TIME CRITICAL REMOVAL ACTION (TCRA)
ACTION MEMORANDUM

For

LHAAP-17
Burning Ground No.2/Flashing Area

Longhorn Army Ammunition Plant
Karnack, Texas

August 2021

EXECUTIVE SUMMARY

ES.1 A Time Critical Removal Action (TCRA) is required for the 3.9 acre Burning Ground No.2/Flashing Area, LHAAP-17, a portion of the former 8,416-acre Longhorn Army Ammunition Plant (LHAAP) located in Karnack, Texas.

ES.2 The former LHAAP is an inactive, government-owned, formerly contractor operated and maintained, DoD facility that was established in December 1941 with the primary mission of manufacturing TNT. It is on the National Priorities List (NPL) and is under a Federal Facility Agreement (FFA) with USEPA and the Texas Commission on Environmental Quality (TCEQ). LHAAP-17 was used as a burning/flashing ground from 1959 through 1980. Although LHAAP-17 remains under Army's administrative control, much of the former installation has been transferred to the U. S. Fish and Wildlife Service for use as a refuge. LHAAP-17 is adjacent to refuge lands and to internationally designated wetlands.

The Army will, to the extent practicable, conduct the TCRA in compliance with the provisions of 40 CFR 300.415(b) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Executive Order 12580, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 42 U.S.C.A. §§9601 et. seq.), as amended, and the DOD Environmental Restoration Program (DERP, 10 U.S.C. §2701) which provides the authority to respond to potential threats of a release at LHAAP.

ES.3 LHAAP-17 is in the remedial action phase of its restoration. Along with a groundwater remedy and land use controls, removal of soil contaminated with explosives and perchlorate is a requirement of the 2016 Record of Decision (ROD). Implementation of the remedial action began in 2019, but all work was stopped due to the discovery of MEC in the surface and subsurface soils. The removal of MEC under this TCRA will allow the remedial work to safely continue.

ES.4 Soil removal activities began at Site LHAAP-17 in August 2019. Halfway through excavation work, an unfuzed and empty (i.e., no energetic material present) 4.2" illumination mortar was uncovered prompting a temporary work stoppage (USACE, 2020). Soil removal recommenced but was subsequently halted due to the recovery of munitions and explosives of concern (MEC). The MEC included M301 81-millimeter (mm) illumination mortars, artillery base tracer elements, and an M19 series rifle-launched green parachute signal (USACE, 2020), all of which contain perchlorate as the illuminant/pyrotechnic material. Given the previous recovery of munitions, which qualified personnel determined were munitions and explosives of concern (MEC), a threat to public health or welfare exists within LHAAP-17. Failure to implement a removal action prior to resumption of the soil excavation requirement of the 2016 ROD poses an unacceptable risk to environmental construction workers, off-path Refuge visitors and trespassers. The Army proposes to conduct a TCRA in order to significantly reduce, mitigate or eliminate the threat to the environment and the public at LHAAP-17.

ES.5 Under this TCRA, the Army will remove munitions from the site. After conducting a surface sweep to remove munitions from the surface, the Army will conduct a geophysical

survey to identify subsurface anomalies, investigate those selected (i.e., anomalies that are determined by data analysis to most likely be munitions) to depths of 4 to 6 feet below the ground surface (bgs), remove and properly dispose of munitions within the 3.9 acres that make up LHAAP-17. The TCRA's primary objective is to mitigate and minimize the potential for environmental construction workers, off-path Refuge visitors and trespassers to encounter military munitions.

ES.6 Given the probable presence of munitions, some of which may be MEC, at LHAAP-17 and the risk posed to environmental construction workers, off-path Refuge visitors and trespassers, the Army has determined a TCRA is necessary to protect human health and the environment. There is a moderate probability that munitions, some of which may be MEC, may be encountered within LHAAP-17 during soil removal activities to carry out the requirements of the 2016 ROD. If not removed, munitions pose an unacceptable risk if not addressed through a response (removal) action. The Army estimates this TCRA will cost approximately $115,381.

