	Metal powder, preparation building, propellant finishing, illuminating	1.5
SUMP101	Y-Area	45-Y	Metal powder, preparation building, propellant finishing, illuminating	4.0
SUMP102	Static Test Area	16-T	Reclamation unit	4.0
SUMP103	Static Test Area	16-T	Reclamation unit	4.0
SUMP104	Static Test Area	16-T	Reclamation unit	7.5
SUMP105	Static Test Area	16-T	Reclamation unit	4.0
SUMP123	Y-Area	18-Y	Storage and component rework	Unknown
SUMP800 (SUMP124)	Static Test Area	23-T	Conditioning	Unknown
WRSUMP001	Y-Area	34-Y	Signal Assembly	4.0
WRSUMP002	Y-Area	38-Y	Consolidate and assemble propellants	4.0
WRSUMP003	Y-Area	16-Y	Igniter Assembly Building	4.0

TABLE 3
SUMPS AND WASTE RACKS (LHAAP-35/36) ON THE PROPERTY RATIONALE FOR NO FURTHER INVESTIGATION REQUIRED LONGHORN ARMY AMMUNITION PLANT (LHAAP) KARNACK, TEXAS

Location Code	Nearest Site	Building	Reason Investigation Not Required
SUMP094	LHAAP-48	16-Y	1,2
SUMP095	LHAAP-48	34-Y	2
SUMP096	LHAAP-48	34-Y	1,2
SUMP097	LHAAP-48	38-Y	2
SUMP098	LHAAP-48	38-Y	1,2
SUMP099	LHAAP-48	38-Y	2
SUMP100	LHAAP-48	45-Y	1,2
SUMP101	LHAAP-48	45-Y	1,2
SUMP102	LHAAP-35C (53)	16-T	1,2
SUMP103	LHAAP-35C (53)	16-T	1,2
SUMP104	LHAAP-35C (53)	16-T	2
SUMP105	LHAAP-35C (53)	16-T	1,2
SUMP123	LHAAP-48	18-Y	2
SUMP800 (SUMP124)	LHAAP-35C (53)	23-T	2
WRSUMP001	LHAAP-48	34-Y	2
WRSUMP002	LHAAP-48	38-Y	2
WRSUMP003	LHAAP-48	16-Y	2

1 – Sump contents concentrations were below the maximum value of TCEQ Medium-Specific Concentration Cleanup Goals or Upper Prediction Limits (UPLs) for background in soils (Shaw, 2006).

2 – Sites 48 and 35C (53) were evaluated by Shaw, 2006, Draft Final Site Evaluation Report, LHAAP-48 (Former Igniter Production Area) and LHAAP-35C (53) (Static Test Area), March.

TABLE 4
SEPTIC TANKS (LHAAP-55) ON THE PROPERTY
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
KARNACK, TEXAS

Septic Tank Number	Parcel	Capacity (Gallons)	Year Installed	(Former) Building Associated	Tank Location Confirmed
ST-02	Y-Area	937	1955	18-Y-1, Pyrotech Production	Yes
ST-03	Y-Area	937	1955	16-Y-1, Pyrotech Production	Yes
ST-05	Static Test Area	Unknown	Unknown	8-T, Change House	Yes
ST-06	Static Test Area	972	Unknown	25-T, 23-T	Yes
ST-07	Static Test Area	937	1955	16-T-1, Public Toilet	No
ST-08	Static Test Area	Unknown	1955	13-T, Administration Building	Yes
ST-09	Static Test Area	937	1955	34-T-1, Septic toilet/Shower for Static Test Facility	Yes
ST-10	Static Test Area	937	1955	39-T-1, Septic toilet/Shower for Static Test Facility	Yes

TABLE 5
STORAGE, RELEASE, OR DISPOSAL OF HAZARDOUS SUBSTANCES
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
KARNACK, TEXAS

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Production Area-Former Sewage Treatment Plant	None	None	Various	1942-1999 Stored	Unknown	The Sewage Treatment Plant received storm water, boiler blowdown, laundry wastes, vehicle wash rack wastes, and effluent from film development at the X-ray facility. Sludge was dried on sand beds and shipped to Landfill 16. The Sewage Treatment Plant was closed in 1999 in accordance with the requirements of the TNRCC-approved RCRA closure plan. The TNRCC determined that no additional investigations were required.
Production Area-Former TNT Waste Disposal Plant	None	None	TNT Wastewater	1943-1945 Released	Unknown	Refer to Table 1 for remedial actions.
Production Area-Former TNT Waste Disposal Plant	None	None	Mercury	Unknown Released	Unknown	No Remedial Actions Required

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Y-Area	Various	None	Wastewater from Sumps containing propellant, PEP dusts, and solvents	1952-1997 Stored/Released	Unknown	Refer to Table 1 for remedial actions .
Production Area-Former Acid Storage Area	301 A (1513)	AST	Condensate	1942-1945 Stored	50 gallons	Tank removed No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	301 A (4701)	AST	Unknown	1942-1945 Stored	21,000 gallons	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	301 A (2719, 2720))	2 AST	Ammonia	1942-1945 Stored	16,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Production Area-Former Acid Storage Area	301 B (9461,9462 9469,9778, 9779,9471, 11198, 11199, 11200, 11201, 12232, 11202)	12 ASTs	Ammonia	1942-1945 Stored	14,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	302 A (D-264)	AST	Condensate	1942-1945 Stored	160 gallons	Tank has been removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	302 A (1518-1525)	8 ASTs	Nitric Acid	1942-1945 Stored	8,225 gallons each	Tanks have been removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	302 A (1517)	AST	Condensate	1942-1945 Stored	14,000 gallons	Tank has been removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Production Area-Former Acid Storage Area	303 A (4852, 4864, 4861, 4865, 6862, 4863, 4866)	7 ASTs	Nitric Acid	1942-1945 Stored	360 gallons each	Tanks have been removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	303 A (22205-4)	AST	Condensate	1942-1945 Stored	120 gallons	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	303 B (1584, 1585, 1586, 1587, 4831, 4832)	6 ASTs	Residual Acid	1942-1945 Stored	65,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	303 C	2 ASTs (89354, 89355)	Nitric Acid	1942-1945 Stored	2,200 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	303 D	2 ASTs (1574, 1581)	Sulfuric Acid	1942-1945 Stored	12,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Production Area-Former Acid Storage Area	305 B	AST (94044-2)	Hydrochloric Acid	1942-1945 Stored	7,500 gallons	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	305 B	2 ASTs (49044-7, 4044-9)	Nitric Acid	1942-1945 Stored	7,500 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	305 B	2 ASTs (22201-22, 22201-22)	Unknown	1941-1945 Stored	7,500 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	305 C	5 ASTs (2210, 2211, 2212, 2213, 2214)	Sulfuric Acid	1942-1945 Stored	67,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	305 C	2 ASTs (5504, 5505)	Sulfuric Acid	1942-1945 Stored	67,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Production Area-Former Acid Storage Area	305 D	4 ASTs (1554, 1555, 1556, 1557)	Sulfuric Acid	1942-1945 Stored	67,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	305 D	2 ASTs (5502,5503)	"Mixed acid storage"	1942-1945 Stored	67,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	305 E	5 ASTs (1610,1611, 1612, 1623, 1614)	Sulfuric Acid	1942-1945 Stored	67,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	305 E	2 ASTs (4823, 4824)	Sulfuric Acid	1942-1945 Stored	67,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	305 G	4 ASTs (2231,2232, 2233, 2234)	"Residual Acid"	1942-1945 Stored	67,000 Gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Production Area-Former Acid Storage Area	305 G	2 ASTs (5506, 5507)	Sulfuric Acid	1942-1945 Stored	67,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	305 H	2 ASTs (2229, 2230)	Oleum	1942-1945 Stored	67,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	305 H	3 ASTs (4818, 4819, 4820)	Oleum	1942-1945 Stored	67,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	305 J	1 AST (22204-1)	"F-83 Storage"	1942-1945 Stored	17,000 gallons	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	305 J	1 AST (27848-3A)	"F-83 Storage"	1942-1945 Stored	17,000 gallons	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Production Area-Former Acid Storage Area	305 K	10 ASTs (1602 through 1609, 27848-2C, 27848-2D))	TNT Mix	1942-1945 Stored	17,000 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	307 A	2 ASTs (5803, 5804)	"Batch Tanks"	1942-1945 Stored	9,500 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	308 A	4 ASTs (1588, 1589, 1590, 1591)	"Acid receiving tanks for strong acid"	1942-1945 Stored	5,500 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	308 A	2 ASTs (6086, 6087. 6088, 6089)	"Acid receiving tanks for weak acid"	1942-1945 Stored	4,900 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Production Area-Former Acid Storage Area	308 A	12 ASTS (4850, 4894, 4895, 4900, 4928, 4929, 6262, 6263, 6073, 6074, 42-562-A1, 42-562-A2)	"Acid cooler tank"	1942-1945 Stored	1,200 gallons each	Tank removed. No releases are known to have occurred at the Acid Storage Area. All ASTS have been removed. Building foundations and several concrete saddles and platforms for support of ASTs are all that currently exist at the site.
Production Area-Former Acid Storage Area	None	None	Lead, Mercury	Unknown Released	Unknown	Lead and mercury are the primary soil contaminants at the Former Acid Storage Area. No further action required. Refer to Table 1, Column 4.
Static Test Area	Unknown	Unknown	Bromine	1997 Stored	1,810 pounds	No Remedial Action Required.
Static Test Area	Unknown	Unknown	Nitric Acid	1997 Stored	36,305 pounds	No Remedial Action Required.
Static Test Area	Unknown	Unknown	Sulfuric Acid	1997 Stored	7,288 pounds	No Remedial Action Required.

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Static Test Area	17-T	AST	Bulk Mixed Acid	1992 Stored	2,200 gallons	Tank Removed. No Remedial Action Required.
Static Test Area	17-T	T-810A, T-810B	Bulk Acetic Anhydride	1992 Stored	2,230 gallons	Removed by tank truck for disposal by DRMO. Tanks removed. No remedial action required.
Static Test Area	16-T	AST	Methylene chloride	Unknown, Stored	10,000 gallons	This tank was removed. No remedial action required.
Static Test Area	25-T	AST	Bulk acetone	1992 Stored	7.050 gallons	The tanks were removed. No remedial action required.
Static Test Area	17-T	AST	Bulk nitric acid	1992 Stored	7,300 gallons	Tank removed No remedial action required.

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Static Test Area	17-T	AST	Bulk sulfuric acid	1992 Stored	6,800 gallons	Tank removed. No remedial action required.
Static Test Area	23-T	None	DADN	1992 Stored	5,000 pounds	Material was transferred to building 811-45 for storage and resale. No remedial action required.
Static Test Area	23-T	Drums	Sulfuric	1992 stored	Four drums	No remedial action required
Static Test Area	23-T	None	Nitric acid	1991 Released	3,125 pounds	A release in the form of 3,125 pounds (1,417 kilograms) nitric acid was reported at Building 23-T in 1991. The release to air was due to an equipment failure and resulted in an explosion which rose approximately 1,300 feet into the air. The incident was reported as required (Thiokol, 1992a). No further action required,
Static Test Area	23-T	Transformer	PCBs	1984 Released	75 gallons	A transformer containing oil with 536 ppm PCBs leaked approximately 75 gallons of oil. Cleanup of the spill was planned for March 1984. No confirmation of cleanup of this spill has been located. PCBs (35ug/Kg) were detected in a surface soil sample around Building 23-T during the Phase II ESA.

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Static Test Area	16-T (Tank 16-T)	AST	Methylene Chloride	Unknown	10,000 gallons	Tank has been removed.
Static Test Area	25-T (Tanks T-1170 and T-1180)	AST	Acetone	1990s	Individuall y unknown	These two tanks were located adjacent to the building and contained a total of 7,050 gallons of acetone circa 1992. Plans were made to transfer the material to DRMO via tanker truck. The tanks were removed prior to 2003.
Static Test Area	NA	Sumps	Wastewater from sumps. Wastewater from sumps containing propellant, PEP dusts, and solvents	Unknown, Stored/released	Unknown	Trichloroethylene, SVOCs, and perchlorate were detected below levels of concern. No further action required.

*The information contained in this notice is required under the authority of regulations promulgated under section 120(h) of the Comprehensive Environmental Response, Liability, and Compensation Act (CERCLA or "Superfund") 42 U.S.C. section 9620(h). This table provides information on the storage of hazardous substances for one year or more in quantities greater than or equal to 1,000kilograms or the hazardous substances' CERCLA reportable quantity (whichever is greater).

TABLE 6
FORMER PETROLEUM PRODUCT UST/AST SITES
LONGHORN ARMY AMMUNITION PLANT (LHAAP
KARNACK, TEXAS

Parcel	Building (Tank ID)	AST/ UST	Name of Petroleum Product(s)	Date of Storage, Release or Disposal	Quantity/ Size	Remedial Actions
Production Area-LHAAP-08	12-G/ 15-G (Tank 1)	UST	Diesel Fuel	1976-1993	280 gallons	Tank was removed in 1993 and samples in the excavation were below detection limit (30 ppm TPH). Tank was 20 feet north and 10 feet west of the west corner of Building 15-G, adjacent to the auxiliary power generator for the plant.
Static Test Area-LHAAP-53	28-T (Tank 30-T)	AST	Diesel Fuel	1988-1998	20,000 gallons	Tank removed. VOCs were not detected in any of the soil samples collected at the former tank location during the Phase II ESA. Low-level concentrations of TPH were detected in all three of the soil samples; however, the detected concentrations were below their respective laboratory reporting limits.

TABLE 7
ASBESTOS
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
KARNACK, TEXAS

Building Number	Building Name	Site ID	Building Status	Friable Asbestos	Non-Friable Asbestos	Comments
38-Y	Igniter Blending Building	Y-Area	Existing‡	Assumed	Assumed	Potential ACM roofing material (Tar)
40-Y	Igniter Test Building	Y-Area	Existing‡	Assumed	Assumed	Potential ACM roofing material (Tar)
34-T	Static Test Facility	Static Test Area	Existing	Assumed	Assumed	Potential ACM roofing material
36T-1	Rocket Motor Firing Stand	Static Test Area	Existing	Assumed	Assumed	Potential ACM roofing material
36T-2	Rocket Motor Firing Stand	Static Test Area	Existing	Assumed	Assumed	Potential ACM roofing material
36T-3	Rocket Motor Firing Stand	Static Test Area	Existing	Assumed	Assumed	Potential ACM roofing material
36T-4	Rocket Motor Firing Stand	Static Test Area	Existing	Assumed	Assumed	Potential ACM roofing material

‡These buildings are the concrete structure that remained after demolition activities.

TABLE 8
SUMMARY OF REMAINING BUILDINGS COMPLETELY DECONTAMINATED OF EXPLOSIVES
KARNACK, TEXAS

Parcel	Building Number	Description	Area (Square Feet)
Static Test Area	34-T	Static Test Facility	2,738
Static Test Area	36T-1	Rocket Motor Firing Stand	
Static Test Area	36T-2	Rocket Motor Firing Stand	
Static Test Area	36T-3	Rocket Motor Firing Stand	
Static Test Area	36T-4	Rocket Motor Firing Stand	

All buildings at LHAAP have been decontaminated to 5X
5X- Indicates that the equipment or facilities have been completely decontaminated and are free of hazard, and may be released for general use or to the general public.
Source: Plexus(2005), CES(1998)

TABLE 9
ADJACENT PROPERTIES‡
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
KARNACK, TEXAS

Site No.	Site Name	ECP Category
LHAAP-29	Former TNT Production Area	5*
LHAAP-47	Plant 3/Hand Signal Assemblies	5*

‡Refer to **Figure 2**for location of adjacent properties in reference to transfer parcels.

*ECP Category 5; Areas where release, disposal, and or migration of hazardous substance has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken.

TABLE 10
GROUNDWATER MONITORING WELL LOCATIONS
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
KARNACK, TEXAS

Monitoring Well ID	Site ID	Depth (feet)	Installation Date (month/year)	Easting X Coordinate	Northing Y Coordinate
113	LHAAP-32	29	6/1982	3305938.990	6958183.050
32WW02	LHAAP-32	47	7/1998	3306046.910	6958086.450
32-TMW-01	LHAAP-32	20	8/2004	3306222.410	6957667.190
32WW01	LHAAP-32	48	7/1998	3306237.060	6957724.340
08WW01	LHAAP-08	18	11/2000	3310498.194	6958043.017
LHSMW63	LHAAP-48	20	9/1994	3314367.070	6959186.880
LHSMW62	LHAAP-48	27.6	9/1994	3313544.510	6959033.380
48WW02	LHAAP-48	28	9/2006	3314550.091	6959024.030
48WW01	LHAAP-48	55	4/2004	3314579.818	6959110.511
LHSMW66	LHAAP-48	18	9/1994	3314814.410	6959503.120
LHSMW64	LHAAP-48	25	9/1994	3314918.240	6959088.760
LHSMW65	LHAAP-48	18	9/1994	3314968.030	6959265.020
49WW01	LHAAP-49	34	11/1998	3304439.80	6957833.60
49WW02	LHAAP-49	24	11/1998	3303973.50	6957381.30
49WW04	LHAAP-49	35	11/2008	3303954.50	6957356.93
49WW05	LHAAP-49	32	11/2008	3303986.11	6957579.15
49WW06 Replacement well for 49WW03	LHAAP-49	34	11/2008	3304174.53	6957645.76
49WW07	LHAAP-49	32	11/2008	3304246.28	6957278.13
49WW08	LHAAP-49	32	11/2008	3303794.44	6957136.47
LHSMW69	LHAAP-53	51	9/1994	3315271.770	6957346.180
LHSMW68	LHAAP-53	22	9/1994	3315493.340	6957111.640
LHSMW67	LHAAP-53	20	9/1994	3315706.920	6957361.090
LHSMW70	LHAAP-53	22	9/1994	3316533.170	6958033.520
LHSMW71	LHAAP-53	17.5	9/1994	3316839.630	6958207.890

Figures

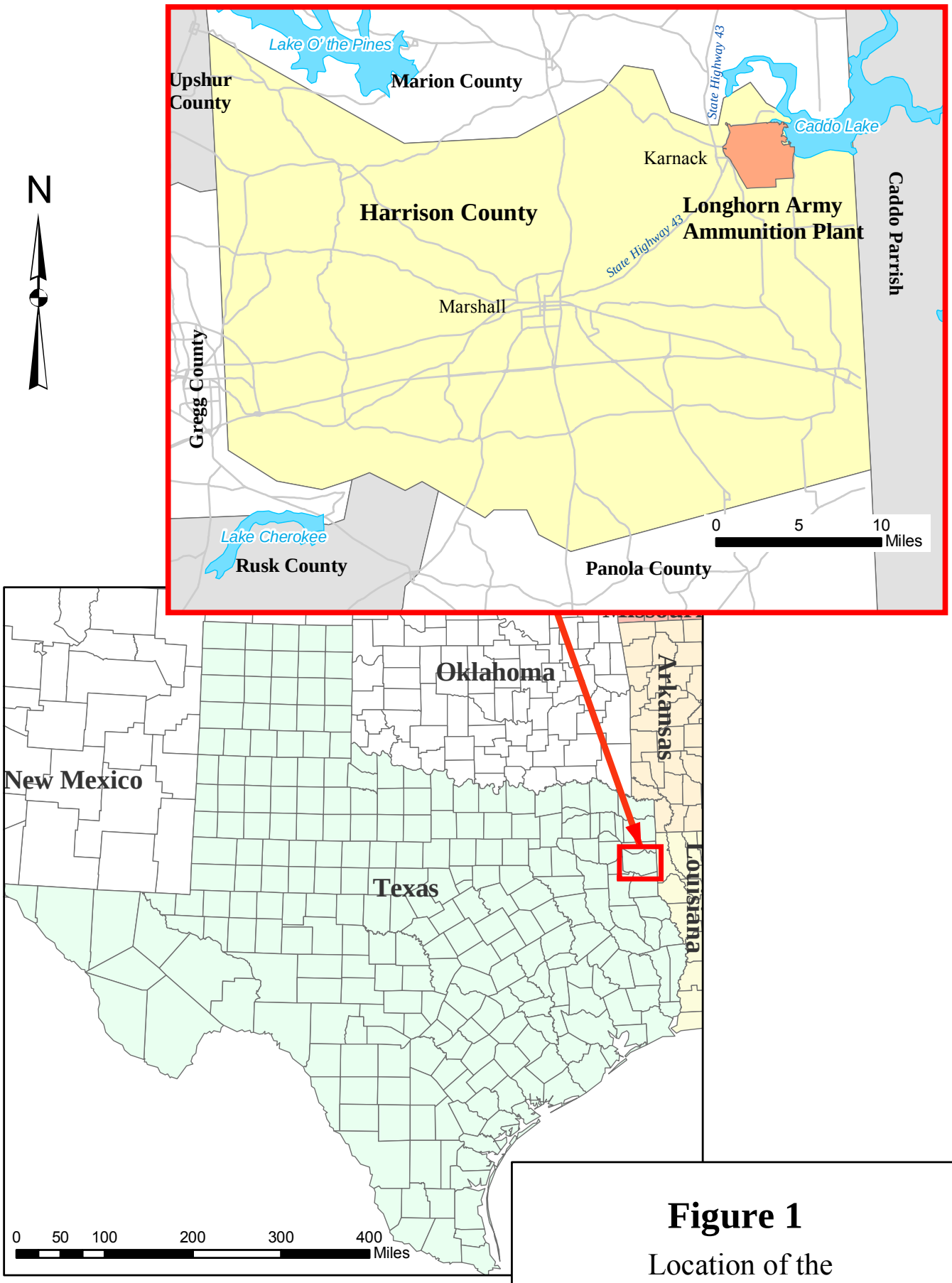

Figure 1

Location of the
Longhorn Army Ammunition Plant
Harrison County, Texas

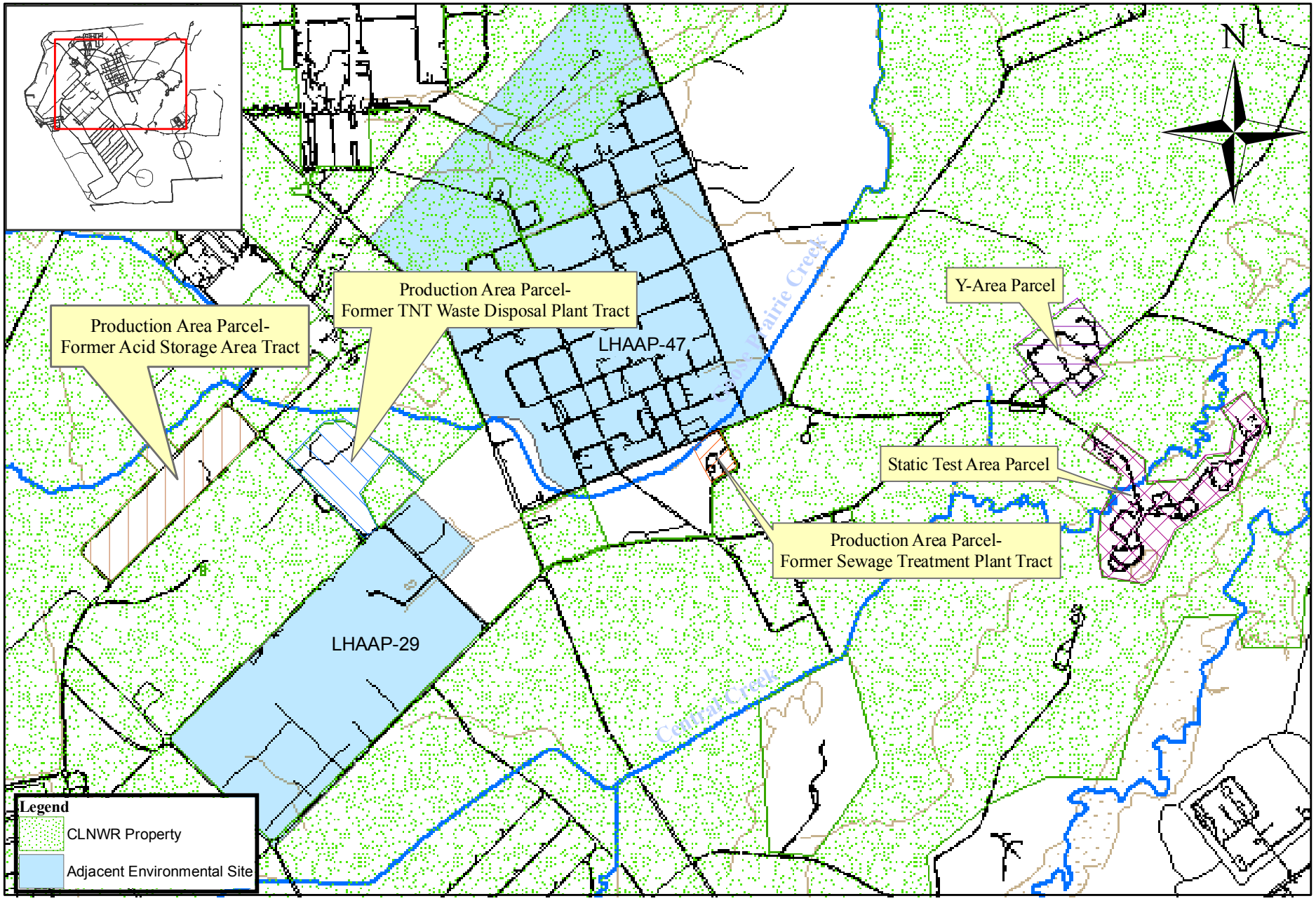

Figure 2

LONGHORN ARMY AMMUNITION PLANT

ECOP VI Parcels

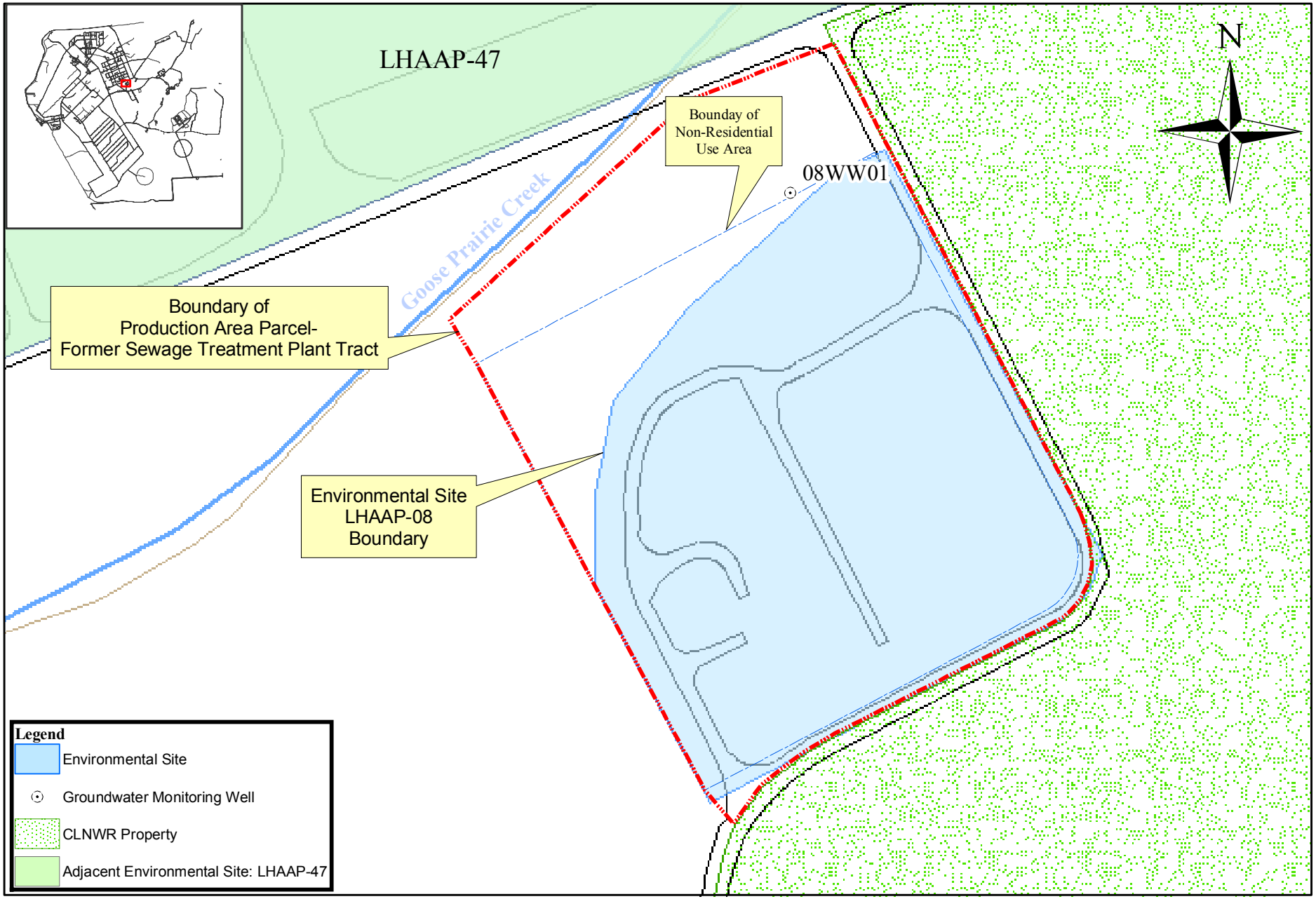

Figure 3
LONGHORN ARMY AMMUNITION PLANT

Location of Environmental Site(s) in the
Production Area Parcel-Former Sewage Treatment Plant Parcel

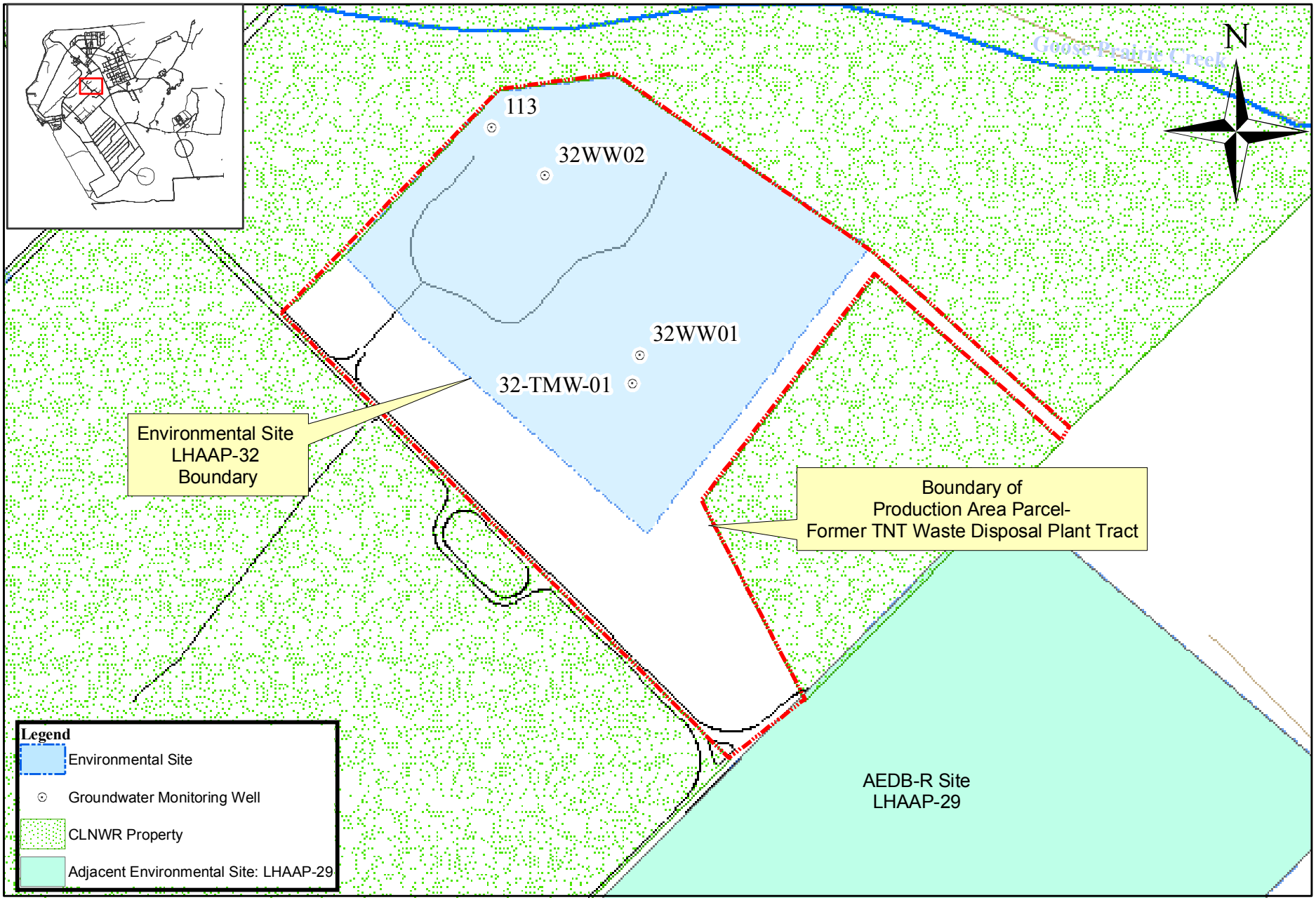

Figure 4
LONGHORN ARMY AMMUNITION PLANT

Location of Environmental Site in Production Area Parcel -
Former TNT Waste Disposal Plant Tract

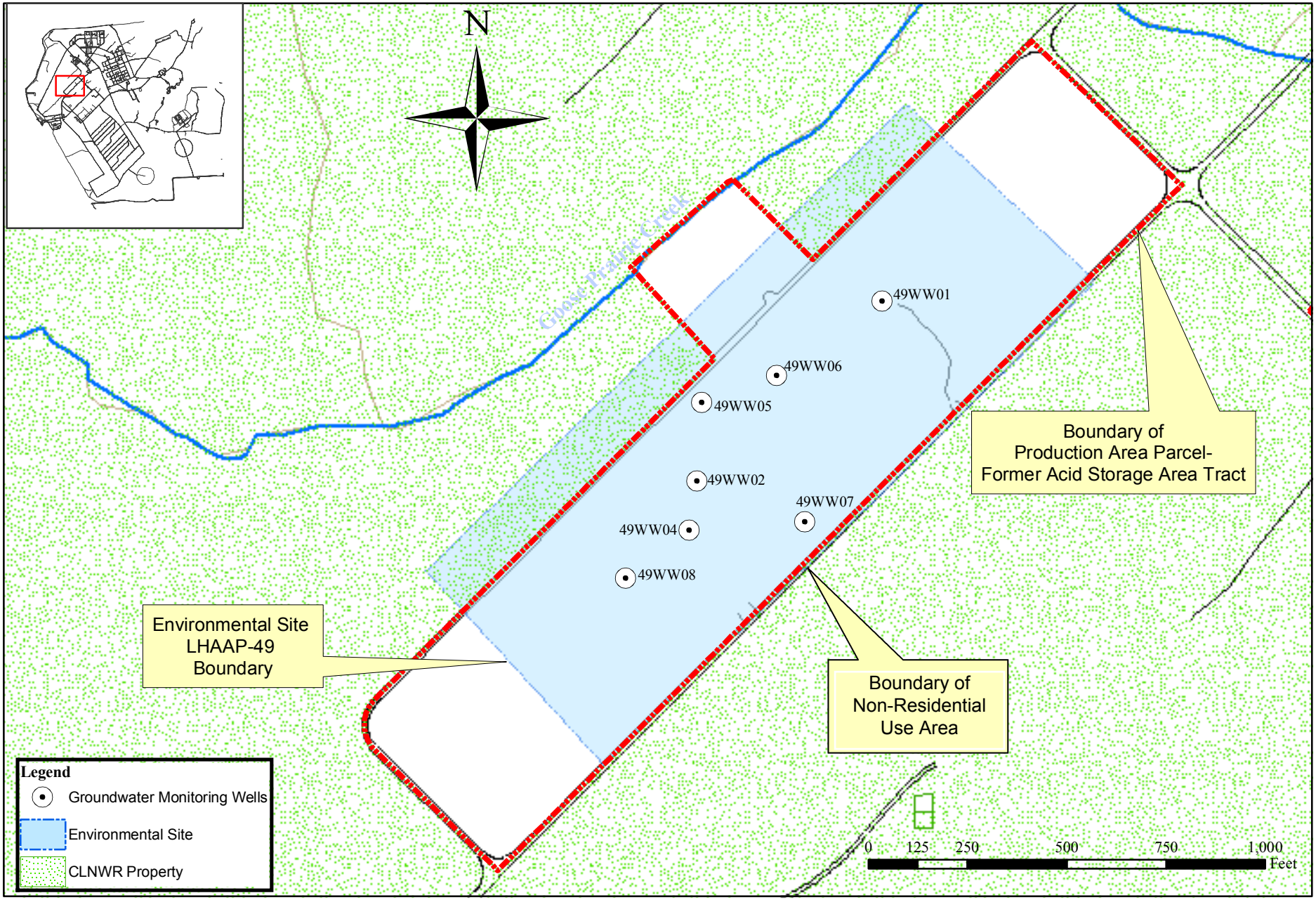

Figure 5

LONGHORN ARMY AMMUNITION PLANT

Location of Environmental Site in Production Area Parcel -
Former Acid Storage Area Tract

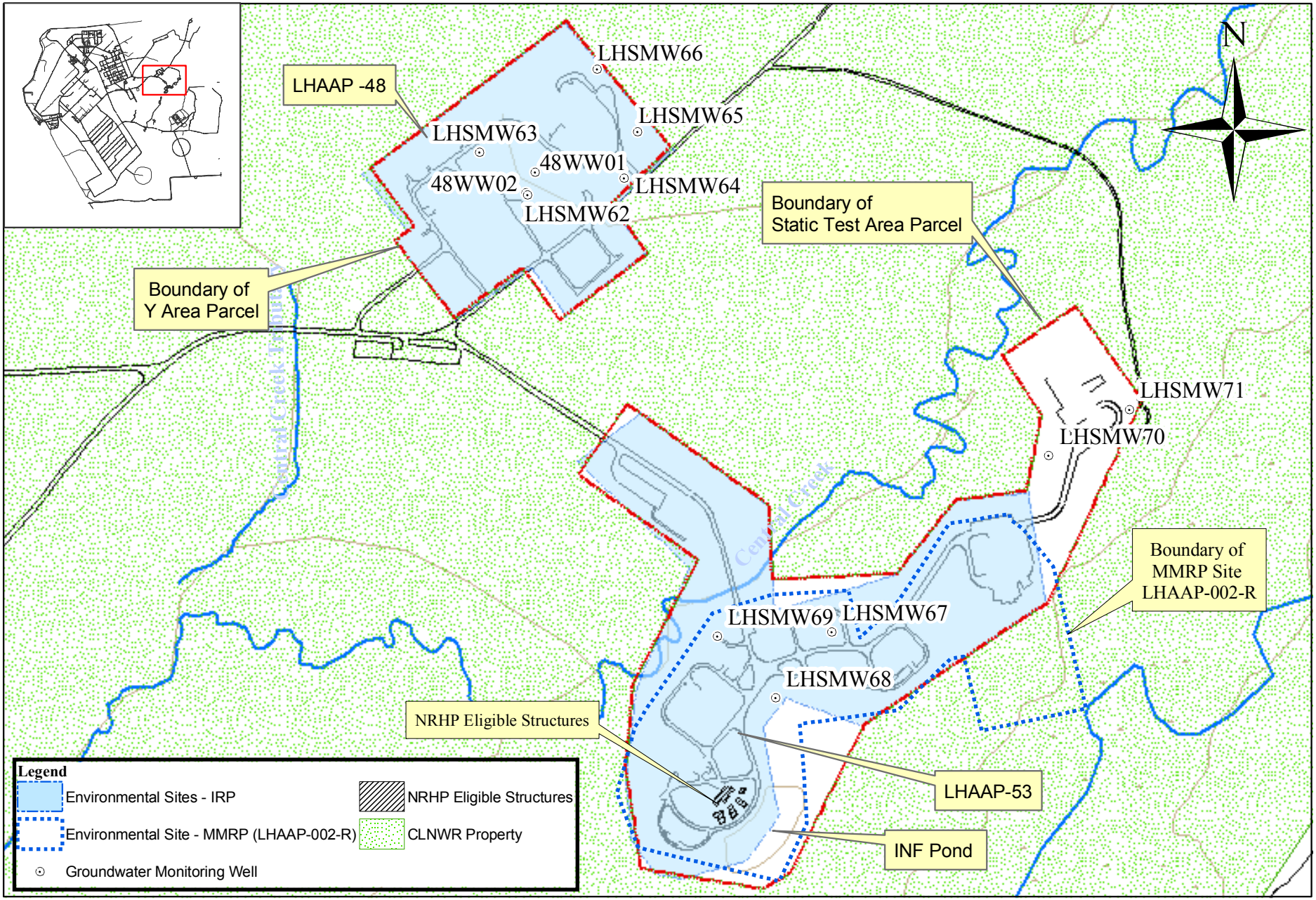

Figure 6

LONGHORN ARMY AMMUNITION PLANT

Locations of Environmental Sites with Unrestricted Use
at the Y-Area and Static Test Area Parcels

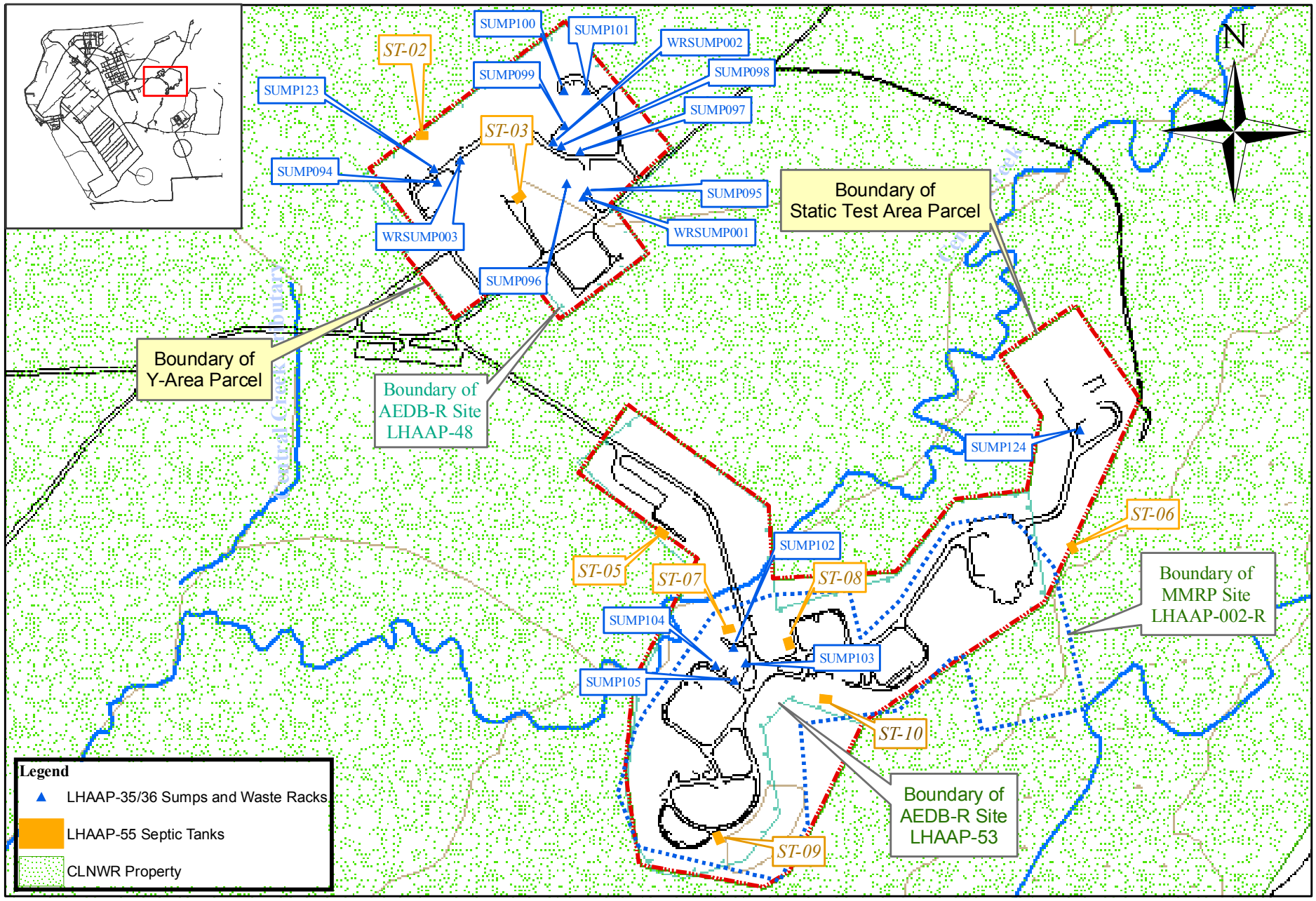

Figure 7
LONGHORN ARMY AMMUNITION PLANT

Restricted Use Environmental Sites at the Y-Area and Static Test Area Parcels

Attachment 1
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U.S. Fish & Wildlife Service, 2011, National Wetlands Inventory, http://www.fws.gov/wetlands/, accessed January 19, 2011.

Attachment 2
DOD Environmental Condition of Property (ECP) Categories

DOD Environmental Condition of Property Categories

Category	Description
Category 1	Areas where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas).
Category 2	Areas where only release of disposal of petroleum products has occurred.
Category 3	Areas where release, disposal, and or migration of hazardous Substance has occurred, but at concentrations that do not require a removal or remedial response.
Category 4	Areas where release, disposal, and or migration has occurred, and all removal or remedial actions to protect human health and the environment have taken place.
Category 5	Areas where release, disposal, and or migration has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken.
Category 6	Areas where release, disposal, and or migration has occurred, but required actions have not yet been implemented.
Category 7	Areas that are not evaluated or require additional evaluation.

Attachment 3
Environmental Protection Provisions

Environmental Protection Provisions

The following conditions, restrictions, and notifications will be incorporated by reference into the Letter of Transfer from the Department of the U.S. Army to the transferee to ensure the protection of human health and the environment and in furtherance of ongoing and completed remediation activities at the Property.

1. Inclusion of Provisions:

The transferee to whom the Property is transferred shall neither transfer the Property, lease the Property, nor grant any interest, privilege, or license whatsoever in connection with the Property without the inclusion of the environmental protection provisions contained herein, and shall require the inclusion of such environmental protection provisions in all further deeds, transfers, leases, or grant of any interest, privilege, or license, unless there is a specific legal finding authorizing a change and specifically addressing any liabilities that will result from the change.

2. Federal Facilities Agreement:

The U.S. Army acknowledges that portions of Longhorn Army Ammunition Plant have been identified as National Priorities List (NPL) sites under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended. The transferee acknowledges that the U.S. Army has provided it with a copy of the LHAAP Federal Facility Agreement (FFA) dated December 30, 1991 and will provide the transferee with a copy of any amendments thereto. The transferee, its successors and assigns, agree that should any conflict arise between the terms of the FFA as they presently exist or may be amended, and the provisions of this property transfer, the terms of the FFA will take precedence. The transferee, its successors and assigns, further agree that notwithstanding any other provisions of the transfer, the U.S. Army assumes no liability to the transferee, its successors and assigns, should implementation of the FFA interfere with the use of the Property. The transferee, its successors and assigns, shall have no claim on account of any such interference against the U.S. Army or any officer, agent, employee or contractor thereof.

3. No Liability for Non-Army Contamination:

The U.S. Army shall not incur liability for response action or corrective action found to be necessary after the date of transfer, in any case in which the transferee to whom the Property is transferred, or other non-Army person or entity, is identified as the party responsible for contamination of the Property.

4. CERCLA Access Notice:

The USEPA and TCEQ and their officers, agents, employees, contractors, and subcontractors

have the right, upon reasonable notice to the transferee, to enter upon the Property in any case in which a response action or corrective action is found to be necessary after the date of transfer of the Property, or such access is necessary to carry out a response action or corrective action on adjoining property, including, without limitation, the following purposes:

To conduct investigations and surveys, including, where necessary, drilling, soil and water sampling, testing-pitting, test soil borings and other activities;

To inspect field activities of the U.S. Army and its contractors and subcontractors;

To conduct any test or survey related to the environmental conditions at the transferred Property or to verify any data submitted to the USEPA or TCEQ by the U.S. Army relating to such conditions;

To construct, operate, maintain or undertake any other response or remedial actions as required or necessary including, but not limited to, monitoring wells, pumping wells and treatment facilities.

5. Notice of the Presence of Asbestos and Covenant:

A. The Grantee is hereby informed and does acknowledge that friable and non-friable asbestos-containing material ("ACM") has been found on the Property. Although all buildings have been demolished except NPHP eligible buildings 34-T, 36T-1, 36T-2, 36T-3, and 36T-4 located at LHAAP-35C (53) and structural remnants of buildings 38-Y and 40-Y located at LHAAP-48, the Property may contain other improvements such as equipment, facilities, and pipelines, above and below the ground, that contain non-friable asbestos or ACM. The Occupational Safety and Health Administration and the Environmental Protection Agency have determined that such unprotected or unregulated exposure to airborne asbestos fibers increases the risk of asbestos-related diseases, including certain cancers that can result in disability or death.

B. The Grantee covenants and agrees that its use and occupancy of the Property will be in compliance with all applicable laws relating to asbestos. The Grantee agrees to be responsible for any remediation or abatement of asbestos found to be necessary on the Property, to include ACM in or on buried pipelines, which may be required under applicable law or regulation.

C. The Grantee acknowledges that it has inspected or has had the opportunity to inspect the Property as to its asbestos and ACM condition and any hazardous or environmental conditions relating thereto. The Grantee shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any asbestos or ACM hazards or concerns.

6. Notice of the Presence of Lead-Based Paint and Covenant Against the Use of Property for Residential Purpose

A. Most of the buildings located on the Property have been demolished (remaining buildings include NPHP eligible buildings 34-T, 36T-1, 36T-2, 36T-3, and 36T-4 located at LHAAP-35C (53) and structural remnants of buildings 38-Y and 40-Y located at LHAAP-48); however, the Grantee is hereby informed and does acknowledge that all remaining structures (i.e., monolithic walls, slabs, equipment, etc.) on the Property, which were constructed or

rehabilitated prior to 1978, are presumed to contain lead-based paint. Lead from paint, paint chips, and dust can pose health hazards if not managed properly. Every purchaser of any interest in Residential Real Property on which a residential dwelling was built prior to 1978 is notified that there is a risk of exposure to lead from lead-based paint that may place young children at risk of developing lead poisoning.

B. The Grantee covenants and agrees that it shall not permit the occupancy or use of any structures on the Property as Residential Property, as defined under 24 Code of Federal Regulations Part 35, without complying with this section and all applicable Federal, State, and local laws and regulations pertaining to lead-based paint and/or lead-based paint hazards. Prior to permitting the occupancy of the Property where its use subsequent to sale is intended for residential habitation, the Grantee specifically agrees to perform, at its sole expense, the Army's abatement requirements under Title X of the Housing and Community Development Act of 1992 (Residential Lead-Based Paint Hazard Reduction Act of 1992).

C. The Grantee acknowledges that it has inspected or has had the opportunity to inspect the Property as to its lead-based paint content and condition and any hazardous or environmental conditions relating thereto. The Grantee shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any lead-based paint hazards or concerns.

7. Notice of the Potential for the Presence of Munitions and Explosives Concern, and Covenant:

Based upon a review of existing records and available information, none of the land proposed for transfer is known or suspected to contain munitions and explosives of concern (MEC). The term MEC means specific categories of military munitions that may pose unique explosives safety risks and includes: (1) Unexploded Ordnance (UXO), as defined in 10 U.S.C. §101(e)(5); (2) Discarded military munitions (DMM), as defined in 10 U.S.C. §2710(e)(2); or (3) Munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. §2710(e)(3), present in high enough concentrations to pose an explosive hazard. In the event that transferee, its successors, or assign should discover any MEC on the Property, they shall immediately stop any intrusive or ground-disturbing work in the area or in any adjacent areas and shall not attempt to remove or destroy it, but shall immediately notify the Harrison County Sheriff's Department (phone number: 903-9234000), so that appropriate explosive ordnance disposal personnel can be dispatched to address such MEC as required under applicable law and regulations. An alternate contact is the City of Marshall Fire Department (phone number: 903-938-6711). Local authorities must contact the U.S. Army's 705th Explosives Ordnance Detachment (EOD) at Fort Polk, LA (phone number: 337-531-5502; the 24-hour emergency phone number is 337531-5505).

8. Notice of the Presence of Groundwater Monitoring Wells and Covenant:

a. The transferee is herby informed and does acknowledge the presence on the Property of twenty-four (24) groundwater monitoring wells that may be necessary for the U.S. Army to complete monitoring after the date of transfer of title to the Property, or portions thereof.

b. Promptly upon the determination by the U.S. Army that a well is no longer necessary for monitoring, the U.S. Army will close such well at the U.S. Army's sole cost and expense in accordance with applicable laws, regulations, and ordinances.

9. Notice of Archaeological Property and Preservation Covenant:

The archaeological sites 41HS817 and 41HS818 and National Register of Historic Places eligible buildings 34-T, 36T-1, 36T-2, 36T-3, and 36T-4 are located in the County of Harrison, Texas, the transferee hereby covenants on behalf of itself, its heirs, successors, and assigns at all times to the Texas State Historic Preservation Officer, to maintain and preserve the archaeological properties. The transferee will honor its responsibilities under the National Historic Preservation Act and will coordinate all activities in furtherance of its responsibilities with the Texas State Historic Preservation Office, appropriately federally recognized tribes and other interested parties.

10. Conditions, Restrictions, and Covenants Binding and Enforceable:

These restrictions and covenants are binding on the transferee, its successors and assigns, and shall be included in subsequent deeds; shall run with the land; are forever enforceable; shall benefit the public in general and the territory surrounding the Property, including lands retained by the U.S. Army; and shall further the common environmental objectives of the U.S. Army and the State of Texas and are therefore enforceable by the U.S. Army and the State of Texas.

In accordance with 30 Texas Administrative Code (TAC) §335.566, a notification has been recorded in the Harrison County Office stating that LHAAP-08, LHAAP-35/36, LHAAP-49 and LHAAP-55 are suitable for nonresidential use. The nonresidential land use notifications are provided in Attachment 6. Limited monitoring will be conducted to ensure that the use of the sites remain consistent with the nonresidential use exposure scenarios evaluated in the risk evaluation and will be documented in the form of Letters of Certification transmitted every five years to TCEQ. Although the Army may later pass these procedural responsibilities to the designated transferee, in conjunction with the property transfer, the Army shall retain responsibility for future environmental response actions.

Attachment 4
Texas Historical Commission/United States Army Corps of Engineers Correspondence

TEXAS HISTORICAL COMMISSION

The State Agency for Historic Preservation

EV-ER
Note concurs
Pls prepare a response

July 10, 2000

0-7-10870

Mr. William Fickel, Jr.
Chief, Environmental Division
Department of Army
Fort Worth District, Corps of Engineers
P.O. Box 17300
Fort Worth, TX 76102

Re: Project review under Section 106 of the National Historic Preservation Act of 1966, *Submission of Building and Structure Inventory of the Post-1946 Built Environment at Longhorn Army Ammunition Plant, Karnack, Harrison County, Texas (COE/DA)*

Dear Mr. Fickel:

Thank you for providing this office with an opportunity to comment on the above referenced document. This letter serves as comment from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The National Register staff has reviewed the inventory and it is our opinion that it provides a well-organized presentation of properties that pertain to the Cold War missions of LHAAP. While staff generally agrees with the assessment of NRHP eligibility, we are concerned with the determination of non-eligibility made for the properties associated with the destruction of Pershing missiles under the 1988 Intermediate-Range Nuclear Forces (INF) Treaty. Although the buildings comprising the Static Test Area were not constructed for this purpose, they became the symbolic and physical center of this important event and process.

Beginning on September 8, 1988, with the static firing of a Pershing IA and Pershing II missile, Longhorn assumed the primary role in eliminating the stockpile of intermediate-range missiles coming under the INF Treaty. The events of the day, supervised by representatives of the Soviet Inspection Team, U.S. On-Site Inspection Agency, and Vice President Bush, became an international symbol of the objectives of the treaty. After this historic day, LHAAP continued to serve as the main site for the dismantling of Pershing missiles. LHAAP's mission under the INF Treaty continued for nearly three years, with the last Pershing II missile eliminated at Longhorn in May 1991.

Given the importance of the INF treaty and the events that took place at LHAAP, the National Register staff maintains that site has potential NRHP eligibility at the national level of significance under Criterion A, Events; meeting eligibility under Criteria Consideration G, for being the primary physical embodiment of this historic event. Although there can be made an argument that the signing of the treaty is the real significance of the *event*, it is a given fact the LHAAP was the main physical site where the objectives of the treaty were realized. The mission of dismantling intermediate-range missiles continued on a regular basis at Longhorn for three years, having eliminated several hundred Pershing IA and II missiles by the close of 1991. In this regard, the buildings located in the Static Test Area directly associated with this mission form a potential NRHP historic district.

From the information presented in the document, staff cannot concur that the buildings individually or collectively have lost a sufficient degree of integrity to preclude NRHP eligibility. We therefore request

P.O. BOX 12276 · AUSTIN, TX 78711-2276 · 512/463-6100 · FAX 512/475-4872 · TDD 1-800/735-2989
www.thc.state.tx.us

July 10, 2000
Mr. William Fickel, Jr.
Page 2

specific information on the loss of integrity and how this has impacted the site's ability to communicate significance under Criterion A.

Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review, please contact John W. Murphey at 512/463-5942.

Sincerely,

John W. Murphey, Historian
for F. Lawerence Oaks, SHPO

cc: Linda Roark, Division of Architecture

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

August 1, 2000

Environmental Division

SUBJECT: Project review of *Building and Structure Inventory of the Post-1946 Built Environment at Longhorn Army Ammunition Plant, Karnack, Texas* (Prior et al. 2000), reference number 0-7-10870

Mr. F. Lawerence Oaks
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276, Capitol Station
Austin, TX 78711-2276

Dear Mr. Oaks:

Thank you for your comment letter of July 10, 2000 regarding the results of the referenced report prepared for the post-1946 built environment at Longhorn Army Ammunition Plant (LHAAP) located near Karnack, Texas. The report, *Building and Structure Inventory of the Post-1946 Built Environment at Longhorn Army Ammunition Plant, Karnack, Texas*, was prepared by Geo-Marine, Inc., of Plano, Texas, under a contract to the U.S. Army Corps of Engineers, Fort Worth District (CESWF), in order to assess the potential Cold War significance of portions of LHAAP.

The comment letter prepared by Mr. John Murphey of your staff on July 10, 2000 notes that specific properties associated with the events surrounding the demolition of the Pershing IA and Pershing II missiles under the Intermediate Nuclear Forces (INF) Treaty could form a *National Register of Historic Places* (NRHP) eligible district. This NRHP eligible district appears to meet a national level of significance under *Criterion A: Events*, meeting the eligibility requirements of *Criteria Consideration G: Properties Which Have Achieved Significance Within The Past Fifty Years*. In consultation with the Commander's Representative (CR) for Longhorn / Louisiana Army Ammunition Plant, CESWF and the CR concur with that opinion and have identified the buildings directly associated with the INF demolition of the Pershing missiles in consultation with your office as the complex of buildings 34T, 36T-1, 36T-2, 36T-3, and 36T-4 located in the former test services area of LHAAP (Enclosure 1). These buildings are roughly bounded by Tucson Avenue and Taylor Avenue as shown on Enclosure 2.

In consideration of the foregoing the identified properties shown on Enclosure 1, and as identified above, will be treated as NRHP eligible and no demolition of these properties will be permitted to occur without appropriate consultation with your office. The suggested NRHP eligible district boundary shown on Enclosure 2 will be clearly marked and identified to installation personnel and other contractors in order to prevent any inadvertent impacts. A revised final version of the referenced inventory report will be prepared reflecting all comments and eligibility determinations and will then be forwarded to your office for your records.

The U.S. Fish and Wildlife Service (USFWS) have agreed to accept the majority, or all, of LHAAP as wildlife preserve. Transferred properties will include any previously identified historic properties and will include the NRHP eligible district identified here. As transfers occur, USFWS will be notified of any historic properties located within the transferred parcels and all appropriate documentation will be provided to the USFWS representatives. As part of the Federal to Federal transfer of LHAAP, the USFWS will assume any further Section 106 responsibilities associated with any NRHP eligible or listed properties. If you wish to be notified of the transfers please respond to the Commander's Representative at Longhorn / Louisiana Army Ammunition Plant as identified in the copy furnished list below.

If you have any further questions please contact Mr. Stephen P. Austin of this office at 817-978-6385.

Sincerely,

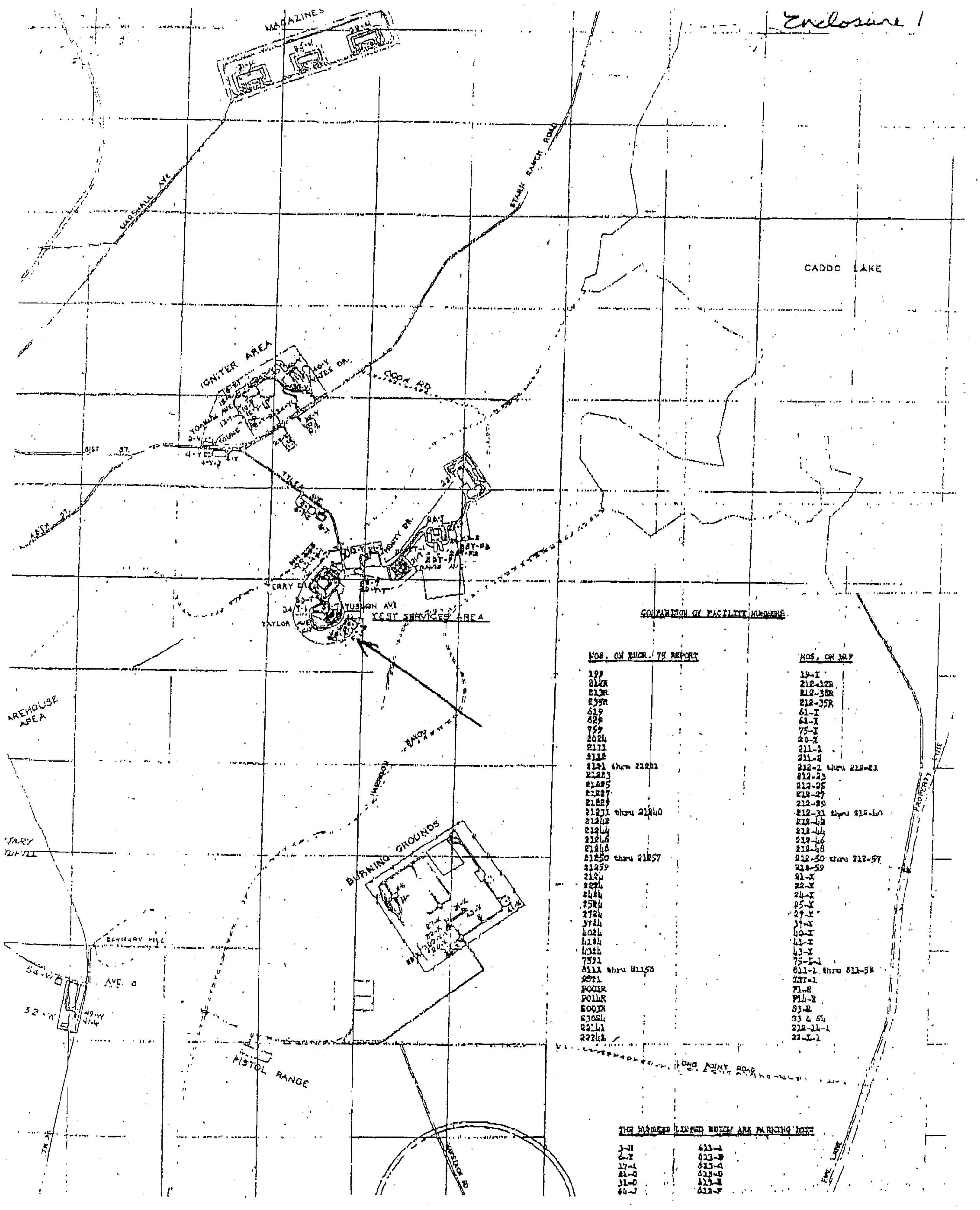
Enclosures(2)

William Fickel, Jr.
Chief, Environmental Division

Copy Furnished with enclosures:

Commander's Representative
Longhorn/Louisiana Army Ammunition Plant
Attention: Mr. David Tolbert
P.O. Box 658
Doyline, LA 71023-0658

Longhorn Army Ammunition Plant
Attention: Mr. Lynn Mucklerath
P.O. Box 658
Doyline, LA 71023-0658



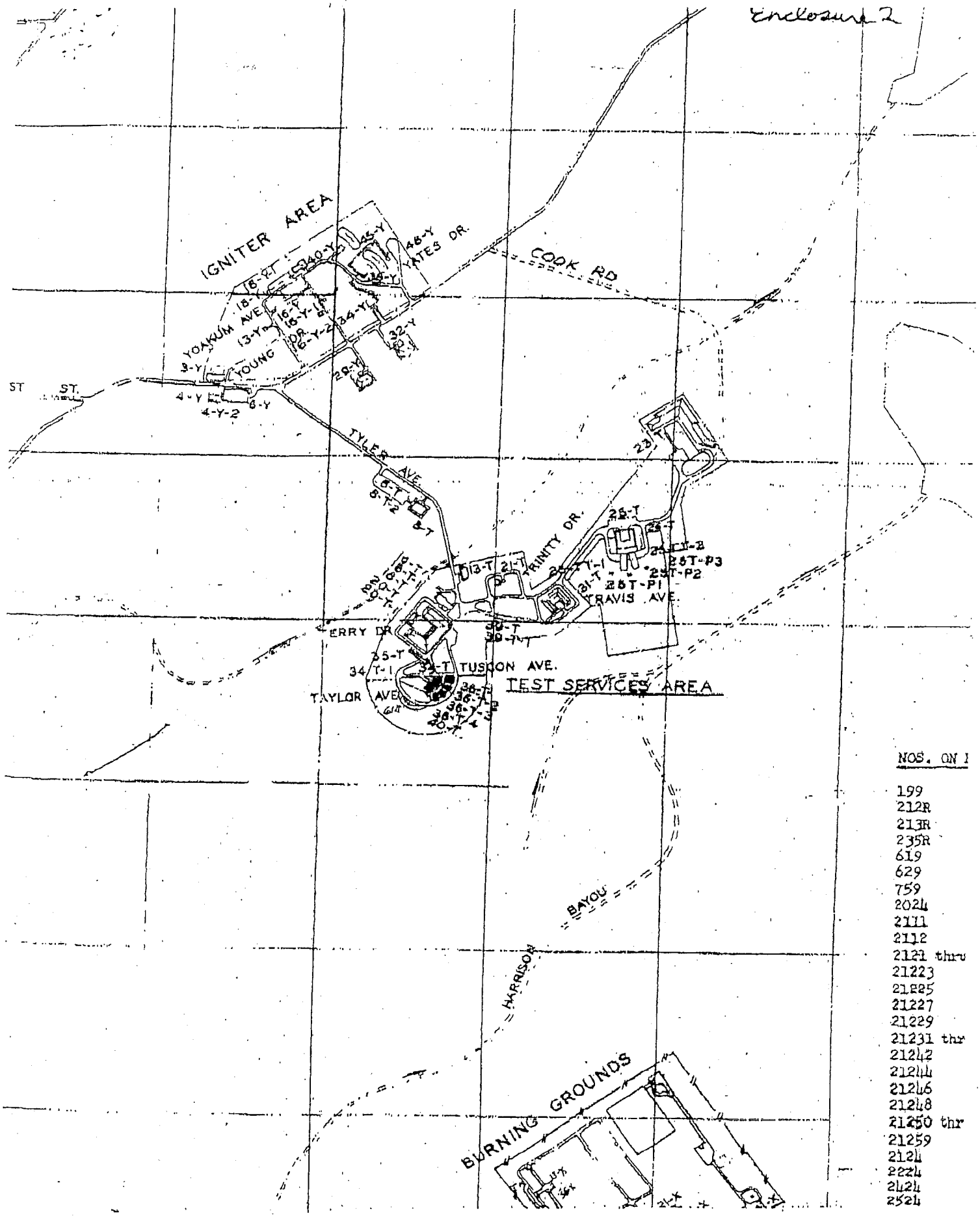
COMPARISON OF FACILITY NUMBERS

NOS. ON ENGR. 75 REPORT	NOS. ON MAP
199	19-Y
212R	212-12R
213R	212-13R
235R	212-35R
619	61-Y
629	62-Y
759	75-Y
2024	20-X
2111	211-1
2112	211-2
2121 thru 21221	212-2 thru 212-21
21223	212-23
21225	212-25
21227	212-27
21229	212-29
21231 thru 21240	212-31 thru 212-40
21242	212-42
21244	212-44
21246	212-46
21248	212-48
21250 thru 21257	212-50 thru 212-57
21259	212-59
2124	21-X
2224	22-X
2424	24-X
2524	25-X
2724	27-X
3724	37-X
4024	40-X
4124	41-X
4324	43-X
7591	75-Y-1
8111 thru 81158	811-1 thru 811-58
9571	137-1
P001R	P1-R
P014R	P14-R
S003R	93-R
63054	63 & 64
22141	212-14-1
22242	22-X-1

THE NUMBERS LISTED BELOW ARE PARKING LOTS

3-H	613-A
6-Y	613-B
17-A	613-C
21-G	613-D
31-D	613-E
64-J	613-F

Enclosure 2



NOS. ON I

199
212R
213R
235R
619
629
759
2024
2111
2112
2121 thru
21223
21225
21227
21229
21231 thr
21242
21244
21246
21248
21250 thr
21259
2124
2224
2424
2524

Attachment 5

Static Test Area; EPA Accidental Release Information Program form and personal correspondence, nitric acid release, 1991

Thiokol CORPORATION
ORDNANCE OPERATIONS
Longhorn Division

April 21, 1992

Administrative Contracting Officer
Longhorn/Louisiana Army Ammunition Plant
ATTN: SMCLO-EN
Marshall, Texas 75670

SUBJECT: EPA Accidental Release Information Program

REFERENCE: Longhorn Contract DAAA09-87-Z-0014
SMCLO-EV Dated March 31, 1992;
Suspended April 21, 1992

Dear Sir:

Enclosed is the subject document concerning the Nitric Acid spill on September 26, 1991.

If you have any questions, please contact Bob Smink at Ext. 2686.

Very truly yours,

R. C. Leander
Safety & Environmental Manager

ENV
21 Apr 92

ERNS/REGIONAL CASE # _____ / NRC # _____

U.S. ENVIRONMENTAL PROTECTION AGENCY
ACCIDENTAL RELEASE INFORMATION PROGRAM

PART A. EMERGENCY RESPONSE NOTIFICATION SYSTEM - VERIFICATION

Information regarding an accidental release incident in your facility has been recorded in the Emergency Response Notification System (ERNS). Below is the information available in ERNS regarding this release. Please verify this information by making any corrections and/or by providing any missing information in the spaces provided (attach additional pages as necessary).

1. **Facility:** Longhorn Army Ammunition Plant

Dun & Bradstreet Number 002 - 241 - 164

Street P. O. Box 1149
City Marshall
County Harrison
State Texas Zip 75670

Telephone (903) 679-2100

2. **Spill Location:** (X Check here if same as Facility Address)

Street _____
City _____
County _____
State _____ Zip _____

Telephone ( ) _____

Latitude (Deg/Min) 36 / 15 Longitude 94 / 10

3. **Primary Chemical Released:** Nitric Acid/N_2O_5/N_2O_4

4. **ERNS Reporting Date/Time:** 09/26/91 (mm/dd/yy) / 1600 (24-hr clock)

5. **Reported through NRC?** Yes X No _____

ERNS/REGIONAL CASE # _____ / NRC # _____

6. Federal, State, and Local Authorities Notified:

(e.g., NRC, EPA Regional Office, SERC, DNR, LEPC, Police, and others. Show dates as mm/dd/yy; times in 24 hour clock.)

Agency	Date	Time	Person Contacted
Texas Water Commission	09/17/91	1622	Alan Church
Texas Air Control Board	09/17/91	1634	John C. Gott

7. Responding Agencies:

U.S. Army Longhorn Army Ammunition Plant

8. Response Action(s):

Containment within the existing secondary containment facility. Measurement of soil and water pH in the local area. No contamination of soil or surface water.

ERNS/REGIONAL CASE # _____ / NRC # _____

PART B. ACCIDENTAL RELEASE PREVENTION - SUPPLEMENTAL INFORMATION

SECTION I. FACILITY PROFILE

1. Plant Manager/Facility Owner: U.S. Army

2. Responding Official: Robert W. Bringman, LTC

Title: Commander

Address: Longhorn Army Ammunition Plant
P. O. Box 1149
Marshall, TX 75670

Telephone: (903) 679-2100

Signature: _____ Date: _____

3. Please provide the four-digit Standard Industrial Classification (SIC) codes that best describe your facility operations:

SIC code(s): 3483 (Primary), 3764, 2899

Primary product or service: Load, assemble, and packout of pyrotechnic ammunition and solid propellants.

4. Indicate the total number of employees typically at the facility (include all full-time and part time employees, all employees on sick leave, paid holidays, paid vacations, managers and corporate officers at the facility, and contractors):

Number of Employees: 897

ERNS/REGIONAL CASE # _____ / NRC # _____

SECTION II. HAZARDOUS SUBSTANCE RELEASE PROFILE

For the following section, if exact responses cannot be provided please provide estimates using your best professional judgment.

5. **Date/Time Release Began:** 09/17/92 (month/day/year); 1320 (24-hr clock)

Ended: 09/17/92 (month/day/year); 1320 (24-hr clock)

6. In the table below, provide release estimates for the primary chemical released (in lbs, only) to each media. Quantities released to each media should add up to the total quantity released. For solutions, adjust the quantity of the chemical released for chemical concentration (e.g., report 1,000 lbs of 50% sulfuric acid released as 500 lbs sulfuric acid). For multiple chemicals attach additional pages as necessary.

Chemical Name: Nitric Acid/Nitrogen pentoxide

CAS Number: 7697-37-2

Concentration (wt%): 99.7

Physical State at time of release: Liquid/Vapor Fuming Liquid

Released To:	Quantity (lbs):	
Air	45*	Most of this fell back onto the pad and ran into the sump as H_2NO_3.
Surface Water		
Land		
Treatment Facility	3080**	** The containment system was designed to catch and hold 125% of all the acid in the system.
Total Quantity Released:	3125	

7. Check the item below that best describes when the release occurred:

a. [X] During routine operation
b. [ ] During routine startup
c. [ ] While in process of shutting down operations
d. [ ] While unit was shutdown for maintenance/product changeover, etc.
e. [ ] During special test, or non-standard, trial run conditions
f. [ ] During startup of new construction, new equipment
g. [ ] Other (please describe):

_____
_____
_____

ERNS/REGIONAL CASE # _____ / NRC # _____

8. Check the item below that best describes the status of the facility, unit, or process line as a result of the release:

a. ____ No interruption; continued operations
b. ____ Restarted after release
c. _X_ Shut down for repairs; with plans to restart
d. ____ Permanently closed
e. ____ Other (please describe):

_____
_____
_____

9. Check the one item below that best describes the location of the loss of containment in the specified area:

a. **Process Vessel:** _X_ wall, ___ overflow, ___ vent, ___ drain
b. **Storage vessel:** ___ wall, ___ overflow, ___ vent, ___ drain
c. **Valve:** ___ flange, ___ seal, ___ body
d. **Piping:** ___ flange, ___ joint, ___ elbow, ___ wall
e. **Pump:** ___ flange, ___ seal, ___ body
f. Other process equipment (please describe):

_____
_____
_____

10. How was the release first discovered? (check as many as apply)

a. ____ Process control device indication
b. ____ Chemical specific detector, alarm
c. ____ Observation by employee(s)
d. _X_ Explosion/fire
e. ____ Third party notification
f. ____ Other (please describe):

_____
_____
_____

11. Check one item below that best describes what initiated the release:

a. _X_ Equipment failure
b. ____ Operator error

ERNS/REGIONAL CASE # _____ / NRC # _____

12. Indicate other factors that contributed to the equipment failure or operator error (check as many as apply and elaborate below):

a. ____ "Upset" condition
b. ____ "By-pass" condition
c. ____ Maintenance activity
d. ____ Training deficiencies
e. ____ Inappropriate operating procedures
f. ____ Faulty process design
g. ____ Unsuitable equipment
h. ____ Unusual weather Conditions
i. X Other (please describe):

Incident occurred in new design of a Research & Development nature.

13. Provide a brief chronological description of the events that led up to and contributed to the release event (if helpful, include a sketch). Briefly discuss the results of your investigation. Use additional pages as necessary.

The electrolytic cell was being operated to prove out this new process. During operation, the cell ruptured due to an over pressure caused by, as determined in the subsequent investigation, a reaction between the circulating acids and the electrode. The original research did not indicate this failure scenario.

14. Check all items that describe the end effects of the release event:

a. ____ Spill
b. X Vapor release
c. ____ Explosion
d. ____ Fire
e. X Other (describe):

The liquid acid spilled was collected in the sump under the process equipment. The majority of the N_2O_5 release condensed as N_2NO_3 and fell back onto the concrete pad and was collected in the sump. A small cloud of formed, ascended to an height of some 1300 feet in a no-wind situation, condensed, and fell back to the HMX pad.

ERNS/REGIONAL CASE # _____ / NRC # _____

15. Was the general public notified? Yes ____ No _X_

If yes, indicate the type of communication technologies used to alert and notify the public to evacuate or take other safety measures. Check as many items as apply:

a. ____ Door-to-door notification
b. ____ Loudspeakers/public access system
c. ____ Tone alert radio/pagers
d. ____ Siren/alarms
e. ____ Modulated power lines
f. ____ Aircraft
g. ____ Radio
h. ____ Television
i. ____ Cable override
j. ____ Telephone
k. ____ Other (please describe):

_____
_____
_____

16. Indicate the number of persons injured, hospitalized (as opposed to treated and released) and fatalities that occurred as a result of the release (indicate with NA if not known):

	Injuries	Hospitalized	Fatalities
Facility employees	None	None	None
Contractors	"	"	"
General public	"	"	"
Responders	"	"	"

17. Indicate the number of persons evacuated and/or sheltered-in-place as a result of the release (indicate with NA if not known):

	Evacuated	Sheltered in Place
Facility employees	9	2
Contractors	None	None
General public	None	None

ERNS/REGIONAL CASE # _____ / NRC # _____

18. Describe the immediate response activities taken to mitigate the release (capture, neutralize or destroy a toxic chemical before it is released into the environment). Check as many as apply.

a. ___ Reduce system pressure/temperature
b. ___ Apply spray scrubber/curtain
c. ___ Transfer contents from failed equipment
d. X Dilute and/or neutralize
e. X Containment
f. X Plant/process shutdown
g. X Divert release to treatment
h. ___ Vacuum/release recovery
i. ___ Incineration/flares
j. ___ None
k. ___ Other (describe):

_____
_____
_____

19. Indicate the environmental effects that occurred as a result of the release:

a. ___ Fish Kills
b. ___ Vegetation damage
c. ___ Soil contamination
d. ___ Groundwater contamination
e. ___ Wildlife kills
f. X None
g. ___ Other (please describe):

_____
_____
_____

20. Estimate the financial impact of the accidental release for the facility (e.g., cleanup cost, outside contractors cost, hours/wages diverted to cleanup or lost to shutdown, loss of production) and for the general public (e.g., damage to natural resources, public and private properties). An aggregate figure may be provided if a breakdown is not available.

a. Facility Costs: $ 15,000 (est)

b. General Public Costs: $ None

Total Costs: $ 15,000

ERNS/REGIONAL CASE # _____ / NRC # _____

SECTION III. PREVENTION PROFILE

21a. What formalized hazard evaluation was performed prior to this release at the process or storage area within your facility where the accident occurred? When was it last conducted? How frequently is this evaluation conducted (e.g. every 2 years)? Indicate frequency in years and date last conducted as mm/dd/yy.

			Frequency	Last Conducted
a.	___	Cause-Consequence analyses		
b.	___	Dow and Mond Hazard Indices		
c.	___	Event Tree analyses		
d.	X	Failure Modes/Effects analyses	1	April 1989
e.	___	Fault Tree analyses		
f.	X	HAZOP Studies	1	April 1989
g.	___	Human Error analyses		
h.	___	Probabilistic Risk Assessments		
i.	___	What If analyses		
j.	___	No evaluation ever done for this area		
k.	___	Other evaluation (describe, indicate frequency, date done):		

21b. Was the hazard evaluation performed effective in predicting this release event? Why or why not?

No, because this incident was not predicted by the original research and development work performed by Lawrence Livermore and Thiokol Corp.

22a. Identify the training, procedures, and/or management practices used at this facility prior to this release to prevent accidental releases. Check all that apply.

a. X Preventive Maintenance/Inspections
b. X Accident Investigations
c. ___ Audits
d. ___ Inventory/capacity reductions
e. X Employee safety training
f. X Standard operating procedures
g. X Emergency response training
h. ___ None
i. ___ Other (please describe):

ERNS/REGIONAL CASE # _____ / NRC # _____

22b. Describe any changes to existing training, procedures and management practices, or what new types of training, procedures and management practices are or will be implemented as a result of this release?

None. Not considered pertinent to this incident. The changes made were to equipment materials of construction which were determined as the cause. The existing training and procedures were observed as being adequate to prevent personal injury, and to clean up the resulting spills, which were adequately contained.

23a. What engineering systems or controls were in use prior to the release at the process or storage area within your facility where the accident occurred? Check all that apply.

a. ___ Backup/Redundant systems
b. _X_ Automatic Shut-offs
c. ___ Bypass/Surge systems
d. _X_ Manual Overrides
e. ___ Controls for operations monitoring and warning
f. ___ Interlocks
g. ___ None
h. ___ Other (please describe):

23b. Describe any changes to the existing engineering systems or controls, and any new types of engineering systems/controls that are or will be implemented as a result of this release:

The release was ascribed to contact between the acid in the cell and the metal electrode during application of power to the cell. The metal in the electrode was changed to a different metal, subsequently tested and found that the new metal was a viable alternative that did not show any reaction to the acid material during electrolysis.

Thomas Beam

17 September 1991

TO: Env & Safety Manager

FROM: Env. Coordinator

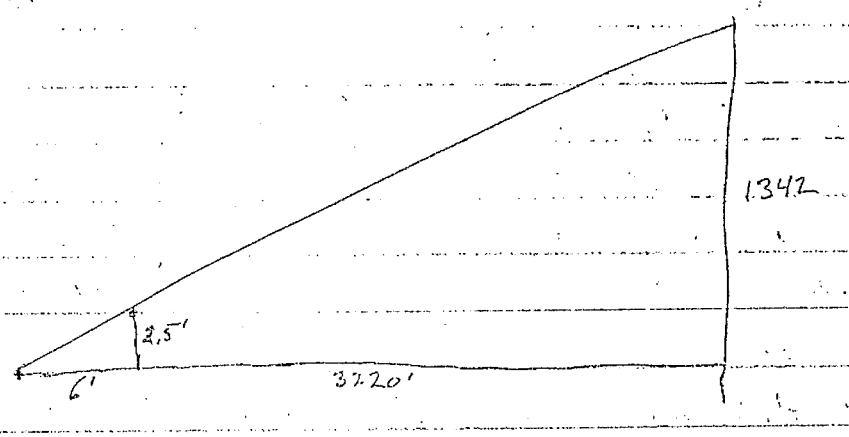
Subject: Acid Release HMX

Chris Reddam and C.R. Smith were working in the vicinity of the UXO at the burning ground. We noticed a cloud, slightly yellow-brown in color, away from the static test / HMX area. As we watched the cloud stopped rising and the moisture in the cloud started to fall back toward the ground. Using Chris as an intermediate reference we performed a triangulation on cloud height determination. Cloud height at it's highest point was 1342 feet. As we continued to watch the cloud ~~rested~~ receded below the tree line. Time for the cloud to rise and fall back was approximately 2 minutes. Winds were calm with light and variable breeze. Burning ground personnel advised us that our evacuation order had been given so we departed the burning ground and returned to Building 720K.

