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27 September 2019

Katrina Higgins-Coltrain
Task Order Monitor
1201 Elm St; Ste 500
Mail Code: SEDRL
Dallas, Tx 75270-2102

RE: Final Design Report for Source Control, Revision 00
Wilcox Oil Company Remedial Design
U.S. Environmental Protection Agency (EPA) Region 6
Remedial Action Contract 2
Contract: EP-W-06-004

Dear Ms. Coltrain:

EA Engineering, Science, and Technology, Inc., PBC (EA) is transmitting one electronic copy via email of the Final Design Report, Revision 00 for the above-referenced Task Order. The report includes comments received from EPA and ODEQ on 20 September 2019.

EA has also transmitted an electronic copy of this submittal to the ODEQ via email.

If you have any questions regarding this submittal, please call me at (972) 315-3922.

Sincerely,

Patrick Appel, PMP
Project Manager

Enclosure

cc: Todd Downham, ODEQ
Luis Vega, EA Alternate Project Manager (letter only)
File

100017609

TRANSMITTAL OF DOCUMENTS FOR ACCEPTANCE BY EPA		DATE: 27 September 2019	TRANSMITTAL NO.: **007**
TO: **Ms. Katrina Higgins-Coltrain** **U.S. Environmental Protection Agency Region 6**		FROM: **Patrick Appel** **EA Engineering, Science, and Technology, Inc., PBC**	
SUBTASK NO.	DELIVERABLE		NO. OF COPIES
11	Final Design Report, Revision 00 Wilcox Oil Company Superfund Site Remedial Design Bristow, Creek County, Oklahoma		EPA: 1 Electronic Copy via email ODEQ: 1 Electronic Copy via email
ACCEPTANCE ACTION			
DOCUMENTS FOUND ACCEPTABLE (LIST BY SUBTASK NO.)		NAME/TITLE/SIGNATURE OF REVIEWER DATE	

Final Remedial Design Report for Source Control
Wilcox Oil Company Superfund Site
Bristow, Creek County, Oklahoma
EPA Identification No. OK0001010917

Remedial Action Contract 2 Full Service
Contract: EP-W-06-004
Task Order: 68HE0618F0311

Prepared for

U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
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September 2019
Revision: 00
EA Project No. 14342.169

CONTENTS

APPENDICES

ACRONYMS AND ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirement
B(a)P	benzo(a)pyrene
bgs	below ground surface
BMP	best management practices
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	contaminant of concern
CY	cubic yard(s)
EA	EA Engineering, Science, and Technology, Inc., PBC
EPA	U.S. Environmental Protection Agency
ft	feet
ft^2	square feet
FEMA	Federal Emergency Management Agency
LMS	Lockheed Martin SERAS
MCL	Maximum Contaminant Level
mg/L	milligram(s) per liter
mg/kg	milligram(s) per kilogram
NCP	National Contingency Plan
NPL	National Priorities List
ODEQ	Oklahoma Department of Environmental Quality
OPDES	Oklahoma Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
PM	Particulate Matter
RAO	Remedial Action Objective
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision

ACRONYMS AND ABBREVIATIONS (Continued)

ROST	Rapid Optical Scanning Tool
SSHP	Site Safety and Health Plan
TCLP	Toxicity Characteristic Leaching Procedure
WUS	Waters of the U.S.
XRF	X-ray fluorescence

1. INTRODUCTION

EA Engineering, Science, and Technology, Inc., PBC (EA) has prepared this Final Remedial Design Report for Task Order 68HE0618F0311 under U.S. Environmental Protection Agency (EPA) Remedial Action Contract No. EP-W-06-004. The EPA National Superfund Database Identification Number is OK0001010917. EPA is the lead agency and the Oklahoma Department of Environmental Quality (ODEQ) is the support agency.

The purpose of this Remedial Design (RD) Report is to present the drawings and specifications that will be used to translate the Source Control Record of Decision (ROD) for the Wilcox Oil Company Superfund Site (hereinafter "the Site") into a remedy that will be constructed during the Remedial Action (RA). The *Remedial Design/Remedial Action Handbook* (EPA 1995) was used in the development of this Report.

This report addresses: (1) the contaminated media to be remediated during the RA; (2) the contaminants of concern (COCs) within that media; (3) the physical characteristics, chemical characteristics, and volumes of the media to be remediated; (4) remedial strategies and pre-treatment requirements; (5) the estimated timeframe to complete the RA; and (6) the estimated cost to complete the RA.

1.1 SITE LOCATION AND DESCRIPTION

The Wilcox Oil Company Superfund Site is located at a former oil refinery and tank farm near Bristow, Creek County, Oklahoma. The geographic coordinates of the site are approximately 35° 50' 31" N and 96° 23' 02" W.

The Wilcox Oil Company operated the facility from the 1920s until 1963 and went through several expansions and mergers in that time. The site includes remnants of former oil refining operations and tank farms and can be divided into five major operational areas: Wilcox Process Area, Lorraine Process Area, East Tank Farm, North Tank Farm, and Loading Dock Area. An active railroad divides the two former process areas and product storage areas. A vacant church property and several residences are presently located within the boundaries of the site. Figure D-1 and D-2 provide a general site location of the Site as well as a Site layout of the five major operational areas. Figure D-3 provides the location of the waste areas included in this Source Material Removal Action.

Wilcox Process Area

The Wilcox Process Area is fenced and spans approximately 18 acres. Most of the equipment and storage tanks have been salvaged for scrap iron by private landowners and remaining structures are in ruins. The former lead additive area is mostly devoid of vegetation. There are multiple areas of visible black waste of a hydrocarbon nature. A building that was originally part of the former refinery has been converted to a residence but is currently vacant and another residence in a mobile trailer is also vacant. An intermittent creek (West Tributary) flows southward across the refinery process area, through a small pond, and into Sand Creek.

Lorraine Process Area

The Lorraine Process Area covers the area south of West 221st Street South (formerly Refinery Road) and west of the railroad tracks. No refinery structures remain. Most of the area is on the First Assembly of God Church property, which is currently vacant and consists of perimeter fencing, a parking lot, and a vacant residence. Sand Creek borders the west side of the Lorraine Process Area.

North Tank Farm

The North Tank Farm is located north of West 221st Street South and west of the railroad tracks. The boundaries are not well-defined to the north. The North Tank Farm included crude and fuel oil storage tanks, all of which have since been removed. An occupied residence is located in the center of the North Tank Farm and there is a dump containing miscellaneous construction debris and refuse.

Loading Dock Area

The Loading Dock Area is located north of Refinery Road and east of the railroad tracks. There are no remedial activities planned for this area as part of this design.

East Tank Farm

The East Tank Farm spans approximately 80 acres and includes pits, ponds, and circular berms that surround tank bottoms. The East Tributary flows southward along the eastern boundary and passes through a series of reservoirs to Sand Creek. There are three occupied residences located on the East Tank Farm and three occupied residences just across the street.

All former crude oil storage tanks have been removed; however, remnants of the tank contents remain visible. Many of the earthen berms surrounding the pits, ponds, and former tanks have been breached or leveled. It is not known if underground piping associated with the tanks remains or was removed. There are multiple areas of stressed vegetation, barren soil, and visible black waste of a hydrocarbon nature.

Magellan Pipeline Company, LP operates a liquid pumping station in the northwest part of the East Tank Farm, as well as an active hazardous liquid pipeline that transects the East Tank Farm, Loading Dock Area, and North Tank Farm from the southeast to the northwest.

The remaining tank waste areas are contaminant sources that have been identified for remediation due to the presence of high contaminant concentrations, proximity to residential homes, and the proximity to the creek. See Chapter 2.1 for additional Pit 1 Lead Area information located in the East Tank Farm area.

1.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The following provides a brief discussion of previous investigation, removal, remedial, and enforcement activities.

- Preliminary Assessment performed at the former Wilcox Refinery Site by ODEQ in December 1994.
- Expanded Site Inspection performed at the former Wilcox Refinery Site for the EPA in March 1997.
- Site Assessment performed at the former Wilcox Refinery Site by EPA in March 1999.
- Preliminary Assessment performed at the former Lorraine Refinery Site by ODEQ in September 2008.
- Site Inspection performed at the former Lorraine Refinery Site by ODEQ in August 2009.
- Expanded Site Inspection performed at the former Lorraine Refinery Site by ODEQ in September 2010.
- Expanded Site Inspection performed at the former Wilcox Refinery Site by ODEQ in September 2011.
- Hazard Ranking System Package was completed in May 2013.

The site was listed on the National Priorities List (NPL) in December 2013 and the EPA and ODEQ have since performed additional Site investigations. Activities from the ongoing Remedial Investigation (RI) at the site are referenced below.

- EPA performed residential soil sampling and fenced potential exposure areas to restrict access in May through July 2015 (Weston Solutions Inc. 2016).
- EPA conducted a geophysical survey, a Rapid Optical Scanning Tool (ROST) laser-induced fluorescence survey, and a field-portable X-ray fluorescence (XRF) survey across portions of the Wilcox and Lorraine Process Areas and the East Tank Farm between 30 November through 16 December 2015 (Lockheed Martin SERAS [LMS] 2016).
- RI Field Events 1-3 occurred August through October 2016 and included a passive soil gas survey, residential vapor intrusion sampling, residential well sampling, surface and subsurface soil sampling, surface water sampling, wetland survey, and a geophysical survey of residential wells.
- ODEQ conducted a Naturally Occurring Radioactive Material Survey in November 2016.
- RI Field Event 4 occurred in April 2017 and included surface and subsurface soil sampling and plugging of a residential well due to the presence of light non-aqueous phase liquid.
- Removal Action of approximately 1,349 tons of tank waste source material from a residential property occurred September through October 2017 (Weston Solutions Inc. 2017).
- RI Field Event 5 occurred October through November 2017 and included sampling of surface and subsurface soil, sediment, and surface water, waste characterization sampling, and test pit excavation and sampling.

- RI Field Event 6 occurred in March 2018 and included surface and subsurface soil sampling in the North Tank Farm and waste characterization sampling at the lead additive area.
- RI Field Event 7 occurred in November 2018 and included installation and development of six ground water monitoring wells and surface and subsurface soil sampling.
- RI Field Event 8 occurred in December 2018 and included sampling of soil, groundwater, surface water, and sediment.
- A pilot study occurred in February 2019 on lead additive area source material in the Wilcox Process Area to determine the feasibility of stabilizing the lead source material.