TABLE OF CONTENTS

LIST OF FIGURES

1.0 PURPOSE

The purpose of this Action Memorandum is to request and document approval of the selected removal action described herein for the 3.9 acre Burning Ground No.2/Flashing Area, Group 2, LHAAP-17 located at the former Longhorn Army Ammunition Plant in Karnack, Texas (**Figure 1)**.

2.0 SITE CONDITIONS AND BACKGROUND

The former LHAAP is a closed, government-owned, formerly contractor operated and maintained, DoD facility that was established in December 1941 with the primary mission of manufacturing TNT. Production of TNT began at Plant 1 in October 1942 and continued through World War II until August 1945, when the facility was placed on standby status until February 1952. In 1952, the LHAAP facility was reactivated with the opening of Plant 2, where pyrotechnic ammunition, such as photoflash bombs, simulators, hand signals, and tracers for 40-millimeter ammunition, were produced until 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 Force Treaty in effect between the United States and the former Union of Soviet Socialist Republics. 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. Over 7200 acres of the former installation have been transferred to the U.S. Fish and Wildlife Service (USFWS) as the Caddo Lake National Wildlife Refuge (Refuge). LHAAP-17 is bordered in part by the Refuge boundary.

LHAAP-17 was used as a burning/flashing ground from 1959 through 1980 (**Figure 2**). The waste residues were reportedly removed from the trenches in 1984, and the site was allowed to revegetate. Remedial action was initiated in 2019 in accordance with the 2016 ROD and soil excavation in 13 individual excavation areas began in August with a goal to remove soil contaminated with 2,4,6-trinitrotouene (TNT), 2,4-dinitrotoluene (DNT), and 2,6-DNT exceeding human health criteria. MD and MEC were encountered during soil excavation and a work stoppage was ordered on September 29, 2019.

Given the recovery of munitions at the site, which qualified personnel determined were munitions and explosives of concern (MEC), a threat to public health or welfare exists within the acreage of the LHAAP-17 site. There is a moderate to high probability that munitions, some of which may be MEC, would be encountered within LHAAP-17 (USACE, 2020) during resumption of remedial activities. Those munitions pose an unacceptable risk if not addressed through a response (removal) action.

2.1 Site Description

2.1.1 Removal Site Evaluation

Implementation of the LHAAP-17 remedial action began with the soil removal requirement of the 2016 ROD. Excavation in Area H (**Figure 3**) began on August 20, 2019, with soil being

stockpiled over the eastern portion of Area H to prepare for loading. Loading of trucks began on August 21, 2019. Excavation activities continued from August 21–August 30. During the excavation of Area N on August 30, 2019, a 4.2-inch mortar round was discovered. The Harrison County Sheriff was contacted, who referred the notice to Fort Hood Explosive Ordnance Disposal (EOD). Fort Hood EOD personnel inspected the item and identified it as an M335 4.2-inch illumination mortar round (U.S. Army 2019). The EOD personnel determined that the item could not be transported safely and detonated the item on September 3, 2019. Following detonation, the EOD personnel determined that the item was empty. Excavation activities resumed on September 5, 2019 and continued until a second munition item was encountered during excavation of Area N on September 7, 2019. Activities were once again halted, and the site was secured. The Harrison County Sheriff was notified, and the Sheriff contacted Army EOD, who dispatched a unit from Fort Polk on September 10, 2019. The item was determined to be empty, and detonation was not necessary.