Mr. Leander radioed from the incident scene to ascertain the reporting requirements. The CRTK manual indicates that the RQ for NOX is 100 pounds. Nitric acid is 1000 pounds.

He advised that it appeared that the army had collected most of the acid and that the gaseous release was probably significantly less than that. Estimated 5-10 pounds.

When we can gain entry, Chris and I will take soil samples to determine the extent of soil contamination by acid.


1342
2.5'
6'
3720'

HMX 25-T 18 Sep 91

32-T North pH 5.27
32-T North East pH 5.43

25-T North East Corner Bunker pH 5.89
25-T West Front Top Bunker pH 6.33

Background pH @ Longhorn ≡ 5.49

Attachment 6

Nonresidential Land Use Notifications

136 pages

2011-000003377

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

NOTICE

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 03/24/2011 03:52 PM **Document Number:** 2011-000003377 **Receipt No:** 1103745 **Amount:** $ 32.00 **By:** Lauren Boyd, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT CDU OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

AARON WILLIAMS EC-ER
1645 SOUTH 101ST EAST AVENUE

TULSA, OK 74128

STATE OF TEXAS HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remedial investigation of the land described herein. The site, LHAAP-08, the former Sewage Treatment Plant, operated from 1942 to 1997. 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-08 is not itself considered an NPL site. Environmental activities at LHAAP-08 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ as the lead regulatory agency that no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-08 included stabilization ponds, Dunbar filters, sludge drying beds, and an Imhoff tank. The plant received storm water, boiler blow down, laundry waste, vehicle wash rack waste, and effluent from film development at the X-ray facility. Treated effluent was discharged into Goose Prairie Creek and Caddo Lake. Soil and groundwater investigations in 2000, 2001, and 2005 included sampling for explosives compounds, metals, semivolatile organic compounds, volatile organic compounds, dioxins and furans, pesticides and PCBs. Soil results included detections of low levels of metals, perchlorate and dioxin. Low levels of metals, dioxin and furan compounds and perchlorate were detected in groundwater. An assessment of risk to exposure to soil and groundwater at LHAAP-08, based on the

nonresidential use scenario, indicated that potential human health risks are within the acceptable range established by EPA. 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.

II

The LHAAP-08 parcel is a 2.974 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-08 site and USEPA and TCEQ concluded that no further investigation or action is required for LHAAP-08. Contaminants in soil samples from LHAAP-08 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of LHAAP-08 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-08 is consistent with the non-residential use scenario evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. 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.

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

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 25 th day of January, 2011 ~~2010~~.

BEFORE ME, on this the 25 th day of Jan 2011, 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 25 day of January,

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

NOTARY PUBLIC STATE OF TEXAS
ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 3-17-2011

FIELD NOTES DESCRIPTION OF
"LHAAP–08" TRACT
(PROPOSED INDUSTRIAL USE NOTIFICATION AREA)
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP–08" being 2.974 acre of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP–08" being more particularly described as follows :

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998636625, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "IGNATIUS–1" (N=6957090.304 feet E=3311081.788 feet) and "IGNATIUS–2" (N=6955582.752 feet E=3311851.704 feet). Said traverse indicates a surface distance of 1693.005 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940", and the abbreviation C.N.I.B.C. indicates concrete nail in bottle cap.

Commencing at monument "IGNATIUS–1" referenced above,

THENCE N 52deg56'26"W 814.32' to an I.R.O.P.C. set for the Southmost corner of this tract and this POINT OF BEGINNING,

THENCE N 28deg08'32"W 374.05' along the S.W. B.L. of this tract to an I.R.O.P.C. set for this tract's Westmost corner,

THENCE N 62deg03'14"E 348.01' along the N.W. B.L. of this tract to a C.N.I.B.C. set (in the asphalt pavement of South Houston Road) for this tract's Northmost corner,

THENCE S 27deg43'38"E 328.00' along the N.E. B.L. of this tract to a C.N.I.B.C. set (in the asphalt pavement of South Houston Road) for the North end of a curve,

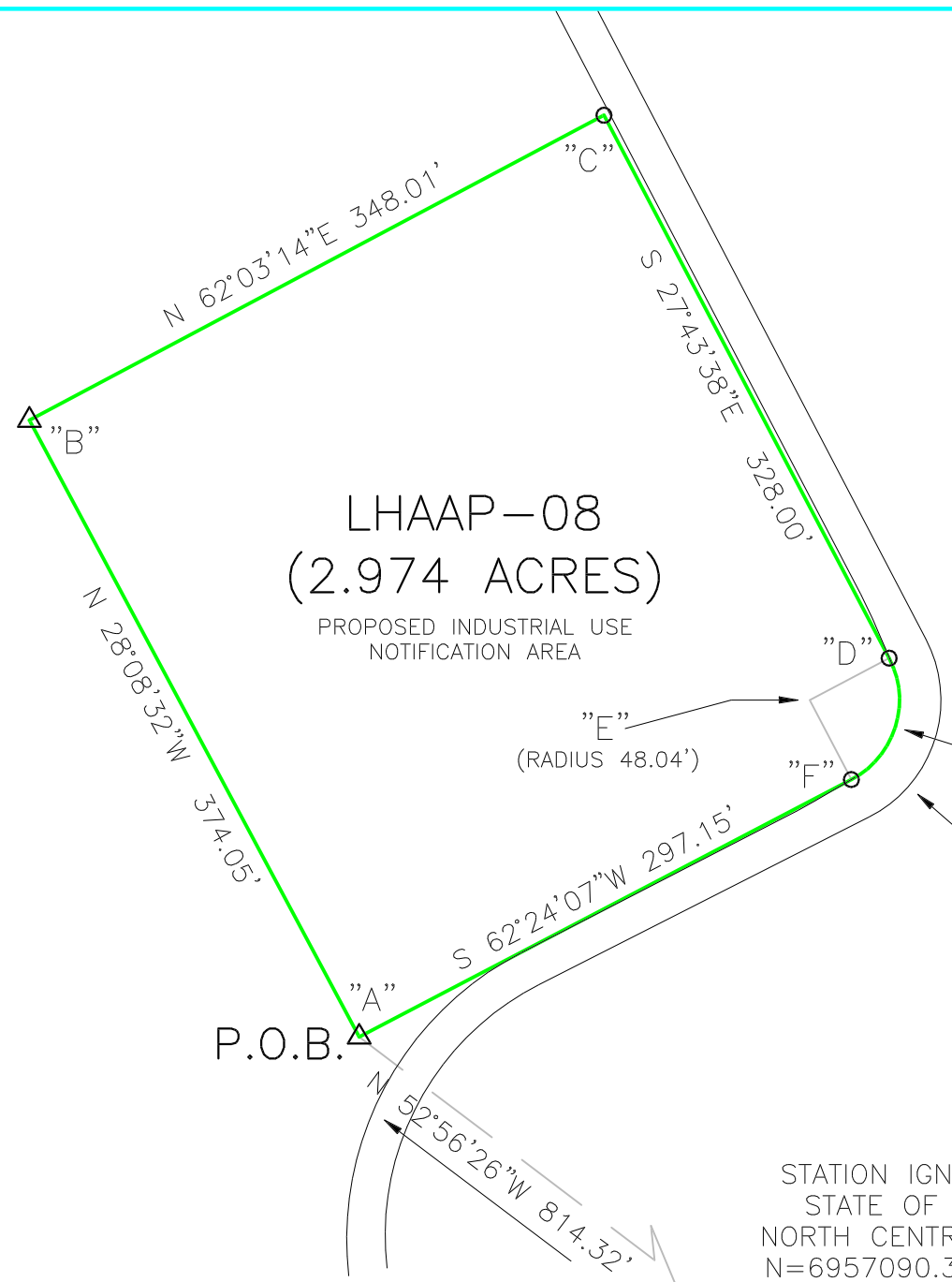
THENCE along a curve to the right (having a radius of 48.04' and an arc length of 75.57', being subtended by a chord of S 17deg20'14"W 68.02') to a C.N.I.B.C. set (in the asphalt pavement of South Houston Road) for the South end of said curve,

THENCE S 62deg24'07"W 297.15' along the S.E. B.L. of this tract to this POINT OF BEGINNING, containing 2.974 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler

Tom A. Fidler, R.P.L.S. Number 3940



ARC 75.57' RADIUS 48.04'
CHORD S 17°20'14"W 68.02'

SOUTH HOUSTON ROAD
(ASPHALT; ATYPICAL WIDTH
AREAS NOT SHOWN)

STATION IGNATIUS-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957090.304 FEET
E=3311081.788 FEET

BEARING SOURCE
S 27°03'13.2"E 1692.774'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1693.005')

STATION IGNATIUS-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6955582.752 FEET
E=3311851.704 FEET

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998636625 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS IGNATIUS-1 & IGNATIUS-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

SCALE 1"=100'

100 0 100 200 300
GRAPHIC SCALE - FEET

COORDINATE TABLE

POINT	NORTH	EAST
A	6957581.048	3310431.952
B	6957910.879	3310255.527
C	6958073.970	3310562.954
D	6957783.633	3310715.561
E	6957761.282	3310673.037
F	6957718.708	3310695.292

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in July 2008.

Witness my hand and seal this the 29th day of July, 2008

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- O INDICATES CONCRETE NAIL IN BOTTLE CAP (SET IN ASPHALT)
- △ INDICATES 1/2" IRON REBAR WITH ORANGE PLASTIC CAP ENGRAVED "FIDLER" & "RPLS 3940" (SET)
- ——— INDICATES BOUNDARY OF PROPOSED INDUSTRIAL USE NOTIFICATION AREA

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

LHAAP-8
(2.974 ACRES)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

001899

JOB #0407088	0407088.CRD	0605063F.DWG
07/29/2008	0605063.CRD	DRAWN BY JTJ

2012-000000706

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MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000706 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump094 (called Sump 094 on the attached Exhibit A) is part of LHAAP-35/36. Sump094 is a former sump location near Building 16-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump094 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump094) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump094 parcel is 64 square feet, more or less, or 0.00146 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump094 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump094 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump094 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump094 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the ____th day of _____, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
SUMP 094
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 64.0 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

THENCE N 07deg59'31"W 569.56' to a point for the Southmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following four courses :

(01) N 37deg59'57"W 8.00' to a point for the Westmost corner of this tract,
(02) N 52deg00'03"E 8.00' to a point for the Northmost corner of this tract,
(03) S 37deg59'57"E 8.00' to a point for the Eastmost corner of this tract,
(04) S 52deg00'03"W 8.00' to this POINT OF BEGINNING.

This tract contains 64.0 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940

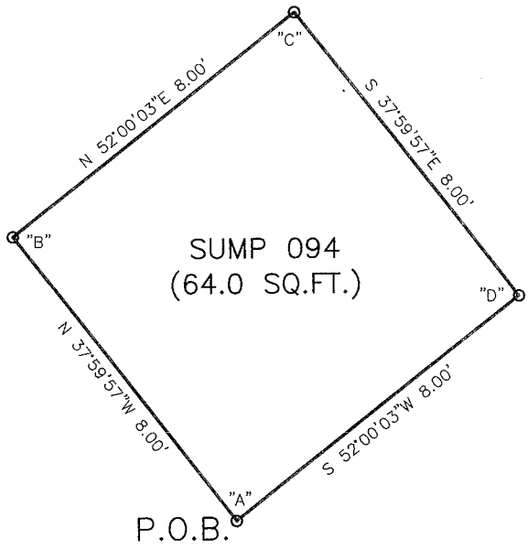
LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP



COORDINATE TABLE

POINT	NORTH	EAST
A	6959071.485	3314200.311
B	6959077.789	3314195.385
C	6959082.715	3314201.689
D	6959076.411	3314206.615

SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE - FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 14, 2011.

N 07°59'31"W 569.56'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 094
(64.0 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	H.PTS H.LEG
03/14/2011	1103025H.DWG	DRAWN BY JTJ

00189915

2012-000000707

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

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6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000707 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump095 (called Sump 095 on the attached Exhibit A) is part of LHAAP-35/36. Sump095 is a former sump location near Building 34-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump095 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump095) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump095 parcel is 69.6 square feet, more or less, or 0.00159 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump095 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump095 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump095 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump095 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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- ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
SUMP 095
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 69.6 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

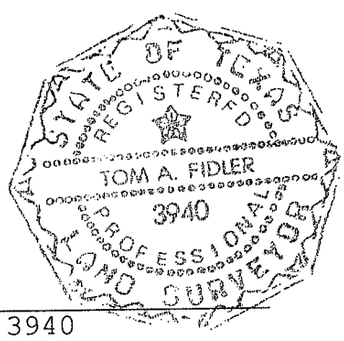
THENCE N 43deg48'28"E 725.22' to a point for the Southmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following eight courses :

(01)	N 37deg59'57"W	12.00'	to a point for tract corner,
(02)	S 52deg00'03"W	3.10'	to a point for tract corner,
(03)	N 37deg59'57"W	6.00'	to a point for the Westmost corner of this tract,
(04)	N 52deg00'03"E	8.00'	to a point for the Northmost corner of this tract,
(05)	S 37deg59'57"E	6.00'	to a point for tract corner,
(06)	S 52deg00'03"W	3.10'	to a point for tract corner,
(07)	S 37deg59'57"E	12.00'	to a point for the Eastmost corner of this tract,
(08)	S 52deg00'03"W	1.80'	to this POINT OF BEGINNING.

This tract contains 69.6 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

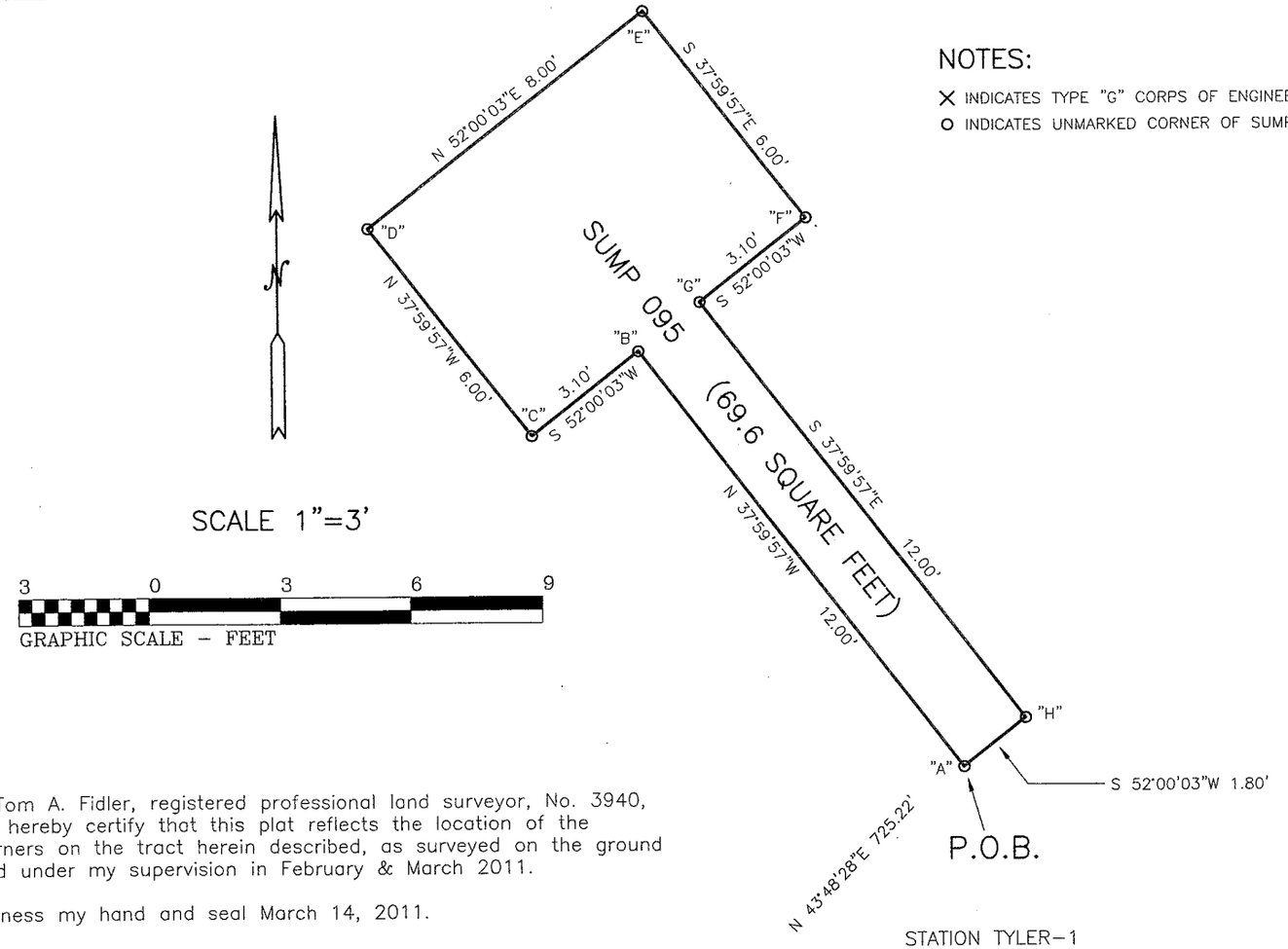


Tom A. Fidler, R.P.L.S. Number 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP



NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6959030.826	3314781.526
B	6959040.282	3314774.138
C	6959038.373	3314771.695
D	6959043.101	3314768.001
E	6959048.027	3314774.305
F	6959043.299	3314777.999
G	6959041.390	3314775.556
H	6959031.934	3314782.944

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 14, 2011.

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 095
(69.6 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	F.PTS F.LEG
03/14/2011	1103025F.DWG	DRAWN BY JTJ

00189921

2012-000000708

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000708 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump096 (called Sump 096 on the attached Exhibit A) is part of LHAAP-35/36. Sump096 is a former sump location near Building 34-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump096 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump096) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump096 parcel is 64 square feet, more or less, or 0.00146 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump096 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump096 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump096 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump096 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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- ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

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

FIELD NOTES DESCRIPTION OF
SUMP 096
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 64.0 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

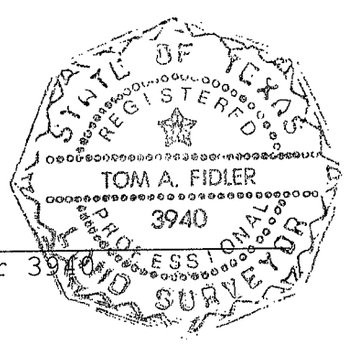
THENCE N 36deg34'53"E 696.04' to a point for the Southmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following four courses :

(01) N 37deg59'57"W 8.00' to a point for the Westmost corner of this tract,
(02) N 52deg00'03"E 8.00' to a point for the Northmost corner of this tract,
(03) S 37deg59'57"E 8.00' to a point for the Eastmost corner of this tract,
(04) S 52deg00'03"W 8.00' to this POINT OF BEGINNING.

This tract contains 64.0 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

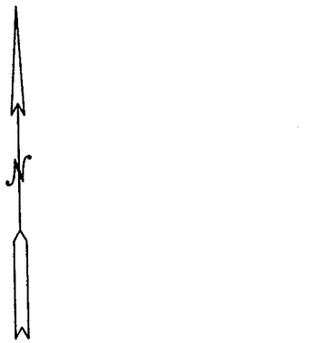


Tom A. Fidler, R.P.L.S. Number 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

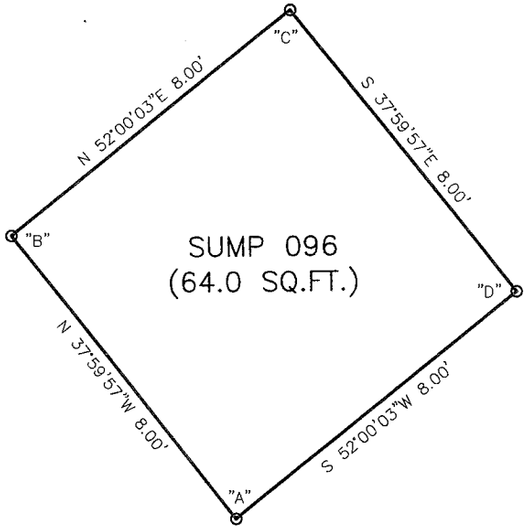
NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP



SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE – FEET



STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6959066.385	3314694.311
B	6959072.689	3314689.385
C	6959077.615	3314695.689
D	6959071.311	3314700.615

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 14, 2011.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 096
(64.0 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	G.PTS G.LEG
03/14/2011	1103025G.DWG	DRAWN BY JTJ

00189927

2012-000000709

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000709 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump097 (called Sump 097 on the attached Exhibit A) is part of LHAAP-35/36. Sump097 is a former sump location near Building 38-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump097 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump097) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump097 parcel is 76.6 square feet, more or less, or 0.00175 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump097 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump097 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump097 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump097 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30 th day of June, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
SUMP 097
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 76.6 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

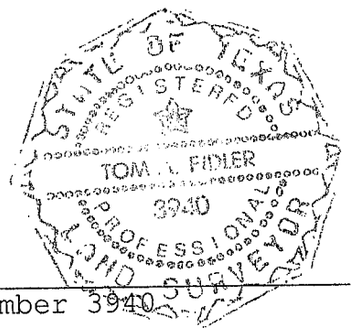
THENCE N 33deg53'28"E 842.86' to this POINT OF BEGINNING, said point being at the Southmost corner of the external face of the concrete which defines this sump,

THENCE along the external face of the concrete which defines this sump the following four courses, each course ending at a corner of the external face of said concrete :

(01)	N 58deg18'32"W	6.20',	being this sump's Westmost corner,
(02)	N 37deg53'34"E	12.45',	being this sump's Northmost corner,
(03)	S 58deg06'49"E	6.18',	being this sump's Eastmost corner,
(04)	S 37deg47'39"W	12.43',	being the aforementioned POINT OF BEGINNING.

This tract contains 76.6 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

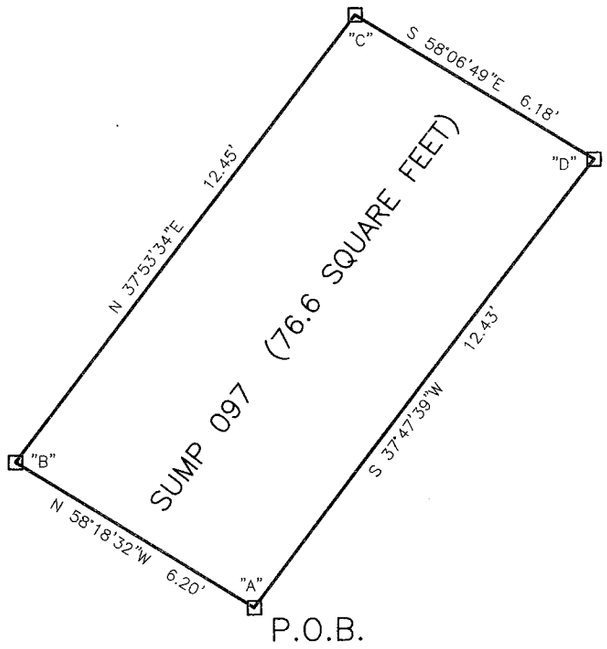
LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

NOTES:

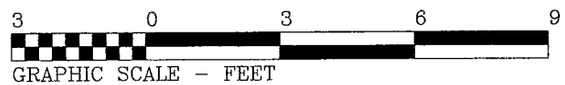
- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES CORNER OF EXTERNAL FACE OF CONCRETE
- O INDICATES UNMARKED POINT



COORDINATE TABLE

POINT	NORTH	EAST
A	6959207.120	3314749.495
B	6959210.377	3314744.219
C	6959220.206	3314751.868
D	6959216.943	3314757.113

SCALE 1"=3'



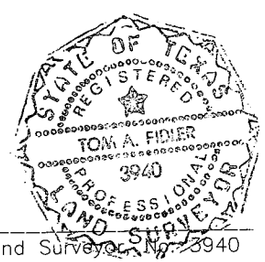
I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 4, 2011.

N 33°53'28"E 842.86'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET



Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 097
(76.6 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	Z.PTS Z.LEG
MAR. 4, 2011	0908074Z.DWG	DRAWN BY JTJ

00189933

2012-000000710

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000710 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump098 (called Sump 098 on the attached Exhibit A) is part of LHAAP-35/36. Sump098 is a former sump location near Building 38-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump098 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump098) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump098 parcel is 39.4 square feet, more or less, or 0.0009 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump098 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump098 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump098 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump098 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

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

FIELD NOTES DESCRIPTION OF
SUMP 098
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 39.4 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

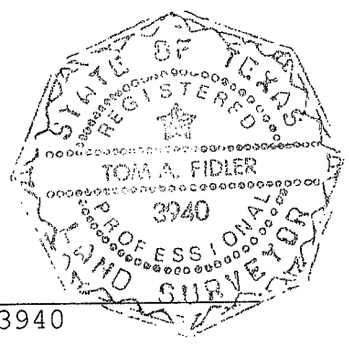
THENCE N 28deg58'18"E 815.98' to this POINT OF BEGINNING, said point being at the Southmost corner of the external face of the concrete which defines this sump,

THENCE along the external face of the concrete which defines this sump the following four courses, each course ending at a corner of the external face of said concrete :

(01)	N 51deg59'37"W	9.74',	being this sump's Westmost corner,
(02)	N 43deg01'55"E	4.05',	being this sump's Northmost corner,
(03)	S 52deg06'01"E	9.75',	being this sump's Eastmost corner,
(04)	S 43deg15'56"W	4.07',	being the aforementioned POINT OF BEGINNING.

This tract contains 39.4 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

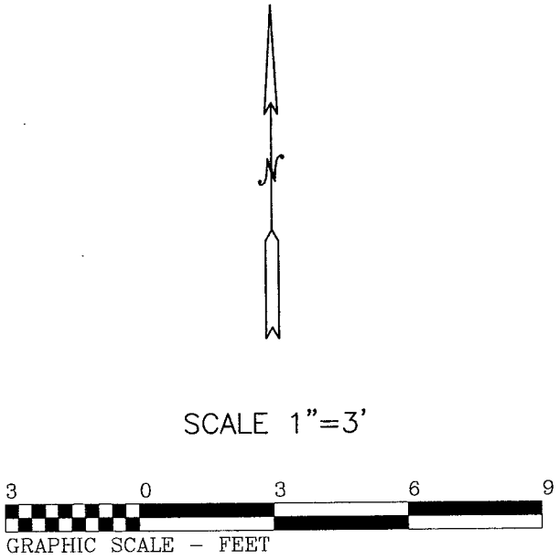


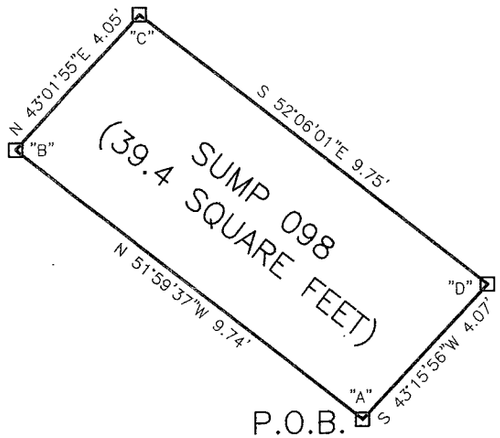
Tom A. Fidler, R.P.L.S. Number 3940

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
□ INDICATES CORNER OF EXTERNAL FACE OF CONCRETE
O INDICATES UNMARKED POINT

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com





NOTE

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COORDINATE TABLE

POINT	NORTH	EAST
A	6959221.331	3314674.744
B	6959227.327	3314667.072
C	6959230.288	3314669.837
D	6959224.296	3314677.534

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 4, 2011.

N 28°58'18"E 815.98'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 098
(39.4 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	Y.PTS Y.LEG
MAR. 4, 2011	0908074Y.DWG	DRAWN BY JTJ

00189939

2012-000000711

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000711 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump099 (called Sump 099 on the attached Exhibit A) is part of LHAAP-35/36. Sump099 is a former sump location near Building 38-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump099 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump099) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump099 parcel is 48 square feet, more or less, or 0.0011 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump099 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump099 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump099 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump099 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30 th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
SUMP 099
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 48.0 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

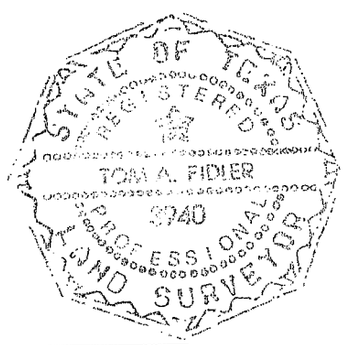
THENCE N 27deg36'35"E 879.49' to a point for the Southmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following four courses :

(01) N 37deg59'57"W 8.00' to a point for the Westmost corner of this tract,
(02) N 52deg00'03"E 6.00' to a point for the Northmost corner of this tract,
(03) S 37deg59'57"E 8.00' to a point for the Eastmost corner of this tract,
(04) S 52deg00'03"W 6.00' to this POINT OF BEGINNING.

This tract contains 48.0 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

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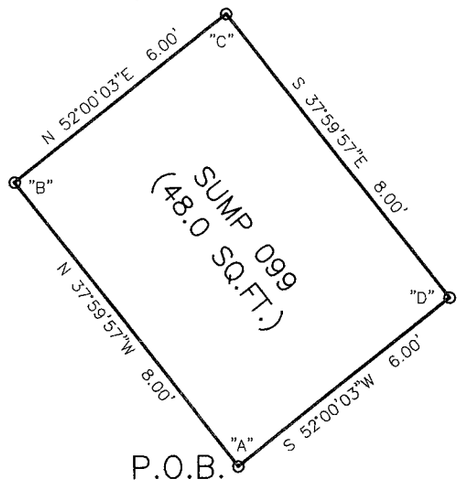
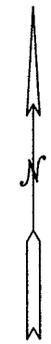
NOTES

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP

COORDINATE TABLE

POINT	NORTH	EAST
A	6959286.801	3314687.099
B	6959293.105	3314682.173
C	6959296.799	3314686.901
D	6959290.495	3314691.827





SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE - FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 14, 2011.

N 27°36'35"E 879.49'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 099
(48.0 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	J.PTS J.LEG
03/14/2011	1103025J.DWG	DRAWN BY JTJ

00189945

2012-000000712

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000712 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

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LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump100) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump100 parcel is 80 square feet, more or less, or 0.00183 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump100 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump100 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump100 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump100 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of JUNE, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
SUMP 100
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 80.0 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

THENCE N 23deg52'16"E 995.90' to a point for the Southmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following four courses :

(01) N 37deg59'57"W 8.00' to a point for the Westmost corner of this tract,
(02) N 52deg00'03"E 10.00' to a point for the Northmost corner of this tract,
(03) S 37deg59'57"E 8.00' to a point for the Eastmost corner of this tract,
(04) S 52deg00'03"W 10.00' to this POINT OF BEGINNING.

This tract contains 80.0 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

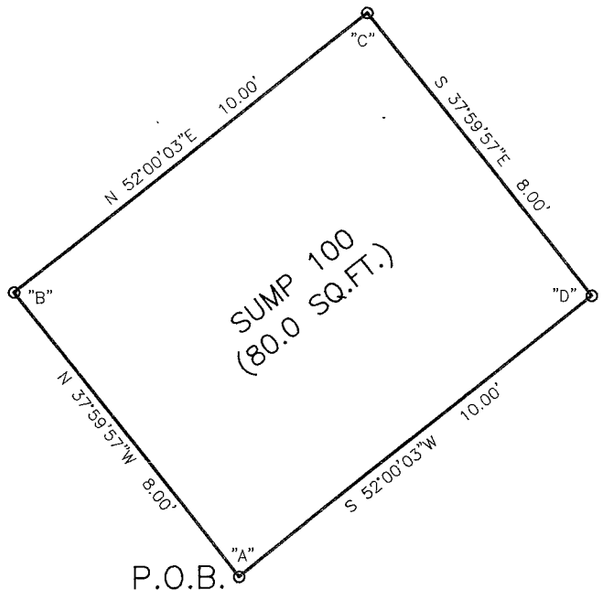
STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, R.P.L.S. Number 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.



NOTES

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP

COORDINATE TABLE

POINT	NORTH	EAST
A	6959418.170	3314682.523
B	6959424.474	3314677.597
C	6959430.630	3314685.477
D	6959424.326	3314690.403

SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE – FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 14, 2011.

N 23°52'16"E 995.90'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 100
(80.0 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	K.PTS K.LEG
03/14/2011	1103025K.DWG	DRAWN BY JTJ

00189951

2012-000000713

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000713 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump101 (called Sump 101 on the attached Exhibit A) is part of LHAAP-35/36. Sump101 is a former sump location near Building 45-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump101 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump101) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump101 parcel is 67 square feet, more or less, or 0.00153 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump101 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump101 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump101 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump101 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30 th day of June, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
SUMP 101
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 67.0 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

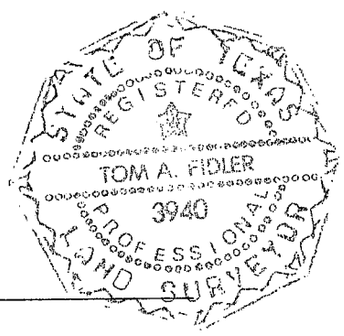
THENCE N 27deg18'47"E 1027.58' to this POINT OF BEGINNING, said point being at the Southmost corner of the external face of the concrete which defines this sump,

THENCE along the external face of the concrete which defines this sump the following four courses, each course ending at a corner of the external face of said concrete :

(01)	N 38deg59'52"W	11.24',	being this sump's Westmost corner,
(02)	N 57deg48'20"E	5.99',	being this sump's Northmost corner,
(03)	S 39deg05'42"E	11.26',	being this sump's Eastmost corner,
(04)	S 57deg59'19"W	6.01',	being the aforementioned POINT OF BEGINNING.

This tract contains 67.0 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

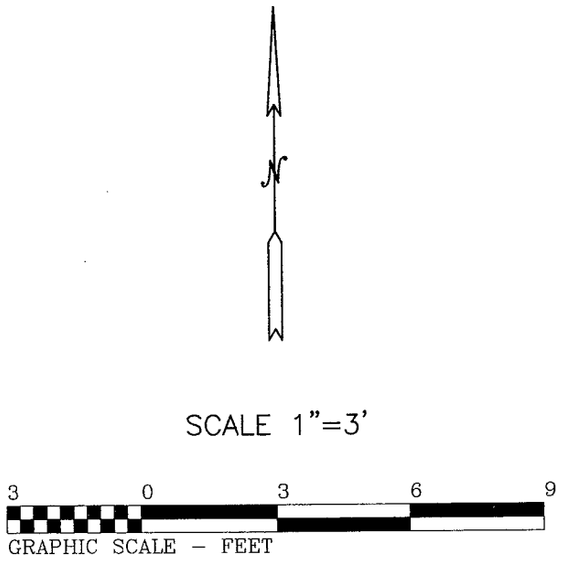


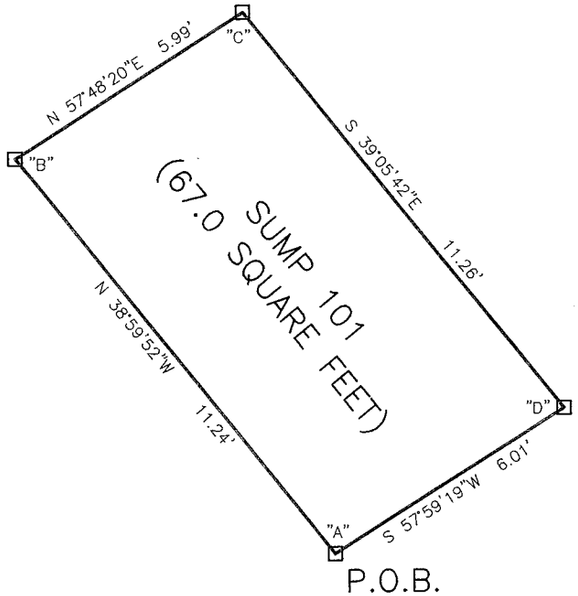
Tom A. Fidler, R.P.L.S. Number 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- ☐ INDICATES CORNER OF EXTERNAL FACE OF CONCRETE
- O INDICATES UNMARKED POINT





NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6959420.476	3314751.003
B	6959429.211	3314743.930
C	6959432.404	3314749.001
D	6959423.663	3314756.102

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 4, 2011.

N 27°18'47"E 1027.58'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 101
(67.0 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	A.PTS A.LEG
MAR. 4, 2011	1103025A.DWG	DRAWN BY JTJ

00189957

2012-000000714

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000714 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump102 (called Sump 102 on the attached Exhibit A) is part of LHAAP-35/36. Sump102 is a former sump location near Building 16-T physically located within site boundary of LHAAP-35C(53) of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump102 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump102) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump102 parcel is 154.4 square feet, more or less, or 0.00354 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump102 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump102 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump102 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump102 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
SUMP 102
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 154.4 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-2" referenced above,

THENCE S 17deg29'41"E 550.28' to a point for the Northmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following ten courses :

(01)	S 15deg52'38"E	7.67'	to a point for the Eastmost corner of this tract,
(02)	S 74deg07'22"W	6.94'	to a point for tract corner,
(03)	N 15deg52'38"W	5.54'	to a point for tract corner,
(04)	S 74deg07'22"W	12.94'	to a point for tract corner,
(05)	S 36deg37'46"W	24.51'	to a point for tract corner,
(06)	S 53deg22'14"E	7.10'	to a point for tract corner,
(07)	S 36deg37'46"W	2.10'	to a point for the Southmost corner of this tract,
(08)	N 53deg22'14"W	9.25'	to a point for the Westmost corner of this tract,
(09)	N 36deg37'46"E	27.31'	to a point for tract corner,
(10)	N 74deg07'22"E	20.63'	to this POINT OF BEGINNING.

This tract contains 154.4 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTES:

× INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1116.219')

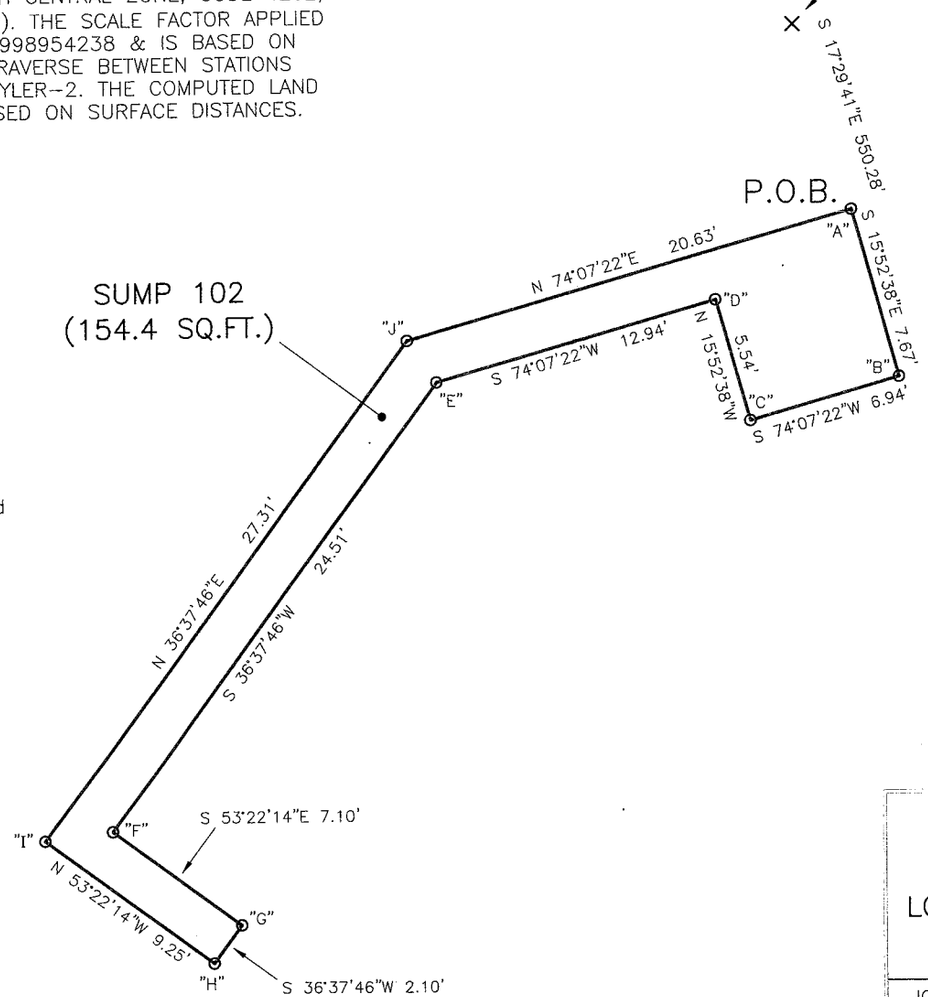
STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

SCALE 1"=6'

6 0 6 12 18
GRAPHIC SCALE – FEET



COORDINATE TABLE

POINT	NORTH	EAST
A	6957307.354	3315333.565
B	6957299.975	3315335.664
C	6957298.077	3315328.991
D	6957303.409	3315327.474
E	6957299.870	3315315.030
F	6957280.203	3315300.409
G	6957275.965	3315306.110
H	6957274.278	3315304.856
I	6957279.797	3315297.433
J	6957301.711	3315313.725

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 11, 2011.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

SUMP 102
(154.4 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #1101007	0407088.CRD	B.PTS B.LEG
MAR. 11, 2011	1103025B.DWG	DRAWN BY JTJ

00189963

2012-000000715

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000715 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump103 (called Sump 103 on the attached Exhibit A) is part of LHAAP-35/36. Sump103 is a former sump location near Building 16-T physically located within site boundary of LHAAP-35C(53) of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump103 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump103) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump103 parcel is 209.1 square feet, more or less, or 0.0048 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump103 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump103 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump103 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump103 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
SUMP 103
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 209.1 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-2" referenced above,

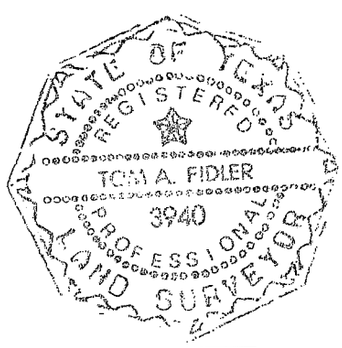
THENCE S 20deg31'34"E 601.43' to a point for the Northmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following ten courses :

(01)	S 16deg10'14"E	10.01'	to a point for the Eastmost corner of this tract,
(02)	S 73deg49'46"W	9.99'	to a point for tract corner,
(03)	N 16deg10'14"W	2.67'	to a point for tract corner,
(04)	S 36deg37'46"W	27.57'	to a point for the Southmost corner of this tract,
(05)	N 53deg22'14"W	29.02'	to a point for the Westmost corner of this tract,
(06)	N 36deg37'46"E	2.10'	to a point for tract corner,
(07)	S 53deg22'14"E	27.18'	to a point for tract corner,
(08)	N 36deg37'46"E	26.86'	to a point for tract corner,
(09)	N 16deg10'14"W	5.03'	to a point for tract corner,
(10)	N 73deg49'46"E	9.99'	to this POINT OF BEGINNING.

This tract contains 209.1 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 11, 2011.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@coblelynx.com

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

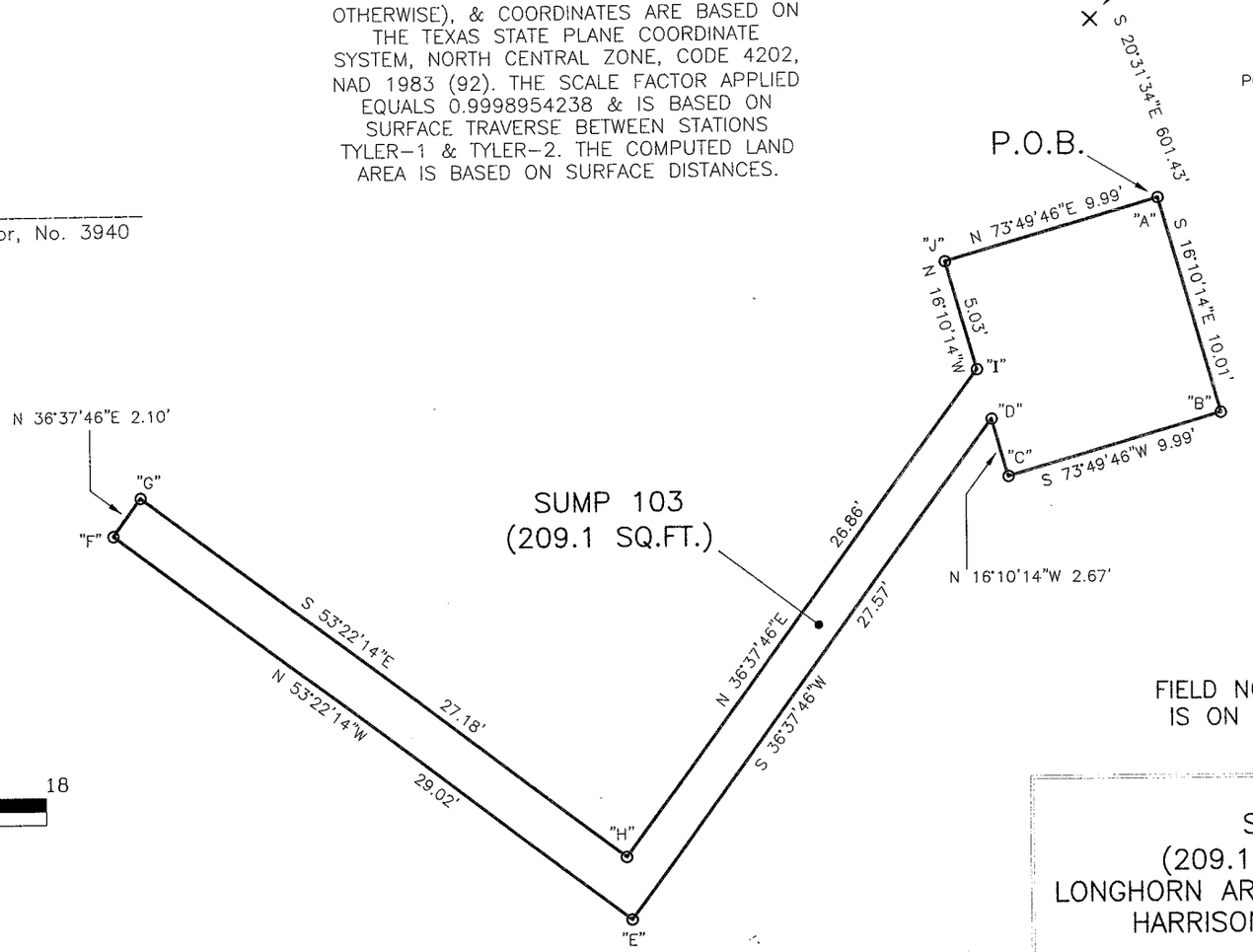
STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6957268.937	3315379.021
B	6957259.319	3315381.810
C	6957256.536	3315372.213
D	6957259.104	3315371.468
E	6957236.982	3315355.021
F	6957254.297	3315331.731
G	6957255.984	3315332.985
H	6957239.765	3315354.800
I	6957261.320	3315370.825
J	6957266.154	3315369.424



FIELD NOTES DESCRIPTION IS ON SEPARATE SHEET

SCALE 1"=6'

6 0 6 12 18
GRAPHIC SCALE - FEET

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP

SUMP 103
(209.1 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #1101007	0407088.CRD	C.PTS C.LEG
MAR. 11, 2011	1103025C.DWG	DRAWN BY JTJ

00189969

2012-000000716

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000716 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump104 (called Sump 104 on the attached Exhibit A) is part of LHAAP-35/36. Sump104 is a former sump location near Building 16-T physically located within site boundary of LHAAP-35C(53) of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump104 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump104) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump104 parcel is 149.2 square feet, more or less, or 0.00342 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump104 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump104 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump104 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump104 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of JUNE, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
SUMP 104
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 149.2 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-2" referenced above,

THENCE S 09deg38'40"E 580.62' to a point for the Northmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following eight courses :

(01)	S 53deg22'14"E	23.26'	to a point for the Eastmost corner of this tract,
(02)	S 36deg37'46"W	2.24'	to a point for tract corner,
(03)	N 53deg22'14"W	20.93'	to a point for tract corner,
(04)	S 36deg37'46"W	24.04'	to a point for the Southmost corner of this tract,
(05)	N 53deg22'14"W	7.69'	to a point for the Westmost corner of this tract,
(06)	N 36deg37'46"E	7.70'	to a point for tract corner,
(07)	S 53deg22'14"E	5.37'	to a point for tract corner,
(08)	N 36deg37'46"E	18.58'	to this POINT OF BEGINNING.

This tract contains 149.2 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 11, 2011.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

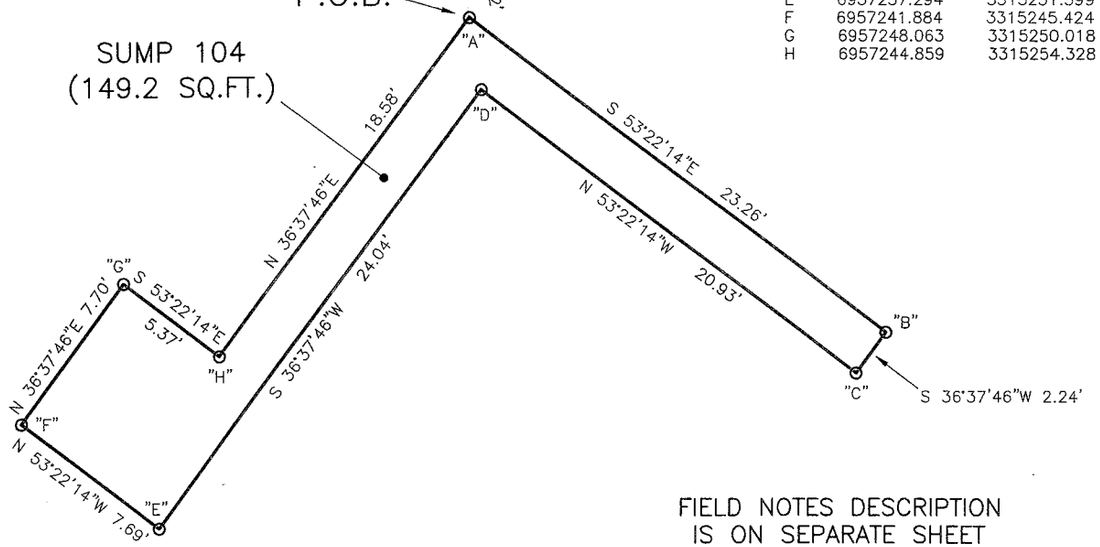
BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

S 09°38'40"E 580.62'

COORDINATE TABLE

POINT	NORTH	EAST
A	6957259.767	3315265.412
B	6957245.891	3315284.077
C	6957244.097	3315282.743
D	6957256.587	3315265.943
E	6957237.294	3315251.599
F	6957241.884	3315245.424
G	6957248.063	3315250.018
H	6957244.859	3315254.328



FIELD NOTES DESCRIPTION IS ON SEPARATE SHEET

SCALE 1"=6'

6 0 6 12 18
GRAPHIC SCALE – FEET

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

SUMP 104
(149.2 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #1101007	0407088.CRD	D.PTS D.LEG
MAR. 11, 2011	1103025D.DWG	DRAWN BY JTJ

00189975

2012-000000717

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000717 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump105 (called Sump 105 on the attached Exhibit A) is part of LHAAP-35/36. Sump105 is a former sump location near Building 16-T physically located within site boundary of LHAAP-35C(53) of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump105 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump105) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump105 parcel is 201.7 square feet, more or less, or 0.00463 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump105 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump105 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump105 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump105 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30 th day of June, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
SUMP 105
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 201.7 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-2" referenced above,

THENCE S 13deg17'42"E 623.38' to a point for the Northmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following eight courses :

(01)	S 53deg22'14"E	26.51'	to a point for the Eastmost corner of this tract,
(02)	S 36deg37'46"W	15.65'	to a point for tract corner,
(03)	S 53deg22'14"E	8.85'	to a point for tract corner,
(04)	S 36deg37'46"W	10.63'	to a point for the Southmost corner of this tract,
(05)	N 53deg22'14"W	10.86'	to a point for tract corner,
(06)	N 36deg37'46"E	24.04'	to a point for tract corner,
(07)	N 53deg22'14"W	24.50'	to a point for the Westmost corner of this tract,
(08)	N 36deg37'46"E	2.24'	to this POINT OF BEGINNING.

This tract contains 201.7 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

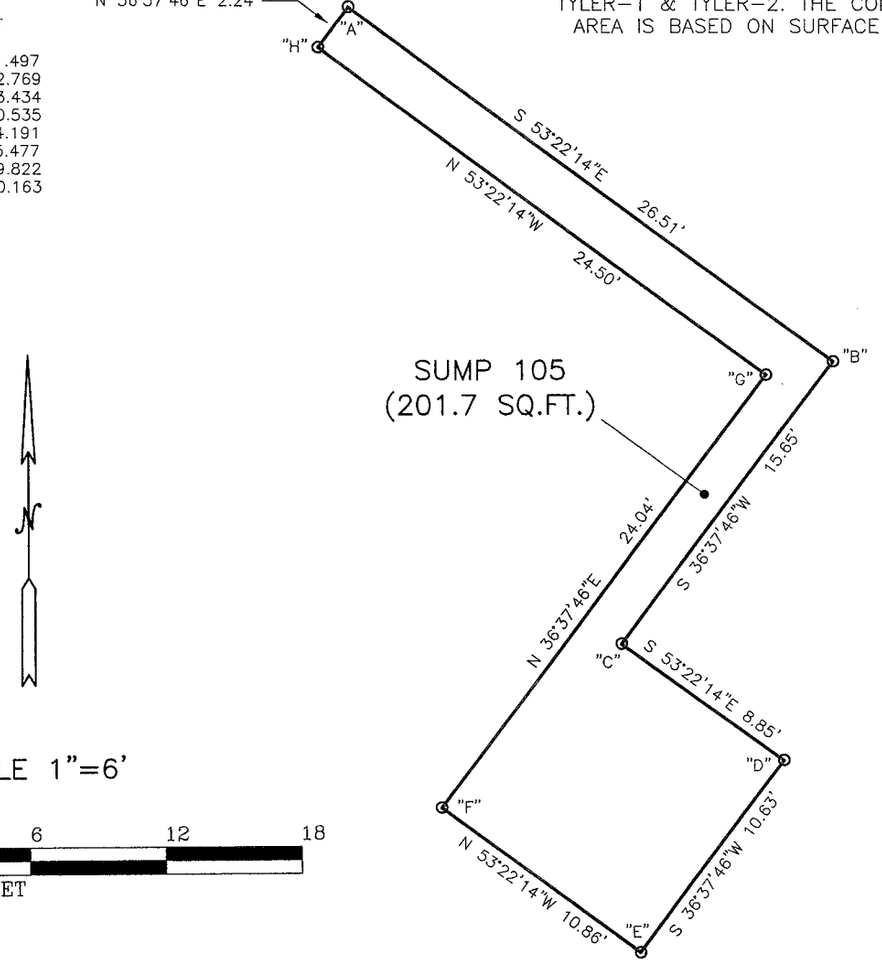
S 13°17'42"E 623.38'

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6957225.505	3315311.497
B	6957209.690	3315332.769
C	6957197.135	3315323.434
D	6957191.856	3315330.535
E	6957183.323	3315324.191
F	6957189.801	3315315.477
G	6957209.095	3315329.822
H	6957223.711	3315310.163



SCALE 1"=6'

6 0 6 12 18
GRAPHIC SCALE - FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 11, 2011.

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

SUMP 105
(201.7 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #1101007	0407088.CRD	E.PTS E.LEG
MAR. 11, 2011	1103025E.DWG	DRAWN BY JTJ

2012-000000718

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000718 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump123 (called Sump 123 on the attached Exhibit A) is part of LHAAP-35/36. Sump123 is a former sump location near Building 18-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump123 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump123) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The Sump123 parcel is 60 square feet, more or less, or 0.00137 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the Sump123 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump123 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump123 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump123 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
SUMP 123
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 60.0 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

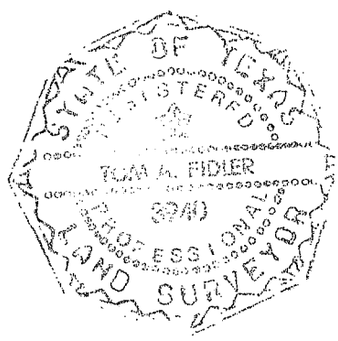
THENCE N 07deg59'31"W 569.56' to a point for the Southmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following four courses :

(01) N 37deg59'57"W 6.00' to a point for the Westmost corner of this tract,
(02) N 52deg00'03"E 10.00' to a point for the Northmost corner of this tract,
(03) S 37deg59'57"E 6.00' to a point for the Eastmost corner of this tract,
(04) S 52deg00'03"W 10.00' to this POINT OF BEGINNING.

This tract contains 60.0 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

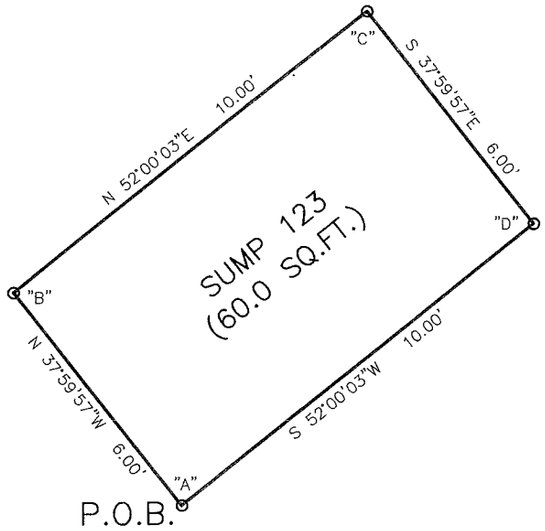
LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

NOTES

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP



COORDINATE TABLE

POINT	NORTH	EAST
A	6959122.758	3314187.907
B	6959127.486	3314184.213
C	6959133.642	3314192.093
D	6959128.914	3314195.787

SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE - FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 14, 2011.

N 08°28'00"W 622.08'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 123
(60.0 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	I.PTS I.LEG
03/14/2011	1103025I.DWG	DRAWN BY JTJ

00189987

2012-000000719

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FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000719 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. WRSump001 (called W.R. Sump 001 on the attached Exhibit A) is part of LHAAP-35/36. WRSump001 is a former waste rack sump location near Building 34-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36 of which WRSump001 is a part is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2, no further action.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps were also associated with wash racks (waste rack sumps including WRSump001) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The WRSump001 parcel is 57.1 square feet, more or less, or 0.00131 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the WRSump001 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from WRSump001 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of WRSump001 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of WRSump001 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
W.R. SUMP 001
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 57.1 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

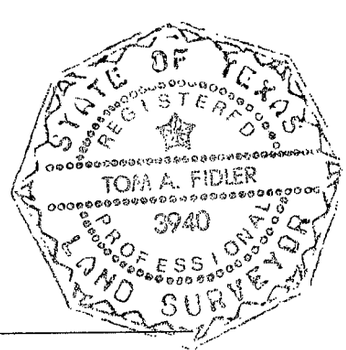
THENCE N 42deg37'08"E 700.32' to this POINT OF BEGINNING, said point being at the Southmost corner of the external face of the concrete wall which defines this sump,

THENCE along the external face of the concrete wall which defines this sump the following twelve courses, each course ending at a corner of the external face of said concrete wall :

(01)	N 36deg36'16"W	4.50',	
(02)	N 51deg51'25"E	1.07',	
(03)	N 38deg08'35"W	2.46',	
(04)	S 63deg07'08"W	0.85',	
(05)	N 38deg08'35"W	7.98',	being this sump's Westmost corner,
(06)	N 51deg51'25"E	3.70',	being this sump's Northmost corner,
(07)	S 39deg59'44"E	8.17',	
(08)	S 52deg07'09"W	1.00',	
(09)	S 39deg59'44"E	2.34',	
(10)	N 50deg00'16"E	1.14',	
(11)	S 39deg59'44"E	4.67',	being this sump's Eastmost corner,
(12)	S 52deg10'33"W	4.68',	being the aforementioned POINT OF BEGINNING.

This tract contains 57.1 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

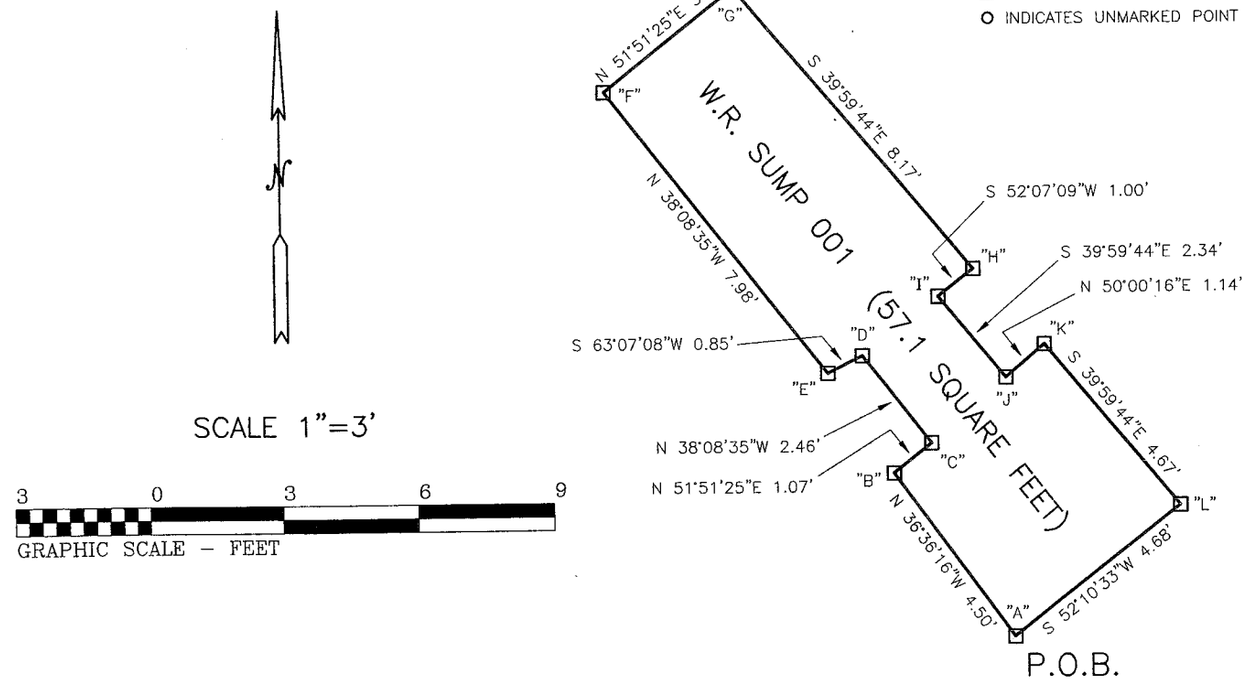


Tom A. Fidler, R.P.L.S. Number 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES CORNER OF EXTERNAL FACE OF CONCRETE WALL
- O INDICATES UNMARKED POINT



NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6959022.804	3314753.696
B	6959026.415	3314751.014
C	6959027.074	3314751.854
D	6959029.012	3314750.332
E	6959028.627	3314749.573
F	6959034.899	3314744.647
G	6959037.183	3314747.555
H	6959030.925	3314752.805
I	6959030.313	3314752.018
J	6959028.519	3314753.523
K	6959029.252	3314754.396
L	6959025.676	3314757.396
M	6959022.804	3314753.696

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 1, 2011.

N 42°37'08"E 700.32'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

W.R. SUMP 001
(57.1 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	W.PTS W.LEG
MAR. 1, 2011	0908074W.DWG	DRAWN BY JTJ

00188993

2012-000000720

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000720 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. WRSump002 (called W.R. Sump 002 on the attached Exhibit A) is part of LHAAP-35/36. WRSump002 is a former waste rack sump location near Building 38-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which WRSump002 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2, no further action.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps were also associated with wash racks (waste rack sumps including WRSump002) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The WRSump002 parcel is 61.1 square feet, more or less, or 0.00140 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the WRSump002 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from WRSump002 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of WRSump002 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of WRSump002 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
W.R. SUMP 002
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 61.1 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

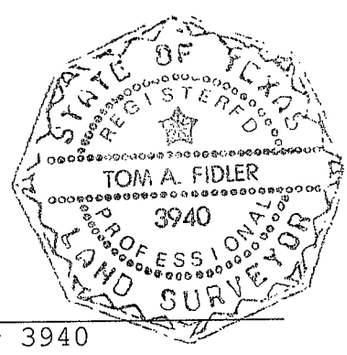
THENCE N 27deg03'19"E 797.78' to this POINT OF BEGINNING, said point being at the Southmost corner of the external face of the concrete wall which defines this sump,

THENCE along the external face of the concrete wall which defines this sump the following twelve courses, each course ending at a corner of the external face of said concrete wall :

(01)	N 50deg15'02"W	4.01',	being this sump's Westmost corner,
(02)	N 38deg19'51"E	7.83',	
(03)	S 58deg29'13"E	0.84',	
(04)	N 41deg11'11"E	3.09',	
(05)	N 51deg30'19"W	1.32',	
(06)	N 40deg19'40"E	4.55',	being this sump's Northmost corner,
(07)	S 54deg31'45"E	4.65',	being this sump's Eastmost corner,
(08)	S 38deg16'58"W	4.65',	
(09)	N 53deg12'50"W	1.23',	
(10)	S 39deg42'05"W	3.32',	
(11)	S 51deg04'42"E	0.79',	
(12)	S 38deg16'58"W	7.89',	being the aforementioned POINT OF BEGINNING.

This tract contains 61.1 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

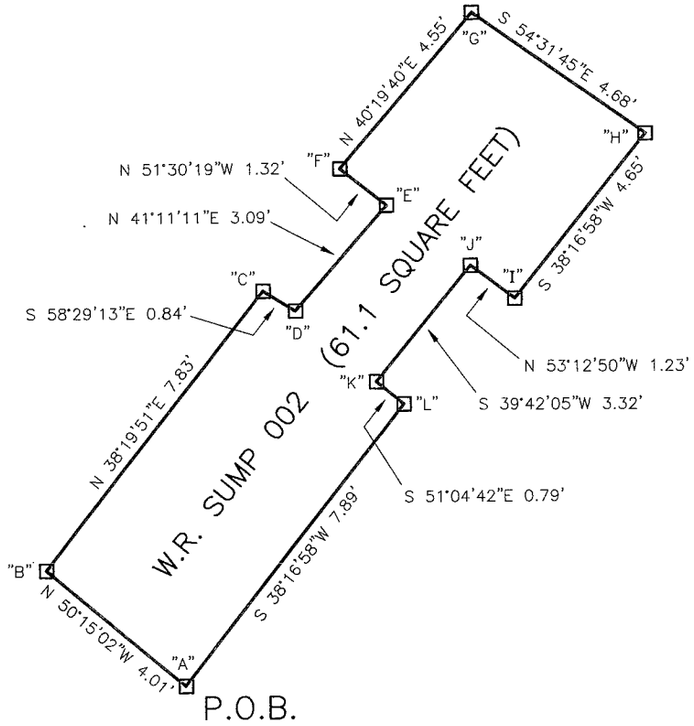
LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES CORNER OF EXTERNAL FACE OF CONCRETE WALL
- O INDICATES UNMARKED POINT



COORDINATE TABLE

POINT	NORTH	EAST
A	6959217.937	3314642.369
B	6959220.500	3314639.287
C	6959226.642	3314644.143
D	6959226.201	3314644.863
E	6959228.524	3314646.896
F	6959229.343	3314645.866
G	6959232.815	3314648.814
H	6959230.097	3314652.628
I	6959226.443	3314649.744
J	6959227.177	3314648.763
K	6959224.624	3314646.643
L	6959224.129	3314647.256
M	6959217.937	3314642.369

N 27°03'19"E 797.78'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE - FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 1, 2011.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

W.R. SUMP 002
(61.1 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	X.PTS X.LEG
MAR. 1, 2011	0908074X.DWG	DRAWN BY JTJ

00189999

2012-000000721

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000721 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. WRSump003 (called W.R. Sump 003 on the attached Exhibit A) is part of LHAAP-35/36. WRSump003 is a former waste rack sump location near Building 16-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). 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 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which WRSump003 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2, no further action.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps were also associated with wash racks (waste rack sumps including WRSump003) where containers were cleaned and stored. Further information may be found in 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 in 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.

II

The WRSump003 parcel is 69.5 square feet, more or less, or 0.00159 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the WRSump003 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from WRSump003 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of WRSump003 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of WRSump003 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30 th day of June, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the 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 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

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

FIELD NOTES DESCRIPTION OF
W.R. SUMP 003
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 69.5 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

THENCE N 00deg06'48"W 643.61' to this POINT OF BEGINNING, said point being at the Southmost corner of the external face of the concrete wall which defines this sump,

THENCE along the external face of the concrete wall which defines this sump the following twelve courses, each course ending at a corner of the external face of said concrete wall :

(01)	N 37deg49'35"W	4.09',	being this sump's Westmost corner,
(02)	N 48deg49'52"E	10.08',	
(03)	S 40deg22'17"E	0.96',	
(04)	N 51deg37'59"E	1.64',	
(05)	N 32deg53'50"W	1.27',	
(06)	N 49deg58'25"E	4.65',	being this sump's Northmost corner,
(07)	S 41deg50'19"E	4.65',	being this sump's Eastmost corner,
(08)	S 43deg56'08"W	4.79',	
(09)	N 44deg10'19"W	1.61',	
(10)	S 52deg56'11"W	1.74',	
(11)	S 39deg31'31"E	1.01',	
(12)	S 49deg33'58"W	10.21',	being the aforementioned POINT OF BEGINNING.

This tract contains 69.5 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

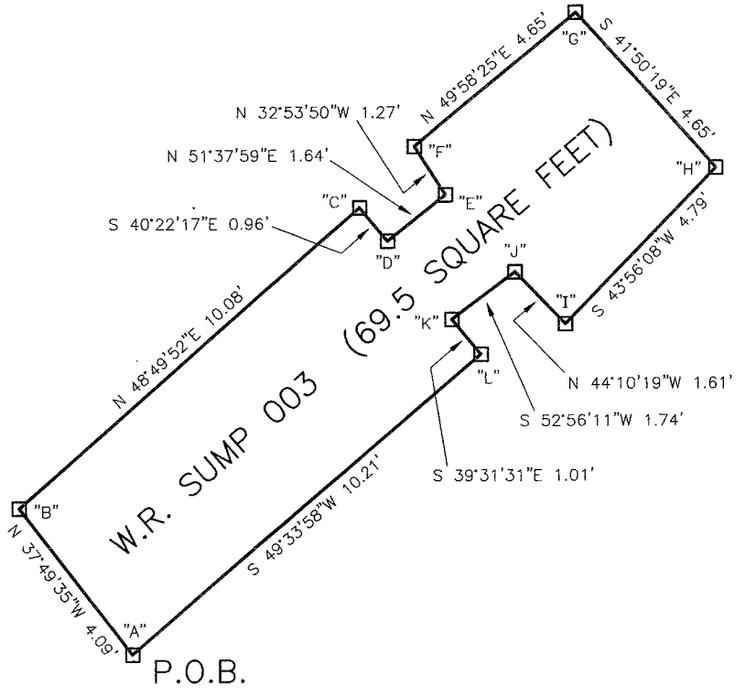
STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, R.P.L.S. Number 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.



NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES CORNER OF EXTERNAL FACE OF CONCRETE WALL
- O INDICATES UNMARKED POINT

COORDINATE TABLE

POINT	NORTH	EAST
A	6959151.071	3314278.227
B	6959154.302	3314275.719
C	6959160.937	3314283.306
D	6959160.202	3314283.931
E	6959161.221	3314285.218
F	6959162.288	3314284.528
G	6959165.278	3314288.088
H	6959161.816	3314291.188
I	6959158.365	3314287.863
J	6959159.516	3314286.744
K	6959158.468	3314285.356
L	6959157.691	3314285.996

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 1, 2011.

N 00°06'48"W 643.61'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE - FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

W.R. SUMP 003
(69.5 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	V.PTS V.LEG
MAR. 1, 2011	0908074V.DWG	DRAWN BY JTJ

00190005

2012-000000704

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

7 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000704 **Receipt No:** 1200645 **Amount:** $ 36.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. LHAAP-49 is a former Acid Storage location at the former Longhorn Army Ammunition Plant (LHAAP). 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 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. LHAAP-49 is considered an NPL listed site, and remedial activities at LHAAP-49 were performed in accordance with the FFA requirements.

LHAAP-49 is located in the west-central portion of LHAAP. LHAAP-49 is the former Acid Storage Area, which was used from 1942 to 1945 for storage and formulation of acids and acid mixtures in support of trinitrotoluene production during World War II. Nitric acid and sulfuric acid were manufactured and handled in large quantities in this area. A no further action Record of Decision for LHAAP-49 was signed by USEPA in 2010 establishing no remedy was required. Further information may be found in 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

in 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.

II

LHAAP-49 is a 30.540 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of LHAAP-49 and USEPA and TCEQ concluded that no further investigation or action is required.

Limited monitoring of LHAAP-49 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-49 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

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-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 21 th day of July, 2011.

BEFORE ME, on this the 21 th day of July, personally appeared Rose M. Zeiler, of the 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 21 day of July, 2011.

ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 03-17-2015

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

FIELD NOTES DESCRIPTION OF
LHAAP-49
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 30.540 acres of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998768897, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "HMX-3" (N=6956487.252 feet E=3303483.509 feet) and "HMX-5" (N=6958206.213 feet E=3305201.721 feet). Said traverse indicates a surface distance of 2430.748 feet between said monuments. The computed land area is based on grid (State Plane) distances.

BEGINNING at a 60d nail set for the Southmost corner of this tract, said nail being in asphalt pavement at the intersection of 6th Street and 4th Street, from which nail the monument "HMX-3" referenced above bears N 09deg00'02"E 74.61' ,

THENCE N 46deg42'14"W crossing some of said asphalt pavement, then generally along 4th Street's Northeast edge of asphalt, then crossing a curved section of 4th Street's asphalt, and continuing beyond 4th Street's asphalt, for a total distance of 509.81', to a 60d nail set for the Southmost West corner of this tract,

THENCE N 45deg04'42"E eventually crossing 4th Street's asphalt, then generally along 4th Street's Southeast edge of asphalt, for a total distance of 1323.80', to a 60d nail set (in the Southeast edge of said asphalt pavement) for the Westerly reentrant corner of this tract,

THENCE N 45deg22'03"W crossing 4th Street's asphalt pavement and continuing for a total distance of 308.18' to a point (in the Southeasterly edge of flowing water [May 3, 2011] of Goose Prairie Creek) for the Northmost West corner of this tract, from which point a 1/2" iron rod with Tom Fidler orange plastic cap set for reference bears S 45deg22'03"E 11.34', said rod being at the top of the Southeasterly bank of Goose Prairie Creek,

THENCE N 47deg40'44"E 331.25' along a N.W. B.L. of this tract to a point (in the Southeasterly edge of flowing water [May 3, 2011] of Goose Prairie Creek) for the Westmost North corner of this tract, from which point a 1/2" iron rod with Tom Fidler orange plastic cap set for reference bears S 44deg45'45"E 13.46', said rod being at the top of the Southeasterly bank of Goose Prairie Creek,

THENCE S 44deg45'45"E along a N.E. B.L. of this tract, and eventually crossing 4th Street's asphalt pavement, for a total distance of 292.85' to a 60d nail set in the Southeast edge of said asphalt pavement for the Northerly reentrant corner of this tract,

THENCE N 44deg47'09"E generally along 4th Street's Southeast edge of asphalt pavement, then entering said pavement at the

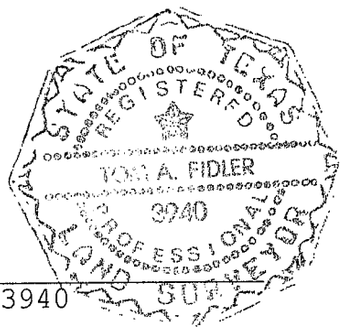
intersection of 4th Street and Avenue "C", for a total distance of 781.21' to a 60d nail set in said asphalt pavement for the Eastmost North corner of this tract,

THENCE S 45deg47'29"E crossing some of said pavement, then generally along the Southwest edge of the asphalt pavement of Avenue "C", then entering said pavement at the intersection of Avenue "C" and 6th Street, for a total distance of 507.27' to a 60d nail set for the Eastmost corner of this tract, from which the monument "HMX-5" referenced above bears N 13deg12'58"E 77.94' ,

THENCE S 44deg55'17"W crossing some of said pavement, then generally along the Northwest edge of the asphalt pavement of 6th Street, then entering said pavement at the aforementioned intersection of 6th Street and 4th Street, for a total distance of 2424.55' to this POINT OF BEGINNING.

This tract contains 30.540 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

LANDMARK CONSULTANTS, INC
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
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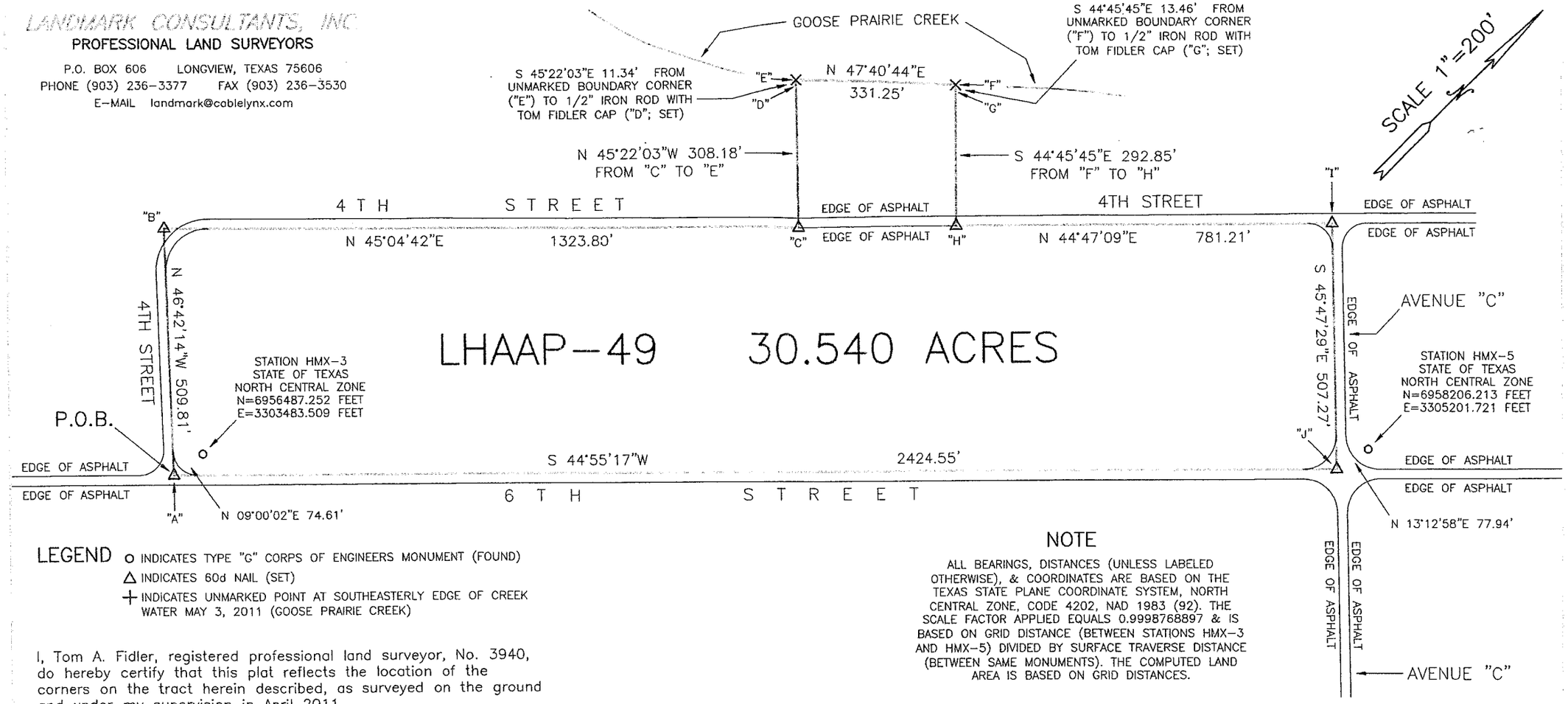
E-MAIL landmark@cablelynx.com



LEGEND

- o INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- △ INDICATES 60d NAIL (SET)
- + INDICATES UNMARKED POINT AT SOUTHEASTERLY EDGE OF CREEK WATER MAY 3, 2011 (GOOSE PRAIRIE CREEK)

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998768897 & IS BASED ON GRID DISTANCE (BETWEEN STATIONS HMX-3 AND HMX-5) DIVIDED BY SURFACE TRAVERSE DISTANCE (BETWEEN SAME MONUMENTS). THE COMPUTED LAND AREA IS BASED ON GRID DISTANCES.

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in April 2011.

Witness my hand and seal May 5, 2011.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

COORDINATE TABLE

POINT	NORTH	EAST
A	6956413.564	3303471.837
B	6956763.174	3303100.790
C	6957697.967	3304038.137
D(ROD)	6957906.516	3303826.894
E	6957914.483	3303818.824
F	6958137.506	3304063.741
G(ROD)	6958127.951	3304073.216
H	6957929.573	3304269.956
I	6958484.036	3304820.288
J	6958130.332	3305183.901

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

LHAAP-49
(30.540 ACRES)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #1104040	0407088.CRD	M.PTS M.LEG
MAY 5, 2011	1103025M.DWG	DRAWN BY JTJ

00190012

2010-000005562

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

34 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 04/27/2010 04:08 PM **Document Number:** 2010-000005562 **Receipt No:** 1006195 **Amount:** $ 144.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW E & I
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

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:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The site, LHAAP-55, consisted of 10 septic tank and leachate field systems that served outlying areas of the former Longhorn Army Ammunition Plant (LHAAP) within or near LHAAP-48 and LHAAP-35C(53). 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. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-55 is not itself considered an NPL site. Environmental activities at LHAAP-55 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ as the lead regulatory agency that no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-55 consisted of 10 septic tank and leachate field systems that served outlying areas of LHAAP that could not be connected to the plant sanitary sewer system. Although there was no history of industrial waste being placed into these septic tanks, soil samples were collected from borings installed at septic systems that were associated with industrial processes and analyzed for metals, explosives, semi volatile organic compounds, and volatile organic compounds where appropriate. 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.