1.3 SITE GEOLOGY

According to the U.S. Department of Agriculture Soil Survey, the site contains: Stephensville and Darnell fine sandy loams; Verdigris silt loam; and Oil-waste land. The Stephensville and Darnell fine sandy loams cover most of the site. These soils consist of shallow to moderately deep upland soils developed over reddish-yellow to red sandstone or interbedded sandstone and sandy shale.

Oil-waste land is listed as having contamination by oil and saltwater waste from oil wells. This land is typically gullied and eroded and bare of vegetation.

The Verdigris silt loam is in the southwestern portion of the site along Sand Creek. These soils occupy the flood plains of streams, are moderately well drained, and they are flooded occasionally to frequently.

1.4 SOURCE CONTROL RECORD OF DECISION

In September 2018, EPA issued a Source Control ROD (EPA 2018) to implement an early action limited in scope to address refinery tank waste and lead additive area source materials. The action is not intended to achieve the final remedy for the site; a future decision will be made by the EPA. The early action consists of the following preliminary components, as described in the ROD:

- Excavation of approximately 2,269 cubic yards (CY) of lead additive area source material. The material is to be treated through stabilization prior to transport and disposal at a permitted and regulated offsite facility.
- Excavation of approximately 28,093 CY of tank waste source material.
- All excavated and treated source material will be transported to an offsite permitted and regulated disposal facility.
- Excavated areas will be sampled, backfilled with clean soil from an offsite location, and re-vegetated.
- All excavated areas will be graded for drainage.

1.5 REMEDIAL ACTION OBJECTIVES

Taking appropriate source control actions at sites during the investigation stage of the process is consistent with the National Contingency Plan (NCP) and existing EPA guidance. The NCP [40 CFR § 300.430(a)(1)] states, "Remedial actions are to be implemented as soon as site data and information make it possible to do so." This is further clarified in the preamble to the NCP (Federal Register 1990),

> *EPA expects to take early action at sites where appropriate and to remediate sites in phases using operable units as early actions to eliminate, reduce or control the hazards posed by a site or to expedite the completion of total site cleanup. In deciding whether to initiate early actions. EPA must balance the desire to definitively characterize site risks and analyze alternative remedial approaches for addressing those threats in great detail with the desire to implement protective measures quickly.*
>
> *EPA promotes the responsiveness and efficiency of the Superfund program by encouraging action prior to or concurrent with conduct of an RI/FS as information is sufficient to support a remedy selection. These actions may be taken under removal or remedial authorities as*
> *appropriate.*

This early action is necessary to protect public health or the environment from actual or threatened releases of hazardous substances which may present an imminent and substantial endangerment.

The source control action is appropriate and consistent with the NCP and existing EPA guidance. The source control action will:

- Eliminate, reduce, or control actual or potential risks and hazards posed by the source material
- Eliminate, reduce, or control actual or potential migration of contaminants or further environmental degradation posed by the source material
- Expedite Site cleanup completion; promote prompt risk reduction and increase Site response efficiency
- Be consistent with the final Site remedy.

Following are the Remedial Action Objectives (RAOs) for the source materials:

- RAO-1: Prevent ingestion and dermal contact exposure to human and ecological receptors through the removal of tank waste to reach a target health-based concentration of 0.11 milligrams per kilogram (mg/kg) benzo(a)pyrene and the removal of the lead additive area to reach a target health-based concentration of 800 mg/kg for lead.
- RAO-2: Prevent contaminant migration to soil, sediment, and indoor air through the removal of tank waste to reach a target health-based concentration of 0.11 mg/kg

benzo(a)pyrene and the removal of the lead additive area to reach a target health-based concentration of 800 mg/kg for lead.

RAO-3: Removal of source materials to eliminate and prevent further degradation of the surrounding environment as a result of exposure to or migration from tank waste and the lead additive area.

1.6 MEDIA-SPECIFIC REMEDIATION LEVELS

The scope for this early/interim source control is limited to *source material* removal. Final soil cleanup levels will be established during the risk assessment and final Site-wide remedy selection process. After removal of the source materials in the RA, remaining soil will be sampled and evaluated in accordance with the RAOs and remediation goals identified for soil and established as part of the final Site-wide selected remedy.

The target health-based concentration for the lead has been established as 800 mg/kg lead, and tank waste 0.11 mg/kg of benzo(a)pyrene. These concentrations have been used as criteria for determining the quantity of source material to be removed.

2. DESIGN CRITERIA

The following sections describes the technical parameters and criteria on which the design is based.

2.1 TANK WASTE SOURCE MATERIAL

Previous investigations have identified the presence of petroleum contamination at eight former aboveground storage tank locations and one sludge separation pit. The tanks and pits were bottomless and unlined, resulting in residual petroleum byproducts remaining following their demolition and removal from the Site. Oily, tar-like liquid is present at the surface or below a thin layer of soil, which migrates to the surface and spreads out when heated by the summer sun. Parts of the surface are coated in a hardened solid form of the tank waste, similar in appearance to asphaltic pavement without aggregate. Berms were constructed to provide liquid containment around some of the tanks, causing contaminants to be concentrated within the berms. Some berms have since been breached or show signs of tank waste on top of or within them.

The liquid and solid forms of the contamination are collectively referred to as tank waste source material, which is not classified as hazardous waste based on previous sampling results.

The volume of tank waste has been estimated based on the descriptions of excavation areas provided in the ROD, historical aerial photographs of the site while the facility was in operation, data collected by LMS during the ROST survey (LMS 2016), waste samples and soil samples collected via direct push technology during the RI (data unpublished), test pitting, waste characterization sampling, and recent visual observations of tank waste. The excavation depth has been estimated based on analysis of soil borings conducted during the LMS survey and during the RI. Figure D-1 presents each area to be excavated. A description of the tank waste excavation areas identified in the ROD, and the specific factors used to define the extent of each excavation are as follows:

- NTF 1 Area: Located in the northwest portion of the Site, west of the railroad and north of Refinery Rd. Aerial and depth extent supported by visual field observations, test pits, waste characterization sampling, and boring data showing average depth to bedrock is two feet. See Figure D-4.
- Tank 11: Located in the south-central portion of the Site, south of Refinery Rd. and west of S 349 Rd. Aerial and depth extent supported by ROST data from LMS 2016 and historical aerial photography. See Figure D-5.
- Tank 12: Located near the center of the Site, south of Refinery Rd. and west of S 349 Rd., adjacent to Sand Creek. Aerial and depth extent supported by ROST data from LMS 2016 and soil boring data from RI Field Events 1-3, October 2016. See Figure D-6.
- Pit 1: Located in the east-central portion of the Site, south of several residences that are along Refinery Rd. Aerial and depth extent of tank waste supported by visual field observations and average depth to bedrock data estimated at three feet. Pit 1 Lead excavation area supported by EPA Lead Soil Sampling Results Letter, RI Residential Soil

Sampling Field Event, January 2015. Area to be excavated to a depth of 12 inches due to the lead grid exceeding 800 mg/kg. See Figure D-7.

- Lorraine Tank Area: Located in the Lorraine Process Area in the southwest portion of the Site, west of the railroad and south of the former First Assembly of God Church, adjacent to Sand Creek. Aerial and depth extent supported by visual field observations, test pits, waste characterization sampling, and historical tank location data. See Figure D-8.
- Tank 1: Located in the eastern portion of the Site, east of a tributary to Sand Creek and south of a reservoir. Aerial and depth extent supported by visual field observations and historical aerial photography. See Figure D-9.
- Tank 3. Located in the southeastern portion of the Site, adjacent to a tributary to Sand Creek and north of a reservoir. Aerial and depth extent supported by ROST data from LMS 2016, test pits, waste characterization sampling, and soil boring data from RI Field Events 1-3, October 2016. See Figure D-10.
- Tank 10. Located near the center of the Site, south of Refinery Rd., and in the middle of an existing pasture that is mostly clear of trees. Aerial and depth extent supported by ROST data from LMS 2016 and historical aerial photography. See Figure D-11.

A summary of the tank waste excavation areas are as follows:

Table 1. Tank Area Aerial Extent, Depth of Excavation and Estimated Volume of Removal

Tank Location	Aerial Extent (Square Feet)	Average Depth of Excavation (Feet)	Estimated Volume of Removal (Cubic Yard)
NTF 1	2,875	2	213
Tank 11	12,994	5	2,406
Tank 12	43,363	6	9,636
Pit 1 Tank Waste Area	17,316	3	1,924
Pit 1 Lead Area	8,770	1	327
Lorraine Tank	5,167	2	383
Tank 1	12,472	3	1,386
Tank 3	12,191	8	3,612
Tank 10	48,491	3	5,388

The total estimated quantity of tank waste requiring excavation and disposal is approximately 24,948 CY. The total estimated quantity of lead area source material in Pit 1 requiring stabilization, excavation and disposal is approximately 327 CY.

2.2 PIT 1 LEAD AREA AND LEAD ADDITIVE AREA SOURCE MATERIAL

The lead additive area of the Wilcox Process Area is in the southwestern portion of the Site, adjacent to Sand Creek. The source material is located near the surface and contains high concentrations of lead. The areas with highest concentrations are devoid of vegetation and the surface appears bright white, in contrast to darker soils and thick vegetation throughout the rest of the site.

The lead additive excavation area is delineated in the Drawings (Appendix A) based on the source material that has been shown to be in excess of the target health-based concentration by XRF scans of the surface (LMS 2016). Samples have previously been collected across the lead additive area at various depth intervals. Based on the concentration of leachable lead in the source material, it is classified as a characteristic hazardous waste for disposal purposes.

The Pit 1 lead excavation area is in the central portion of the East Tank Farm area. The source material is located near surface. Pit 1 lead excavation area is supported by lead identified in composite sample grid 050 in RI Residential Soil Sampling Field Event, December 2014. (EPA, 2015) Laboratory analysis of the samples in this area indicated the presence of actionable levels of lead reported in the subsurface soil at 6-inch (906 mg/kg) and 12-inch (5850 mg/kg) depths.

The lead additive area source material is to be excavated everywhere it is known to exceed 800 mg/kg of total lead, not exceeding a depth of two feet. The Pit 1 lead area source material is to be excavated everywhere to a depth of one foot. Where contaminant concentrations at the surface exceeded the target concentration, the concentrations at depth were used to determine the necessary depth of excavation to remove all material that exceeded the target concentration. The lead excavation area is broken into subareas with varying excavation depths to minimize excavating source materials which do not exceed the target concentration.