A U.S. Army Corps of Engineers Ordnance and Explosives Safety Specialist (OESS) mobilized to the site for unexploded ordnance construction support in the event any further munitions items were encountered. Excavation activities resumed with OESS support on September 16, 2019 and continued through September 28, 2019. Numerous inert munitions items encountered in Areas L, M, and N (**Figure 3**) were removed and secured by the OESS. Two 81-millimeter illumination rounds were recovered by the OESS between Areas L and M (**Figure 3**) that could not be confirmed as inert, and EOD was dispatched to detonate the rounds on September 28, 2019. All further excavation in Areas L, M, and N, was halted on September 27, 2019, but excavation activities continued in other areas. During excavation of the eastern portion of Area H on September 28, 2019, additional MEC items were encountered, and all further intrusive activities were discontinued. Piles of excavated soil and open pits, potentially containing MEC, remain unscreened at the site.

If not removed, munitions pose an unacceptable risk if not addressed through a response (removal) action and will present MEC safety hazards to environmental construction workers, off-path Refuge visitors and trespassers. The Army proposes to conduct a TCRA in order to significantly reduce, mitigate or eliminate the threat to environmental construction workers, trespassers, and off-path Refuge visitors and allow the continuation of the remedial action at LHAAP-17 in the shortest timeframe.

2.1.2 Physical Location

LHAAP is located in central east Texas (see **Figure 4**) in the northeast corner of Harrison County. LHAAP is approximately 14 miles northeast of Marshall, Texas, and approximately 40 miles west of Shreveport, Louisiana. The former Army installation occupied 8,416 acres between State Highway 43 at Karnack, Texas and the southwestern shore of Caddo Lake. LHAAP now consists of approximately 1100 acres, the remainder having been transferred to U.S. Fish and Wildlife Service (USFWS) to become the Caddo Lake National Wildlife Refuge. LHAAP-17, known as the Burning Ground No. 2/Flashing Area, is a 3.9-acre site located within a heavily wooded section in the southeastern portion of LHAAP (**Figure 1**).

2.1.3 Site Characteristics

LHAAP is part of the Cypress Bayou Basin and is within the Pineywoods ecological region of Texas. Most of LHAAP is flat to gently rolling terrain with an average slope of 3 percent or less. Surface water at LHAAP drains to the northeast into Caddo Lake, a drinking water supply, via four drainage systems known as Goose Prairie Creek, Central Creek, Harrison Bayou, and Saunders Branch (Shaw, 2008a). Caddo Lake in East Texas and Louisiana, as well as portions of LHAAP along Harrison Bayou, was designated a Wetlands of International Importance in 1993 by the Ramsar Convention on Wetlands. TCEQ considers Harrison Bayou a high-quality natural wetland area. LHAAP-17 is situated adjacent to Harrison Bayou (**Figure 1**). There are no archeological sites located on LHAAP-17.

2.1.4 Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant, or Contaminant

As indicated, military munitions were encountered during implementation of the soil removal portion of the remedial action requirement of the 2016 ROD for LHAAP-17.

The MEC recovered during 2019 soil removal activities included M301 81-millimeter (mm) illumination mortars, artillery base tracer elements, and a M19 series rifle-launched green parachute signal (USACE 2020a), all of which contain perchlorate as the illuminant/pyrotechnic material. The MEC presents an explosive safety hazard to those who come into direct contact with it. The munitions were a few inches to 5 feet below ground surface (bgs). Because these munitions were classified as MEC by qualified personnel, there exists a threat to public health or welfare within the acreage of LHAAP-17. Failure to implement a removal action poses an unacceptable risk to environmental construction workers during remedial activities and to trespassers and off-path Refuge visitors. By delaying resumption of the remedial action required by the 2016 ROD, it increases risks to human health and the environment through the potential leaching of contaminants in the open pits and in the deteriorating soils piles to groundwater which may increase groundwater contamination. The Army proposes to conduct a TCRA in order to significantly reduce, mitigate or eliminate the threat of an encounter with MEC at LHAAP-17 during remedial activities by environmental construction workers, and to off-path Refuge visitors and trespassers.