II

The LHAAP-55 parcel include: ST-01 with 1,807 square feet, more or less, or 0.04148 acre tract; ST-02 with 1,791 square feet, more or less, or 0.04111 acre tract; ST-03 with 1,784 square feet, more or less, or 0.04095 acre tract; ST-04 with 1,789 square feet, more or less, or 0.04106 acre tract; ST-05 with 1,825 square feet more or less, or 0.04189 acre tract; ST-06 with 1,800 square feet, more or less, or 0.04132 acre tract; ST-07 with 1,865 square feet, more or less, or 0.04281 acre tract; ST-08 with 1,785 square feet, more or less, or 0.04097 acre tract; ST-09 with 2,004 square feet, more or less, or 0.04600 acre tract; and ST-10 with 1,804 square feet, more or less, or 0.04141 acre tract 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.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-55 site and USEPA and TCEQ concluded that no further investigation or action is required for LHAAP-55. Contaminants in soil samples from LHAAP-55 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of LHAAP-55 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-55 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family 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.

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 10 th day of March, 2010.

BEFORE ME, on this the 10 th day of March, 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 10 day of March, 2010.

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

ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 3-17-2011

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-02, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,791 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-02, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-1" referenced above,

THENCE N 05deg57'31"W 746.36' to a 60d nail set for the Eastmost S.E.C. of this tract and this POINT OF BEGINNING,

THENCE N 90deg00'00"W 19.74' along a S.B.L. of this tract to a 60d nail set (in an abandoned utility pole lying on the ground) for this tract's Eastmost S.W.C. ,

THENCE N 00deg00'00"E 5.36' along a W.B.L. of this tract to a 60d nail set for this tract's Southwest reentrant corner,

THENCE N 90deg00'00"W 15.73' along a S.B.L. of this tract to a 60d nail set for this tract's Southeast reentrant corner,

THENCE S 00deg00'00"W 15.91' along an E.B.L. of this tract to a 60d nail set for this tract's Westmost S.E.C. ,

THENCE N 90deg00'00"W 46.53' along a S.B.L. of this tract to a 60d nail set for this tract's Westmost S.W.C. ,

THENCE N 00deg00'00"E 32.43' along a W.B.L. of this tract to a 60d nail set for this tract's Westmost N.W.C. ,

THENCE N 90deg00'00"E 46.53' along a N.B.L. of this tract to a 60d nail set for this tract's Westmost N.E.C. ,

THENCE S 00deg00'00"E 14.52' along an E.B.L. of this tract to a 60d nail set for this tract's Northeast reentrant corner,

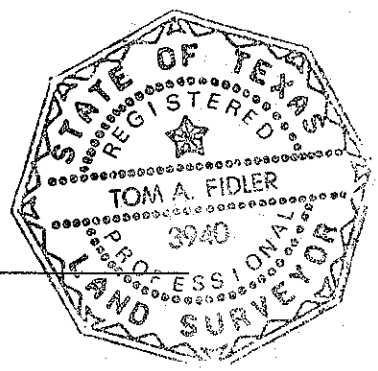
THENCE S 90deg00'00"E 15.73' along a N.B.L. of this tract to a 60d nail set for this tract's Northwest reentrant corner,

THENCE N 00deg00'00"W 5.33' along a W.B.L. of this tract to a 60d nail set for this tract's Eastmost N.W.C. ,

THENCE N 90deg00'00"E 19.74' along a N.B.L. of this tract to a 60d nail set for this tract's Eastmost N.E.C. ,

THENCE S 00deg00'00"E 12.69' along an E.B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,791 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

LANDMARK CONSULTANTS, INC.
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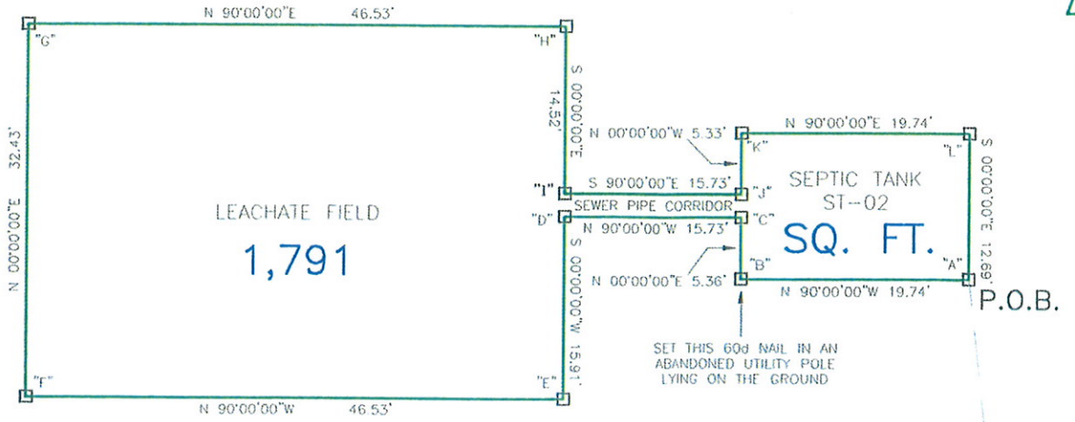
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202. NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999895438 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.



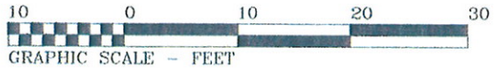
COORDINATE TABLE

Point	North	East
A	6959249.790	3314202.020
B	6959249.790	3314182.280
C	6959255.150	3314182.280
D	6959255.150	3314166.552
E	6959239.240	3314166.552
F	6959239.240	3314120.022
G	6959271.670	3314120.022
H	6959271.670	3314166.552
I	6959257.150	3314166.552
J	6959257.150	3314182.280
K	6959262.480	3314182.280
L	6959262.480	3314202.020

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES 60d NAIL (SET)
- o INDICATES UNMARKED POINT

SCALE 1"=10'



NOTE

THE BOUNDARY OF ST-02, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October 2009.

Witness my hand and seal October 26, 2009.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

N 05°57'31"W 746.36'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1116.219')

SEPTIC TANK ST-02 WITH LEACHATE FIELD (1,791 SQUARE FEET) (PART OF LHAAP-55) LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	J.PTS J.LEG
10/26/2009	0908074J.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-03, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,784 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-03, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-1" referenced above,

THENCE N 24deg50'41"E 537.01' to a 60d nail set for the Southmost South corner of this tract and this POINT OF BEGINNING,

THENCE N 35deg57'31"W 30.43' along a S.W. B.L. of this tract to a 60d nail set for a South reentrant corner of this tract,

THENCE S 54deg02'29"W 1.92' along a S.E. B.L. of this tract to a 60d nail set for a South corner of this tract,

THENCE N 38deg10'26"W 12.26' along a S.W. B.L. of this tract to a 60d nail set for a South reentrant corner of this tract,

THENCE S 50deg49'08"W 5.10' along a S.E. B.L. of this tract to a 60d nail set for this tract's Northmost South corner,

THENCE N 39deg10'52"W 19.74' along a S.W. B.L. of this tract to a 60d nail set for this tract's Westmost corner,

THENCE N 50deg49'08"E 12.69' along a N.W. B.L. of this tract to a 60d nail set for this tract's Westmost North corner,

THENCE S 39deg10'52"E 19.74' along a N.E. B.L. of this tract to a 60d nail set for this tract's Westmost East corner,

THENCE S 50deg49'08"W 5.58' along a S.E. B.L. of this tract to a 60d nail set for this tract's East reentrant corner,

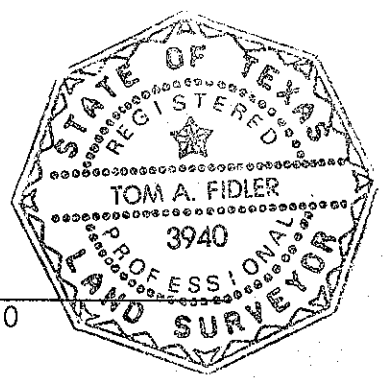
THENCE S 38deg10'26"E 10.37' along a N.E. B.L. of this tract to a 60d nail set for this tract's North reentrant corner,

THENCE N 54deg02'29"E 46.53' along a N.W. B.L. of this tract to a 60d nail set for this tract's Eastmost North corner,

THENCE S 35deg57'31"E 32.43' along a N.E. B.L. of this tract to a 60d nail set for this tract's Eastmost East corner,

THENCE S 54deg02'29"W 46.53' along a S.E. B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,784 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00190022

LANDMARK CONSULTANTS, INC.
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NOTE

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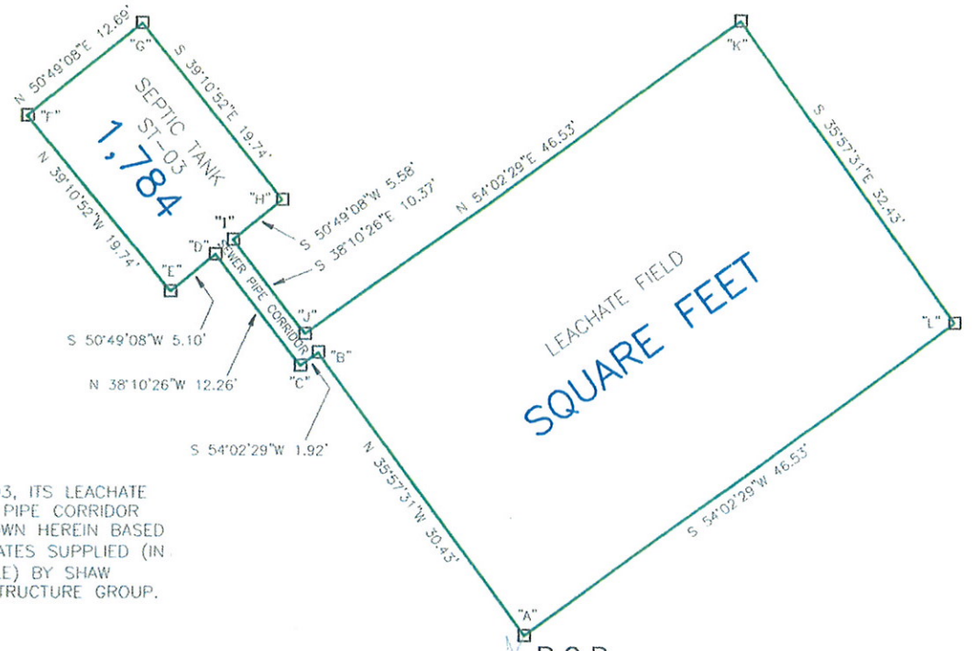


NOTE

THE BOUNDARY OF ST-03, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES 60d NAIL (SET)
- O INDICATES UNMARKED POINT

COORDINATE TABLE

Point	North	East
A	6958994.769	3314505.128
B	6959019.400	3314487.259
C	6959018.270	3314485.702
D	6959027.905	3314478.127
E	6959024.680	3314474.170
F	6959039.982	3314461.699
G	6959047.999	3314471.535
H	6959032.697	3314484.007
I	6959029.169	3314479.678
J	6959021.019	3314486.085
K	6959048.342	3314523.748
L	6959022.091	3314542.791

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October 2009.

Witness my hand and seal October 26, 2009.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SCALE 1"=10'

10 0 10 20 30
GRAPHIC SCALE - FEET

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

SEPTIC TANK ST-03 WITH LEACHATE FIELD (1,784 SQUARE FEET) (PART OF LHAAP-55) LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	K.PTS K.LEG
10/26/2009	0908074K.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-05, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,825 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-05, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-2" referenced above,

THENCE N 52deg46'07.6"W 36.82' to a point, said point being S 52deg46'07.6"E 1079.28' from said monument "TYLER-1" ,

THENCE S 37deg13'52"W 81.68' to a 60d nail set for the Northmost East corner of this tract and this POINT OF BEGINNING ,

THENCE S 33deg39'28"W 12.69' along a S.E. B.L. of this tract to a 60d nail set for this tract's Northmost South corner,

THENCE N 56deg20'32"W 17.74' along a S.W. B.L. of this tract to a chisled "X" set in concrete for this tract's South reentrant corner,

THENCE S 36deg51'06"W 32.79' along a S.E. B.L. of this tract to a 60d nail set for this tract's East reentrant corner,

THENCE S 57deg33'12"E 44.52' along a N.E. B.L. of this tract to a 60d nail set for this tract's Southmost East corner,

THENCE S 32deg26'48"W 32.43' along a S.E. B.L. of this tract to a 60d nail set for this tract's Southmost South corner,

THENCE N 57deg33'12"W 46.53' along a S.W. B.L. of this tract to a 60d nail set for this tract's West corner,

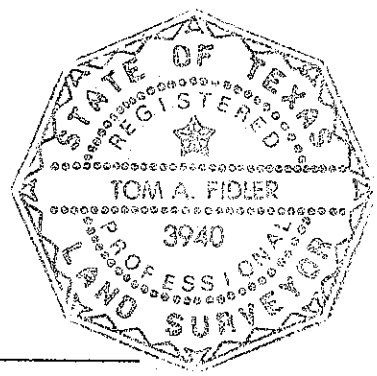
THENCE N 32deg26'48"E 32.43' along a N.W. B.L. of this tract to a 60d nail set for deflection corner,

THENCE N 36deg51'06"E 32.84' along a N.W. B.L. of this tract to a chisled "X" set in concrete for deflection corner,

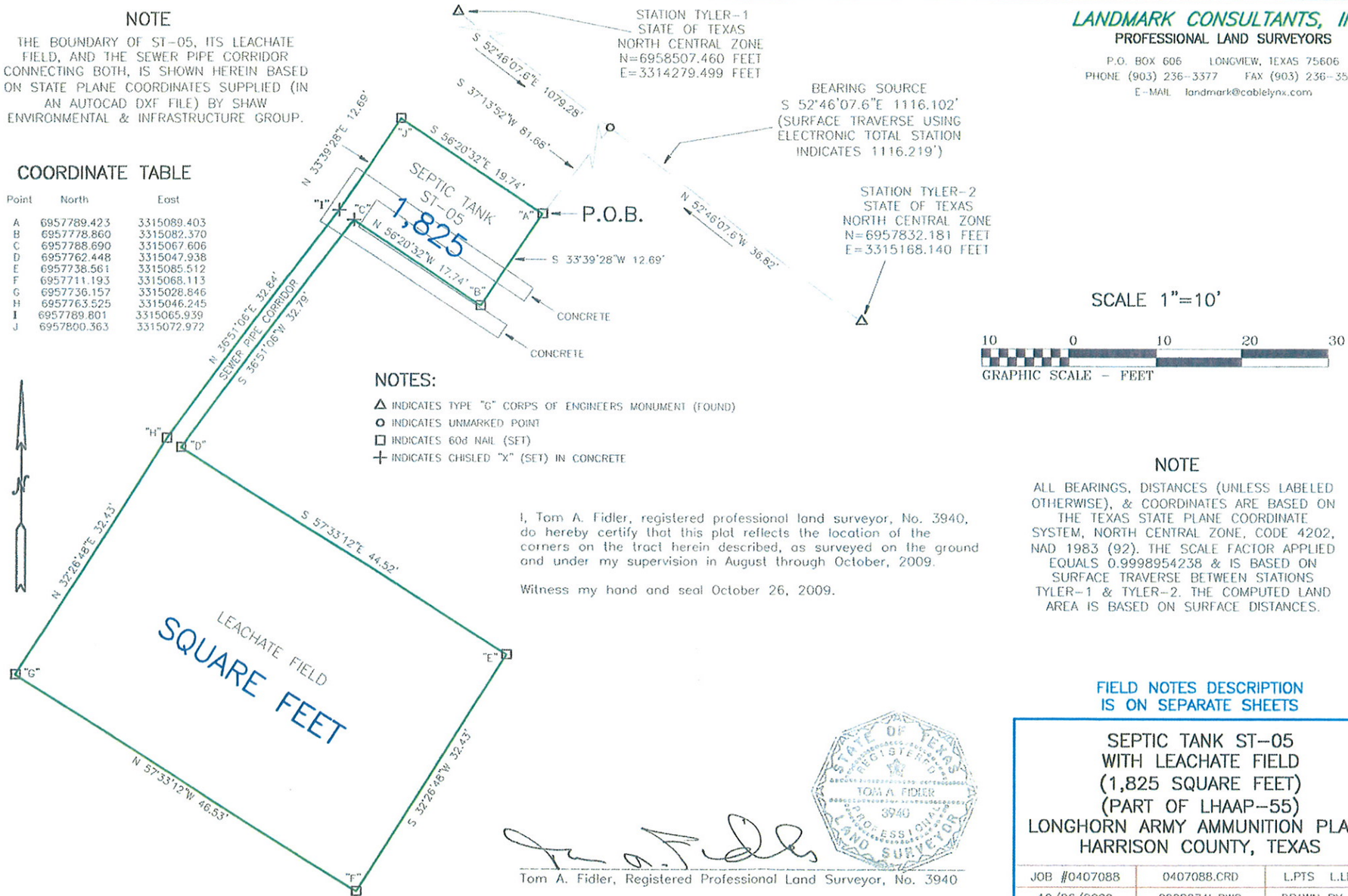
THENCE N 33deg39'28"E 12.69' along a N.W. B.L. of this tract to a 60d nail set for this tract's North corner,

THENCE S 56deg20'32"E 19.74' along a N.E. B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,825 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940



NOTE

THE BOUNDARY OF ST-05, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

COORDINATE TABLE

Point	North	East
A	6957789.423	3315089.403
B	6957778.860	3315082.370
C	6957788.690	3315067.606
D	6957762.448	3315047.938
E	6957738.561	3315085.512
F	6957711.193	3315068.113
G	6957736.157	3315028.846
H	6957763.525	3315046.245
I	6957789.801	3315065.939
J	6957800.363	3315072.972

NOTES:

- △ INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- o INDICATES UNMARKED POINT
- □ INDICATES 60d NAIL (SET)
- + INDICATES CHISLED "X" (SET) IN CONCRETE

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October, 2009.

Witness my hand and seal October 26, 2009.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

SEPTIC TANK ST-05 WITH LEACHATE FIELD (1,825 SQUARE FEET) (PART OF LHAAP-55) LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	L.PTS L.LEG
10/26/2009	0908074L.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-06, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,800 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-06, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-2" referenced above,

THENCE S 85deg57'52"E 1425.64' to a 60d nail set for the Northmost N.W.C. of this tract and this POINT OF BEGINNING,

THENCE N 67deg08'12"E 12.69' along a N.B.L. of this tract to a 60d nail set for this tract's Northmost N.E.C. ,

THENCE S 22deg51'48"E 19.74' along an E.B.L. of this tract to a 60d nail set for this tract's Northmost S.E.C. ,

THENCE S 67deg08'12"W 4.97' along a S.B.L. of this tract to a 60d nail set for this tract's S.E. reentrant corner,

THENCE S 22deg49'50"E 19.87' along an E.B.L. of this tract to a 60d nail set for this tract's N.E. reentrant corner,

THENCE N 64deg30'12"E 16.55' along a N.B.L. of this tract to a

60d nail set for this tract's Southmost N.E.C. ,

THENCE S 25deg29'48"E 46.53' along an E.B.L. of this tract to a 60d nail set for this tract's Southmost S.E.C. ,

THENCE S 64deg30'12"W 32.43' along a S.B.L. of this tract to a 60d nail set for this tract's Southmost S.W.C. ,

THENCE N 25deg29'48"W 46.53' along a W.B.L. of this tract to a 60d nail set for this tract's Southmost N.W.C. ,

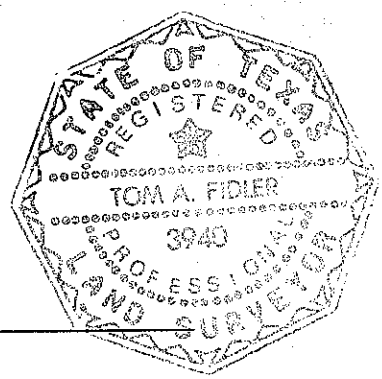
THENCE N 64deg30'12"E 13.88' along a N.B.L. of this tract to a 60d nail set for this tract's N.W. reentrant corner,

THENCE N 22deg49'50"W 19.96' along a W.B.L. of this tract to a 60d nail set for this tract's S.W. reentrant corner,

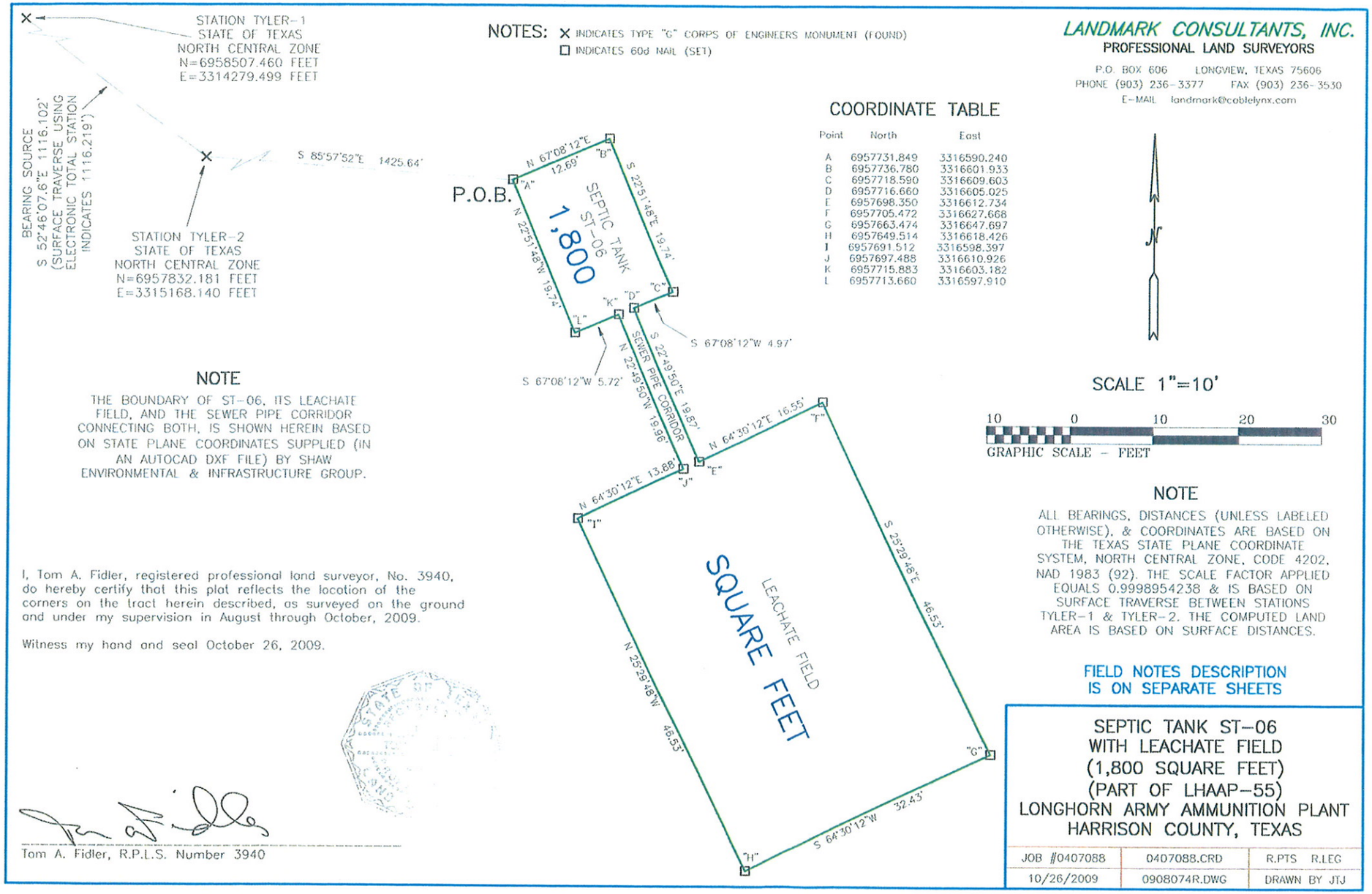
THENCE S 67deg08'12"W 5.72' along a S.B.L. of this tract to a 60d nail set for this tract's Northmost S.W.C. ,

THENCE N 22deg51'48"W 19.74' along a W.B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,800 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940



COORDINATE TABLE

Point	North	East
A	6957731.849	3316590.240
B	6957736.780	3316601.933
C	6957718.590	3316609.603
D	6957716.660	3316605.025
E	6957698.350	3316612.734
F	6957705.472	3316627.668
G	6957663.474	3316647.697
H	6957649.514	3316618.426
I	6957691.512	3316598.397
J	6957697.488	3316610.926
K	6957715.883	3316603.182
L	6957713.660	3316597.910

SCALE 1"=10'

10 0 10 20 30

GRAPHIC SCALE – FEET

NOTE

THE BOUNDARY OF ST-06, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October, 2009.

Witness my hand and seal October 26, 2009.

Tom A. Fidler, R.P.L.S. Number 3940

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

SEPTIC TANK ST-06 WITH LEACHATE FIELD (1,800 SQUARE FEET) (PART OF LHAAP-55) LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	R.PTS R.LEG
10/26/2009	0908074R.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-07, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,865 square feet of land out of the Longhorn Ordance Works Reservation, (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-07, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-2" referenced above,

THENCE S 20deg14'47"E 467.25' to a 60d nail set for the N.E.C. corner of this tract and this POINT OF BEGINNING ,

THENCE S 13deg37'37"E 32.43' along an E.B.L. of this tract to a 60d nail set for this tract's S.E.C. ,

THENCE S 76deg22'23"W 46.53' along a S.B.L. of this tract to a 60d nail set for this tract's S.W.C. ,

THENCE N 13deg37'37"W 14.74' along a W.B.L. of this tract to a 60d nail set for this tract's Eastmost reentrant corner,

THENCE S 77deg04'57"W 23.21' along a S.B.L. of this tract to a 60d nail set for a somewhat reentrant corner of this tract,

THENCE S 29deg56'20"W 28.62' along a S.E. B.L. of this tract

to a 60d nail set for this tract's Southmost reentrant corner,

THENCE S 54deg24'06"E 5.82' along a N.E. B.L. of this tract to a 60d nail set for this tract's East corner,

THENCE S 35deg35'54"W 19.74' along a S.E. B.L. of this tract to a 60d nail set for this tract's South corner,

THENCE N 54deg24'06"W 12.69' along a S.W. B.L. of this tract to a 60d nail set for this tract's West corner,

THENCE N 35deg35'54"E 19.74' along a N.W. B.L. of this tract to a 60d nail set for this tract's North corner,

THENCE S 54deg24'06"E 4.86' along a N.E. B.L. of this tract to a 60d nail set for this tract's Westmost reentrant corner,

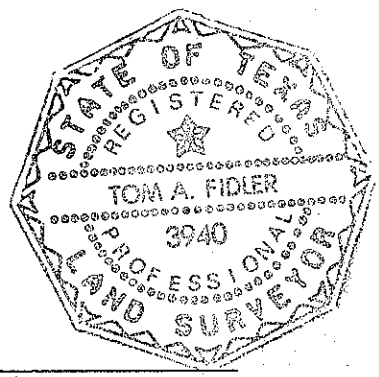
THENCE N 29deg56'20"E 29.29' along a N.W. B.L. of this tract to a 60d nail set for this tract's Southmost N.W.C. ,

THENCE N 77deg04'57"E 24.06' along a N.B.L. of this tract to a 60d nail set for this tract's Northmost reentrant corner,

THENCE N 13deg37'37"W 15.69' along a W.B.L. of this tract to a 60d nail set for this tract's Northmost N.W.C. ,

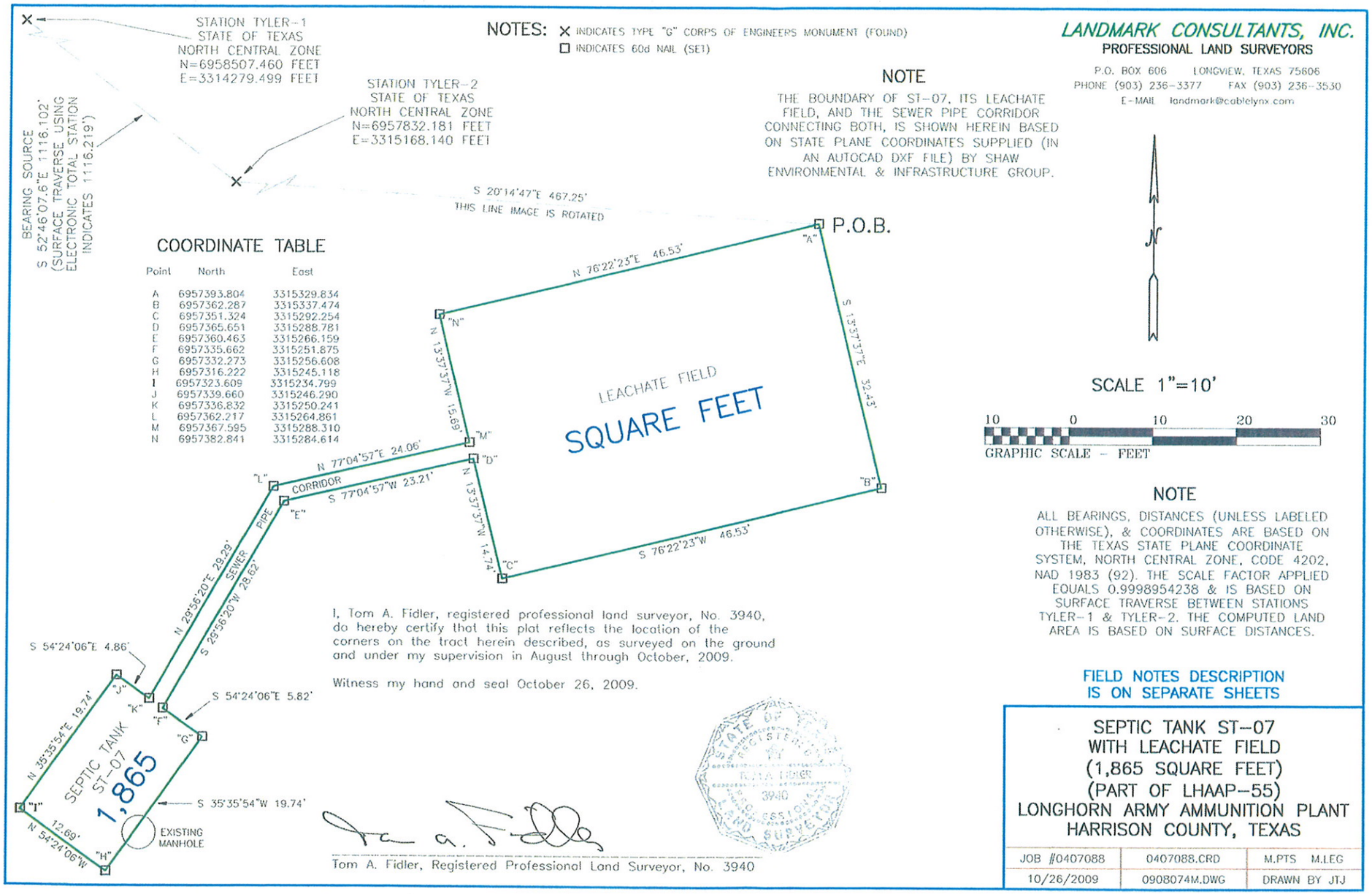
THENCE N 76deg22'23"E 46.53' along a N.B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,865 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00190031



NOTES: ✕ INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
□ INDICATES 60d NAIL (SET)

NOTE

THE BOUNDARY OF ST-07, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

COORDINATE TABLE

Point	North	East
A	6957393.804	3315329.834
B	6957362.287	3315337.474
C	6957351.324	3315292.254
D	6957365.651	3315288.781
E	6957360.463	3315266.159
F	6957335.662	3315251.875
G	6957332.273	3315256.608
H	6957316.222	3315245.118
I	6957323.609	3315234.799
J	6957339.660	3315246.290
K	6957336.832	3315250.241
L	6957362.217	3315264.861
M	6957367.595	3315288.310
N	6957382.841	3315284.614

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October, 2009.

Witness my hand and seal October 26, 2009.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

N

SCALE 1"=10'

10 0 10 20 30
GRAPHIC SCALE - FEET

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

SEPTIC TANK ST-07 WITH LEACHATE FIELD (1,865 SQUARE FEET) (PART OF LHAAP-55) LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	M.PTS M.LEG
10/26/2009	0908074M.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-08, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,785 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-08, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-2" referenced above,

THENCE S 37deg52'57"E 620.24' to a 60d nail set for the Northmost N.E.C. corner of this tract and this POINT OF BEGINNING,

THENCE S 16deg08'12"E 46.53' along an E.B.L. of this tract to a 60d nail set for this tract's Eastmost S.E.C. ,

THENCE S 73deg51'48"W 32.43' along a S.B.L. of this tract to a 60d nail set for slight deflection corner,

THENCE S 70deg49'57"W 12.79' along a S.B.L. of this tract to a 60d nail set for this tract's Southmost reentrant corner,

THENCE S 17deg16'09"E 6.37' along an E.B.L. of this tract to a 60d nail set for this tract's Westmost S.E.C. ,

THENCE S 72deg43'51"W 19.74' along a S.B.L. of this tract to a 60d nail set for this tract's only S.W.C. ,

THENCE N 17deg16'09"W 12.69' along a W.B.L. of this tract to a chisled "X" set in concrete for this tract's Southmost N.W.C. ,

THENCE N 72deg43'51"E 19.74' along a N.B.L. of this tract to a 60d nail set for this tract's Southmost N.E.C. ,

THENCE S 17deg16'09"E 4.32' along an E.B.L. of this tract to a 60d nail set for this tract's Westmost reentrant corner,

THENCE N 70deg49'57"E 12.83' along a N.B.L. of this tract to a 60d nail set for this tract's Eastmost reentrant corner,

THENCE N 16deg08'12"W 44.52' along a W.B.L. of this tract to a 60d nail set for this tract's Northmost N.W.C. ,

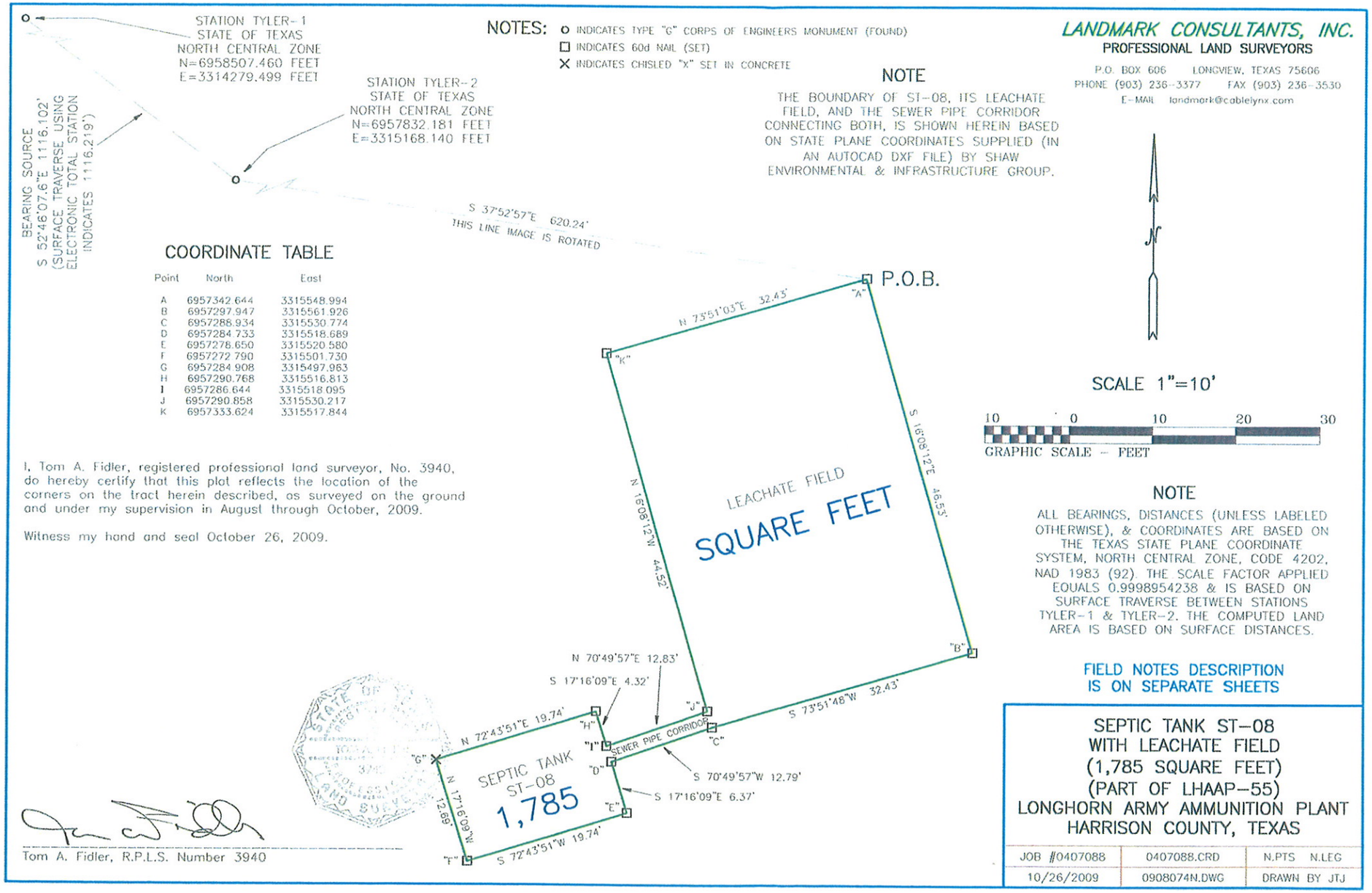
THENCE N 73deg51'03"E 32.43' along a N.B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,785 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, R.P.L.S. Number 3940

00190034



NOTES: o INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
□ INDICATES 60d NAIL (SET)
× INDICATES CHISLED "X" SET IN CONCRETE

NOTE

THE BOUNDARY OF ST-08, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

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P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

COORDINATE TABLE

Point	North	East
A	6957342.644	3315548.994
B	6957297.947	3315561.926
C	6957288.934	3315530.774
D	6957284.733	3315518.689
E	6957278.650	3315520.580
F	6957272.790	3315501.730
G	6957284.908	3315497.963
H	6957290.768	3315516.813
I	6957286.644	3315518.095
J	6957290.858	3315530.217
K	6957333.624	3315517.844

SCALE 1"=10'

10 0 10 20 30
GRAPHIC SCALE – FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October, 2009.

Witness my hand and seal October 26, 2009.

Tom A. Fidler, R.P.L.S. Number 3940

NOTE

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FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

SEPTIC TANK ST-08
WITH LEACHATE FIELD
(1,785 SQUARE FEET)
(PART OF LHAAP-55)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	N.PTS N.LEG
10/26/2009	0908074N.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-09, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 2,004 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-09, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-2" referenced above,

THENCE S 03deg30'04"E 1101.12' to a 60d nail set for the North corner of this tract and this POINT OF BEGINNING,

THENCE S 47deg56'14"E 12.69' along a N.E. B.L. of this tract to a 60d nail set for this tract's East corner,

THENCE S 42deg03'46"W 19.74' along a S.E. B.L. of this tract to a 60d nail set for this tract's South corner,

THENCE N 47deg56'14"W 4.08' along a S.W. B.L. of this tract to a 60d nail set for this tract's S.E. reentrant corner,

THENCE S 18deg07'53"E 120.09' along an E.B.L. of this tract to a 60d nail set for this tract's N.E. reentrant corner,

THENCE N 67deg40'46"E 15.01' along a N.B.L. of this tract to a

60d nail set for this tract's N.E.C. ,

THENCE S 22deg19'14"E 46.53' along an E.B.L. of this tract to a 60d nail set for this tract's S.E.C. ,

THENCE S 67deg40'46"W 32.43' along a S.B.L. of this tract to a 60d nail set for this tract's S.W.C. ,

THENCE N 22deg19'14"W 46.53' along a W.B.L. of this tract to a 60d nail set for this tract's N.W.C. ,

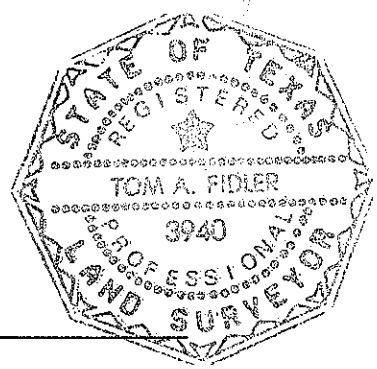
THENCE N 67deg40'46"E 15.42' along a N.B.L. of this tract to a 60d nail set for this tract's N.W. reentrant corner,

THENCE N 18deg07'53"W 123.73' along a W.B.L. of this tract to a 60d nail set for this tract's S.W. reentrant corner,

THENCE N 47deg56'14"W 4.59' along a S.W. B.L. of this tract to a 60d nail set for this tract's West corner,

THENCE N 42deg03'46"E 19.74' along a N.W. B.L. of this tract to this POINT OF BEGINNING. This tract contains 2,004 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

SEPTIC TANK ST-09
WITH LEACHATE FIELD
(2,004 SQUARE FEET)
(PART OF LHAAP-55)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	P.PTS P.LEG
10/26/2009	0908074P.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October, 2009.

Witness my hand and seal October 26, 2009.

Tom A. Fidler, R.P.L.S. Number 3940

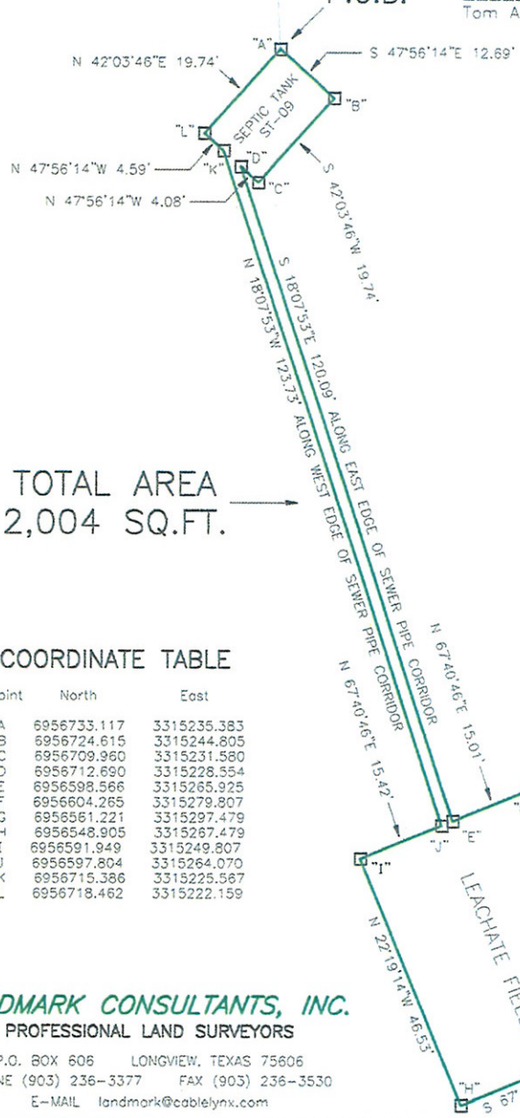
STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1116.219')

S 03°30'04"E 1101.12'

P.O.B.



TOTAL AREA
2,004 SQ.FT.

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

NOTE

THE BOUNDARY OF ST-09, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

COORDINATE TABLE

Point	North	East
A	6956733.117	3315235.383
B	6956724.615	3315244.805
C	6956709.960	3315231.580
D	6956712.690	3315228.554
E	6956598.566	3315265.925
F	6956604.265	3315279.807
G	6956561.221	3315297.479
H	6956548.905	3315267.479
I	6956591.949	3315249.807
J	6956597.804	3315264.070
K	6956715.386	3315225.567
L	6956718.462	3315222.159

SCALE 1"=20'

20 0 20 40 60
GRAPHIC SCALE - FEET

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTES: × INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
□ INDICATES 60d NAIL (SET)

00190037

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-10, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,804 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-10, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-2" referenced above,

THENCE S 34deg34'49"E 861.93' to a 60d nail set for the Westmost N.W.C. of this tract and this POINT OF BEGINNING,

THENCE S 81deg33'36"E 46.53' along a N.B.L. of this tract to a 60d nail set for this tract's Westmost N.E.C. ,

THENCE S 08deg26'24"W 13.21' along an E.B.L. of this tract to a 60d nail set for this tract's N.E. reentrant corner,

THENCE S 82deg30'08"E 21.87' along a N.B.L. of this tract to a 60d nail set for this tract's N.W. reentrant corner,

THENCE N 08deg55'06"E 4.34' along a W.B.L. of this tract to a 60d nail set for this tract's Eastmost N.W.C. ,

THENCE S 81deg04'54"E 19.74' along a N.B.L. of this tract to a 60d nail set for this tract's Eastmost N.E.C. ,

THENCE S 08deg55'06"W 12.69' along an E.B.L. of this tract to a 60d nail set for this tract's Eastmost S.E.C. ,

THENCE N 81deg04'54"W 19.74' along a S.B.L. of this tract to a 60d nail set for this tract's Eastmost S.W.C. ,

THENCE N 08deg55'06"E 6.34' along a W.B.L. of this tract to a 60d nail set for this tract's S.W. reentrant corner,

THENCE N 82deg30'08"W 21.85' along a S.B.L. of this tract to a 60d nail set for this tract's S.E. reentrant corner,

THENCE S 08deg26'24"W 17.22' along an E.B.L. of this tract to a 60d nail set for this tract's Westmost S.E.C. ,

THENCE N 81deg33'36"W 46.53' along a S.B.L. of this tract to a 60d nail set for this tract's Westmost S.W.C. ,

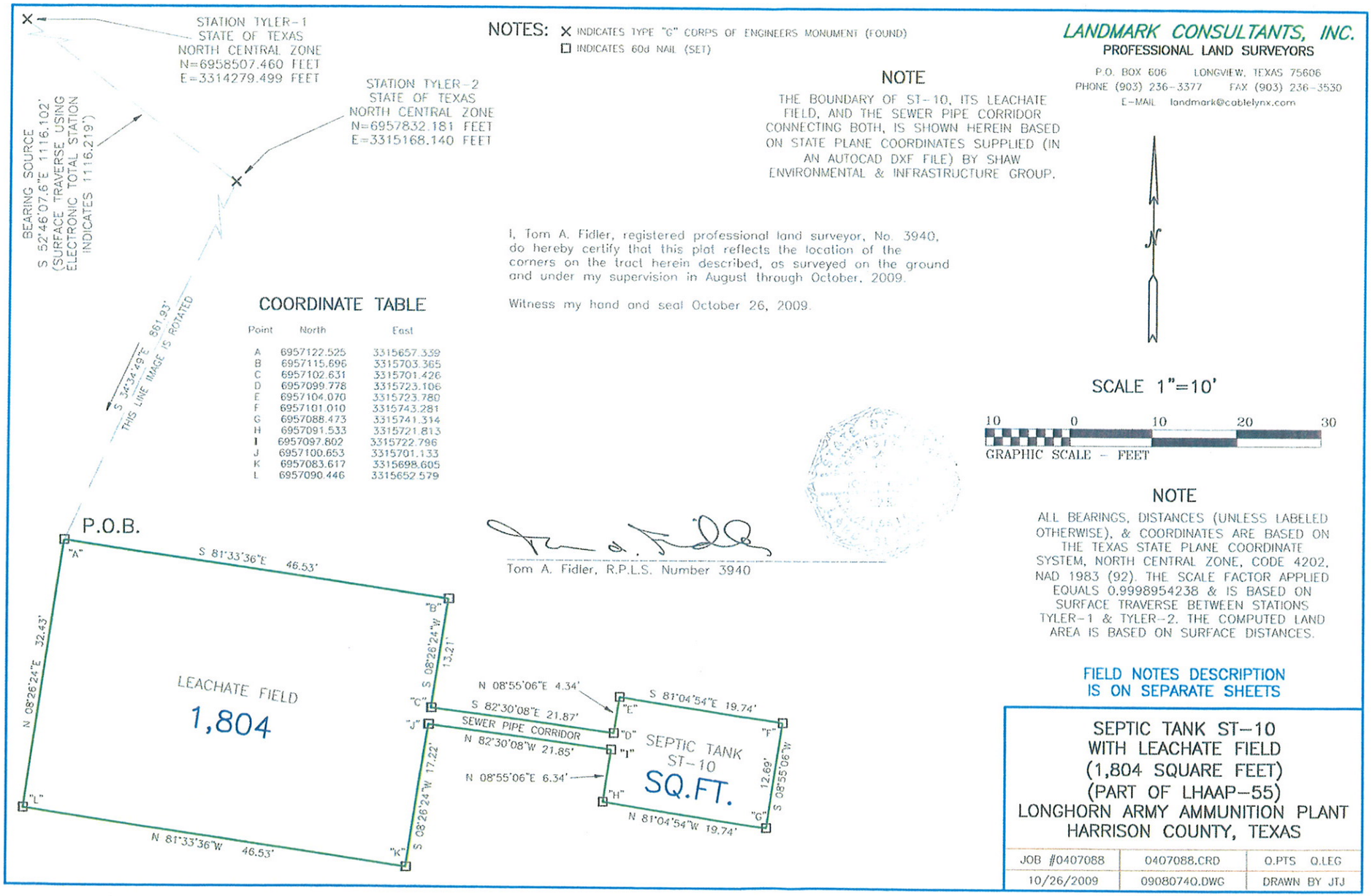
THENCE N 08deg26'24"E 32.43' along a W.B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,804 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, R.P.L.S. Number 3940

00190040



NOTES: ✕ INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
□ INDICATES 60d NAIL (SET)

NOTE

THE BOUNDARY OF ST-10, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

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E-MAIL landmark@cablelynx.com

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October, 2009.

Witness my hand and seal October 26, 2009.

COORDINATE TABLE

Point	North	East
A	6957122.525	3315657.339
B	6957115.696	3315703.365
C	6957102.631	3315701.426
D	6957099.778	3315723.106
E	6957104.070	3315723.780
F	6957101.010	3315743.281
G	6957088.473	3315741.314
H	6957091.533	3315721.813
I	6957097.802	3315722.796
J	6957100.653	3315701.133
K	6957083.617	3315698.605
L	6957090.446	3315652.579

Tom A. Fidler, R.P.L.S. Number 3940

SCALE 1"=10'

10 0 10 20 30
GRAPHIC SCALE - FEET

NOTE

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FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

SEPTIC TANK ST-10
WITH LEACHATE FIELD
(1,804 SQUARE FEET)
(PART OF LHAAP-55)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	O.PTS Q.LEG
10/26/2009	09080740.DWG	DRAWN BY JTJ

Subject:	**Final Minutes, Monthly Managers Meeting, Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**Teleconference – 866-203-6896, passcode 1759304791**
Date of Meeting:	**January 9, 2014 – 9:00 AM**

Welcome **RMZ**

Attendees:

Army BRAC:	Rose Zeiler
EPA:	Rich Mayer, Phil Turner
TCEQ:	April Palmie, Dale Vodak
USACE:	Aaron Williams, Rick Smith
AECOM:	Dave Wacker, Gretchen McDonnell, Josh Miller
AEC:	Marilyn Plitnik
USFWS:	Paul Bruckwicki, Barry Forsythe

Action Items

AECOM

- Provide a summary of the treated water nutrient data, after fluidized bed reactor feeding optimization has been implemented. **Pending until Spring.** Optimization efforts were suspended to allow equilibration of the FBR after an acetic acid issue. Further optimization will be performed in Spring when temperatures are more suitable.
- Develop a letter responsive to stated aspects of modifications to the GWTP air sampling plan. The letter should provide basis of change from weekly to monthly sampling. It should also state that monthly data will be presented in the quarterly GWTP reports, but that an email notification will be made monthly (before the subsequent sampling event) to indicate that data has been reviewed and provide a summary statement of the results. The letter include a contingency plan for confirmation sampling if initial sampling indicates air limits have been exceeded. **Pending.**
- Provide USFWS with maps of well coordinates for existing and new wells at all sites under AECOM's contract. **Pending.** AECOM has assembled a list of coordinates for both old and new wells, and will forward that to USACE. Target for completion of the map is before the next Monthly Managers' Meeting. Ms. Palmie requested a list of all wells sampled in 2013 for purposes of legislative reporting.
- For LHAAP-18/24 Revised FS, provide to Army the list of technologies/alternatives planned for evaluation, as well as those screened out, for agency use in determining whether they would like additional technologies evaluated. **Complete.**

Army

- Provide USFWS with map of well coordinates for new wells (specifically, LHAAP-35B(37), LHAAP-35A(58), LHAAP-46, LHAAP-50 and LHAAP-67) and existing wells on transferred properties. **Pending.** AECOM has assembled a list of coordinates for both old and new wells, and will forward that to USACE. Target for completion of the map is before the next Monthly Managers' Meeting.
- Develop a tentative schedule for completion of the LHAAP 5-Year Review, based on receipt of EPA comments and development of associated RTCs. **Complete.**

EPA

- Mr. Mayer stated he would try to arrange a call before December 20th relating to discussion of 1,4-dioxane methods and will provide an agenda for the call. **Pending.** Mr. Mayer will be trying to schedule a call within the week, with the subject being a discussion of the details of the various analytical methods.

TCEQ

AEC

Defense Environmental Restoration Program (DERP) PBR Update **AECOM**

Item 1 (5-Year Review) – A tentative document finalization schedule has been submitted. Goal is return response to agency comments and a redline version of the document by February 10th.

Item 2 (IWWP, QAPP, SOPs and HASP) – RTCs are being wrapped up with the response to agency comments expected to go back to the agencies by January 24th.

Item 3 (LHAAP-18/24 Explanation of Significant Differences) – Document is in agency review with EPA/TCEQ to provide comments by January 13th.

Item 4 (GWTP Quarterly Report) – Mr. Mayer stated EPA will submit comments either today or tomorrow.

Item 5 (LHAAP-18/24 Revised FS) – The Draft Revised FS is planned for submittal to agencies by January 29th. A PSI WP Addenda, describing additional work needed to define DNAPL areas and fill in some remaining data, is planned for submittal by January 17th. The end of February is targeted for mobilization to conduct the PSI WP Addenda work. Mr. Wacker stated that the FS alternatives evaluation/selection would not be impacted by the data generated by the PSI WP Addendum field work. EPA and TCEQ agreed to discuss off-line and notify Army whether they want to push the schedule for the Draft FS back to allow data from the PSI WP Addendum field work to be incorporated before their review.

Item 6 (LHAAP-46, 67 RACR) – Documents in progress. Agencies requested that RACRs be held until all data gaps have been filled (i.e, additional well needed on north side of LHAAP-46 to bound plume).

Item 7 (Monthly Managers' Meeting) – Scheduled for February 20th at 1PM, at the LHAAP Army trailer. Examination of retained soil cores will begin at 10AM.

Item 8 (LHAAP-37, 50 and 58) – RACR documents being generated and investigation-derived waste disposal being coordinated.

Item 9 (LHAAP-29 RI/FS Addendum WP) – Targeting the end of January for submittal to agencies.

Items 10 and 11 (LHAAP-17 PDI WP and LHAAP-16 RD WP) – These items are on hold based on dispute between Army and EPA.

Item 12 (February RAB) – Scheduled for February 20th at 6PM. Longhorn tour time for next RAB will need to be set up during this meeting.

Item 13 (GWTP O&M/Air Monitoring) – FBR is being monitored closely and allowed to re-equilibrate after acetic acid issue, delaying full implementation of FBR feeding optimization activities. Further optimization will be performed in Spring when temperatures are more suitable. Monthly air data memo will be submitted to the agencies within the next day or two.

Item 14 (Admin Record Update) – 3rd quarter update has been finalized. 4th quarter update being prepared and should be submitted soon.

Item 15 (BERA Addendum) – Draft planned for submittal to Army by January 20th. Agencies should receive the document for review by the end of February.

Item 16 (Nutrient Issue for HB and INF) – discussed earlier in the meeting.

(LHAAP-03 Draft Final ROD) – ROD will become final unless EPA initiates dispute by January 13th.

- Upcoming document submissions to regulators (see Document and Issue Tracking table)
- Upcoming field work
  LHAAP-18/24 PSI WP Addendum field activities
  LHAAP-29 RI/FS Addendum WP field activities
  Quarterly sampling for MNA network wells at LHAAP-46, LHAAP-50, LHAAP-58 and LHAAP-67 begins in March.
  A revised version of the 6-month Longhorn "look ahead" will be submitted within the next week, along with a revised version of the site-wide groundwater monitoring planner.
- Monthly data – discussed earlier in the meeting
- Groundwater Treatment Plant
  - Ongoing maintenance to replace pumps in four ICTs. Ensuring freeze protection for colder weather.
  - Air Monitoring (Results, Frequency and Reporting) – GWTP monthly air data email will be issued shortly
  - ESD – discussed earlier in the meeting
  - UIC Reporting – Ms. Zeiler reviewed that administrative reporting requirements of an ARAR are not applicable to Longhorn as a Federal CERCLA site, but that she has advised Army legal that Longhorn provides reporting information as a courtesy to facilitate Ms. Palmie's ability to interface with the TCEQ UIC program. Army Legal has required that, because this reporting is not being done to satisfy the UIC requirement, the data must be reported to the agency's Longhorn remediation project manager and not to the UIC program.

    Therefore, with respect to LHAAP-18/24 GWTP operations, Ms. Palmie will receive a quarterly email stating no injection was performed, and a short statement relating to UIC activities will be placed in the quarterly GWTP report. Injection work conducted to-date for LHAAP-58 was done largely in accordance with the approved RAWP and will be documented in the RACR. Because submittal of the RACR will not take place for a few months, AECOM will provide Ms. Palmie with an email documenting deviations from the RAWP. LHAAP-37 injections will be covered under the biannual reports submitted by Aberdeen Testing Center and forwarded to Ms. Palmie by Ms. Zeiler.

Ms. Palmie advised that, if any contact or paperwork is received directly from the UIC program, those inquiries can be referred to her.

MMRP Update **Army**

- Update – No update

Other Environmental Restoration **Army**

- Decision Documents for multiple sites – status update – in progress
- Site 37 Bioplug – new data received by Army today will be reviewed
- 1,4-dioxane sampling at Longhorn –discussed earlier in meeting
- Quarterly Reporting and Requirements
  - GWTP Evaluation with air monitoring data – discussed earlier in meeting
  - Surface Water/Perimeter Well Tech Memo with validation reports – Army reviewing the current memo with goal of presentation to the RAB in February.
  - Administrative Record Update – discussed earlier in meeting
- Annual Reporting
  - LUC Management Plan Update – no update at this time
  - CIP/CRP Revision (Biennial) and questionnaire October 2015 – no update

Programmatic Issues **RMZ/RM/AP**

- Status of Dispute – Mr. Mayer stated a meeting between EPA and Army to discuss the dispute has been tentatively scheduled for February 21, 2014.

USFWS Update **RMZ/PB**

- Environmental Restoration Issues with Transfer Schedule Impact – LHAAP-12 transfer to USFWS is imminent.
- USFWS Comments on Documents - none

Schedule Next Managers' Meeting – February 20th. Examination of retained boring cores will begin at 10AM, with the meeting tentatively set to begin at 1PM.

New Action Items

AECOM

- Add CRP/CIP item to the Document and Issue Tracking table.
- Provide Ms. Palmie with an email documenting deviations from the RAWP with respect to injection-related activities at LHAAP-58.

EPA

- Develop a list of wells/sites for upcoming EPA split sampling and advise Army.
- Resend the link to new EPA screening level tables to Ms. Zeiler and Mr. Torcoletti.

Adjourn

ACRONYM LIST

AEC	**United States Army Environmental Command**
AECOM	**AECOM Technology Services, Inc.**
AP	**April Palmie**
ARAR	**Applicable or Relevant and Appropriate Requirement**
BERA	**Baseline Ecological Risk Assessment**
BRAC	**Base Realignment and Closure**
CERCLA	**Comprehensive Environmental Response, Compensation, and Liability Act**
CRP/CIP	**Community Relations Plan/Community Involvement Plan**
DERP	**Defense Environmental Restoration Program**
DNAPL	**Dense Non-Aqueous Phase Liquid**
EPA	**United States Environmental Protection Agency**
ESD	**Explanation of Significant Differences**
FBR	**Fluidized Bed Reactor**
FS	**Feasibility Study**
GWTP	**Ground Water Treatment Plant**
HASP	**Health and Safety Plan**
HB	**Harrison Bayou**
ICT	**Interceptor – Collector Trench**
INF	**Intermediate-Range Nuclear Forces**
IWWP	**Installation-Wide Work Plan**
LHAAP	**Longhorn Army Ammunition Plant**
LUC	**Land Use Control**
MMM	**Monthly Managers' Meeting**
MMRP	**Military Munitions Response Program**
O&M	**Operation and Maintenance**
PB	**Paul Bruckwicki**
PBR	**Performance-Based Remediation**
PDI	**Pre-Design Investigation**
PSI	**Post-Screening Investigation**
QAPP	**Quality Assurance Project Plan**
RAB	**Restoration Advisory Board**
RACR	**Remedial Action Completion Report**
RD	**Remedial Design**
RI	**Remedial Investigation**
RM	**Rich Mayer**
RMZ	**Rose M. Zeiler**
ROD	**Record of Decision**
RTC	**Response to Comments**
SOP	**Standard Operating Procedure**
TCEQ	**Texas Commission on Environmental Quality**
UIC	**Underground Injection Control**
USACE	**United States Army Corps of Engineers**
USFWS	**United States Fish and Wildlife Service**
WP	**Work Plan**

FINAL

EXPLANATION OF SIGNIFICANT DIFFERENCES

RECORD OF DECISION FOR EARLY INTERIM REMEDIAL ACTION AT BURNING GROUND NO. 3

LONGHORN ARMY AMMUNITION PLANT

KARNACK, TEXAS

Prepared For:

U.S. Army Corps of Engineers

Prepared By:

AECOM

AECOM Technical Services, Inc.

February 2014

FINAL

EXPLANATION OF SIGNIFICANT DIFFERENCES

RECORD OF DECISION FOR EARLY INTERIM REMEDIAL ACTION AT BURNING GROUND NO. 3

LONGHORN ARMY AMMUNITION PLANT

KARNACK, TEXAS

Prepared For:

U.S. Army Corp of Engineers

Tulsa District

Prepared By:

AECOM Technical Services, Inc.

Contract No. W912DY-09-D-0059

Task Order No. DS01

February 2014

Table of Contents

List of Tables

List of Appendixes

Acronyms and Abbreviations

AECOM	AECOM Technical Services, Inc.
AMCV	Air Monitoring Comparison Value
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
ESD	Explanation of Significant Difference
ESL	Effects Screening Level
gpm	gallons per minute
GWTP	Ground Water Treatment Plant
ICT	interceptor collection trench
IRA	Interim Remedial Action
LHAAP	Longhorn Army Ammunition Plant
LTTD	low temperature thermal desorption
NPL	National Priorities List
PID	photoionization detector
ROD	Record of Decision
TCEQ	Texas Commission on Environmental Quality
TLV	Threshold Limit Value
TNRCC	Texas Natural Resources Conservation Commission
U.S.	United States
U.S. Army	U.S. Department of the Army
UEP	unlined evaporation pond
USEPA	U.S. Environmental Protection Agency
VOCs	volatile organic compounds

1 INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE

Site and Location: LHAAP-18/24 is a fenced, cleared area consisting of 34.5 acres in the southeastern section of Longhorn Army Ammunition Plant (LHAAP). The Groundwater Treatment Plant (GWTP) is the facility where extracted groundwater from LHAAP-18/24 is treated. The GWTP is located immediately adjacent to and southeast of Longhorn site LHAAP-18/24 at the eastern end of Avenue Q.

Lead Agency and Supporting Agencies:

Lead Agency – United States Department of the Army (U.S. Army)
Supporting Agencies – U.S. Environmental Protection Agency (USEPA) Region 6 and Texas Commission on Environmental Quality (TCEQ) as a Federal Facilities Agreement Partner
Citation: This Explanation of Significant Difference (ESD) is in Compliance with Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) §117(c) and the National Contingency Plan §300(c)(2)(1)

Date of Interim Remedial Action Record of Decision (IRA ROD) (USACE, 1995) Signature: May 1995, Administrative Record, Bates Stamp range 012681-012751

1.1 Need for this ESD

This ESD is needed as a result of changes to the GWTP to remove the catalytic oxidation air emission control unit as a component of the Selected Remedy described in Section I of the Interim Remedial Action Record of Decision (IRA ROD) (USACE, 1995). The catalytic oxidation unit removes volatile organic compounds (VOCs) from the GWTP air stripping unit that removes those same compounds from extracted groundwater. Section J of the IRA ROD (USACE, 1995) established the air emission criteria for Standard Exemptions 68 and 118 at 30 TAC §116.211(a) as an action-specific Applicable or Relevant and Appropriate Requirement (ARAR) for control of air emissions from the remedial action processes.[1] The catalytic oxidation unit achieved the ARAR by converting the VOCs in the air stripper off-gas to carbon dioxide, water, and hydrochloric acid gases. The catalytic oxidation unit initially treated an additional source of VOCs from a low temperature thermal desorption (LTTD) soil treatment process. That soil treatment process is now complete.

On May 24, 2012, the air scrubber system on the catalytic oxidizer malfunctioned due to an air blower breakdown, resulting in significant damage to the scrubber unit and the inability to operate the catalytic oxidizer. Because it was anticipated that there would be a considerable delay in acquiring and installing replacement equipment, the Army proposed an interim solution of bypassing the catalytic oxidizer until equipment replacement could take place. The Army provided the USEPA and TCEQ with air emission estimates that met the substantive

[1] Although other emission criteria may have been possible under CERCLA 121(d), the Standard Permit emission criteria were selected.

requirements of the current "Permits by Rule" provisions of 30 TAC §106.533.[2] USEPA and TCEQ concurred with Army's plan to operate the GWTP without use of the catalytic oxidizer as an interim measure.

Interim air emission monitoring (discussed in **Section 3.1**) following the air stripper breakdown confirms that the air stripping unit at the GWTP can reliably achieve air emissions significantly below the action-specific ARAR (i.e., 30 TAC §106.533 and/or former 30 TAC §116.211(a)) without the catalytic oxidation unit. Although neither of these criteria require the use of air emission control equipment, this ESD is required because the catalytic oxidation unit is identified as a remedy component of the Selected Remedy and there is no provision for removing the catalytic oxidation unit from the remedy if no longer required to meet the ARAR.

Because the Selected Remedy of extracting and air stripping VOCs from the groundwater remains in place and all ARARs will continue to be met without the catalytic oxidation unit, its deletion does not result in a fundamental change in the Selected Remedy requiring an IRA ROD amendment. All other GWTP system components remain unchanged and are not included in this ESD.

This ESD will become part of the Administrative Record file in accordance with 40 CFR §300.825(a)(2) and will be part of the information repository for the site. The public may access this report at the Marshall Public Library:

Marshall Public Library
300 South Alamo Blvd.
Marshall, TX 75670

[2] 30 TAC §106.533 "permit by rule" provisions replaced 30 TAC §116.211's permit exemption provisions in existence on May 4, 1994.

2 SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

2.1 Site History and Contamination

LHAAP-18/24 had been used from 1955 until 1997 as a burial and burning ground for various industrial wastes and hazardous wastes generated at LHAAP. Burned wastes included solvents, oil, and red phosphorus. Buried wastes include rocket motor washout residues, illuminating mixtures, oxidizing agents, solvents, oils, and detergents. The former unlined evaporation pond (UEP) was constructed in 1963 to collect water from the washout of rocket motor casings and the process waste sumps. The water contained solvents, explosive compounds, and metal residues. The UEP was no longer used after 1984 and was closed in 1986. LHAAP-18/24 was identified as a National Priorities List (NPL) site and is in the Federal Facility Agreement signed by USEPA, TCEQ, and the Army and effective December 30, 1991 (Administrative Record Bates Stamp range 004404-004405).

The groundwater at LHAAP-18/24 is believed to have been contaminated by infiltration from the UEP that was used to store manufacturing wastewater and from burning trenches used to flash pyrotechnic, propellant, and explosive waste streams. High concentrations of solvents (VOCs), primarily methylene chloride and trichloroethylene, and traces of heavy metals, such as barium, have been detected within subsurface soils, buried waste, and the uppermost water bearing-zone at the site. The concentrations of methylene chloride as of April 1994, prior to the IRA, ranged from approximately 10,550 mg/L, near the center of the plume, to less than 0.005 mg/L, near the northwest edge of the plume. The concentration of trichloroethylene as of April 1994, prior to the IRA, ranged from approximately 1,520 mg/L near the center of the plume, to less than 0.005 mg/L near the northwest edge of the plume. The extent of impacted groundwater extended beyond the 34.5-acre boundary of the site. Soil samples from 1987 through 1989 detected trichloroethylene with a maximum concentration of 1,000 mg/kg, methylene chloride with a maximum concentration of 742 mg/kg and acetone with a maximum concentration of 33 mg/kg. Barium, chromium, and lead have also been detected in site soil samples at concentrations exceeding expected background concentrations for the area. The majority of impacted soil occurred in the northern portion of the site where the majority of waste burial and disposal/burning practices occurred.

In 1998, as part of the interim remedial action, the GWTP was put into operation to treat water collected from 14 interceptor collection trenches (ICTs) totaling 5,000 linear feet and 28 collection sumps associated with those ICTs.

The GWTP also receives flow from eight extraction wells at LHAAP-16. Those extraction wells were installed in 1996 and 1997 as part of a treatability study. These wells were not required as part of the interim ROD for LHAAP-16 and are expected to be abandoned as part of the final remedy for LHAAP-16. The wells are located between the landfill at LHAAP-16 and Harrison Bayou. The groundwater at LHAAP-16 is largely contaminated with chlorinated ethenes and perchlorate.

The GWTP was not operated between May 24, 2012 and September 6, 2012, due to the malfunction of the catalytic oxidation air emission control unit described in **Section 1.1**. Since September 6, 2012, the GWTP has been operated without the catalytic oxidation unit, but with

weekly air emission monitoring. Upon restart of the groundwater extraction and treatment system, the flow rate has ranged between 167 to 192 gallons per minute (gpm), which is consistent with the original design parameters and the flow rate experienced prior to May 24, 2012.

2.2 Selected Remedy

The IRA ROD Selected Remedy includes:

- Extraction of shallow groundwater and treatment using metal precipitation, air stripping, and off-gas treatment for VOCs, and
- Excavation of source material and treatment using LTTD and off-gas treatment for VOCs.

The excavation and treatment of the source material is complete and is therefore not addressed by this ESD.

3 BASIS FOR THE DOCUMENT

3.1 Information Prompting and Supporting Significant Differences from the Selected Remedy

Former 30 TAC §116.211, Standard Exemptions 68 and 118 and/or the current permit by rule emission criteria of 30 TAC §106.533 constitute the ARAR for air emissions from the GWTP. Since 2000, these air emissions have been monitored continuously for total hydrocarbons using a Model 51 FID and quarterly for VOCs using method TO-14.

In accordance with an electronic mail from the USEPA and the TCEQ dated July 23, 2012, the parties agreed to operate the GWTP without the catalytic oxidizer. The parties' agreement was conditioned on the collection of weekly air samples from the emission point, ambient air at the GWTP, and ambient air downwind of the emission point at the nearest off-site boundary. Since September 6, 2012, weekly VOC air samples have been acquired.

The current TCEQ requirements at 30 TAC §106.533 were applied to the air data collected from the air stripper emission point and from the ambient air samples. Air monitoring began in September 2012 with the restart of the GWTP operations and continues on a weekly basis. The weekly data are analyzed and compiled in weekly reports that are submitted to the US EPA and TCEQ. Along with the air data, photoionization detector (PID) measurements are collected. Correlation between the air sampling data and the PID measurements were determined for the GWTP ambient air and for the stripper air line data. The correlations indicated that the PID data provide a good estimate of the VOC concentrations in the GWTP ambient air and the stripper emissions (**Table 3-1**). Below is a summary of the approach and results.

Per the TCEQ request, the ambient air data collected at the GWTP and downwind were compared to the TCEQ Air Monitoring Comparison Values (AMCVs) protective of human health. For chemicals with no published AMCVs, the short term Effects Screening Levels (ESLs) were used for comparison. All ambient air concentrations were lower than the AMCVs or ESLs and are protective of human health.

All emission rates measured from the stripper air line were lower than the allowable maximum hourly emission limits to the nearest off-site receptor per 30 TAC §106.533(b)(6)[3] and the annual emission rate of five tons per year (30 TAC §106.533(f)(1)(B)) allowed for each chemical.

Therefore, the ARARs related to the treatment requirements for air emissions continue to be met without catalytic oxidation treatment.

[3] Off-site receptor--Any recreational area, residence, commercial/industrial facility, or other normally occupied structures not used solely by the owner or operator of the facilities or the owner of the site upon which the facilities are located. Measurements of distances to determine compliance with this distance restriction must be taken toward structures that are in use as of the date that a notification is filed with the commission.

3.2 Information in the Administrative Record Supporting the Need for the Change

The USEPA requested that an ESD be submitted to address differences between operating the GWTP with a catalytic oxidizer for air abatement versus operating the GWTP without a catalytic oxidizer (USEPA, email to US Army on March 21, 2013). AECOM Technical Services, Inc. (AECOM) has produced an Interim Air Monitoring Plan supporting the need for the change (AECOM, 2012). This information and other supporting documents are included in the Administrative Record.

Table 3-1: PID Readings and Correlation with Analytical Results

Date	PID Field Measurement (ppmv)		Calculated PID* (ppmv)		Measured/Calculated PID	
	Ambient Air at GWTP	Stripper Air Line	Ambient Air at GWTP	Stripper Air Line	Ambient Air at GWTP	Stripper Air Line
6-Sep-12	0.1	22.3	0.0115	10.2		
16-Sep-12	0.1	22.3	0.0186	10.9		
24-Sep-12	0.05	7	0.0283	15.6		
1-Oct-12	0.15	15.7	0.0650	13.9		
8-Oct-12	0	15.7	0.0228	13.7		
15-Oct-12	0.1	20	0.0811	15.4		
22-Oct-12	0.1	13	0.0805	9.89		
29-Oct-12	0.1	12.6	0.0399	10.5		
5-Nov-12	0.05	29.8	0.0434	16.5		
12-Nov-12	0.1	14.4	0.0245	10.8		
19-Nov-12	0	20.3	0.0235	11.4		
27-Nov-12	0.1	18	0.0204	12.7		
3-Dec-12	0	22.5	0.0156	9.74		
13-Dec-12	0.1	11.2	0.0156	8.20		
17-Dec-12	0.1	12.9	0.0413	7.67		
24-Dec-12	0	20.1	0.0241	11.9		
2-Jan-13	0	37.1	0.0125	8.62		
7-Jan-13	0.1	12.7	0.0176	6.79		
14-Jan-13	0.1	23.4	0.026	7.08		
21-Jan-13	0.1	15.1	0.0371	5.96		
28-Jan-13	0	28.6	0.0746	20.0		
4-Feb-13	0.1	14.9	0.0226	11.4		
11-Feb-13	0.1	11.1	0.0364	12.5		
18-Feb-13	0	13	0.0213	7.67		
27-Feb-13	0	14.5	0.0257	11.8		
11-Mar-13	0	13.7	0.0125	15.5		
18-Mar-13	0	17	0.0403	16.7		
25-Mar-13	0.1	14.1	0.0144	12.1		
2-Apr-13	0.1	22.7	0.0751	8.8		
8-Apr-13	0	15.8	0.0240	14.9		
15-Apr-13	0	16.2	0.0225	19.2		
22-Apr-13	0	14.3	0.0556	11.1		
1-May-13	0	12.8	0.0556	11.1		
6-May-13	0	18.1	0.0138	17.7		
13-May-13	0	12.9	0.0264	13.4		
21-May-13	0	16.2	0.0241	19.2		
28-May-13	0	16.2	0.0304	15.3		
5-Jun-13	0	7.7	0.0387	10.4		
12-Jun-13	0	9.1	0.0264	11.9		
19-Jun-13	0	11.1	0.0875	10.7		
24-Jun-13	0	7.6	0.0261	11.6		
1-Jul-13	0	17.7	0.0314	14.4		
8-Jul-13	0	13.1	0.0314	28.7		
15-Jul-13	0	15.7	0.0556	25.8		
22-Jul-13	0	10.9	0.0319	23.8		
29-Jul-13	0	8.6	0.0484	22.2		
5-Aug-13	0	12.3	0.0258	17.2		
12-Aug-13	0	11.8	0.0386	15.7		
19-Aug-13	0	15.4	0.048	20.8		
26-Aug-13	0	11.1	0.0442	14.7		
3-Sep-13	0	12	0.0714	16.5		
9-Sep-13	0	15	0.0335	19.0		
16-Sep-13	0	13.2	0.0335	14.3		
23-Sep-13	0	14.3	0.0695	19.0		
Average	0.0343	15.6	0.0364	13.9	94%	112%

* Calculated based on TCEQ equation in 30 TAC 106.533(h)

Concentration (ug/m^3) = PID reading (ppmv) * MW (g/mole)/{0.02445* Mole fraction (from analytical results)}

Mole fraction = compound concentration (mol/m^3)/sum of all molar concentrations (mol/m^3)

Molar Concentration (mol/m^3) = Analytical concentrations (ug/m^3)/{1,000,000 ug/g * MW (g/mol)}

4 DESCRIPTION OF SIGNIFICANT DIFFERENCE

4.1 Significant Differences in Scope

The remedial objectives for the Early Interim Remedial Action were to eliminate or minimize the potential for exposure to human and ecological receptors by reducing or preventing further migration of contaminants from source material and shallow groundwater into deeper groundwater zones, and possibly surface water bodies. LTTD treatment of the source material was completed prior to breakdown of the catalytic oxidation unit. The deletion of the catalytic oxidation unit does not require any modification to the pumping rates from the 14 interceptor collection trenches, 28 collection sumps, or 8 LHAAP-16 extraction wells.

4.2 Significant Differences in Performance

The deletion of the catalytic oxidation unit from the Selected Remedy has no impact on reducing or preventing further groundwater migration of contaminants from source material and shallow groundwater.

While air emissions from the GWTP will be higher without the catalytic oxidation unit, the total emissions will remain below the level of regulatory significance as determined by former 30 TAC §116.211(a).

4.3 Significant Differences in Cost

Current Shallow Groundwater Treatment & Disposal Costs:

Capital	$4,490,000	
Annual Operations & Maintenance	$400,000	
Present-worth	$3,000,000	(air stripping)
	$2,080,000	(metal precipitation)

The change in cost is unknown since the IRA ROD did not break out specific costs for the off-gas treatment for VOCs. However it is known that removing the catalytic oxidizer from the groundwater treatment process will avoid an additional capital cost of ~$700,000 for replacement of the catalytic oxidizer unit.

4.4 Expected Changes in Outcome

The deletion of the catalytic oxidation unit from the Selected Remedy does not affect the cleanup criteria or the time required to achieve the cleanup criteria. Deletion of the catalytic oxidation unit has not resulted in a change to the groundwater extraction rates or the rate of contaminant mass removal from the groundwater. No changes to performance standards specified in the IRA ROD are proposed. The current TCEQ emission criteria under 30 TAC §106.533, (replacing former Texas Natural Resources Conservation Commission (TNRCC) 30 TAC §116.122(a)), is the current ARAR. Operation of the GWTP without a catalytic oxidizer will continue to meet the ARAR. **Appendix A** presents a summary of the current ARAR.

5 SUPPORT AGENCY COMMENTS

The USEPA and TCEQ have reviewed this ESD and support the proposed changes.

6 STATUTORY DETERMINATIONS

The modification presented herein satisfies CERCLA §121. The GWTP is performing as intended and all ambient air health based standards and emission limits are met.

7 PUBLIC PARTICIPATION

In accordance with 40 CFR §300.435(c)(2)(i), the ESD will be placed into the Administrative Record and a notice briefly summarizing the ESD will be published in the *Marshall News Messenger*.

Authorizing Signature:

Thomas C Lederle Date: 24 Feb 2014

Thomas E. Lederle
Chief
BRAC Division, ACSIM
U.S. Army

Concurrence Signature:

I have reviewed this document, and any comments I had have been addressed and/or incorporated:

Pamela Phillips, Acting Date: 4/3/14

Carl Edlund, P.E.

Director
Superfund Division
U.S. Environmental Protection Agency
Region 6

8 REFERENCES

AECOM Technical Services, Inc. (AECOM), 2012, *Interim Air Monitoring Plan. Longhorn Ammunition Plant, Karnack, Texas*. *Karnack, Texas.* September.

U.S. Army Corps of Engineers (USACE), 1995, EPA/ROD/R06-95/092. *Record of Decision for Early Interim Remedial Action at Burning Ground No. 3, Longhorn Ammunition Plant, Karnack, Texas*. May.

U.S. Environmental Protection Agency (USEPA), 2013, E-mail, *Longhorn Interim ROD 18/24, An ESD or ROD Amendment?*. March 21.

APPENDIX A: APPLICABLE AIR MONITORING STANDARDS

Longhorn Army Ammunition Plant
Groundwater Treatment Plant
Applicable Air Standards 30 TAC 106

		Ambient Air Standards			Emission Standards						
Pollutant	CAS	Short Term ESL March 2012	AMCVs (ST Health)	AMCVs (ST Health)	Allowable Annual Emission (1)	TLV (L)	TLV Reference	Compliance section	Distance Downwind to nearest off-site Receptor (D)	(K) value	Allowable Maximum Hourly Emission Limit at Nearest off-site Receptor [2][3]
		µg/m^3	ppbv	µg/m^3	tpy	mg/m^3			ft		lb/hr
1,1-Dichloroethane	75-34-3	4000	1000	4047	5	405	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.0
1,1-Dichloroethene	75-35-4	210	180	714	5	20	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.4
1,2-Dichloroethane	107-06-2	160	40	162	5	40	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	2.9
Acetone	67-64-1	5900	NA	NA	5	590	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.0
Benzene	71-43-2	170	180	575	5	3	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	0.21
Carbon disulfide	75-15-0	30	NA	NA	5	31	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	2.2
Chloroform	67-66-3	100	20	98	5	10	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	0.71
cis-1,2-Dichloroethene	540-59-0	7900	NA	NA	5	793	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.0
Methylene chloride	75-09-2	3600	3500	12158	5	26	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.9
Tetrachloroethene	127-18-4	2000	1000	6782	5	33.5	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	2.4
trans-1,2-Dichloroethene	540-59-0	7900	NA	NA	5	793	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.0
Trichloroethene	79-01-6	540	100	537	5	135	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	6.0
Vinyl chloride	75-01-4	20000	26000	66460	5	2	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	0.14
n-Hexane	110-54-3	5300	1800	6336	5	1800	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.0
Styrene	100-42-5	110	5100	21725	5	21	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.5
Toluene	108-88-3	640	4000	15074	5	188	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	6.0
Ethylbenzene	100-41-4	740	20000	86844	5	434	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.0
m,p-Xylenes	179601-23-	180	1700	7382	5	434	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.0
o-Xylene	95-47-6	1600	1700	7382	5	434	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.0
1,3-Dichlorobenzene	541-73-1	720	NA	NA	5	(4)	--	30 TAC 106.533(f)(1)(A)(i)	2000	14	1.0
Propene (C3 H6)	115-07-1	Asphyxiant	Asphyxiant	Asphyxiant	5	(4)	--	30 TAC 106.533(f)(1)(A)(i)	2000	14	6.0
Dichlorodifluoromethane (CCl2F2)	75-71-8	50000	10000	49452	5	4950	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.0
Ethanol	64-17-5	18800	NA	NA	5	1880	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.0
Trichlorofluoromethane (CCl3F)	75-69-4	28000	10000	56184	5	5620	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.0
Trichlorotrifluoroethane (C2Cl3F3)	76-13-1	38000	NA	NA	5	7670	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2000	14	1.0
alpha-Pinene	80-56-8	60	628	3499	5	(4)	--	30 TAC 106.533(f)(1)(A)(i)	2000	14	1.0
d-Limonene	5989-27-5	1100	NA	NA	5	(4)	--	30 TAC 106.533(f)(1)(A)(i)	2000	14	1.0

(1) Per 30TAC 106.533(f)(1)(B)

(2) The maximum hourly limit allowed by 30 TAC 106.262, per pollutant, is 6 lbs/hr per "Figure 1: 30 TAC 106.262(a)". The E value was overridden with 6 lb/hr when the calculated E was higher.