The quantity of lead additive area source material excavation is estimated to be 5,711 CY.

2.3 LEAD ADDITIVE AREA SOURCE MATERIAL STABILIZATION TREATABILITY STUDIES

The lead additive area contains characteristically hazardous waste based on Toxicity Characteristic Leaching Procedure (TCLP) testing results, which indicate that lead leaches from the source material above Land Disposal Restriction criteria (40 CFR 268.34). Source material from the lead additive area will be treated through stabilization, which is a chemical process where a contaminant is physically and chemically bound to restrict the leachability and mobility of a contaminant. Stabilization, in this case, involves the addition and mixing of a reagent with the lead additive area source material at the site, prior to or immediately after excavation and before final loading and transport.

EA conducted treatability studies to determine if the use of commercially available metal-stabilizing reagents was feasible to treat the lead additive area source material. Treatability studies were first conducted by multiple reagent manufacturers at bench-scale, and then by a single selected manufacturer in the field, simulating actual conditions of the full-scale RA.

2.3.1 Bench-Scale Stabilization Treatability Pilot Study

Three companies that manufacture and market stabilizing reagent products were retained for the bench-scale pilot study. The companies and their respective products were: TDJ Group (Blastox), Premier Magnesia (EnviroBlend), and Free Flow Technologies (FF-100).

A sample of source material was collected by EA from locations where previous sampling showed there was the highest lead concentration at the Site. The sample was blended, homogenized, and split so that each company would receive a similar sample. An untreated sample was provided to a third-party testing laboratory for baseline analysis of TCLP lead, which resulted in a TCLP lead concentration of 236 mg/L. The total lead concentration of 12,000 mg/kg for this sample was in line with the highest previously reported samples.

The goal was to reduce the TCLP lead concentrations below 5 mg/kg, which is the concentration suitable for disposal as non-hazardous waste at a Resource Conservation and Recovery Act (RCRA) Subtitle D landfill.

Each company conducted a study where various dosages of their product were mixed with the provided source material and sent samples to a single third-party testing lab for analysis of TCLP lead. Results of treatment with Blastox (20 mg/L TCLP lead) and EnviroBlend (40 mg/L TCLP lead) exceeded the target concentration. Free Flow Technologies successfully treated the tank waste source material to TCLP lead concentration of 1.6 mg/L with a 5% (w/w) addition of FF-100. Blastox and EnviroBlend were not given further consideration and a field pilot test was conducted using the FreeFlow FF-100 stabilizing reagent.

2.3.2 In Situ Stabilization Treatability Field Study

EA conducted an *in-situ* stabilization treatability field study using the FF-100 stabilizing reagent. EA contracted with a qualified field services contractor that had previous experience with soil stabilization reagents and in situ soil mixing. Prior to excavation and treatment, two 5-point composite samples were collected from 0 to 0.5 and the 0.5 to 2 ft and submitted to the laboratory for TCLP Lead analysis. Total lead concentrations were 49,600 mg/kg and 14,400 mg/kg.

EA procured two 2,000-pound supersacks of FF-100, of which one was to be used for the study and one was reserved. EA determined how much source material was to be excavated to utilize exactly 2,000 pounds of the reagent, staked out the area in the proposed lead removal area at the Site, and oversaw the excavation and mixing. A 5-point composite sample of the source material/reagent mixture was collected, and all samples were sent for lab analysis. Samples were also collected from the sidewall and floor of the excavated area. Following application of the stabilization material, testing results showed that TCLP lead concentrations were 0.02 mg/L, which are below the hazardous waste criteria.

2.4 LONG-TERM PERFORMANCE AND MAINTENANCE REQUIREMENTS

All materials are to be transported and disposed of offsite, therefore there are no long-term performance and maintenance requirements for contaminated media at the site.

2.5 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state environmental laws that specifically address a hazardous substance, pollutant, contaminant, RA, location, or other

circumstance found at a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.

Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state environmental laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, RA, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site, that their use is well suited to the particular site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be relevant and appropriate.

ARARs are divided into chemical-specific, action-specific, and location-specific categories.

2.5.1 Chemical-Specific ARARs

Chemical-specific requirements include promulgated health- or risk-based standards, numerical values, or methodologies that, when applied to site-specific conditions, establish the acceptable amount or concentration of a contaminant that may be detected or discharged in the environment.

The chemical specific ARARs for this Report are discussed in further detail in Table 2 below.

Table 2: Chemical -Specific ARARs

FEDERAL		
Potential Applicable Relevant and Appropriate Requirements	**Description**	**Comment**
Identification and Listing of Hazardous Waste 40 CFR 261 Subpart C, 261.24	Provides criteria for identification of characteristic hazardous wastes.	Applicable: Lead area source material is a characteristic hazardous waste.
Standards Applicable to Generators of Hazardous Waste 40 CFR 262.11	Regulates the identification of hazardous and characteristic hazardous waste.	Applicable: source materials will be excavated, treated, and disposed in an offsite facility.
Land Disposal Restrictions (LDRs)	Establishes treatment standards for land disposal of hazardous wastes.	
40 CFR 268 Subpart D, 268.40	Applicability of Treatment Standards	Applicable: Lead area source material
40 CFR 268 Subpart D, 268.45	Treatment Standards for Hazardous Debris	Applicable: Lead area source material
40 CFR 268 Subpart D, 268.48	Universal Treatment Standards	Applicable: Lead area source material
40 CFR 268 Subpart D, 268.49	Alternative LDR treatment standards for contaminated soil	Applicable: Lead area source material
STATE		
Oklahoma Clean Air Act Air Pollution Control Rules OAC	Sets ambient air quality standards for a variety of constituents, including particulate matter.	
OAC 252-100-25-3	Visible Emissions and Particulates	Applicable during remedial
OAC 252-100-29-2	Control of Fugitive Dust	Applicable during remedial
OAC 252-100-29-3	Control of Fugitive Dust	Applicable during remedial

2.5.2 Action-Specific ARARs

Action-specific ARARs are typically technology- or activity-based requirements that apply to actions involving special categories of wastes. Action-specific requirements are usually triggered by certain remedial activities that may be a component of the overall remedial strategy. Action-specific requirements do not in themselves determine site-specific RAs; rather, they indicate the way a selected alternative must be achieved.

Action-specific ARARs for this Report are discussed in further detail in Table 3 and 4 below.

Table 3: Action-Specific ARARs - FEDERAL

Potential Applicable Relevant and Appropriate Requirements	Description	Comment
FEDERAL		
Land Disposal Restrictions (LDRs)	Establishes restriction for land disposal of hazardous wastes.	
40 CFR 268 Subpart C, 268.34	Waste specific prohibitions—toxicity characteristic metals wastes	Applicable: Lead area source material
Procedures for planning and implementing offsite response actions 40 CFR 300.440	Criteria set forth for facilities regulated under RCRA that can accept CERCLA wastes	Applicable: offsite disposal of site source material
Standards Applicable to Generators of Hazardous Waste	Regulates the manifesting, pre-transport requirements, and record keeping and reporting for hazardous waste generators.	
40 CFR 262 Subpart B	The manifest	Relevant and Appropriate: solid waste source materials will be generated and transported offsite
40 CFR 262 Subpart C	Pre-Transport Requirements	Relevant and Appropriate: solid waste source materials will be generated and transported offsite
40 CFR 262 Subpart D	Recordkeeping and Reporting	Relevant and Appropriate: solid waste source materials will be generated and transported offsite
40 CFR 262 Subpart M	Preparedness, Prevention, and Emergency Procedures for Large Quantity Generator	Relevant and Appropriate: onsite construction.
Standards Applicable to Transporters of Hazardous Waste	Establishes standards which apply to persons transporting hazardous waste within the United States if the transportation requires a manifest under RCRA.	
40 CFR 263 Subpart B	Compliance with the manifest system and Recordkeeping	Relevant and Appropriate: solid waste source materials will be generated and transported offsite
40 CFR 263 Subpart C	Hazardous Waste Discharges	Relevant and Appropriate: solid waste source materials will be generated and transported offsite
Department of Transportation Requirements Governing the Transportation of Hazardous Materials 49 CFR 171, 172, 173, 177, and 178	Establishes the requirements for the transportation of hazardous materials as defined by the US Department of Transportation. Regulations prescribed in this law shall govern safety aspects, including security of the transportation of hazardous wastes. prescribes the requirements for shipping papers, package marking, labeling, and transport vehicle placarding applicable to the shipment and transportation of those hazardous materials	Applicable: solid waste source materials will be generated and transported offsite.
Construction and Development Effluent Guidelines 40 CFR 450.21	regulations associated with discharges from construction activity	Applicable: construction activities at the site.

The National Pollutant Discharge Elimination System	Establishes requirements for management of stormwater and associated discharges, including best management practices	
40 CFR 122.26(b)(14)(x)	stormwater discharges	Substantive requirements are relevant and appropriate to site storm water runoff
40 CFR 122.26(c)(1)(ii)	stormwater discharges	Substantive requirements are relevant and appropriate to site storm water runoff
40 CFR 122.41	Conditions applicable to all permits	Substantive requirements are relevant and appropriate to site storm water runoff
40 CFR 122.42(d)	Additional conditions applicable to specified categories of NPDES permits	Substantive requirements are relevant and appropriate to site storm water runoff
40 CFR 122.44(k)(1), (k)(2), and (k)(4)	Best Management Practice	Substantive requirements are relevant and appropriate to site storm water runoff

Table 4: Action-Specific ARARs -STATE		
Potential Applicable Relevant and Appropriate Requirements	**Description**	**Comment**
STATE		
Oklahoma Highway Remediation and Cleanup Services Act OAC 252:210-1-3	Provides rules for regulation of highway spill remediation and cleanup services and regulation of cleanup service operators as necessary for protection of the waters of the state, the public health and the environment.	Applicable: if a spill or release occurs during transportation a licensed operator will be used to remediate the spill or release.
Oklahoma Hazardous Waste Management Act 27A O.S. § 2-7-101 et seq. Hazardous Waste Management rules	Implements the Oklahoma Hazardous Waste Management Act (OHWMA), which provides rules for the handling, transportation, treatment, storage, recycling, and/or disposal of hazardous waste regulated by the OHWMA	
OAC 252:205-5-1	disposal plan	Substantive requirements are Relevant and Appropriate: solid waste source materials will be generated and transported offsite
OAC 252:205-5-5	manifest requirements	Relevant and Appropriate: solid waste source materials will be generated and transported offsite
OAC 252:205-7-2	Leakage, other releases prohibited in transport	Applicable: solid waste source materials will be generated and transported offsite
OAC 252:205-7-4	Additional transporter Rules	Relevant and Appropriate: solid waste source materials will be generated and transported offsite.
OAC 252:205-9-6	Additional waste analysis requirements	Applicable: solid waste source materials will be generated and transported offsite
Oklahoma Solid Waste Management Actv27A O.S. § 2-10-101 et seq. Solid Waste Management rules	Regulates the collection, transportation, processing, and/or disposal of solid waste and/or tires.	
OAC 252:515-31-3	Non-hazardous Industrial Solid Waste (NHIW) Management	Applicable: solid waste source materials will be generated and transported offsite.
OAC 252:515-33-2	Transportation to permitted facility - No person shall transport solid waste to a disposal facility unless such facility has a currently active permit or other authorization from the DEQ to accept solid waste.	Applicable: solid waste source materials will be generated and transported offsite.