2.1.5 NPL Status

LHAAP-17 is on the National Priorities List (NPL), having been placed on the Superfund National Priorities List (NPL) on August 9, 1990. The U.S. Army, USEPA, and the Texas Water Commission (currently known as the TCEQ) entered into the Federal Facility Agreement (FFA) for remedial activities at LHAAP on December 30, 1991. Nothing in the FFA alters the Army's authority with respect to removal actions conducted pursuant to CERCLA 5104, 42 U.S.C. §9604. The Army will, to the extent practicable, conduct the TCRA in compliance with the provisions of 40 CFR 300.415(b) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Executive Order 12580, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 42 U.S.C.A. §§9601 et. seq.), as amended, and the

DOD Environmental Restoration Program (DERP, 10 U.S.C. §2701) which provides the authority to respond to potential threats of a release at LHAAP.

2.2 Other Actions to Date

No removal actions have taken place at LHAAP-17 and no other encounters with MEC have been recorded. As discussed previously, the site was in the process of remediation under a 2016 ROD.

2.3 State and Local Authorities' Roles

The Army (through lead agency authority under CERCLA and the FFA) proposes to conduct a TCRA in order to significantly reduce, mitigate or eliminate the threat to environmental construction workers and the public at the LHAAP-17 site. The Army is the lead agency for the environmental response actions at LHAAP. The Army is acting in partnership with the USEPA Region 6 and the Texas Commission on Environmental Quality (TCEQ), the regulatory agencies providing technical support, project review and comment, and oversight of the U.S. Army cleanup program. The USEPA and the U.S. Army jointly selected the remedy for LHAAP-17 and TCEQ concurred with the selected remedy in this Record of Decision (ROD). USEPA Region 6 and TCEQ support performing a removal action under Army's CERCLA removal authority.

As required under 40 CFR § 300.415(n)(2), the Army will publish a notice of availability of the administrative record file established pursuant to §300.820 of the NCP, to give adequate notice to a community within 60 days of initiation of on-site removal activity. The Army will provide a 30-day public comment period of the Administrative Record, which will include this TCRA Action Memorandum, authorizing the work described here-in. A response to comments will also be provided. The Army expects the authorized work will be initiated during or within days of the public comment period on the Administrative Record.

3.0 THREATS TO PUBLIC HEALTH, WELFARE, OR THE ENVIRONMENT

The probable presence of MEC at the site constitutes a threat to public health and safety because munitions located near the surface and in the subsurface of the soil present the threat of explosion. The 2016 ROD for LHAAP-17 requires excavation of contaminated soil, now known to contain MEC. The LHAAP-17 site is adjacent to the National Wildlife Refuge, which is open to the public and, although there are controls at the two access points, there are none along the forested edges of LHAAP-17 that could otherwise eliminate exposure to public users. The site meets conditions set forth in 40 CFR 300.415(b)(2) authorizing a removal action to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release because of the following factors:

- 40 CFR 300.415(b)(2)(i): Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants, and

- 40 CFR 300.415(b)(2)(vi): Threat of fire or explosion.

4.0 ENDANGERMENT DETERMINATION

The potential presence of MEC on the ground surface and subsurface at the remedial site constitutes a threat to public health and safety. The current risk exposure pathway for the TCRA area is associated with the remediation work associated with the 2016 RD.

5.0 PROPOSED ACTIONS AND ESTIMATED COSTS

The TCRA scope of work includes the identification and removal of surface and subsurface MEC and associated munitions constituent (MC) contamination, prior to recommencing remedial activities in accordance with the selected remedy contained in the 2016 ROD. The objective includes options to expand the area of the munitions response as needed. The work will be carried out in accordance with the Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) for LHAAP-17 burning Ground No.2/Flashing Area, Group 2, Time Critical Removal Action for Munitions and Explosives of Concern (MEC). The required work is:

An instrument-aided surface sweep will be conducted, followed by collection of Digital Geophysical Mapping (DGM) of the subsurface, including pits. The DGM data will be processed, and targets selected (i.e., subsurface anomalies) for reacquisition and intrusive response. Subsequent to this, MC sampling will be completed and any MEC and/or material potentially presenting an explosive hazard (MPPEH), and all investigation-derived waste (IDW) streams will be properly managed and disposed. Soil excavation activities in pits and soil piles will be conducted using remotely operated earth moving machinery consisting of one John Deere 750 bulldozer, one front-end loader, and one 200-class excavator. Following removal, the soils will be sifted to allow removal of MD and MEC by qualified Unexploded Ordnance technicians. MC sampling will be completed and the soil, MD, and MEC will be disposed as required. Blow-in Place actions will be completed as necessary.