(3) The maximum hourly emission rate allowed by 30 TAC 106.261(a)(3) for chemicals with an limit value (L) greater than 200 mg/m^3 is 1 lb/hr.

(4) No TLVs for these chemicals

May 13, 2014

Errata for *Final Explanation of Significant Differences Record Of Decision for Early Interim Remedial Action at Burning Ground No. 3, LHAAP, February 2014.*

This PDF's following page shows one corrected page from the *Final Explanation of Significant Differences Record Of Decision for Early Interim Remedial Action at Burning Ground No. 3, LHAAP, February 2014.* The page reflects the correction described below. The error has been corrected in the PDF version of the ESD available in the Administrative Record.

Page 1-1

Footnote 1 refers to the wrong CERCLA section. It should say: CERCLA 121(d).

1 INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE

Site and Location: LHAAP-18/24 is a fenced, cleared area consisting of 34.5 acres in the southeastern section of Longhorn Army Ammunition Plant (LHAAP). The Groundwater Treatment Plant (GWTP) is the facility where extracted groundwater from LHAAP-18/24 is treated. The GWTP is located immediately adjacent to and southeast of Longhorn site LHAAP-18/24 at the eastern end of Avenue Q.

Lead Agency and Supporting Agencies:

Lead Agency – United States Department of the Army (U.S. Army)
Supporting Agencies – U.S. Environmental Protection Agency (USEPA) Region 6 and Texas Commission on Environmental Quality (TCEQ) as a Federal Facilities Agreement Partner
Citation: This Explanation of Significant Difference (ESD) is in Compliance with Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) §117(c) and the National Contingency Plan §300(c)(2)(1)

Date of Interim Remedial Action Record of Decision (IRA ROD) (USACE, 1995) Signature: May 1995, Administrative Record, Bates Stamp range 012681-012751

1.1 Need for this ESD

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On May 24, 2012, the air scrubber system on the catalytic oxidizer malfunctioned due to an air blower breakdown, resulting in significant damage to the scrubber unit and the inability to operate the catalytic oxidizer. Because it was anticipated that there would be a considerable delay in acquiring and installing replacement equipment, the Army proposed an interim solution of bypassing the catalytic oxidizer until equipment replacement could take place. The Army provided the USEPA and TCEQ with air emission estimates that met the substantive

[1] Although other emission criteria may have been possible under CERCLA 121(d), the Standard Permit emission criteria were selected.

AECOM

Subject:	**Final Minutes, Quarterly Restoration Advisory Board (RAB) Meeting, Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**Karnack Community Center, Karnack, Texas**
Date of Meeting:	**February 20, 2014, 6:00 – 7:30 PM**

Meeting Participants:

LHAAP/BRAC:	Rose M. Zeiler
USACE:	Aaron Williams, Rick Smith
USAEC:	Robin Paul
AECOM:	Dave Wacker, Gretchen McDonnell
TCEQ:	April Palmie
USEPA Region 6:	Rich Mayer, Janetta Coats, Kent Becher (USGS liaison), Barry Forsythe (USFWS Liason)
USFWS:	Paul Bruckwicki
RAB:	**Present:** Paul Fortune, Terry Britt, Charles Dixon, Carol Fortune, Judith Johnson, Ted Kurz, Richard LeTourneau, Tom Walker, John Pollard, Jr., Nigel Shivers, Pickens Winters **Absent:** Ken Burkhalter, Robert Cargill, Lee Guice, James Lambright, Judy Vandeventer
Public:	Dawn Orsak, CLI-TAG Mary Britt, Carlos Black, Joe Black, Robert Keathley

An agenda handout for the RAB meeting was provided for the meeting. Additional hard copy meeting materials provided included the AECOM slide presentation, a surface water and perimeter well perchlorate data handout, and a GWTP summary handout showing pounds of chemicals removed and volume of water treated. Draft November 2014 RAB meeting minutes were provided to RAB members for review prior to the meeting.

Welcome – Rose Zeiler
Mr. Fortune opened the meeting and invited any first-time attendees to introduce themselves.

Mr. Joe Black introduced himself as a first-time meeting attendee, but lifelong Caddo Lake area resident. Mr. Black stated his son, also named Joe Black, is a candidate for Harrison County judge.

Open Items – Rose Zeiler

Minutes
Ms. McDonnell noted that one change was made to the version of the minutes that had been distributed for RAB review, which was to correct the name of the church where Mr. Pollard serves as deacon. Ms. Fortune made a motion to approve the November 2013 RAB meeting minutes. Motion seconded by Mr. Pollard.

Tour of Longhorn Sites Planned for May
By vote of the RAB members, the tour was scheduled for May 15th at 3PM. Participants should meet in front of the entrance for the USFWS building, just inside the gates of the refuge. The tour will likely take two hours. The tour is for RAB members, but members of the public may attend if their name and contact information is submitted in advance.

New Members
Mr. Kurz stated that he knew a potential candidate for the RAB. Mr. Fortune asked that AECOM provide an application.

Website
The Longhorn website is schedule for debut at the next RAB meeting. When the site becomes active, a notice will be sent to the RAB members and the interested parties list. The address will be http://www.longhornaap.com.

A map of the site will allow viewers to click on a site of interest, and be led directly to documents relating to that site. Groundwater plume map updates, fact sheets on remedial technologies in use, and administrative record documents are anticipated to be available on the website.

Installation Action Plan
Dr. Zeiler asked the group if any RAB member had not received their copy of the Installation Action Plan. No member indicated they had not received the document.

Open Questions
Ms. Coats, USEPA, asked if any local government officials had requested tours of Longhorn. Dr. Zeiler stated that local government officials are on the Longhorn interested parties list, so receive notifications of Longhorn RAB activities, but no requests have been received for several years. Dr. Zeiler stated that the interested parties list would be reviewed to ensure it is updated to include current local government officials. William Hatfield was identified as the current county commissioner for the Longhorn area and should be on the interested parties list.

Defense Environmental Restoration Program (DERP) Update – AECOM (Dave Wacker)

Fieldwork Completed and Upcoming Field Activities Planned
Mr. Wacker provided a brief overview of the CERCLA process phases, to facilitate discussion on the status of progress at several LHAAP sites where field work has recently been completed or is underway (LHAAP-46, LHAAP-67, LHAAP-18/24, LHAAP-35B(37), LHAAP-50,

LHAAP-35A(58), LHAAP-12 and LHAAP-16). Five sites (LHAAP-46, LHAAP-67, LHAAP-35B(37), LHAAP-50, LHAAP-35A(58)) are currently in the "remedy in place" phase of the process, undergoing monitored natural attenuation (MNA). See attached AECOM PowerPoint presentation for maps and tables associated with sites referenced below.

LHAAP-46 Plant 2 Area Update – Remedy In Place

Primary contaminant is trichloroethene (TCE) in groundwater with a maximum current concentration of 144 micrograms per liter (µg/L), and a clean-up level of 5 µg/L. The remedy for the site is MNA and land use controls, so additional wells were installed earlier this year and the initial monitoring round conducted.

Contamination at the site consists of shallow (to ~30' bgs) and intermediate (~30-60' bgs) groundwater zone plumes with a total of 21 wells now being monitored to observe the plumes. Mr. Wacker showed maps of the shallow and intermediate zone groundwater TCE plumes. Quarterly MNA monitoring is in progress. A Remedial Action Completion Report is being generated at this time.

Mr. Fortune asked how long a site will be monitored to determine whether MNA is a suitable remedy. Eight quarters of monitoring are prescribed before enough data is collected to perform an initial evaluation of MNA effectiveness. Mr. Wacker stated that the total estimated duration to complete remediation is stated in the ROD. Mr. Fortune asked when the quarterly monitoring started. Mr. Wacker stated that the remedy for LHAAP-46 has been in place for about a year, and the eight quarters of monitoring needed to judge MNA effectiveness started when the remedy was put in place. Mr. Fortune asked if there was additional data collected from prior to AECOM that could be used in determining whether MNA is working. Mr. Wacker stated that, although older data was used for nature and extent definition prior to implementation of the remedy, the eight quarters of monitoring needed to judge the effectiveness of MNA started when the remedy was implemented.

LHAAP-67 AST Farm – Remedy In Place

This site has TCE concentrations similar to the LHAAP-46 site, but confined to the shallow groundwater zone. MNA and land use controls for TCE in groundwater is the remedy. Additional wells were installed and the initial monitoring round conducted. The total plume size is relatively small, approximately 300 feet by 400 feet.

A Remedial Action Completion Report is being generated at this time, and the annual report will be prepared in August 2014.

LHAAP-18/24 Burning Ground 3 & Unlined Evaporation Pond – Interim Remedy In Place

As background, Mr. Wacker stated that LHAAP-18/24 was the primary waste management area for LHAAP and is the most highly contaminated site at Longhorn. Currently, the interim remedial action in place consists of collection of impacted groundwater from collection trenches (located along down-gradient sides of the site and in hot spots within the site), and routing of collected groundwater to the GWTP for removal of contaminants. Annual sampling of the interceptor collection trenches (ICTs), will be conducted in February.

A significant amount of additional investigation work has been completed at LHAAP-18/24 this year toward completing a revised feasibility study for the site, and additional work is being proposed to collect more information required to support the revised feasibility study. The

additional work relates to defining the extent of DNAPL source material in the former Unlined Evaporation Pond (UEP) area where liquid wastes were disposed on a daily basis during the site's operation.

Mr. Fortune asked for clarification on the UEP versus the INF Pond. Mr. Wacker explained that the UEP was a waste disposal area within the LHAAP-18/24 site. The INF Pond is in different location, not within the LHAAP-18/24 site, where treated water from the GWTP can be stored when water cannot be discharged to Harrison Bayou due to low water flow in the bayou.

LHAAP-35B(37) – Chemical Laboratory – Remedy In Place

This site is the former Chemical Laboratory with shallow groundwater impacted by tetrachloroethylene (PCE) and TCE plumes. LHAAP-35B(37) is also the site of the bioplug demonstration study being conducted by the US Army's Aberdeen Testing Center. The bioplug demonstration study is separate from the remediation specified in the ROD for the site.

If the bioplug approach does not reduce contaminants to acceptable levels during its performance period, the aquifer will be allowed to return to natural conditions and AECOM will begin the monitored natural attenuation remedy as approved in the ROD. AECOM has already installed the MNA monitoring well network specified in the ROD.

LHAAP-50 Former Sump Water Tank – Remedy In Place

LHAAP-50 was the site of a large above-ground water tank that received sump water from across the plant. Issues at the site are perchlorate in soil, and perchlorate and VOCs in groundwater.

Areas of perchlorate-impacted surface soil have been excavated and removed (approximately 183 cubic yards), and disposed at an off-site landfill. Mr. Wacker showed a map defining the excavation area.

To address groundwater, 19 new monitoring wells were installed to support implementation of the approved monitored natural attenuation remedy. An annual report will be prepared to provide an evaluation of the remedy.

LHAAP-58 Shops Area – Remedy In Place

Multiple plant activities that were conducted in this area and could have contributed to contamination at the site (paint shop, laundry, carpentry, etc.). VOCs have impacted groundwater at the site. There are two separate groundwater plumes; "eastern plume" and "western plume", each with their own remediation strategy.

In the center of the east plume, where concentrations are on the order of a few thousand micrograms per liter, In-Situ Bioremediation (ISB) is being completed to more aggressively treat those higher concentration impacts. Approximately 225 gallons of Wil-Clear Plus, a sodium lactate food source for microbes that will degrade VOCs, was injected at each of 12 injection points in the east plume. Injection of the food source was followed by injection of bioaugmentation solution after confirmation that the type of microbes required to degrade the contaminants were not present at the site. This site is subject to quarterly MNA monitoring.

Mr. Wacker reviewed some initial contaminant data from the eastern plume, showing a reduction of PCE and TCE in well 03WW01. However, well 35AWW09 showed an increase of PCE, which is likely due to movement of contaminated water resulting from injection of the food source and bioaugmentation solution. Mr. Wacker used these examples to illustrate why we perform eight quarters of sampling over two years to obtain a better view of the actual performance of the remedy after the immediate effects of fluid injection dissipate.

Mr. Fortune asked what the western plume contaminants were. Mr. Wacker stated that the contaminant is TCE. Mr. Fortune asked what activities were done to create the contamination. Mr. Wacker stated that there were multiple operations in this area that could have caused solvent impacts, including a paint shop.

LHAAP-12 and LHAAP-16 – Remedy In Place (Operation and Maintenance)
Continuing operation and maintenance activities have been performed at these landfill sites.

Annual sampling of wells associated with LHAAP-12 was recently completed. MNA is being reevaluated at LHAAP-12 and there is the possibility some minor additional work may be done (i.e., installation of a new well). The contaminant concentrations at LHAAP-12 are fairly low and Army is working to demonstrate that MNA is reducing contaminant concentrations at the site. This year, MNA effectiveness could not be effectively evaluated because the only contaminated well at the site was dry during the sampling event, and could not be sampled, leaving us without a new data point for the trend analysis.

As an interim measure to prevent impacts to Harrison Bayou, LHAAP-16 has extraction wells collecting water for treatment at the GWTP. The annual sampling of these extraction wells was done in February. An additional round of sampling more wells at LHAAP-16 was done a few months ago, and that data will likely be presented at the next RAB meeting. Mr. Wacker noted that decision on a final remedy for LHAAP-16 has been delayed due to the dispute between Army and USEPA.

CERCLA 5-Year Review Process for Multiple Sites
The 5-Year Review has been performed and the report document is being reviewed by the USEPA. The review included sites with either final or interim remedies in place, such as LHAAP-12 and LHAAP-16 landfill sites, LHAAP-18/24 associated with the GWTP, the Pistol Range and LHAAP-49 Acid Storage Area.

Mr. Wacker explained that a CERCLA 5-Year Review is required every five years for any site that has been closed but not restored to unrestricted use conditions. Sites at Longhorn that are restored to conditions suitable for future industrial use, but not suitable for residential use, require these reviews.

GWTP
The GWTP continues to operate to contain the groundwater plumes at LHAAP-18/24 and LHAAP-16. See attached handout showing treated groundwater volumes and mass of chemicals removed. Treated water is either discharged to Harrison Bayou or released back to the LHAAP-18/24 site.

Mr. Dixon asked if the chemicals removed from groundwater are destroyed or released to the air. Mr. Wacker stated that perchlorate is destroyed by bacterial treatment. Metals are precipitated from the water, resulting in a small amount of sludge that is periodically disposed of at a landfill. VOCs are stripped from the water and discharged to the air, with air discharges being monitored in several locations to ensure Texas air standards are not exceeded. Mr. Wacker pointed out that air samples have been collected from multiple locations for over a year without any Texas air standard being exceeded. Dr. Zeiler stated that the GWTP will be on the Longhorn RAB tour route in May, where the RAB will be provided with a briefing on how the plant works.

Perimeter Well and Surface Water Sampling

Perchlorate sampling is conducted quarterly for groundwater at several locations along the perimeter of the former facility footprint in accordance with the 1999 dispute resolution. Historically, Army voluntarily sampled these wells for a wide variety of chemicals that were used at the plant. Surface water is also sampled for perchlorate at five locations. The latest quarterly data is from the September 2013 sampling event indicated no detections of perchlorate at any of the surface water sampling locations (see attached handout), and no real changes in observations from the monitoring wells.

Upcoming Work, Meetings and Documents

Remedial Action Operation quarterly sampling will continue at LHAAP-46, LHAAP-50, LHAAP-58 and LHAAP-67. Semi-annual compliance sampling will be conducted at LHAAP-18/24 in May. Finalization of the CERCLA 5-Year Review report will be signed this year. Generation of remedial action completion reports for LHAAP-37, LHAAP-46, LHAAP-50, LHAAP-58 and LHAAP-67 is ongoing.

LHAAP-18/24 and LHAAP-29 will have some additional field work completed to install a few wells, and perform some soil sampling associated with the feasibility studies for both the sites. Work on remaining sites will be delayed until resolution of the dispute between Army and USEPA.

Mr. LeTourneau asked who is responsible for abandonment of monitoring wells once they are no longer needed. Dr. Zeiler stated that most wells are maintained for long periods of time, beyond the contract duration of any one consultant, so the Army is responsible for abandonment of wells.

Other Environmental Restoration Issues – Rose Zeiler

Dispute Resolution

Mr. Wacker showed a list of sites where work is being delayed due to the dispute between Army and USEPA over clean-up levels and land use controls. Mr. Mayer explained that USEPA has a dispute process that is followed when they disagree with what another federal agency wants to do with respect to conducting clean-up of sites. Mr. Mayer stated that the Longhorn dispute is being worked at the highest levels in both Army and USEPA, where it is in the hands of the Deputy Assistant Secretary of the Army and the USEPA Administrator.

Mr. Mayer stated that a meeting between Army and USEPA had been planned for next week, but it has now been tentatively rescheduled for April.

Mr. Fortune asked if the dispute will be settled at this meeting. Mr. Mayer stated that the Deputy Assistant Secretary of the Army will present their side of the dispute to the USEPA Administrator during this meeting, and the USEPA Administrator will likely make a decision after that meeting. Dr. Zeiler stated that the Army has an appeal process to follow if the Army does not agree with the USEPA Administrator's decision.

Mr. Britt asked what we are doing to make sure conditions are not degrading while the dispute goes on. Dr. Zeiler stated that we are doing monitoring.

Dr. Zeiler asked AECOM to prepare a slide bulleting the dispute issues for the next RAB meeting.

DNAPL Presentation

Dr. Zeiler provided a basic introduction to Dense Non-Aqueous Phase Liquids, or DNAPLs. DNAPLS are heavier than water, opposed to light non-aqueous phase liquids (LNAPLs) like gasoline or oil which will float on water. Due to their density, DNAPLs will travel down through the subsurface until they hit an aquitard (a layer that impedes its progress, like a clay). The layered sands and clays at Longhorn provide discontinuous "shelves" of limited extent that can be overflowed with DNAPL. (See attached AECOM Powerpoint presentation slides 8 through 10 for an illustration of how DNAPL moves in the subsurface.)

There are areas where DNAPL "pools" in places, but there is also "residual" left behind in cracks and fractures where DNAPL once was in greater quantities. Our biggest challenge is to find it. Whatever treatment is used, it will be to treat that DNAPL where it is. DNAPL is extremely difficult to clean-up. In 2003, well-known contaminant hydrogeologist John Cherry said that a DNAPL residual site had never been remediated to true drinking water standards. Many DNAPL sites have instead been remediated to "alternative clean-up levels" developed and agreed to by regulatory agencies because the technology did not exist to achieve clean-up to drinking water standards. In summary, Ms. Zeiler stated that the best approach is to find the DNAPL and get rid of it, because it is a long-term endeavor to clean-up residual DNAPL left in an aquifer.

For LHAAP-18/24 and LHAAP-29, we will be working to collect additional data to more closely define the volumes of DNAPL we need to treat so we can identify which technology has the best chance of success. Mr. Mayer stated that even dissolved-phase chlorinated solvents are very difficult to remediate because they partition into soil materials and then release into groundwater later. Mr. Mayer further stated that over 100 sites nationwide have been approved for an alternative clean-up level because they have tried various technologies and demonstrated that remediation to the USEPA maximum contaminant level (MCL) is "impracticable".

Mr. LeTourneau asked what depth the contamination is at. Mr. Wacker stated that LHAAP-29 has contaminants at 90 feet below ground surface. The perimeter of the contamination has

been defined horizontally, and we have identified clean groundwater underneath the contamination at 90 feet, but we need to tighten the perimeter to know better how much true volume we are dealing with. Mr. LeTourneau asked how we know contamination will not move from where it is now at 90 feet down to 150 feet or other depths. Dr. Zeiler remarked that is was a primary question, but not one that anyone here could answer, but we do believe the contamination moved quickly to where it is now, in a matter of days or months rather than years. We know where the bottom of the contamination is now, but it could change. An aquitard could stop the travel of the contaminant, but if the aquifer is fractured or discontinuous, it could allow contamination to move deeper.

Mr. Kurz asked whether the work at Longhorn would end up being judged as having diminishing returns at some point, resulting in the government ending funding of remediation work there. Dr. Zeiler responded that Army must continue to fund remediation work at Longhorn until remediation is complete. For funding, Army generates a liability projection every year for their sites as part of the budgeting process, and it projects costs for the next 30 years. Until Army can demonstrate that a clean-up goal will be met, costs will be projected for 30 years out every year.

Dr. Zeiler went on to explain that when a remedial technology reaches a point of "diminishing returns", you typically to switch to a different method to reach the end goal. Or, using LHAAP-29 as an example, when you find the assumptions made when the remedy was decided were not valid, another option needs to be explored. For LHAAP-29, an additional technology will be evaluated and treatability testing done to ensure options being evaluated are viable. The last resort is to arrive at agreement on an alternative clean-up standard, as has been done at many sites with residual DNAPL impacts similar to LHAAP-18/24, where clean-up to the usual standards is beyond our existing technology.

Mr. Fortune stated that when Longhorn first became an National Priorities List site, the initial estimates given for time and funding to remediate Longhorn were 6-7 years and $50M dollars to clean-up. Mr. Mayer stated that the estimates done at that time were done before migration of contaminants was well understood, and what has been learned since then that has shown those estimates to be invalid.

Look Ahead at the Schedule
Next RAB meeting is tentatively scheduled for May 15th from 6PM – 7:30PM at the Karnack Community Center.

A motion to adjourn was made by Ms. Fortune and seconded by Mr.Britt.

Adjourn

February Meeting Attachments and Handouts:

- *Meeting Agenda*
- *Minutes from November 2013 RAB meeting*
- *AECOM Powerpoint Presentation*
- *GWTP Treated Groundwater Volumes Handout*
- *Surface Water Sampling Results Handout*

Acronyms

AECOM	AECOM Technical Services, Inc.
bgs	below ground surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive, Environmental Response, Compensation, and Liability Act
CLI	Caddo Lake Institute
DERP	Defense Environment Response Program
DNAPL	Dense Non-Aqueous Phase Liquid
GWTP	Groundwater Treatment Plant
ICT	interceptor-collector trench
INF	Intermediate-Range Nuclear Forces
ISB	In-Situ Bioremediation
LHAAP	Longhorn Army Ammunition Plant
LNAPL	Light Non-Aqueous Phase Liquid
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
PCE	tetrachloroethylene
RAB	Restoration Advisory Board
ROD	Record of Decision
TAG	Technical Assistance Grant
TCE	trichloroethene
TCEQ	Texas Commission on Environmental Quality
TSDH	Texas State Department of Health
UEP	Unlined Evaporation Pond
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Center
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
µg/L	micrograms per liter
VOC	volatile organic compound

LONGHORN ARMY AMMUNITION PLANT
RESTORATION ADVISORY BOARD
Karnack, Texas
(479) 635-0110

AGENDA

DATE:	Thursday, February 20, 2014
TIME:	6:00 – 7:30 PM
PLACE:	Karnack Community Center, Karnack, Texas

06:00 Welcome and Introduction

06:05 Open items {RMZ}
- RAB Administrative Issues
- Minutes
- Tour of Longhorn Sites Planned for May
- Website
- Installation Action Plan

06:15 Defense Environmental Restoration Program (DERP) Update {AECOM}
- Fieldwork completed and upcoming field activities planned
- Groundwater Treatment Plant (GWTP) Update
- Environmental Update for Active Sites (progress since last meeting)

06:50 Other Environmental Restoration Issues {RMZ}
- Sitewide LUC Management Plan Update
- Bioplug Demonstration at LHAAP-37
- Dispute Status Update
- Schedule

07:00 Presentations:
- Dense Non-Aqueous Phase Liquids (DNAPLs)

07:30 Adjourn {RMZ}

AECOM

Subject:	**Final Minutes, Quarterly Restoration Advisory Board (RAB) Meeting, Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**Karnack Community Center, Karnack, Texas**
Date of Meeting:	**November 14, 2013, 6:00 – 7:30 PM**

Meeting Participants:

LHAAP/BRAC:	Rose M. Zeiler
USACE:	Aaron Williams, Rick Smith
USAEC:	Marilyn Plitnik, Robin Paul, Cathy Kropp
AECOM:`	Dave Wacker, Gretchen McDonnell
TCEQ:	April Palmie
USEPA Region 6:	Rich Mayer, Janetta Coats, Kent Becher (USGS)
USFWS:	Paul Bruckwicki, Jason Roesner
RAB:	**Present:** Paul Fortune, Carol Fortune, Richard LeTourneau, Tom Walker, Judith Johnson, James Lambright **Absent:** Judy Vandeventer, Ken Burkhalter, Ted Kurz, Charles Dixon, Pickens Winters, Robert Cargill, Lee Guice, Nigel Shivers
RAB Candidates	Terry Britt, John Pollard, Jr.
Public:	Rick Lowerre, CLI-TAG Bridget LaBorde and Robert Whittaker, TMD Technologies Group Tina Walker, Tom Ellerbee, Carrie Bradford, and David Rivera, Texas State Department of Health

An agenda handout for the RAB meeting was provided for the meeting. Additional hard copy meeting materials provided included the AECOM slide presentation, Draft July RAB meeting minutes, a surface water and perimeter well perchlorate data handout, and a GWTP summary handout showing pounds of chemical s removed and volume of water treated.

Welcome – Rose Zeiler
Ms. Zeiler welcomed attendees to the meeting. Special guests were introduced by Ms. Zeiler:

- TMD Technologies Group (Ms. LaBorde and Mr. Whitaker) will be presenting an update on the demonstration study being conducted at LHAAP-37.
- Texas State Department of Health (TSDH) representatives (Mr. Rivera, Mr. Ellerbe, Ms. Walker and Dr. Bradford). Mr. Ellerbe stated that TSDH brought a handout to the meeting containing information relating to Longhorn, and that if anyone has any questions related to public health, they should contact TSDH.
- Ms. Cathy Kropp from US Army Environmental Center was introduced and will be providing an overview of the Longhorn RAB charter and the process of appointing new members.
- Mr. Rick Lowerre of Caddo Lake Institute (CLI) was introduced.
- Mr. Rick Smith of the U.S. Army Corps of Engineers (USACE) was introduced as replacing Mr. John Lambert as the USACE Project Manager for Longhorn.
- Mr. Terry Britt, a RAB membership candidate, was also introduced.

Open Items – Rose Zeiler

Minutes
Ms. Fortune made a motion to approve the July 2013 RAB meeting minutes. Motion seconded by Ms. Johnson.

New Members
Ms. Kropp provided a summary of the RAB member selection process and the RAB charter. Community RAB members must agree to attend regularly and on a voluntary basis (no compensation). A two-thirds vote of sitting RAB members in attendance is required to approve a new RAB member, and membership is effective starting with the next meeting, assuming approval of the Army BRAC Director.

Mr. Terry Britt was introduced as an applicant for RAB membership. Mr. Britt stated he is a resident of Uncertain, and has already been attending RAB meetings. Mr. Britt is interested in restoration of the refuge as a community member and hunter. Mr. Britt is also the President of the Caddo Lake WSC, with public water supply wells near the boundary of the former LHAAP footprint.

Mr. John Pollard, Jr. (arriving after the meeting was called to order) was introduced upon arrival as an applicant. Mr. Pollard stated that he is 79 years old and married, with children and grandchildren. Mr. Pollard served in the United States Army from 1954 – 1957 and is a deacon at Ebenezer Baptist Church in Marshall. Mr. Pollard stated that he feels it is important to be educated on what is going on in the community, and was interested in RAB membership when he saw the newspaper solicitation. Mr. Pollard is on the city planning and zoning commission, and has been on other boards in the past.

The voting members of the RAB in attendance were provided with paper ballots, and voted unanimously to accept both Mr. Britt and Mr. Pollard as new members. Mr. Britt and Mr. Pollard will be officially seated after approval by Mr. Tom Lederle, Army BRAC Director.

Tour
A RAB tour of Longhorn environmental sites will be scheduled for May on the day of the RAB meeting.

LHAAP-37 Bioplug Demonstration Project Update

Ms. Bridget LaBorde and Mr. Robert Whitaker of TMD Technologies Group provided a presentation explaining the Bioplug demonstration project being conducted at LHAAP-35B(37) by Aberdeen Test Center. RAB member questions regarding the technology were answered. See attached LHAAP-37 Bioplug Demonstration Study Presentation. RAB members were given the opportunity to ask questions about the technology.

Ms. Zeiler prefaced the presentation by saying that, prior to implementation of the approved monitored natural attenuation (MNA) remediation remedy for LHAAP-37, Aberdeen Test Center requested permission to conduct a demonstration study using the "bioplug" remediation technology at the site. Army is holding off on full implementation of the approved MNA remedy while the demonstration study is conducted to see what this technology can do to address the groundwater impacts.

Ms. LaBorde stated that the June 2013 data (after 8 months of operation) was not showing a trend for remediation, attributed to slower-than-anticipated groundwater flow across the site. Groundwater elevations have dropped at the site due to relatively dry conditions over the past several years, and groundwater flow rates have decreased along with that. However, September 2013 data (after 11 months of system operation) showed trends in some wells for degradation of volatile organic compounds (VOCs). The system is planned to operate for a total of 24 months.

Defense Environmental Restoration Program (DERP) Update – AECOM (Dave Wacker)

Fieldwork Completed and Upcoming Field Activities Planned
Mr. Wacker provided an update and summary of several sites where field work has recently been completed or is underway (LHAAP-46, LHAAP-67, LHAAP-18/24, LHAAP-35B(37), LHAAP-50, LHAAP-35A(58), LHAAP-03, LHAAP-12 and LHAAP-16). See attached AECOM PowerPoint presentation for maps and tables referenced below. Mr. Wacker also noted a display of photographs depicting recent field work conducted.

<u>LHAAP-46 Plant 2 Area Update – Remedy In Place</u>

Primary contaminant is trichloroethene (TCE) in groundwater at levels less than 100 micrograms per liter (μg/L), with a clean-up level of 5 μg/L. The remedy for the site is MNA and land use controls, so additional wells were installed earlier this year and the initial monitoring round conducted.

Contamination at the site consists of shallow (to ~30' bgs) and intermediate (~30-60' bgs) groundwater zone plumes with a total of 21 wells now being monitored to observe the plumes. Mr. Wacker showed maps of the shallow and intermediate zone groundwater TCE plumes,

comparing how the plumes were mapped before and after the addition of data from 7 new monitoring wells installed this Spring.

Mr. Wacker noted that during the most recent sampling event several of the wells monitoring the east side of the shallow groundwater zone plume were dry due to drought conditions. If water returns to those wells, the shape of the plume could change if the water is impacted. The analytical results from the first round of sampling were similar to historical results.

The intermediate groundwater zone plume was previously mapped as one continuous area of impact. However, analytical results from the first round of sampling showed no impacts at 46WW09, resulting in the plume being redrawn as two separate but smaller areas of contamination. Delineation of the north edge of the northern plume area has not been accomplished, so another well will be installed in that area to obtain a clean data point that defines the extent of the plume when future field work is completed in the next several months.

LHAAP-67 AST Farm – Remedy In Place

This site has TCE concentrations similar to the LHAAP-46 site, but confined to the shallow groundwater zone. MNA and land use controls for TCE in groundwater is the remedy. Additional wells were installed and the initial monitoring round conducted.

New wells and direct push sampling identified groundwater impacts farther to the west than had been previously mapped, so the next plume configuration map the RAB will see will show the plume extending farther west. The total plume size is still relatively small, approximately 300 feet by 400 feet.

LHAAP-18/24 Burning Ground 3 & Unlined Evaporation Pond – Interim Remedy In Place

A significant amount of additional investigation work has been completed at LHAAP-18/24 this year and a draft data report has been generated and submitted to TCEQ and EPA for review and comment. Ultimately, a revised feasibility study will be completed for the site.

As background, Ms. Zeiler stated that LHAAP-18/24 is the most highly contaminated at Longhorn. Mr. Wacker added that, because of the high level of contamination, compliance monitoring is performed at this site semi-annually, with ~60 wells being sampled during each event and the next event is planned for December.

LHAAP-35B(37) – Chemical Laboratory – Remedy In Place

This site is the former Chemical Laboratory with shallow groundwater impacted by tetrachloroethylene (PCE) and TCE plumes. LHAAP-35B(37) is the subject of the bioplug demonstration study briefed earlier in the meeting by TMD Technologies Group.

If the bioplug approach does not reduce contaminants to acceptable levels, the aquifer will be allowed to return to natural conditions and AECOM will begin the approved remedy using monitored natural attenuation. New wells have recently been installed, so the approved monitored natural attenuation remedy is ready for implementation if the bioplug activity is not successful.

LHAAP-50 Former Sump Water Tank – Remedy In Place

LHAAP-50 was the site of a large above-ground water tank that received sump water from across the plant. Issues at the site are perchlorate in soil, and perchlorate and VOCs in groundwater.

Two areas of perchlorate-impacted soil were recently excavated and removed (approximately 183 cubic yards), and disposed at an off-site landfill. Mr. Wacker showed several photographs of the excavation work that had been performed, including photos demonstrating the depth of the excavation and silt fencing installed between the excavation site and the nearby Goose Prairie Creek.

Confirmation samples were taken to establish that all perchlorate-impacted soils exceeding the clean-up goals had been removed, and the area was backfilled with clean soil. The confirmation sampling layout showing samples collected from the floor and sidewalls of the excavation was presented and explained.

To address groundwater 19 new monitoring wells were installed to support implementation of the approved monitored natural attenuation remedy.

LHAAP-58 Shops Area – Remedy In Place

Multiple plant activities were completed in this area and could have contributed to contamination at the site. VOC impacts to groundwater is the issue at the site. There are two groundwater plumes; "eastern plume" and "western plume", each with their own remediation strategy.

In the heart of the east plume, where concentrations are on the order of a few thousand micrograms per liter, In-Situ Bioremediation (ISB) is being completed to more aggressively treat those higher concentration impacts. Approximately 225 gallons of Wil-Clear Plus, a sodium lactate nutrient for microbes that will degrade VOCs, was injected at each of 12 injection points in the east plume over a month ago. Nutrient was injected at depths of between 23 and 33 feet bgs. Mr. Wacker presented and explained photographs of the injection event activities. The type of microbes required to degrade the contaminants were not present at the site as confirmed by a treatability study completed several months ago by the Army, so bioaugmentation was performed this week to add the required microbes. Approximately one gallon of augmentation solution was injected at each of the locations. The next sampling event will be in January and will collect data to monitor progress of the ISB activities.

Fifteen new groundwater monitoring wells were installed this summer at LHAAP-58 to allow implementation of the monitored natural attenuation remedy for both the eastern and western plumes.

LHAAP-03 – Record of Decision In Progress

LHAAP-03 is a small area within LHAAP-35A(58) associated with the former paint shop. The remedy consists of excavating an approximate 20-feet by 25-feet area (~50 cubic yards) of shallow soil that is impacted with arsenic and lead, for landfill disposal. This will result in two or three truckloads of soil being transported. Any groundwater issues associated with LHAAP-03 will be dealt with as part of LHAAP-35A(58) which fully-encompasses LHAAP-03. Army has received TCEQ's comments on the Record of Decision, and is awaiting EPA's comments.

LHAAP-12 and LHAAP-16 – Remedy In Place (Operation and Maintenance)
Continuing operation and maintenance activities have been performed at these landfill sites. Repainting and relabeling of wells has been a recent focus to improve visibility.

CERCLA 5-Year Review Process for Multiple Sites
The 5-Year review has been performed and the report document is being reviewed by the agencies. The review includes LHAAP-12 and LHAAP-16 which are landfill sites with remedies in place, LHAAP-18/24 associated with the GWTP, the Pistol Range and LHAAP-49 Acid Storage Area.

GWTP
The GWTP continues to operate to contain the groundwater plumes at LHAAP-18/24 and LHAAP-16. See attached AECOM PowerPoint Presentation for more detail where a groundwater extraction data chart and contaminant mass was presented. There has been no flow in Harrison Bayou lately to facilitate discharge of treated water, so treated water has been applied to the ground surface of LHAAP-18/24 through the sprinkler system. The next semi-annual compliance monitoring event for LHAAP-18/24 will be conducted at the end of the month. Preventive maintenance and repairs continue. Quarterly extraction rates are on par with what has been extracted historically.

Perimeter Well Sampling
Perchlorate sampling is conducted for groundwater at several locations along the perimeter of the former facility footprint. A table showing perchlorate results for perimeter wells was presented and included in the hard copy slide packet available at the meeting. Mr. Wacker noted that five of the six designated perimeter wells were dry during the June 2013 event. These wells show a history of being dry depending upon site weather conditions.

Surface Water Sampling
Mr. Wacker explained a handout showing results of surface water sampling for perchlorate in Goose Prairie Creek and Harrison Bayou. The chart indicates very little perchlorate detected in surface water for the past few years.

Upcoming Work, Meetings and Documents
Remedial Action Operations will continue at LHAAP-46, LHAAP-50, LHAAP-58 and LHAAP-67. Semi-annual compliance sampling will be conducted at LHAAP-18/24. Finalization of the CERCLA 5-Year Review report and generation of draft Remedial Action Completion reports for LHAAP-37, LHAAP-46, LHAAP-50, LHAAP-58 and LHAAP-67 is ongoing.

Other Environmental Restoration Issues – Rose Zeiler

Dispute Resolution
Resolution of the ongoing dispute between USEPA and Army regarding clean-up goals continues. While no specific information is available on details of dispute resolution, Ms. Zeiler explained the impacts of the dispute on the remediation work.

LHAAP-16, LHAAP-17, LHAAP-001-R-01, and LHAAP-003-R-01 were on the original list of disputed RODs and progress on those sites stopped in September 2011 when the dispute was initiated. Progress on LHAAP-29 was halted shortly after the dispute was initiated, when it reached the draft final ROD stage. Draft final RODs have been generated for LHAAP-04 and LHAAP-47, but final RODs could not be achieved due to the dispute.

Ms. Zeiler stated that she would bring any new information relating to resolution of the dispute to the RAB as soon as she receives it. She advised the RAB that there are dispute issues on the table that could cause Army to have to go back and do more work on these sites (even those sites that have already been "closed").

Mr Fortune asked if USEPA was telling Army that the sites haven't been cleaned up correctly. Mr. Mayer stated that there is a disagreement on cleanup level that should be used for certain contaminants. Another part of the issue relates to what land use controls must consist of to protect residents if contamination is left at the site.

Ms. Palmie added that there are promulgated federal clean-up standards for most contaminants, but there is not a federal clean-up standard for perchlorate. Where a federal standard does not exist, state standards are usually used when available. The Texas perchlorate clean-up goals have been historically used at Longhorn, but USEPA now feels that a lower "health advisory level" should be used instead, so the crux of the dispute is whether we continue to use the Texas clean-up goal or start to use a lower concentration goal as USEPA wants to do.

Ms. Zeiler stated that Army can only agree to clean-up standards that have actually been made into legal standards by either state or Federal law, and the health advisory level USEPA wants to use is not a legal standard. Further, when the Federal Facility Agreement was signed, USEPA, TCEQ and Army agreed that the Army was grandfathered into the original Texas Risk Reduction Rules and would conduct all remediation work at LHAAP in accordance with those standards. Therefore, all the sampling and investigation that has been done at LHAAP has been done using those clean-up levels.

Mr. Fortune asked who in USEPA made this decision to dispute Longhorn's contaminant clean up goals. Mr. Mayer stated that USEPA now has a policy that all Superfund sites where groundwater could be used for residential use would be cleaned up to residential standards. Mr. Mayer is hopeful a decision will be made within the next three or four months.

Community Involvement Plan / Community Relations Plan
Comments from the RAB Technical Assistance Grant (TAG) holder, CLI, were reviewed and discussed by Ms. Zeiler.

- CLI's comment regarding placing all Administrative Record documents on a searchable website open to the general public (in addition to the Marshall Public Library repository) is being addressed. Although Army is not required to provide internet accessibility to the data to the general public, they have been working toward a website for some time. USAEC has agreed to fund the current contractor (AECOM) to develop a website. The site should be available about 6-8 weeks from when AECOM is authorized to proceed with development of the website.

- CLI suggested that criteria for determining whether the Community Relations Plan has met its objectives should be developed. Army believes that the best and most direct method for making this determining is through feedback through periodic questionnaires. Questionnaires allow open communication where suggestions for changes or improvements can be made directly.
- CLI suggested that the public be provided the opportunity to make formal comments on a variety of technical documents throughout the CERCLA remedy selection process, and specifically during the Remedial Design phase. Ms. Zeiler states that Army follows CERCLA regulation with respect to public comment, through the Proposed Plan public review process. While the Proposed Plan document itself does not provide all technical remedy selection details, it refers the reader to the documents used in the decision-making process leading to the Proposed Plan. Comments, including technical comments, received from the public during the Proposed Plan public comment period are addressed prior to the ROD. For example, Mr. Wacker cited two rounds of groundwater thallium sampling conducted at twenty wells as part of the remedial action at LHAAP-46, which was included in response to public comments on the ROD for LHAAP-46. Ms. Zeiler also stated that the RAB would be updated throughout the Remedial Design phase for upcoming sites and was welcome to provide comments in or after meeting updates.
- Population density information in the Community Relations Plan was questioned by CLI. Ms. Zeiler stated that the information in the plan was taken from the latest census data at the time it was being written.

Ms. Zeiler asked for any additional questions on these responses. Receiving no additional comments from either the RAB or Mr. Lowerre, CLI, Ms. Zeiler stated the Community Relations Plan would be finalized after the RAB meeting.

Look Ahead at the Schedule
Next RAB meeting is tentatively scheduled for February 20th from 6PM – 7:30PM at the Karnack Community Center.

A motion to adjourn was made by Mr. Fortune and seconded by Mr. Lambright.

Adjourn

November Meeting Attachments and Handouts:

- *Meeting Agenda*
- *Minutes from July 2013 RAB meeting*
- *AECOM Powerpoint Presentation*
- *GWTP Treated Groundwater Volumes Handout*
- *Surface Water Sampling Results Handout*
- *LHAAP-37 Bioplug Demonstration Study Presentation*

Acronymns

AECOM	AECOM Technical Services, Inc.
AST	above-ground storage tank
BRAC	Base Realignment and Closure
CERCLA	Comprehensive, Environmental Response, Compensation, and Liability Act
CLI	Caddo Lake Institute
DERP	Defense Environment Response Program
GWTP	Groundwater Treatment Plant
ISB	In-Situ Bioremediation
LHAAP	Longhorn Army Ammunition Plant
MNA	Monitored Natural Attenuation
PCE	tetrachloroethylene
RAB	Restoration Advisory Board
ROD	Record of Decision
TAG	Technical Assistance Grant
TCE	trichloroethene
TCEQ	Texas Commission on Environmental Quality
TSDH	Texas State Department of Health
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Center
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
µg/L	micrograms per liter
VOC	volatile organic compound
WSC	Water Supply Corporation

Longhorn Army Ammunition Plant Restoration Advisory Board Meeting February 20, 2014

AECOM Environment

Agenda

06:00 Welcome and Introduction

06:05 Open items {RMZ}
- RAB Administrative Issues
- Minutes
- Tour of Longhorn Sites Planned for May
- Website
- Installation Action Plan

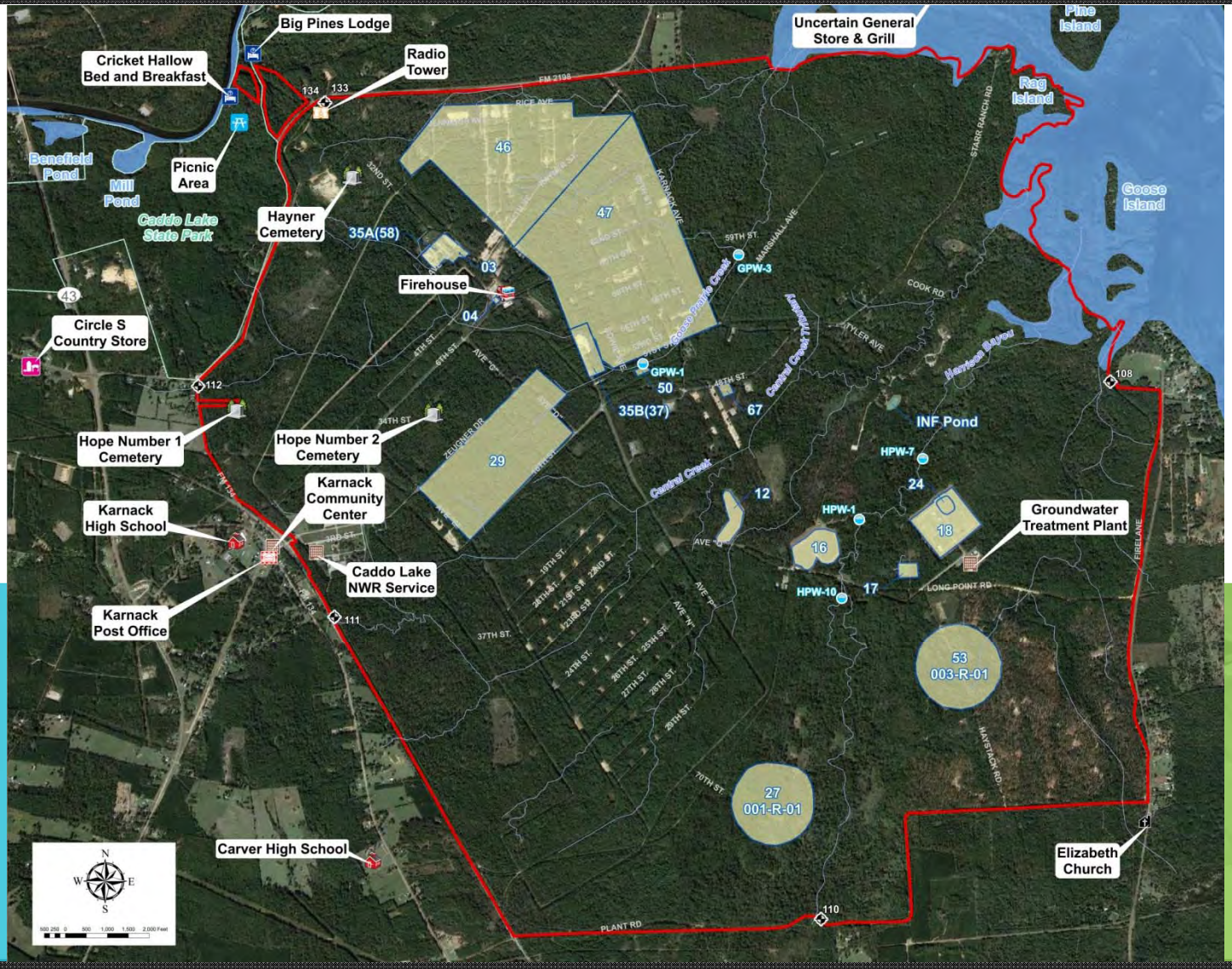
06:15 Defense Environmental Restoration Program (DERP) Update {AECOM}
- Fieldwork completed and upcoming field activities planned
- Groundwater Treatment Plant (GWTP) Update
- Environmental Update for Active Sites (progress since last meeting)

06:50 Other Environmental Restoration Issues {RMZ}
- Sitewide LUC Management Plan Update
- Bioplug Demonstration at LHAAP-37
- Dispute Status Update
- Schedule

07:00 Presentations:
- Dense Non-Aqueous Phase Liquids (DNAPLs)

07:30 Adjourn {RMZ}

Longhorn Map



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Longhorn Active Site List

LHAAP-03	Building 722 Paint Shop
LHAAP-04	Pilot Wastewater Treatment Plant
LHAAP-12	Landfill 12
LHAAP-16	Landfill 16
LHAAP-17	Burning Ground No.2/Flashing Area
LHAAP-18	Burning Ground No.3
LHAAP-24	Unlined Evaporation Pond
LHAAP-29	Former TNT Production Area
LHAAP-37	Chemical Laboratory Waste Pad
LHAAP-46	Plant Area 2
LHAAP-47	Plant Area 3
LHAAP-50	Former Sump Water Tank
LHAAP-58	Maintenance Complex
LHAAP-67	Aboveground Storage Tank Farm
LHAAP-001-R-01	South Test Area/Bomb Test Area
LHAAP-003-R-01	Ground Signal Test Area

RAB Administrative Issues

- Minutes
- Installation Action Plan
- RAB Tour - Planned to coincide with May RAB – Discuss Schedule and Planned Destinations
- Planned Destinations:
  - Groundwater Treatment Plant (LHAAP-18/24)
  - Landfills 12 and 16
  - LHAAP-29
  - LHAAP-03
  - LHAAP-50
  - LHAAP-37
  - LHAAP-58
- Any Other Specific Areas of Interest?

LHAAP Restoration Website

http://www.longhornaap.com

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LHAAP Restoration Website (cont)

- Created to present the project to the Public and allow for easy access to information and communication between the Army and the Public.
- Contains an overview of LHAAP, individual sites, contamination plume maps, documents, RAB meeting minutes, and Administrative Record.
- Lets you keep up with current LHAAP events and upcoming RAB meetings.

Dense Non-Aqueous Phase Liquid (DNAPL)

- Dense Non-Aqueous Phase Liquids are present at LHAAP-29 and LHAAP-18/24
  - Typically chlorinated hydrocarbons, such as trichloroethylene (TCE) and Methylene Chloride (MC)
  - Compounds with densities greater than water or specific gravity greater than 1
  - These compounds ‘sink’ until they reach an confined unit (aquitard) then spread via preferential pathways along the aquitard (which may be opposite of groundwater flow direction)
- Present in two locations in shallow groundwater at LHAAP-18/24 and one location at LHAAP-29, all three of these locations are proposed for further work to delineate the extent of DNAPL this spring

DNAPL (cont)

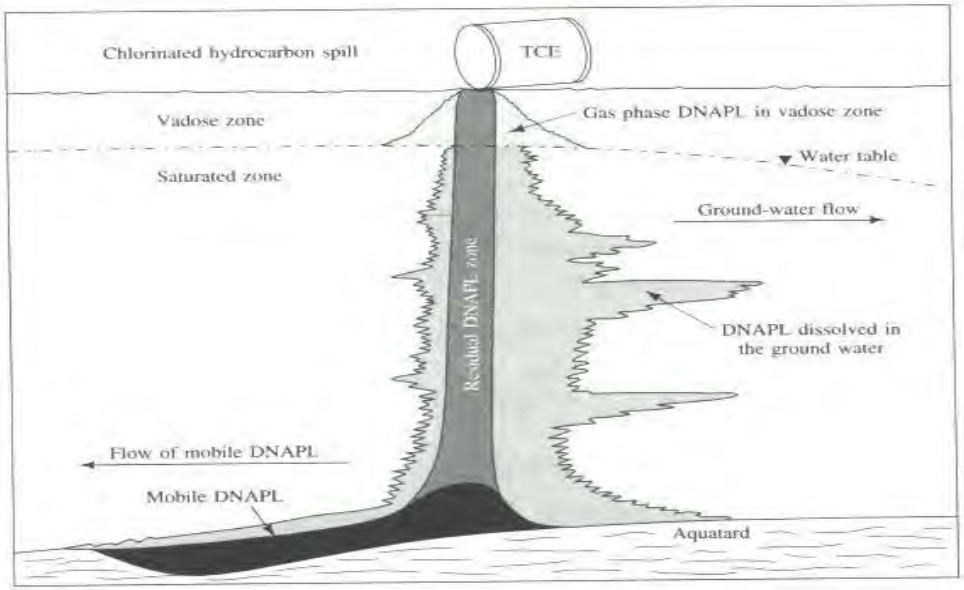

FIGURE 5.28 Distribution of a dense nonaqueous phase liquid in the vadose and saturated zone.

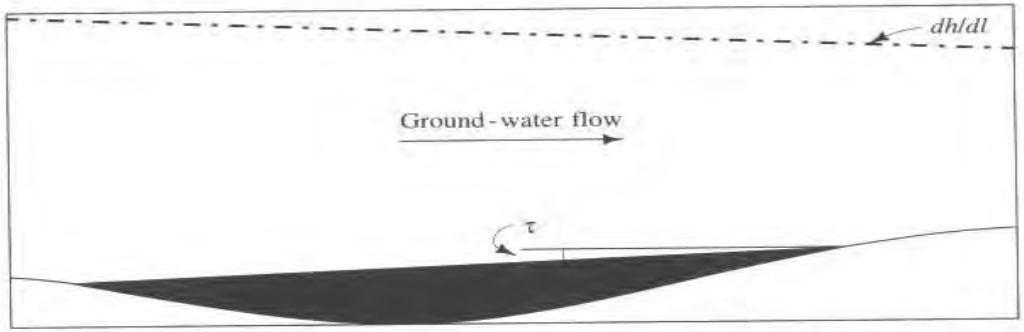

FIGURE 5.29 Sloping interface between a static layer of DNAPL and flowing ground water.

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DNAPL (cont)

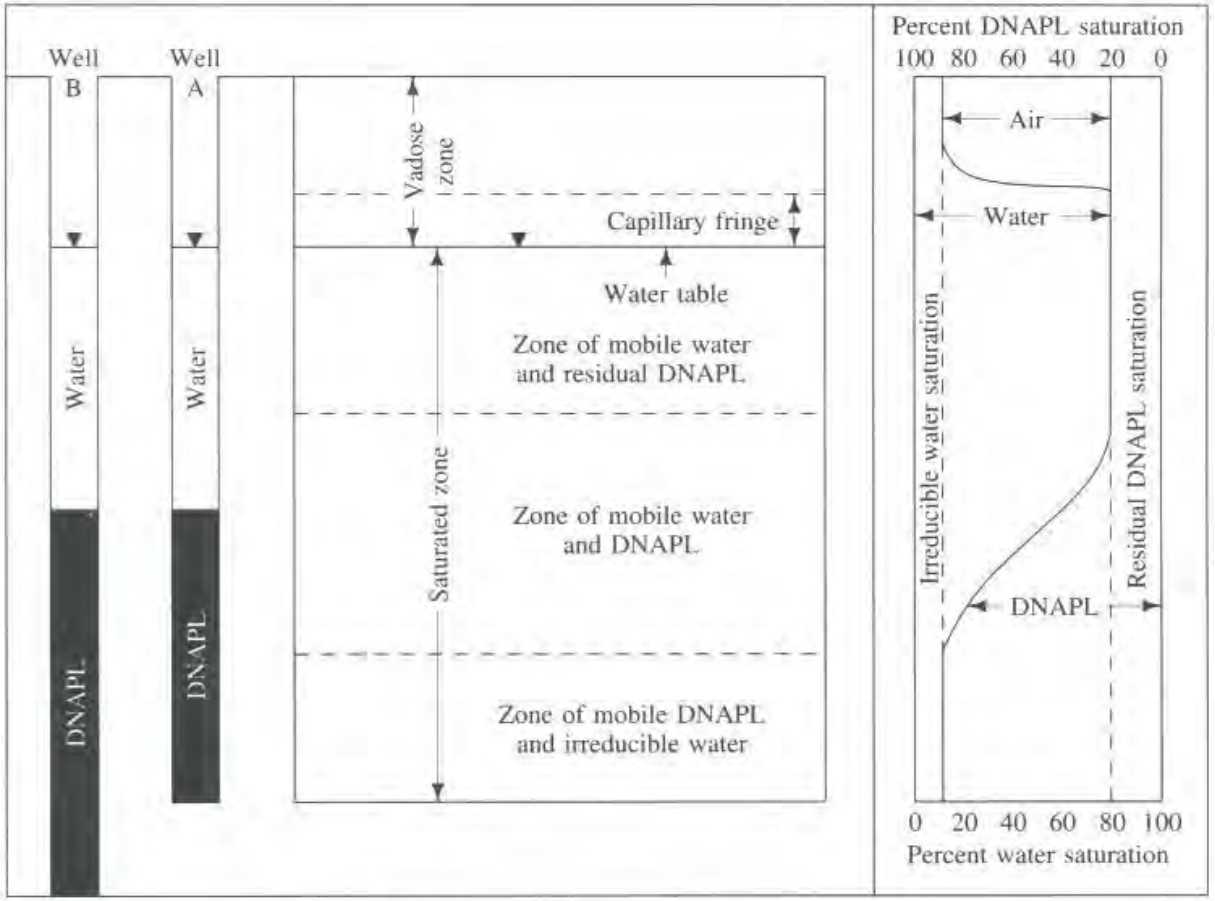
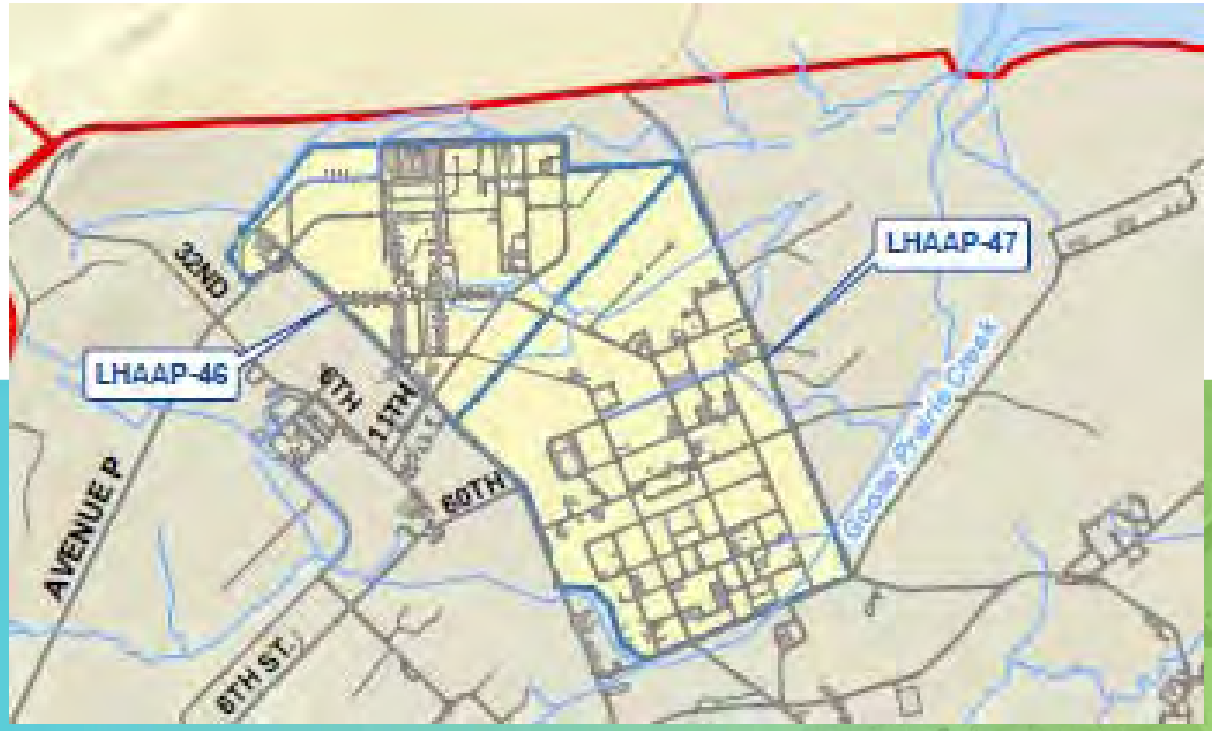


FIGURE 5.26 Zones of a DNAPL and the relationship of mobile DNAPL and nonmobile DNAPL to the DNAPL saturation; relationship of mobile DNAPL thickness to thickness of DNAPL is measured in a monitoring well.

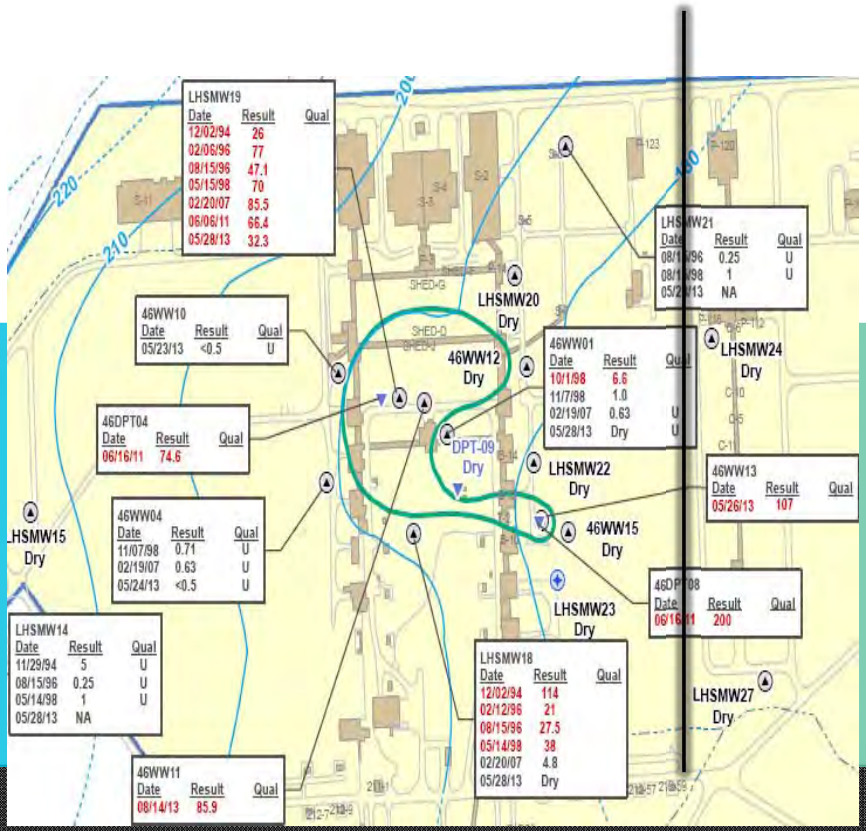
Status of Environmental Sites

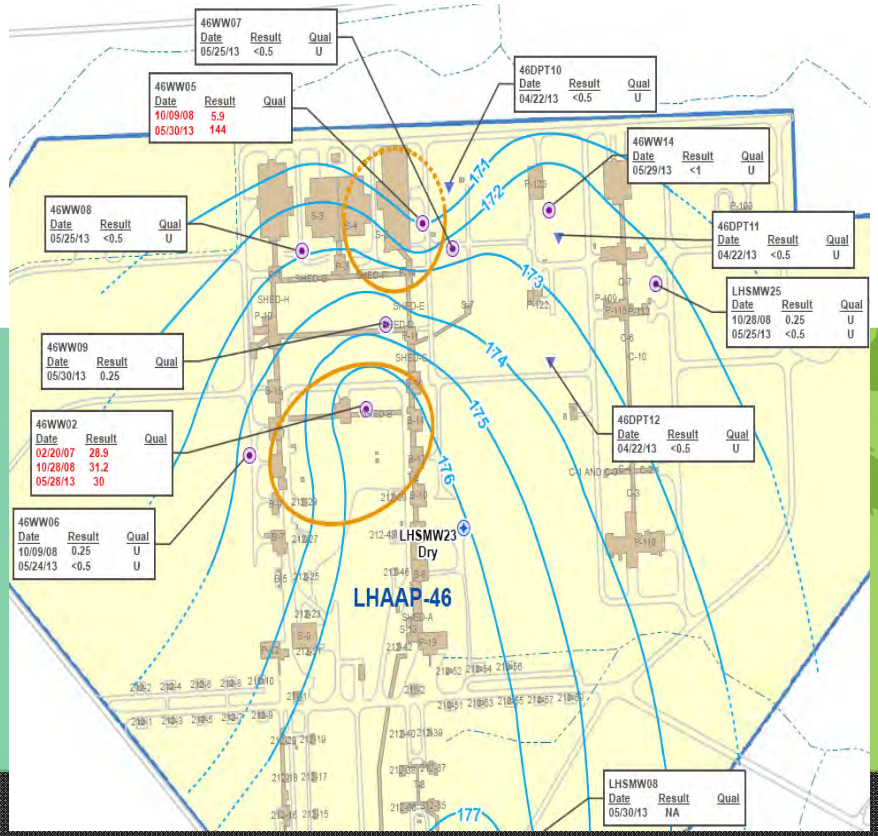
– LHAAP-46 – Plant Area 2
  - Final Remedy: Monitored Natural Attenuation (MNA) and Land Use Controls (LUCs)
  - Contaminants of Concern: Volatile Organic Compounds (VOCs, primarily TCE)



Status of Environmental Sites (cont)

- LHAAP-46 – Plant Area 2
  - TCE plumes below. Completion Report in Progress.
  - Three rounds of quarterly sampling for TCE completed, an annual report will be available in ~August documenting the first 4 quarters of sampling
  - Shallow on left, intermediate on right





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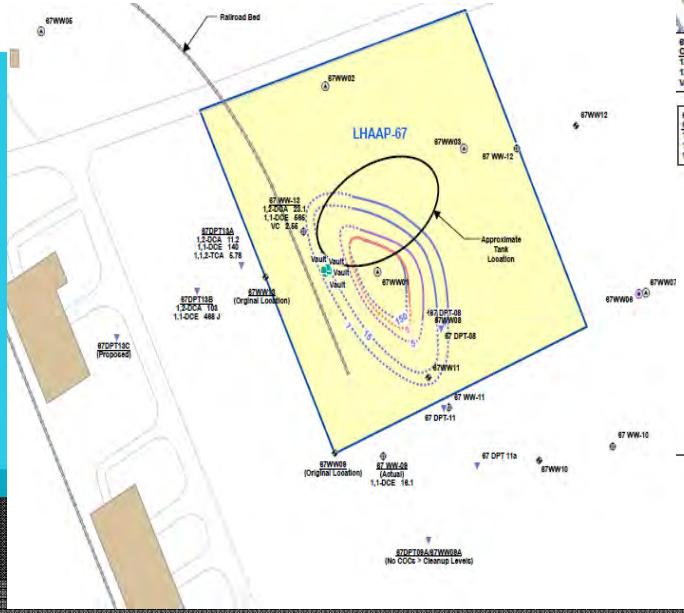
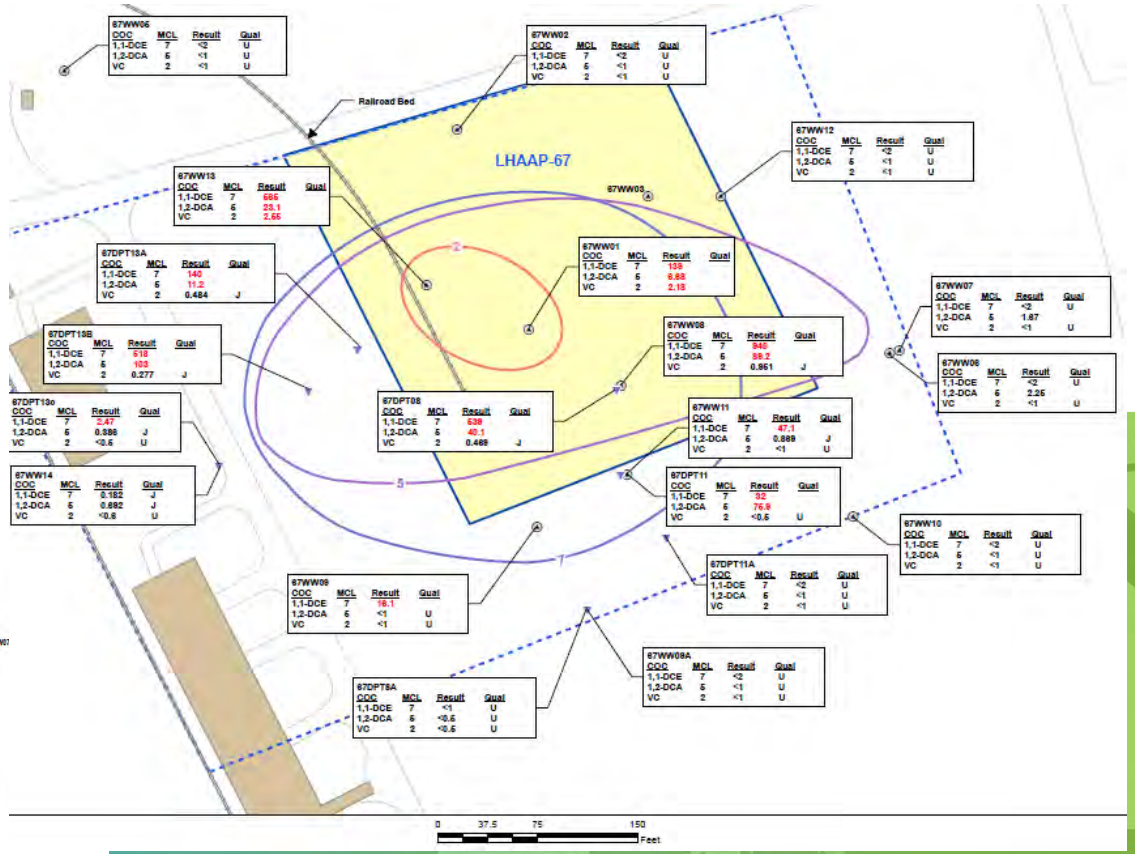
Status of Environmental Sites (cont)

– LHAAP-67 – Aboveground Storage Tank Farm
  - Final remedy: MNA, LUC
  - Contaminants of Concern: VOCs, Contaminants are confined to the upper shallow groundwater zone
  - Three rounds of quarterly sampling for TCE completed, an annual report will be available in ~August documenting the first 4 quarters of sampling

Status of Environmental Sites (cont)

- LHAAP-67 – Aboveground Storage Tank Farm
  - Changes in plume understanding with new data, former boundary map on left, current on right :



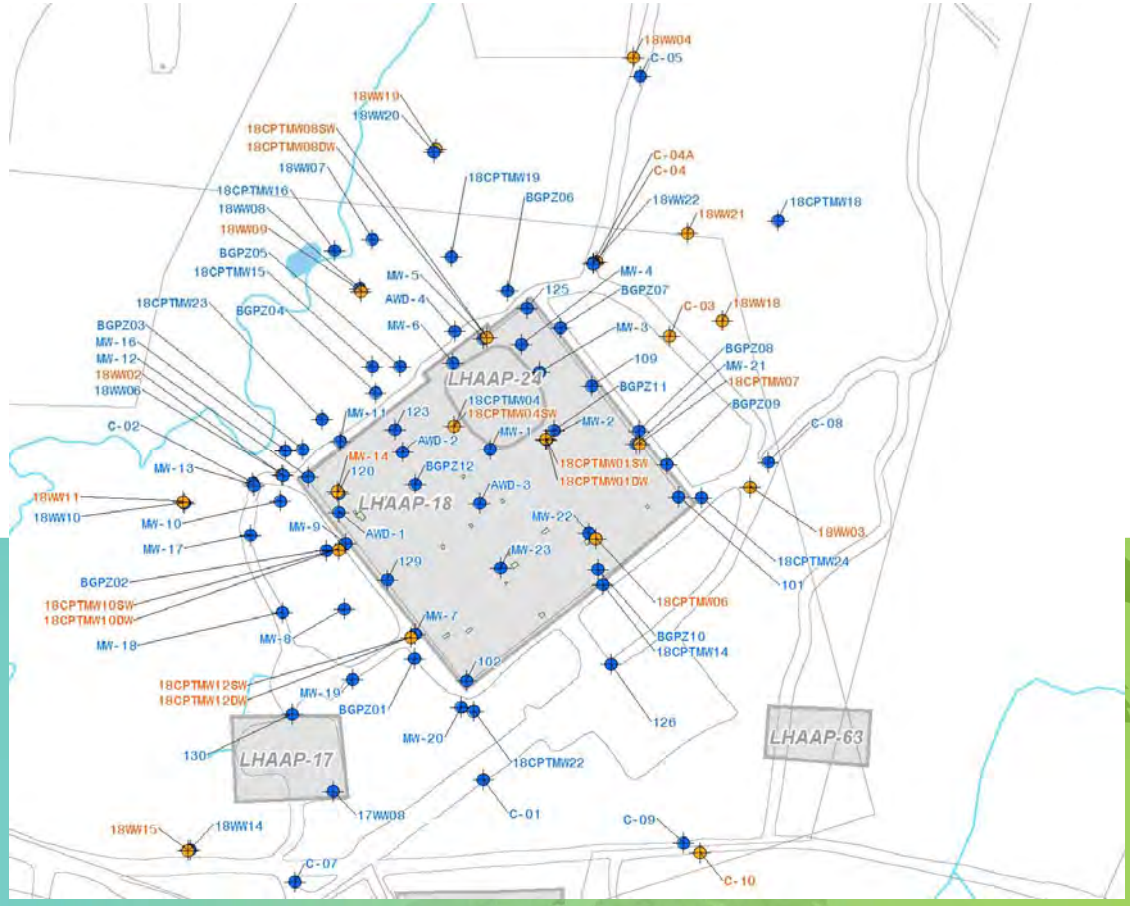


Status of Environmental Sites (cont)

- LHAAP-18/24 – Burning Grounds #3 and Unlined Evaporation Pond
  - Interim remedy: Continuous extraction and treatment of groundwater from collection trenches surrounding and within the site (green in image below)
  - Contaminants of concern: Perchlorate, VOCs (TCE, MC), Metals

Status of Environmental Sites (cont)

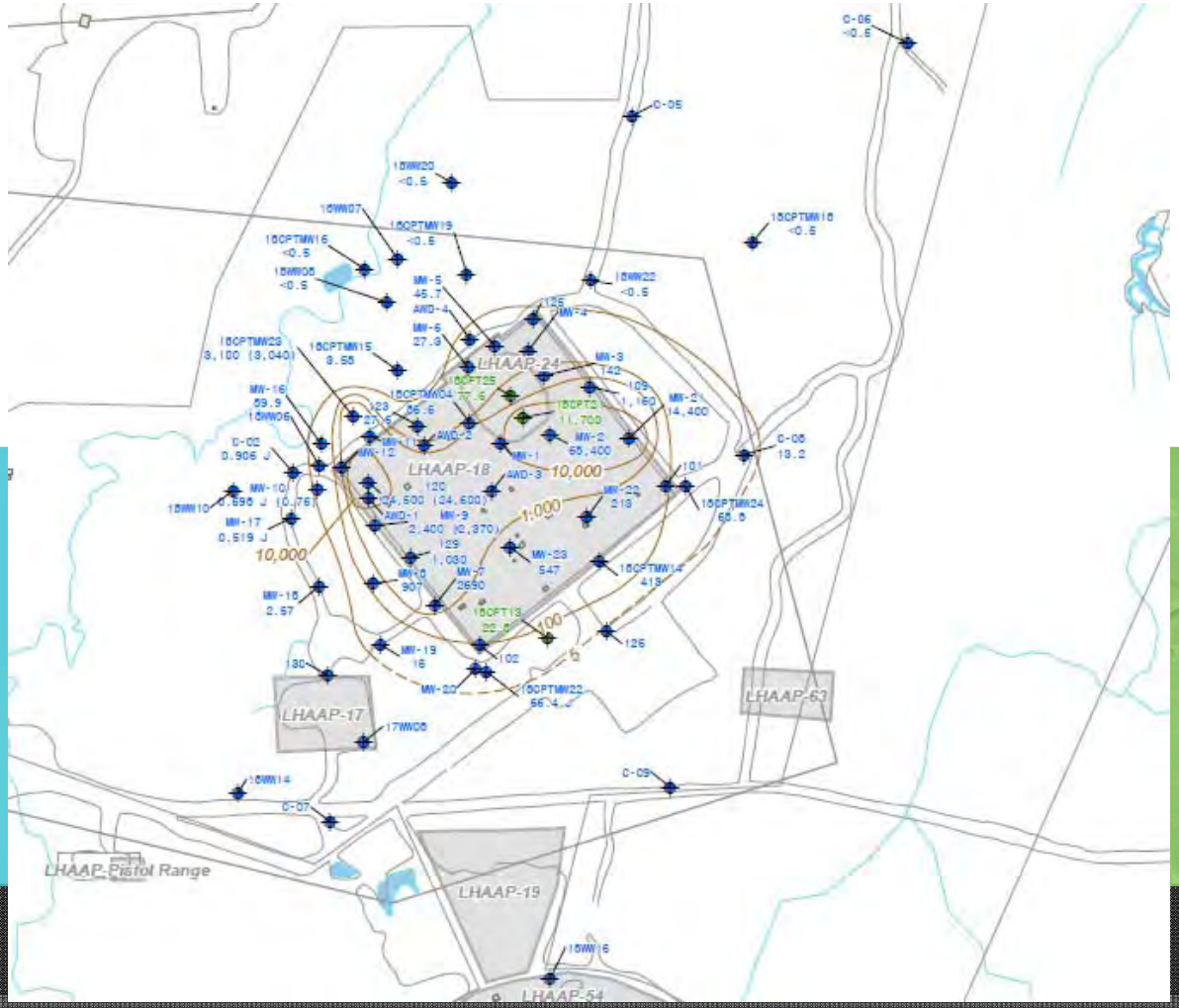
– LHAAP-18/24
  - Revised Feasibility Study in-progress
  - Addenda to Current Work Plan under review to collect additional data based upon DNAPL and additional source material found from field activities completed six months ago.



AECOM

Status of Environmental Sites (cont)

– LHAAP-18/24
  - DNAPL and Additional Source Material Locations



AECOM

Status of Environmental Sites (cont)

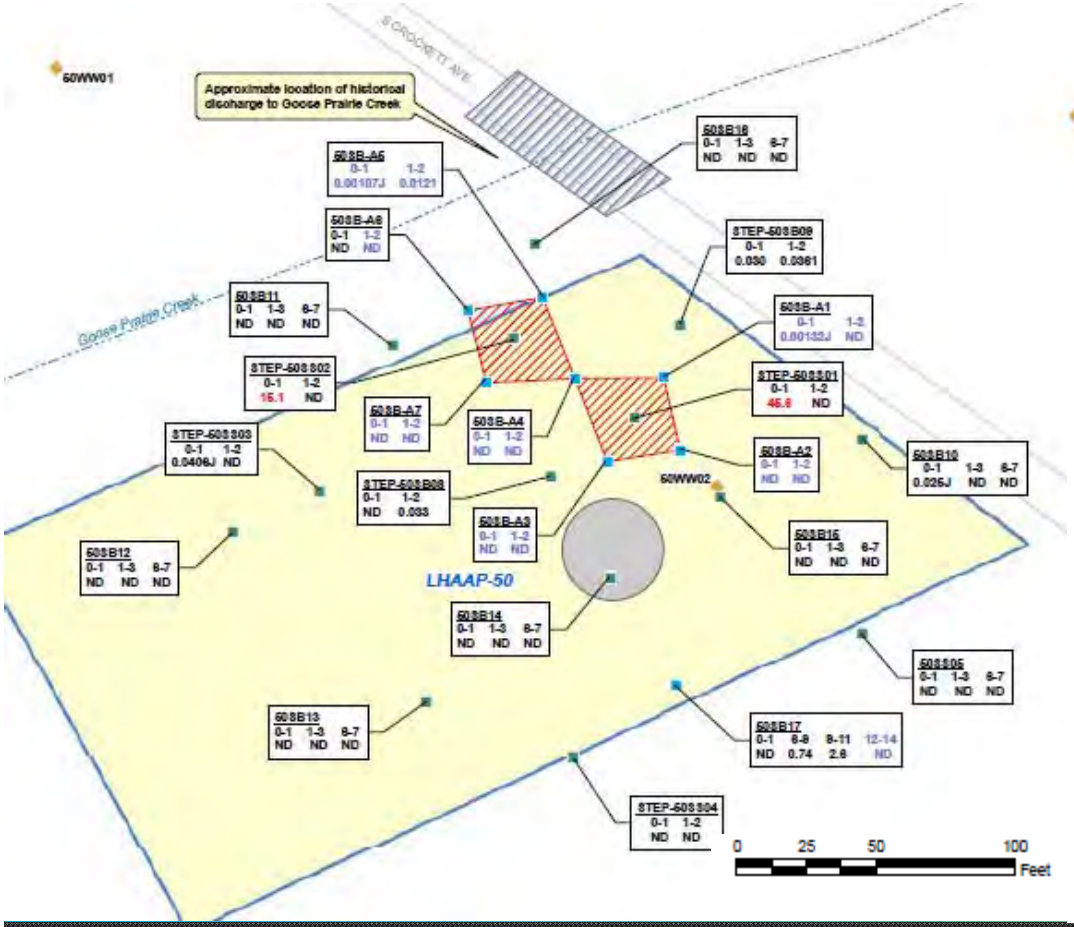
- LHAAP-35B (37) – Chemical Laboratory
  - Final remedy: Monitored Natural Attenuation and Land Use Controls
  - Contaminants of concern: VOCs (PCE and TCE)
    - Only present in the shallow groundwater zone
  - Bio-plug Study On-going Completion Report in progress

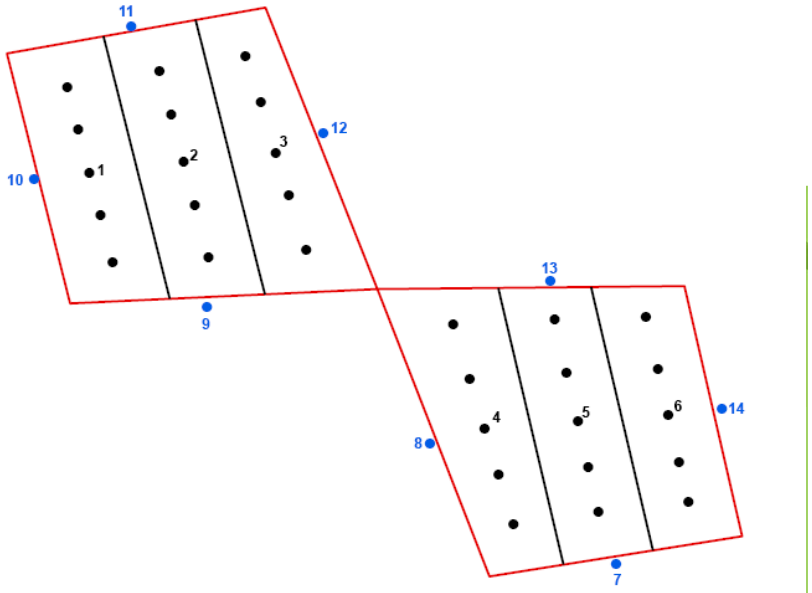
Status of Environmental Sites (cont)

– LHAAP-50 – Former Sump Water Tank
  - Final remedy: Soil excavation, Monitored Natural Attenuation and Land Use Controls for groundwater
  - Contaminants of concern: Perchlorate in soil, and Perchlorate and VOCs in groundwater

Status of Environmental Sites (cont)

– LHAAP-50 – See Photo Board for Excavation Photographs
  - Completion Report in Progress, quarterly sampling underway two rounds completed.