OAC 252:515-33-4	Adequate enclosure - All persons transporting solid waste to a disposal facility shall provide an adequate enclosure to prevent waste from spilling, falling, leaking, or blowing en route to the disposal site. The person hauling solid waste to a disposal site shall collect any waste that spills, falls, leaks, or blows from the waste-hauling vehicle	Applicable: solid waste source materials will be generated and transported offsite.
Oklahoma Pollutant discharge Elimination System (OPDES) OAC 252:606-5-5	stormwater discharges	Substantive requirements are relevant and appropriate to construction activities.
General Water Quality Standards OAC 252:611-1-6	Nonpoint source Pollution controls	Substantive requirements are relevant and appropriate to construction activities.

2.5.3 Location-Specific ARARs

Location-specific ARARs are restrictions placed on concentrations of hazardous substances or the conduct of activities because of a special location that has important geographical, biological, or cultural features.

Location-specific ARARs for this Report are discussed in further detail in Table 5 below.

Table 5: Location-Specific ARARs		
FEDERAL		
Potential Applicable Relevant and Appropriate Requirements	**Description**	**Comment**
The Native American Graves Protection And Repatriation Act –25 United States Code (USC) Section 3001 et seq and its regulations Title 43 CFR Part 10	Protects Native American graves from desecration through the removal and trafficking of human remains and cultural items including funerary and sacred objects.	Substantive requirements applicable if Native American burials or cultural items are identified within area to be disturbed
National Historic Preservation Act –16 USC 470 et seq; 36 CFR Part 800	Provides for the protection of sites with historic places and structures	Substantive requirements applicable if eligible resources are identified within area to be disturbed
Archeological Resources Protection Act of 1979 – 16 USC Sections 47000-47011; 43 CFR Part 7	Prohibits removal of or damage to archaeological resources unless by permit or exception	Substantive requirements applicable if eligible resources are identified within area to be disturbed
American Indian Religious Freedom Act –42 USC Section 1996 et seq.	Protects religious, ceremonial, and burial sites, and the free practice of religions by Native American groups.	Substantive requirements applicable if Native American sacred sites are identified within area to be disturbed.
Endangered Species Act – 16 USC Sections 15331-1548, Title 50 CFR Parts 17 and 402	Regulates the protection of threatened and endangered species or critical habitat of such species.	Substantive requirements applicable if protected species are identified within area to be disturbed

TO BE CONSIDERED - FEDERAL		
Potential Applicable Relevant and Appropriate Requirements	**Description**	**Comment**
Executive Order on Floodplain Management Order No. 11988	Requires federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, the adverse impacts associated with direct and indirect development of a floodplain.	To Be considered during remedial actions since portions of the site are within the 100-year floodplain.
Executive Order 11990, Protection of Wetlands	Require Federal agencies, wherever possible, to avoid or minimize adverse impacts of Federal actions upon wetlands and to preserve and enhance the natural values of wetlands.	To Be considered during remedial actions since portions of the site are within or near wetlands.

2.6 TECHNICAL FACTORS OF IMPORTANCE

2.6.1 Biddability and Constructability

Biddability and constructability were considered during the RD process. Excavation limits have been set to ensure the RA can be completed in a timely manner without extraordinary effort. There are a limited number of distinct phases required to complete the work so that bids can be reviewed, and a construction contractor quickly selected based on limited criteria.

Estimated quantities are provided in the Drawings and Specifications (Appendixes A and B, respectively) to assist in Contractor bidding. However, it is understood and expressed that the quantity of tank waste excavation and other bid items related to tank waste may vary significantly as it is based on limited data. Provisions allow either the EPA or the Contractor to seek adjustment of payment unit rates if the final quantity varies from the estimated quantity by 25%.

Data was collected during the RD to estimate the quantity of stabilization reagent that would be required to treat the lead areas source material. The areas of highest known lead concentration were successfully treated with the specified reagent dosage. However, higher concentrations of lead may exist in the source material, which may result in additional reagent being used to pass the required confirmation sampling.

The RA will require site access measures and completion of earthwork using only standard construction practices. Earthwork can be accomplished with typical earth moving equipment. Typical best management practices will be used for sediment and erosion control.

2.6.2 Green and Sustainable Remediation

Green and sustainable products and practices were reviewed for their incorporation into the design to the extent possible. Green and sustainable practices have been incorporated into the design as follows:

- All specified materials may be provided by local suppliers, especially regarding aggregate for construction site access, clean backfill, and restoration materials.
- The Contractor must disclose their preferred disposal facility. Strong preference should be given bids that incorporate the nearest facility, thus reducing the impact to hauling long distances for disposal of waste materials.
- Restoration measures designed to prevent future erosion and pollution.
- Preventing discharge of untreated stormwater to streams or wetlands.

3. BASIS OF DESIGN

This section describes the analyses conducted to select the design approach, provides discussion on the design assumptions, permitting requirements, and identification of easement and access requirements.

3.1 CONSTRUCTION APPROACH AND ASSUMPTIONS

3.1.1 Mobilization and Site Preparation

Site preparation will include mobilization of personnel, equipment, and materials, utility locating, vegetation clearing, construction of access roads, and clearing of other site debris.

Mobilization and site preparation include transport of construction equipment to the site and construction of temporary staging and access facilities. Site preparation activities would begin concurrently with equipment mobilization. Prior to mobilization, the Contractor will submit an approved Site Safety and Health Plan (SSHP), which will detail key personnel in the Contractor's Safety and Health Program and those involved in daily safety activities at the site. Site preparation will consist of the following:

- Performing a pre-removal Site survey to obtain existing grade elevations
- Performing an underground utilities survey as necessary
- Establishing necessary traffic control, security fencing, and construction entrance/exit points
- Installing temporary offices, lighting and other utilities, sanitary facilities, and decontamination stations
- Installing erosion control measures
- Establishing temporary haul routes through the Site and designate staging areas for potential temporary construction stormwater management
- Establishing drainage control for construction stormwater
- Clearing and grubbing of the areas that reside in the planned excavation areas.

Demobilization after construction is completed includes removing temporary facilities and equipment from the Site and cleaning any adjacent areas of the Site that may have been impacted during construction.

Dust control measures, such as water spray, will be used to mitigate fugitive dust during excavation. Air monitoring equipment will be used to establish a safety perimeter based on the presence of potential vapors and/or dust to ensure the health and safety of onsite workers, the surrounding community, and the environment. Onsite workers directly involved in the excavation may be required to use respirators, and criteria for doing so will be outlined in the SSHP.

3.1.2 Tank Waste Excavation

Excavation of the tank waste source material and offsite disposal has been identified as the preferred solution in the Source Control ROD. The tank waste is not readily identified by the numerous subsurface sampling data for the Site; therefore, its exact aerial extent and depth is unknown. Design provisions that direct the excavation are intended to accommodate data gaps. The combined tank waste source material excavation volume of 24,948 CY represents the estimated remediation volume for contaminated material requiring removal.

The excavation limits will be identified in the field as the excavation takes place. EPA and ODEQ will make continuous visual observations to verify the extent of the tank waste and direct the RA Contractor where tank waste is to be removed. Visual observations will be conducted in the areas shown on the Drawings (Appendix A) and will focus on visible signs of tank waste on the surface. Observations will be conducted below grade as excavation progresses. Excavation will continue vertically and horizontally based on visual observations until all visible tank waste is removed. Excavations that exceed 8 feet will require permission from the EPA and ODEQ due to the extra effort and cost that will be required.

The disposal landfill will require waste characterization prior to ultimate disposal of the material. In order to accommodate direct loading of the haul trucks, pre-excavation characterization sampling and laboratory analysis will be conducted by the RA Contractor prior of excavation of the tank waste. Soil borings will be conducted during the mobilization phase of the project to facilitate the characterization sampling, which may also provide insight into required excavation depth. The pre-excavation characterization sampling requirements will be conducted per landfill requirements and are expected to be comprehensive, including, but not limited to: TCLP volatile organic compounds, TCLP semi-volatile organic compounds, TCLP metals, total petroleum hydrocarbons, and reactivity, corrosivity, and ignitibility.

After removal of tank waste source material, the excavated area will be surveyed to confirm excavation quantities and sampled to determine contaminant concentrations at the base and sides of excavation. Post-excavation sampling will be completed by the RA Contractor and will include grab samples taken from the exposed excavation floor and walls. Excavation floor sample grids of 40 ft by 40 ft will be established, with a 5-point composite taken in each grid. Composite samples include corners and center for each sampling grid. Sidewalls will be sampled every 40 linear feet, with five-point composites taken at the corners and center of the sidewall. If the sidewall material is not homogenous based on field screening methods an aliquot representing each variation can be collected vertically along the side wall to represent the wall sample. Sample analysis will include benzo(a)pyrene and lead.

The excavated areas will be backfilled with clean fill from an offsite source, compacted, and graded to drain by minimizing low spots and flattening any remaining slopes. The area will be covered with organic topsoil and re-vegetated with native plants and grasses via hydroseeding. The RA Contractor will be responsible for supplying topsoil for all excavation areas and ensuring 80% vegetation coverage has been achieved. A final survey will be conducted to confirm final backfill quantities.