The cost of this TCRA is estimated at $115,381.00 but could range up to $248,066.00 depending on the number of optional digs that are executed.

6.0 EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If not removed, munitions pose an unacceptable risk if not addressed through a response (removal) action. If no action is taken or if it is delayed, the future threat to receptors is considered to be the same or greater than at the current time since the potential for MEC remains across the LHAAP-17 site presenting a MEC safety hazard to environmental construction workers, off-path Refuge visitors and trespassers. In the event the remedial action required by the ROD is delayed indefinitely due to the unacceptable risk of exposure MEC presents to the environmental worker, excavated pits will remain open to the weather and present physical fall and explosive safety hazards, fill with rainwater to potentially further contaminate groundwater through leaching; and, allow for continued plume migration as the groundwater remedy is further delayed. Failure to implement a removal action poses an unacceptable risk to trespassers, to the environment, and to human health.

7.0 **RECOMMENDATION**

This decision document represents the selected removal action for the LHAAP-17 site in Karnack, Texas, developed in accordance with CERCLA and is not inconsistent with the NCP, the FFA, or the DERP Manual (DoDM 4715.20). This decision is based on the administrative record for the site.

8.0 AUTHORIZING SIGNATURE

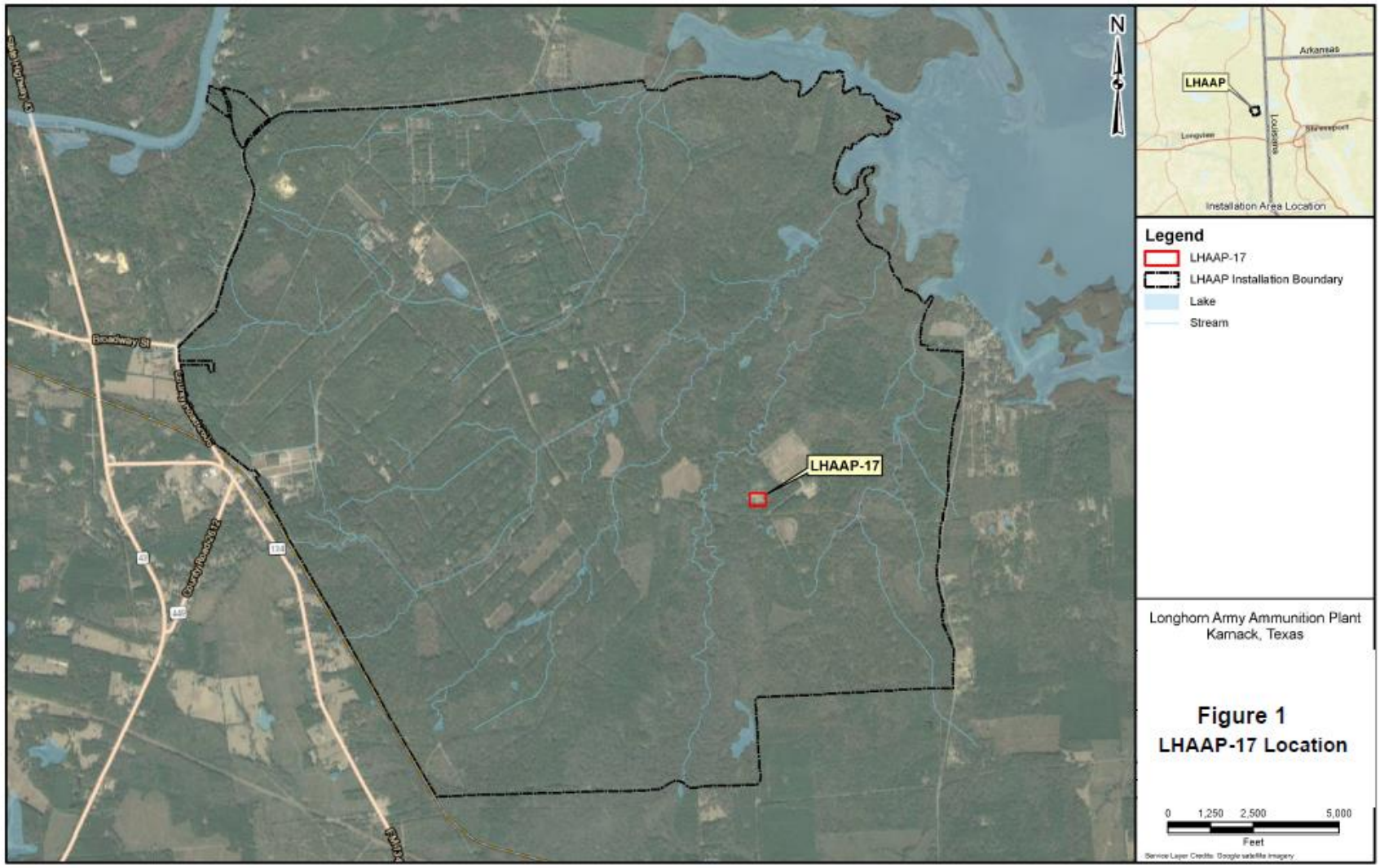
This Action Memorandum presents the selected response action at the 3.9 acre Burning Ground No. 2/Flashing Area Group 2, LHAAP, wherein the Army proposes to conduct a TCRA in order to significantly reduce, mitigate or eliminate the threat to environmental construction workers and the public. The Army is the lead agency under the CERLCA at LHAAP, and has developed this Action Memorandum consistent with the NCP and the FFA. This action memorandum is consistent with the 1990 FFA where it is stated that nothing in the agreement shall alter the Army's authority with respect to removal actions conducted pursuant to CERCLA 5104, 42 U.S.C. §9604. This decision document will be incorporated into the Administrative Record file for the LHAAP site. This document, presenting a selected remedy with a present worth cost estimate of $115,381, is approved by the undersigned.