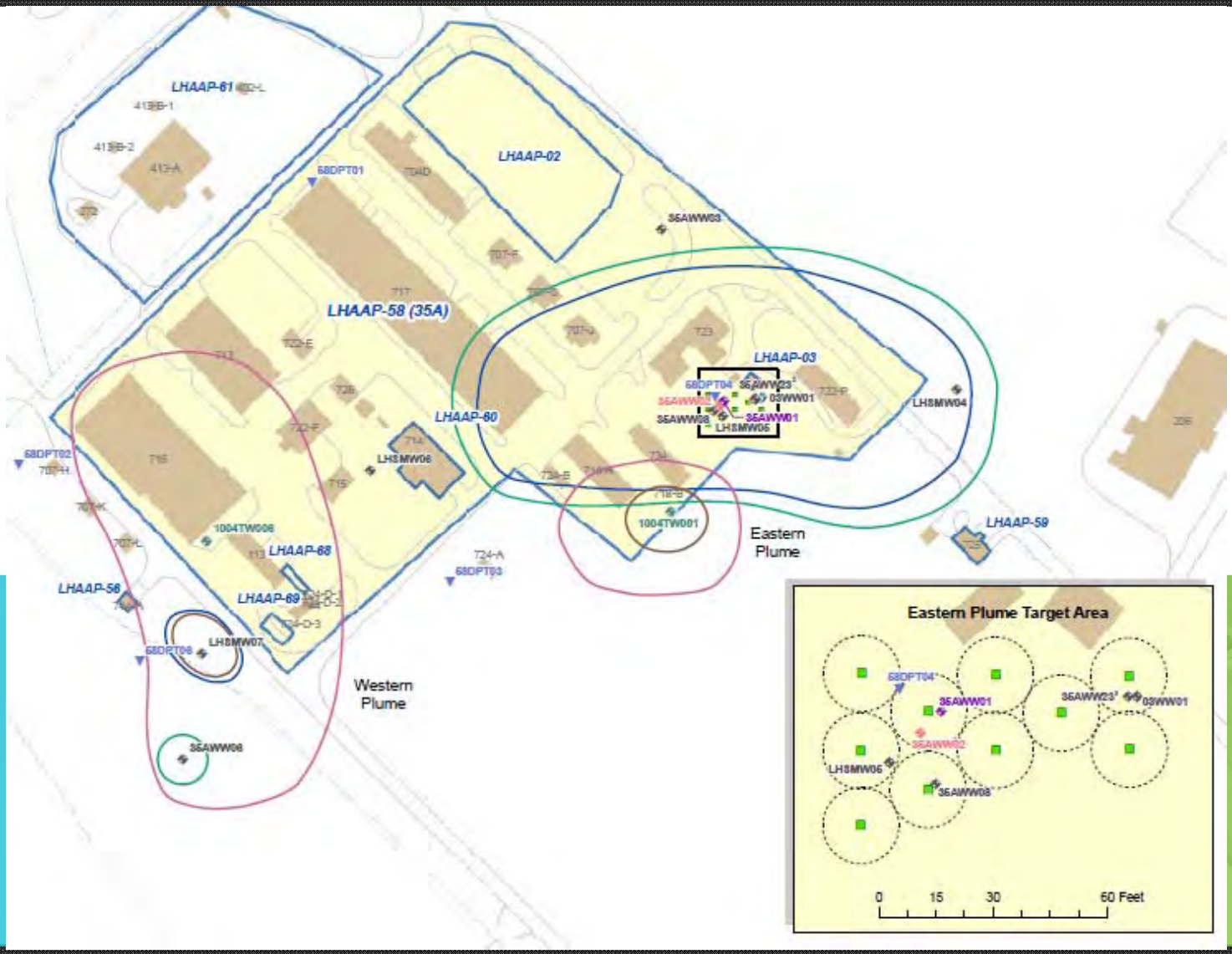


Status of Environmental Sites (cont)

- LHAAP-58 – Shops Area
  - Final remedy:
    - Eastern Plume: In-situ Bioremediation, MNA, LUCs
    - Western Plume: MNA, LUCs
  - Contaminants of concern: VOCs

AECOM

Status of Environmental Sites (cont)



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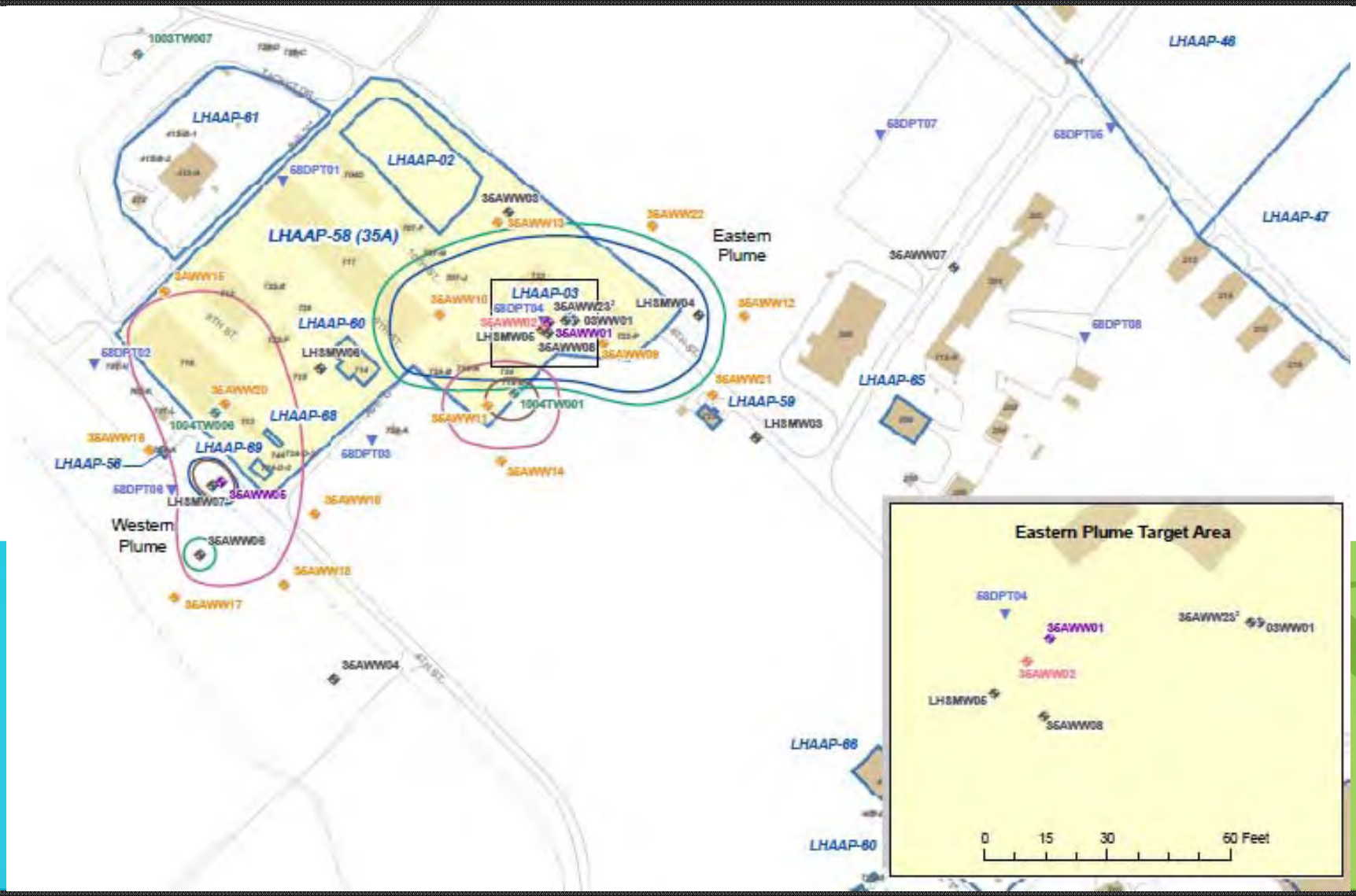
Status of Environmental Sites (cont)

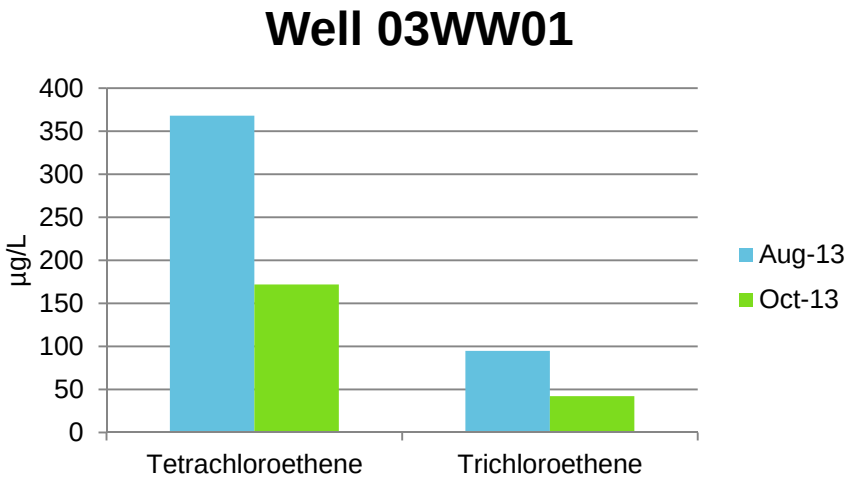


AECOM

Status of Environmental Sites (cont)

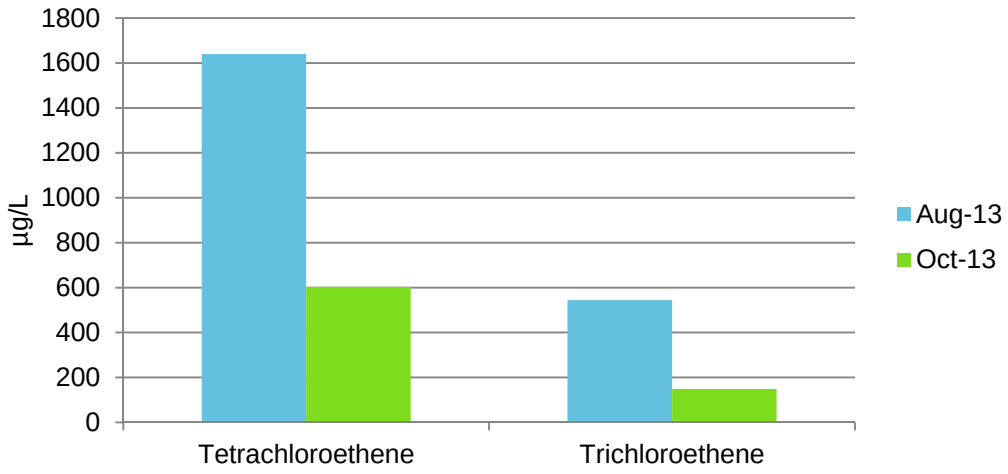
1. Comparison of Baseline to First Round Sampling Data After ISB at LHAAP-58

Monitoring Well	Tetrachloroethene (micrograms per liter)	Trichloroethene (micrograms per liter)
Well 03WW01		
Aug-13	368	94.8
Oct-13	172 J	42.1 J
Well 35AWW08		
Aug-13	1640	544
Oct-13	603 J	149 J
Well 35AWW09		
Aug-13	21.9	11.9
Oct-13	57.6 J	8.97 J
Well 35AWW10		
Aug-13	<0.5 U	<0.5 U
Oct-13	<0.5 U	<0.5 U

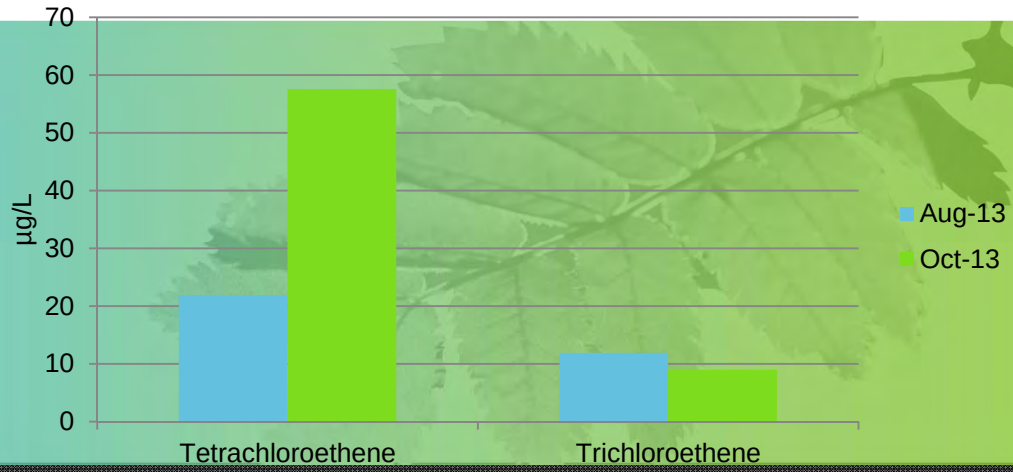


Status of Environmental Sites (cont)

Well 35AWW08



Well 35AWW09



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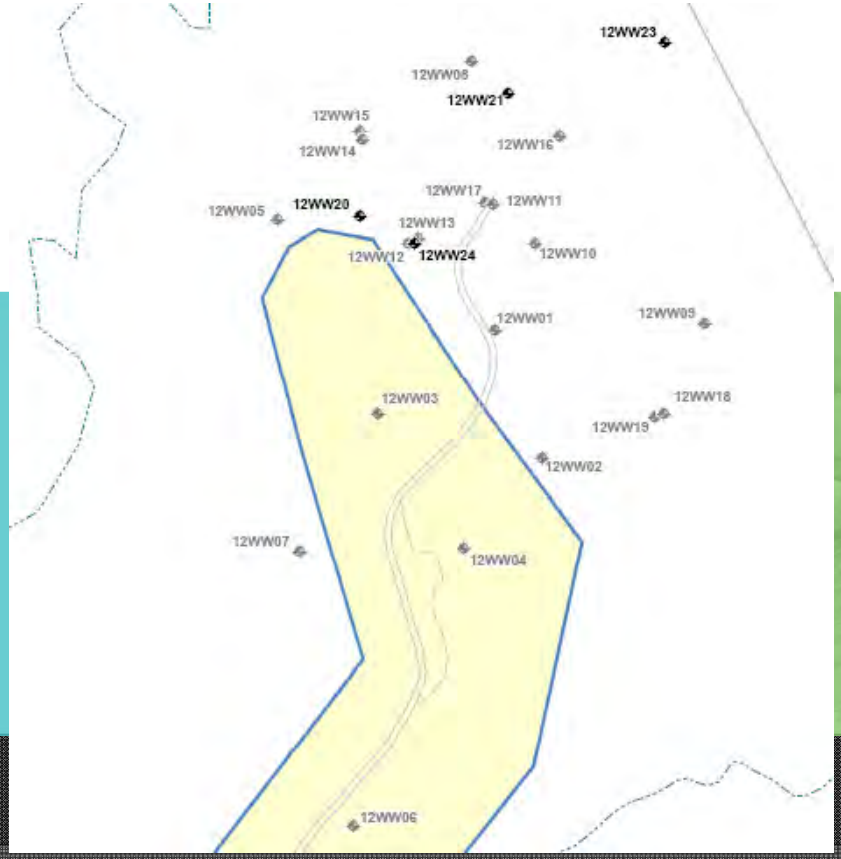
Status of Environmental Sites (cont)

- LHAAP-03 - Record of Decision, Remedial Design/Remedial Action Work Plan On-hold Due to Dispute
- LHAAP-04 - Record of Decision, Remedial Design/Remedial Action Work Plan On-hold Due to Dispute
- LHAAP-16 - Record of Decision, Remedial Design/Remedial Action Work Plan On-hold Due to Dispute
- LHAAP-17 - Record of Decision, Remedial Design/Remedial Action Work Plan On-hold Due to Dispute
- LHAAP-47 - Record of Decision, Remedial Design/Remedial Action Work Plan On-hold Due to Dispute
- LHAAP-001-R-01 - Record of Decision, Remedial Design/Remedial Action Work Plan On-hold Due to Dispute
  LHAAP-003-R-01 - Record of Decision, Remedial Design/Remedial Action Work Plan On-hold Due to Dispute

Status of Environmental Sites (cont)

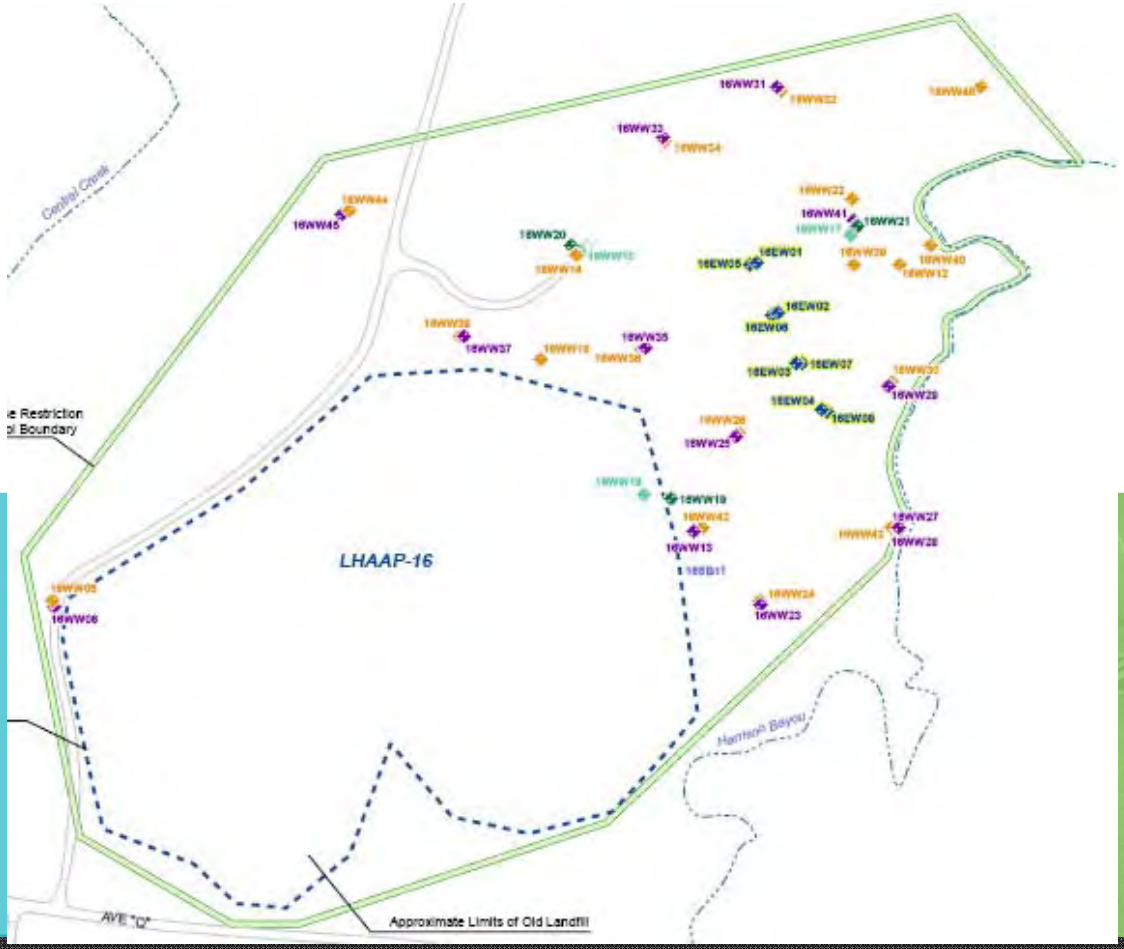
– LHAAP-12 – Landfill 12
  - Completing Operations and Maintenance (mowing, signs, repairing sparse vegetation or subsidence areas)
  - Annual sampling completed in December
  - Evaluating MNA, potentially installing a new well within the plume area



AECOM

Status of Environmental Sites (cont)

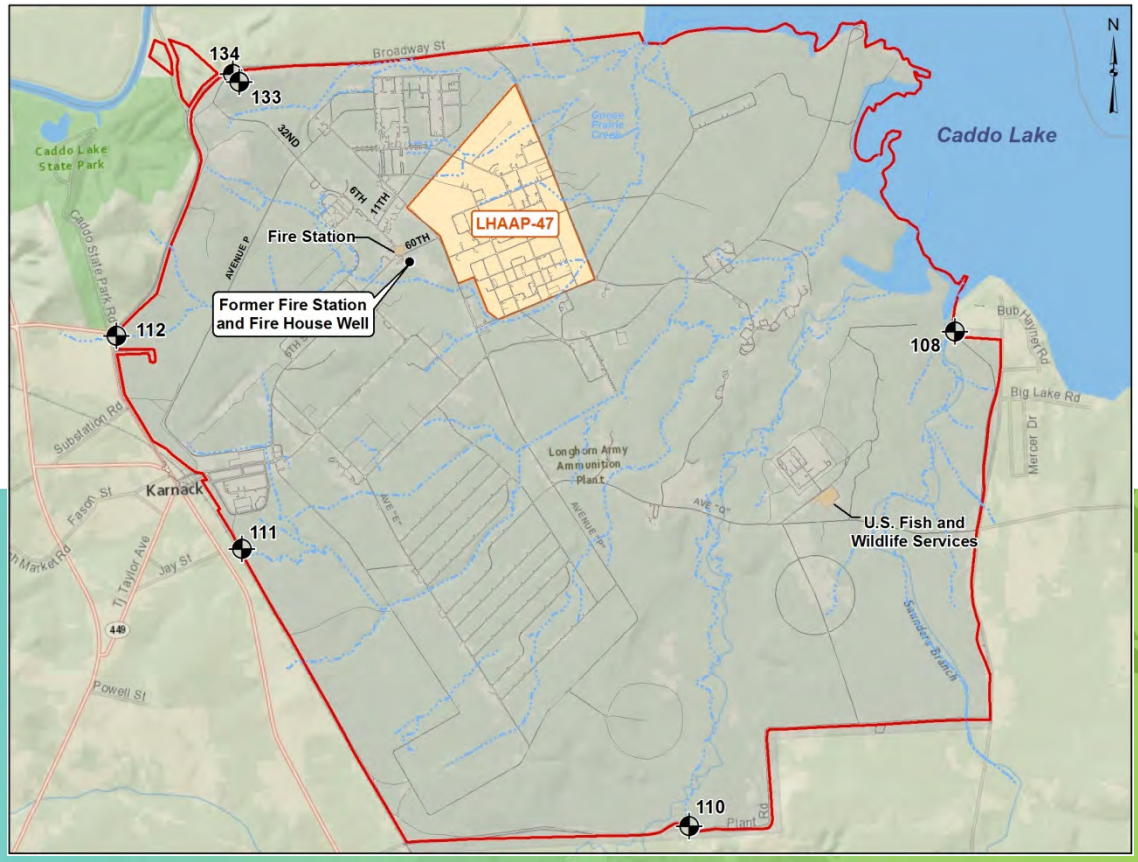
- LHAAP-16 – Landfill 16
  - Eight extraction wells sampled in February



Status of Environmental Sites (cont)

– Perimeter Wells

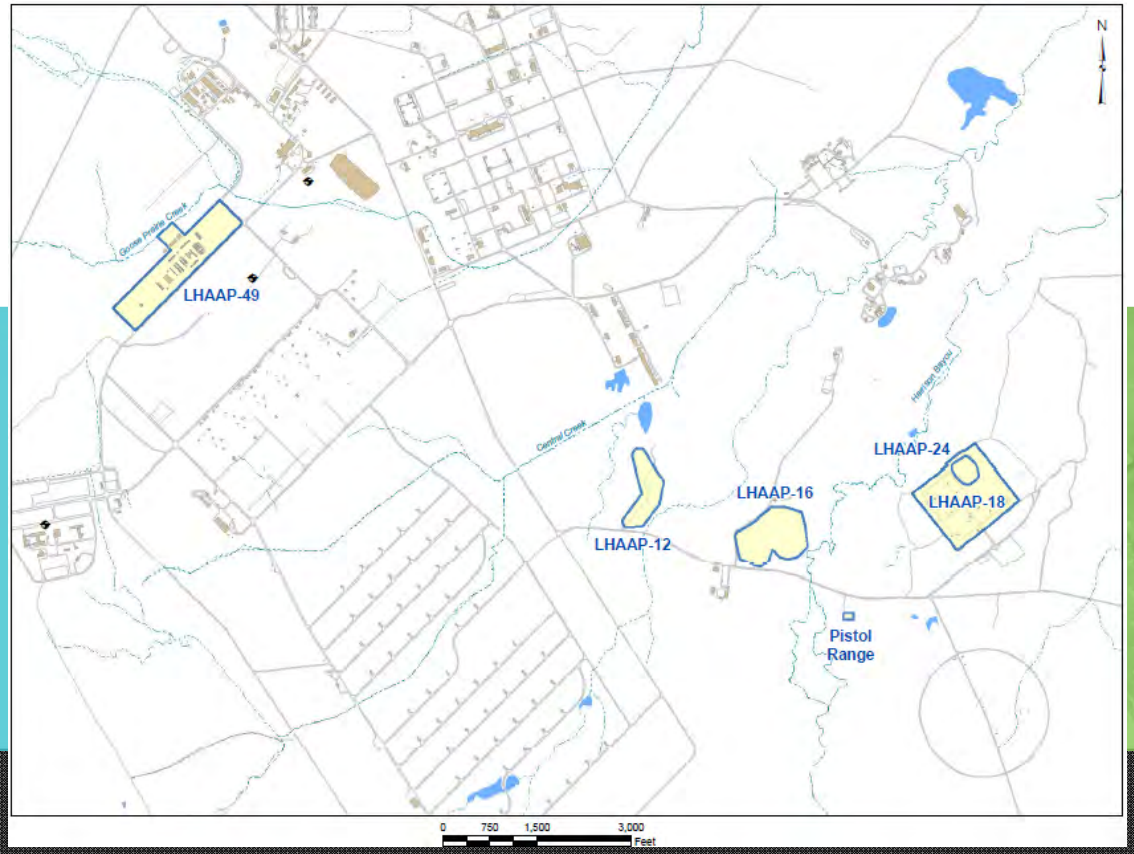
Well ID	Screen Depth (feet bgs)
108	5.5 - 20.5
110	5 - 20
111	5.4 - 20.4
112	5.25 - 20.25
133	64.5 - 84.5
134	90 -110



AECOM

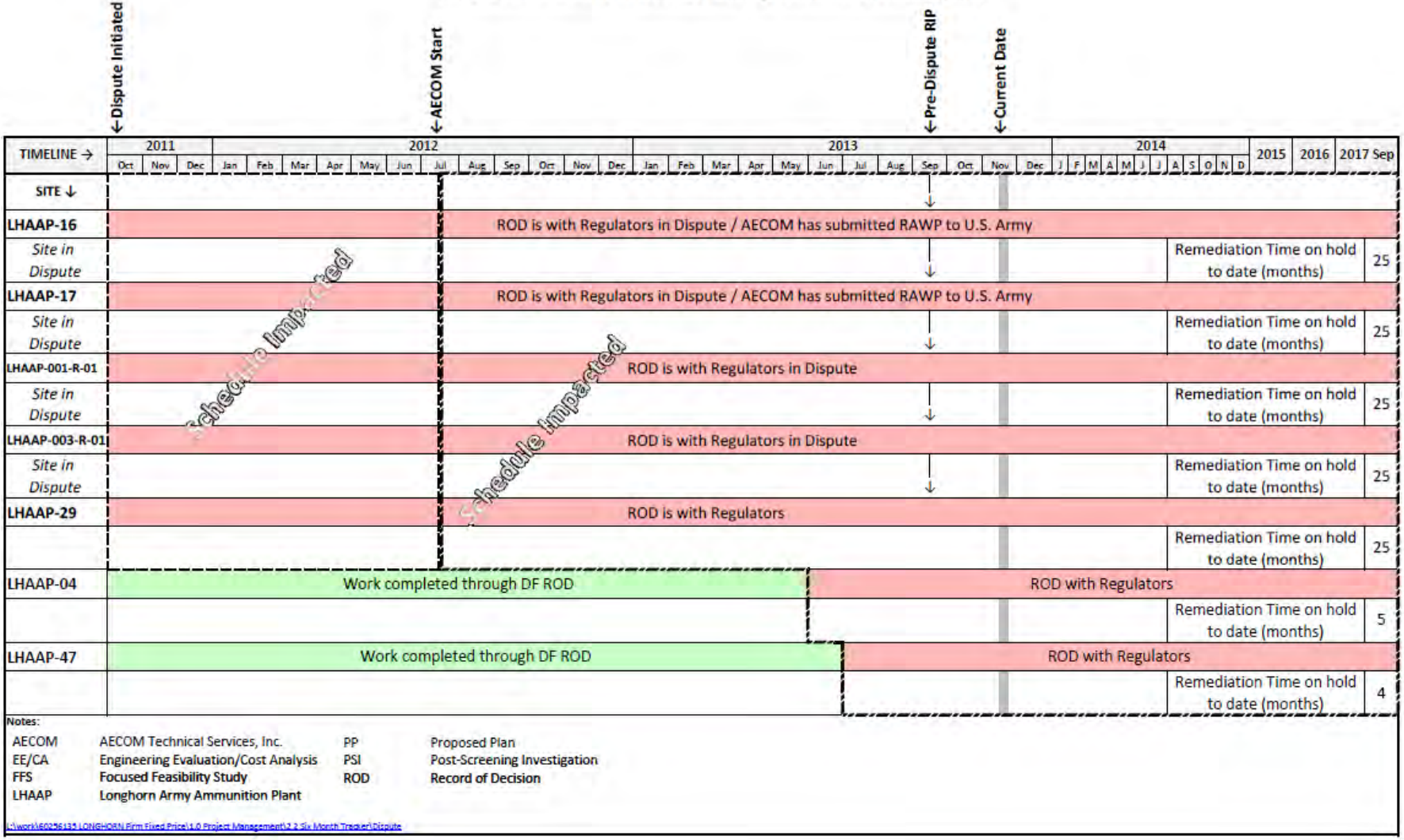
Status of Environmental Sites (cont)

- CERCLA Five-Year Review Process for Multiple Sites
  - Comment/Response to Comments on the Five-Year Review Report On-going
  - Review completed for LHAAP-12, LHAAP-16, LHAAP-18, LHAAP-24, LHAAP-49, and LHAAP-004-R-01



Dispute Status

Sites at which Work has Ceased Pending Resolution of the Dispute



Notes:

AECOM	AECOM Technical Services, Inc.	PP	Proposed Plan
EE/CA	Engineering Evaluation/Cost Analysis	PSI	Post-Screening Investigation
FFS	Focused Feasibility Study	ROD	Record of Decision
LHAAP	Longhorn Army Ammunition Plant		

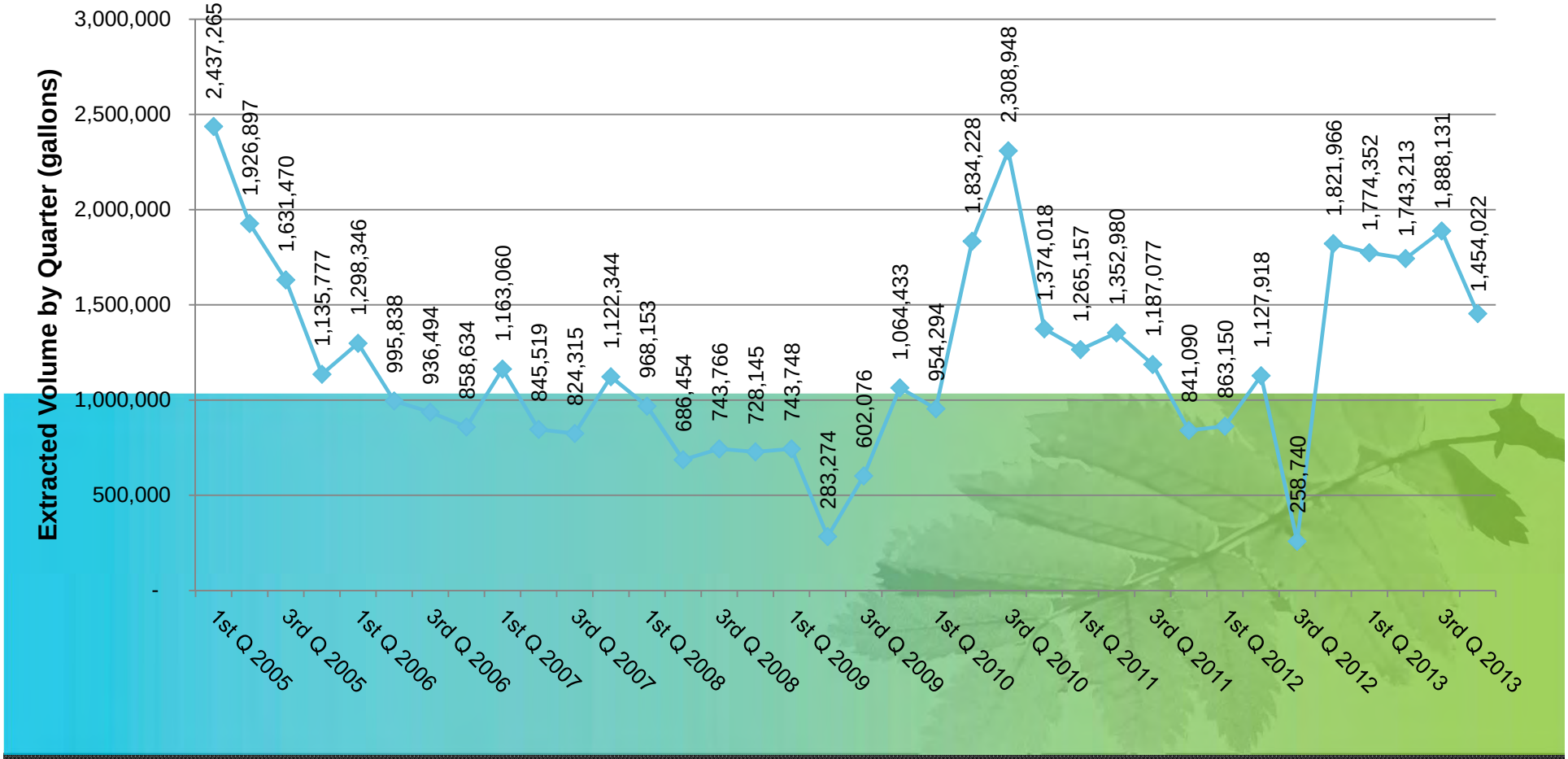
L:\work\60256135 LONGHORN Firm Fixed Price\1.0 Project Management\2.2 Six Month Trigger\Dispute

Groundwater Treatment Plant Operations and Management

- The Groundwater Treatment Plant continues to operate to contain the plume at LHAAP-18/24 and LHAAP-16.
- Water continues to be returned to LHAAP-18/24 or into Harrison Bayou, depending on the amount of water in the bayou.
- Compliance monitoring continues per existing sampling plan.
- Maintenance and repairs of wells, pumps, tanks, and ancillary equipment is on-going.

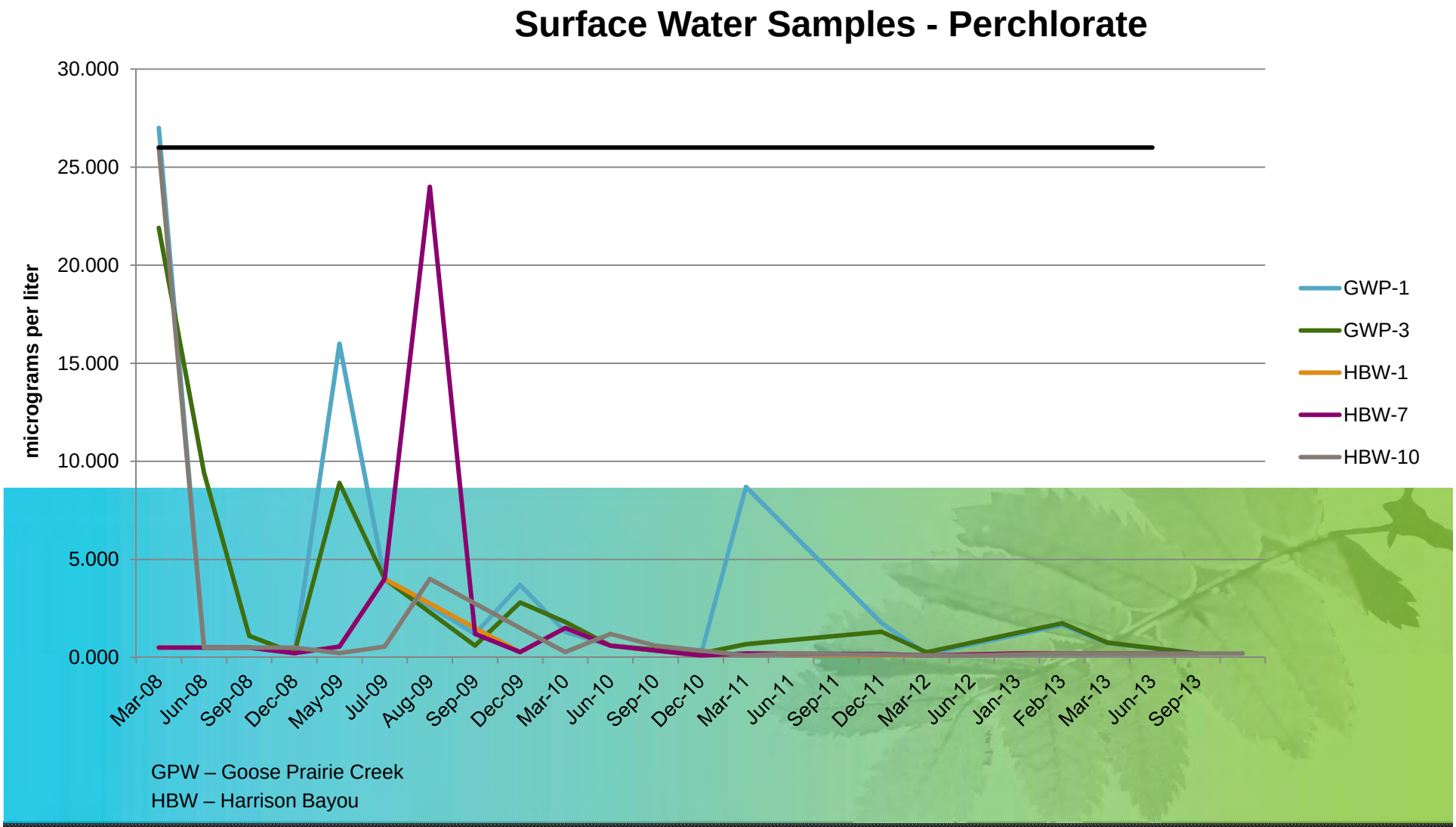
GWTP O&M (cont)

Quarterly Extraction Rate



AECOM

Surface Water Sample Results



AECOM

Upcoming Fieldwork, Meetings, and Documents

1. Continue quarterly groundwater sampling for recently completed monitoring networks at LHAAP-46, 50, 58, 67 in March, in addition to semi-annual compliance sampling at LHAAP-18/24 in May

2. CERCLA Five-Year Review: To be Signed in 2014

3. Final Completion Reports for LHAAP-37, 46, 50, 58, 67

4. LHAAP-18/24 and LHAAP-29 – Well Installation, Soil Sampling, Cone Penetrometer Testing/Membrane Interface Probe, Initial Treatability Testing

5. Sites where work has ceased pending dispute resolution:
    1. LHAAP-03
    2. LHAAP-04
    3. LHAAP-47
    4. LHAAP-16
    5. LHAAP-17
    6. LHAAP-29
    7. LHAAP-001-R-01
    8. LHAAP-003-R-01

Bio Plug Study at LHAAP 35B (37)

– See separate slide presentation

Back-up Slides

Groundwater Treatment Plant - Treated Groundwater Volumes

The amount of groundwater treated is determined by measuring the number of gallons of treated water returned to LHAAP-18/24, released to the INF Pond, or discharged to Harrison Bayou.

Treated Water Data
(in gallons)

Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08
1,041,491	848,356	804,822	792,148	665,883	818,872	791,306	568,812	776,904	748,377	690,052	617,199

Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09
655,059	619,274	726,118	552,299	598,144	433,800	488,807	526,958	387,644	0	414,853	735,716

Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10
808,322	636,306	727,492	391,898	695,343	802,656	894,731	962,121	1,257,977	1,314,924	1,041,495	1,136,547

Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11
956,567	705,805	849,712	811,679	668,281	1,090,348	817,325	900,338	916,552	784,369	652,524	733,456

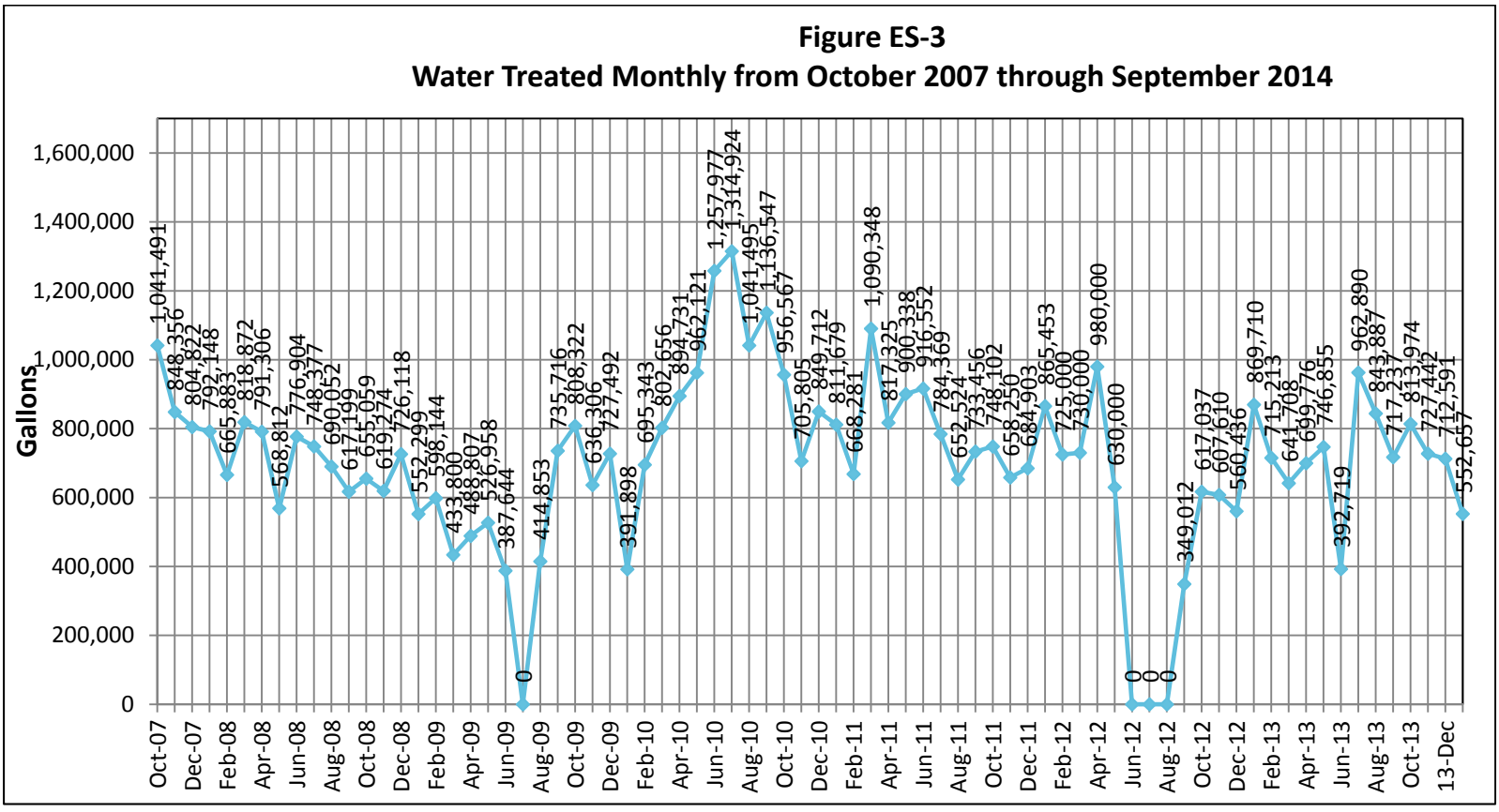
Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12
748,102	658,250	684,903	865,453	725,000*	730,000*	980,000*	630,000*	0	0	0	349,012

Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13
617,037	607,610	560,436	869,710	751,213	641,708	699,776	746,855	392,719	962,890	843,887	717,237

Oct-13	Nov-13	Dec-13	Jan-14
813,974	727,442	712,591	552,657

* Indicates estimate

Figure ES-3
Water Treated Monthly from October 2007 through September 2014

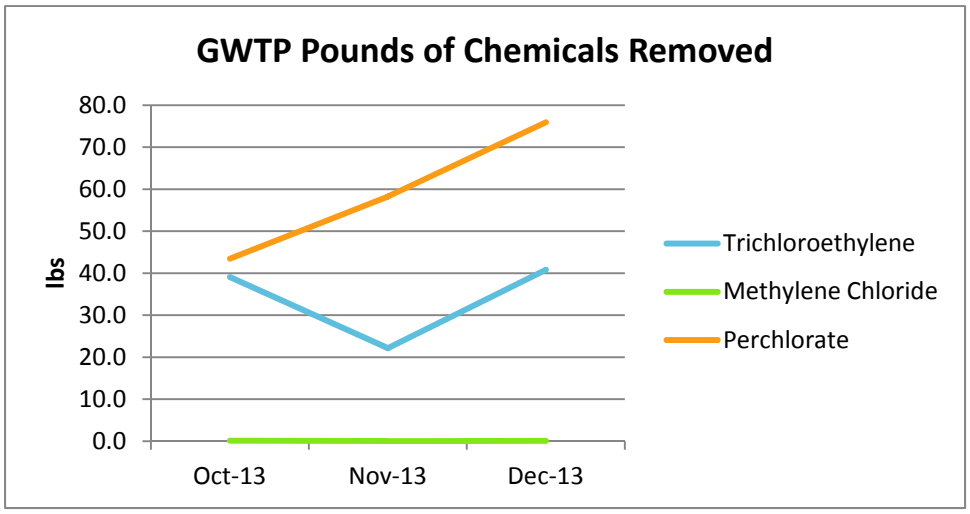


The pounds of chemicals removed for the 3rd Quarter of 2013 can be found below and are calculated by the following formula:

$$\frac{\text{(Concentration [µg/L] x Volume [gallons] x 3.785 [liters per gallon])}}{\text{(453,600,000 µg per pound)}}$$

Pounds of Chemicals Removed From LHAAP-18/24, 3rd Quarter 2013

	Trichloroethylene	Methylene Chloride	Perchlorate
Oct-13	39.1	0.11	43.5
Nov-13	22.2	0.03	58.3
Dec-13	40.8	0.11	76.0



Harrison Bayou and Goose Prairie Creek – Perchlorate Data

Surface water samples are collected quarterly from each location in Harrison Bayou and Goose Prairie Creek unless they are dry.

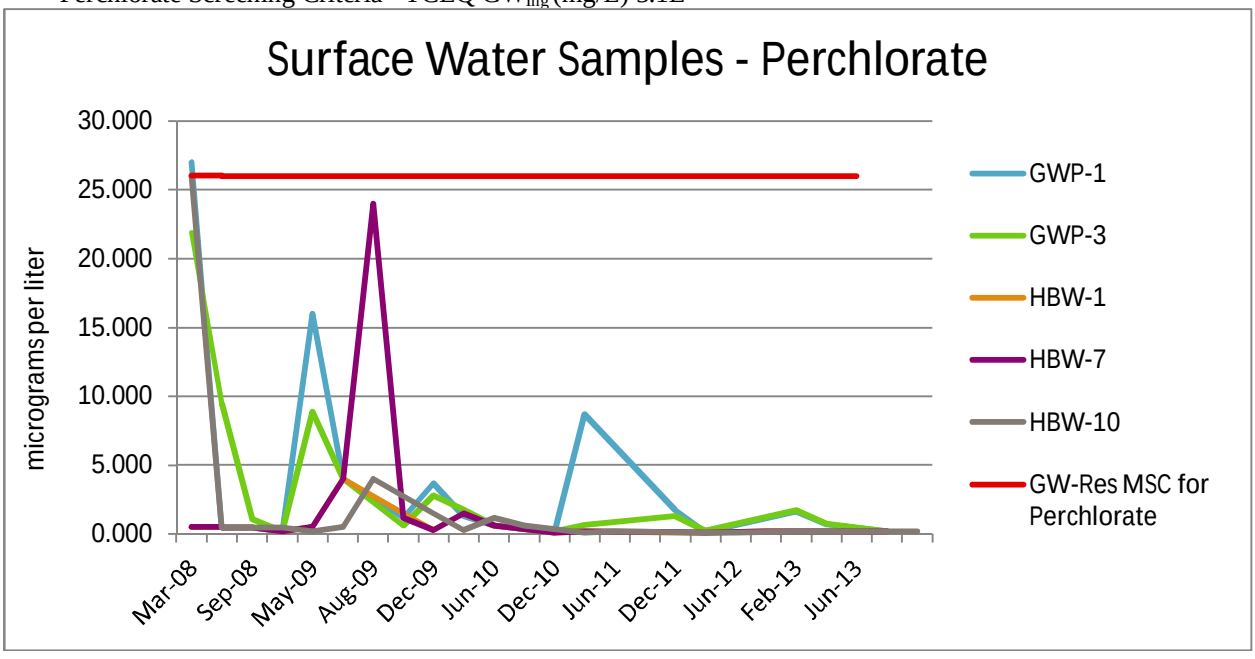
Historic Surface Water Sample Data
(in micrograms per liter)

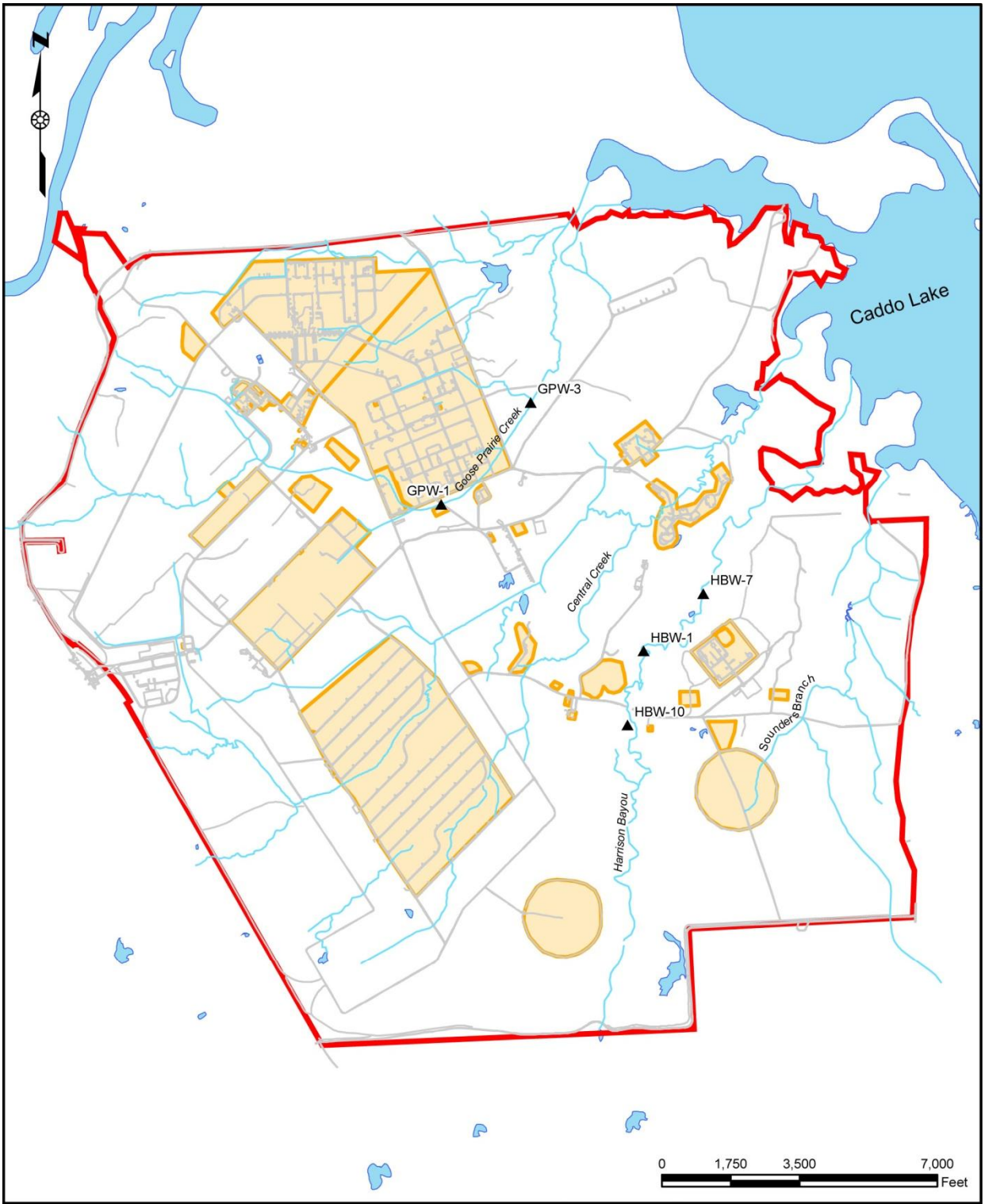
Creek Sample ID	Mar 2008	Jun 2008	Sep 2008	Dec 2008	May 2009	July 2009	Aug 2009	Sep 2009	Dec 2009	Mar 2010	Jun 2010
GPW-1	27	0.5U	0.5U	0.22U	16	4U	dry	1.2U	3.7	1.3J	0.6U
GPW-3	21.9	9.42	1.1	0.22U	8.9	4U	dry	0.6U	2.8	1.8J	0.6U
HBW-1	0.5U	0.5U	0.5U	0.22U	0.55U	4U	dry	1.5U	0.275U	1.5U	0.6U
HBW-7	0.5U	0.5U	0.5U	0.22U	0.55U	4U	24	1.2U	0.275U	1.5U	0.6U
HBW-10	0.5U	0.5U	0.5U	0.22U	0.55U	4U	dry	1.5U	0.275U	1.2U	0.6U

Creek Sample ID	Sep 2010	Dec 2010	Mar 2011	Jun 2011	Sep 2011	Dec 2011	Mar 2012	Jun 2012	Jan 2013	Feb 2013	Mar 2013
GPW-1	dry	0.1U	8.7	dry	dry	1.76	0.163J	dry	dry	1.65	0.735
GPW-3	dry	0.199J	0.673	dry	dry	1.31	0.261	dry	dry	1.74	0.754
HBW-1	dry	0.1U	0.2U	dry	dry	0.1U	0.1U	dry	<0.2U	dry	<0.2U
HBW-7	dry	0.1U	0.2U	dry	dry	0.171J	0.1U	dry	<0.2U	dry	<0.2U
HBW-10	dry	0.1U	0.2U	dry	dry	0.1U	0.1U	dry	<0.2U	dry	<0.2U

Creek Sample ID	Jun 2013	Sept 2013
GPW-1	dry	<0.2 U
GPW-3	dry	<0.2 U
HBW-1	<0.2U	<0.2 U
HBW-7	<0.2U	<0.2 U
HBW-10	<0.2U	<0.2 U

Notes:
Perchlorate Screening Criteria - TCEQ GW_{Ing} (mg/L) $5.1E^{-02}$





Legend

- ▲ Surface Water Sampling Location
- Stream
- Road
- Site
- Lake

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

SURFACE WATER SAMPLING LOCATION

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Subject:	**Final Minutes, Monthly Managers Meeting, Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**LHAAP Army Trailer and Teleconference – 866-203-6896, passcode 1759304791**
Date of Meeting:	**February 20, 2014 – 1:00 PM**

Welcome **RMZ**

Attendees:

Army BRAC: Rose Zeiler
EPA: Rich Mayer, Janetta Coats, Kent Becher (USGS Liaison)
TCEQ: April Palmie, Dale Vodak
USACE: Aaron Williams, Rick Smith
AECOM: Dave Wacker, Gretchen McDonnell, Marwan Salameh (by phone), Harry Vandenberg (by phone)
AEC: Robin Paul
USFWS: Paul Bruckwicki, Barry Forsythe

Action Items
AECOM

Army

- Provide a summary of the treated water nutrient data, after fluidized bed reactor feeding optimization has been implemented. **Pending until Spring.**
- Develop a letter responsive to stated aspects of modifications to the GWTP air sampling plan. The letter should provide basis of change from weekly to monthly sampling. **Pending.** The letter will go to agencies late this week or early next week.
- Provide USFWS with maps of well coordinates for existing and new wells at all sites under AECOM's contract. **Complete.** Additional enlargement maps will be issued by USACE.
- Add CRP/CIP item to the Document and Issue Tracking table. **Complete.**
  Provide Ms. Palmie with an email documenting deviations from the Remedial Action Work Plan with respect to injection-related activities at LHAAP-58. **Complete.**

EPA

- Mr. Mayer stated he would try to arrange a call before December 20th relating to discussion of 1,4-dioxane methods and will provide an agenda for the call. **Complete.** The agencies will be receiving Army's plan forward for this sampling within the next few weeks.
  Develop a list of wells/sites for upcoming EPA sampling and advise Army. **Pending.**
- Resend the link to new EPA screening level tables to Ms. Zeiler and Mr. Torcoletti. **Complete.**

TCEQ

AEC

Defense Environmental Restoration Program (DERP) PBR Update **AECOM**

- Upcoming document submissions to regulators (see Document and Issue Tracking table)

Items 1 (5-Year Review) - Agency comments are being reviewed by Army and are expected to be returned to the agencies on February 25th.

Item 2 (IWWP, QAPP, SOPs, and HASP) - Responses to agency comments are expected to be returned to agencies on February 25th.

Item 3 (LHAAP-18/24 – Explanation of Significant Differences) - The final version of this document is with Army for signature. Expected submittal to agencies on February 28th.

Item 4 (GWTP Quarterly Report) - Only surprise is as discussed earlier in the meeting that there are some perchlorate results for effluent but that treatment issue has been resolved.

Item 5 (LHAAP-18/24-Revised FS and PSI WP Addenda) – PSI WP Addenda will be submitted to agencies within the next week or two. Agencies have decided they did not want to see the Revised FS until the PSI WP addendum data has been incorporated. If the PSI WP scope goes to agencies by February 25th, and agencies complete review in two weeks instead of 30 days due to limited material to review, field work could potentially occur near the end of March. Data would then be back and reported by the first part of May, with the LHAAP-18/24 Revised FS submitted to the agencies by July.

Item 6 (LHAAP-46, LHAAP-67 RACRs) - Agencies will receive the LHAAP-67 RACR first. The LHAAP-46 RACR will be delayed to allow installation of another well to delineate the north side (down-gradient edge) of the intermediate plume at 46. Baseline groundwater monitoring data for LHAAP-46 and LHAAP-67 has been submitted in the validated data packets being supplied for the Monthly Managers' Meetings. Mr. Wacker showed a map with the planned location for the additional intermediate zone monitoring well at LHAAP-46. This well will be added during the mobilization for field work for LHAAP-29. Mr. Wacker also stated that dry wells at LHAAP-46 (and other sites) have been checked frequently for water between scheduled quarterly sampling events to attempt sampling.

Item 7 (Monthly Managers' Meeting) - Next monthly managers meeting scheduled for March 25th at 10AM, by teleconference.

Item 8 (LHAAP-37, LHAAP-50, LHAAP-58) - LHAAP-50 will be the first of these three sites to have its RACR submitted to the agencies. The LHAAP-37 RACR will be delayed to allow installation of another shallow zone well to delineate the down-gradient extent of the plume. Ms. McDonnell pointed out the currently proposed location for the additional well on a map for Mr. Becher and Mr. Mayer.

Mr. Wacker provided his planned comments for the RAB meeting on the initial LHAAP-58 ISB results. Page 11 of the February 2014 RAB briefing relates to this data. The MMM group concurred with the planned message.

Item 9 (LHAAP-29 RI/FS Addenda) – The document has been submitted for agency review. Mr. Mayer stated he had taken a first look at it. Dr. Zeiler asked reviewers to keep in mind that some of the data collection we are doing is where RI and RD phases overlap. Army is particularly concerned with collecting extra data in areas where previous sampling was judged invalid. Mr. Williams has provided a summary of the impacts of the BERA addendum on the LHAAP-29 RI/FS

Addendum. Mr. Vandenberg summarized the scope of the proposed work in the addendum that the agencies are currently reviewing.

- Soil vapor survey near 29WW15 where intermediate aquifer has methylene chloride impacts, and in former building 801F where the original methylene chloride source tank was located.
- Soil sampling in various locations shown in the work plan insets, looking for the extent of explosives impacts.
- Characterization of the intermediate groundwater aquifer which is impacted by methylene chloride at DNAPL concentrations
    - CPT/MIP to depth of 90-100 feet around 29WW15 where high methylene chloride concentration was detected
    - CPT/MIP Step-outs/ins depending on what is found in initial MIPs are included in the work plan.
- Install up to 3 additional groundwater monitoring wells around 29WW15.
- Collection of data to help evaluate the In-Situ Thermal Desorption technology
- Install biotraps in the new monitoring wells to determine whether biodegradation of methylene chloride is occurring, to evaluate whether biodegradation may be a useful component in addressing the impacts

Mr. Mayer stated he would attempt to return comments by February 28th. Ms. Palmie stated that TCEQ could provide comments by March 6th, but would try to expedite. Dr. Zeiler requested that agency issues be discussed by phone to try to expedite comment response and approval.

Mr. Mayer asked what the plan was for soil removals at LHAAP-29. Dr. Zeiler stated that no changes are anticipated to the soil removals specified in the ROD. Mr. Mayer asked about TCEQ's historical concerns regarding characterization of product lines at LHAAP-29. Dr. Zeiler stated that resolution to questions about characterization of product lines was reached in the ROD, and that the addendum includes some additional sampling along the wooden line.

Item 10 (LHAAP-17 PDI WP, LHAAP-16 RD WP, LHAAP-03 RD/RAWP, LHAAP-04 ROD, LHAAP-47 RD) – Placeholder for documents on hold due to Army and EPA dispute.

Item 11 (February RAB) – Will be held tonight at 6PM. The May RAB meeting date and time will be decided tonight at RAB meeting.

Item 12 (GWTP O&M/Air Monitoring) – Discussed earlier in the meeting. Some ICT pump maintenance/replacement has been conducted. Annual ICT sampling planned for this month, within the next 10 days. Monthly emails summarizing GWTP air results started in January, with the first email capturing the first three months of air data.

Mr. Becher asked where sprinkling of treated groundwater was being done at LHAAP-18/24, remarking that historically there were more sprinklers at 18/24 than what he is seeing now. Mr. Wacker stated that there are two sprinkler arrays currently in place and the sprinkling is rotated through the sprinkler heads in those arrays.

Item 13 (Admin Record Update) – The Administrative Record update for the 4th quarter of 2014 is in progress.

Item 14 (BERA Addendum) – Report has not yet been received by USACE, but the contractor is close to completing.

Item 15 (Nutrient Issue for HB and INF) – discussed earlier in meeting. FBR has had a series of unfortunate events over the past few months. In October, a batch of improperly mixed acetic acid was delivered to the GWTP, followed closely by a short-term power outage that caused FBR recirculation to stop when temps were below freezing, both delivering a blow to the bacteria populations in the FBR. Through a series of troubleshooting and repairs, and return of warmer weather, the FBR has recovered and is back to treating perchlorate at an adequate level. Effluent results in the next quarterly report will reflect this. No discharge to Harrison Bayou was done during the period when the FBR had issues, and no discharge to the bayou will occur until more analytical data is received to confirm adequate treatment of perchlorate. Nutrient feeding has not been optimized at this time in light of FBR issues, although the last quarterly report indicated lower nutrient levels.

Item 16 (Website) – The home page of Longhorn website is included in the RAB presentation. Mr. Wacker advised the website is still under Army review, but will likely be rolled out at the next RAB meeting. The interested parties list will also be notified, likely through an email message. Dr. Zeiler stated that discussion continues on what the exact content of the site will be; however, the expected level of background information and current status updates on the website will be similar to that included in the Installation Action Plan. Mr. Wacker said the website features a clickable site map that takes the viewer to the relevant documents for whichever site is clicked, versus having to go through the Administrative Record to identify applicable documents for each site.

Item17 (CRP/CIP) – This entry maintained on the Document and Issue Tracker as a reminder that we have CRP/CIP requirements and recommendations that must be addressed, particularly when new documents are issued.

Defense Environmental Restoration Program (DERP) PBR Update (continued) AECOM

- Upcoming field work
  - ICP sampling at LHAAP-18/24 in February
  - Starting the next quarterly MNA groundwater monitoring events for LHAAP-46, LHAAP-67, LHAAP-50 and LHAAP-58 in the March-April timeframe.
  - LHAAP-18/24 and LHAAP-29 field events discussed earlier in the meeting
  - EPA Split Sampling - As discussed earlier in the meeting, EPA is developing a list of wells/sites for upcoming EPA sampling. Mr. Mayer stated the focus will likely be on 29 and 18/24. EPAs contract allows their contractor to mobilize to Longhorn up to three separate times between now and September, and covers a total of 25 well samples for a wide suite of analytes, including 1,4-dioxane. Mr. Mayer stated that EPA would prefer to split samples with Army rather than conduct sampling themselves. Dr. Zeiler stated that Army must collect splits if EPA conducts their own sampling. The data validation piece of EPA's contract for the split samples is being finalized. Mr. Mayer stated that EPA may also want to sample the Fire Station well for perchlorate. Mr. Wacker stated that AECOM has recently sampled this well for drinking water parameters, but not for a wide range of analytes. Mr. Mayer asked Dr. Zeiler to propose anything they think would benefit from sampling under this contract. Mr. Wacker suggested samples be collected from sites being held up by the dispute between Army and EPA.

- Monthly data

- A cover sheet has been added to the monthly validated data submittal to show what data is in the packet.
- Ms. Palmie asked that separation sheets be added between data sets for each site or that the header be used to indicate the different data sets.
- Mr. Becher and Mr. Mayer stated well 134 has shown low level perchlorate hits consistently over the last 5-6 quarters. Mr. Becher recalled that this occurrence was apparently investigated in the past, with the false positives thought to be due to use of EPA Method 300.0; however, the analytical method has since changed to EPA Method 6850 and perchlorate has persisted. Ms. Zeiler recalled that perchlorate detections were found at locations across Texas not known to have any historical use of perchlorate. The fact that fireworks were also fired from near this location was discussed. The group agreed to add an action item to review the results during the next managers meeting.

- Groundwater Treatment Plant
  - Air Monitoring (Results, Frequency and Reporting) – As discussed earlier in the meeting, Army is providing a letter that providing the basis for change from weekly to monthly sampling. It will also state that monthly data will be presented in the quarterly GWTP reports, but that an email notification will be made monthly (before the subsequent sampling event) to indicate that data has been reviewed and provide a summary statement of the results. The letter will include a contingency plan for confirmation sampling if initial sampling indicates air limits have been exceeded.
  - ESD – discussed earlier in meeting
  - UIC Reporting – This line item will be removed from the next MMM agenda as injection of treated groundwater is no longer anticipated.

MMRP Update **Army**

- Update – no update

Other Environmental Restoration **Army**

- Decision Documents for multiple sites – in progress. No specific update.
- Site 37 Bioplug
  - Animal damage to the bioplugs was discovered this month. Army is contacting Aberdeen Testing Center to determine how the animal damage will be addressed, the schedule for addressing the damage and possible implications of resulting missing data on the demonstration project.
- 1,4-dioxane sampling at Longhorn – discussed earlier in meeting
- Quarterly Reporting and Requirements
  - GWTP Evaluation with air monitoring data –
  - Surface Water/Perimeter Well Tech Memo with validation reports – September 2013 data has been added to surface water handout for RAB, provided as slides 34 and 35 in the February 2014 RAB breifing.
  - Administrative Record Update –discussed earlier in meeting
- Annual Reporting
  - LUC Management Plan Update (due September 2014) - placeholder
  - CIP/CRP Revision (Biennial) and questionnaire October 2015

Programmatic Issues **RMZ/RM/AP**

- Status of Dispute – Mr. Mayer stated that a meeting between EPA and Army was planned for February 27; however, the EPA Administrator will be out of town, resulting in the

meeting being tentatively rescheduled for April. Mr. Wacker stated that a round of new data collected at LHAAP-16 suggests concentrations in five of six plume wells have increased, and some of the increases are somewhat dramatic. Dr. Zeiler stated that this data will be examined more closely before conclusions are drawn, but emphasized that the potential for plume migration increases the longer the dispute prevents finalization of a ROD and implementation of a remedy.

USFWS Update **RMZ/PB**

- Environmental Restoration Issues with Transfer Schedule Impact – Mr. Bruckwicki has discovered a potential sump at LHAAP-47. A drain and wooden cover were observed at the corner of a building near 60th and Independence.
- USFWS Comments on Documents - none

Surface Water Sampling Procedures Discussion

Mr. Becher stated that he feels collection of surface water samples without more ancillary data is problematic, and he feels more supporting data is needed to know more about the flow conditions in the surface water body at the time of sampling. Dr. Zeiler asked what ancillary data Mr. Becher is looking for, how it would be used, why it is necessary, and what impacts it would have on the remedies implemented at the sites. Mr. Mayer summarized that he is concerned with groundwater-surface water interaction at various sites, wanting to ensure sampling is being conducted when groundwater is discharging to surface water bodies. Mr. Becher stated that he wants to see enough information to know the relationship between groundwater and surface water at the time of the sampling event, so the surface water concentration data can be better interpreted.

Dr. Zeiler stated that the CSMs for the sites defined potentially complete exposure pathways that could impact surface water, and the remedies were designed to cut off those pathways. The soil-to-surface water exposure pathways were cut off by removal of impacted soils or liner installation. Any interaction between the groundwater and surface water was addressed by the groundwater remedies. She further noted that these CSMs and remedies implemented received EPA and TCEQ concurrence.

Ms. Paul stated that, in the CERCLA process, post-ROD questions on the any facet of a remedy are addressed through the five-year review process.

Mr. Wacker added that the only additional requirement for surface water sampling he was aware of is during implementation of soil excavations where storm water runoff to the creek might be sampled to ensure implementation of the remedy did not impact surface water.

Ms. Zeiler stated she would ask the contractor to consider taking a photograph of the stream at the time of sampling, a description of the flow, and the date/amount of last rainfall event. Mr. Becher stated that he felt Army should additionally read existing staff plates and do cross-sectional flow measurements across each sampling point.

Schedule Next Managers' Meeting –March 25th at 10AM, by teleconference.

New Action Items

AECOM

- Add Steve Tzhone to distribution list for Administration Record update CDs.

- Add an action item to review low-level perchlorate detections in well 134 at the next managers' meeting.
- Generate, for agency submittal, one page memos with one figure to show the locations of new plume delineation wells at LHAAP-46 and LHAAP-37
- Provide hard copy of the LHAAP-29 RI/FS Addendum Work Plan to Mr. Becher, who stated he had not received a hard copy**.**
- As requested by Ms. Palmie, either add separation sheets be added between data sets for each site or use the header space to indicate the different data sets.
- Remove "UIC Reporting" sub-bullet from "Groundwater Treatment Plant" bullet of the next MMM agenda.

Army

- Obtain information from Aberdeen Testing Center on what the action will be to address bioplug demonstration site issues.

Adjourn

Attachments: LHAAP Data Validated January – February 2014
-GWTP Influent and Effluent
-LHAAP-12 Annual Groundwater Event
-LHAAP-18/24 Compliance Sampling
-LHAAP-46 Quarterly MNA Groundwater Event
-LHAAP-50 Baseline MNA Groundwater Event
-LHAAP-35A(58) Baseline MNA Groundwater Event

ACRONYM LIST

AEC	**United States Army Environmental Command**
AECOM	**AECOM Technology Services, Inc.**
AP	**April Palmie**
BERA	**Baseline Ecological Risk Assessment**
BRAC	**Base Realignment and Closure**
CERCLA	**Comprehensive Environmental Response, Compensation, and Liability Act**
CPT/MIP	**Cone Penetration Test/Membrane Interface Probe**
CRP/CIP	**Community Relations Plan/Community Involvement Plan**
CSM	**Conceptual Site Model**
DERP	**Defense Environmental Restoration Program**
DNAPL	**Dense Non-Aqueous Phase Liquid**
EPA	**United States Environmental Protection Agency**
ESD	**Explanation of Significant Differences**
FBR	**Fluidized Bed Reactor**
FS	**Feasibility Study**
GWTP	**Ground Water Treatment Plant**
HASP	**Health and Safety Plan**
HB	**Harrison Bayou**
ICT	**Interceptor – Collector Trench**
INF	**Intermediate-Range Nuclear Forces**
ISB	**In-Situ Bioremediation**
IWWP	**Installation-Wide Work Plan**
LHAAP	**Longhorn Army Ammunition Plant**

LUC	**Land Use Control**
MMM	**Monthly Managers' Meeting**
MMRP	**Military Munitions Response Program**
MNA	**Monitored Natural Attenuation**
O&M	**Operation and Maintenance**
PB	**Paul Bruckwicki**
PBR	**Performance-Based Remediation**
PDI	**Pre-Design Investigation**
PSI	**Post-Screening Investigation**
QAPP	**Quality Assurance Project Plan**
RAB	**Restoration Advisory Board**
RACR	**Remedial Action Completion Report**
RD	**Remedial Design**
RI	**Remedial Investigation**
RM	**Rich Mayer**
RMZ	**Rose M. Zeiler**
ROD	**Record of Decision**
SOP	**Standard Operating Procedure**
TCEQ	**Texas Commission on Environmental Quality**
UIC	**Underground Injection Control**
USACE	**United States Army Corps of Engineers**
USFWS	**United States Fish and Wildlife Service**
USGS	**United States Geological Service**
WP	**Work Plan**

LHAAP Data Validated
January-February 2014

GWTP Influent and Effluent *Bi-weekly, Monthly, and Quarterly Sampling*
December 2013
Oil and Grease (1664A)
Chemical Oxygen Demand (410.4)
Metals (6010C)
Metals (6020A)
Perchlorate (6850)
Hexavalent Chromium (7196A)
VOC (8260B)
SVOC (8270D)
Inorganic Anions (9056)

Site 12 *Annual Sampling*
December 2013, January 2014
VOC (8260B)

Site 18/24 *Semi-annual, annual Sampling*
December 2013
Alkalinity (310.2)
TOC (415.1)
Metals (6010C)
Metals (6020A)
Perchlorate (6850)
Mercury (7470A)
VOC (8260B)
Inorganic Anions (9056)
Dissolved Gasses (RSK-175)
Ferrous Iron (SM3500FE)
Dechlorinating Bacteria

Site 46 *Semi-annual and Quarterly Sampling*
September 2013
Alkalinity (310.2)
Nitrogen, Nitrate-Nitrite (353.2)
Phosphorus (365.4)
Extractable Sulfides (376.1)
TOC (415.1)
Metals (6010C)
Metals (6020A)
VOC (8260B)
Inorganic Anions (9056)
Dissolved Gasses (RSK-175)

Site 50 *Quarterly Sampling*
November 2013
Perchlorate (6850)
VOC (8260B)

Site 58 *Quarterly Sampling*
September 2013, October 2013
Alkalinity (310.2)
Nitrogen, Nitrate-Nitrite (353.2)
Phosphorus (365.4)
Extractable Sulfides (376.1)
TOC (415.1)
Metals (6010C)
Metals (6020A)
VOC (8260B)
Volatile Fatty Acids (830-MBA)
Inorganic Anions (9056)
Dissolved Gasses (RSK-175)
Ferrous Iron (SM3500FE)

Location ID: Sample Date:	Units	MCL/ MSC	LH18/24-SP140-7143-COMP 12/29/2013	LH18/24-SP140-7143-GRAB 12/29/2013
ID Location:			GWTP – Collected from a spigot on the discharge of influent TK-140 Sampled Monthly	GWTP – Collected from a spigot on the discharge of influent TK-140 Sampled Monthly
Oil and Grease (1664A)				
OIL & GREASE	mg/L		<2.8 U	<2.8 U
Chemical Oxygen Demand (410.4)				
CHEMICAL OXYGEN DEMAND	mg/L		<20 U	<20 U
Metals (6010C)				
ALUMINUM	mg/L	100	<0.1 U	0.0836 J
IRON	mg/L		0.575	0.489
SELENIUM	mg/L	0.05	<0.01 U	<0.01 U
Metals (6020A)				
ANTIMONY	mg/L	0.006	<0.001 U	<0.001 U
ARSENIC	mg/L	0.01	0.00636	0.00408
BARIUM	mg/L	2	0.43	0.44
CADMIUM	mg/L	0.005	0.000594 J	0.000548 J
CHROMIUM	mg/L	0.1	0.00154 J	0.00226 J
COBALT	mg/L	6.1	0.016	0.0159
LEAD	mg/L	0.015	<0.001 U	<0.001 U
MANGANESE	mg/L	14	0.649	0.652
NICKEL	mg/L	2	0.0226	0.0214
SILVER	mg/L	0.51	<0.001 U	<0.001 U
THALLIUM	mg/L	0.002	<0.0002 U	<0.0002 U
VANADIUM	mg/L	0.72	<0.001 U	<0.001 U
ZINC	mg/L	31	0.0553	0.0549
Perchlorate (6850)				
PERCHLORATE	ug/L	72	17900	20300
Hexavalent Chromium (7196A)				
HEXAVALENT CHROMIUM	mg/L	0.1	<0.01 UJ	<0.01 UJ
Volatile Organic Compounds (8260B)				
1,1,1,2-TETRACHLOROETHANE	ug/L	110	N/A	<25 U
1,1,1-TRICHLOROETHANE	ug/L	200	N/A	<25 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	N/A	<20 U
1,1,2-TRICHLOROETHANE	ug/L	5	N/A	<25 U
1,1-DICHLOROETHANE	ug/L	10000	N/A	<12.5 U
1,1-DICHLOROETHENE	ug/L	7	N/A	28.3 J
1,1-DICHLOROPROPENE	ug/L	2.9	N/A	<25 U
1,2,3-TRICHLOROBENZENE	ug/L	310	N/A	<15 U
1,2,3-TRICHLOROPROPANE	ug/L	0.004	N/A	<50 UJ
1,2,4-TRICHLOROBENZENE	ug/L	70	N/A	<20 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	N/A	<25 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	N/A	<100 UJ
1,2-DIBROMOETHANE	ug/L	0.005	N/A	<25 U
1,2-DICHLOROBENZENE	ug/L	600	N/A	<12.5 U
1,2-DICHLOROETHANE	ug/L	5	N/A	71.3
1,2-DICHLOROPROPANE	ug/L	5	N/A	<20 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	N/A	<25 U
1,3-DICHLOROBENZENE	ug/L	3100	N/A	<25 U
1,3-DICHLOROPROPANE	ug/L	29	N/A	<20 U
1,4-DICHLOROBENZENE	ug/L	75	N/A	<12.5 U
2,2-DICHLOROPROPANE	ug/L	42	N/A	<25 U
2-BUTANONE	ug/L	61000	N/A	<250 UJ
2-CHLOROTOLUENE	ug/L	2000	N/A	<12.5 U
2-HEXANONE	ug/L	6100	N/A	<250 UJ
4-CHLOROTOLUENE	ug/L	2000	N/A	<25 U
4-METHYL-2-PENTANONE	ug/L	8200	N/A	<250 U
ACETONE	ug/L	92000	N/A	<250 UJ
BENZENE	ug/L	5	N/A	<12.5 U
BROMOBENZENE	ug/L	2000	N/A	<12.5 U
BROMOCHLOROMETHANE	ug/L	4100	N/A	<20 U
BROMODICHLOROMETHANE	ug/L	4.6	N/A	<25 U
BROMOFORM	ug/L	36	N/A	<50 U
BROMOMETHANE	ug/L	140	N/A	<50 U
CARBON DISULFIDE	ug/L	10000	N/A	<50 U
CARBON TETRACHLORIDE	ug/L	5	N/A	<25 U
CHLOROBENZENE	ug/L	100	N/A	<12.5 U
CHLOROETHANE	ug/L	41000	N/A	<50 U
CHLOROFORM	ug/L	1000	N/A	13.1 J
CHLOROMETHANE	ug/L	220	N/A	<50 U
CIS-1,2-DICHLOROETHENE	ug/L	70	N/A	2380
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	N/A	<25 U
DIBROMOCHLOROMETHANE	ug/L	34	N/A	<25 U
DIBROMOMETHANE	ug/L	380	N/A	<25 U
DICHLORODIFLUOROMETHANE	ug/L	20000	N/A	<25 U
ETHYLBENZENE	ug/L	700	N/A	<25 U
HEXACHLOROBUTADIENE	ug/L	20	N/A	<25 U
ISOPROPYLBENZENE	ug/L	1000	N/A	<25 U
M,P-XYLENE	ug/L	10000	N/A	<50 U
METHYLENE CHLORIDE	ug/L	5	N/A	<25 U
NAPHTHALENE	ug/L	2000	N/A	<20 U
N-BUTYLBENZENE	ug/L	4100	N/A	<25 U
N-PROPYLBENZENE	ug/L	4100	N/A	<12.5 U
O-XYLENE	ug/L	10000	N/A	<25 U
P-ISOPROPYLTOLUENE	ug/L	10000	N/A	<25 U
SEC-BUTYLBENZENE	ug/L	4100	N/A	<25 U
STYRENE	ug/L	100	N/A	<12.5 U
TERT-BUTYLBENZENE	ug/L	4100	N/A	<25 U
TETRACHLOROETHENE	ug/L	5	N/A	<25 U
TOLUENE	ug/L	1000	N/A	<25 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	N/A	<25 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	N/A	<50 U
TRICHLOROETHENE	ug/L	5	N/A	10000
TRICHLOROFLUOROMETHANE	ug/L	31000	N/A	<25 U
VINYL CHLORIDE	ug/L	2	N/A	46 J
Semivolatile Organic Compounds (8270D)				
HEXACHLOROBENZENE	ug/L	1	<0.5 U	<0.5 U
Inorganic Anions (9056)				
CHLORIDE	mg/L		524	470
SULFATE	mg/L		151	152