3.1.3 Lead Area Source Material Excavation

This section describes the approach to removing lead areas source material from the project site. Excavation, treatment, and offsite disposal has been identified as the preferred solution and further described in the Source Control ROD. The extent and depth of excavation is defined in the Drawings.

The Contractor will provide a Pre-Construction Work Plan for completing the excavation. It is expected that stabilizing reagent will either be mixed prior to or immediately after excavation. The Engineer will review the Pre-Construction Work Plan for feasibility. Transport of untreated material across the site will be limited and mixing close to the site of excavation will be preferred. As excavation areas are completed, surveys would be completed to document the final extent of excavation. A final grading survey will be conducted after any necessary backfilling of the excavation area is completed. These surveys would be used to determine compliance with the specifications and as a basis for payment.

After mixing the stabilizing reagent at the manufacturer's recommended dosage, the Engineer will collect composite samples for TCLP lead analysis, according to the sampling schedule provided in the Drawings and Specifications (Appendixes A and B, respectively). The time needed for laboratory testing of stabilized material will likely result in multiple, concurrent excavation areas.

The effectiveness of the chemical stabilization will be confirmed via sampling directed by the landfill, to include at a minimum, analytical TCLP lead testing. After successful sampling results, the material will be loaded and hauled for disposal at a regulated offsite landfill.

After removal of lead areas source material, the excavated area will be surveyed to confirm excavation quantities and sampled to determine lead concentrations. Post-excavation sampling will be completed by the RA Contractor and include grab samples taken of the exposed excavation floor and walls. Excavation floor sample grids of 40 ft by 40 ft will be established, with a 5-point composite taken in each grid. Composite samples include corners and center for each sampling grid. Sidewalls will be sampled every 40 linear feet, with five-point composites taken at the corners and center of the sidewall. If the sidewall material is not homogenous based on field screening methods an aliquot representing each variation can be collected vertically along the side wall to represent the wall sample. Sample analysis will include Benzo(a)pyrene and lead.

The excavated areas will be graded to drain, minimizing low spots and steep slopes, and using runoff controls where necessary. Because the final site remedy has not been selected, the import of backfill to the lead source area will be used only as a last effort to control drainage. This limitation is to restrict the placement of clean backfill in an area that may be addressed in the final remedy. Adding clean backfill may result in an increase in the volume of material that will need to be remediated. Any additional backfill in this area will require consultation with EPA and ODEQ., then organic topsoil will be applied. The area will then be re-vegetated with native plants and grasses via hydroseeding. The RA Contractor will be responsible for watering until 80% vegetative coverage is achieved.

3.1.4 Near-Surface Debris Management

Near-surface debris consists of buried structures, foundations, and refinery equipment. Near-surface debris is heterogeneous and would be difficult to screen or separate and recycling facilities would not likely accept such material. If buried structures are encountered during excavation, they will be removed and cleaned of source material to the greatest extent possible and stockpiled on site.

3.1.5 Offsite Disposal

Excavated material will be transported to the appropriate offsite disposal facility by truck. Requirements for land disposal that are relevant to this RD have been coordinated with American Environmental Landfill, located approximately 30 miles northeast of the Site, which is the nearest qualified facility to the Site. Sample frequencies defined in the Drawings and Specifications (Appendixes A and B, respectively) meet those provided by that landfill. If the Contractor chooses to utilize another disposal source the requirements may vary, and it will require approval from the EPA.

Source material characterization data required to meet specific disposal facility requirements will be described by the RA Contractor's chosen landfill and completed by the RA Contractor prior to loading and hauling material offsite. At a minimum it will include sampling and comprehensive analysis of the following categories: TCLP volatile organic compounds, TCLP metals, TCLP semi-volatile organic compounds, total petroleum hydrocarbons, and reactivity, corrosivity, and ignitibility.

Source material shall be direct loaded into trucks for off-site disposal to the greatest extent possible. To accomplish this, the Contractor is directed to complete direct push sampling in the tank waste source material areas prior to bulk excavation.

Prior to leaving the site, all trucks will be decontaminated and tarped to contain source materials within the bed of the truck. Transport will only occur via the preapproved transportation route.

3.1.6 Wet Source Material Handling and Contingency Construction Dewatering

Because excavations may encounter wet conditions and groundwater, provisions for excavating and handling wet material and a contingency for excavation dewatering have been be considered. Excavated material not passing the standard paint filter test typically required for Subtitle D landfill disposal will require draining directly to the ground or a small containment area before loading and transporting off site.

Excavation may not proceed in wet conditions if groundwater is encountered. As a contingency, water with free product would be removed for temporary onsite storage in tanks for testing. Excavation dewatering water will be discharged onsite.

3.1.7 Stormwater Runoff Controls during Construction

Contract plans and specifications require the selected contractor to control and manage stormwater originating on the Site during construction. The plans and specifications require the contractor to develop a Stormwater Pollution Prevention Plan in accordance with substantive requirements of the current OPDES Permit.

Typical best management practices (BMPs) to be used include flow control measures to direct runoff during excavation and other site work, silt fencing surrounding excavation and staging areas, covering of stockpiles as practicable, dewatering treatment, and site stabilization following completion of construction. Contractor personnel will carry out a BMP monitoring and inspection program, based on the substantive requirements of the OPDES permit. If stormwater treatment became necessary, the contractor would be required to develop appropriate management and disposal measures. Such measures would likely include typical treatment processes such as solid particle settling and filtration.

3.2 OTHER DESIGN CONSIDERATIONS

3.2.1 Stream Crossing Design

The stream crossing on the east side of the site is necessary to access the Wilcox Tank 1 tank waste source material removal area with trucks and excavating equipment. Alternative access routes that were considered were not acceptable due to the potential for spreading contamination onto private property that is generally not considered the site and would require extra decontamination measures.

The crossing will consist of twin 48-inch metal culverts placed in the stream and covered with clean backfill and roadway aggregate. Reinforcing geotextile will be provided over the subgrade and between layers of soil to provide stability and improve the ease of removing the crossing after construction is complete.

Minimal excavation and slope disturbance is expected during construction of the stream crossing because the stream banks have a relatively shallow slope along the chosen alignment. Disturbed soils and stream banks that are not covered with crossing materials will be revegetated immediately with a cover crop to provide soil stability. The embankment fill and culvert pipe outlet will be protected from scour by a layer of riprap. Sediment management during construction of the crossing will be achieved by use of silt fencing and by completing the construction during periods of low baseline flow in the stream.

The stream crossing is designed to pass the flow of a 2-year storm within the twin 48-inch culverts with at least 1 foot of freeboard before overtopping the road.

3.2.2 Magellan Pipeline Company Utility Crossing

Magellan Pipeline Company (Magellan) owns and operates a buried 8-inch pipeline that bisects the Site from northwest to southeast. Several temporary haul routes will cross the pipeline. Coordination with Magellan indicated they approve of the crossings of their pipeline, as long as

no excavation occurs within their 50 foot-wide right-of-way, all crossings provide at least three feet of total cover, and equipment is limited to a weight of 80,000 lbs. and 20,000 lbs. per axle.

Magellan completed a field survey of the access road crossings. The location of the pipeline, access road crossings, and existing depth to pipeline are indicated on the Drawings (Appendix A), and locations have been flagged in the field.

3.2.3 Plan for Minimizing Negative Effects on the Environment during and after Construction

Wetlands were identified during wetland and Waters of the U.S. (WUS) surveys the Site. Construction activities have been designed to limit impact to wetlands and WUS. No excavation or access roads are planned within identified wetlands, and the temporary stream crossing located within the WUS is to be removed prior to project completion.

The Drawings and Specifications (Appendixes A and B, respectively) include provisions for final restoration and vegetative stabilization of all disturbed areas of the Site. A specific erosion inspection plan is not recommended.

3.2.4 Permits

Section 121(e)(1) of CERCLA exempts EPA from having to obtain permits (local, state or federal) for any RA conducted entirely on Site; however, the "substantive requirements" of such permits must still be met.

ODEQ regulates construction stormwater discharges for sites with more than 1 acre of disturbed area. OPDES General Permit No. OKR050000 applies to construction sites. The requirements of the permit are associated with sediment and erosion control.

U.S. Army Corps of Engineers provides Nationwide Permit 38 for Cleanup of Hazardous and Toxic Waste. The permit authorizes activities at certain sites where containment, stabilization, or removal of hazardous waste materials are performed by a government agency. Pre-construction notification is not required, but the applicable permit requirements which will be met during the RA include:

- Limiting impact to waterways and animal habitats
- Preventing adverse impacts from impoundments and managing of surface water flow to change the course of any stream
- Preventing work to impact or fills to be placed in wetlands or regulated floodplains
- Minimizing all adverse effects to WUS.

3.2.5 Identification of Easement and Access Requirements

Utility providers own and/or operate various utility lines at the site, and they may or may not have property easements. They may have special access provisions or other accommodations

necessary to complete the work, which are defined in the Drawings and Specifications (Appendixes A and B, respectively). Those which have provided coordination during the RD to accommodate work near their facilities include:

- Oklahoma Gas and Electric
- Magellan Pipeline Company, LP
- Oklahoma Natural Gas.

For this design, EA assumes that EPA has acquired and will maintain access agreements from private land owners.

4. DRAWINGS AND SPECIFICATIONS

This section identifies the Drawings and Specifications that have been prepared for this Report.