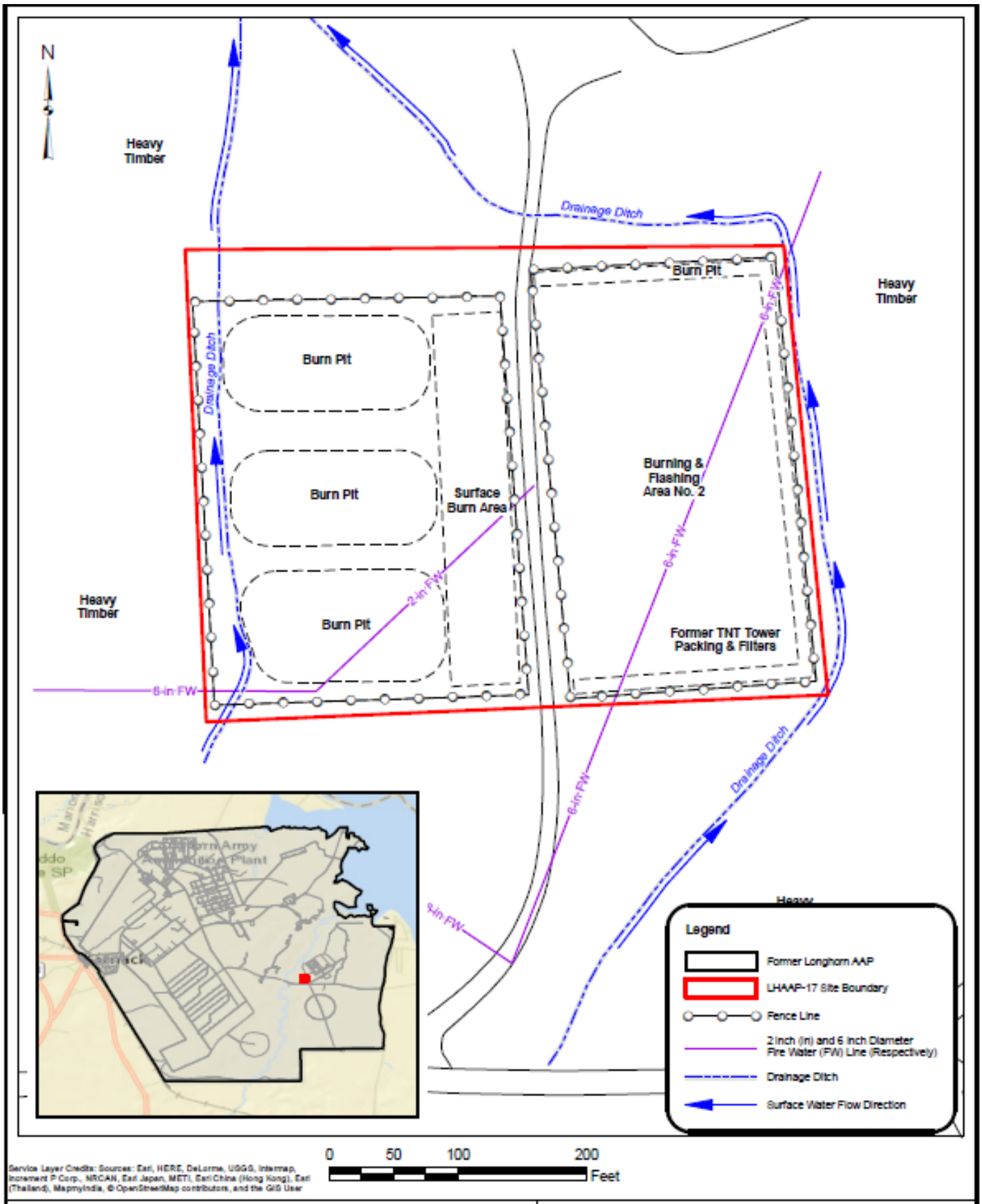
APPROVED:

RAMSDELL.RICHARD.C.1161451408 Digitally signed by RAMSDELL.RICHARD.C.1161451408 Date: 2021.10.08 09:10:45 -04'00'

Date October 8, 2021

Richard C. Ramsdell
Chief, Base Realignment and Closure Branch
Installation Services Directorate, DCS, G-9


N
LHAAP
Arkansas
Louisiana
Longview
Shreveport
Installation Area Location
Legend
LHAAP-17
LHAAP Installation Boundary
Lake
Stream
LHAAP-17
Broadway St
Old Highway 43
Longhorn Parkway
Old Scenic Loop Rd
Longhorn Army Ammunition Plant
Karnack, Texas
Figure 1
LHAAP-17 Location
0 1,250 2,500 5,000
Feet



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Time Critical Removal Action
Longhorn Army Ammunition Plant
Karnack, Texas July 2021

Figure 2
Flashing and Burning Areas of LHAAP-17


N
Area-B
Area-C
Area-D
Area-E
Area-H
LHAAP-17
Area-F
Area-K
Area-J
Area-L
Area-M
Area-N
Area-G
LHAAP-17
Installation Area Location
Legend
LHAAP-17
Currrent Excavation Limits
Backfilled
Currently Open
Stream
Longhorn Army Ammunition Plant
Karnack, Texas
Figure 3
LHAAP-17
Excavation Areas
0 25 50 100
Feet