Location ID: Sample Date:	Units	MCL/ MSC	LH18/24- SP650-6138- COMP 12/12/2013	LH18/24- SP650-6138- GRAB 12/12/2013	LH18/24- SP650-6141- COMP 12/23/2013	LH18/24- SP650-6141- GRAB 12/23/2013	LH18/24- SP650-6142- COMP 12/29/2013
ID Location:			GWTP – Collected from holding jar which collects the discharge from a spigot on effluent TK-650 every couple of hours Sampled Biweekly	GWTP – Collected from a spigot on the discharge of effluent TK-650 Sampled Biweekly	GWTP – Collected from holding jar which collects the discharge from a spigot on effluent TK-650 every couple of hours Sampled Biweekly	GWTP – Collected from a spigot on the discharge of effluent TK-650 Sampled Biweekly	GWTP – Collected from holding jar which collects the discharge from a spigot on effluent TK-650 every couple of hours Sampled Quarterly
Oil and Grease (1664A)							
OIL & GREASE	mg/L		N/A	N/A	N/A	N/A	1.9 J
Chemical Oxygen Demand (410.4)							
CHEMICAL OXYGEN DEMAND	mg/L		N/A	N/A	N/A	N/A	263
Metals (6010C)							
ALUMINUM	mg/L	100	N/A	N/A	N/A	N/A	<0.1 U
IRON	mg/L		N/A	N/A	N/A	N/A	0.165 J
SELENIUM	mg/L	0.05	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U
Metals (6020A)							
ANTIMONY	mg/L	0.006	N/A	N/A	N/A	N/A	0.000744 J
ARSENIC	mg/L	0.01	N/A	N/A	N/A	N/A	0.00421
BARIUM	mg/L	2	N/A	N/A	N/A	N/A	0.428
CADMIUM	mg/L	0.005	N/A	N/A	N/A	N/A	<0.0006 U
CHROMIUM	mg/L	0.1	N/A	N/A	N/A	N/A	0.00706
COBALT	mg/L	6.1	N/A	N/A	N/A	N/A	0.00228
LEAD	mg/L	0.015	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U
MANGANESE	mg/L	14	N/A	N/A	N/A	N/A	0.151
NICKEL	mg/L	2	N/A	N/A	N/A	N/A	0.0172
SILVER	mg/L	0.51	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U
THALLIUM	mg/L	0.002	N/A	N/A	N/A	N/A	<0.0002 U
VANADIUM	mg/L	0.72	N/A	N/A	N/A	N/A	<0.001 U
ZINC	mg/L	31	N/A	N/A	N/A	N/A	0.0309 J
Perchlorate (6850)							
PERCHLORATE	ug/L	72	<0.2 U	<0.2 U	1.19	1.38	10800
Hexavalent Chromium (7196A)							
HEXAVALENT CHROMIUM	mg/L	0.1	N/A	N/A	<0.01 U	<0.01 U	<0.01 UJ
Volatile Organic Compounds (8260B)							
1,1,1,2-TETRACHLOROETHANE	ug/L	110	N/A	<0.5 U	N/A	<0.5 U	N/A
1,1,1-TRICHLOROETHANE	ug/L	200	N/A	<0.5 U	N/A	<0.5 U	N/A
1,1,2,2-TETRACHLOROETHANE	ug/L	14	N/A	<0.4 U	N/A	<0.4 U	N/A
1,1,2-TRICHLOROETHANE	ug/L	5	N/A	<0.5 U	N/A	<0.5 U	N/A
1,1-DICHLOROETHANE	ug/L	10000	N/A	<0.25 U	N/A	<0.25 U	N/A
1,1-DICHLOROETHENE	ug/L	7	N/A	<1 U	N/A	<1 U	N/A
1,1-DICHLOROPROPENE	ug/L	2.9	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2,3-TRICHLOROBENZENE	ug/L	310	N/A	<0.3 U	N/A	<0.3 U	N/A
1,2,3-TRICHLOROPROPANE	ug/L	0.004	N/A	<1 U	N/A	<1 UJ	N/A
1,2,4-TRICHLOROBENZENE	ug/L	70	N/A	<0.4 U	N/A	<0.4 U	N/A
1,2,4-TRIMETHYLBENZENE	ug/L	5100	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	N/A	<2 U	N/A	<2 U	N/A
1,2-DIBROMOETHANE	ug/L	0.005	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2-DICHLOROBENZENE	ug/L	600	N/A	<0.25 U	N/A	<0.25 U	N/A
1,2-DICHLOROETHANE	ug/L	5	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2-DICHLOROPROPANE	ug/L	5	N/A	<0.4 U	N/A	<0.4 U	N/A
1,3,5-TRIMETHYLBENZENE	ug/L	5100	N/A	<0.5 U	N/A	<0.5 U	N/A
1,3-DICHLOROBENZENE	ug/L	3100	N/A	<0.5 U	N/A	<0.5 U	N/A
1,3-DICHLOROPROPANE	ug/L	29	N/A	<0.4 U	N/A	<0.4 U	N/A
1,4-DICHLOROBENZENE	ug/L	75	N/A	<0.25 U	N/A	<0.25 U	N/A
2,2-DICHLOROPROPANE	ug/L	42	N/A	<0.5 U	N/A	<0.5 U	N/A
2-BUTANONE	ug/L	61000	N/A	<5 U	N/A	<5 U	N/A
2-CHLOROTOLUENE	ug/L	2000	N/A	<0.25 U	N/A	<0.25 U	N/A
2-HEXANONE	ug/L	6100	N/A	<5 U	N/A	<5 U	N/A
4-CHLOROTOLUENE	ug/L	2000	N/A	<0.5 U	N/A	<0.5 UJ	N/A
4-METHYL-2-PENTANONE	ug/L	8200	N/A	<5 U	N/A	<5 U	N/A
ACETONE	ug/L	92000	N/A	75.9	N/A	78.3 J	N/A
BENZENE	ug/L	5	N/A	<0.25 U	N/A	<0.25 U	N/A
BROMOBENZENE	ug/L	2000	N/A	<0.25 U	N/A	<0.25 U	N/A
BROMOCHLOROMETHANE	ug/L	4100	N/A	<0.4 U	N/A	<0.4 U	N/A
BROMODICHLOROMETHANE	ug/L	4.6	N/A	<0.5 U	N/A	<0.5 U	N/A
BROMOFORM	ug/L	36	N/A	<1 U	N/A	<1 U	N/A
BROMOMETHANE	ug/L	140	N/A	<1 U	N/A	<1 U	N/A
CARBON DISULFIDE	ug/L	10000	N/A	<1 U	N/A	2.54	N/A
CARBON TETRACHLORIDE	ug/L	5	N/A	<0.5 U	N/A	<0.5 U	N/A
CHLOROBENZENE	ug/L	100	N/A	<0.25 U	N/A	<0.25 U	N/A
CHLOROETHANE	ug/L	41000	N/A	<1 U	N/A	<1 U	N/A
CHLOROFORM	ug/L	1000	N/A	<0.25 U	N/A	<0.25 U	N/A
CHLOROMETHANE	ug/L	220	N/A	<1 U	N/A	<1 U	N/A
CIS-1,2-DICHLOROETHENE	ug/L	70	N/A	0.719 J	N/A	0.688 J	N/A
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	N/A	<0.5 U	N/A	<0.5 U	N/A
DIBROMOCHLOROMETHANE	ug/L	34	N/A	<0.5 U	N/A	<0.5 U	N/A
DIBROMOMETHANE	ug/L	380	N/A	<0.5 U	N/A	<0.5 U	N/A
DICHLORODIFLUOROMETHANE	ug/L	20000	N/A	<0.5 U	N/A	<0.5 U	N/A
ETHYLBENZENE	ug/L	700	N/A	<0.5 U	N/A	<0.5 U	N/A
HEXACHLOROBUTADIENE	ug/L	20	N/A	<0.5 U	N/A	<0.5 U	N/A
ISOPROPYLBENZENE	ug/L	1000	N/A	<0.5 U	N/A	<0.5 U	N/A
M,P-XYLENE	ug/L	10000	N/A	<1 U	N/A	<1 U	N/A
METHYLENE CHLORIDE	ug/L	5	N/A	<0.5 U	N/A	<0.5 U	N/A
NAPHTHALENE	ug/L	2000	N/A	<0.4 U	N/A	<0.4 U	N/A
N-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	N/A	<0.5 U	N/A
N-PROPYLBENZENE	ug/L	4100	N/A	<0.25 U	N/A	<0.25 U	N/A
O-XYLENE	ug/L	10000	N/A	<0.5 U	N/A	<0.5 U	N/A
P-ISOPROPYLTOLUENE	ug/L	10000	N/A	<0.5 U	N/A	<0.5 U	N/A
SEC-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	N/A	<0.5 U	N/A
STYRENE	ug/L	100	N/A	<0.25 U	N/A	<0.25 U	N/A
TERT-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	N/A	<0.5 U	N/A
TETRACHLOROETHENE	ug/L	5	N/A	<0.5 U	N/A	<0.5 U	N/A
TOLUENE	ug/L	1000	N/A	<0.5 U	N/A	<0.5 U	N/A
TRANS-1,2-DICHLOROETHENE	ug/L	100	N/A	<0.5 U	N/A	<0.5 U	N/A
TRANS-1,3-DICHLOROPROPENE	ug/L	29	N/A	<1 U	N/A	<1 U	N/A
TRICHLOROETHENE	ug/L	5	N/A	0.954 J	N/A	0.984 J	N/A
TRICHLOROFLUOROMETHANE	ug/L	31000	N/A	<0.5 U	N/A	<0.5 U	N/A
VINYL CHLORIDE	ug/L	2	N/A	<0.5 U	N/A	<0.5 U	N/A
Semivolatile Organic Compounds (8270D)							
HEXACHLOROBENZENE	ug/L	1	N/A	N/A	N/A	N/A	<0.5 U
Inorganic Anions (9056)							
CHLORIDE	mg/L		716	718	741	753	708
SULFATE	mg/L		153	154	151	147	201

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	LH18/24-SP650-6142-GRAB 12/29/2013	LH18/24-SP650-6144-COMP 1/8/2014	LH18/24-SP650-6144-GRAB 1/8/2014
ID Location:			GWTP – Collected from a spigot on the discharge of effluent TK-650 Sampled Quarterly	GWTP – Collected from holding jar which collects the discharge from a spigot on effluent TK-650 every couple of hours Sampled Biweekly	GWTP – Collected from a spigot on the discharge of effluent TK-650 Sampled Biweekly
Oil and Grease (1664A)					
OIL & GREASE	mg/L		<2.8 U	N/A	N/A
Chemical Oxygen Demand (410.4)					
CHEMICAL OXYGEN DEMAND	mg/L		272	N/A	N/A
Metals (6010C)					
ALUMINUM	mg/L	100	<0.1 U	N/A	N/A
IRON	mg/L		0.153 J	N/A	N/A
SELENIUM	mg/L	0.05	<0.01 U	<0.01 U	<0.01 U
Metals (6020A)					
ANTIMONY	mg/L	0.006	0.000607 J	N/A	N/A
ARSENIC	mg/L	0.01	0.00429	N/A	N/A
BARIUM	mg/L	2	0.412	N/A	N/A
CADMIUM	mg/L	0.005	<0.0006 U	N/A	N/A
CHROMIUM	mg/L	0.1	0.00549	N/A	N/A
COBALT	mg/L	6.1	0.00234	N/A	N/A
LEAD	mg/L	0.015	<0.001 U	<0.001 U	0.000965 J
MANGANESE	mg/L	14	0.15	N/A	N/A
NICKEL	mg/L	2	0.0175	N/A	N/A
SILVER	mg/L	0.51	<0.001 U	<0.001 U	<0.001 U
THALLIUM	mg/L	0.002	<0.0002 U	N/A	N/A
VANADIUM	mg/L	0.72	<0.001 U	N/A	N/A
ZINC	mg/L	31	0.0271 J	N/A	N/A
Perchlorate (6850)					
PERCHLORATE	ug/L	72	11400	9980	10200
Hexavalent Chromium (7196A)					
HEXAVALENT CHROMIUM	mg/L	0.1	<0.01 UJ	<0.01 U	<0.01 U
Volatile Organic Compounds (8260B)					
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U	N/A	<0.5 U
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U	N/A	<0.5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U	N/A	<0.4 U
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 U	N/A	<0.5 U
1,1-DICHLOROETHANE	ug/L	10000	<0.25 U	N/A	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	<1 U	N/A	<1 U
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 UJ	N/A	<0.5 U
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U	N/A	<0.3 U
1,2,3-TRICHLOROPROPANE	ug/L	0.004	<1 UJ	N/A	<1 U
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U	N/A	<0.4 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	N/A	<0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 UJ	N/A	<2 U
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	N/A	<0.5 U
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	N/A	<0.25 U
1,2-DICHLOROETHANE	ug/L	5	<0.5 U	N/A	<0.5 U
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	N/A	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	N/A	<0.5 U
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	N/A	<0.5 U
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	N/A	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	N/A	<0.25 U
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	N/A	<0.5 U
2-BUTANONE	ug/L	61000	<5 UJ	N/A	<5 U
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	N/A	<0.25 U
2-HEXANONE	ug/L	6100	<5 U	N/A	<5 U
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	N/A	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	N/A	<5 U
ACETONE	ug/L	92000	141 J	N/A	205
BENZENE	ug/L	5	<0.25 U	N/A	<0.25 U
BROMOBENZENE	ug/L	2000	<0.25 U	N/A	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	N/A	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	N/A	<0.5 U
BROMOFORM	ug/L	36	<1 U	N/A	<1 U
BROMOMETHANE	ug/L	140	<1 U	N/A	<1 U
CARBON DISULFIDE	ug/L	10000	<1 U	N/A	<1 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	N/A	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U	N/A	<0.25 U
CHLOROETHANE	ug/L	41000	<1 U	N/A	<1 U
CHLOROFORM	ug/L	1000	<0.25 U	N/A	<0.25 U
CHLOROMETHANE	ug/L	220	<1 U	N/A	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	0.696 J	N/A	0.985 J
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	N/A	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	N/A	<0.5 U
DIBROMOMETHANE	ug/L	380	<0.5 U	N/A	<0.5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	N/A	<0.5 U
ETHYLBENZENE	ug/L	700	<0.5 U	N/A	<0.5 U
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	N/A	<0.5 U
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	N/A	<0.5 U
M,P-XYLENE	ug/L	10000	<1 U	N/A	<1 U
METHYLENE CHLORIDE	ug/L	5	<0.5 U	N/A	<0.5 U
NAPHTHALENE	ug/L	2000	<0.4 U	N/A	<0.4 U
N-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U
N-PROPYLBENZENE	ug/L	4100	<0.25 U	N/A	<0.25 U
O-XYLENE	ug/L	10000	<0.5 U	N/A	<0.5 U
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	N/A	<0.5 U
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U
STYRENE	ug/L	100	<0.25 U	N/A	<0.25 U
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U
TETRACHLOROETHENE	ug/L	5	<0.5 U	N/A	<0.5 U
TOLUENE	ug/L	1000	<0.5 U	N/A	<0.5 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	<0.5 U	N/A	<0.5 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	N/A	<1 U
TRICHLOROETHENE	ug/L	5	0.893 J	N/A	1.59
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	N/A	<0.5 U
VINYL CHLORIDE	ug/L	2	<0.5 U	N/A	<0.5 U
Semivolatile Organic Compounds (8270D)					
HEXACHLOROBENZENE	ug/L	1	<0.5 U	N/A	N/A
Inorganic Anions (9056)					
CHLORIDE	mg/L		712	687	715
SULFATE	mg/L		203	159	171

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	12WW20- 010814 1/8/2014	12WW21- 010814 1/8/2014	12WW22- 010814 1/8/2014	12WW23- 010814 1/8/2014	12WW24- 12111 12/11/2013
ID Location:			Site 12 – NW, central region, near landfill cap. Sampled Annually	Site 12 – N, middle region. Sampled Annually	Site 12 – NNW, outer region, along parcel boundary. Sampled Annually	Site 12 – NE, outer region along road within parcel boundary. Sampled Annually	Site 12 – NW, central region, near landfill cap. Sampled Annually
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
1,1,1-TRICHLOROETHANE	ug/L	200	<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
1,1,2-TRICHLOROETHANE	ug/L	5	<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	0.733 J
1,1-DICHLOROETHENE	ug/L	7	<1 U	<1 U	<1 U	<1 U	0.888 J
1,1-DICHLOROPROPENE	ug/L	2.9	<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
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<1 U	<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
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<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
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	<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
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<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
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	<0.25 U	<0.25 U	<0.25 U	3.64
2,2-DICHLOROPROPANE	ug/L	42	<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
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
2-HEXANONE	ug/L	6100	<5 U	<5 U	<5 U	<5 U	<5 U
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	<5 U	<5 U	<5 U	<5 U
ACETONE	ug/L	92000	<5 U	<5 U	<5 U	8.76 J	7.45 J
BENZENE	ug/L	5	<0.25 U	<0.25 U	<0.25 U	<0.25 U	0.619 J
BROMOBENZENE	ug/L	2000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
BROMOFORM	ug/L	36	<1 U	<1 U	<1 U	<1 U	<1 U
BROMOMETHANE	ug/L	140	<1 U	<1 U	<1 U	<1 U	<1 U
CARBON DISULFIDE	ug/L	10000	<1 U	<1 U	<1 U	<1 U	<1 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U	<0.25 U	<0.25 U	<0.25 U	7.32
CHLOROETHANE	ug/L	41000	<1 U	<1 U	<1 U	<1 U	<1 U
CHLOROFORM	ug/L	1000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	0.143 J
CHLOROMETHANE	ug/L	220	<1 U	<1 U	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	0.552 J	<0.5 U	<0.5 U	<0.5 U	66.1
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<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
DICHLORODIFLUOROMETHANE	ug/L	20000	<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
HEXACHLOROBUTADIENE	ug/L	20	<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
M,P-XYLENE	ug/L	10000	<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
NAPHTHALENE	ug/L	2000	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
N-BUTYLBENZENE	ug/L	4100	<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
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	<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
TERT-BUTYLBENZENE	ug/L	4100	<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	1.54
TOLUENE	ug/L	1000	<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	0.276 J
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	<1 U	<1 U	<1 U	<1 U
TRICHLOROETHENE	ug/L	5	0.721 J	<0.5 U	<0.5 U	<0.5 U	259
TRICHLOROFLUOROMETHANE	ug/L	31000	<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	0.873 J

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	109- 121413 12/14/2013	109F- 121413 12/14/2013	120- 121413 12/14/2013	120F- 121413 12/14/2013	123- 121413 12/14/2013	123F- 121413 12/14/2013	126- 121413 12/14/2013	126F- 121413 12/14/2013
ID Location:			Site 18/24 – NE, just inside the fence line Sampled Semi-annually	Site 18/24 – NE, just inside the fence line. Filtered, Sampled Semi-annually	Site 18/24 – W, inside the fence line, outer region Sampled annually	Site 18/24 – W, inside the fence line, outer region. Filtered, Sampled annually	Site 18/24 – NW inside the fence line outer region Sampled Semi-annually	Site 18/24 – NW inside the fence line outer region. Filtered, Sampled Semi-annually	Site 18/24 – SE, on right side of road as you turn toward Site 18/24 entrance Sampled Semi-annually	Site 18/24 – SE, on right side of road as you turn toward Site 18/24 entrance. Filtered, Sampled Semi-annually
Alkalinity (310.2)										
ALKALINITY, TOTAL	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Organic Carbon (415.1)										
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Metals (6010C)										
ALUMINUM	mg/L	100	N/A	<0.1 U	N/A	<0.1 U	N/A	<0.1 U	N/A	<0.1 U
BERYLLIUM	mg/L	0.004	N/A	<0.01 U	N/A	<0.01 U	N/A	<0.01 U	N/A	<0.01 U
CALCIUM	mg/L		N/A	28.5	N/A	14.9	N/A	13.7	N/A	293
IRON	mg/L		N/A	<0.1 U	N/A	<0.1 U	N/A	<0.1 U	N/A	0.122 J
MAGNESIUM	mg/L		N/A	22.6	N/A	16.4	N/A	9.71	N/A	237
POTASSIUM	mg/L		N/A	<1 U	N/A	1.64 J	N/A	<1 U	N/A	2.08
SELENIUM	mg/L	0.05	N/A	<0.01 U	N/A	<0.01 U	N/A	<0.01 U	N/A	<0.01 U
SODIUM	mg/L		N/A	258	N/A	547	N/A	61.5	N/A	843
Metals (6020A)										
ANTIMONY	mg/L	0.006	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U
ARSENIC	mg/L	0.01	N/A	0.00134 J	N/A	0.00414	N/A	<0.001 U	N/A	0.0125
BARIUM	mg/L	2	N/A	0.418	N/A	0.068	N/A	0.19	N/A	9.38
CADMIUM	mg/L	0.005	N/A	<0.0006 U	N/A	0.000679 J	N/A	<0.0006 U	N/A	0.000393 J
CHROMIUM	mg/L	0.1	N/A	<0.002 U	N/A	<0.002 U	N/A	<0.002 U	N/A	0.00207 J
COBALT	mg/L	6.1	N/A	<0.001 U	N/A	0.0282	N/A	0.00168 J	N/A	0.0029
COPPER	mg/L	1.3	N/A	<0.002 U	N/A	0.00532	N/A	0.0014 J	N/A	0.00481
LEAD	mg/L	0.015	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U
MANGANESE	mg/L	14	N/A	0.00396 J	N/A	0.383	N/A	0.00209 J	N/A	0.0739
NICKEL	mg/L	2	N/A	0.00284 J	N/A	0.0229	N/A	0.00288 J	N/A	0.0215
SILVER	mg/L	0.51	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U
THALLIUM	mg/L	0.002	N/A	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U
VANADIUM	mg/L	0.72	N/A	0.000516 J	N/A	0.00166 J	N/A	<0.001 U	N/A	<0.001 U
ZINC	mg/L	31	N/A	<0.025 U	N/A	0.0287 J	N/A	<0.025 U	N/A	0.035 J
Perchlorate (6850)										
PERCHLORATE	ug/L	72	85300	N/A	124000	N/A	15	N/A	0.887	N/A
Mercury (7470A)										
MERCURY	mg/L	0.002	N/A	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U
Volatile Organic Compounds (8260B)										
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,1,1-TRICHLOROETHANE	ug/L	200	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<2 U	N/A	<40 U	N/A	<0.4 U	N/A	<0.4 U	N/A
1,1,2-TRICHLOROETHANE	ug/L	5	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,1-DICHLOROETHANE	ug/L	10000	3.17 J	N/A	41.2 J	N/A	<0.25 U	N/A	<0.25 U	N/A
1,1-DICHLOROETHENE	ug/L	7	13.5	N/A	278	N/A	<1 U	N/A	<1 U	N/A
1,1-DICHLOROPROPENE	ug/L	2.9	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2,3-TRICHLOROBENZENE	ug/L	310	<1.5 U	N/A	<30 U	N/A	<0.3 U	N/A	<0.3 U	N/A
1,2,3-TRICHLOROPROPANE	ug/L	0.004	<5 U	N/A	<100 U	N/A	<1 U	N/A	<1 U	N/A
1,2,4-TRICHLOROBENZENE	ug/L	70	<2 U	N/A	<40 U	N/A	<0.4 U	N/A	<0.4 U	N/A
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<10 U	N/A	<200 U	N/A	<2 U	N/A	<2 U	N/A
1,2-DIBROMOETHANE	ug/L	0.005	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2-DICHLOROBENZENE	ug/L	600	<1.25 U	N/A	<25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
1,2-DICHLOROETHANE	ug/L	5	<2.5 U	N/A	89.3 J	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2-DICHLOROPROPANE	ug/L	5	<2 U	N/A	<40 U	N/A	<0.4 U	N/A	<0.4 U	N/A
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,3-DICHLOROBENZENE	ug/L	3100	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,3-DICHLOROPROPANE	ug/L	29	<2 U	N/A	<40 U	N/A	<0.4 U	N/A	<0.4 U	N/A
1,4-DICHLOROBENZENE	ug/L	75	<1.25 U	N/A	<25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
2,2-DICHLOROPROPANE	ug/L	42	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
2-BUTANONE	ug/L	61000	<25 U	N/A	<500 U	N/A	<5 U	N/A	<5 U	N/A
2-CHLOROTOLUENE	ug/L	2000	<1.25 U	N/A	<25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
2-HEXANONE	ug/L	6100	<25 U	N/A	<500 U	N/A	<5 U	N/A	<5 U	N/A
4-CHLOROTOLUENE	ug/L	2000	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
4-METHYL-2-PENTANONE	ug/L	8200	<25 U	N/A	<500 U	N/A	<5 U	N/A	<5 U	N/A
ACETONE	ug/L	92000	<25 UJ	N/A	<500 U	N/A	<5 UJ	N/A	<5 U	N/A
BENZENE	ug/L	5	<1.25 U	N/A	<25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
BROMOBENZENE	ug/L	2000	<1.25 U	N/A	<25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
BROMOCHLOROMETHANE	ug/L	4100	<2 U	N/A	<40 U	N/A	<0.4 U	N/A	<0.4 U	N/A
BROMODICHLOROMETHANE	ug/L	4.6	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
BROMOFORM	ug/L	36	<5 U	N/A	<100 U	N/A	<1 U	N/A	<1 U	N/A
BROMOMETHANE	ug/L	140	<5 UJ	N/A	<100 U	N/A	<1 UJ	N/A	<1 U	N/A
CARBON DISULFIDE	ug/L	10000	<5 U	N/A	<100 U	N/A	<1 U	N/A	<1 U	N/A
CARBON TETRACHLORIDE	ug/L	5	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
CHLOROBENZENE	ug/L	100	<1.25 U	N/A	<25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
CHLOROETHANE	ug/L	41000	<5 U	N/A	<100 U	N/A	<1 U	N/A	<1 U	N/A
CHLOROFORM	ug/L	1000	4.02 J	N/A	102	N/A	<0.25 U	N/A	<0.25 U	N/A
CHLOROMETHANE	ug/L	220	<5 U	N/A	<100 U	N/A	<1 U	N/A	<1 U	N/A
CIS-1,2-DICHLOROETHENE	ug/L	70	306	N/A	3200	N/A	<0.5 U	N/A	<0.5 U	N/A
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
DIBROMOCHLOROMETHANE	ug/L	34	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
DIBROMOMETHANE	ug/L	380	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
DICHLORODIFLUOROMETHANE	ug/L	20000	<2.5 UJ	N/A	<50 U	N/A	<0.5 UJ	N/A	<0.5 U	N/A
ETHYLBENZENE	ug/L	700	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
HEXACHLOROBUTADIENE	ug/L	20	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
ISOPROPYLBENZENE	ug/L	1000	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
M,P-XYLENE	ug/L	10000	<5 U	N/A	<100 U	N/A	<1 U	N/A	<1 U	N/A
METHYLENE CHLORIDE	ug/L	5	<2.5 U	N/A	214	N/A	<0.5 U	N/A	<0.5 U	N/A
NAPHTHALENE	ug/L	2000	<2 U	N/A	<40 U	N/A	<0.4 U	N/A	<0.4 U	N/A
N-BUTYLBENZENE	ug/L	4100	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
N-PROPYLBENZENE	ug/L	4100	<1.25 U	N/A	<25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
O-XYLENE	ug/L	10000	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
P-ISOPROPYLTOLUENE	ug/L	10000	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
SEC-BUTYLBENZENE	ug/L	4100	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
STYRENE	ug/L	100	<1.25 U	N/A	<25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
TERT-BUTYLBENZENE	ug/L	4100	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
TETRACHLOROETHENE	ug/L	5	2.25 J	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
TOLUENE	ug/L	1000	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
TRANS-1,2-DICHLOROETHENE	ug/L	100	5.03	N/A	27 J	N/A	<0.5 U	N/A	<0.5 U	N/A
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<5 U	N/A	<100 U	N/A	<1 U	N/A	<1 U	N/A
TRICHLOROETHENE	ug/L	5	1280 J	N/A	32200	N/A	<0.5 UJ	N/A	<0.5 U	N/A
TRICHLOROFLUOROMETHANE	ug/L	31000	<2.5 U	N/A	<50 U	N/A	<0.5 U	N/A	<0.5 U	N/A
VINYL CHLORIDE	ug/L	2	7.76	N/A	336	N/A	<0.5 U	N/A	<0.5 U	N/A
Inorganic Anions (9056)										
CHLORIDE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SULFATE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dissolved Gases (RSK-175)										
ETHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ETHENE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
METHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ferrous Iron (SM3500FE)										
FERROUS IRON	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dechlorinating Bacteria										
DEHALOCOCCOIDES (DHC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TCEA REDUCTASE (TCE)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BAV1 VINYL CHLORIDE REDUCTASE (BVC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE REDUCTASE (VCR)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	129- 121313 12/13/2013	129F- 121313 12/13/2013	17WW08- 121613 12/16/2013	17WW08F- 121613 12/16/2013	18CPTMW01DW- 120213 12/2/2013	18CPTMW01DWF- 120213 12/2/2013	18CPTMW01SW- 120213 12/2/2013	18CPTMW04- 120313 12/3/2013
ID Location:			Site 18/24 – SW, just inside the fence line Sampled Annually	Site 18/24 – SW, just inside the fence line. Filtered, Sampled Annually	Site 17 – SSW of 18/24, inside site 17 boarder. Sampled Annually	Site 17 – SSW of 18/24, inside site 17 boarder. Filtered, Sampled Annually	Site 18/24 – NE, inside the fence line, middle region Deep Wilcox Sampled Semi-annually	Site 18/24 – NE, inside the fence line, middle region Deep Wilcox. Filtered, Sampled Semi-annually	Site 18/24 – NE, inside the fence line, middle region Shallow Wilcox Sampled Semi-annually	Site 18/24 – NW, inside the fence line, middle region Sampled Semi-annually
Alkalinity (310.2)										
ALKALINITY, TOTAL	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Organic Carbon (415.1)										
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Metals (6010C)										
ALUMINUM	mg/L	100	N/A	<0.1 U	N/A	<0.1 U	N/A	<0.1 U	0.0511 J	<0.1 U
BERYLLIUM	mg/L	0.004	N/A	<0.01 U	N/A	<0.01 U	N/A	<0.01 U	<0.01 U	<0.01 U
CALCIUM	mg/L		N/A	25.6	N/A	49.5	N/A	8.5	40.8	43.4
IRON	mg/L		N/A	<0.1 U	N/A	14.5	N/A	0.297	35.7	1.82
MAGNESIUM	mg/L		N/A	20.2	N/A	33.7	N/A	2.87	19.8	37
POTASSIUM	mg/L		N/A	<1 U	N/A	1.07 J	N/A	3.9	9.7	1.22 J
SELENIUM	mg/L	0.05	N/A	<0.01 U	N/A	0.0142 J	N/A	<0.01 U	<0.01 U	<0.01 U
SODIUM	mg/L		N/A	242	N/A	429	N/A	206	104	316
Metals (6020A)										
ANTIMONY	mg/L	0.006	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	<0.001 U	<0.001 U
ARSENIC	mg/L	0.01	N/A	0.00126 J	N/A	0.00569 J	N/A	0.00458	0.0176	0.0102
BARIUM	mg/L	2	N/A	0.532	N/A	0.234	N/A	0.0598	0.968	1.34
CADMIUM	mg/L	0.005	N/A	0.000433 J	N/A	<0.0006 U	N/A	<0.0006 U	<0.0006 U	<0.0006 U
CHROMIUM	mg/L	0.1	N/A	0.00146 J	N/A	0.0124	N/A	<0.002 U	0.00265 J	<0.002 U
COBALT	mg/L	6.1	N/A	<0.001 U	N/A	0.00769	N/A	0.00301	0.00533	0.00233
COPPER	mg/L	1.3	N/A	0.00135 J	N/A	0.00486	N/A	<0.002 U	0.00154 J	<0.002 U
LEAD	mg/L	0.015	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	<0.001 U	<0.001 U
MANGANESE	mg/L	14	N/A	0.00838	N/A	0.804	N/A	0.0637	0.637	0.192
NICKEL	mg/L	2	N/A	0.00797 J	N/A	0.378 J	N/A	0.0054 J	0.00732 J	0.00479 J
SILVER	mg/L	0.51	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	<0.001 U	<0.001 U
THALLIUM	mg/L	0.002	N/A	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U	<0.0002 U	<0.0002 U
VANADIUM	mg/L	0.72	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	0.000715 J	<0.001 U
ZINC	mg/L	31	N/A	0.0218 J	N/A	<0.025 U	N/A	<0.025 U	0.0564	<0.025 U
Perchlorate (6850)										
PERCHLORATE	ug/L	72	129000	N/A	0.159 J	N/A	<0.2 U	N/A	6.03	0.364 J
Mercury (7470A)										
MERCURY	mg/L	0.002	N/A	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U	<0.0002 U	<0.0002 U
Volatile Organic Compounds (8260B)										
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
1,1,1-TRICHLOROETHANE	ug/L	200	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<2 U	N/A	<0.4 U	N/A	<0.4 U	N/A	<4 U	<0.4 U
1,1,2-TRICHLOROETHANE	ug/L	5	3.93 J	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
1,1-DICHLOROETHANE	ug/L	10000	<1.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A	<2.5 U	0.312 J
1,1-DICHLOROETHENE	ug/L	7	2.6 J	N/A	<1 U	N/A	<1 U	N/A	15.8 J	2.31
1,1-DICHLOROPROPENE	ug/L	2.9	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
1,2,3-TRICHLOROBENZENE	ug/L	310	<1.5 U	N/A	<0.3 U	N/A	<0.3 U	N/A	<3 U	<0.3 U
1,2,3-TRICHLOROPROPANE	ug/L	0.004	<5 U	N/A	<1 U	N/A	<1 U	N/A	<10 U	<1 U
1,2,4-TRICHLOROBENZENE	ug/L	70	<2 U	N/A	<0.4 U	N/A	<0.4 U	N/A	<4 U	<0.4 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<10 U	N/A	<2 U	N/A	<2 U	N/A	<20 U	<2 U
1,2-DIBROMOETHANE	ug/L	0.005	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
1,2-DICHLOROBENZENE	ug/L	600	<1.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A	<2.5 U	<0.25 U
1,2-DICHLOROETHANE	ug/L	5	154	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	0.489 J
1,2-DICHLOROPROPANE	ug/L	5	<2 U	N/A	<0.4 U	N/A	<0.4 U	N/A	<4 U	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
1,3-DICHLOROBENZENE	ug/L	3100	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
1,3-DICHLOROPROPANE	ug/L	29	<2 U	N/A	<0.4 U	N/A	<0.4 U	N/A	<4 U	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	<1.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A	<2.5 U	<0.25 U
2,2-DICHLOROPROPANE	ug/L	42	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
2-BUTANONE	ug/L	61000	<25 U	N/A	<5 U	N/A	<5 U	N/A	<50 U	<5 U
2-CHLOROTOLUENE	ug/L	2000	<1.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A	<2.5 U	<0.25 U
2-HEXANONE	ug/L	6100	<25 U	N/A	<5 U	N/A	<5 U	N/A	<50 U	<5 U
4-CHLOROTOLUENE	ug/L	2000	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	<25 U	N/A	<5 U	N/A	<5 U	N/A	<50 U	<5 U
ACETONE	ug/L	92000	<25 UJ	N/A	<5 U	N/A	<5 U	N/A	<50 U	<5 U
BENZENE	ug/L	5	1.18 J	N/A	<0.25 U	N/A	<0.25 U	N/A	6.68 J	<0.25 U
BROMOBENZENE	ug/L	2000	<1.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A	<2.5 U	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<2 U	N/A	<0.4 U	N/A	<0.4 U	N/A	18.8	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
BROMOFORM	ug/L	36	<5 U	N/A	<1 U	N/A	<1 U	N/A	<10 U	<1 U
BROMOMETHANE	ug/L	140	<5 U	N/A	<1 U	N/A	<1 U	N/A	<10 U	<1 U
CARBON DISULFIDE	ug/L	10000	<5 U	N/A	<1 U	N/A	<1 UJ	N/A	<10 UJ	<1 UJ
CARBON TETRACHLORIDE	ug/L	5	1.68 J	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
CHLOROBENZENE	ug/L	100	<1.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A	<2.5 U	<0.25 U
CHLOROETHANE	ug/L	41000	<5 U	N/A	<1 U	N/A	<1 U	N/A	<10 U	<1 U
CHLOROFORM	ug/L	1000	10.2	N/A	<0.25 U	N/A	<0.25 U	N/A	5.28 J	<0.25 U
CHLOROMETHANE	ug/L	220	<5 U	N/A	<1 U	N/A	<1 U	N/A	<10 U	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	8.71	N/A	<0.5 U	N/A	<0.5 U	N/A	30.4	71.5
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
DIBROMOMETHANE	ug/L	380	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
ETHYLBENZENE	ug/L	700	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
HEXACHLOROBUTADIENE	ug/L	20	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
ISOPROPYLBENZENE	ug/L	1000	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
M,P-XYLENE	ug/L	10000	<5 U	N/A	<1 U	N/A	<1 U	N/A	<10 U	<1 U
METHYLENE CHLORIDE	ug/L	5	<2.5 U	N/A	<0.5 U	N/A	0.274 J	N/A	22600	<0.5 U
NAPHTHALENE	ug/L	2000	<2 U	N/A	<0.4 U	N/A	<0.4 U	N/A	<4 U	<0.4 U
N-BUTYLBENZENE	ug/L	4100	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
N-PROPYLBENZENE	ug/L	4100	<1.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A	<2.5 U	<0.25 U
O-XYLENE	ug/L	10000	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
P-ISOPROPYLTOLUENE	ug/L	10000	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
SEC-BUTYLBENZENE	ug/L	4100	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
STYRENE	ug/L	100	<1.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A	<2.5 U	<0.25 U
TERT-BUTYLBENZENE	ug/L	4100	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
TETRACHLOROETHENE	ug/L	5	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	1.04
TOLUENE	ug/L	1000	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	7.78 J	<0.5 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	4.03 J	0.324 J
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<5 U	N/A	<1 U	N/A	<1 U	N/A	<10 U	<1 U
TRICHLOROETHENE	ug/L	5	3170	N/A	<0.5 U	N/A	1	N/A	1100	128
TRICHLOROFLUOROMETHANE	ug/L	31000	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	<0.5 U
VINYL CHLORIDE	ug/L	2	<2.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A	<5 U	5.56
Inorganic Anions (9056)										
CHLORIDE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SULFATE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dissolved Gases (RSK-175)										
ETHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ETHENE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
METHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ferrous Iron (SM3500FE)										
FERROUS IRON	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dechlorinating Bacteria										
DEHALOCOCCOIDES (DHC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TCEA REDUCTASE (TCE)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BAV1 VINYL CHLORIDE REDUCTASE (BVC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE REDUCTASE (VCR)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	18CPTMW04SW-120313 12/3/2013	18CPTMW04SWF-120313 12/3/2013	18CPTMW06-120513 12/5/2013	18CPTMW07-120513 12/5/2013	18CPTMW07F-120513 12/5/2013 1	18CPTMW08DW-120213 12/2/2013	18CPTMW08DWF-120213 12/2/2013	18CPTMW08SW-120213 12/2/2013
ID Location:			Site 18/24 – NW, inside the fence line, middle region Shallow Wilcox Sampled Semi-annually	Site 18/24 – NW, inside the fence line, middle region Shallow Wilcox. Filtered, Sampled Semi-annually	Site 18/24 – SSE, inside the fence line, middle region Sampled Semi-annually	Site 18/24 – NNE, inside the fence line, outer region Sampled Semi-annually	Site 18/24 – NNE, inside the fence line, outer region. Filtered, Sampled Semi-annually	Site 18/24 – N, inside the fence line, outer region Deep Wilcox Sampled Semi-annually	Site 18/24 – N, inside the fence line, outer region Deep Wilcox. Filtered, Sampled Semi-annually	Site 18/24 – N, inside the fence line, outer region Shallow Wilcox, Sampled Semi-annually
Alkalinity (310.2)										
ALKALINITY, TOTAL	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Organic Carbon (415.1)										
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Metals (6010C)										
ALUMINUM	mg/L	100	N/A	<0.1 U	0.122 J	N/A	<0.1 U	N/A	<0.1 U	0.135 J
BERYLLIUM	mg/L	0.004	N/A	<0.01 U	<0.01 U	N/A	<0.01 U	N/A	<0.01 U	<0.01 U
CALCIUM	mg/L		N/A	43.9	2.84	N/A	43.1	N/A	5.74	32.2
IRON	mg/L		N/A	9.99	0.164 J	N/A	6.63	N/A	0.198 J	1.17
MAGNESIUM	mg/L		N/A	16.6	3.22	N/A	18.5	N/A	3.99	30.7
POTASSIUM	mg/L		N/A	52.7	181	N/A	19.8	N/A	80.5	3.78
SELENIUM	mg/L	0.05	N/A	<0.01 U	<0.01 U	N/A	<0.01 U	N/A	<0.01 U	<0.01 U
SODIUM	mg/L		N/A	117	181	N/A	112	N/A	135	127
Metals (6020A)										
ANTIMONY	mg/L	0.006	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	<0.001 U
ARSENIC	mg/L	0.01	N/A	0.00831	0.00508	N/A	0.00821	N/A	0.00266	0.00103 J
BARIUM	mg/L	2	N/A	0.95	0.198	N/A	0.848	N/A	0.0611	0.835
CADMIUM	mg/L	0.005	N/A	<0.0006 U	<0.0006 U	N/A	<0.0006 U	N/A	<0.0006 U	<0.0006 U
CHROMIUM	mg/L	0.1	N/A	<0.002 U	0.00948	N/A	<0.002 U	N/A	<0.002 U	0.00134 J
COBALT	mg/L	6.1	N/A	0.00386	<0.001 U	N/A	0.00672	N/A	<0.001 U	0.0209
COPPER	mg/L	1.3	N/A	<0.002 U	0.00128 J	N/A	0.00109 J	N/A	<0.002 U	0.00104 J
LEAD	mg/L	0.015	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	<0.001 U
MANGANESE	mg/L	14	N/A	0.718	0.0174	N/A	0.634	N/A	0.0394	0.898
NICKEL	mg/L	2	N/A	0.00226 J	<0.004 U	N/A	0.00907	N/A	<0.004 U	0.0138
SILVER	mg/L	0.51	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	<0.001 U
THALLIUM	mg/L	0.002	N/A	<0.0002 U	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U	<0.0002 U
VANADIUM	mg/L	0.72	N/A	<0.001 U	0.00207	N/A	<0.001 U	N/A	<0.001 U	<0.001 U
ZINC	mg/L	31	N/A	<0.025 U	<0.025 U	N/A	<0.025 U	N/A	<0.025 U	0.0355 J
Perchlorate (6850)										
PERCHLORATE	ug/L	72	<0.2 U	N/A	0.818	<0.2 U	N/A	3.09	N/A	58000
Mercury (7470A)										
MERCURY	mg/L	0.002	N/A	<0.0002 U	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U	<0.0002 U
Volatile Organic Compounds (8260B)										
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,1-DICHLOROETHANE	ug/L	10000	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	4.99
1,1-DICHLOROETHENE	ug/L	7	<1 U	N/A	<1 U	<1 U	N/A	<1 U	N/A	1.5 J
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U	N/A	<0.3 U	<0.3 U	N/A	<0.3 U	N/A	<0.3 U
1,2,3-TRICHLOROPROPANE	ug/L	0.004	<1 U	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	N/A	<2 U	<2 U	N/A	<2 U	N/A	<2 U
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
1,2-DICHLOROETHANE	ug/L	5	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
2-BUTANONE	ug/L	61000	<5 U	N/A	<5 U	<5 U	N/A	<5 U	N/A	<5 U
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
2-HEXANONE	ug/L	6100	<5 U	N/A	<5 U	<5 U	N/A	<5 U	N/A	<5 U
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	N/A	<5 U	<5 U	N/A	<5 U	N/A	<5 U
ACETONE	ug/L	92000	<5 U	N/A	<5 U	<5 U	N/A	<5 U	N/A	<5 U
BENZENE	ug/L	5	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	0.161 J
BROMOBENZENE	ug/L	2000	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
BROMOFORM	ug/L	36	<1 U	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
BROMOMETHANE	ug/L	140	<1 U	N/A	<1 U	<1 UJ	N/A	<1 U	N/A	<1 U
CARBON DISULFIDE	ug/L	10000	<1 UJ	N/A	12.8	<1 U	N/A	25	N/A	<1 UJ
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
CHLOROETHANE	ug/L	41000	<1 U	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
CHLOROFORM	ug/L	1000	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	0.918 J
CHLOROMETHANE	ug/L	220	<1 U	N/A	<1 U	<1 UJ	N/A	<1 U	N/A	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	<0.5 U	N/A	6.45	<0.5 U	N/A	<0.5 U	N/A	23.2
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
DIBROMOMETHANE	ug/L	380	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
ETHYLBENZENE	ug/L	700	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
M,P-XYLENE	ug/L	10000	<1 U	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
METHYLENE CHLORIDE	ug/L	5	<0.5 U	N/A	233	<0.5 U	N/A	<0.5 U	N/A	0.467 J
NAPHTHALENE	ug/L	2000	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	0.278 J
N-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
N-PROPYLBENZENE	ug/L	4100	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
O-XYLENE	ug/L	10000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
STYRENE	ug/L	100	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
TETRACHLOROETHENE	ug/L	5	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	0.353 J
TOLUENE	ug/L	1000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	0.404 J	N/A	<0.5 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	0.425 J
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
TRICHLOROETHENE	ug/L	5	<0.5 U	N/A	24.4	0.874 J	N/A	0.31 J	N/A	106
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
VINYL CHLORIDE	ug/L	2	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	20.9
Inorganic Anions (9056)										
CHLORIDE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SULFATE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dissolved Gases (RSK-175)										
ETHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ETHENE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
METHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ferrous Iron (SM3500FE)										
FERROUS IRON	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dechlorinating Bacteria										
DEHALOCOCCOIDES (DHC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TCEA REDUCTASE (TCE)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BAV1 VINYL CHLORIDE REDUCTASE (BVC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE REDUCTASE (VCR)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	18CPTMW10DW-120313 12/3/2013	18CPTMW10SW-120313 12/3/2013	18CPTMW12DW-120413 12/4/2013	18CPTMW12SW-120413 12/4/2013	18CPTMW12SWFD-120413 12/4/2013	18CPTMW14-121713 12/17/2013	18CPTMW15-121713 12/17/2013	18CPTMW16-121813 12/18/2013
ID Location:			Site 18/24 – WSW, outside the fence line, along the outer loop road Deep Wilcox Sampled Semi-annually	Site 18/24 – WSW, outside the fence line, along the outer loop road Shallow Wilcox Sampled Semi-annually	Site 18/24 – SW, outside the fence line, along the road surrounding the fence line Deep Wilcox Sampled Semi-annually	Site 18/24 – SW, outside the fence line, along the road surrounding the fence line Shallow Wilcox Sampled Semi-annually	Site 18/24 – SW, outside the fence line, along the road surrounding the fence line Shallow Wilcox. Dup, Sampled Semi-annually	Site 18/24 – SE, outside the fence line, along the road surrounding the fence line Sampled Semi-annually	Site 18/24 – NW, outside the fence line Sampled Semi-annually	Site 18/24 – NW, outside the fence line, near Harrison Bayou Sampled Semi-annually
Alkalinity (310.2)										
ALKALINITY, TOTAL	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Organic Carbon (415.1)										
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Metals (6010C)										
ALUMINUM	mg/L	100	0.154 J	<0.1 U	0.0876 J	0.164 J	0.173 J	0.385	<0.1 U	N/A
BERYLLIUM	mg/L	0.004	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	N/A
CALCIUM	mg/L		26.9	38.1	17.5	53.3	52.7	131	38.3	N/A
IRON	mg/L		20.8	70.3	3.94	8.93	9.35	1.16	17	N/A
MAGNESIUM	mg/L		12.4	21.9	9.97	34.5	34.3	69.7	40	N/A
POTASSIUM	mg/L		20.1	4.64	17.1	13.9	14.8	237	5.78	N/A
SELENIUM	mg/L	0.05	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	0.00928 J	N/A
SODIUM	mg/L		134	114	158	213	212	659	418	N/A
Metals (6020A)										
ANTIMONY	mg/L	0.006	0.00108 J	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	N/A
ARSENIC	mg/L	0.01	0.00584	0.00404	0.00502	0.0122	0.0123	0.0171 J	0.00552 J	N/A
BARIUM	mg/L	2	0.312	0.583	0.201	0.622	0.577	2.73	0.528	N/A
CADMIUM	mg/L	0.005	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	0.000471 J	N/A
CHROMIUM	mg/L	0.1	0.00197 J	<0.002 U	0.00117 J	0.00181 J	0.00186 J	0.0161	<0.002 U	N/A
COBALT	mg/L	6.1	0.002	0.00729	0.00139 J	0.0185	0.019	0.00226	0.138	N/A
COPPER	mg/L	1.3	0.00257 J	<0.002 U	<0.002 U	0.00147 J	0.00108 J	0.00188 J	<0.002 U	N/A
LEAD	mg/L	0.015	0.000787 J	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	N/A
MANGANESE	mg/L	14	0.479	0.98	0.219	1.13	1.05	0.0851	1.06	N/A
NICKEL	mg/L	2	0.00473 J	0.00726 J	0.0027 J	0.0117	0.012	0.00509 J	0.0784	N/A
SILVER	mg/L	0.51	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	N/A
THALLIUM	mg/L	0.002	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	N/A
VANADIUM	mg/L	0.72	0.000708 J	<0.001 U	<0.001 U	<0.001 U	0.000503 J	0.00202	<0.001 U	N/A
ZINC	mg/L	31	0.027 J	0.0446 J	<0.025 U	0.0203 J	0.0248 J	<0.025 U	0.087	N/A
Perchlorate (6850)										
PERCHLORATE	ug/L	72	<0.2 U	<0.2 U	0.283 J	<0.2 U	<0.2 U	14.5	504	<0.2 U
Mercury (7470A)										
MERCURY	mg/L	0.002	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	N/A
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	<1.25 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	<1.25 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	<1 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	<1.25 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	<0.25 U	<0.626 U	<0.25 U	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<2.5 U	<1 U	<1 U
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1.25 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	<0.75 UJ	<0.3 U	<0.3 U
1,2,3-TRICHLOROPROPANE	ug/L	0.004	<1 U	<1 U	<1 U	<1 U	<1 U	<2.5 UJ	<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	<1 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	<1.25 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	<5 UJ	<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	<1.25 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	<0.626 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	2.03 J	<0.5 U	<0.5 U
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<1 U	<0.4 U	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1.25 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	<1.25 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	<1 U	<0.4 U	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.626 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	<1.25 U	<0.5 U	<0.5 U
2-BUTANONE	ug/L	61000	<5 U	<5 U	<5 U	<5 U	<5 U	<12.5 UJ	<5 U	<5 U
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.626 U	<0.25 U	<0.25 U
2-HEXANONE	ug/L	6100	<5 U	<5 U	<5 U	<5 U	<5 U	<12.5 U	<5 U	<5 U
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1.25 UJ	<0.5 U	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	<5 U	<5 U	<5 U	<5 U	<12.5 U	<5 U	<5 U
ACETONE	ug/L	92000	<5 U	<5 U	<5 UJ	<5 UJ	<5 UJ	<12.5 UJ	<5 U	<5 U
BENZENE	ug/L	5	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	0.499 J	<0.25 U	<0.25 U
BROMOBENZENE	ug/L	2000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.626 U	<0.25 U	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<1 U	<0.4 U	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1.25 U	<0.5 U	<0.5 U
BROMOFORM	ug/L	36	<1 U	<1 U	<1 U	<1 U	<1 U	<2.5 U	<1 U	<1 U
BROMOMETHANE	ug/L	140	<1 U	<1 U	<1 U	<1 U	<1 U	<2.5 U	<1 U	<1 U
CARBON DISULFIDE	ug/L	10000	<1 UJ	<1 UJ	<1 U	<1 U	<1 U	<2.5 U	<1 U	<1 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1.25 U	<0.5 U	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.626 U	<0.25 U	<0.25 U
CHLOROETHANE	ug/L	41000	<1 U	<1 U	<1 U	<1 U	<1 U	<2.5 U	<1 U	<1 U
CHLOROFORM	ug/L	1000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	4.56	<0.25 U	<0.25 U
CHLOROMETHANE	ug/L	220	<1 U	<1 U	<1 U	<1 U	<1 U	<2.5 U	<1 UJ	<1 UJ
CIS-1,2-DICHLOROETHENE	ug/L	70	0.378 J	<0.5 U	<0.5 U	0.442 J	0.461 J	<1.25 U	0.982 J	<0.5 U
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1.25 U	<0.5 U	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1.25 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	<1.25 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	<1.25 U	<0.5 UJ	<0.5 UJ
ETHYLBENZENE	ug/L	700	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1.25 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	<1.25 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	<1.25 U	<0.5 U	<0.5 U
M,P-XYLENE	ug/L	10000	<1 U	<1 U	<1 U	<1 U	<1 U	<2.5 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	0.721 J	<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	<1 U	<0.4 U	<0.4 U
N-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1.25 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	<0.626 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	<1.25 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	<1.25 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	<1.25 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	<0.626 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	<1.25 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	0.872 J	<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	<1.25 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	<1.25 U	<0.5 U	<0.5 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	<1 U	<1 U	<1 U	<1 U	<2.5 U	<1 U	<1 U
TRICHLOROETHENE	ug/L	5	4.07	6.67	0.257 J	3.62	3.72	538	5.35	<0.5 U
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1.25 U	<0.5 U	<0.5 U
VINYL CHLORIDE	ug/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1.25 U	0.781 J	<0.5 U
Inorganic Anions (9056)										
CHLORIDE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SULFATE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dissolved Gases (RSK-175)										
ETHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ETHENE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
METHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ferrous Iron (SM3500FE)										
FERROUS IRON	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dechlorinating Bacteria										
DEHALOCOCCOIDES (DHC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TCEA REDUCTASE (TCE)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BAV1 VINYL CHLORIDE REDUCTASE (BVC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE REDUCTASE (VCR)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	18CPTMW16F-121813 12/18/2013	18CPTMW18-121913 12/19/2013	18CPTMW19-120413 12/4/2013	18CPTMW19F-120413 12/4/2013	18CPTMW22-120513 12/5/2013	18CPTMW23-120513 12/5/2013	18CPTMW24-120413 12/4/2013	18WW08-121913 12/19/2013	18WW11-121713 12/17/2013
ID Location:			Site 18/24 – NW, outside the fence line, near Harrison Bayou. Filtered, Sampled Semi-annually	Site 18/24 – NE, outside the fence line, in the woods Sampled Semi-annually	Site 18/24 – N, outside the fence line Sampled Semi-annually	Site 18/24 – N, outside the fence line. Filtered, Sampled Semi-annually	Site 18/24 – S, outside the fence line, along the road surrounding the fence line Sampled Semi-annually	Site 18/24 – WNW, outside the fence line, near the road surrounding the fence line Sampled Semi-annually	Site 18/24 – E, outside the fence line, on the road surrounding the fence line Sampled Semi-annually	Site 18/24 – NNW, outside the fence line Sampled Semi-Annually	Site 18/24 – W, outside the fence line.
Alkalinity (310.2)											
ALKALINITY, TOTAL	mg/L		N/A	428	N/A	N/A	N/A	N/A	N/A	37.8	N/A
Total Organic Carbon (415.1)											
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	4.81 J	N/A	N/A	N/A	N/A	N/A	5.67 J	N/A
Metals (6010C)											
ALUMINUM	mg/L	100	<0.1 U	<0.1 U	N/A	2.07	<0.1 U	0.0555 J	<0.1 U	<0.1 U	N/A
BERYLLIUM	mg/L	0.004	<0.01 U	<0.01 U	N/A	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	N/A
CALCIUM	mg/L		15.3	353	N/A	2.04	28.8	9.09	376	28.7	N/A
IRON	mg/L		4.86	0.483	N/A	4.27	0.0915 J	15.3	9.53	2.42	N/A
MAGNESIUM	mg/L		7.86	278	N/A	1.53	26.6	7.24	218	42.2	N/A
POTASSIUM	mg/L		5.72	17.1	N/A	6.38	1.29 J	6.4	17.9	1.28 J	N/A
SELENIUM	mg/L	0.05	0.00765 J	0.00987 J	N/A	<0.01 U	<0.01 U	<0.01 U	<0.01 U	0.00808 J	N/A
SODIUM	mg/L		106	1310	N/A	20.1	171	58.2	1040	421	N/A
Metals (6020A)											
ANTIMONY	mg/L	0.006	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	N/A
ARSENIC	mg/L	0.01	0.00351 J	0.0233 J	N/A	0.0038	0.00291	0.00731	0.018	0.00868 J	N/A
BARIUM	mg/L	2	0.192	0.636	N/A	0.085	0.39	0.225	8.76	0.0607	N/A
CADMIUM	mg/L	0.005	<0.0006 U	0.000635 J	N/A	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	N/A
CHROMIUM	mg/L	0.1	<0.002 U	0.00652	N/A	0.00693	<0.002 U	0.00125 J	0.0013 J	0.00845	N/A
COBALT	mg/L	6.1	0.0025	0.0144	N/A	0.000667 J	0.00126 J	0.0172	0.00971	0.00919	N/A
COPPER	mg/L	1.3	<0.002 U	0.00226 J	N/A	0.00209 J	<0.002 U	0.00148 J	0.00359 J	0.00153 J	N/A
LEAD	mg/L	0.015	<0.001 U	<0.001 U	N/A	0.00108 J	<0.001 U	<0.001 U	<0.001 U	<0.001 U	N/A
MANGANESE	mg/L	14	0.338	2.86	N/A	0.0283	0.082	0.389	0.548 J	0.514	N/A
NICKEL	mg/L	2	0.00205 J	0.027	N/A	0.0041 J	0.00452 J	0.0147	0.0207	0.0192	N/A
SILVER	mg/L	0.51	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	N/A
THALLIUM	mg/L	0.002	0.000104 J	0.000105 J	N/A	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	N/A
VANADIUM	mg/L	0.72	<0.001 U	<0.001 U	N/A	0.0049	0.000511 J	<0.001 U	<0.001 U	0.00139 J	N/A
ZINC	mg/L	31	<0.025 U	0.0141 J	N/A	0.0713	<0.025 U	0.0332 J	0.0147 J	0.0142 J	N/A
Perchlorate (6850)											
PERCHLORATE	ug/L	72	N/A	0.265 J	8.15	N/A	67500	0.908	43.7 J	304	<0.2 U
Mercury (7470A)											
MERCURY	mg/L	0.002	<0.0002 U	<0.0002 U	N/A	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	N/A
Volatile Organic Compounds (8260B)											
1,1,1,2-TETRACHLOROETHANE	ug/L	110	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
1,1,1-TRICHLOROETHANE	ug/L	200	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<2 U	<0.4 U	<0.4 U	<0.4 U
1,1,2-TRICHLOROETHANE	ug/L	5	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
1,1-DICHLOROETHANE	ug/L	10000	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	N/A	<1 U	<1 U	N/A	2.01	3.41 J	<1 U	<1 U	<1 U
1,1-DICHLOROPROPENE	ug/L	2.9	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
1,2,3-TRICHLOROBENZENE	ug/L	310	N/A	<0.3 U	<0.3 U	N/A	<0.3 U	<1.5 U	<0.3 U	<0.3 U	<0.3 U
1,2,3-TRICHLOROPROPANE	ug/L	0.004	N/A	<1 U	<1 U	N/A	<1 U	<5 U	<1 U	<1 UJ	<1 U
1,2,4-TRICHLOROBENZENE	ug/L	70	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<2 U	<0.4 U	<0.4 U	<0.4 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	N/A	<2 U	<2 U	N/A	<2 U	<10 U	<2 U	<2 UJ	<2 U
1,2-DIBROMOETHANE	ug/L	0.005	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
1,2-DICHLOROBENZENE	ug/L	600	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U
1,2-DICHLOROETHANE	ug/L	5	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	79.7	<0.5 U	<0.5 U	<0.5 U
1,2-DICHLOROPROPANE	ug/L	5	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<2 U	<0.4 U	<0.4 U	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
1,3-DICHLOROBENZENE	ug/L	3100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
1,3-DICHLOROPROPANE	ug/L	29	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<2 U	<0.4 U	<0.4 U	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U
2,2-DICHLOROPROPANE	ug/L	42	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
2-BUTANONE	ug/L	61000	N/A	<5 U	<5 U	N/A	<5 U	<25 U	<5 U	<5 UJ	<5 U
2-CHLOROTOLUENE	ug/L	2000	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U
2-HEXANONE	ug/L	6100	N/A	<5 U	<5 U	N/A	<5 U	<25 U	<5 U	<5 UJ	<5 U
4-CHLOROTOLUENE	ug/L	2000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	N/A	<5 U	<5 U	N/A	<5 U	<25 U	<5 U	<5 U	<5 U
ACETONE	ug/L	92000	N/A	<5 U	<5 U	N/A	<5 U	<25 U	<5 U	<5 UJ	<5 U
BENZENE	ug/L	5	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	0.74 J	<0.25 U	<0.25 U	<0.25 U
BROMOBENZENE	ug/L	2000	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<2 U	<0.4 U	<0.4 U	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
BROMOFORM	ug/L	36	N/A	<1 U	<1 U	N/A	<1 U	<5 U	<1 U	<1 U	<1 U
BROMOMETHANE	ug/L	140	N/A	<1 U	<1 U	N/A	<1 UJ	<5 U	<1 UJ	<1 U	<1 U
CARBON DISULFIDE	ug/L	10000	N/A	<1 U	<1 U	N/A	<1 U	<5 U	<1 U	<1 U	<1 U
CARBON TETRACHLORIDE	ug/L	5	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
CHLOROBENZENE	ug/L	100	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U
CHLOROETHANE	ug/L	41000	N/A	<1 U	<1 U	N/A	<1 U	<5 U	<1 U	<1 U	<1 U
CHLOROFORM	ug/L	1000	N/A	<0.25 U	<0.25 U	N/A	1.34	<1.25 U	0.133 J	0.196 J	<0.25 U
CHLOROMETHANE	ug/L	220	N/A	<1 U	<1 U	N/A	<1 UJ	<5 UJ	<1 UJ	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	N/A	<0.5 U	<0.5 U	N/A	0.29 J	244	0.485 J	<0.5 U	<0.5 U
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
DIBROMOMETHANE	ug/L	380	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
ETHYLBENZENE	ug/L	700	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
HEXACHLOROBUTADIENE	ug/L	20	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
ISOPROPYLBENZENE	ug/L	1000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
M,P-XYLENE	ug/L	10000	N/A	<1 U	<1 U	N/A	<1 U	<5 U	<1 U	<1 U	<1 U
METHYLENE CHLORIDE	ug/L	5	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
NAPHTHALENE	ug/L	2000	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<2 U	<0.4 U	<0.4 U	<0.4 U
N-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
N-PROPYLBENZENE	ug/L	4100	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U
O-XYLENE	ug/L	10000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
P-ISOPROPYLTOLUENE	ug/L	10000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
SEC-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
STYRENE	ug/L	100	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U
TERT-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	ug/L	5	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
TOLUENE	ug/L	1000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	N/A	<0.5 U	<0.5 U	N/A	2.45	<2.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	N/A	<1 U	<1 U	N/A	<1 U	<5 U	<1 U	<1 U	<1 U
TRICHLOROETHENE	ug/L	5	N/A	<0.5 U	<0.5 U	N/A	50.3	943	81.7 J	0.459 J	<0.5 U
TRICHLOROFLUOROMETHANE	ug/L	31000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	ug/L	2	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U
Inorganic Anions (9056)											
CHLORIDE	mg/L		N/A	2860	N/A	N/A	N/A	N/A	N/A	619	N/A
NITRATE	mg/L	10	N/A	<2 U	N/A	N/A	N/A	N/A	N/A	<1 U	N/A
NITRITE	mg/L	1	N/A	<2 U	N/A	N/A	N/A	N/A	N/A	<1 U	N/A
SULFATE	mg/L		N/A	61.9	N/A	N/A	N/A	N/A	N/A	167	N/A
Dissolved Gases (RSK-175)											
ETHANE	ug/L		N/A	<2 U	N/A	N/A	N/A	N/A	N/A	<2 U	N/A
ETHENE	ug/L		N/A	<2 U	N/A	N/A	N/A	N/A	N/A	<2 U	N/A
METHANE	ug/L		N/A	23.3	N/A	N/A	N/A	N/A	N/A	1.47 J	N/A
Ferrous Iron (SM3500FE)											
FERROUS IRON	mg/L		N/A	0.512	N/A	N/A	N/A	N/A	N/A	<0.04 U	N/A
Dechlorinating Bacteria											
DEHALOCOCCOIDES (DHC)	cells/ml		N/A	<0.4 U	N/A	N/A	N/A	N/A	N/A	<0.4 U	N/A
TCEA REDUCTASE (TCE)	cells/ml		N/A	<0.4 U	N/A	N/A	N/A	N/A	N/A	<0.4 U	N/A
BAV1 VINYL CHLORIDE REDUCTASE (BVC)	cells/ml		N/A	<0.4 U	N/A	N/A	N/A	N/A	N/A	<0.4 U	N/A
VINYL CHLORIDE REDUCTASE (VCR)	cells/ml		N/A	<0.4 U	N/A	N/A	N/A	N/A	N/A	<0.4 U	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	18WW11F- 121713 12/17/2013	18WW20- 121613 12/16/2013	18WW20F- 121613 12/16/2013	18WW22- 121813 12/18/2013	AWD4- 121013 12/10/2013	AWD4F- 121013 12/10/2013	C-01- 121313 12/13/2013	C02- 121813 12/18/2013
ID Location:			Site 18/24 – W, outside the fence line. Filtered	Site 18/24 – N, outside the fence line, near Harrison Bayou Sampled Annually	Site 18/24 – N, outside the fence line, near Harrison Bayou. Filtered, Sampled Annually	Site 18/24 – NNE, outside the fence line, on the road heading north Sampled Semi-annually	Site 18/24 – NNW, outside the fence line, just along the perimeter road Sampled Annually	Site 18/24 – NNW, outside the fence line, just along the perimeter road. Filtered, Sampled Annually	Site 18/24 – SSE, outside the fence line, on your right heading towards the GWTP. Sampled Annually	Site 18/24 – W, outside the fence line, along the outer loop road Sampled Annually
Alkalinity (310.2)										
ALKALINITY, TOTAL	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Organic Carbon (415.1)										
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Metals (6010C)										
ALUMINUM	mg/L	100	<0.1 U	N/A	<0.1 U	0.786	N/A	<0.1 U	<0.1 U	N/A
BERYLLIUM	mg/L	0.004	<0.01 U	N/A	<0.01 U	<0.01 U	N/A	<0.01 U	<0.01 U	N/A
CALCIUM	mg/L		14.3	N/A	2.52	141	N/A	19.1	126	N/A
IRON	mg/L		25.3	N/A	10.5	0.179 J	N/A	15.1	0.166 J	N/A
MAGNESIUM	mg/L		7.32	N/A	1.55	<0.5 U	N/A	17.5	96.7	N/A
POTASSIUM	mg/L		1.98 J	N/A	1.55 J	260	N/A	1.13 J	2.05	N/A
SELENIUM	mg/L	0.05	<0.01 U	N/A	0.00617 J	0.00928 J	N/A	<0.01 U	<0.01 U	N/A
SODIUM	mg/L		71.6	N/A	24.9	188	N/A	116	469	N/A
Metals (6020A)										
ANTIMONY	mg/L	0.006	<0.001 U	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U	N/A
ARSENIC	mg/L	0.01	0.00224 J	N/A	0.000709 J	0.00275	N/A	0.00113 J	0.00577	N/A
BARIUM	mg/L	2	0.177	N/A	0.102	0.731	N/A	0.508	0.866	N/A
CADMIUM	mg/L	0.005	<0.0006 U	N/A	<0.0006 U	<0.0006 U	N/A	0.000359 J	<0.0006 U	N/A
CHROMIUM	mg/L	0.1	<0.002 U	N/A	<0.002 U	0.0959	N/A	0.453	0.00171 J	N/A
COBALT	mg/L	6.1	<0.001 U	N/A	<0.001 U	0.00182 J	N/A	0.0647	0.000588 J	N/A
COPPER	mg/L	1.3	<0.002 U	N/A	<0.002 U	0.00317 J	N/A	0.0337	0.00268 J	N/A
LEAD	mg/L	0.015	<0.001 U	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U	N/A
MANGANESE	mg/L	14	0.392	N/A	0.18	0.00213 J	N/A	0.555	0.0249	N/A
NICKEL	mg/L	2	0.00525 J	N/A	<0.004 U	0.00629 J	N/A	3.56	0.006 J	N/A
SILVER	mg/L	0.51	<0.001 U	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U	N/A
THALLIUM	mg/L	0.002	<0.0002 U	N/A	<0.0002 U	<0.0002 U	N/A	<0.0002 U	<0.0002 U	N/A
VANADIUM	mg/L	0.72	<0.001 U	N/A	<0.001 U	0.0161	N/A	<0.005 U	<0.001 U	N/A
ZINC	mg/L	31	<0.025 U	N/A	<0.025 U	<0.025 U	N/A	0.0151 J	0.0173 J	N/A
Perchlorate (6850)										
PERCHLORATE	ug/L	72	N/A	0.46	N/A	3.82	23300	N/A	1.66	<0.2 U
Mercury (7470A)										
MERCURY	mg/L	0.002	<0.0002 U	N/A	<0.0002 U	<0.0002 U	N/A	<0.0002 U	<0.0002 U	N/A
Volatile Organic Compounds (8260B)										
1,1,1,2-TETRACHLOROETHANE	ug/L	110	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
1,1,1-TRICHLOROETHANE	ug/L	200	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	N/A	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U
1,1,2-TRICHLOROETHANE	ug/L	5	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
1,1-DICHLOROETHANE	ug/L	10000	N/A	<0.25 U	N/A	<0.25 U	2.49	N/A	<0.25 U	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	N/A	<1 U	N/A	<1 U	1.04 J	N/A	<1 U	<1 U
1,1-DICHLOROPROPENE	ug/L	2.9	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
1,2,3-TRICHLOROBENZENE	ug/L	310	N/A	<0.3 U	N/A	<0.3 UJ	<0.3 U	N/A	<0.3 U	<0.3 UJ
1,2,3-TRICHLOROPROPANE	ug/L	0.004	N/A	<1 U	N/A	<1 UJ	<1 U	N/A	<1 UJ	<1 UJ
1,2,4-TRICHLOROBENZENE	ug/L	70	N/A	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	N/A	<2 U	N/A	<2 UJ	<2 U	N/A	<2 UJ	<2 UJ
1,2-DIBROMOETHANE	ug/L	0.005	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
1,2-DICHLOROBENZENE	ug/L	600	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U
1,2-DICHLOROETHANE	ug/L	5	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
1,2-DICHLOROPROPANE	ug/L	5	N/A	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
1,3-DICHLOROBENZENE	ug/L	3100	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
1,3-DICHLOROPROPANE	ug/L	29	N/A	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U
2,2-DICHLOROPROPANE	ug/L	42	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
2-BUTANONE	ug/L	61000	N/A	<5 U	N/A	<5 UJ	<5 U	N/A	<5 UJ	<5 UJ
2-CHLOROTOLUENE	ug/L	2000	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U
2-HEXANONE	ug/L	6100	N/A	<5 U	N/A	<5 UJ	<5 U	N/A	<5 UJ	<5 UJ
4-CHLOROTOLUENE	ug/L	2000	N/A	<0.5 U	N/A	<0.5 UJ	<0.5 U	N/A	<0.5 U	<0.5 UJ
4-METHYL-2-PENTANONE	ug/L	8200	N/A	<5 U	N/A	<5 U	<5 U	N/A	<5 U	<5 U
ACETONE	ug/L	92000	N/A	<5 U	N/A	18.6 J	<5 U	N/A	<5 UJ	<5 UJ
BENZENE	ug/L	5	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U
BROMOBENZENE	ug/L	2000	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	N/A	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
BROMOFORM	ug/L	36	N/A	<1 U	N/A	<1 U	<1 U	N/A	<1 U	<1 U
BROMOMETHANE	ug/L	140	N/A	<1 U	N/A	<1 U	<1 U	N/A	<1 U	<1 U
CARBON DISULFIDE	ug/L	10000	N/A	<1 U	N/A	<1 U	<1 U	N/A	<1 U	<1 U
CARBON TETRACHLORIDE	ug/L	5	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
CHLOROBENZENE	ug/L	100	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U
CHLOROETHANE	ug/L	41000	N/A	<1 U	N/A	<1 U	<1 U	N/A	<1 U	<1 U
CHLOROFORM	ug/L	1000	N/A	<0.25 U	N/A	<0.25 U	0.36 J	N/A	<0.25 U	<0.25 U
CHLOROMETHANE	ug/L	220	N/A	<1 U	N/A	<1 U	<1 U	N/A	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	N/A	<0.5 U	N/A	<0.5 U	10.7	N/A	<0.5 U	<0.5 U
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
DIBROMOMETHANE	ug/L	380	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
ETHYLBENZENE	ug/L	700	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
HEXACHLOROBUTADIENE	ug/L	20	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
ISOPROPYLBENZENE	ug/L	1000	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
M,P-XYLENE	ug/L	10000	N/A	<1 U	N/A	<1 U	<1 U	N/A	<1 U	<1 U
METHYLENE CHLORIDE	ug/L	5	N/A	0.257 J	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
NAPHTHALENE	ug/L	2000	N/A	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U
N-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
N-PROPYLBENZENE	ug/L	4100	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U
O-XYLENE	ug/L	10000	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
P-ISOPROPYLTOLUENE	ug/L	10000	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
SEC-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
STYRENE	ug/L	100	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U
TERT-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
TETRACHLOROETHENE	ug/L	5	N/A	<0.5 U	N/A	<0.5 U	0.257 J	N/A	<0.5 U	<0.5 U
TOLUENE	ug/L	1000	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	N/A	<1 U	N/A	<1 U	<1 U	N/A	<1 U	<1 U
TRICHLOROETHENE	ug/L	5	N/A	<0.5 U	N/A	<0.5 U	56.8	N/A	0.256 J	<0.5 U
TRICHLOROFLUOROMETHANE	ug/L	31000	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U
VINYL CHLORIDE	ug/L	2	N/A	<0.5 U	N/A	<0.5 U	4.3	N/A	<0.5 U	<0.5 U
Inorganic Anions (9056)										
CHLORIDE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SULFATE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dissolved Gases (RSK-175)										
ETHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ETHENE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
METHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ferrous Iron (SM3500FE)										
FERROUS IRON	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dechlorinating Bacteria										
DEHALOCOCCOIDES (DHC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TCEA REDUCTASE (TCE)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BAV1 VINYL CHLORIDE REDUCTASE (BVC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE REDUCTASE (VCR)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	C02F-121813 12/18/2013	C03-121613 12/16/2013	C04-121813 12/18/2013	C04F-121813 12/18/2013	C09-121013 12/10/2013	C10-121013 12/10/2013	C10F-121013 12/10/2013	MW2-121413 12/14/2013
ID Location:			Site 18/24 – W, outside the fence line, along the outer loop road. Filtered, Sampled Annually	Site 18/24 – NE, outside the fence line, along the outer loop road Sampled Annually	Site 18/24 – N, outside the fence line, along the road heading north Sampled Annually	Site 18/24 – N, outside the fence line, along the road heading north. Filtered, Sampled Annually	Site 18/24 – SSE, outside the fence line, along Long Point Road. Filtered, Sampled Semi-annually	Site 18/24 – SSE, outside the fence line, along Long Point Road. Sampled Semi-annually	Site 18/24 – SSE, outside the fence line, along Long Point Road. Filtered, Sampled Annually	Site 18/24 – NE, inside the fence line, middle region Sampled Semi-annually
Alkalinity (310.2)										
ALKALINITY, TOTAL	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Organic Carbon (415.1)										
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Metals (6010C)										
ALUMINUM	mg/L	100	<0.1 U	<0.1 U	N/A	<0.1 U	0.198 J	N/A	<0.1 U	<0.1 U
BERYLLIUM	mg/L	0.004	<0.01 U	<0.01 U	N/A	<0.01 U	<0.01 U	N/A	<0.01 U	<0.01 U
CALCIUM	mg/L		21.9	59	N/A	11.3	226	N/A	86.2	196
IRON	mg/L		67.2	101	N/A	4.61	0.176 J	N/A	7.08	17.8
MAGNESIUM	mg/L		12.6	34.8	N/A	5.37	148	N/A	53.6	139
POTASSIUM	mg/L		3.32	3.39	N/A	1.77 J	1.17 J	N/A	3.51	4.14
SELENIUM	mg/L	0.05	<0.01 U	<0.01 U	N/A	<0.01 U	<0.01 U	N/A	<0.01 U	0.0313
SODIUM	mg/L		78.4	174	N/A	24	562	N/A	313	401
Metals (6020A)										
ANTIMONY	mg/L	0.006	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U
ARSENIC	mg/L	0.01	0.00143 J	0.00752 J	N/A	0.000613 J	0.007	N/A	0.00413	0.00757
BARIUM	mg/L	2	0.443	1.36	N/A	0.185	0.601	N/A	0.986	5.77
CADMIUM	mg/L	0.005	<0.0006 U	<0.0006 U	N/A	<0.0006 U	0.000488 J	N/A	<0.0006 U	0.000547 J
CHROMIUM	mg/L	0.1	<0.002 U	0.00132 J	N/A	<0.002 U	0.00274 J	N/A	<0.002 U	0.0628
COBALT	mg/L	6.1	<0.001 U	0.00161 J	N/A	<0.001 U	0.000598 J	N/A	<0.001 U	0.0636
COPPER	mg/L	1.3	<0.002 U	0.00152 J	N/A	<0.002 U	0.0027 J	N/A	<0.002 U	0.003 J
LEAD	mg/L	0.015	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U
MANGANESE	mg/L	14	1.26	1.61	N/A	0.184	0.023	N/A	1.09	3.64
NICKEL	mg/L	2	<0.004 U	0.00306 J	N/A	<0.004 U	0.0114	N/A	0.00344 J	0.0986
SILVER	mg/L	0.51	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U
THALLIUM	mg/L	0.002	<0.0002 U	<0.0002 U	N/A	<0.0002 U	<0.0002 U	N/A	<0.0002 U	<0.0002 U
VANADIUM	mg/L	0.72	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U
ZINC	mg/L	31	<0.025 U	0.0263 J	N/A	<0.025 U	<0.025 U	N/A	<0.025 U	0.0297 J
Perchlorate (6850)										
PERCHLORATE	ug/L	72	N/A	65.3	1.1	N/A	6.72	1.31	N/A	7920
Mercury (7470A)										
MERCURY	mg/L	0.002	<0.0002 U	<0.0002 U	N/A	<0.0002 U	<0.0002 U	N/A	<0.0002 U	<0.0002 U
Volatile Organic Compounds (8260B)										
1,1,1,2-TETRACHLOROETHANE	ug/L	110	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
1,1,1-TRICHLOROETHANE	ug/L	200	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<2000 U
1,1,2-TRICHLOROETHANE	ug/L	5	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
1,1-DICHLOROETHANE	ug/L	10000	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<1250 U
1,1-DICHLOROETHENE	ug/L	7	N/A	<1 U	<1 U	N/A	<1 U	<1 U	N/A	<5000 U
1,1-DICHLOROPROPENE	ug/L	2.9	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
1,2,3-TRICHLOROBENZENE	ug/L	310	N/A	<0.3 U	<0.3 UJ	N/A	<0.3 U	<0.3 U	N/A	<1500 U
1,2,3-TRICHLOROPROPANE	ug/L	0.004	N/A	<1 U	<1 UJ	N/A	<1 U	<1 U	N/A	<5000 UJ
1,2,4-TRICHLOROBENZENE	ug/L	70	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<2000 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	N/A	<2 U	<2 UJ	N/A	<2 U	<2 U	N/A	<10000 UJ
1,2-DIBROMOETHANE	ug/L	0.005	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
1,2-DICHLOROBENZENE	ug/L	600	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<1250 U
1,2-DICHLOROETHANE	ug/L	5	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
1,2-DICHLOROPROPANE	ug/L	5	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<2000 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
1,3-DICHLOROBENZENE	ug/L	3100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
1,3-DICHLOROPROPANE	ug/L	29	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<2000 U
1,4-DICHLOROBENZENE	ug/L	75	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<1250 U
2,2-DICHLOROPROPANE	ug/L	42	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
2-BUTANONE	ug/L	61000	N/A	<5 U	<5 UJ	N/A	<5 U	<5 U	N/A	<25000 UJ
2-CHLOROTOLUENE	ug/L	2000	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<1250 U
2-HEXANONE	ug/L	6100	N/A	<5 U	<5 UJ	N/A	<5 U	<5 U	N/A	<25000 UJ
4-CHLOROTOLUENE	ug/L	2000	N/A	<0.5 U	<0.5 UJ	N/A	<0.5 U	<0.5 U	N/A	<2500 U
4-METHYL-2-PENTANONE	ug/L	8200	N/A	<5 U	<5 U	N/A	<5 U	<5 U	N/A	<25000 U
ACETONE	ug/L	92000	N/A	<5 U	<5 UJ	N/A	<5 U	<5 U	N/A	<25000 UJ
BENZENE	ug/L	5	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<1250 U
BROMOBENZENE	ug/L	2000	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<1250 U
BROMOCHLOROMETHANE	ug/L	4100	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<2000 U
BROMODICHLOROMETHANE	ug/L	4.6	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
BROMOFORM	ug/L	36	N/A	<1 U	<1 U	N/A	<1 U	<1 U	N/A	<5000 U
BROMOMETHANE	ug/L	140	N/A	<1 U	<1 U	N/A	<1 U	<1 U	N/A	<5000 U
CARBON DISULFIDE	ug/L	10000	N/A	<1 U	<1 U	N/A	<1 U	<1 U	N/A	<5000 U
CARBON TETRACHLORIDE	ug/L	5	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
CHLOROBENZENE	ug/L	100	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<1250 U
CHLOROETHANE	ug/L	41000	N/A	<1 U	<1 U	N/A	<1 U	<1 U	N/A	<5000 U
CHLOROFORM	ug/L	1000	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<1250 U
CHLOROMETHANE	ug/L	220	N/A	<1 U	<1 U	N/A	<1 U	<1 U	N/A	<5000 U
CIS-1,2-DICHLOROETHENE	ug/L	70	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	63500
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
DIBROMOCHLOROMETHANE	ug/L	34	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
DIBROMOMETHANE	ug/L	380	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
DICHLORODIFLUOROMETHANE	ug/L	20000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
ETHYLBENZENE	ug/L	700	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
HEXACHLOROBUTADIENE	ug/L	20	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
ISOPROPYLBENZENE	ug/L	1000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
M,P-XYLENE	ug/L	10000	N/A	<1 U	<1 U	N/A	<1 U	<1 U	N/A	<5000 U
METHYLENE CHLORIDE	ug/L	5	N/A	0.738 J	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	1390000
NAPHTHALENE	ug/L	2000	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<2000 U
N-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
N-PROPYLBENZENE	ug/L	4100	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<1250 U
O-XYLENE	ug/L	10000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
P-ISOPROPYLTOLUENE	ug/L	10000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
SEC-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
STYRENE	ug/L	100	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<1250 U
TERT-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
TETRACHLOROETHENE	ug/L	5	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
TOLUENE	ug/L	1000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	N/A	<1 U	<1 U	N/A	<1 U	<1 U	N/A	<5000 U
TRICHLOROETHENE	ug/L	5	N/A	0.491 J	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	88400
TRICHLOROFLUOROMETHANE	ug/L	31000	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
VINYL CHLORIDE	ug/L	2	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<2500 U
Inorganic Anions (9056)										
CHLORIDE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SULFATE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dissolved Gases (RSK-175)										
ETHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ETHENE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
METHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ferrous Iron (SM3500FE)										
FERROUS IRON	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dechlorinating Bacteria										
DEHALOCOCCOIDES (DHC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TCEA REDUCTASE (TCE)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BAV1 VINYL CHLORIDE REDUCTASE (BVC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE REDUCTASE (VCR)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	MW3- 120913 12/9/2013	MW5- 120913 12/9/2013	MW5FD- 120913 12/9/2013	MW7- 121413 12/14/2013	MW7F- 121413 12/14/2013	MW8- 121913 12/19/2013	MW8- 121913 12/20/2013	MW9- 121313 12/13/2013
ID Location:			Site 18/24 – N, inside the fence line, outer region Sampled Semi-annually	Site 18/24 – N, inside the fence line, outer region Sampled Semi-annually	Site 18/24 – N, inside the fence line, outer region. Dup, Sampled Semi-annually	Site 18/24 – SW, outside the fence line, along the road surrounding the fence line Sampled Semi-annually	Site 18/24 – SW, outside the fence line, along the road surrounding the fence line. Filtered, Sampled Semi-annually	Site 18/24 – SW, outside the fence line Sampled Semi-Annually	Site 18/24 – SW, outside the fence line Sampled Semi-Annually	Site 18/24 – WSW, outside the fence line, along the road surrounding the fence line Sampled Semi-annually
Alkalinity (310.2)										
ALKALINITY, TOTAL	mg/L		N/A	N/A	N/A	N/A	N/A	24.8	N/A	N/A
Total Organic Carbon (415.1)										
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	N/A	N/A	N/A	N/A	4.77 J	N/A	N/A
Metals (6010C)										
ALUMINUM	mg/L	100	<0.1 U	<0.1 U	<0.1 U	N/A	<0.1 U	<0.1 U	N/A	<0.1 U
BERYLLIUM	mg/L	0.004	<0.01 U	<0.01 U	<0.01 U	N/A	<0.01 U	<0.01 U	N/A	<0.01 U
CALCIUM	mg/L		20.2	18.6	19.3	N/A	12.1	38.1	N/A	46
IRON	mg/L		0.434	0.0991 J	0.111 J	N/A	0.22	0.114 J	N/A	0.727
MAGNESIUM	mg/L		10.2	21	20.9	N/A	12.1	35.8	N/A	14.3
POTASSIUM	mg/L		1.44 J	2.07	2.1	N/A	0.953 J	<1 U	N/A	0.93 J
SELENIUM	mg/L	0.05	<0.01 U	<0.01 U	<0.01 U	N/A	0.00663 J	<0.01 U	N/A	<0.01 U
SODIUM	mg/L		156	109	110	N/A	397	277	N/A	30.8
Metals (6020A)										
ANTIMONY	mg/L	0.006	<0.001 U	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U	N/A	<0.001 U
ARSENIC	mg/L	0.01	0.000801 J	0.000862 J	0.000629 J	N/A	0.00162 J	0.00513 J	N/A	<0.001 U
BARIUM	mg/L	2	0.301	0.789	0.819	N/A	0.105	0.448	N/A	0.472
CADMIUM	mg/L	0.005	<0.0006 U	0.000661 J	0.000631 J	N/A	<0.0006 U	0.000849 J	N/A	<0.0006 U
CHROMIUM	mg/L	0.1	0.00272 J	0.0119	0.0149	N/A	0.00805	0.0244	N/A	0.13
COBALT	mg/L	6.1	0.0059	0.0028	0.0027	N/A	<0.001 U	0.0174	N/A	0.00081 J
COPPER	mg/L	1.3	0.00144 J	0.00164 J	0.00152 J	N/A	0.00135 J	0.00561	N/A	0.00204 J
LEAD	mg/L	0.015	<0.001 U	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U	N/A	<0.001 U
MANGANESE	mg/L	14	1.42	0.0973	0.097	N/A	0.00395 J	0.26	N/A	0.0256
NICKEL	mg/L	2	0.00598 J	0.067	0.0658	N/A	0.145	0.118	N/A	0.0239
SILVER	mg/L	0.51	<0.001 U	<0.001 U	<0.001 U	N/A	<0.001 U	<0.001 U	N/A	<0.001 U
THALLIUM	mg/L	0.002	<0.0002 U	<0.0002 U	0.000102 J	N/A	<0.0002 U	<0.0002 U	N/A	<0.0002 U
VANADIUM	mg/L	0.72	<0.001 U	<0.001 U	<0.001 U	N/A	0.000733 J	<0.001 U	N/A	<0.001 U
ZINC	mg/L	31	<0.025 U	0.0234 J	0.0232 J	N/A	<0.025 U	0.0217 J	N/A	<0.025 U
Perchlorate (6850)										
PERCHLORATE	ug/L	72	11400	24500	24100	36700	N/A	63600	N/A	132
Mercury (7470A)										
MERCURY	mg/L	0.002	<0.0002 U	<0.0002 U	<0.0002 U	N/A	<0.0002 U	<0.0002 U	N/A	<0.0002 U
Volatile Organic Compounds (8260B)										
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U	<0.4 U	<0.4 U	<4 U	N/A	<2 U	N/A	<4 U
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
1,1-DICHLOROETHANE	ug/L	10000	4.47	3.76	3.69	<2.5 U	N/A	<1.25 U	N/A	<2.5 U
1,1-DICHLOROETHENE	ug/L	7	4.82	0.948 J	0.918 J	8.38 J	N/A	<5 U	N/A	<10 U
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U	<0.3 U	<0.3 U	<3 U	N/A	<1.5 U	N/A	<3 U
1,2,3-TRICHLOROPROPANE	ug/L	0.004	<1 U	<1 U	<1 U	<10 U	N/A	<5 UJ	N/A	<10 UJ
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U	<0.4 U	<0.4 U	<4 U	N/A	<2 U	N/A	<4 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	<2 U	<2 U	<20 U	N/A	<10 UJ	N/A	<20 UJ
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	<0.25 U	<0.25 U	<2.5 U	N/A	<1.25 U	N/A	<2.5 U
1,2-DICHLOROETHANE	ug/L	5	<0.5 U	<0.5 U	<0.5 U	34.1	N/A	20.1	N/A	<5 U
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	<0.4 U	<0.4 U	<4 U	N/A	<2 U	N/A	<4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	0.713 J	0.731 J	<5 U	N/A	<2.5 U	N/A	<5 U
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	<0.4 U	<0.4 U	<4 U	N/A	<2 U	N/A	<4 U
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	<0.25 U	<0.25 U	<2.5 U	N/A	<1.25 U	N/A	<2.5 U
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
2-BUTANONE	ug/L	61000	<5 U	<5 U	<5 U	<50 U	N/A	<25 UJ	N/A	<50 UJ
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	<0.25 U	<0.25 U	<2.5 U	N/A	<1.25 U	N/A	<2.5 U
2-HEXANONE	ug/L	6100	<5 U	<5 U	<5 U	<50 U	N/A	<25 U	N/A	<50 UJ
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 UJ	N/A	<5 U
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	<5 U	<5 U	<50 U	N/A	<25 U	N/A	<50 U
ACETONE	ug/L	92000	<5 U	<5 U	<5 U	<50 UJ	N/A	<25 UJ	N/A	<50 UJ
BENZENE	ug/L	5	0.243 J	<0.25 U	<0.25 U	4.24 J	N/A	<1.25 U	N/A	<2.5 U
BROMOBENZENE	ug/L	2000	<0.25 U	<0.25 U	<0.25 U	<2.5 U	N/A	<1.25 U	N/A	<2.5 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	<0.4 U	<0.4 U	<4 U	N/A	<2 U	N/A	<4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
BROMOFORM	ug/L	36	<1 U	<1 U	<1 U	<10 U	N/A	<5 U	N/A	<10 U
BROMOMETHANE	ug/L	140	<1 U	<1 U	<1 U	<10 UJ	N/A	<5 U	N/A	<10 U
CARBON DISULFIDE	ug/L	10000	<1 U	<1 U	<1 U	<10 U	N/A	<5 U	N/A	<10 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	<0.5 U	<0.5 U	3.94 J	N/A	<2.5 U	N/A	<5 U
CHLOROBENZENE	ug/L	100	<0.25 U	<0.25 U	<0.25 U	<2.5 U	N/A	<1.25 U	N/A	<2.5 U
CHLOROETHANE	ug/L	41000	<1 U	<1 U	<1 U	<10 U	N/A	<5 U	N/A	<10 U
CHLOROFORM	ug/L	1000	1.19	0.4 J	0.407 J	16.2	N/A	2.03 J	N/A	2.17 J
CHLOROMETHANE	ug/L	220	<1 U	<1 UJ	<1 U	<10 U	N/A	<5 U	N/A	<10 U
CIS-1,2-DICHLOROETHENE	ug/L	70	48	12.1	11.9	16.1	N/A	8.05	N/A	181
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
DIBROMOMETHANE	ug/L	380	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	<0.5 U	<0.5 U	<5 UJ	N/A	<2.5 U	N/A	<5 U
ETHYLBENZENE	ug/L	700	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
M,P-XYLENE	ug/L	10000	<1 U	<1 U	<1 U	<10 U	N/A	<5 U	N/A	<10 U
METHYLENE CHLORIDE	ug/L	5	<0.5 U	<0.5 U	<0.5 U	7.81 J	N/A	<2.5 U	N/A	<5 U
NAPHTHALENE	ug/L	2000	<0.4 U	<0.4 U	<0.4 U	<4 U	N/A	<2 U	N/A	<4 U
N-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
N-PROPYLBENZENE	ug/L	4100	<0.25 U	<0.25 U	<0.25 U	<2.5 U	N/A	<1.25 U	N/A	<2.5 U
O-XYLENE	ug/L	10000	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
STYRENE	ug/L	100	<0.25 U	<0.25 U	<0.25 U	<2.5 U	N/A	<1.25 U	N/A	<2.5 U
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
TETRACHLOROETHENE	ug/L	5	0.612 J	0.252 J	0.267 J	<5 U	N/A	<2.5 U	N/A	<5 U
TOLUENE	ug/L	1000	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	1.38	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	<1 U	<1 U	<10 U	N/A	<5 U	N/A	<10 U
TRICHLOROETHENE	ug/L	5	266	51.9	51.1	2140	N/A	1430	N/A	1810
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	<0.5 U	<0.5 U	<5 U	N/A	<2.5 U	N/A	<5 U
VINYL CHLORIDE	ug/L	2	29.5	9.53	9.34	<5 U	N/A	<2.5 U	N/A	<5 U
Inorganic Anions (9056)										
CHLORIDE	mg/L		N/A	N/A	N/A	N/A	N/A	520	N/A	N/A
NITRATE	mg/L	10	N/A	N/A	N/A	N/A	N/A	<0.8 U	N/A	N/A
NITRITE	mg/L	1	N/A	N/A	N/A	N/A	N/A	<0.8 U	N/A	N/A
SULFATE	mg/L		N/A	N/A	N/A	N/A	N/A	14.8	N/A	N/A
Dissolved Gases (RSK-175)										
ETHANE	ug/L		N/A	N/A	N/A	N/A	N/A	<2 U	N/A	N/A
ETHENE	ug/L		N/A	N/A	N/A	N/A	N/A	<2 U	N/A	N/A
METHANE	ug/L		N/A	N/A	N/A	N/A	N/A	1.01 J	N/A	N/A
Ferrous Iron (SM3500FE)										
FERROUS IRON	mg/L		N/A	N/A	N/A	N/A	N/A	<0.04 U	N/A	N/A
Dechlorinating Bacteria										
DEHALOCOCCOIDES (DHC)	cells/ml		N/A	N/A	N/A	N/A	N/A	1.3	N/A	N/A
TCEA REDUCTASE (TCE)	cells/ml		N/A	N/A	N/A	N/A	N/A	<0.4 U	N/A	N/A
BAV1 VINYL CHLORIDE REDUCTASE (BVC)	cells/ml		N/A	N/A	N/A	N/A	N/A	0.5	N/A	N/A
VINYL CHLORIDE REDUCTASE (VCR)	cells/ml		N/A	N/A	N/A	N/A	N/A	<0.4 U	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	MW14- 120913 12/9/2013	MW14F- 120913 12/9/2013	MW17- 121613 12/16/2013	MW18- 121813 12/18/2013	MW18F- 121813 12/18/2013	MW18FD- 121813 12/18/2013	MW18FDF- 121813 12/18/2013	MW19- 121713 12/17/2013
ID Location:			Site 18/24 – W, inside the fence line, outer region Sampled Semi-annually	Site 18/24 – W, inside the fence line, outer region. Filtered, Sampled Semi-annually	Site 18/24 – W, outside the fence line, along the outer loop road Sampled Semi-annually	Site 18/24 – SW, outside the fence line, along the outer loop road Sampled Semi-annually	Site 18/24 – SW, outside the fence line, along the outer loop road. Filtered, Sampled Semi-annually	Site 18/24 – SW, outside the fence line, along the outer loop road. Dup, Sampled Semi-annually	Site 18/24 – SW, outside the fence line, along the outer loop road. Filtered dup, Sampled Semi-annually	Site 18/24 – SSW, outside the fence line, along the outer loop road Sampled Semi-annually
Alkalinity (310.2)										
ALKALINITY, TOTAL	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Organic Carbon (415.1)										
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Metals (6010C)										
ALUMINUM	mg/L	100	N/A	<0.5 U	<0.1 U	N/A	<0.1 U	N/A	<0.1 U	N/A
BERYLLIUM	mg/L	0.004	N/A	<0.05 U	<0.01 U	N/A	<0.01 U	N/A	<0.01 U	N/A
CALCIUM	mg/L		N/A	86.4	55.8 J	N/A	11.7	N/A	10.9	N/A
IRON	mg/L		N/A	143	11.6 J	N/A	11.9	N/A	11.8	N/A
MAGNESIUM	mg/L		N/A	52.1	24.4 J	N/A	6.65	N/A	6.13	N/A
POTASSIUM	mg/L		N/A	10.2	2.73	N/A	1.31 J	N/A	1.21 J	N/A
SELENIUM	mg/L	0.05	N/A	<0.05 U	<0.01 U	N/A	<0.01 U	N/A	0.00822 J	N/A
SODIUM	mg/L		N/A	442	91.2 J	N/A	86	N/A	83.2	N/A
Metals (6020A)										
ANTIMONY	mg/L	0.006	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	N/A
ARSENIC	mg/L	0.01	N/A	0.00413	0.00591 J	N/A	0.00172 J	N/A	0.00219	N/A
BARIUM	mg/L	2	N/A	0.602	0.782 J	N/A	0.27 J	N/A	0.265 J	N/A
CADMIUM	mg/L	0.005	N/A	0.000357 J	<0.0006 U	N/A	<0.0006 U	N/A	<0.0006 U	N/A
CHROMIUM	mg/L	0.1	N/A	<0.002 U	0.018	N/A	<0.002 U	N/A	<0.002 U	N/A
COBALT	mg/L	6.1	N/A	0.00838	0.0162	N/A	0.00528	N/A	0.00529	N/A
COPPER	mg/L	1.3	N/A	0.00125 J	0.00101 J	N/A	0.001 J	N/A	<0.002 U	N/A
LEAD	mg/L	0.015	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	N/A
MANGANESE	mg/L	14	N/A	3.58	0.719	N/A	0.612	N/A	0.583	N/A
NICKEL	mg/L	2	N/A	0.0273	0.0719	N/A	0.0657	N/A	0.0674	N/A
SILVER	mg/L	0.51	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	N/A
THALLIUM	mg/L	0.002	N/A	<0.0002 U	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U	N/A
VANADIUM	mg/L	0.72	N/A	<0.001 U	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	N/A
ZINC	mg/L	31	N/A	0.136	<0.025 U	N/A	<0.025 U	N/A	<0.025 U	N/A
Perchlorate (6850)										
PERCHLORATE	ug/L	72	204000	N/A	0.376 J	<0.2 U	N/A	<0.2 U	N/A	<0.2 U
Mercury (7470A)										
MERCURY	mg/L	0.002	N/A	<0.0002 U	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U	N/A
Volatile Organic Compounds (8260B)										
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U
1,1,2-TRICHLOROETHANE	ug/L	5	4.1	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,1-DICHLOROETHANE	ug/L	10000	31.4	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	139	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U	N/A	<0.3 U	<0.3 UJ	N/A	<0.3 UJ	N/A	<0.3 U
1,2,3-TRICHLOROPROPANE	ug/L	0.004	<1 U	N/A	<1 U	<1 UJ	N/A	<1 UJ	N/A	<1 U
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	N/A	<2 U	<2 UJ	N/A	<2 UJ	N/A	<2 U
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
1,2-DICHLOROETHANE	ug/L	5	68.2	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	0.31 J
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
2-BUTANONE	ug/L	61000	<5 U	N/A	<5 U	<5 UJ	N/A	<5 UJ	N/A	<5 U
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
2-HEXANONE	ug/L	6100	<5 U	N/A	<5 U	<5 UJ	N/A	<5 UJ	N/A	<5 U
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	N/A	<0.5 U	<0.5 UJ	N/A	<0.5 UJ	N/A	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	N/A	<5 U	<5 U	N/A	<5 U	N/A	<5 U
ACETONE	ug/L	92000	<5 U	N/A	<5 U	<5 UJ	N/A	<5 UJ	N/A	<5 U
BENZENE	ug/L	5	4.34	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
BROMOBENZENE	ug/L	2000	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
BROMOFORM	ug/L	36	<1 U	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
BROMOMETHANE	ug/L	140	<1 U	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
CARBON DISULFIDE	ug/L	10000	<1 U	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
CHLOROETHANE	ug/L	41000	1.52 J	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
CHLOROFORM	ug/L	1000	7.8	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
CHLOROMETHANE	ug/L	220	<1 U	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	1940	N/A	0.256 J	<0.5 U	N/A	<0.5 U	N/A	0.692 J
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
DIBROMOMETHANE	ug/L	380	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
ETHYLBENZENE	ug/L	700	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
M,P-XYLENE	ug/L	10000	<1 U	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
METHYLENE CHLORIDE	ug/L	5	0.689 J	N/A	0.346 J	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
NAPHTHALENE	ug/L	2000	<0.4 U	N/A	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U
N-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
N-PROPYLBENZENE	ug/L	4100	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
O-XYLENE	ug/L	10000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
STYRENE	ug/L	100	<0.25 U	N/A	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
TETRACHLOROETHENE	ug/L	5	1.13	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
TOLUENE	ug/L	1000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	18.2	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	N/A	<1 U	<1 U	N/A	<1 U	N/A	<1 U
TRICHLOROETHENE	ug/L	5	12500	N/A	0.656 J	1.95	N/A	2.04	N/A	6.38
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
VINYL CHLORIDE	ug/L	2	4.37	N/A	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U
Inorganic Anions (9056)										
CHLORIDE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SULFATE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dissolved Gases (RSK-175)										
ETHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ETHENE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
METHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ferrous Iron (SM3500FE)										
FERROUS IRON	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dechlorinating Bacteria										
DEHALOCOCCOIDES (DHC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TCEA REDUCTASE (TCE)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BAV1 VINYL CHLORIDE REDUCTASE (BVC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE REDUCTASE (VCR)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	MW19F- 121713 12/17/2013	MW19FD- 121713 12/17/2013	MW19FDF- 121713 12/17/2013	MW21- 121413 12/14/2013	MW21F- 121413 12/14/2013	MW21FD- 121413 12/14/2013	MW21FDF- 121413 12/14/2013
ID Location:			Site 18/24 – SSW, outside the fence line, along the outer loop road. Filtered, Sampled Semi-annually	Site 18/24 – SSW, outside the fence line, along the outer loop road. Dup, Sampled Semi-annually	Site 18/24 – SSW, outside the fence line, along the outer loop road. Filtered dup, Sampled Semi-annually	Site 18/24 – ENE, inside the fence line, middle region Sampled Semi-annually	Site 18/24 – ENE, inside the fence line, middle region. Filtered, Sampled Semi-annually	Site 18/24 – ENE, inside the fence line, middle region. Dup, Sampled Semi-annually	Site 18/24 – ENE, inside the fence line, middle region. Filtered dup, Sampled Semi-annually
Alkalinity (310.2)									
ALKALINITY, TOTAL	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Organic Carbon (415.1)									
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Metals (6010C)									
ALUMINUM	mg/L	100	<0.1 U	N/A	<0.1 U	N/A	<0.1 U	N/A	<0.1 U
BERYLLIUM	mg/L	0.004	<0.01 U	N/A	<0.01 U	N/A	<0.01 U	N/A	<0.01 U
CALCIUM	mg/L		143	N/A	150	N/A	325	N/A	304
IRON	mg/L		91.8	N/A	94.6	N/A	2.75	N/A	2.9
MAGNESIUM	mg/L		82.8	N/A	84.5	N/A	276	N/A	270
POTASSIUM	mg/L		3.57	N/A	3.78	N/A	2.23	N/A	2.32
SELENIUM	mg/L	0.05	<0.01 U	N/A	<0.01 U	N/A	<0.01 U	N/A	0.0111 J
SODIUM	mg/L		1330	N/A	1410	N/A	795	N/A	766
Metals (6020A)									
ANTIMONY	mg/L	0.006	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U
ARSENIC	mg/L	0.01	0.0106 J	N/A	0.0102 J	N/A	0.0093	N/A	0.00977
BARIUM	mg/L	2	0.153	N/A	0.145	N/A	11.3	N/A	12
CADMIUM	mg/L	0.005	<0.0006 U	N/A	<0.0006 U	N/A	0.000925 J	N/A	0.000897 J
CHROMIUM	mg/L	0.1	0.0494	N/A	0.036	N/A	0.217	N/A	0.239
COBALT	mg/L	6.1	0.0102	N/A	0.00963	N/A	0.069	N/A	0.0713
COPPER	mg/L	1.3	0.00396 J	N/A	0.00343 J	N/A	0.0134	N/A	0.014
LEAD	mg/L	0.015	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U
MANGANESE	mg/L	14	2.44	N/A	2.34	N/A	2.47	N/A	2.66
NICKEL	mg/L	2	0.445	N/A	0.43	N/A	0.899	N/A	0.906
SILVER	mg/L	0.51	<0.001 U	N/A	<0.001 U	N/A	<0.001 U	N/A	<0.001 U
THALLIUM	mg/L	0.002	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U
VANADIUM	mg/L	0.72	<0.001 U	N/A	<0.001 U	N/A	<0.005 U	N/A	<0.005 U
ZINC	mg/L	31	<0.025 U	N/A	<0.025 U	N/A	0.0336 J	N/A	0.0349 J
Perchlorate (6850)									
PERCHLORATE	ug/L	72	N/A	<0.2 U	N/A	49200	N/A	49300	N/A
Mercury (7470A)									
MERCURY	mg/L	0.002	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U	N/A	<0.0002 U
Volatile Organic Compounds (8260B)									
1,1,1,2-TETRACHLOROETHANE	ug/L	110	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
1,1,1-TRICHLOROETHANE	ug/L	200	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
1,1,2,2-TETRACHLOROETHANE	ug/L	14	N/A	<0.4 U	N/A	<40 U	N/A	<40 U	N/A
1,1,2-TRICHLOROETHANE	ug/L	5	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
1,1-DICHLOROETHANE	ug/L	10000	N/A	<0.25 U	N/A	<25 U	N/A	<25 U	N/A
1,1-DICHLOROETHENE	ug/L	7	N/A	<1 U	N/A	<100 U	N/A	<100 U	N/A
1,1-DICHLOROPROPENE	ug/L	2.9	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
1,2,3-TRICHLOROBENZENE	ug/L	310	N/A	<0.3 U	N/A	<30 U	N/A	<30 U	N/A
1,2,3-TRICHLOROPROPANE	ug/L	0.004	N/A	<1 U	N/A	<100 U	N/A	<100 U	N/A
1,2,4-TRICHLOROBENZENE	ug/L	70	N/A	<0.4 U	N/A	<40 U	N/A	<40 U	N/A
1,2,4-TRIMETHYLBENZENE	ug/L	5100	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	N/A	<2 U	N/A	<200 U	N/A	<200 U	N/A
1,2-DIBROMOETHANE	ug/L	0.005	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
1,2-DICHLOROBENZENE	ug/L	600	N/A	<0.25 U	N/A	<25 U	N/A	<25 U	N/A
1,2-DICHLOROETHANE	ug/L	5	N/A	0.354 J	N/A	86.7 J	N/A	84.5 J	N/A
1,2-DICHLOROPROPANE	ug/L	5	N/A	<0.4 U	N/A	<40 U	N/A	<40 U	N/A
1,3,5-TRIMETHYLBENZENE	ug/L	5100	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
1,3-DICHLOROBENZENE	ug/L	3100	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
1,3-DICHLOROPROPANE	ug/L	29	N/A	<0.4 U	N/A	<40 U	N/A	<40 U	N/A
1,4-DICHLOROBENZENE	ug/L	75	N/A	<0.25 U	N/A	<25 U	N/A	<25 U	N/A
2,2-DICHLOROPROPANE	ug/L	42	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
2-BUTANONE	ug/L	61000	N/A	<5 U	N/A	<500 U	N/A	<500 U	N/A
2-CHLOROTOLUENE	ug/L	2000	N/A	<0.25 U	N/A	<25 U	N/A	<25 U	N/A
2-HEXANONE	ug/L	6100	N/A	<5 U	N/A	<500 U	N/A	<500 U	N/A
4-CHLOROTOLUENE	ug/L	2000	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
4-METHYL-2-PENTANONE	ug/L	8200	N/A	<5 U	N/A	<500 U	N/A	<500 U	N/A
ACETONE	ug/L	92000	N/A	<5 U	N/A	<500 UJ	N/A	<500 UJ	N/A
BENZENE	ug/L	5	N/A	<0.25 U	N/A	<25 U	N/A	<25 U	N/A
BROMOBENZENE	ug/L	2000	N/A	<0.25 U	N/A	<25 U	N/A	<25 U	N/A
BROMOCHLOROMETHANE	ug/L	4100	N/A	<0.4 U	N/A	<40 U	N/A	<40 U	N/A
BROMODICHLOROMETHANE	ug/L	4.6	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
BROMOFORM	ug/L	36	N/A	<1 U	N/A	<100 U	N/A	<100 U	N/A
BROMOMETHANE	ug/L	140	N/A	<1 U	N/A	<100 UJ	N/A	<100 UJ	N/A
CARBON DISULFIDE	ug/L	10000	N/A	<1 U	N/A	<100 U	N/A	<100 U	N/A
CARBON TETRACHLORIDE	ug/L	5	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
CHLOROBENZENE	ug/L	100	N/A	<0.25 U	N/A	<25 U	N/A	<25 U	N/A
CHLOROETHANE	ug/L	41000	N/A	<1 U	N/A	<100 U	N/A	<100 U	N/A
CHLOROFORM	ug/L	1000	N/A	<0.25 U	N/A	24.2 J	N/A	22.8 J	N/A
CHLOROMETHANE	ug/L	220	N/A	<1 U	N/A	<100 U	N/A	<100 U	N/A
CIS-1,2-DICHLOROETHENE	ug/L	70	N/A	0.761 J	N/A	117	N/A	110	N/A
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
DIBROMOCHLOROMETHANE	ug/L	34	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
DIBROMOMETHANE	ug/L	380	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
DICHLORODIFLUOROMETHANE	ug/L	20000	N/A	<0.5 U	N/A	<50 UJ	N/A	<50 UJ	N/A
ETHYLBENZENE	ug/L	700	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
HEXACHLOROBUTADIENE	ug/L	20	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
ISOPROPYLBENZENE	ug/L	1000	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
M,P-XYLENE	ug/L	10000	N/A	<1 U	N/A	<100 U	N/A	<100 U	N/A
METHYLENE CHLORIDE	ug/L	5	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
NAPHTHALENE	ug/L	2000	N/A	<0.4 U	N/A	<40 U	N/A	<40 U	N/A
N-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
N-PROPYLBENZENE	ug/L	4100	N/A	<0.25 U	N/A	<25 U	N/A	<25 U	N/A
O-XYLENE	ug/L	10000	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
P-ISOPROPYLTOLUENE	ug/L	10000	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
SEC-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
STYRENE	ug/L	100	N/A	<0.25 U	N/A	<25 U	N/A	<25 U	N/A
TERT-BUTYLBENZENE	ug/L	4100	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
TETRACHLOROETHENE	ug/L	5	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
TOLUENE	ug/L	1000	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
TRANS-1,2-DICHLOROETHENE	ug/L	100	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
TRANS-1,3-DICHLOROPROPENE	ug/L	29	N/A	<1 U	N/A	<100 U	N/A	<100 U	N/A
TRICHLOROETHENE	ug/L	5	N/A	6.94	N/A	14600	N/A	14500	N/A
TRICHLOROFLUOROMETHANE	ug/L	31000	N/A	<0.5 U	N/A	<50 U	N/A	<50 U	N/A
VINYL CHLORIDE	ug/L	2	N/A	<0.5 U	N/A	58.8 J	N/A	56.9 J	N/A
Inorganic Anions (9056)									
CHLORIDE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SULFATE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dissolved Gases (RSK-175)									
ETHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
ETHENE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
METHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ferrous Iron (SM3500FE)									
FERROUS IRON	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dechlorinating Bacteria									
DEHALOCOCCOIDES (DHC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A
TCEA REDUCTASE (TCE)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A
BAV1 VINYL CHLORIDE REDUCTASE (BVC)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE REDUCTASE (VCR)	cells/ml		N/A	N/A	N/A	N/A	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	46SW09-093013 9/30/2013	46WW05-092413 9/24/2013	46WW05F-092413 9/24/2013	46WW09-092413 9/24/2013	46WW09F-092413 9/24/2013	46WW13-092413 9/24/2013	46WW13F-092413 9/24/2013
ID Location:			Site 46 - ENE, creek sample, outside the fence line, where the creek and Karnack Ave meet. Sampled semi-annually	Site 46 - N, inside the fence line, outer region. Sampled quarterly	Site 46 - N, inside the fence line, outer region. Filtered, Sampled quarterly	Site 46 - N, within the site boundary, middle region. Sampled quarterly	Site 46 - N, within the site boundary, middle region. Filtered, Sampled quarterly	Site 46 - NW, within the site boundary, center region. Sampled quarterly	Site 46 - NW, within the site boundary, center region. Filtered, Sampled quarterly
Alkalinity (310.2)									
ALKALINITY, TOTAL	mg/L	N/A	N/A	69.5	N/A	160	N/A	N/A	N/A
Nitrate-Nitrite Nitrogen (353.2)									
NITROGEN, NITRATE-NITRITE	mg/L	N/A	N/A	0.26	N/A	0.389	N/A	N/A	N/A
Phosphorus (365.4)									
PHOSPHORUS	mg/L	N/A	N/A	0.171 J	N/A	<0.2 U	N/A	N/A	N/A
Extractable Sulfides (376.1)									
SULFIDE	mg/L	N/A	N/A	<1 U	N/A	0.533 J	N/A	N/A	N/A
Total Organic Carbon (415.1)									
TOTAL ORGANIC CARBON (TOC)	mg/L	N/A	N/A	12.3	N/A	6.94	N/A	N/A	N/A
Metals (6010C)									
IRON	mg/L	N/A	N/A	N/A	27.6 J	N/A	N/A	N/A	N/A
Metals (6020A)									
MANGANESE	mg/L	14	N/A	N/A	13.4	N/A	2.34	N/A	N/A
THALLIUM	mg/L	0.002	N/A	0.000714	N/A	<0.0002 U	<0.0002 U	N/A	<0.0002 U
Volatile Organic Compounds (8260B)									
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U	N/A
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,1-DICHLOROETHANE	ug/L	10000	<0.25 U	0.973 J	N/A	<0.25 U	N/A	<0.25 U	N/A
1,1-DICHLOROETHENE	ug/L	7	<1 U	7.81	N/A	<1 U	N/A	3.76	N/A
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U	<0.3 U	N/A	<0.3 U	N/A	<0.3 U	N/A
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<1 U	<1 U	N/A	<1 U	N/A	<1 U	N/A
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U	N/A
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	<2 U	N/A	<2 U	N/A	<2 U	N/A
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
1,2-DICHLOROETHANE	ug/L	5	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U	N/A
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U	N/A
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
2-BUTANONE	ug/L	61000	<5 U	<5 U	N/A	<5 UJ	N/A	<5 U	N/A
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
2-HEXANONE	ug/L	6100	<5 U	<5 U	N/A	<5 UJ	N/A	<5 U	N/A
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	<5 U	N/A	<5 U	N/A	<5 U	N/A
ACETONE	ug/L	92000	<5 UJ	<5 U	N/A	<5 UJ	N/A	<5 U	N/A
BENZENE	ug/L	5	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
BROMOBENZENE	ug/L	2000	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U	N/A
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
BROMOFORM	ug/L	36	<1 U	<1 U	N/A	<1 U	N/A	<1 U	N/A
BROMOMETHANE	ug/L	140	<1 UJ	<1 U	N/A	<1 U	N/A	<1 U	N/A
CARBON DISULFIDE	ug/L	10000	<1 U	<1 U	N/A	<1 U	N/A	<1 U	N/A
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
CHLOROBENZENE	ug/L	100	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	0.143 J	N/A
CHLOROETHANE	ug/L	41000	<1 U	<1 U	N/A	<1 U	N/A	<1 U	N/A
CHLOROFORM	ug/L	1000	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
CHLOROMETHANE	ug/L	220	<1 U	<1 U	N/A	<1 U	N/A	<1 U	N/A
CIS-1,2-DICHLOROETHENE	ug/L	70	<0.5 U	8.12	N/A	<0.5 U	N/A	35.5	N/A
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
DIBROMOMETHANE	ug/L	380	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
ETHYLBENZENE	ug/L	700	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
M,P-XYLENE	ug/L	10000	<1 U	<1 U	N/A	<1 U	N/A	<1 U	N/A
METHYLENE CHLORIDE	ug/L	5	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
NAPHTHALENE	ug/L	2000	<0.4 U	<0.4 U	N/A	<0.4 U	N/A	<0.4 U	N/A
N-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
N-PROPYLBENZENE	ug/L	4100	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
O-XYLENE	ug/L	10000	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
STYRENE	ug/L	100	<0.25 U	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	N/A
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
TETRACHLOROETHENE	ug/L	5	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	0.386 J	N/A
TOLUENE	ug/L	1000	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
TRANS-1,2-DICHLOROETHENE	ug/L	100	<0.5 U	0.274 J	N/A	<0.5 U	N/A	3.05	N/A
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	<1 U	N/A	<1 U	N/A	<1 U	N/A
TRICHLOROETHENE	ug/L	5	<0.5 U	112	N/A	<0.5 U	N/A	103	N/A
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	N/A
VINYL CHLORIDE	ug/L	2	<0.5 U	1.79	N/A	<0.5 U	N/A	9.83	N/A
Inorganic Anions (9056)									
CHLORIDE	mg/L	N/A	N/A	343	N/A	465	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	<4 UJ	N/A	<10 UJ	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	<4 UJ	N/A	<10 UJ	N/A	N/A	N/A
SULFATE	mg/L	N/A	N/A	4090	N/A	2340	N/A	N/A	N/A
Dissolved Gases (RSK-175)									
CARBON DIOXIDE	ug/L	N/A	N/A	210000	N/A	58400	N/A	N/A	N/A
ETHANE	ug/L	N/A	N/A	<2 U	N/A	<2 U	N/A	N/A	N/A
ETHENE	ug/L	N/A	N/A	<2 U	N/A	<2 U	N/A	N/A	N/A
METHANE	ug/L	N/A	N/A	39.4	N/A	<2 U	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	LHSMW19-092413 9/24/2013	LHSMW19F-092413 9/24/2013
ID Location:			Site 46 - NNW, inside the fence line, middle region. Sampled quarterly	Site 46 - NNW, inside the fence line, middle region. Filtered, Sampled quarterly
Alkalinity (310.2)				
ALKALINITY, TOTAL	mg/L	N/A	191	N/A
Nitrate-Nitrite Nitrogen (353.2)				
NITROGEN, NITRATE-NITRITE	mg/L	N/A	<0.05 U	N/A
Phosphorus (365.4)				
PHOSPHORUS	mg/L	N/A	0.447	N/A
Extractable Sulfides (376.1)				
SULFIDE	mg/L	N/A	<1 U	N/A
Total Organic Carbon (415.1)				
TOTAL ORGANIC CARBON (TOC)	mg/L	N/A	4.18	N/A
Metals (6010C)				
IRON	mg/L	N/A	N/A	<0.1 U
Metals (6020A)				
MANGANESE	mg/L	14	N/A	0.0765
THALLIUM	mg/L	0.002	<0.0002 U	N/A
Volatile Organic Compounds (8260B)				
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U	N/A
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U	N/A
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U	N/A
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 U	N/A
1,1-DICHLOROETHANE	ug/L	10000	<0.25 U	N/A
1,1-DICHLOROETHENE	ug/L	7	<1 U	N/A
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U	N/A
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U	N/A
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<1 U	N/A
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U	N/A
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	N/A
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	N/A
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	N/A
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	N/A
1,2-DICHLOROETHANE	ug/L	5	<0.5 U	N/A
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	N/A
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	N/A
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	N/A
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	N/A
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	N/A
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	N/A
2-BUTANONE	ug/L	61000	<5 UJ	N/A
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	N/A
2-HEXANONE	ug/L	6100	<5 UJ	N/A
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	N/A
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	N/A
ACETONE	ug/L	92000	<5 UJ	N/A
BENZENE	ug/L	5	<0.25 U	N/A
BROMOBENZENE	ug/L	2000	<0.25 U	N/A
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	N/A
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	N/A
BROMOFORM	ug/L	36	<1 U	N/A
BROMOMETHANE	ug/L	140	<1 U	N/A
CARBON DISULFIDE	ug/L	10000	<1 U	N/A
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	N/A
CHLOROBENZENE	ug/L	100	<0.25 U	N/A
CHLOROETHANE	ug/L	41000	<1 U	N/A
CHLOROFORM	ug/L	1000	<0.25 U	N/A
CHLOROMETHANE	ug/L	220	<1 U	N/A
CIS-1,2-DICHLOROETHENE	ug/L	70	2.44	N/A
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	N/A
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	N/A
DIBROMOMETHANE	ug/L	380	<0.5 U	N/A
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	N/A
ETHYLBENZENE	ug/L	700	<0.5 U	N/A
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	N/A
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	N/A
M,P-XYLENE	ug/L	10000	<1 U	N/A
METHYLENE CHLORIDE	ug/L	5	<0.5 U	N/A
NAPHTHALENE	ug/L	2000	<0.4 U	N/A
N-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A
N-PROPYLBENZENE	ug/L	4100	<0.25 U	N/A
O-XYLENE	ug/L	10000	<0.5 U	N/A
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	N/A
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A
STYRENE	ug/L	100	<0.25 U	N/A
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A
TETRACHLOROETHENE	ug/L	5	<0.5 U	N/A
TOLUENE	ug/L	1000	<0.5 U	N/A
TRANS-1,2-DICHLOROETHENE	ug/L	100	0.4 J	N/A
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	N/A
TRICHLOROETHENE	ug/L	5	40.9	N/A
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	N/A
VINYL CHLORIDE	ug/L	2	<0.5 U	N/A
Inorganic Anions (9056)				
CHLORIDE	mg/L	N/A	211	N/A
NITRATE	mg/L	10	<2 U	N/A
NITRITE	mg/L	1	<2 U	N/A
SULFATE	mg/L	N/A	454	N/A
Dissolved Gases (RSK-175)				
CARBON DIOXIDE	ug/L	N/A	40400	N/A
ETHANE	ug/L	N/A	<2 U	N/A
ETHENE	ug/L	N/A	<2 U	N/A
METHANE	ug/L	N/A	<2 U	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	47WW38-110613 11/6/2013	50WW05-110613 11/6/2013	50WW07-110513 11/5/2013	50WW09-110113 11/1/2013	50WW10-110513 11/5/2013	50WW10FD-110513 11/5/2013	50WW20-110713 11/7/2013	50WW26-110613 11/6/2013
ID Location:			Site 47 - N, inside Site 47 but within the Site 50 Perchlorate plume. Sampled quarterly	Site 50 - NE, outside the site boundary. Sampled quarterly	Site 50 - E, outside the site boundary, along S. Houston Rd. Sampled quarterly	Site 50 - NE, within the site boundary, near the road. Sampled quarterly	Site 50 - ENE, inside the site boundary, near the ditch. Sampled quarterly	Site 50 - ENE, inside the site boundary, near the ditch. Filtered, Sampled quarterly	Site 50 - E, outside the site boundary. Sampled quarterly	Site 50 - ENE, outside the site boundary, near Site-08 boundary. Sampled quarterly
Perchlorate (6850)										
PERCHLORATE	ug/L	72	1160 J	0.397 J	<0.2 U	<0.2 U	0.906	0.924	<0.2 U	<0.2 U
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
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
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
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
1,1-DICHLOROETHANE	ug/L	10000	<0.25 U	0.275 J	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	<1 U	2.57	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
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
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
1,2,3-TRICHLOROPROPANE	ug/L	0.004	<1 U	<1 U	<1 U	<1 U	<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
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
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	<2 U	<2 U	<2 UJ	<2 UJ	<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
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
1,2-DICHLOROETHANE	ug/L	5	<0.5 U	2.81	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
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
1,3,5-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
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
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
1,4-DICHLOROBENZENE	ug/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
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
2-BUTANONE	ug/L	61000	<5 U	<5 U	<5 U	<5 UJ	<5 UJ	<5 U	<5 U	<5 U
2-CHLOROTOLUENE	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
2-HEXANONE	ug/L	6100	<5 U	<5 U	<5 U	<5 UJ	<5 UJ	<5 U	<5 U	<5 U
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
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	<5 U	<5 U	<5 UJ	<5 UJ	<5 U	<5 U	<5 U
ACETONE	ug/L	92000	3.3 J	3.28 J	2.55 J	<5 UJ	3.73 J	7.67 J	<5 U	3.32 J
BENZENE	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
BROMOBENZENE	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
BROMOCHLOROMETHANE	ug/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
BROMODICHLOROMETHANE	ug/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
BROMOFORM	ug/L	36	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
BROMOMETHANE	ug/L	140	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CARBON DISULFIDE	ug/L	10000	<1 U	<1 U	<1 U	<1 U	15.6	17	<1 U	<1 U
CARBON TETRACHLORIDE	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
CHLOROBENZENE	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
CHLOROETHANE	ug/L	41000	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CHLOROFORM	ug/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
CHLOROMETHANE	ug/L	220	<1 U	<1 U	<1 U	0.5 J	<1 U	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	<0.5 U	12.4	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
CIS-1,3-DICHLOROPROPENE	ug/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
DIBROMOCHLOROMETHANE	ug/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
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
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
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
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
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
M,P-XYLENE	ug/L	10000	<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
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
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
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
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
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
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
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
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
TETRACHLOROETHENE	ug/L	5	<0.5 U	1.54	<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
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
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
TRICHLOROETHENE	ug/L	5	<0.5 U	280	<0.5 U	0.26 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U
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
VINYL CHLORIDE	ug/L	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