4.1 DRAWINGS (APPENDIX A)

Sheet No.	Drawing No.	Drawing Title
1.	G-001	Cover Sheet
2.	G-002	General Notes and Legend
3.	C-101	Sitewide Demolition, Clearing, And Site Access
4.	C-102	North Tank Farm 1 Demolition, Clearing, And Site Access
5.	C-103	Lorraine Tank Demolition, Clearing, And Site Access
6.	C-104	Lead Removal Area Demolition, Clearing, And Site Access
7.	C-105	Tank 11 & Tank 12 Demolition, Clearing, And Site Access
8.	C-106	Tank 10 & Pit 1 Demolition, Clearing, And Site Access
9.	C-107	Tank 1 & Tank 3 Demolition, Clearing, And Site Access
10.	C-108	Sitewide Excavation Plan
11.	C-109	North Tank Farm 1 Excavation Plan
12.	C-110	Lorraine Tank Excavation Plan
13.	C-111	Lead Removal Area Excavation Plan
14.	C-112	Tank 11 Excavation Plan
15.	C-113	Tank 12 Excavation Plan
16.	C-114	Tank 10 Excavation Plan
17.	C-115	Pit 1 Excavation Plan
18.	C-116	Tank 3 Excavation Plan
19.	C-117	Tank 1 Excavation Plan
20.	C-301	Profiles
21.	C-501	Details I

4.2 TECHNICAL SPECIFICATIONS (APPENDIX B)

Number	Specification Title
00 10 00	Summary
00 41 00	Schedule of Supplies and Services
01 20 00	Pricing and Payment Procedures
01 30 00	Administrative Requirements
01 33 00	Submittal Requirements
01 35 29.13	Health, Safety, & Emergency
01 45 00	Quality Control
01 50 00	Temporary Facilities and Controls
01 57 00	Temporary Erosion and Sediment Control
01 70 00	Execution and Closeout Requirements
01 72 00	Decontamination of Personnel and Equipment
02 41 00	Demolition and Restoration of Site Features
02 55 00	Stabilization of Lead Area Source Material
02 61 00	Removal and Disposal of Contaminated Materials
31 10 00	Site Clearing
31 23 23	Fill
31 34 19	Geosynthetic Soil Reinforcement
31 37 00	Riprap
32 92 19	Seeding
33 42 13	Pipe Culverts

5. FINAL REMEDIAL ACTION COST ESTIMATE

The total construction costs for RA activities are currently estimated at approximately $5,233,000. Appendix C provides a summary of the construction costs.

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Appendix A

Construction Drawings

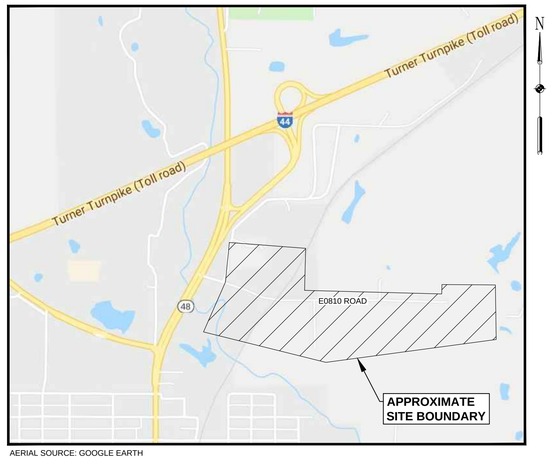
WILCOX OIL COMPANY SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN
CREEK COUNTY, OKLAHOMA

IMAGE SOURCE: WWW.GOOGLEMAPS.COM

VICINITY MAP
NOT TO SCALE

SHEET LIST

SHEET NO.	DRAWING NO.	DRAWING TITLE
1	G-001	COVER SHEET
2	G-002	GENERAL NOTES AND LEGEND
3	C-101	DEMOLITION, CLEARING, AND SITE ACCESS - KEYMAP
4	C-102	NORTH TANK FARM 1 DEMOLITION, CLEARING, AND SITE ACCESS
5	C-103	LORRAINE TANK DEMOLITION, CLEARING, AND SITE ACCESS
6	C-104	LEAD REMOVAL AREA DEMOLITION, CLEARING, AND SITE ACCESS
7	C-105	TANK 11 & TANK 12 DEMOLITION, CLEARING, AND SITE ACCESS
8	C-106	TANK 10 & PIT 1 DEMOLITION, CLEARING, AND SITE ACCESS
9	C-107	TANK 1 & TANK 3 DEMOLITION, CLEARING, AND SITE ACCESS
10	C-108	EXCAVATION PLAN - KEYMAP
11	C-109	NORTH TANK FARM 1 EXCAVATION PLAN
12	C-110	LORRAINE TANK EXCAVATION PLAN
13	C-111	LEAD REMOVAL AREA EXCAVATION PLAN
14	C-112	TANK 11 EXCAVATION PLAN
15	C-113	TANK 12 EXCAVATION PLAN
16	C-114	TANK 10 EXCAVATION PLAN
17	C-115	PIT 1 EXCAVATION PLAN
18	C-116	TANK 3 EXCAVATION PLAN
19	C-117	TANK 1 EXCAVATION PLAN
20	C-301	PROFILES
21	C-501	DETAILS



AERIAL SOURCE: GOOGLE EARTH

LOCATION MAP
NOT TO SCALE

PREPARED FOR:

EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

PREPARED BY:

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

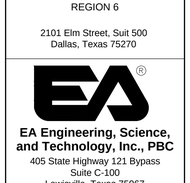
REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT MANAGER:
ND	JAP	SW	PA

SEAL



WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN
CREEK COUNTY, OKLAHOMA

COVER SHEET

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019

PROJECT NUMBER: 14342169

G-001

SHEET: 1 OF 21

GENERAL NOTES:

GENERAL CONSTRUCTION NOTES

1. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, ORDINANCES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.

2. ONLY THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFETY OF ALL WORK. ALL WORK, INCLUDING WORK WITHIN EXCAVATIONS, SHALL BE IN ACCORDANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).

3. PROJECT DOCUMENTS CONSISTS OF THESE PLAN SHEETS, PROJECT SPECIFICATIONS, PROJECT CONTRACTS, AND ANY AND ALL SUBSEQUENT EXECUTED PROJECT DOCUMENTATION ISSUED AS, OR WITH, CHANGE ORDERS, AND RFI'S (REQUEST FOR INFORMATION). THE CONTRACTOR SHALL REVIEW ALL PROJECT DOCUMENTS AND VERIFY ALL DIMENSIONS, QUANTITIES, AND FIELD CONDITIONS. ANY CONFLICTS OR OMISSIONS WITH THE DOCUMENTS SHALL BE REPORTED TO THE ENGINEER/PROJECT MANAGER FOR CLARIFICATION PRIOR TO PERFORMANCE OF ANY WORK IN QUESTION. IN THE EVENT THE CONSTRUCTOR DOES NOT NOTIFY THE ENGINEER/PROJECT MANAGER, THE CONTRACTOR ASSUMES FULL RESPONSIBILITY AND ANY AND ALL EXPENSE FOR ANY REVISIONS NECESSARY OR CORRECTIONAL WORK REQUIRED.

EXISTING CONDITIONS NOTES

1. PRELIMINARY SITE SURVEY WAS PERFORMED BY MIKE HUDDLESTON SURVEYING ON NOV 26-30, 2018. HORIZONTAL COORDINATES ARE PRESENTED IN OKLAHOMA STATE PLAN COORDINATES, NORTH ZONE NAD 83. VERTICAL DATUM FOR ELEVATION IS NAVD88.

2. THE PRIMARY CONSTRUCTION CONTROL POINT IS A CHISELED MARK ON THE FIRE HYDRANT ACCROSS REFINERY ROAD FROM FIRST ASSEMBLY OF GOD CHURCH. THE CONTRACTOR SHALL SET ADDITONAL CONTROL POINTS TO CARRY OUT INTERMITTENT SURVEYING, AS NECESSARY.

3. EXISTING STRUCTURES, VEGETATION, OR SITE IMPROVEMENTS THAT ARE NOT DESIGNATED FOR REMOVAL SHALL NOT BE DISTURBED. EXISTING STRUCTURES WHICH ARE DAMAGED OR DISPLACED BY THE CONTRACTOR SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE. REPAIRS SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION OF THE REPAIRS. REPAIRS SHALL BE ACCEPTED BY THE ENGINEER PRIOR TO FINAL PAYMENT.

4. IF THE CONTRACTOR DESIRES TO REMOVE FENCING TO ACCOMMODATE CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL REQUEST THE ENGINEER TO OBTAIN THE OWNER'S WRITTEN PERMISSION BEFORE FENCE IS REMOVED. CONTRACTOR SHALL RESTORE THE FENCE TO ITS ORIGINAL CONDITION AT THE EARLIEST OPPORTUNITY. WHILE ANY FENCING IS REMOVED, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SECURITY OF THE SITE UNTIL THE FENCE IS RESTORED.

5. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE PROJECT SPECIFICATION AND PLANS, AS AMENDED AND REVISED BY THE ENGINEER. ALL INSTALLATION DETAILS ARE TYPICAL AND MAY BE CHANGED TO BETTER FIT EXISTING LOCAL CONDITIONS UPON APPROVAL BY THE ENGINEER.

6. THE CONTRACTOR SHALL NOT INSTALL ITEMS AS SHOWN ON THESE PLANS WHEN IT IS OBVIOUS THAT FIELD CONDITIONS ARE DIFFERENT THAN SHOWN IN THE PLANS. SUCH CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN A TIMELY MANNER. IN THE EVENT OF REWORK CAUSED BY DIFFERING FIELD CONDITIONS, THE CONTRACTOR ASSUMES FULL RESPONSIBILITY AND EXPENSE FOR ANY REVISIONS NECESSARY, INCLUDING ENGINEERING DESIGN FEES.

PERMITTING NOTES

1. THE CONTRACTOR SHALL MEET THE REQUIREMENTS OF U.S. ARMY CORPS OF ENGINEERS (USACE) NATIONWIDE PERMIT 38 - CLEANUP OF HAZARDOUS AND TOXIC WASTE. THE CONTRACTOR SHALL NOT APPLY FOR OR OBTAIN THE PERMIT AND WILL NOT BE RESPONSIBLE FOR PRECONSTRUCTION NOTIFICATION TO THE USACE DISTRICT ENGINEER.

2. ALL MATERIALS PLACED WITHIN THE FLOODPLAIN BOUNDARIES MUST BE REMOVED BEFORE COMPLETION OF THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MANAGING WATER FLOWS THROUGH WORK AREAS AND PREVENTING SOIL EROSION AND SEDIMENTATION TO THE GREATEST EXTENT POSSIBLE.

TRAFFIC CONTROL NOTES

1. CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL MEASURES TO PROVIDE A SAFE AND ADEQUATE MEANS OF CHANNELIZING VEHICLE TRAFFIC AROUND AND THROUGH THE CONSTRUCTION AREA TO RESIDENCES AT THE SITE. A TRAFFIC CONTROL PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO MOBILIZATION. THE TRAFFIC CONTROL PLAN SHALL INDICATE SIGNAGE LOCATIONS AND CONSIDER THE VARIOUS PHASES AND LOCATIONS OF ACTIVITY THROUGHOUT THE PROJECT SITE.