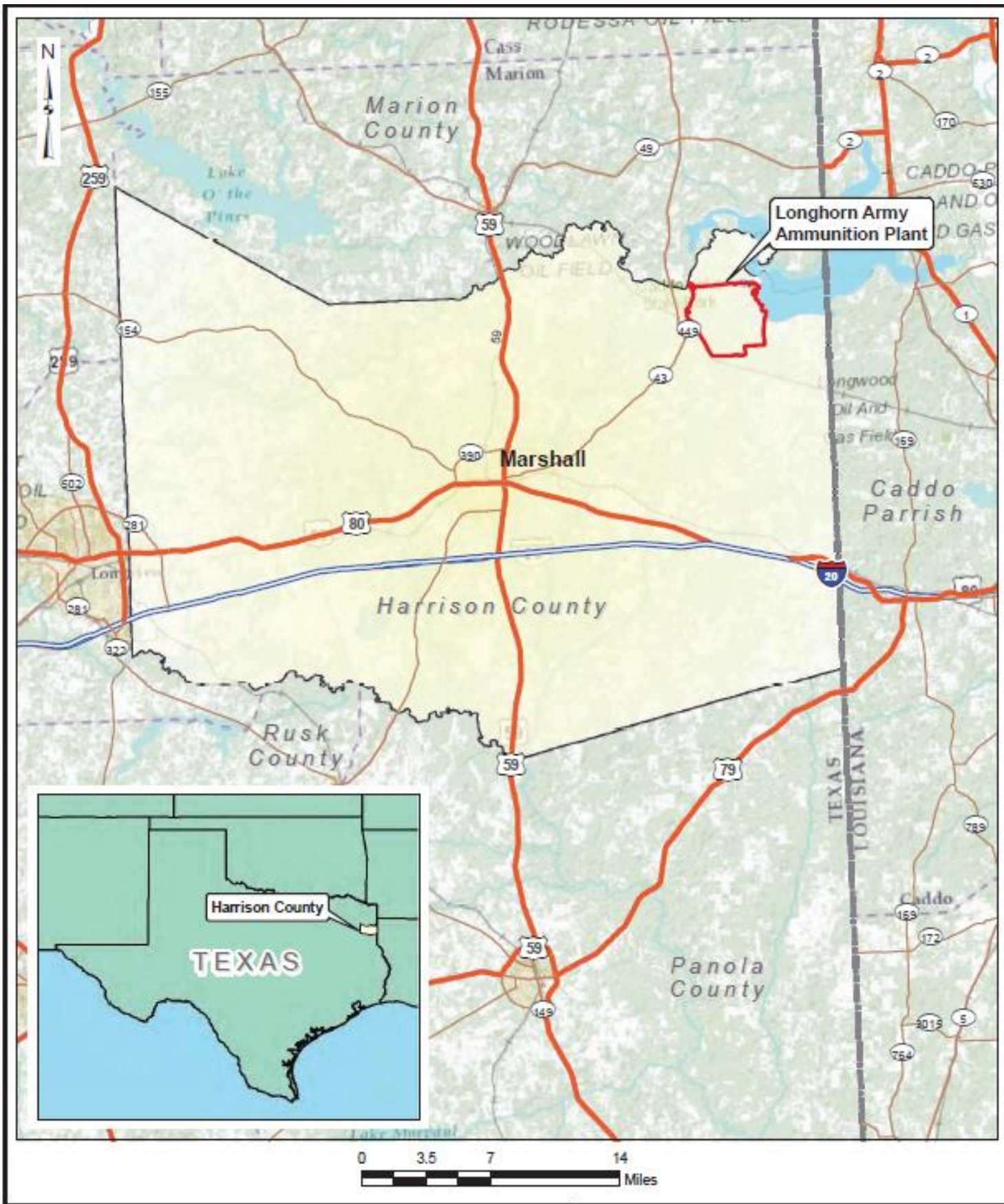

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Figure 4
Location Map
Longhorn Army Ammunition Plant