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	50WW26FD-110613 11/6/2013	50WW27-110613 11/6/2013	LHSMW54-110713 11/7/2013
ID Location:			Site 50 - ENE, outside the site boundary. Filtered, Sampled quarterly	Site 50 - E, outside the site boundary. Sampled quarterly	Site 47 - NE, outside the site boundary, inside site 47. Sampled quarterly
Perchlorate (6850)					
PERCHLORATE	ug/L	72	<0.2 U	<0.2 U	<0.2 U
Volatile Organic Compounds (8260B)					
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<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
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<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
1,1-DICHLOROETHANE	ug/L	10000	<0.25 U	<0.25 U	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	<1 U	<1 U	<1 U
1,1-DICHLOROPROPENE	ug/L	2.9	<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
1,2,3-TRICHLOROPROPANE	ug/L	0.004	<1 U	<1 U	<1 U
1,2,4-TRICHLOROBENZENE	ug/L	70	<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
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	<2 UJ	<2 U
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	<0.5 U	<0.5 U
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	<0.25 U	<0.25 U
1,2-DICHLOROETHANE	ug/L	5	<0.5 U	<0.5 U	<0.5 U
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	<0.4 U	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<0.5 U	<0.5 U
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	<0.5 U	<0.5 U
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	<0.4 U	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	<0.25 U	<0.25 U
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	<0.5 U	<0.5 U
2-BUTANONE	ug/L	61000	<5 U	<5 UJ	<5 U
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	<0.25 U	<0.25 U
2-HEXANONE	ug/L	6100	<5 U	<5 UJ	<5 U
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	<0.5 U	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	<5 UJ	<5 U
ACETONE	ug/L	92000	<5 U	<5 UJ	2.52 J
BENZENE	ug/L	5	<0.25 U	<0.25 U	<0.25 U
BROMOBENZENE	ug/L	2000	<0.25 U	<0.25 U	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	<0.4 U	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	<0.5 U	<0.5 U
BROMOFORM	ug/L	36	<1 U	<1 U	<1 U
BROMOMETHANE	ug/L	140	<1 U	<1 U	<1 U
CARBON DISULFIDE	ug/L	10000	<1 U	<1 U	<1 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	<0.5 U	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U	<0.25 U	<0.25 U
CHLOROETHANE	ug/L	41000	<1 U	<1 U	<1 U
CHLOROFORM	ug/L	1000	<0.25 U	<0.25 U	<0.25 U
CHLOROMETHANE	ug/L	220	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	<0.5 U	<0.5 U	0.392 J
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	<0.5 U	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	<0.5 U	<0.5 U
DIBROMOMETHANE	ug/L	380	<0.5 U	<0.5 U	<0.5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	<0.5 U	<0.5 U
ETHYLBENZENE	ug/L	700	<0.5 U	<0.5 U	<0.5 U
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	<0.5 U	<0.5 U
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	<0.5 U	<0.5 U
M,P-XYLENE	ug/L	10000	<1 U	<1 U	<1 U
METHYLENE CHLORIDE	ug/L	5	<0.5 U	<0.5 U	<0.5 U
NAPHTHALENE	ug/L	2000	<0.4 U	<0.4 U	<0.4 U
N-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	<0.5 U
N-PROPYLBENZENE	ug/L	4100	<0.25 U	<0.25 U	<0.25 U
O-XYLENE	ug/L	10000	<0.5 U	<0.5 U	<0.5 U
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	<0.5 U	<0.5 U
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	<0.5 U
STYRENE	ug/L	100	<0.25 U	<0.25 U	<0.25 U
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	ug/L	5	<0.5 U	<0.5 U	<0.5 U
TOLUENE	ug/L	1000	<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
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	<1 U	<1 U
TRICHLOROETHENE	ug/L	5	<0.5 U	<0.5 U	112
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	ug/L	2	<0.5 U	<0.5 U	<0.5 U

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	03WW01- 082013 8/20/2013	03WW01- 101013 10/10/2013	03WW01F- 101013 10/10/2013	35AWW08- 082013 8/20/2013	35AWW08- 101013 10/10/2013	35AWW08F- 101013 10/10/2013	35AWW09- 082913 8/29/2013	35AWW09F- 082913 8/29/2013
ID Location:			Site 58 - E, inside the site boundary, outer region. Sampled quarterly	Site 58 - E, inside the site boundary, outer region. Sampled quarterly	Site 58 - E, inside the site boundary, outer region. Filtered, Sampled quarterly	Site 58 - E, inside the site boundary, outer region. Sampled quarterly	Site 58 - E, inside the site boundary, outer region. Sampled quarterly	Site 58 - E, inside the site boundary, outer region. Filtered, Sampled quarterly	Site 58 - E, inside the site boundary, outer region. Sampled quarterly	Site 58 - E, inside the site boundary, outer region. Filtered, Sampled quarterly
Alkalinity (310.2)										
ALKALINITY, TOTAL	mg/L		142	39700	N/A	174	35600	N/A	250	N/A
Nirtate-Nitrite Nitrogen (353.2)										
NITROGEN, NITRATE-NITRITE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	0.201	N/A
Phosphorus (365.4)										
PHOSPHORUS	mg/L		<0.2 U	243	N/A	0.178 J	361	N/A	0.351 J	N/A
Extractable Sulfides (376.1)										
SULFIDE	mg/L		<1 U	<1 U	N/A	1.2 J	<1 U	N/A	1.75 J	N/A
Total Organic Carbon (415.1)										
TOTAL ORGANIC CARBON (TOC)	mg/L		10.5	49200	N/A	16.5	66400	N/A	5.77	N/A
Metals (6010C)										
IRON	mg/L		<0.1 U	36.6	N/A	4.75	29.7	N/A	<0.1 U	<0.1 U
Metals (6020A)										
MANGANESE	mg/L	14	0.0589	60.4	65.2	5.71	45.8	40.7	0.361	0.341
Volatile Organic Compounds (8260B)										
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
1,1,1-TRICHLOROETHANE	ug/L	200	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.8 U	<2 U	N/A	<4 U	<4 U	N/A	<0.4 U	N/A
1,1,2-TRICHLOROETHANE	ug/L	5	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
1,1-DICHLOROETHANE	ug/L	10000	1.14 J	<1.25 U	N/A	<2.5 U	<2.5 U	N/A	<0.25 U	N/A
1,1-DICHLOROETHENE	ug/L	7	<2 U	<5 U	N/A	<10 U	<10 U	N/A	<1 U	N/A
1,1-DICHLOROPROPENE	ug/L	2.9	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.6 U	<1.5 U	N/A	<3 U	<3 U	N/A	<0.3 U	N/A
1,2,3-TRICHLOROPROPANE	ug/L	0.004	<2 U	<5 U	N/A	<10 U	<10 U	N/A	<1 U	N/A
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.8 U	<2 U	N/A	<4 U	<4 U	N/A	<0.4 U	N/A
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<1 U	1.39 J	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<4 U	<10 U	N/A	<20 U	<20 U	N/A	<2 U	N/A
1,2-DIBROMOETHANE	ug/L	0.005	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
1,2-DICHLOROBENZENE	ug/L	600	<0.5 U	<1.25 U	N/A	<2.5 U	<2.5 U	N/A	<0.25 U	N/A
1,2-DICHLOROETHANE	ug/L	5	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
1,2-DICHLOROPROPANE	ug/L	5	<0.8 U	<2 U	N/A	<4 U	<4 U	N/A	<0.4 U	N/A
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
1,3-DICHLOROBENZENE	ug/L	3100	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
1,3-DICHLOROPROPANE	ug/L	29	<0.8 U	<2 U	N/A	<4 U	<4 U	N/A	<0.4 U	N/A
1,4-DICHLOROBENZENE	ug/L	75	<0.5 U	<1.25 U	N/A	<2.5 U	<2.5 U	N/A	<0.25 U	N/A
2,2-DICHLOROPROPANE	ug/L	42	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
2-BUTANONE	ug/L	61000	<10 U	1250 J	N/A	<50 U	1440 J	N/A	<5 U	N/A
2-CHLOROTOLUENE	ug/L	2000	<0.5 U	<1.25 U	N/A	<2.5 U	<2.5 U	N/A	<0.25 U	N/A
2-HEXANONE	ug/L	6100	<10 U	<25 U	N/A	<50 U	<50 U	N/A	<5 U	N/A
4-CHLOROTOLUENE	ug/L	2000	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
4-METHYL-2-PENTANONE	ug/L	8200	<10 U	12.7 J	N/A	<50 U	<50 U	N/A	<5 U	N/A
ACETONE	ug/L	92000	<10 UJ	1910 J	N/A	<50 U	2570 J	N/A	<5 UJ	N/A
BENZENE	ug/L	5	<0.5 U	<1.25 U	N/A	<2.5 U	<2.5 U	N/A	<0.25 U	N/A
BROMOBENZENE	ug/L	2000	<0.5 U	<1.25 U	N/A	<2.5 U	<2.5 U	N/A	<0.25 U	N/A
BROMOCHLOROMETHANE	ug/L	4100	<0.8 U	<2 U	N/A	<4 U	<4 U	N/A	<0.4 U	N/A
BROMODICHLOROMETHANE	ug/L	4.6	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
BROMOFORM	ug/L	36	<2 U	<5 U	N/A	<10 U	<10 U	N/A	<1 U	N/A
BROMOMETHANE	ug/L	140	<2 U	<5 U	N/A	<10 U	<10 U	N/A	<1 UJ	N/A
CARBON DISULFIDE	ug/L	10000	<2 U	<5 U	N/A	<10 U	<10 U	N/A	<1 U	N/A
CARBON TETRACHLORIDE	ug/L	5	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
CHLOROBENZENE	ug/L	100	<0.5 U	<1.25 U	N/A	<2.5 U	<2.5 U	N/A	<0.25 U	N/A
CHLOROETHANE	ug/L	41000	<2 U	<5 U	N/A	<10 U	<10 U	N/A	<1 U	N/A
CHLOROFORM	ug/L	1000	<0.5 U	<1.25 U	N/A	<2.5 U	<2.5 U	N/A	<0.25 U	N/A
CHLOROMETHANE	ug/L	220	<2 UJ	<5 U	N/A	<10 UJ	<10 U	N/A	<1 UJ	N/A
CIS-1,2-DICHLOROETHENE	ug/L	70	0.978 J	<2.5 U	N/A	9.35 J	<5 U	N/A	<0.5 U	N/A
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
DIBROMOCHLOROMETHANE	ug/L	34	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
DIBROMOMETHANE	ug/L	380	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
DICHLORODIFLUOROMETHANE	ug/L	20000	<1 U	<2.5 U	N/A	<5 UJ	<5 U	N/A	<0.5 U	N/A
ETHYLBENZENE	ug/L	700	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
HEXACHLOROBUTADIENE	ug/L	20	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
ISOPROPYLBENZENE	ug/L	1000	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
M,P-XYLENE	ug/L	10000	<2 U	<5 U	N/A	<10 U	<10 U	N/A	<1 U	N/A
METHYLENE CHLORIDE	ug/L	5	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
NAPHTHALENE	ug/L	2000	<0.8 U	<2 U	N/A	<4 U	<4 U	N/A	<0.4 U	N/A
N-BUTYLBENZENE	ug/L	4100	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
N-PROPYLBENZENE	ug/L	4100	<0.5 U	<1.25 U	N/A	<2.5 U	<2.5 U	N/A	<0.25 U	N/A
O-XYLENE	ug/L	10000	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
P-ISOPROPYLTOLUENE	ug/L	10000	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
SEC-BUTYLBENZENE	ug/L	4100	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
STYRENE	ug/L	100	<0.5 U	<1.25 U	N/A	<2.5 U	<2.5 U	N/A	<0.25 U	N/A
TERT-BUTYLBENZENE	ug/L	4100	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
TETRACHLOROETHENE	ug/L	5	368	172 J	N/A	1640	603 J	N/A	21.9	N/A
TOLUENE	ug/L	1000	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
TRANS-1,2-DICHLOROETHENE	ug/L	100	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<2 U	<5 U	N/A	<10 U	<10 U	N/A	<1 U	N/A
TRICHLOROETHENE	ug/L	5	94.8	42.1 J	N/A	544	149 J	N/A	11.9	N/A
TRICHLOROFLUOROMETHANE	ug/L	31000	<1 UJ	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
VINYL CHLORIDE	ug/L	2	<1 U	<2.5 U	N/A	<5 U	<5 U	N/A	<0.5 U	N/A
Volatile Fatty Acids (830-MBA)										
ACETIC ACID	mg/L		<1 U	946	N/A	<1 U	776	N/A	<1 U	N/A
BUTYRIC ACID	mg/L		<1 U	<100 U	N/A	<1 U	<100 U	N/A	<1 U	N/A
LACTIC ACID	mg/L		<1 U	97100	N/A	<1 U	89700	N/A	<1 U	N/A
PROPIONIC ACID	mg/L	51	<10 U	<1000 U	N/A	<10 U	<1000 U	N/A	<10 U	N/A
PYRUVIC ACID	mg/L		<0.1 U	61.5	N/A	<0.1 U	61.7	N/A	<0.1 U	N/A
Inorganic Anions (9056)										
CHLORIDE	mg/L		892	398	N/A	2510	905	N/A	1970	N/A
NITRATE	mg/L	10	<1 U	<20 U	N/A	<4 U	12.3 J	N/A	<1 U	N/A
NITRITE	mg/L	1	<1 U	<20 U	N/A	<4 U	<20 U	N/A	<1 U	N/A
SULFATE	mg/L		534	487	N/A	1480	703	N/A	1070	N/A
Dissolved Gases (RSK-175)										
CARBON DIOXIDE	ug/L		143000	N/A	N/A	143000	N/A	N/A	150000	N/A
ETHANE	ug/L		<2 U	<2 U	N/A	<2 U	<2 U	N/A	<2 U	N/A
ETHENE	ug/L		<2 U	<2 U	N/A	<2 U	<2 U	N/A	<2 U	N/A
METHANE	ug/L		<2 U	<2 U	N/A	<2 U	<2 UJ	N/A	31.5	N/A
Ferrous Iron (SM3500FE)										
FERROUS IRON	mg/L		<0.04 U	35.4 J	N/A	<0.04 U	52.4 J	N/A	<0.04 U	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Location ID: Sample Date:	Units	MCL/ MSC	35AWW09- 101013 10/10/2013	35AWW09F- 101013 10/10/2013	35AWW10- 082913 8/29/2013	35AWW10F- 082913 8/29/2013	35AWW10- 101013 10/10/2013	35AWW10F- 101013 10/10/2013
ID Location:			Site 58 - E, inside the site boundary, outer region. Sampled quarterly	Site 58 - E, inside the site boundary, outer region. Filtered, Sampled quarterly	Site 58 - ESE, inside the site boundary, middle region. Sampled quarterly	Site 58 - ESE, inside the site boundary, middle region. Filtered, Sampled quarterly	Site 58 - ESE, inside the site boundary, middle region. Sampled quarterly	Site 58 - ESE, inside the site boundary, middle region. Filtered, Sampled quarterly
Alkalinity (310.2)								
ALKALINITY, TOTAL	mg/L		235	N/A	379	N/A	128	N/A
Nirtate-Nitrite Nitrogen (353.2)								
NITROGEN, NITRATE-NITRITE	mg/L		N/A	N/A	0.455	N/A	N/A	N/A
Phosphorus (365.4)								
PHOSPHORUS	mg/L		<0.2 U	N/A	0.412	N/A	<0.2 U	N/A
Extractable Sulfides (376.1)								
SULFIDE	mg/L		<1 U	N/A	<1 U	N/A	<1 U	N/A
Total Organic Carbon (415.1)								
TOTAL ORGANIC CARBON (TOC)	mg/L		9.83	N/A	3.84	N/A	5.42	N/A
Metals (6010C)								
IRON	mg/L		N/A	<0.1 U	<0.1 U	<0.1 U	0.155 J	N/A
Metals (6020A)								
MANGANESE	mg/L	14	N/A	0.234	0.0814	0.0739	0.0811	0.0681
Volatile Organic Compounds (8260B)								
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 UJ	N/A	<0.4 U	N/A	<0.4 U	N/A
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
1,1-DICHLOROETHANE	ug/L	10000	<0.25 UJ	N/A	<0.25 U	N/A	<0.25 U	N/A
1,1-DICHLOROETHENE	ug/L	7	<1 UJ	N/A	<1 U	N/A	<1 U	N/A
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 UJ	N/A	<0.3 U	N/A	<0.3 U	N/A
1,2,3-TRICHLOROPROPANE	ug/L	0.004	<1 UJ	N/A	<1 U	N/A	<1 U	N/A
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 UJ	N/A	<0.4 U	N/A	<0.4 U	N/A
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 UJ	N/A	<2 U	N/A	<2 U	N/A
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2-DICHLOROBENZENE	ug/L	600	<0.25 UJ	N/A	<0.25 U	N/A	<0.25 U	N/A
1,2-DICHLOROETHANE	ug/L	5	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
1,2-DICHLOROPROPANE	ug/L	5	<0.4 UJ	N/A	<0.4 U	N/A	<0.4 U	N/A
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
1,3-DICHLOROPROPANE	ug/L	29	<0.4 UJ	N/A	<0.4 U	N/A	<0.4 U	N/A
1,4-DICHLOROBENZENE	ug/L	75	<0.25 UJ	N/A	<0.25 U	N/A	<0.25 U	N/A
2,2-DICHLOROPROPANE	ug/L	42	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
2-BUTANONE	ug/L	61000	<5 UJ	N/A	<5 U	N/A	<5 U	N/A
2-CHLOROTOLUENE	ug/L	2000	<0.25 UJ	N/A	<0.25 U	N/A	<0.25 U	N/A
2-HEXANONE	ug/L	6100	<5 UJ	N/A	<5 U	N/A	<5 U	N/A
4-CHLOROTOLUENE	ug/L	2000	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
4-METHYL-2-PENTANONE	ug/L	8200	<5 UJ	N/A	<5 U	N/A	<5 U	N/A
ACETONE	ug/L	92000	<5 UJ	N/A	<5 UJ	N/A	<5 U	N/A
BENZENE	ug/L	5	<0.25 UJ	N/A	<0.25 U	N/A	<0.25 U	N/A
BROMOBENZENE	ug/L	2000	<0.25 UJ	N/A	<0.25 U	N/A	<0.25 U	N/A
BROMOCHLOROMETHANE	ug/L	4100	<0.4 UJ	N/A	<0.4 U	N/A	<0.4 U	N/A
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
BROMOFORM	ug/L	36	<1 UJ	N/A	<1 U	N/A	<1 U	N/A
BROMOMETHANE	ug/L	140	<1 UJ	N/A	<1 UJ	N/A	<1 U	N/A
CARBON DISULFIDE	ug/L	10000	<1 UJ	N/A	<1 U	N/A	<1 U	N/A
CARBON TETRACHLORIDE	ug/L	5	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
CHLOROBENZENE	ug/L	100	<0.25 UJ	N/A	<0.25 U	N/A	<0.25 U	N/A
CHLOROETHANE	ug/L	41000	<1 UJ	N/A	<1 UJ	N/A	<1 U	N/A
CHLOROFORM	ug/L	1000	<0.25 UJ	N/A	<0.25 U	N/A	<0.25 U	N/A
CHLOROMETHANE	ug/L	220	<1 UJ	N/A	<1 U	N/A	<1 U	N/A
CIS-1,2-DICHLOROETHENE	ug/L	70	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
DIBROMOMETHANE	ug/L	380	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
ETHYLBENZENE	ug/L	700	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
HEXACHLOROBUTADIENE	ug/L	20	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
ISOPROPYLBENZENE	ug/L	1000	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
M,P-XYLENE	ug/L	10000	<1 UJ	N/A	<1 U	N/A	<1 U	N/A
METHYLENE CHLORIDE	ug/L	5	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
NAPHTHALENE	ug/L	2000	<0.4 UJ	N/A	<0.4 U	N/A	<0.4 U	N/A
N-BUTYLBENZENE	ug/L	4100	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
N-PROPYLBENZENE	ug/L	4100	<0.25 UJ	N/A	<0.25 U	N/A	<0.25 U	N/A
O-XYLENE	ug/L	10000	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
SEC-BUTYLBENZENE	ug/L	4100	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
STYRENE	ug/L	100	<0.25 UJ	N/A	<0.25 U	N/A	<0.25 U	N/A
TERT-BUTYLBENZENE	ug/L	4100	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
TETRACHLOROETHENE	ug/L	5	57.6 J	N/A	<0.5 U	N/A	<0.5 U	N/A
TOLUENE	ug/L	1000	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
TRANS-1,2-DICHLOROETHENE	ug/L	100	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 UJ	N/A	<1 U	N/A	<1 U	N/A
TRICHLOROETHENE	ug/L	5	8.97 J	N/A	<0.5 U	N/A	<0.5 U	N/A
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
VINYL CHLORIDE	ug/L	2	<0.5 UJ	N/A	<0.5 U	N/A	<0.5 U	N/A
Volatile Fatty Acids (830-MBA)								
ACETIC ACID	mg/L		<1 U	N/A	<1 U	N/A	<1 U	N/A
BUTYRIC ACID	mg/L		<1 U	N/A	<1 U	N/A	<1 U	N/A
LACTIC ACID	mg/L		<1 U	N/A	<1 U	N/A	<1 U	N/A
PROPIONIC ACID	mg/L	51	<10 U	N/A	<10 U	N/A	<10 U	N/A
PYRUVIC ACID	mg/L		<0.1 U	N/A	<0.1 U	N/A	<0.1 U	N/A
Inorganic Anions (9056)								
CHLORIDE	mg/L		1730	N/A	135	N/A	16.5	N/A
NITRATE	mg/L	10	<2 U	N/A	<1 U	N/A	0.11 J	N/A
NITRITE	mg/L	1	<2 U	N/A	<1 U	N/A	<0.2 U	N/A
SULFATE	mg/L		1170	N/A	209	N/A	66.2	N/A
Dissolved Gases (RSK-175)								
CARBON DIOXIDE	ug/L		N/A	N/A	61000	N/A	N/A	N/A
ETHANE	ug/L		<2 U	N/A	<2 U	N/A	<2 U	N/A
ETHENE	ug/L		<2 U	N/A	<2 U	N/A	<2 U	N/A
METHANE	ug/L		<2 U	N/A	<2 U	N/A	<2 U	N/A
Ferrous Iron (SM3500FE)								
FERROUS IRON	mg/L		<0.04 U	N/A	<0.04 U	N/A	<0.04 U	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

Subject:	**Final Minutes, Monthly Managers Meeting, Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**LHAAP Army Trailer and Teleconference – 866-203-6896, passcode 1759304791**
Date of Meeting:	**March 25, 2014 – 10:00 AM**

Welcome **RMZ**

Attendees:

Army BRAC:	Rose Zeiler
EPA:	Rich Mayer, Kent Becher (USGS Liaison), Barry Forsythe (USFWS Liason)
TCEQ:	April Palmie, Dale Vodak
USACE:	
AECOM:	Dave Wacker, Gretchen McDonnell, Josh Miller, Marwan Salameh
AEC:	Marilyn Plitnik
USFWS:	Paul Bruckwicki

Welcome **RMZ**

Action Items

AECOM

- Provide a summary of the treated water nutrient data, after fluidized bed reactor feeding optimization has been implemented. **Pending until Spring.** See notes under "FBR Performance Update" header in "Other Environmental Restoration" section of minutes.
- Generate, for agency submittal, one page memos with one figure to show the locations of new plume delineation wells at LHAAP-46 and LHAAP-37. **Complete.**
- As requested by Ms. Palmie, either add separation sheets be added between data sets in validated data submittals or use the header space to indicate the different data sets. **Complete.**
- Provide hard copy of the LHAAP-29 RI/FS Addendum Work Plan to Mr. Becher, who stated he had not received a hard copy**. Complete.** Mr. Mayer asked that one of EPAs two hard copy documents be sent separately to Mr. Becher at USGS, going forward. Ms. Plitnik suggested that EPA forward one of the two copies they receive to Mr. Becher at USGS.
- Add Steve Tzhone to distribution list for Administrative Record update CDs. **Complete.** Mr. Mayer said these CDs could come to him and he would get them to Mr. Tzhone.

Army

- Obtain information from Aberdeen Test Center on what the action will be to address bioplug demonstration site issues. **Complete.** See discussion under "Site 37 Bioplug" header in the "Other Environmental Restoration" section of the minutes.

EPA

- Develop a list of wells/sites for upcoming EPA split sampling and advise Army. **Pending.** See discussion under "Upcoming Field Work" bullet in the "DERP PBR Update" section of the minutes.

TCEQ

AEC

Defense Environmental Restoration Program (DERP) PBR Update **AECOM**

- Upcoming document submissions to regulators (see Document and Issue Tracking table)

  Item 1 (5-Year Review) – Document will be going back to agencies with redlines shortly.

  Item 2 (IWWP, QAPP, SOPs, and HASP) –Document and RTCs will be going back to agencies shortly.

  Item 3 (LHAAP-18/24 – Explanation of Significant Differences) – EPA discovered a citation error in a footnote in the document. Mr. Mayer will check into where the document is on the EPA side. Ms. Palmie has sent a concurrence letter to the TCEQ Executive Director for signature. Ms. Palmie stated that Mr. Tzhone advised her EPA would not sign until TCEQ provides their concurrence letter.

  Item 4 (GWTP Quarterly Report) – Next report coming to the agencies in the next couple of weeks. AECOM will be adding the GWTP sampling locations to the quarterly GWTP report Appendix A schematic, as well as adding the recycle line that allows retreatment through the FBR.

  Item 5 (LHAAP-18/24-Revised FS and PSI WP Addenda) – July 31st planned date for submittal to agencies. Since we last met, TCEQ stated they had no comments on the work plan and a handful of comments were received from EPA. RTCs for EPA comments are being generated. EPA's request for additional wells and sampling is probably the only RTC item that might require further discussion.

  Item 6 (LHAAP-46, LHAAP-67 RACRs) – LHAAP-67 RACR has been submitted to agencies. LHAAP-46 RACR is awaiting additional well installation on the north side. Mr. Mayer noted that intermediate groundwater was not discussed in the LHAAP-67 RACR. Mr. Wacker stated that intermediate groundwater was not identified as an issue in the ROD, so was not addressed in the remedial action. Ms. Palmie noted that agency comments for the LHAAP-67 RACR are due on April 14th.

  Item 7 (Monthly Managers' Meeting) – Next Monthly Managers' Meeting scheduled for April 15th at 10:00AM by teleconference.

  Item 8 (LHAAP-37, LHAAP-50, LHAAP-58) – RACRs for LHAAP-50 and LHAAP-58 are planned for agency submittal within the next two weeks. The LHAAP-37 RACR is on hold pending installation of an additional well on the north side.

  Item 9 (LHAAP-29 RI/FS Addenda) – Agencies received RTCs yesterday. Agencies agreed to provide comments on the RTCs by April 2nd.

  Item 10 (LHAAP-17 PDI WP, LHAAP-16 RD WP, LHAAP-03 RD/RAWP, LHAAP-04 ROD, LHAAP-47 RD) – Placeholder for documents on hold due to Army-EPA dispute.

Item 11 (May RAB) – Next RAB meeting is scheduled for May 15th at 6PM at the Karnack Community Center. The RAB Tour will start at 3PM on the 15th.

Item 12 (GWTP O&M/Air Monitoring) – See discussion under the"GWTP Evaluation with air monitoring data" bullet, in the "Other Environmental Restoration" section of the minutes.

Item 13 (Admin Record Update) – The 4th quarter 2013 update is in Army review and will likely be coming to agencies within ten days. Also see discussion under "Quarterly Reporting and Requirements" bullet in the "Other Environmental Restoration" section of the minutes.

Item 14 (BERA Addendum) – Army will send agencies an update email with the anticipated date the BERA will be submitted.

Item 15 (Nutrient Issue for HB and INF) – Discussed earlier in the meeting.

Item 16 (Website) –Dr. Zeiler stated that the website is intended to be a mechanism for one-way dissemination of information. Ms. Palmie agreed that existing channels established for feedback from the community should be utilized, keeping the website a one-way street. Dr. Zeiler stated that the Administrative Record will be available in full on the website. Mr. Wacker added that the website contains an interactive map of the sites, and scroll-over definitions for key terms. Agencies agreed to provide review of the website after Army review is complete.

Item 17 (CRP/CIP) – Placeholder maintained in the tracker as a reminder that these requirements and recommendations are applicable to our work going forward.

Item 18 (GW Network Optimization and LHAAP-46 Thallium Memos) – A MNA network optimization memo for LHAAP-50 and a thallium-only groundwater sampling modification memo have already been submitted to agencies for consideration; however, Mr. Wacker noted that the agencies have not seen the RACRs associated with many of the sites, making it difficult to perform an informed review of these and forthcoming optimization memos. Mr. Wacker proposed to add discussion of groundwater monitoring optimization plans for MNA sites to the agenda for next MMM, after agencies have had time to review a couple of the RACRs. Ms. Palmie agreed that the RACRs must be reviewed before optimization can be done. Mr. Wacker stated that the goal is to have the optimization plans agreed to prior to the next quarterly monitoring event for each site (July time-frame). Future optimization memos will be held for submittal at the same time as the associated RACR.

Because the LHAAP-67 RACR is already in agency review, AECOM will work to quickly provide the associated optimization memo for LHAAP-67 within the next few days.

The LHAAP-50 RACR is planned for submittal to agencies shortly, and agencies agreed to review and provide comments on the previously submitted LHAAP-50 optimization memo along with the RACR review.

For LHAAP-46 thallium sampling, the sampling event is scheduled for April. Mr. Wacker stated that the thallium sampling is not required by the ROD, and we now have additional rounds of data confirming there is not a thallium issue, so asked that this recommendation be reviewed immediately. (Note: While thallium is not a COC at LHAAP-46, the ROD

includes integration of groundwater sampling for thallium in the RD as a response to address public comment, but not as an action required for remedy protectiveness.) Agencies agreed that it is not necessary to have the LHAAP-46 RACR in hand to evaluate the thallium sampling reduction request, and
will aim for April 4th to provide comments for review on the proposed reductions in thallium sampling.

Defense Environmental Restoration Program (DERP) PBR Update (continued) AECOM

- Upcoming field work
  - AECOM is planning on mobilizing in late April for LHAAP-29 RI/FS Addendum Workplan and LHAAP-18/24 PSI Workplan Addendum field work, as well as additional DPT and well installations at LHAAP-37, LHAAP-46 and LHAAP-50.
  - Mr. Mayer believes EPA's sampling of groundwater wells will take place at LHAAP-29, LHAAP-18/24, the Fire Station well, and potentially 134 or 135. Mr. Mayer stated that Mr. Bruckwicki additionally requested sampling of the groundwater supply well northeast of LHAAP-29 (Water Tower Hill well). Sediment samples from LHAAP-29 at the drainage area where cooling water was historically released may also be collected. Because it may be difficult for EPA to deploy their contractor to match Army's existing sampling schedule, Mr. Mayer said he would be setting up the work order for the EPA contractor to do the actual sampling, not just pulling split samples from Army sampling operations. Mr. Mayer will propose a schedule for the sampling to coordinate with Army, as Army is required to collect split samples from any agency sampling activity.
  - Mr. Mayer stated that he and Mr. Becher had discussed potentially doing a surface water synoptic run for each drainage, including sampling. More information will be provided as EPA develops this, as Army will have to split samples with EPA.
- Monthly data – monthly validated data package was submitted with March MMM agenda
- Groundwater Treatment Plant
  - Air Monitoring (Results, Frequency and Reporting)

Draft Air Monitoring Memo - Ms. Palmie summarized her recently submitted comments on the draft GWTP Air Monitoring Memo. First, she stated that she would like to see a correlation between PID reading and actual contaminant concentration, so it can be shown that the PID trigger level is very conservative compared to the ambient air standard. Second, the narrative should also be clarified to indicate email reporting will be approximately monthly, but not necessarily on a certain day of the month, and to provide more flexibility in the timing between Army receipt of analytical data to reporting to agencies. Third, the most recent analytical results should be used to determine molar fraction for subsequent PID sampling. Finally, inclusion of the Applicable Air Standards table from the ESD in this memo is requested. AECOM will make the requested modifications to the memo.

  - ESD – Discussed earlier in meeting.

MMRP Update Army

- Update – No update

Other Environmental Restoration Army

- Vault at LHAAP-67
  Dr. Zeiler explained that, during remedial action implementation activities, AECOM discovered a small, shallow vault appearing to contain oily water. The location of the vault is such that, although unlikely, there is a small chance it could be contributing to

contamination seen at LHAAP-67. Because addressing this vault is not part of the remedy, Army has asked AEC to separately fund sampling to characterize the water in the vault. No schedule yet for when the sampling will be conducted, but Army will address the vault as necessary.

Ms. McDonnell provided background stating that the vault discovered was of concrete construction, with dimensions of approximately seven feet in length by five feet in width, with an apparent depth of four feet. The vault appeared to contain oily water and mud/sludge. The vault is located near the former railroad track, 40 feet southeast of 67WW13 in the west (up-gradient) end of the plume. The vault was in good condition and holding liquids, which is a good sign, but it does need to be examined more closely given its location.

Mr. Mayer asked if the structure was an oil-water separator. Ms. McDonnell stated that it did not appear to be an oil-water separator, based on the visible internal construction.

- Discuss/develop LHAAP-18/24 FS Addendum submittal schedule
  The previous schedule must be extended due to the additional work required under the LHAAP-18/24 PSI WP Addendum, and associated time required for work plan review and approval. Mr. Wacker said that we are likely looking at a submittal of the FS Addendum to agencies in late August. An action item will be added for the next MMM for this issue.

- EPA expressed concern about low-level perchlorate detections in well 134.
  Dr. Zeiler noted that this issue had already been addressed at a RAB in the past when EPA (Chris Villarreal) presented a discussion of the detections at that well and compared to perchlorate detections in other parts of Texas, concluding there was not a concern. She recommended that EPA first address questions on this issue to Chris Villareal, who previously examined these low-level perchlorate detections, as he is likely the best source of information on the subject. Although the well is currently sampled semi-annually by Army, Mr. Mayer stated that this well may be one that is sampled by their contractor this spring.

- Decision Documents for multiple sites – TCEQ's letter has been submitted to the Division Director for signature, and should be provided to Army shortly.

- Site 37 Bioplug – ATC has provided an email stating repair of animal damage to 15 bioplug heads was completed by their contractor, Advanced BioSystems, on February 27th. Quarterly sampling was conducted on March 19th, at which time two additional damaged bioplug heads were discovered. This damage was reported to Advanced BioSystems and will be repaired shortly. With the arrival of warmer weather, and return of normal food supplies, ATC expects animals will take less interest in the bioplug heads. ATC feels the damage was not significant and should not impact the overall system performance.

- 1,4-dioxane sampling at Longhorn
  AECOM and Army will discuss a path forward to be presented to agencies. Mr. Mayer stated that 1,4-dioxane will likely be an analyte for the sampling to be performed by the EPA contractor.

- Quarterly Reporting and Requirements
  - GWTP Evaluation with air monitoring data – Air monitoring discussed earlier in meeting.

FBR Performance Update - Mr. Salameh provided information relating to recent issues relating to FBR performance.

Background : FBR perchlorate treatment performance issues were noticed in October and end of December/mid-January, with periods of improvement in November/early-December and late January. The latest data indicates that perchlorate-treatment issues have been seen again in mid-February.

Typically, ORP has correlated with perchlorate treatment efficiency, however with the mid-February monitoring event, untreated perchlorate was observed although ORP had been in the appropriate range (below -50 mV). Mr. Salameh provided several sets of recent ORP/perchlorate effluent concentration data.

Date	ORP	Perchlorate in Effluent
January 15	-88 mV	2,750 ug/L
January 20	-48 mV	<0.2 ug/L
January 27	-59 mV	<0.2 ug/L
February 17	-200 mV	<0.2 ug/L
February 24	-318 mV	55 ug/L
March 6	-273 mV	1,760 ug/L

Because the typical correlation between ORP and perchlorate treatment efficiency was not seen, other potential performance factors were examined.

- Acetic acid feed to the FBR had been slightly reduced during the period of low performance because it was not being depleted. However, the lesser amount of acetic acid could have become a limiting factor when performance increased, so the acetic acid feed rate was returned to previous levels. Subsequent effluent analysis indicated the presence of acetic acid at this feed rate, indicating acetic acid is not a limiting factor at this time, although it may have been a factor during the return to poor performance seen in February 24th and March 6th data.
- Also checked the FBR settled bed height to see if additional granular activated carbon was required, but less than 5% loss was observed. The carbon may be replenished, but it is not likely a factor in perchlorate treatment efficiency.

Dr. Zeiler asked whether there could have been an actual loss of bacterial life in the FBR that temporarily caused poor performance. Mr. Salameh stated that loss of bacteria due to cold temperatures (and interruption of recirculation during cold temperatures due to power outage) was suspected, but that performance recovered before planned addition of bacteria to the FBR could be accomplished.

Mr. Salameh advised that effluent was sampled most recently on March 18th, and those results area anticipated from the lab today. Dr. Zeiler stated that Army will review that data quickly upon receipt from AECOM, and pass it along to the agencies.

In response to a question from Mr. Mayer, Mr. Salameh advised that the GWTP had not been discharging to Harrison Bayou during this time period of fluctuating perchlorate treatment performance. Mr. Mayer also asked what is done in cold weather areas to prevent FBR performance issues. Mr. Salameh stated that maintaining the FBR in heated or insulated enclosure is an action typically taken in colder climates. Dr. Zeiler asked if there were hardier bacteria that

could be used, or whether the bacteria acclimate to become more cold-resistant in cold-weather climates, to which Mr. Salameh responded that he did not believe the bacteria became more cold-resistant.

- Quarterly Reporting and Requirements (continued)

    - Water Tower Hill Well Repair – Mr. Wacker briefed that AECOM recently replaced the pump and approximately 60 feet of pipe in this well and the well should be back in service tomorrow. Dr. Zeiler recapped that, although the well is now owned by USFWS through property transfer, Army continues to maintain the well as a part of the remedy at LHAAP-18/24 (secondary production well for GWTP supply).

    - Surface Water/Perimeter Well Tech Memo with validation reports – Mr. Wacker confirmed these have been submitted for the most recent quarter. The agenda item will be changed to read Surface Water/Perimeter Well Quarterly Update. Decision needs to be made on whether these results are added to the Administrative Record in quarterly updates or in an annual update. Ms. Palmie asked that the most recent memo be resent to her.

    - Administrative Record Update – Dr. Zeiler advised that Army will be providing an official year-end package of dispute documentation for addition to the Administrative Record. She asked that EPA and TCEQ provide to her their 2013 dispute-related official correspondence for inclusion in the 4th quarter 2013 AR update, as soon as possible. Mr. Wacker noted that the 4th quarter 2013 AR update is currently with Army for review, so additional documents can still be added at this point. Ms. Palmie stated that there was not official correspondence from TCEQ in 2013, but that she has official correspondence from EPA and Army (EPA Regional decision, Army request to elevate dispute, EPA acknowledgement and elevation of dispute) and will forward to Mr. Mayer and Dr. Zeiler.

- Annual Reporting
    - LUC Management Plan Update (due September 2015)
    - CRP/CIP Revision (Biennial) and questionnaire October 2015

Programmatic Issues **RMZ/RM/AP**

- Status of Dispute – no update

USFWS Update **RMZ/PB**

- Environmental Restoration Issues with Transfer Schedule Impact
    - Dr. Zeiler advised that LHAAP-12 has been transferred to USFWS administrative control. LUC provisions will be triggered and associated milestones will need to be monitored, including annual land use certification.
- USFWS Comments on Documents – none
- Mr. Bruckwicki will provide Dr. Zeiler with a map showing the vault he recently discovered.

Schedule Next Managers' Meeting – April 15th at 10:00AM, by teleconference.

New Action Items

AECOM

- Modify GWTP Air Monitoring Memo as requested by TCEQ.
- Provide analytical results from March 18th GWTP effluent sampling to Army for subsequent submittal to agencies.
- Add the GWTP sampling locations to the quarterly GWTP report Appendix A schematic, as well as adding the recycle line that allows retreatment through the FBR.
- Consolidate RACRs into one item on the Document and Issue Tracking table.
- Add discussion of groundwater monitoring optimization plans for MNA sites to the agenda for next MMM.
- Develop a path forward on 1,4-dioxane sampling with Army, for presentation to the agencies.
- Change "Surface Water/Perimeter Well Tech Memo with validation reports" agenda item to "Surface Water/Perimeter Well Quarterly Update".
- Resend the most recent Surface Water/Perimeter Well Tech Memo to Ms. Palmie.

Army

- Send agencies an email providing the anticipated date the BERA will be submitted.
- Develop new LHAAP-18/24 FS Addendum submittal schedule.
- Decide whether Surface Water/Perimeter Well data will be added to the Administrative Record in quarterly updates or in an annual update.

EPA

TCEQ

AEC

USFWS

- Mr. Bruckwicki will provide Dr. Zeiler with a map showing the vault he recently discovered.