2. REFINERY ROAD IS MANAGED BY CREEK COUNTY HIGHWAY DEPARTMENT DISTRICT 3. THE CONTRACTOR SHALL CONTACT THE COMMISSIONER IF THERE ARE IMPACTS TO THE ROADWAY WHICH WOULD REQUIRE TOTAL CLOSURE OR IF THERE ARE DAMAGES REQUIRING REPAIR OR REPLACEMENT. CREEK COUNTY HIGHWAY DEPARTMENT DISTRICT 3 COMMISSIONER: LANE WHITEHOUSE; PHONE NUMBER: 918-367-3231

3. ALL CONSTRUCTION TRAFFIC CONTROL DEVICES SHALL COMPLY TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), LATEST EDITION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL, SERVICE AND MAINTAIN ALL TRAFFIC CONTROL DEVICES. CONTRACTOR IS RESPONSIBLE TO MAINTAIN AND SERVICE ALL TRAFFIC CONTROL DEVICES 24 HOURS A DAY, 7 DAYS A WEEK THROUGHOUT LENGTH OF PROJECT.

4. ALL TRAFFIC CONTROL DEVICES SHALL BE KEPT IN NEW/CLEAN CONDITION, WASHING OF EQUIPMENT IS INCIDENTAL TO ITS PLACEMENT AND MAINTENANCE.

5. EQUIPMENT OR MATERIALS SHALL NOT BE STORED WITHIN 15 FEET OF A PUBLIC RIGHT-OF-WAY DURING NON-WORKING HOURS WITHOUT THE APPROVAL OF ENGINEER.

6. AT THE END OF EACH WORKDAY, THE CONTRACTOR SHALL CLEAN AND PICK UP THE WORK AREA TO THE SATISFACTION OF THE ENGINEER. AT NO TIME SHALL THE WORK BE LEFT IN A MANNER THAT COULD ENDANGER WORKERS OR THE PUBLIC.

7. 48 HOURS PRIOR TO ANY INSTANCES, NO MATTER HOW SHORT TERM, WHERE ANY PUBLIC RIGHT-OF-WAY WILL BE COMPLETELY CLOSED OFF, CONTRACTOR SHALL NOTIFY RESIDENTS THAT WILL BE AFFECTED BY THE CONSTRUCTION.

8. FAILURE TO COMPLY WITH ANY OF THE ABOVE-MENTIONED REQUIREMENTS WILL BE ADEQUATE CAUSE TO CEASE ALL WORK ON THE PROJECT UNTIL ALL REQUIREMENTS ARE ADDRESSED AND APPROVED BY ENGINEER.

EXISTING UTILITIES NOTES

1. HORIZONTAL UTILITY LOCATIONS ARE APPROXIMATE AND ARE BASED ON FIELD LOCATED UTILITIES AND LOCATIONS BASED ONLY ON THE INFORMATION PROVIDED TO THE ENGINEER BY OTHERS. THIS INFORMATION MAY BE INACCURATE OR INCOMPLETE; UNDERGROUND LINES MAY EXIST THAT ARE NOT SHOWN.

2. THE CONTRACTOR SHALL CONTACT THE STATEWIDE UTILITY LOCATOR SERVICE (811) AT LEAST TWO WORKING DAYS BEFORE BEGINNING CONSTRUCTION. AFTER THE UTILITIES ARE SPOTTED, THE CONTRACTOR SHALL EXPOSE ALL PERTINENT UTILITIES TO VERIFY THEIR VERTICAL AND HORIZONTAL LOCATION. IF A CONFLICT EXISTS BETWEEN EXISTING UTILITIES AND PROPOSED CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH MINIMAL DELAY.

3. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ANY UTILITY LINE, PIPELINE, OR UNDERGROUND UTILITY LINE IN OR NEAR THE AREA OF THE WORK BY ANY MEANS APPROVED BY THE ENGINEER INCLUDING, BUT NOT LIMITED TO, ELECTRONIC LOCATING EQUIPMENT AND/OR POT HOLING. ANY DAMAGE TO ANY OTHER UTILITIES AND/OR COLLATERAL DAMAGE CAUSED BY THE CONTRACTOR SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR.

4. THE CONTRACTOR SHALL COORDINATE ANY REQUIRED UTILITY INTERRUPTIONS WITH THE AFFECTED PROPERTY OWNERS, ENGINEER, AND AFFECTED UTILITY COMPANY A MINIMUM OF THREE (3) WORKING DAYS BEFORE THE INTERRUPTION.

5. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING AND COORDINATING CONSTRUCTION ACTIVITIES WITH UTILITIES PROVIDERS, EXCEPT FOR THOSE PROCEDURES EXPLICITLY STATED ON THE DRAWINGS. PRIVATE UTILITY FACILITIES WITHIN THE PROJECT AREA MAY BE OWNED AND OPERATRED BY THE FOLLOWING COMPANIES:

   a. MAGELLAN PIPELINE COMPANY FOR UNDERGROUND PIPELINE AND RIGHT-OF-WAY.
   b. OKLAHOMA GAS & ELECTRIC FOR OVERHEAD POWER LINES.
   c. OKLAHOMA NATURAL GAS FOR BURIED GAS SERVICE LINES.

6. CONTRACTOR SHALL NOT EXCAVATE WITHIN THE RIGHT-OF-WAY OF THE UNDERGROUND GAS PIPELINE OWNED BY MAGELLAN PIPELINE COMPANY.

7. DO NOT EXCAVATE WITHIN 20 FEET OF ANY EXISTING UTILITY POLES WITHOUT FIRST CONTACTING OKLAHOMA GAS & ELECTRIC (OG&E). REQUEST OVERSIGHT OF POLE BRACING AND EXCAVATING ACTIVITIES. THE PROJECT-SPECIFIC CONTACT AT OG&E IS KEITH MELSON, WHO CAN BE CONTACTED AT MELSONDK@OGE.COM.

8. THE CONTRACTOR SHALL MAINTAIN A RECORD SET OF PLANS AND LOCATE ALL UTILITIES, EXISTING OR NEW, IN THEIR CORRECT LOCATION, HORIZONTAL AND VERTICAL. THIS RECORD SET OF DRAWINGS SHALL BE MAINTAINED ON THE PROJECT SITE AND SHALL BE AVAILABLE TO THE ENGINEER AT ANY TIME DURING CONSTRUCTION. RECORD INFORMATION SHALL INCLUDE HORIZONTAL AND VERTICAL COORDINATE CALLOUTS, LINE SIZES, LINE TYPES, BURIAL DEPTHS, AND ALL OTHER PERTINENT INSTALLATION INFORMATION.

STORM WATER POLLUTION PREVENTION PLAN NOTES

1. THE CONTRACTOR SHALL CONFORM TO ALL STATE AND FEDERAL EROSION CONTROL REGULATIONS. CONTRACTOR SHALL PREPARE A STORM WATER POLLUTION PREVENTION PLAN (SWP3), WHICH SHALL BE APPROVED BY ENGINEER, IN CONFORMANCE WITH THE OKLAHOMA POLLUTANT DISCHARGE ELIMINATION SYSTEM GENERAL PERMIT OKR10.

2. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE SITE ONTO ADJACENT PROPERTY BY CONSTRUCTION OF TEMPORARY EROSION CONTROL BERMS OR INSTALLING SILT FENCES AT THE PROPERTY LINES (OR LIMITS OF CONSTRUCTION WHERE DESIGNATED) AND WETTING SOIL TO PREVENT IT FROM BLOWING.

3. THE CONTRACTOR SHALL COMPLETE FINAL SITE RESTORATION AND PERFORM VEGETATION MANAGEMENT, INCLUDING BUT NOT LIMITED TO WATERING, UNTIL FINAL STABILIZATION IS ACHIEVED.

ENVIRONMENTAL PROTECTION NOTES

1. THE CONTRACTOR SHALL CONFORM TO ALL STATE AND FEDERAL DUST REGULATIONS. WATERING, AS REQUIRED FOR CONSTRUCTION DUST CONTROL, SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION AND NO MEASUREMENT OR PAYMENT SHALL BE MADE. CONSTRUCTION AREAS SHALL BE WATERED FOR DUST CONTROL IN COMPLIANCE WITH OKLAHOMA'S EPA-APPROVED STATE IMPLEMENTATION PLAN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE AVAILABILITY AND USE OF WATER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING ALL EQUIPMENT AND MATERIALS NECESSARY FOR OBTAINING WATER.

2. ALL WASTE PRODUCTS FROM THE CONSTRUCTION SITE, INCLUDING ITEMS DESIGNED FOR REMOVAL, CONSTRUCTION WASTE, CONSTRUCTION EQUIPMENT WASTE PRODUCTS (OIL, GAS, TIRES, ETC.), GARBAGE, GRUBBING, EXCESS CUT MATERIAL, VEGETATIVE DEBRIS, ETC. SHALL BE APPROPRIATELY DISPOSED OF OFFSITE.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEANUP AND REPORTING OF SPILLS OF HAZARDOUS MATERIALS ASSOCIATED WITH THE CONSTRUCTION SITE. HAZARDOUS MATERIALS WHICH MAY BE A THREAT TO THE ENVIRONMENT GENERALLY INCLUDE GASOLINE, DIESEL FUEL, MOTOR OIL, SOLVENTS, CHEMICALS, PAINT, ETC. THE CONTRACTOR SHALL REPORT THE DISCOVERY OF PAST OR PRESENT SPILLS TO THE ENGINEER.

4. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS CONCERNING SURFACE AND UNDERGROUND WATER. CONTACT WITH SURFACE WATER BY CONSTRUCTION EQUIPMENT AND PERSONNEL SHALL BE MINIMIZED. EQUIPMENT MAINTENANCE AND REFUELING OPERATIONS SHALL BE PERFORMED IN AN ENVIRONMENTALLY SAFE MANNER IN COMPLIANCE WITH STATE AND FEDERAL REGULATIONS.

5. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS CONCERNING CONSTRUCTION NOISE AND HOURS OF OPERATION AS STATED IN THE SPECIFICATIONS OR IMPOSED BY THE ENGINEER OR STATE OR LOCAL AUTHORITIES.