Adjourn

Attachments: LHAAP Data Validated February-March 2014
-GWTP Influent and Effluent
-LHAAP-12 Annual Groundwater Event
-LHAAP-18/24 Compliance Sampling
-LHAAP-46 Quarterly MNA Groundwater Event
-LHAAP-50 Baseline MNA Groundwater Event
-LHAAP-67 Quarterly MNA Groundwater Event

ACRONYM LIST

AEC	**United States Army Environmental Command**
AECOM	**AECOM Technology Services, Inc.**
AP	**April Palmie**
AR	**Administrative Record**
ATC	**Aberdeen Test Center**
BERA	**Baseline Ecological Risk Assessment**
BRAC	**Base Realignment and Closure**
CRP/CIP	**Community Relations Plan/Community Involvement Plan**
DERP	**Defense Environmental Restoration Program**
DPT	**Direct Push Technology**
EPA	**United States Environmental Protection Agency**
ESD	**Explanation of Significant Differences**
FBR	**Fluidized Bed Reactor**
FS	**Feasibility Study**
GWTP	**Ground Water Treatment Plant**
HASP	**Health and Safety Plan**
HB	**Harrison Bayou**
INF	**Intermediate-Range Nuclear Forces**
IWWP	**Installation-Wide Work Plan**
LHAAP	**Longhorn Army Ammunition Plant**
LUC	**Land Use Control**
MMM	**Monthly Managers' Meeting**
MMRP	**Military Munitions Response Program**
MNA	**Monitored Natural Attenuation**
O&M	**Operation and Maintenance**
ORP	**Oxidation-Reduction Potential**
PB	**Paul Bruckwicki**
PBR	**Performance-Based Remediation**
PDI	**Pre-Design Investigation**
PID	**Photoionization Detector**
PSI	**Post-Screening Investigation**
QAPP	**Quality Assurance Project Plan**
RAB	**Restoration Advisory Board**
RACR	**Remedial Action Completion Report**
RD	**Remedial Design**
RI	**Remedial Investigation**
RM	**Rich Mayer**
RMZ	**Rose M. Zeiler**
ROD	**Record of Decision**
RTC	**Response to Comments**
SOP	**Standard Operating Procedure**
TCEQ	**Texas Commission on Environmental Quality**
UIC	**Underground Injection Control**
USACE	**United States Army Corps of Engineers**
USFWS	**United States Fish and Wildlife Service**
USGS	**United States Geological Service**
WP	**Work Plan**

LHAAP Data Validated
February-March 2014

GWTP Influent and Effluent *Bi-weekly, Weekly, and Monthly*

January 2014

Ammonia (350.1)	Perchlorate (6850)
Ortho-Phosphate (365.2)	Hexavalent Chromium (7196A)
Total Organic Carbon (415.1)	VOC (8260B)
Metals (6010C)	Inorganic Anions (9056)
Metals (6020A)	

Site 18/24 *Semi-annual, Annual Sampling*

December 2013

Metals (6010C)	Mercury (7470A)
Metals (6020A)	VOC (8260B)
Perchlorate (6850)	

Site 37 *Quarterly Sampling*

January 2014, Febuary 2014

VOC (8260B)

Site 46 *Quarterly Sampling*

January 2014

Total Alkalinity (310.2)	Metals (6020A)
Phosphorus (365.4)	VOC (8260B)
Sulfide (376.1)	Inorganic Anions (9056)
Total Organic Carbon (415.1)	Dissolved Gasses (RSK-175)
Metals (6010C)	

Site 50 *Quarterly Sampling*

January 2014

Perchlorate (6850)	VOC (8260B)

Site 67 *Quarterly Sampling*

September 2013, October 2013, January 2014

Sulfide (376.1)	Inorganic Anions (9056)
Total Carbon (415.1)	Dissolved Gasses (RSK-175)
VOC (8260B)	Ferrous Iron (SM3500FE)

Location ID: Sample Date:	Units	MCL/ MSC	LH18/24-SP140-7145-GRAB 1/15/2014
ID Location:			GWTP – Collected from a spigot on the discharge of influent TK-140 Sampled Monthly
Ammonia (350.1)			
AMMONIA AS N	mg/L		N/A
Ortho-Posphate (365.2)			
ORTHO-PHOSPHATE	mg/L		N/A
Total Organic Carbon (415.1)			
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A
Metals (6010C)			
ALUMINUM	mg/L	100	N/A
IRON	mg/L		N/A
Metals (6020A)			
ANTIMONY	mg/L	0.006	N/A
ARSENIC	mg/L	0.01	N/A
BARIUM	mg/L	2	N/A
CADMIUM	mg/L	0.005	N/A
CHROMIUM	mg/L	0.1	N/A
COBALT	mg/L	6.1	N/A
LEAD	mg/L	0.015	N/A
MANGANESE	mg/L	14	N/A
NICKEL	mg/L	2	N/A
SELENIUM	mg/L	0.05	N/A
SILVER	mg/L	0.51	N/A
THALLIUM	mg/L	0.002	N/A
VANADIUM	mg/L	0.72	N/A
ZINC	mg/L	31	N/A
Perchlorate (6850)			
PERCHLORATE	ug/L	72	22300
Hecavalent Chromium/CR-6 (7196A)			
HEXAVALENT CHROMIUM	mg/L	0.001	N/A
Volatile Organic Compounds (8260B)			
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<25 U
1,1,1-TRICHLOROETHANE	ug/L	200	<25 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<20 U
1,1,2-TRICHLOROETHANE	ug/L	5	<25 U
1,1-DICHLOROETHANE	ug/L	10000	<12.5 U
1,1-DICHLOROETHENE	ug/L	7	36.1 J
1,1-DICHLOROPROPENE	ug/L	2.9	<25 U
1,2,3-TRICHLOROBENZENE	ug/L	310	<15 UJ
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<50 U
1,2,4-TRICHLOROBENZENE	ug/L	70	<20 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<25 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<100 U
1,2-DIBROMOETHANE	ug/L	0.005	<25 U
1,2-DICHLOROBENZENE	ug/L	600	<12.5 U
1,2-DICHLOROETHANE	ug/L	5	81.1
1,2-DICHLOROPROPANE	ug/L	5	<20 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<25 U
1,3-DICHLOROBENZENE	ug/L	3100	<25 U
1,3-DICHLOROPROPANE	ug/L	29	<20 U
1,4-DICHLOROBENZENE	ug/L	75	<12.5 U
2,2-DICHLOROPROPANE	ug/L	42	<25 U
2-BUTANONE	ug/L	61000	<250 UJ
2-CHLOROTOLUENE	ug/L	2000	<12.5 U
2-HEXANONE	ug/L	6100	<250 UJ
4-CHLOROTOLUENE	ug/L	2000	<25 U
4-METHYL-2-PENTANONE	ug/L	8200	<250 UJ
ACETONE	ug/L	92000	<250 U
BENZENE	ug/L	5	<12.5 U
BROMOBENZENE	ug/L	2000	<12.5 U
BROMOCHLOROMETHANE	ug/L	4100	<20 U
BROMODICHLOROMETHANE	ug/L	4.6	<25 U
BROMOFORM	ug/L	36	<50 U
BROMOMETHANE	ug/L	140	<50 U
CARBON DISULFIDE	ug/L	10000	<50 U
CARBON TETRACHLORIDE	ug/L	5	<25 U
CHLOROBENZENE	ug/L	100	<12.5 U
CHLOROETHANE	ug/L	41000	<50 U
CHLOROFORM	ug/L	1000	15 J
CHLOROMETHANE	ug/L	220	<50 U
CIS-1,2-DICHLOROETHENE	ug/L	70	2700
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<25 U
DIBROMOCHLOROMETHANE	ug/L	34	<25 U
DIBROMOMETHANE	ug/L	380	<25 U
DICHLORODIFLUOROMETHANE	ug/L	20000	<25 U
ETHYLBENZENE	ug/L	700	<25 U
HEXACHLOROBUTADIENE	ug/L	20	<25 U
ISOPROPYLBENZENE	ug/L	1000	<25 U
M,P-XYLENE	ug/L	10000	<50 U
METHYLENE CHLORIDE	ug/L	5	765
NAPHTHALENE	ug/L	2000	<20 U
N-BUTYLBENZENE	ug/L	4100	<25 U
N-PROPYLBENZENE	ug/L	4100	<12.5 U
O-XYLENE	ug/L	10000	<25 U
P-ISOPROPYLTOLUENE	ug/L	10000	<25 U
SEC-BUTYLBENZENE	ug/L	4100	<25 U
STYRENE	ug/L	100	<12.5 U
TERT-BUTYLBENZENE	ug/L	4100	<25 U
TETRACHLOROETHENE	ug/L	5	<25 U
TOLUENE	ug/L	1000	<25 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	<25 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<50 U
TRICHLOROETHENE	ug/L	5	10200
TRICHLOROFLUOROMETHANE	ug/L	31000	<25 U
VINYL CHLORIDE	ug/L	2	57.8
Inorganic Anions (9056)			
CHLORIDE	mg/L		N/A
SULFATE	mg/L		N/A

When no MCL was available, MSCs were used.

Location ID: Sample Date:	Units	Daily Avg. Conc.	Daily Max. Conc.	LH18/24-SP650-6145-GRAB 1/15/2014	LH18/24-SP650-6146-GRAB 1/15/2014	LH18/24-SP650-6148-COMP 1/20/2014	LH18/24-SP650-6148-GRAB 1/20/2014	LH18/24-SP650-6149-GRAB 1/27/2014
ID Location:				GWTP – Collected from a spigot on the discharge of effluent TK-650 Sampled Monthly	GWTP – Collected from a spigot on the discharge of effluent TK-650 Sampled Weekly	GWTP – Collected from holding jar which collects the discharge from a spigot on effluent TK-650 every couple of hours	GWTP – Collected from a spigot on the discharge of effluent TK-650 Sampled Biweekly	GWTP – Collected from a spigot on the discharge of effluent TK-650 Sampled Weekly
Ammonia (350.1)								
AMMONIA AS N	mg/L			N/A	8.91	N/A	N/A	4.33
Ortho-Posphate (365.2)								
ORTHO-PHOSPHATE	mg/L			N/A	1.58	N/A	N/A	0.657
Total Organic Carbon (415.1)								
TOTAL ORGANIC CARBON (TOC)	mg/L			N/A	127	N/A	N/A	88.4
Metals (6010C)								
ALUMINUM	mg/L	0.777	1.644	0.171 J	N/A	N/A	N/A	N/A
IRON	mg/L	1.132	2.395	0.283	N/A	N/A	N/A	N/A
Metals (6020A)								
ANTIMONY	mg/L			<0.001 U	N/A	N/A	N/A	N/A
ARSENIC	mg/L	0.365	0.772	0.00422	N/A	N/A	N/A	N/A
BARIUM	mg/L	1	2	0.384	N/A	N/A	N/A	N/A
CADMIUM	mg/L	0.0016	0.0034	0.000345 J	N/A	N/A	N/A	N/A
CHROMIUM	mg/L	0.355	0.752	0.012	N/A	N/A	N/A	N/A
COBALT	mg/L	5.433	11.495	0.0158	N/A	N/A	N/A	N/A
LEAD	mg/L	0.0022	0.0046	<0.001 U	N/A	<0.001 U	<0.001 U	N/A
MANGANESE	mg/L	7.323	15.494	0.304	N/A	N/A	N/A	N/A
NICKEL	mg/L	0.087	0.184	0.127	N/A	N/A	N/A	N/A
SELENIUM	mg/L	0.0057	0.012	0.00951	N/A	0.0105	0.0123	N/A
SILVER	mg/L	0.0014	0.003	<0.001 U	N/A	<0.001 U	<0.001 U	N/A
THALLIUM	mg/L			<0.0002 U	N/A	N/A	N/A	N/A
VANADIUM	mg/L	1.698	3.592	0.00117 J	N/A	N/A	N/A	N/A
ZINC	mg/L	0.146	0.31	0.16	N/A	N/A	N/A	N/A
Perchlorate (6850)								
PERCHLORATE	ug/L	6	13	N/A	2750 J	<2 U	<2 U	<0.2 U
Hecavalent Chromium/CR-6 (7196A)								
HEXAVALENT CHROMIUM	mg/L	0.058	0.124	N/A	N/A	0.00505 J	0.00628 J	N/A
Volatile Organic Compounds (8260B)								
1,1,1,2-TETRACHLOROETHANE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
1,1,1-TRICHLOROETHANE	ug/L	3417	7230	N/A	N/A	N/A	<0.5 U	N/A
1,1,2,2-TETRACHLOROETHANE	ug/L			N/A	N/A	N/A	<0.4 U	N/A
1,1,2-TRICHLOROETHANE	ug/L	102.5	216.9	N/A	N/A	N/A	<0.5 U	N/A
1,1-DICHLOROETHANE	ug/L	6633	14032	N/A	N/A	N/A	<0.25 U	N/A
1,1-DICHLOROETHENE	ug/L	119	253	N/A	N/A	N/A	<1 U	N/A
1,1-DICHLOROPROPENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
1,2,3-TRICHLOROBENZENE	ug/L			N/A	N/A	N/A	<0.3 U	N/A
1,2,3-TRICHLOROPROPANE	ug/L			N/A	N/A	N/A	<1 U	N/A
1,2,4-TRICHLOROBENZENE	ug/L			N/A	N/A	N/A	<0.4 U	N/A
1,2,4-TRIMETHYLBENZENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
1,2-DIBROMO-3-CHLOROPROPANE	ug/L			N/A	N/A	N/A	<2 U	N/A
1,2-DIBROMOETHANE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
1,2-DICHLOROBENZENE	ug/L			N/A	N/A	N/A	<0.25 U	N/A
1,2-DICHLOROETHANE	ug/L	85	181	N/A	N/A	N/A	<0.5 U	N/A
1,2-DICHLOROPROPANE	ug/L			N/A	N/A	N/A	<0.4 U	N/A
1,3,5-TRIMETHYLBENZENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
1,3-DICHLOROBENZENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
1,3-DICHLOROPROPANE	ug/L			N/A	N/A	N/A	<0.4 U	N/A
1,4-DICHLOROBENZENE	ug/L			N/A	N/A	N/A	<0.25 U	N/A
2,2-DICHLOROPROPANE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
2-BUTANONE	ug/L			N/A	N/A	N/A	<5 U	N/A
2-CHLOROTOLUENE	ug/L			N/A	N/A	N/A	<0.25 U	N/A
2-HEXANONE	ug/L			N/A	N/A	N/A	<5 U	N/A
4-CHLOROTOLUENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
4-METHYL-2-PENTANONE	ug/L			N/A	N/A	N/A	<5 U	N/A
ACETONE	ug/L	1132	2395	N/A	N/A	N/A	117	N/A
BENZENE	ug/L	85	181	N/A	N/A	N/A	<0.25 U	N/A
BROMOBENZENE	ug/L			N/A	N/A	N/A	<0.25 U	N/A
BROMOCHLOROMETHANE	ug/L			N/A	N/A	N/A	<0.4 U	N/A
BROMODICHLOROMETHANE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
BROMOFORM	ug/L			N/A	N/A	N/A	<1 U	N/A
BROMOMETHANE	ug/L			N/A	N/A	N/A	<1 U	N/A
CARBON DISULFIDE	ug/L			N/A	N/A	N/A	<1 U	N/A
CARBON TETRACHLORIDE	ug/L	85	181	N/A	N/A	N/A	<0.5 U	N/A
CHLOROBENZENE	ug/L	22300	47180	N/A	N/A	N/A	<0.25 U	N/A
CHLOROETHANE	ug/L			N/A	N/A	N/A	<1 U	N/A
CHLOROFORM	ug/L	1708	3615	N/A	N/A	N/A	<0.25 U	N/A
CHLOROMETHANE	ug/L			N/A	N/A	N/A	<1 U	N/A
CIS-1,2-DICHLOROETHENE	ug/L			N/A	N/A	N/A	0.811 J	N/A
CIS-1,3-DICHLOROPROPENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
DIBROMOCHLOROMETHANE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
DIBROMOMETHANE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
DICHLORODIFLUOROMETHANE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
ETHYLBENZENE	ug/L	26954	57025	N/A	N/A	N/A	<0.5 U	N/A
HEXACHLOROBUTADIENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
ISOPROPYLBENZENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
M,P-XYLENE	ug/L	39.5	83.6	N/A	N/A	N/A	<1 U	N/A
METHYLENE CHLORIDE	ug/L	803	1699	N/A	N/A	N/A	<0.5 U	N/A
NAPHTHALENE	ug/L			N/A	N/A	N/A	<0.4 U	N/A
N-BUTYLBENZENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
N-PROPYLBENZENE	ug/L			N/A	N/A	N/A	<0.25 U	N/A
O-XYLENE	ug/L	39.5	83.6	N/A	N/A	N/A	<0.5 U	N/A
P-ISOPROPYLTOLUENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
SEC-BUTYLBENZENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
STYRENE	ug/L	2829	5987	N/A	N/A	N/A	<0.25 U	N/A
TERT-BUTYLBENZENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
TETRACHLOROETHENE	ug/L	85.4	180.7	N/A	N/A	N/A	<0.5 U	N/A
TOLUENE	ug/L	1980	4189	N/A	N/A	N/A	<0.5 U	N/A
TRANS-1,2-DICHLOROETHENE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
TRANS-1,3-DICHLOROPROPENE	ug/L			N/A	N/A	N/A	<1 U	N/A
TRICHLOROETHENE	ug/L	85	181	N/A	N/A	N/A	1.21	N/A
TRICHLOROFLUOROMETHANE	ug/L			N/A	N/A	N/A	<0.5 U	N/A
VINYL CHLORIDE	ug/L	34	72	N/A	N/A	N/A	<0.5 U	N/A
Inorganic Anions (9056)								
CHLORIDE	mg/L			N/A	N/A	682	681	N/A
SULFATE	mg/L			N/A	N/A	156	164	N/A

Blue Highlighting Indicates Analyte Detected Above Discharge Concentration Limit.

Location ID: Sample Date:	Units	MCL/ MSC	130-121113 12/11/2013	18WW03-121213 12/12/2013	18WW03F-121213 12/12/2013	18WW06-121113 12/11/2013	18WW09-121213 12/12/2013	18WW09FD-121213 12/12/2013	MW10-121113 12/11/2013	MW10F-121113 12/11/2013
ID Location:			Site 18/24 – SW, outside the fence line, right next to the Site 17 boarder Sampled Annually	Site 18/24 – E, outside the fence line Sampled Annually	Site 18/24 – E, outside the fence line. Filtered, Sampled Annually	Site 18/24 – W, just outside the fence line Sampled Annually	Site 18/24 – NW, outside the fence line, near Harrison Bayou Sampled Annually	Site 18/24 – NW, outside the fence line, near Harrison Bayou. Dup, Sampled Annually	Site 18/24 – W, outside the fence line, along the outer loop road Sampled Semi-annually	Site 18/24 – W, outside the fence line, along the outer loop road. Filtered, Sampled Semi-annually
Metals (6010C)										
ALUMINUM	mg/L	100	0.133 J	N/A	<0.1 U	0.144 J	0.0643 J	0.0531 J	N/A	<0.1 U
BERYLLIUM	mg/L	0.004	<0.01 U	N/A	<0.01 U	<0.01 U	<0.01 U	<0.01 U	N/A	<0.01 U
CALCIUM	mg/L		50.9	N/A	13.6	28.2	15.4	15.4	N/A	18.4
IRON	mg/L		0.193 J	N/A	6.58	63.6	34.2	33.6	N/A	56.1
MAGNESIUM	mg/L		34.8	N/A	10.3	15.5	9.1	8.89	N/A	10.7
POTASSIUM	mg/L		0.771 J	N/A	2.31	3.04	1.95 J	1.82 J	N/A	3.54
SELENIUM	mg/L	0.05	<0.01 U	N/A	<0.01 U	<0.01 U	<0.01 U	<0.01 U	N/A	<0.01 U
SODIUM	mg/L		944	N/A	90.6	106	48.2	47.6	N/A	94.2
Metals (6020A)										
ANTIMONY	mg/L	0.006	<0.001 U	N/A	<0.001 U	<0.001 U	<0.001 U	<0.001 U	N/A	<0.001 U
ARSENIC	mg/L	0.01	0.00875	N/A	0.00165 J	0.005	0.00145 J	0.0016 J	N/A	0.00136 J
BARIUM	mg/L	2	0.105	N/A	0.381	0.372	0.231	0.242	N/A	0.465
CADMIUM	mg/L	0.005	0.00047 J	N/A	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	N/A	<0.0006 U
CHROMIUM	mg/L	0.1	0.00202 J	N/A	0.00108 J	0.0792	0.0586	0.0653	N/A	<0.002 U
COBALT	mg/L	6.1	0.000994 J	N/A	<0.001 U	0.00165 J	<0.001 U	0.000515 J	N/A	<0.001 U
COPPER	mg/L	1.3	0.00277 J	N/A	<0.002 U	0.00475	0.00528	0.00258 J	N/A	<0.002 U
LEAD	mg/L	0.015	<0.001 U	N/A	<0.001 U	<0.001 U	<0.001 U	<0.001 U	N/A	<0.001 U
MANGANESE	mg/L	14	0.17	N/A	0.17	0.615	0.746	0.899	N/A	0.87
NICKEL	mg/L	2	0.00681 J	N/A	<0.004 U	0.127	0.0218	0.0222	N/A	0.00281 J
SILVER	mg/L	0.51	<0.001 U	N/A	<0.001 U	<0.001 U	<0.001 U	<0.001 U	N/A	<0.001 U
THALLIUM	mg/L	0.002	<0.0002 U	N/A	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	N/A	<0.0002 U
VANADIUM	mg/L	0.72	0.00226	N/A	<0.001 U	0.000536 J	<0.001 U	<0.001 U	N/A	<0.001 U
ZINC	mg/L	31	0.014 J	N/A	<0.025 U	0.0137 J	<0.025 U	<0.025 U	N/A	<0.025 U
Perchlorate (6850)										
PERCHLORATE	ug/L	72	6060	<0.2 U	N/A	0.334 J	<0.2 U	<0.2 U	2.74	N/A
Mercury (7470A)										
MERCURY	mg/L	0.002	<0.0002 U	N/A	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	N/A	<0.0002 U
Volatile Organic Compounds (8260B)										
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U	<0.4 U	N/A
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
1,1-DICHLOROETHANE	ug/L	10000	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	<0.25 U	N/A
1,1-DICHLOROETHENE	ug/L	7	<1 U	<1 U	N/A	<1 U	<1 U	<1 U	<1 U	N/A
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U	<0.3 U	N/A	<0.3 U	<0.3 U	<0.3 U	<0.3 U	N/A
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<1 U	<1 U	N/A	<1 U	<1 U	<1 U	<1 U	N/A
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U	<0.4 U	N/A
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	<2 U	N/A	<2 U	<2 U	<2 U	<2 U	N/A
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	<0.25 U	N/A
1,2-DICHLOROETHANE	ug/L	5	2.01	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U	<0.4 U	N/A
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U	<0.4 U	N/A
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	<0.25 U	N/A
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
2-BUTANONE	ug/L	61000	<5 U	<5 U	N/A	<5 U	<5 U	<5 U	<5 U	N/A
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	<0.25 U	N/A
2-HEXANONE	ug/L	6100	<5 U	<5 U	N/A	<5 U	<5 U	<5 U	<5 U	N/A
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	<5 U	N/A	<5 U	<5 U	<5 U	<5 U	N/A
ACETONE	ug/L	92000	<5 U	<5 U	N/A	<5 U	<5 U	<5 U	<5 U	N/A
BENZENE	ug/L	5	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	<0.25 U	N/A
BROMOBENZENE	ug/L	2000	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	<0.25 U	N/A
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U	<0.4 U	N/A
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
BROMOFORM	ug/L	36	<1 U	<1 U	N/A	<1 U	<1 U	<1 U	<1 U	N/A
BROMOMETHANE	ug/L	140	<1 UJ	<1 UJ	N/A	<1 UJ	<1 U	<1 UJ	<1 UJ	N/A
CARBON DISULFIDE	ug/L	10000	<1 U	<1 U	N/A	<1 U	<1 U	<1 U	<1 U	N/A
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
CHLOROBENZENE	ug/L	100	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	<0.25 U	N/A
CHLOROETHANE	ug/L	41000	<1 U	<1 U	N/A	<1 U	<1 U	<1 U	<1 U	N/A
CHLOROFORM	ug/L	1000	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	<0.25 U	N/A
CHLOROMETHANE	ug/L	220	<1 UJ	<1 UJ	N/A	<1 UJ	<1 U	<1 UJ	<1 UJ	N/A
CIS-1,2-DICHLOROETHENE	ug/L	70	0.576 J	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
DIBROMOMETHANE	ug/L	380	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
ETHYLBENZENE	ug/L	700	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
M,P-XYLENE	ug/L	10000	<1 U	<1 U	N/A	<1 U	<1 U	<1 U	<1 U	N/A
METHYLENE CHLORIDE	ug/L	5	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
NAPHTHALENE	ug/L	2000	<0.4 U	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U	<0.4 U	N/A
N-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
N-PROPYLBENZENE	ug/L	4100	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	<0.25 U	N/A
O-XYLENE	ug/L	10000	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
STYRENE	ug/L	100	<0.25 U	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	<0.25 U	N/A
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
TETRACHLOROETHENE	ug/L	5	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
TOLUENE	ug/L	1000	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
TRANS-1,2-DICHLOROETHENE	ug/L	100	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	<1 U	N/A	<1 U	<1 U	<1 U	<1 U	N/A
TRICHLOROETHENE	ug/L	5	15.1	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	0.554 J	N/A
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A
VINYL CHLORIDE	ug/L	2	<0.5 U	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	<0.5 U	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

When no MCL was available, MSCs were used.

Location ID: Sample Date:	Units	MCL/ MSC	MW16- 121113 12/11/2013	MW16F- 121112 12/11/2013	MW22- 121113 12/11/2013	MW22F- 121113 12/11/2013	MW23- 121213 12/12/2013	AWD3- 120913 12/9/2013	CO8- 121213 12/12/2013
ID Location:			Site 18/24 – W, outside the fence line, along the road surrounding the fence line Sampled Semi-annually	Site 18/24 – W, outside the fence line, along the road surrounding the fence line. Filtered, Sampled Semi-annually	Site 18/24 – ESE, inside the fence line, middle region Sampled Semi-annually	Site 18/24 – ESE, inside the fence line, middle region. Filtered, Sampled Semi-annually	Site 18/24 – S, inside the fence line, middle region Sampled Semi-annually	Site 18/24 – SW, inside the fence line, central region Sampled Annually	Site 18/24 – E, outside the fence line, along the road heading east-northeast Sampled Semi-annually
Metals (6010C)									
ALUMINUM	mg/L	100	N/A	<0.1 U	N/A	<0.1 U	<0.1 U	0.305	0.141 J
BERYLLIUM	mg/L	0.004	N/A	<0.01 U	N/A	<0.01 U	<0.01 U	<0.01 U	<0.01 U
CALCIUM	mg/L		N/A	21.5	N/A	69 J	9	0.84	129
IRON	mg/L		N/A	42.7	N/A	0.144 J	0.0919 J	0.878	0.251
MAGNESIUM	mg/L		N/A	11.9	N/A	16.6	6.99	0.543 J	71.3
POTASSIUM	mg/L		N/A	2.83	N/A	2.12	2.71	0.693 J	1.07 J
SELENIUM	mg/L	0.05	N/A	<0.01 U	N/A	<0.01 U	<0.01 U	<0.01 U	<0.01 U
SODIUM	mg/L		N/A	80.4	N/A	364 J	287	26.8	422
Metals (6020A)									
ANTIMONY	mg/L	0.006	N/A	<0.001 U	N/A	0.000532 J	<0.001 U	<0.001 U	<0.001 U
ARSENIC	mg/L	0.01	N/A	0.00233	N/A	0.00326	0.0031	<0.001 U	0.00612
BARIUM	mg/L	2	N/A	0.517	N/A	0.844 J	0.31	0.0417	2.45
CADMIUM	mg/L	0.005	N/A	<0.0006 U	N/A	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U
CHROMIUM	mg/L	0.1	N/A	<0.002 U	N/A	0.00207 J	0.00856	0.156	0.00115 J
COBALT	mg/L	6.1	N/A	<0.001 U	N/A	0.00073 J	0.000523 J	0.000603 J	0.000581 J
COPPER	mg/L	1.3	N/A	<0.002 U	N/A	<0.002 U	0.00153 J	0.0025 J	0.00124 J
LEAD	mg/L	0.015	N/A	<0.001 U	N/A	<0.001 U	<0.001 U	<0.001 U	<0.001 U
MANGANESE	mg/L	14	N/A	0.852	N/A	0.0079	0.00621	0.00579	0.0187
NICKEL	mg/L	2	N/A	0.00508 J	N/A	0.18	0.0106	0.0216	0.00542 J
SILVER	mg/L	0.51	N/A	<0.001 U	N/A	<0.001 U	<0.001 U	<0.001 U	<0.001 U
THALLIUM	mg/L	0.002	N/A	<0.0002 U	N/A	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U
VANADIUM	mg/L	0.72	N/A	<0.001 U	N/A	<0.001 U	0.00619	<0.001 U	0.0011 J
ZINC	mg/L	31	N/A	<0.025 U	N/A	<0.025 U	<0.025 U	<0.025 U	<0.025 U
Perchlorate (6850)									
PERCHLORATE	ug/L	72	1.25	N/A	1150	N/A	58000	67.2	0.17 J
Mercury (7470A)									
MERCURY	mg/L	0.002	N/A	<0.0002 U	N/A	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U
Volatile Organic Compounds (8260B)									
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U	N/A	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
1,1-DICHLOROETHANE	ug/L	10000	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	0.789 J	N/A	1.16 J	N/A	<1 U	4.37	<1 U
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U	N/A	<0.3 U	N/A	<0.3 U	<0.3 U	<0.3 U
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<1 U	N/A	<1 U	N/A	<1 U	<1 U	<1 U
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U	N/A	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	N/A	<2 U	N/A	<2 U	<2 U	<2 U
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U
1,2-DICHLOROETHANE	ug/L	5	4.75	N/A	5.64	N/A	30.2	1.93	<0.5 U
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	N/A	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	N/A	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
2-BUTANONE	ug/L	61000	<5 U	N/A	<5 U	N/A	<5 U	<5 U	<5 U
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U
2-HEXANONE	ug/L	6100	<5 U	N/A	<5 U	N/A	<5 U	<5 U	<5 U
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	N/A	<5 U	N/A	<5 U	<5 U	<5 U
ACETONE	ug/L	92000	<5 U	N/A	<5 U	N/A	<5 U	<5 U	<5 U
BENZENE	ug/L	5	<0.25 U	N/A	0.24 J	N/A	0.649 J	0.591 J	<0.25 U
BROMOBENZENE	ug/L	2000	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	N/A	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
BROMOFORM	ug/L	36	<1 U	N/A	<1 U	N/A	<1 U	<1 U	<1 U
BROMOMETHANE	ug/L	140	<1 UJ	N/A	<1 UJ	N/A	<1 UJ	<1 U	<1 UJ
CARBON DISULFIDE	ug/L	10000	<1 U	N/A	<1 U	N/A	<1 U	<1 U	<1 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	N/A	<0.5 U	N/A	0.924 J	24.9	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U
CHLOROETHANE	ug/L	41000	<1 U	N/A	<1 U	N/A	<1 U	<1 U	<1 U
CHLOROFORM	ug/L	1000	<0.25 U	N/A	4.78	N/A	2.6	1.38	<0.25 U
CHLOROMETHANE	ug/L	220	<1 UJ	N/A	<1 UJ	N/A	<1 UJ	<1 U	<1 UJ
CIS-1,2-DICHLOROETHENE	ug/L	70	1.99	N/A	4.97	N/A	3.99	6.31	<0.5 U
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
DIBROMOMETHANE	ug/L	380	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
ETHYLBENZENE	ug/L	700	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
M,P-XYLENE	ug/L	10000	<1 U	N/A	<1 U	N/A	<1 U	<1 U	<1 U
METHYLENE CHLORIDE	ug/L	5	<0.5 U	N/A	<0.5 U	N/A	0.338 J	<0.5 U	<0.5 U
NAPHTHALENE	ug/L	2000	<0.4 U	N/A	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U
N-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
N-PROPYLBENZENE	ug/L	4100	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U
O-XYLENE	ug/L	10000	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
STYRENE	ug/L	100	<0.25 U	N/A	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	ug/L	5	<0.5 U	N/A	0.703 J	N/A	<0.5 U	2.43	<0.5 U
TOLUENE	ug/L	1000	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	<0.5 U	N/A	<0.5 U	N/A	0.737 J	0.273 J	<0.5 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	N/A	<1 U	N/A	<1 U	<1 U	<1 U
TRICHLOROETHENE	ug/L	5	36.6	N/A	463	N/A	703	530	9.54
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	N/A	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	ug/L	2	<0.5 U	N/A	0.354 J	N/A	0.44 J	0.852 J	<0.5 U

Blue Highlighting Indicates Analyte Detected Above MCL/MSC

When no MCL was available, MSCs were used.

Location ID: Sample Date:	Units	MCL/ MSC	35BWW15- 011414 1/14/2014	35BWW17- 020414 2/4/2014
ID Location:			Site 37 - N, inside the site boundary, within the LUC boundary, middle region. Sampled quarterly	Site 37 - NNE, inside the site boundary, within the LUC boundary, outer region. Sampled quarterly
Volatile Organic Compounds (8260B)				
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U	<0.5 U
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U	<0.5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U	<0.4 U
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 U	<0.5 U
1,1-DICHLOROETHANE	ug/L	10000	3.55	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	35.5	<1 U
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U	<0.5 U
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U	<0.3 U
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<1 U	<1 U
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U	<0.4 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	<2 U
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	<0.5 U
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	<0.25 U
1,2-DICHLOROETHANE	ug/L	5	<0.5 U	<0.5 U
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<0.5 U
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	<0.5 U
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	<0.25 U
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	<0.5 U
2-BUTANONE	ug/L	61000	<5 U	<5 U
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	<0.25 U
2-HEXANONE	ug/L	6100	<5 U	<5 U
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	<5 U
ACETONE	ug/L	92000	<5 U	<5 U
BENZENE	ug/L	5	<0.25 U	<0.25 U
BROMOBENZENE	ug/L	2000	<0.25 U	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	<0.5 U
BROMOFORM	ug/L	36	<1 U	<1 U
BROMOMETHANE	ug/L	140	<1 U	<1 U
CARBON DISULFIDE	ug/L	10000	<1 U	<1 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U	<0.25 U
CHLOROETHANE	ug/L	41000	<1 U	<1 U
CHLOROFORM	ug/L	1000	0.213 J	<0.25 U
CHLOROMETHANE	ug/L	220	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	6.25	<0.5 U
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	<0.5 U
DIBROMOMETHANE	ug/L	380	<0.5 U	<0.5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	<0.5 U
ETHYLBENZENE	ug/L	700	<0.5 U	<0.5 U
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	<0.5 U
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	<0.5 U
M,P-XYLENE	ug/L	10000	<1 U	<1 U
METHYLENE CHLORIDE	ug/L	5	<0.5 U	<0.5 U
NAPHTHALENE	ug/L	2000	<0.4 U	<0.4 U
N-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U
N-PROPYLBENZENE	ug/L	4100	<0.25 U	0.25 U
O-XYLENE	ug/L	10000	<0.5 U	<0.5 U
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	<0.5 U
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U
STYRENE	ug/L	100	<0.25 U	0.25 U
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U
TETRACHLOROETHENE	ug/L	5	8.69	0.512
TOLUENE	ug/L	1000	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	<0.5 U	<0.5 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	<1 U
TRICHLOROETHENE	ug/L	5	43.5	<0.5 U
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	<0.5 U
VINYL CHLORIDE	ug/L	2	3.42	<0.5 U

Blue Highlighting Indicates Analyte Detected Above MCL/MSC.

When no MCL was available, MSCs were used.

Location ID: Sample Date:	Units	MCL/ MSC	46WW05-012814 1/28/2014	46WW05F-012814 1/28/2014	46WW08-012814 1/28/2014	46WW08FD-012814 1/28/2014	46WW11-012814 1/28/2014	46WW11F-012814 1/28/2014	LHSMW19-012814 1/28/2014	LHSMW19F-012814 1/28/2014
ID Location:			Site 46 - N, inside the fence line, outer region. Sampled quarterly	Site 46 - N, inside the fence line, outer region. Filtered, Sampled quarterly	Site 46 - NNW, inside the fence line, outer region. Sampled quarterly	Site 46 - NNW, inside the fence line, outer region. Dup, Sampled quarterly	Site 46 - NW, within the site boundary, middle region. Sampled quarterly	Site 46 - NW, within the site boundary, middle region. Filtered, Sampled quarterly	Site 46 - NNW, inside the fence line, middle region. Sampled quarterly	Site 46 - NNW, inside the fence line, middle region. Filtered, Sampled quarterly
Total Alkalinity (310.2)										
ALKALINITY, TOTAL	mg/L		<20 UJ	N/A	N/A	N/A	<20 UJ	N/A	279	N/A
Phosphorus (365.4)										
PHOSPHORUS	mg/L		<0.2 U	N/A	N/A	N/A	<0.2 U	N/A	<0.2 U	N/A
Sulfide (376.1)										
SULFIDE	mg/L		<1 U	N/A	N/A	N/A	<1 U	N/A	<1 U	N/A
Total Organic Carbon (415.1)										
TOTAL ORGANIC CARBON (TOC)	mg/L		15.4	N/A	N/A	N/A	3.11	N/A	5.07	N/A
Metals (6010C)										
IRON	mg/L		N/A	27	N/A	N/A	N/A	0.397	N/A	0.12 J
Metals (6020A)										
MANGANESE	mg/L	14	N/A	16.2	N/A	N/A	N/A	0.0571	N/A	0.075
Volatile Organic Compounds (8260B)										
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U	N/A	<0.4 U	N/A
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
1,1-DICHLOROETHANE	ug/L	10000	1.25	N/A	<0.25 U	<0.25 U	0.136 J	N/A	<0.25 U	N/A
1,1-DICHLOROETHENE	ug/L	7	9.57	N/A	<1 U	<1 U	<1 U	N/A	<1 U	N/A
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U	N/A	<0.3 U	<0.3 U	<0.3 U	N/A	<0.3 U	N/A
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<1 U	N/A	<1 U	<1 U	<1 U	N/A	<1 U	N/A
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U	N/A	<0.4 U	N/A
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	N/A	<2 U	<2 U	<2 U	N/A	<2 U	N/A
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	N/A	<0.25 U	N/A
1,2-DICHLOROETHANE	ug/L	5	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U	N/A	<0.4 U	N/A
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U	N/A	<0.4 U	N/A
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	N/A	<0.25 U	N/A
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
2-BUTANONE	ug/L	61000	<5 U	N/A	<5 U	<5 U	<5 U	N/A	<5 U	N/A
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	N/A	<0.25 U	N/A
2-HEXANONE	ug/L	6100	<5 U	N/A	<5 U	<5 U	<5 U	N/A	<5 U	N/A
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	N/A	<5 U	<5 U	<5 U	N/A	<5 U	N/A
ACETONE	ug/L	92000	<5 U	N/A	<5 U	<5 U	<5 U	N/A	<5 U	N/A
BENZENE	ug/L	5	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	N/A	<0.25 U	N/A
BROMOBENZENE	ug/L	2000	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	N/A	<0.25 U	N/A
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U	N/A	<0.4 U	N/A
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
BROMOFORM	ug/L	36	<1 U	N/A	<1 U	<1 U	<1 U	N/A	<1 U	N/A
BROMOMETHANE	ug/L	140	<1 U	N/A	<1 U	<1 U	<1 U	N/A	<1 U	N/A
CARBON DISULFIDE	ug/L	10000	<1 U	N/A	<1 U	<1 U	<1 U	N/A	<1 U	N/A
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
CHLOROBENZENE	ug/L	100	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	N/A	<0.25 U	N/A
CHLOROETHANE	ug/L	41000	<1 U	N/A	<1 U	<1 U	<1 U	N/A	<1 U	N/A
CHLOROFORM	ug/L	1000	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	N/A	<0.25 U	N/A
CHLOROMETHANE	ug/L	220	<1 U	N/A	<1 U	<1 U	<1 U	N/A	<1 U	N/A
CIS-1,2-DICHLOROETHENE	ug/L	70	10.3	N/A	<0.5 U	<0.5 U	2.04	N/A	2.15	N/A
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
DIBROMOMETHANE	ug/L	380	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
ETHYLBENZENE	ug/L	700	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
M,P-XYLENE	ug/L	10000	<1 U	N/A	<1 U	<1 U	<1 U	N/A	<1 U	N/A
METHYLENE CHLORIDE	ug/L	5	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
NAPHTHALENE	ug/L	2000	<0.4 U	N/A	<0.4 U	<0.4 U	<0.4 U	N/A	<0.4 U	N/A
N-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
N-PROPYLBENZENE	ug/L	4100	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	N/A	<0.25 U	N/A
O-XYLENE	ug/L	10000	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
STYRENE	ug/L	100	<0.25 U	N/A	<0.25 U	<0.25 U	<0.25 U	N/A	<0.25 U	N/A
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
TETRACHLOROETHENE	ug/L	5	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
TOLUENE	ug/L	1000	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
TRANS-1,2-DICHLOROETHENE	ug/L	100	0.415 J	N/A	<0.5 U	<0.5 U	0.575 J	N/A	0.295 J	N/A
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	N/A	<1 U	<1 U	<1 U	N/A	<1 U	N/A
TRICHLOROETHENE	ug/L	5	131	N/A	<0.5 U	<0.5 U	87.5	N/A	33.5	N/A
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
VINYL CHLORIDE	ug/L	2	2.53	N/A	<0.5 U	<0.5 U	<0.5 U	N/A	<0.5 U	N/A
Inorganic Anions (9056)										
CHLORIDE	mg/L		314	N/A	N/A	N/A	208	N/A	226	N/A
NITRATE	mg/L	10	<5 U	N/A	N/A	N/A	<2 U	N/A	<2 U	N/A
NITRITE	mg/L	1	<5 U	N/A	N/A	N/A	<2 U	N/A	<2 U	N/A
SULFATE	mg/L		4010	N/A	N/A	N/A	449	N/A	435	N/A
Dissolved Gases (RSK-175)										
CARBON DIOXIDE	ug/L		208000	N/A	N/A	N/A	97900	N/A	61400	N/A
ETHANE	ug/L		<2 U	N/A	N/A	N/A	<2 U	N/A	<2 U	N/A
ETHENE	ug/L		<2 U	N/A	N/A	N/A	<2 U	N/A	<2 U	N/A
METHANE	ug/L		34.1	N/A	N/A	N/A	<2 UJ	N/A	<2 U	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC.

When no MCL was available, MSCs were used.

Location ID: Sample Date:	Units	MCL/ MSC	50WW19-011414 1/14/2014
ID Location:			Site 50 - ENE, outside of the site boundary, near Site 67. Sampled quarterly
Perchlorate (6850)			
PERCHLORATE	ug/L	72	<0.2 U
Volatile Organic Compounds (8260B)			
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 U
1,1-DICHLOROETHANE	ug/L	10000	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	<1 U
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<1 U
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U
1,2-DICHLOROETHANE	ug/L	5	<0.5 U
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U
1,3,5-TRIMETHYLBENZENE	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	<0.25 U
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U
2-BUTANONE	ug/L	61000	<5 U
2-CHLOROTOLUENE	ug/L	2000	<0.25 U
2-HEXANONE	ug/L	6100	<5 U
4-CHLOROTOLUENE	ug/L	2000	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	<5 U
ACETONE	ug/L	92000	<5 U
BENZENE	ug/L	5	<0.25 U
BROMOBENZENE	ug/L	2000	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U
BROMOFORM	ug/L	36	<1 U
BROMOMETHANE	ug/L	140	<1 U
CARBON DISULFIDE	ug/L	10000	<1 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U
CHLOROETHANE	ug/L	41000	<1 U
CHLOROFORM	ug/L	1000	<0.25 U
CHLOROMETHANE	ug/L	220	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	<0.5 U
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U
DIBROMOMETHANE	ug/L	380	<0.5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U
ETHYLBENZENE	ug/L	700	<0.5 U
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U
ISOPROPYLBENZENE	ug/L	1000	<0.5 U
M,P-XYLENE	ug/L	10000	<1 U
METHYLENE CHLORIDE	ug/L	5	<0.5 U
NAPHTHALENE	ug/L	2000	<0.4 U
N-BUTYLBENZENE	ug/L	4100	<0.5 U
N-PROPYLBENZENE	ug/L	4100	<0.25 U
O-XYLENE	ug/L	10000	<0.5 U
P-ISOPROPYLTOLUENE	ug/L	10000	<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	<0.5 U
TOLUENE	ug/L	1000	<0.5 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	<0.5 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U
TRICHLOROETHENE	ug/L	5	<0.5 U
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U
VINYL CHLORIDE	ug/L	2	<0.5 U

When no MCL was available, MSCs were used.

Location ID: Sample Date:	Units	MCL/ MSC	67WW02- 092713 9/27/2013	67WW02- 012314 1/23/2014	67WW05- 092813 9/28/2013	67WW05- 012314 1/23/2014	67WW06- 092813 9/28/2013	67WW06- 012414 1/24/2014	67WW07- 092713 9/27/2013
ID Location:			Site 67 - NW, within the site boundary, outer region. Sampled quarterly	Site 67 - NW, within the site boundary, outer region. Sampled quarterly	Site 67 - WNW, outside the site boundary. Sampled quarterly	Site 67 - WNW, outside the site boundary. Sampled quarterly	Site 67 - E, outside the site boundary. Sampled quarterly	Site 67 - E, outside the site boundary. Sampled quarterly	Site 67 - E, outside the site boundary, on the LUC boundary. Sampled quarterly
Sulfide (376.1)									
SULFIDE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Carbon (415.1)									
TOTAL INORGANIC CARBON (TIC)	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
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
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
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
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
1,1-DICHLOROETHANE	ug/L	10000	0.508 J	0.406 J	<0.25 U	<0.25 U	<0.25 U	0.234 J	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	0.752 J	<1 U
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
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
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<1 U	<1 U	<1 U	<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
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
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	<2 U	<2 U	<2 U	<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	<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
1,2-DICHLOROETHANE	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	1.77	2.03	1.77
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
1,3,5-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
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
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
1,4-DICHLOROBENZENE	ug/L	75	<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
2-BUTANONE	ug/L	61000	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
2-CHLOROTOLUENE	ug/L	2000	<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 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
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
4-METHYL-2-PENTANONE	ug/L	8200	<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 U	<5 U
BENZENE	ug/L	5	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
BROMOBENZENE	ug/L	2000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
BROMOFORM	ug/L	36	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
BROMOMETHANE	ug/L	140	<1 U	<1 U	<1 U	<1 U	<1 UJ	<1 U	<1 U
CARBON DISULFIDE	ug/L	10000	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
CHLOROETHANE	ug/L	41000	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CHLOROFORM	ug/L	1000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
CHLOROMETHANE	ug/L	220	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<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
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
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
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
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
M,P-XYLENE	ug/L	10000	<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	0.966 J	<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
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
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
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
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
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
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
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
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
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
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
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<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	<0.5 U	<0.5 U	<0.5 U
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
VINYL CHLORIDE	ug/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
Inorganic Anions (9056)									
CHLORIDE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SULFATE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dissolved Gases (RSK-175)									
ETHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
ETHENE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
METHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ferrous Iron (SM3500FE)									
FERROUS IRON	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC.

When no MCL was available, MSCs were used.

Location ID: Sample Date:	Units	MCL/ MSC	67WW07- 012314 1/23/2014	67WW08- 100213 10/2/2013	67WW08- 012314 1/23/2014	67WW09- 092813 9/28/2013	67WW09- 012414 1/24/2014	67WW09A- 092713 9/27/2013	67WW09A- 092713-FD 9/27/2013
ID Location:			Site 67 - E, outside the site boundary, on the LUC boundary. Sampled quarterly	Site 67 - SSE, within the site boundary, middle region. Sampled quarterly	Site 67 - SSE, within the site boundary, middle region. Sampled quarterly	Site 67 - WSW, within the site boundary, on the LUC boundary, outer region. Sampled quarterly	Site 67 - WSW, within the site boundary, on the LUC boundary, outer region. Sampled quarterly	Site 67 - S, outside the site boundary. Sampled quarterly	Site 67 - S, outside the site boundary. Dup, Sampled quarterly
Sulfide (376.1)									
SULFIDE	mg/L		N/A	<1 U	<1 U	N/A	N/A	N/A	N/A
Total Carbon (415.1)									
TOTAL INORGANIC CARBON (TIC)	mg/L		N/A	28.9	N/A	N/A	N/A	N/A	N/A
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	6.32	9.95	N/A	N/A	N/A	N/A
Volatile Organic Compounds (8260B)									
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U	<4 U	<2 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 U	5.08 J	6.7	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,1-DICHLOROETHANE	ug/L	10000	<0.25 U	46.5	54.4	3.97	4.59	<0.25 U	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	<1 U	1120	1340	17.5	20.8	<1 U	<1 U
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U	<3 U	<1.5 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<1 U	<10 U	<5 U	<1 U	<1 U	<1 U	<1 U
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U	<4 U	<2 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 U	<20 U	<10 U	<2 U	<2 UJ	<2 U	<2 U
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	<2.5 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
1,2-DICHLOROETHANE	ug/L	5	1.35	76.5	89.9	0.414 J	0.347 J	<0.5 U	<0.5 U
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	<4 U	<2 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	<4 U	<2 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	<2.5 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
2-BUTANONE	ug/L	61000	<5 U	<50 U	<25 U	<5 U	<5 U	<5 U	<5 U
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	<2.5 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
2-HEXANONE	ug/L	6100	<5 U	<50 U	<25 U	<5 U	<5 U	<5 U	<5 U
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	<50 U	<25 U	<5 U	<5 U	<5 U	<5 U
ACETONE	ug/L	92000	<5 U	<50 U	<25 U	<5 U	<5 U	<5 U	<5 U
BENZENE	ug/L	5	<0.25 U	<2.5 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
BROMOBENZENE	ug/L	2000	<0.25 U	<2.5 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	<4 U	<2 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
BROMOFORM	ug/L	36	<1 U	<10 U	<5 U	<1 U	<1 U	<1 U	<1 U
BROMOMETHANE	ug/L	140	<1 U	<10 U	<5 U	<1 U	<1 U	<1 U	<1 U
CARBON DISULFIDE	ug/L	10000	<1 U	<10 U	<5 U	<1 U	<1 U	<1 U	<1 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U	<2.5 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
CHLOROETHANE	ug/L	41000	<1 U	<10 U	<5 U	<1 U	<1 U	<1 U	<1 U
CHLOROFORM	ug/L	1000	<0.25 U	<2.5 UJ	4.11 J	<0.25 U	<0.25 U	<0.25 U	<0.25 U
CHLOROMETHANE	ug/L	220	<1 U	<10 U	<5 U	<1 U	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	<0.5 U	<5 U	2.73 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
DIBROMOMETHANE	ug/L	380	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
ETHYLBENZENE	ug/L	700	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
M,P-XYLENE	ug/L	10000	<1 U	<10 U	<5 U	<1 U	<1 U	<1 U	<1 U
METHYLENE CHLORIDE	ug/L	5	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
NAPHTHALENE	ug/L	2000	<0.4 U	<4 U	<2 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
N-BUTYLBENZENE	ug/L	4100	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
N-PROPYLBENZENE	ug/L	4100	<0.25 U	<2.5 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
O-XYLENE	ug/L	10000	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
STYRENE	ug/L	100	<0.25 U	<2.5 U	<1.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	ug/L	5	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TOLUENE	ug/L	1000	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	<10 U	<5 U	<1 U	<1 U	<1 U	<1 U
TRICHLOROETHENE	ug/L	5	<0.5 U	<5 U	3.12 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	<5 U	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	ug/L	2	<0.5 U	<5 U	<2.5 U	<0.5 U	0.472 J	<0.5 U	<0.5 U
Inorganic Anions (9056)									
CHLORIDE	mg/L		N/A	1360	1490	N/A	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	<2 U	<2 U	N/A	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	<2 U	<2 U	N/A	N/A	N/A	N/A
SULFATE	mg/L		N/A	297	303	N/A	N/A	N/A	N/A
Dissolved Gases (RSK-175)									
ETHANE	ug/L		N/A	<2 U	<2 U	N/A	N/A	N/A	N/A
ETHENE	ug/L		N/A	<2 U	<2 U	N/A	N/A	N/A	N/A
METHANE	ug/L		N/A	<2 U	7.79	N/A	N/A	N/A	N/A
Ferrous Iron (SM3500FE)									
FERROUS IRON	mg/L		N/A	0.161	0.344	N/A	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC.

When no MCL was available, MSCs were used.

Location ID: Sample Date:	Units	MCL/ MSC	67WW09A-012314 1/23/2014	67WW10-092713 9/27/2013	67WW10-012414 1/24/2014	67WW11-100213 10/2/2013	67WW11 FD-012314 1/23/2014	67WW11-012314 1/23/2014	67WW12-100113 10/1/2013
ID Location:			Site 67 - S, outside the site boundary. Sampled quarterly	Site 67 - SE, outside the site boundary, on the LUC boundary. Sampled quarterly	Site 67 - SE, outside the site boundary, on the LUC boundary. Sampled quarterly	Site 67 - S, within the site boundary, outer region. Sampled quarterly	Site 67 - S, within the site boundary, outer region. Dup, Sampled quarterly	Site 67 - S, within the site boundary, outer region. Sampled quarterly	Site 67 - NNE, outside the site boundary. Sampled quarterly
Sulfide (376.1)									
SULFIDE	mg/L		N/A	N/A	N/A	<1 U	N/A	N/A	N/A
Total Carbon (415.1)									
TOTAL INORGANIC CARBON (TIC)	mg/L		N/A	N/A	N/A	17.6	N/A	N/A	N/A
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	N/A	N/A	5.7	N/A	N/A	N/A
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
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
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
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
1,1-DICHLOROETHANE	ug/L	10000	<0.25 U	0.362 J	0.319 J	10.6	10.7	9.83	<0.25 U
1,1-DICHLOROETHENE	ug/L	7	<1 U	<1 U	<1 U	42.8	43	38.8	<1 U
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
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
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<1 U	<1 U	<1 U	<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
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
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 UJ	<2 U	<2 UJ	<2 U	<2 U	<2 U	<2 UJ
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
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
1,2-DICHLOROETHANE	ug/L	5	<0.5 U	<0.5 U	<0.5 U	0.799 J	0.823 J	0.748 J	<0.5 U
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
1,3,5-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
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
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
1,4-DICHLOROBENZENE	ug/L	75	<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
2-BUTANONE	ug/L	61000	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
2-CHLOROTOLUENE	ug/L	2000	<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 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
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
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
ACETONE	ug/L	92000	<5 U	<5 U	<5 U	33.6	<5 U	<5 U	<5 U
BENZENE	ug/L	5	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
BROMOBENZENE	ug/L	2000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
BROMOFORM	ug/L	36	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
BROMOMETHANE	ug/L	140	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CARBON DISULFIDE	ug/L	10000	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
CHLOROETHANE	ug/L	41000	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CHLOROFORM	ug/L	1000	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
CHLOROMETHANE	ug/L	220	<1 U	<1 U	<1 U	0.536 J	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<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
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
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
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
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
M,P-XYLENE	ug/L	10000	<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
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
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
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
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
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
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
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
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
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
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
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
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<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	<0.5 U	<0.5 U	<0.5 U
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
VINYL CHLORIDE	ug/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.296 J	<0.5 U	<0.5 U
Inorganic Anions (9056)									
CHLORIDE	mg/L		N/A	N/A	N/A	1200	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	N/A	N/A	<2 U	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	N/A	N/A	<2 U	N/A	N/A	N/A
SULFATE	mg/L		N/A	N/A	N/A	375	N/A	N/A	N/A
Dissolved Gases (RSK-175)									
ETHANE	ug/L		N/A	N/A	N/A	<2 U	N/A	N/A	N/A
ETHENE	ug/L		N/A	N/A	N/A	<2 U	N/A	N/A	N/A
METHANE	ug/L		N/A	N/A	N/A	<2 U	N/A	N/A	N/A
Ferrous Iron (SM3500FE)									
FERROUS IRON	mg/L		N/A	N/A	N/A	<0.04 U	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC.

When no MCL was available, MSCs were used.

Location ID: Sample Date:	Units	MCL/ MSC	67WW12- 012414 1/24/2014	67WW13- 100113 10/1/2013	67WW13- 012414 1/24/2014	67WW13FD- 012414 1/24/2014	67WW14- 100113 10/1/2013	67WW14- 100113-FD 10/1/2013	67WW14- 012414 1/24/2014
ID Location:			Site 67 - NNE, outside the site boundary. Sampled quarterly	Site 67 - WSW, within the site boundary, on the LUC boundary, outer region. Sampled quarterly	Site 67 - WSW, within the site boundary, on the LUC boundary, outer region. Sampled quarterly	Site 67 - WSW, within the site boundary, on the LUC boundary, outer region. Dup, Sampled quarterly	Site 67 - SW, outside the site boundary beside Ignatius Avenue. Sampled quarterly	Site 67 - SW, outside the site boundary beside Ignatius Avenue. Dup, Sampled quarterly	Site 67 - SW, outside the site boundary beside Ignatius Avenue. Sampled quarterly
Sulfide (376.1)									
SULFIDE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Carbon (415.1)									
TOTAL INORGANIC CARBON (TIC)	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL ORGANIC CARBON (TOC)	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Volatile Organic Compounds (8260B)									
1,1,1,2-TETRACHLOROETHANE	ug/L	110	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
1,1,1-TRICHLOROETHANE	ug/L	200	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	14	<0.4 U	<0.4 U	<1 U	<1 U	<0.4 U	<0.4 U	<0.4 U
1,1,2-TRICHLOROETHANE	ug/L	5	<0.5 U	3.37	2.99	3.01	<0.5 U	<0.5 U	<0.5 U
1,1-DICHLOROETHANE	ug/L	10000	<0.25 U	33.8	32.7	32.4	0.197 J	0.304 J	0.275 J
1,1-DICHLOROETHENE	ug/L	7	<1 U	515	572	569	1.82 J	2.22	2.58
1,1-DICHLOROPROPENE	ug/L	2.9	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
1,2,3-TRICHLOROBENZENE	ug/L	310	<0.3 U	<0.3 U	<0.75 U	<0.75 U	<0.3 U	<0.3 U	<0.3 U
1,2,3-TRICHLOROPROPANE	ug/L	0.0041	<1 U	<1 U	<2.5 U	<2.5 U	<1 U	<1 U	<1 U
1,2,4-TRICHLOROBENZENE	ug/L	70	<0.4 U	<0.4 U	<1 U	<1 U	<0.4 U	<0.4 U	<0.4 U
1,2,4-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	0.2	<2 UJ	<2 UJ	<5 UJ	<5 UJ	<2 UJ	<2 UJ	<2 UJ
1,2-DIBROMOETHANE	ug/L	0.005	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
1,2-DICHLOROBENZENE	ug/L	600	<0.25 U	<0.25 U	<0.626 U	<0.626 U	<0.25 U	<0.25 U	<0.25 U
1,2-DICHLOROETHANE	ug/L	5	<0.5 U	23.8	22.9	22.9	0.692 J	0.849 J	0.666 J
1,2-DICHLOROPROPANE	ug/L	5	<0.4 U	<0.4 U	<1 U	<1 U	<0.4 U	<0.4 U	<0.4 U
1,3,5-TRIMETHYLBENZENE	ug/L	5100	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
1,3-DICHLOROBENZENE	ug/L	3100	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
1,3-DICHLOROPROPANE	ug/L	29	<0.4 U	<0.4 U	<1 U	<1 U	<0.4 U	<0.4 U	<0.4 U
1,4-DICHLOROBENZENE	ug/L	75	<0.25 U	<0.25 U	<0.626 U	<0.626 U	<0.25 U	<0.25 U	<0.25 U
2,2-DICHLOROPROPANE	ug/L	42	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
2-BUTANONE	ug/L	61000	<5 U	<5 U	<12.5 U	<12.5 U	9.06 J	7.47 J	<5 U
2-CHLOROTOLUENE	ug/L	2000	<0.25 U	<0.25 U	<0.626 U	<0.626 U	<0.25 U	<0.25 U	<0.25 U
2-HEXANONE	ug/L	6100	<5 U	<5 U	<12.5 U	<12.5 U	<5 U	<5 U	<5 U
4-CHLOROTOLUENE	ug/L	2000	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
4-METHYL-2-PENTANONE	ug/L	8200	<5 U	<5 U	<12.5 U	<12.5 U	<5 U	<5 U	<5 U
ACETONE	ug/L	92000	<5 U	<5 U	<12.5 U	<12.5 U	3.27 J	2.59 J	<5 U
BENZENE	ug/L	5	<0.25 U	<0.25 U	<0.626 U	<0.626 U	<0.25 U	<0.25 U	<0.25 U
BROMOBENZENE	ug/L	2000	<0.25 U	<0.25 U	<0.626 U	<0.626 U	<0.25 U	<0.25 U	<0.25 U
BROMOCHLOROMETHANE	ug/L	4100	<0.4 U	<0.4 U	<1 U	<1 U	<0.4 U	<0.4 U	<0.4 U
BROMODICHLOROMETHANE	ug/L	4.6	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
BROMOFORM	ug/L	36	<1 U	<1 U	<2.5 U	<2.5 U	<1 U	<1 U	<1 U
BROMOMETHANE	ug/L	140	<1 U	<1 U	<2.5 U	<2.5 U	<1 U	<1 U	<1 U
CARBON DISULFIDE	ug/L	10000	<1 U	<1 U	<2.5 U	<2.5 U	<1 U	<1 U	<1 U
CARBON TETRACHLORIDE	ug/L	5	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
CHLOROBENZENE	ug/L	100	<0.25 U	<0.25 U	<0.626 U	<0.626 U	<0.25 U	<0.25 U	<0.25 U
CHLOROETHANE	ug/L	41000	<1 U	<1 U	<2.5 U	<2.5 U	<1 U	<1 U	<1 U
CHLOROFORM	ug/L	1000	<0.25 U	<0.25 UJ	<0.626 U	0.359 J	<0.25 U	<0.25 U	<0.25 U
CHLOROMETHANE	ug/L	220	<1 U	<1 U	<2.5 U	<2.5 U	0.64 J	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	ug/L	70	<0.5 U	1.66	1.67 J	1.77 J	<0.5 U	<0.5 U	<0.5 U
CIS-1,3-DICHLOROPROPENE	ug/L	5.3	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
DIBROMOCHLOROMETHANE	ug/L	34	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
DIBROMOMETHANE	ug/L	380	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
DICHLORODIFLUOROMETHANE	ug/L	20000	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
ETHYLBENZENE	ug/L	700	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
HEXACHLOROBUTADIENE	ug/L	20	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
ISOPROPYLBENZENE	ug/L	1000	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
M,P-XYLENE	ug/L	10000	<1 U	<1 U	<2.5 U	<2.5 U	<1 U	<1 U	<1 U
METHYLENE CHLORIDE	ug/L	5	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
NAPHTHALENE	ug/L	2000	<0.4 U	<0.4 U	<1 U	<1 U	<0.4 U	<0.4 U	<0.4 U
N-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
N-PROPYLBENZENE	ug/L	4100	<0.25 U	<0.25 U	<0.626 U	<0.626 U	<0.25 U	<0.25 U	<0.25 U
O-XYLENE	ug/L	10000	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
P-ISOPROPYLTOLUENE	ug/L	10000	<0.5 U	<0.5 U	<1.25 U	<1.25 U	0.431 J	0.353 J	<0.5 U
SEC-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
STYRENE	ug/L	100	<0.25 U	<0.25 U	<0.626 U	<0.626 U	<0.25 U	<0.25 U	<0.25 U
TERT-BUTYLBENZENE	ug/L	4100	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	ug/L	5	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
TOLUENE	ug/L	1000	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	ug/L	100	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,3-DICHLOROPROPENE	ug/L	29	<1 U	<1 U	<2.5 U	<2.5 U	<1 U	<1 U	<1 U
TRICHLOROETHENE	ug/L	5	<0.5 U	2.81	2.86	2.99	<0.5 U	<0.5 U	<0.5 U
TRICHLOROFLUOROMETHANE	ug/L	31000	<0.5 U	<0.5 U	<1.25 U	<1.25 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	ug/L	2	<0.5 U	2.1	2.37 J	2.37 J	<0.5 U	<0.5 U	<0.5 U
Inorganic Anions (9056)									
CHLORIDE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRATE	mg/L	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRITE	mg/L	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SULFATE	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dissolved Gases (RSK-175)									
ETHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
ETHENE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
METHANE	ug/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ferrous Iron (SM3500FE)									
FERROUS IRON	mg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A

Blue Highlighting Indicates Analyte Detected Above MCL/MSC.

When no MCL was available, MSCs were used.

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

April 2, 2014

DAIM-ODB-LO

Ms. April Palmie
Texas Commission on Environmental Quality Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Current and Historic Surface Water and Perimeter Well Sampling Results
1999 Perchlorate Dispute Resolution Requirement
Longhorn Army Ammunition Plant, Karnack, Texas

Dear Ms. Palmie,

As discussed at recent Monthly Managers' Meetings, the surface water and perimeter well data that is collected as a requirement of the 1999 Perchlorate Dispute Resolution, will be documented in the Administrative Record via data memoranda provided quarterly by the Army. The quarterly surface water sampling results and the semi-annual perimeter well sampling results along with historical data, is presented in the attached memorandum for your file.

The point of contact for this action is the undersigned. I ask that Dave Wacker, AECOM's Project Manager, be copied on any communications related to the project. I may be contacted at 479-635-0110, or by email at rose.zeiler@us.army.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
R. Mayer, USEPA Region 6, Dallas, TX
D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
R. Smith, USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
M. Plitnik, USAEC, San Antonio, TX
D. Wacker, AECOM, San Antonio, TX (for project files)

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

April 2, 2014

DAIM-ODB-LO

Mr. Rich Mayer
US Environmental Protection Agency
Superfund Division (6SF-AT)
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Current and Historic Surface Water and Perimeter Well Sampling Results
1999 Perchlorate Dispute Resolution Requirement
Longhorn Army Ammunition Plant, Karnack, Texas

Dear Mr. Mayer,

As discussed at recent Monthly Managers' Meetings, the surface water and perimeter well data that is collected as a requirement of the 1999 Perchlorate Dispute Resolution, will be documented in the Administrative Record via data memoranda provided quarterly by the Army. The quarterly surface water sampling results and the semi-annual perimeter well sampling results along with historical data, is presented in the attached memorandum for your file.

The point of contact for this action is the undersigned. I ask that Dave Wacker, AECOM's Project Manager, be copied on any communications related to the project. I may be contacted at 479-635-0110, or by email at rose.zeiler@us.army.mil.

Sincerely,

Rose M. Zeiler

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
April Palmie, TCEQ
Paul Bruckwicki, USFWS
R. Smith, USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
Dave Wacker, AECOM (for project files)

AECOM

MEMORANDUM FOR FILE

DATE: April 2, 2014

PROJECT NAME: Remediation of Multiple Sites, Longhorn Army Ammunition Plant, Karnack, TX

TO:	Rose Zeiler	Site Manager
	Rick Smith	Project Manager
	Aaron Williams	Project Engineer
FROM:	Dave Wacker	AECOM PM, 210-253-7514

SUBJECT: **Surface Water Data Transmittal March 2008 – February 2014**
Perimeter Well Data Transmittal September 2008 – June 2013
Longhorn Army Ammunition Plant, Karnack, TX
(Contract: W912DY-09-D-0059, Task Order DS01)

REMARKS

Surface Water data for the period of March 2008 – February 2014 and Perimeter Well Perchlorate data for the period of September 2008 – June 2013 is attached for your file.

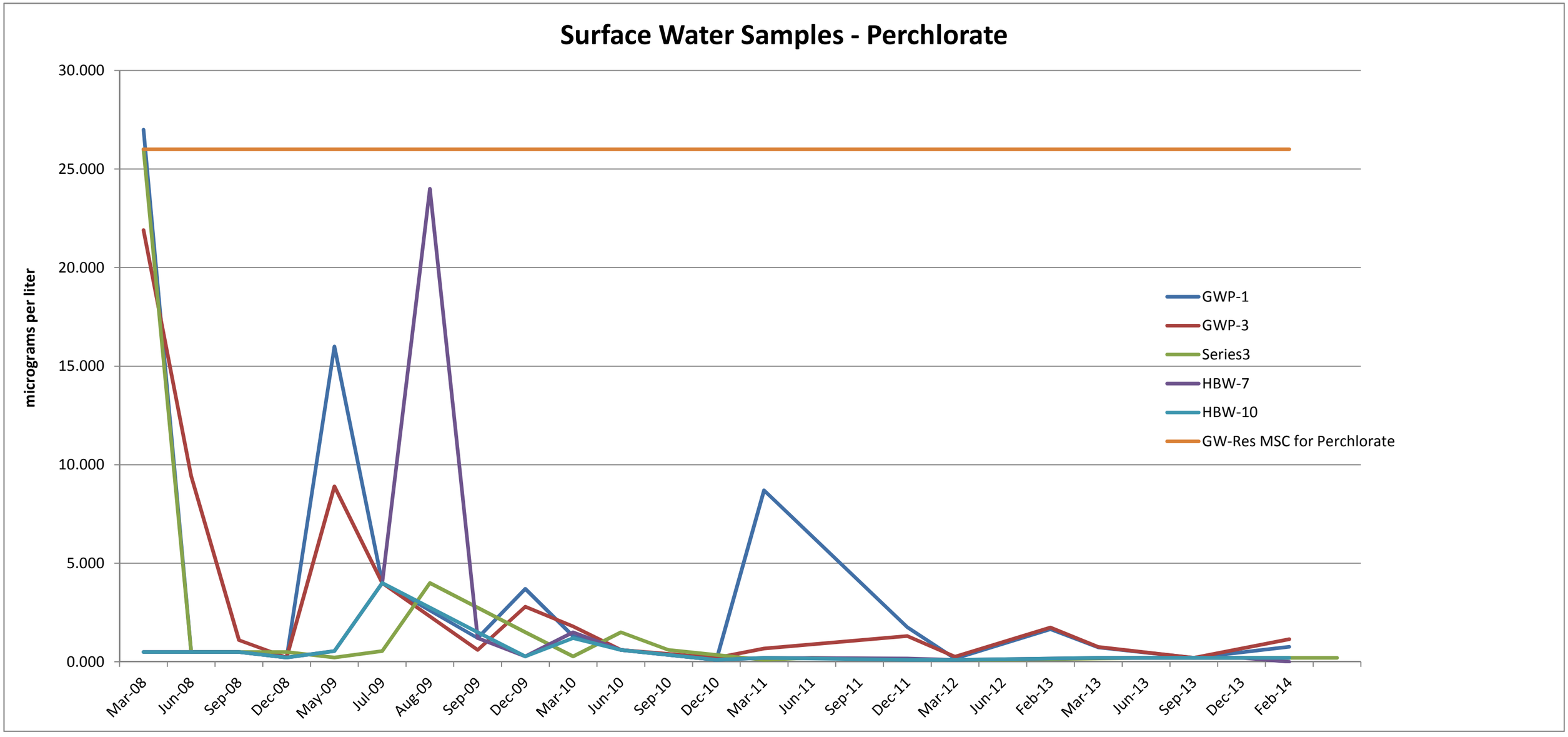
Historic Surface Water Perchlorate Data
(in micrograms per liter)

Sample ID	Mar 2008	Jun 2008	Sep 2008	Dec 2008	May 2009	Jul 2009	Aug 2009	Sep 2009	Dec 2009	Mar 2010	Jun 2010
GPW-1	27	<0.5U[1]	<0.5U	<0.22U	16	<4U	NS[2]	<1.2U	3.7	1.3J[3]	<0.6U
GPW-3	21.9	9.42	1.1	<0.22U	8.9	<4U	NS	<0.6U	2.8	1.8J	<0.6U
HBW-1	<0.5U	<0.5U	<0.5U	<0.22U	<0.55U	<4U	NS	<1.5U	<0.275U	1.5U	<0.6U
HBW-7	<0.5U	<0.5U	<0.5U	<0.22U	<0.55U	<4U	24	<1.2U	<0.275U	1.5U	<0.6U
HBW-10	<0.5U	<0.5U	<0.5U	<0.22U	<0.55U	<4U	NS	<1.5U	<0.275U	1.2U	<0.6U

Sample ID	Sep 2010	Dec 2010	Mar 2011	Jun 2011	Sep 2011	Dec 2011	Mar 2012	Jun 2012	Jan/Feb 2013	Mar 2013	Jun 2013
GPW-1	dry	<0.1U	8.7	dry	dry	1.76	0.163J	dry	1.65	0.735	dry
GPW-3	dry	0.199J	0.673	dry	dry	1.31	0.261	dry	1.74	0.754	dry
HBW-1	dry	<0.1U	<0.2U	dry	dry	<0.1U	0.1U	dry	<0.2U	<0.2U	<0.2U
HBW-7	dry	<0.1U	<0.2U	dry	dry	0.171J	0.1U	dry	<0.2U	<0.2U	<0.2U
HBW-10	dry	<0.1U	<0.2U	dry	dry	<0.1U	0.1U	dry	<0.2U	<0.2U	<0.2U

Sample ID	Sept 2013	Dec 2013	Feb 2014
GPW-1	<0.2 U	dry	0.766
GPW-3	<0.2 U	dry	1.15
HBW-1	<0.2 U	dry	<0.2U
HBW-7	<0.2 U	dry	0.201J
HBW-10	<0.2 U	dry	<0.2U

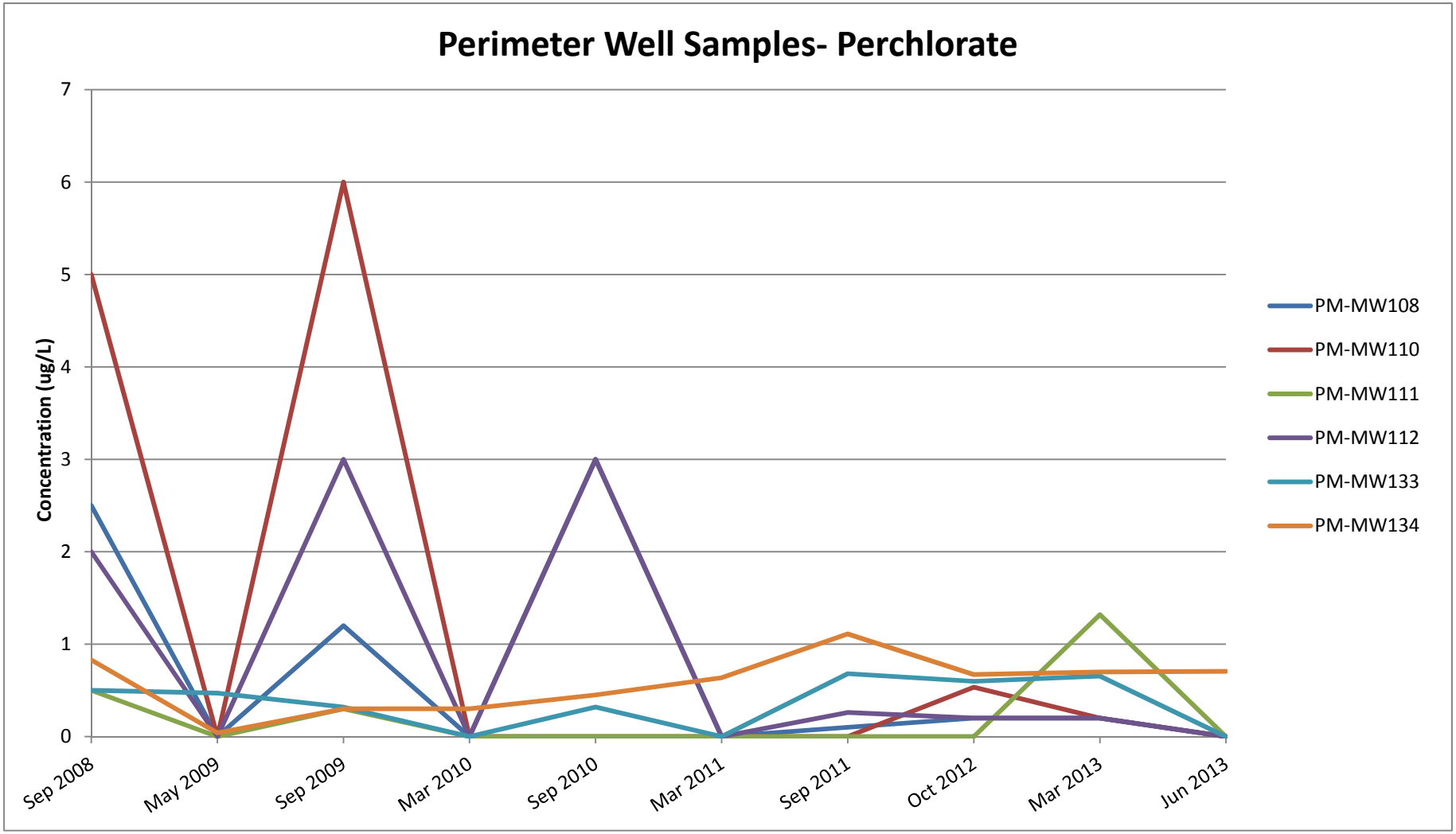
[1] U Non-detect
[2] NS Not Sampled
[3] J Estimated Value

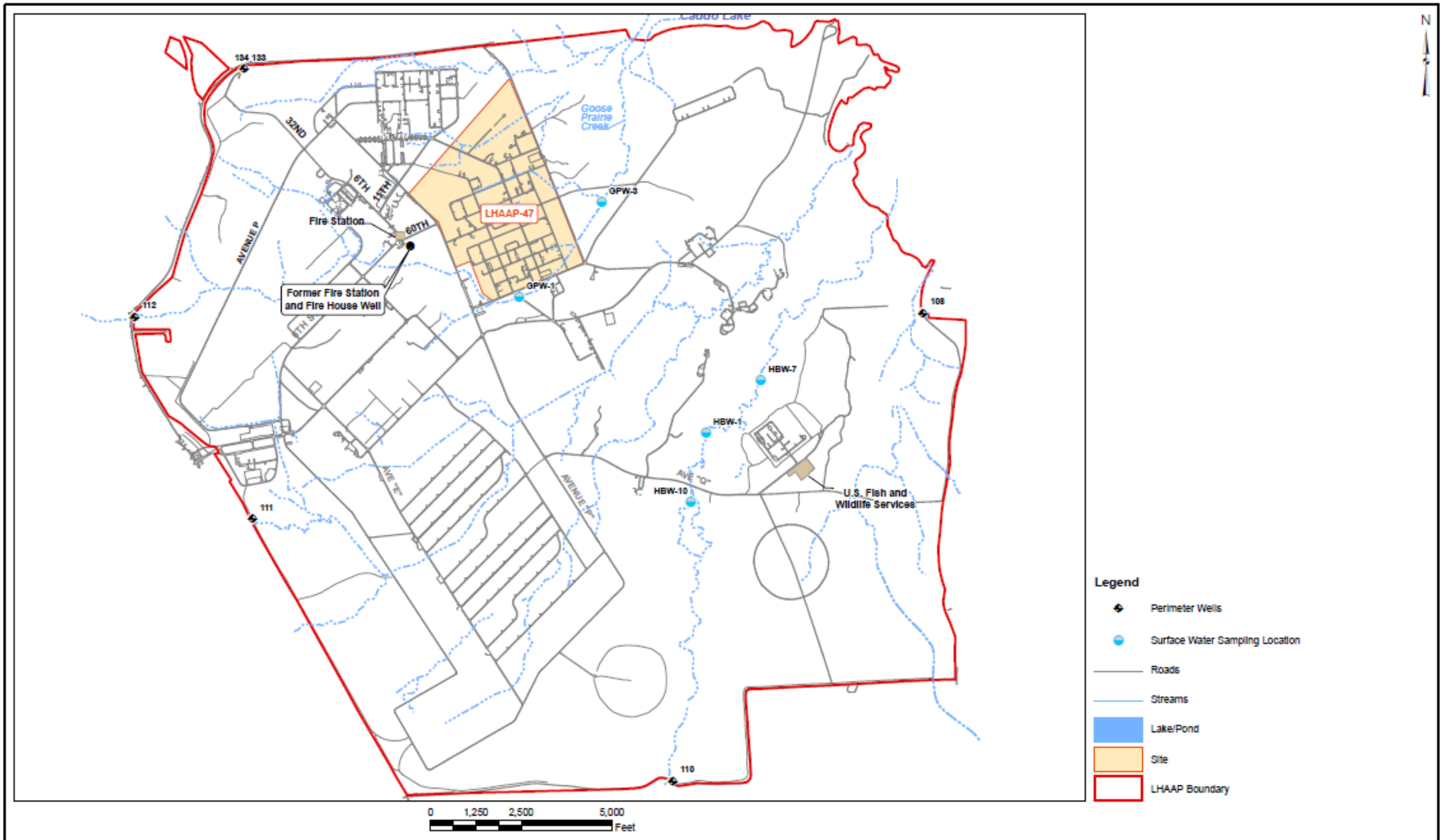

Surface Water Samples - Perchlorate
micrograms per liter
30.000
25.000
20.000
15.000
10.000
5.000
0.000
Mar-08
Jun-08
Sep-08
Dec-08
May-09
Jul-09
Aug-09
Sep-09
Dec-09
Mar-10
Jun-10
Sep-10
Dec-10
Mar-11
Jun-11
Sep-11
Dec-11
Mar-12
Jun-12
Feb-13
Mar-13
Jun-13
Sep-13
Dec-13
Feb-14
GWP-1
GWP-3
Series3
HBW-7
HBW-10
GW-Res MSC for Perchlorate

Historic Perimeter Well Perchlorate Data
(in micrograms per liter)

Sample ID	Sep 2008	May 2009	Sep 2009	Mar 2010	Sep 2010	Mar 2011	Sep 2011	Mar 2012	Oct 2012	Mar 2013	Jun 2013
PM-MW108	2.5U[1]	NS[2]	1.2U	NS	3U	NS	0.1U	NS	0.2U	0.2U	NS
PM-MW110	5U	NS	6U	NS	Dry	NS	Dry	NS	0.535	0.2U	NS
PM-MW111	0.5U	NS	0.3U	NS	Dry	NS	Dry	NS	Dry	1.32	NS
PM-MW112	2U	NS	3U	NS	3U	NS	0.26	NS	0.2U	0.2U	NS
PM-MW133	0.5U	0.47J[3]	0.32	Dry	0.32	Dry	0.68	NS	0.598	0.655	0.685
PM-MW134	0.829U	0.04J	0.3U	0.3U	0.45	0.636	1.11	NS	0.671	0.698	0.706

[1] U Non-detect
[2] NS Not Sampled
[3] J Estimated Value


Perimeter Well Samples- Perchlorate
Concentration (ug/L)
7
6
5
4
3
2
1
0
Sep 2008
May 2009
Sep 2009
Mar 2010
Sep 2010
Mar 2011
Sep 2011
Oct 2012
Mar 2013
Jun 2013
PM-MW108
PM-MW110
PM-MW111
PM-MW112
PM-MW133
PM-MW134



AECOM

Site Vicinity Map
Perimeter Wells and Surface Water Sample Locations
Longhorn Army Ammunition Plant
Karnack, Texas

60274185

October 2013

QUALITY CONTROL SUMMARY REPORT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Prepared For:

U.S. Army Corps of Engineers

Prepared By:

AECOM

AECOM Technical Services

November 2013

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1 INTRODUCTION

AECOM reviewed seven data packages from Microbac Laboratory Services, Marietta, OH. Groundwater samples were collected January 30 through September 30, 2013 at Surface Water Sampling Locations and Perimeter Wells at 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 monitoring for Perchlorate in surface water and along the perimeter of the former plant complies with the decision of the Dispute Resolution Committee December 6, 1999.

Analyses requested included:

- SW6850 – Perchlorates by LC/MS/MS

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 ± 40% drift, then the compound is qualified J or UJ.

1.3.1 Continuing Calibration Verifications (CCV)

All CCVs are within criteria.

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.

No blank contamination found.

1.3.3 Surrogates

All surrogates are within criteria.

1.3.4 Laboratory Control Sample (LCS)

All LCS are within criteria.

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.

Table 1: Completeness by Method

Method	Total Analytes	No. of Rejected Results	% Completeness
SW6850	26	0	100

Table 2: Field Sample Identification and Laboratory Identification

ClientSampleID	LabSampleID	Collected	SW6850	E350.1	365.2	1664A	E415.1	SW8260	SW6010	SW6020	SW9056	SW7196A	410.4	SW8270
L12100226-01	112-011012	10/1/12	X											
L12100226-02	110-011012	10/1/12	X											
L12100226-03	133-011012	10/1/12	X											
L12100226-04	134-011012	10/1/12	X											
L12100226-05	108-021012	10/1/12	X											
L13010790-01	HBW7-013013	1/30/2013	X											
L13010790-02	HBW710-013013	1/30/2013	X											
L13010790-03	HBW1-013013	1/30/2013	X											
L13020474-01	GPW 1-021413	2/14/2013	X											
L13020474-02	GPW 3-021413	2/14/2013	X											
L13030239-01	PW-108-030513	3/5/2013	X											
L13030239-02	PW 111-030613	3/6/2013	X											
L13030239-03	PW-112-030613	3/6/2013	X											
L13030239-04	PW 110-030613	3/6/2013	X											
L13030239-05	PW 133-030613	3/6/2013	X											
L13030239-06	PW 134-030613	3/6/2013	X											
L13030393-01	HBW 1-031113	3/11/2013	X											
L13030393-02	HBW 7-031113	3/11/2013	X											
L13030393-03	HBW 10-031113	3/11/2013	X											
L13030393-04	GPW 1-031113	3/11/2013	X											
L13030393-05	GPW 3-031113	3/11/2013	X											
L13060106-01	PW133-060313	6/3/2013	X											
L13060106-02	PW134-060313	6/3/2013	X											
L13060258-01	HBW 7-060513	6/5/2013	X											
L13060258-02	HBW 10-060513	6/5/2013	X											
L13060255-03	HBW 1-060513	6/5/2013	X											