ABBREVIATIONS

AC	ACRES
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
BGS	BELOW GROUND SURFACE
BLDG	BUILDING
CONC	CONCRETE
CSP	CORRUGATED STEEL PIPE
CY	CUBIC YARD
DIA	DIAMETER
DOT	DEPARTMENT OF TRANSPORTATION
EL/ELEV	ELEVATION
EPA	ENVIRONMENTAL PROTECTION AGENCY
EX/EXIST	EXISTING
FT	FEET
HDPE	HIGH DENSITY POLY ETHYLENE
INV	INVERT
LF	LINEAR FOOT
MAX	MAXIMUM
MIN	MINIMUM
MSL	MEAN SEA LEVEL
NA	NOT APPLICABLE
NAD 83	NORTH AMERICAN DATUM OF 1983
NAVD 88	NORTH AMERICAN VERICAL DATUM OF 1988
NGS	NATIONAL GEODETIC SURVEY
NO.	NUMBER
NTS	NOT TO SCALE
OG&E	OKLAHOMA GAS AND ELECTRIC
PNG	OKLAHOMA NATURAL GAS
SQ FT	SQUARE FEET
SWPPP	STORMWATER POLLUTION PREVENTION PROPOSAL
TYP	TYPICAL
U.S.	UNITED STATES
USACE	U.S. ARMY CORPS OF ENGINEERS
W/	WITH

LEGEND

DESCRIPTION	EXISTING	PROPOSED
BENCHMARK	△ #	△ #
PROPERTY BOUNDARY		NA
LIMIT OF FIELD RUN TOPOGRAPHY		NA
CONTOUR		
CONCRETE		
FENCE		
FENCE POST		
GATE POST		
SIGN		
BOLLARD		
MANHOLE - UNKNOWN	Ⓜ	Ⓜ
MONITORING WELL	MW	MW
DEEP SVE WELL	SVE	SVE
SHALLOW SVE WELL	SSVE	SSVE
INJECTION WELL	IJ	IJ
OB	OB	OB
TREE/BRUSH LINE		
TREE		
WETLAND		NA
STREAM / POUND		NA
STORM DRAIN PIPE		SD
STORM DRAIN UTILITY MARKING	SD	NA
STORM DRAIN MANHOLE	Ⓓ	Ⓓ
STORM DRAIN INLET/CATCH BASIN	CB	CB
SANITARY SEWER PIPE		SS
SANITARY SEWER UTILITY MARKING	SS	NA
SANITARY SEWER MANHOLE	Ⓢ	Ⓢ
SANITARY SEWER CLEANOUT	CO	CO
WATER PIPE	NA	W
WATER UTILITY MARKING	W	NA
WATER MANHOLE	Ⓦ	Ⓦ
WATER METER	Ⓦ	Ⓦ
WATER VALVE	WV	WV
WELL	Ⓦ	NA
FIRE HYDRANT		
ELECTRIC LINE - UNDERGROUND	NA	E
ELECTRIC LINE UTILITY MARKING (UNDERGROUND)	E	NA
ELECTRIC LINE - OVERHEAD	OHE	OHE
ELECTRIC MANHOLE	Ⓔ	Ⓔ
ELECTRIC JUNCTION BOX	Ⓙ	Ⓙ
ELECTRIC TRANSFORMER	T	T
LIGHT POLE		
UTILITY POLE	#	#
GUY WIRE		
GUY POLE		
GAS LINE	NA	G
GAS LINE UTILITY MARKING	G	NA
GAS MANHOLE	Ⓖ	Ⓖ
GAS METER	Ⓖ	Ⓖ
GAS VALVE	GV	GV
COMMUNICATIONS/CATV - UNDERGROUND	NA	C
COMMUNICATIONS/CATV - UTILITY MARKING	C	C
COMMUNICATIONS/CATV MANHOLE	Ⓒ	Ⓒ
COMMUNICATIONS/CATV PEDESTAL	C	C
TELEPHONE - UNDERGROUND	NA	T
TELEPHONE - UTILITY MARKING	T	
TELEPHONE MANHOLE	Ⓣ	Ⓣ
TELEPHONE PEDESTAL	T	T
LIMIT OF DISTURBANCE	NA	LOD
STABILIZED CONSTRUCTION ENTRANCE	NA	
SILT FENCE	NA	SF
100-YEAR FLOODPLAIN		NA
UNDERGROUND GAS PIPE LINE	G	NA
GAS PIPE LINE RIGHT-OF-WAY		NA
IMPROVED ACCESS ROAD		
STABILIZED ACCESS ROAD		
DEMOLITION / TREE CLEARING		

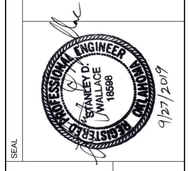
REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT MANAGER:
ND	JAP	SW	PA

SEAL



WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN
CREEK COUNTY, OKLAHOMA

GENERAL NOTES AND LEGEND

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

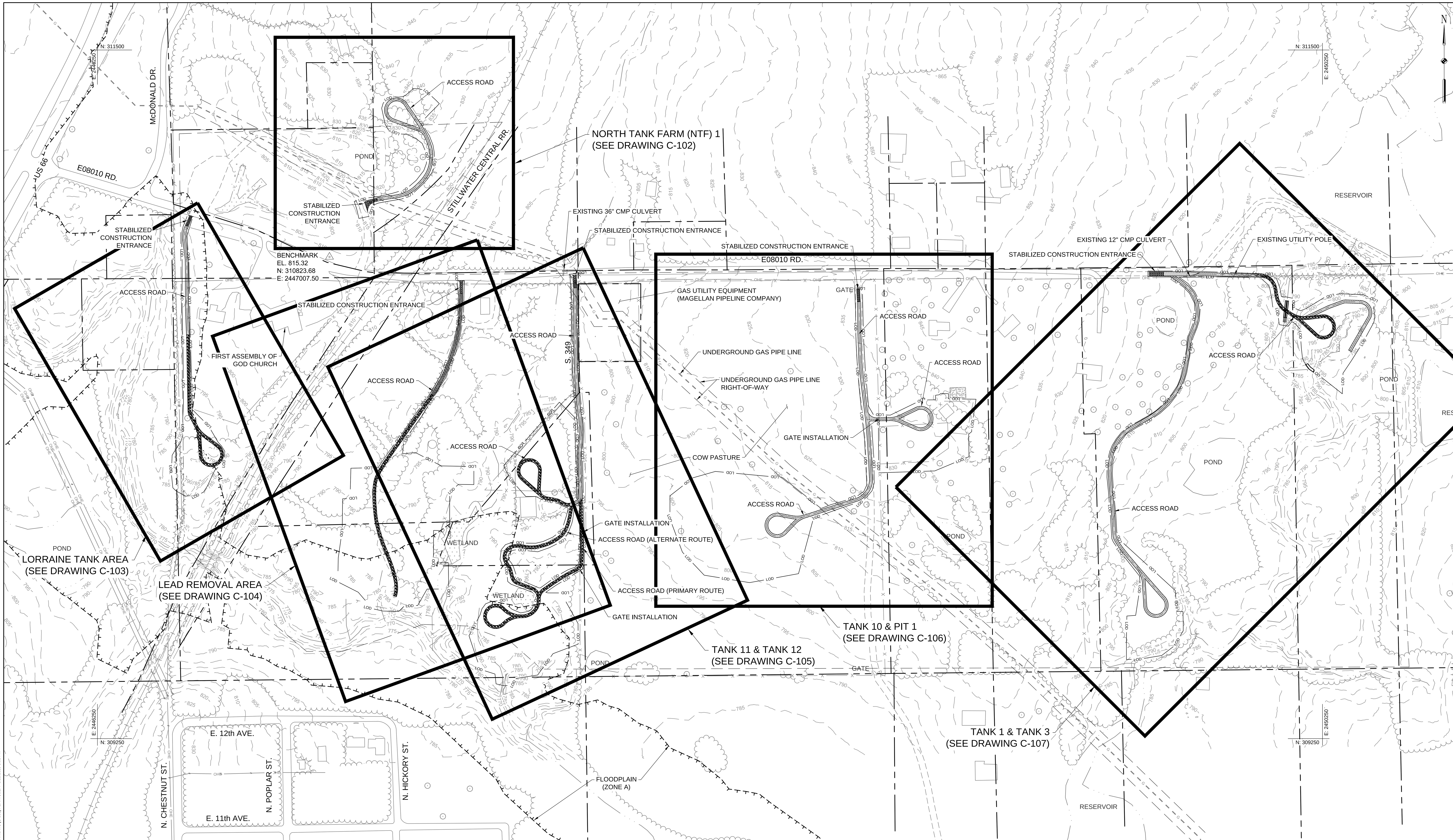
EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019

PROJECT NUMBER: 14342169

G-002

SHEET: 2 OF 21



N: 311500
E: 2446250
McDONALD DR.
US 66
E08010 RD.
ACCESS ROAD
POND
STABILIZED CONSTRUCTION ENTRANCE
STILLWATER CENTRAL RR.
NORTH TANK FARM (NTF) 1
(SEE DRAWING C-102)
EXISTING 36" CMP CULVERT
STABILIZED CONSTRUCTION ENTRANCE
BENCHMARK
EL. 815.32
N: 310823.68
E: 2447007.50
STABILIZED CONSTRUCTION ENTRANCE
FIRST ASSEMBLY OF GOD CHURCH
S. 349
GAS UTILITY EQUIPMENT
(MAGELLAN PIPELINE COMPANY)
UNDERGROUND GAS PIPE LINE
UNDERGROUND GAS PIPE LINE RIGHT-OF-WAY
GATE INSTALLATION
COW PASTURE
WETLAND
ACCESS ROAD (ALTERNATE ROUTE)
ACCESS ROAD (PRIMARY ROUTE)
GATE INSTALLATION
GATE
EXISTING 12" CMP CULVERT
EXISTING UTILITY POLE
RESERVOIR
LORRAINE TANK AREA
(SEE DRAWING C-103)
LEAD REMOVAL AREA
(SEE DRAWING C-104)
TANK 11 & TANK 12
(SEE DRAWING C-105)
TANK 10 & PIT 1
(SEE DRAWING C-106)
TANK 1 & TANK 3
(SEE DRAWING C-107)
FLOODPLAIN
(ZONE A)
E. 12th AVE.
E. 11th AVE.
N. CHESTNUT ST.
N. POPLAR ST.
N. HICKORY ST.
N: 309250
E: 2450250

0 75 150 300
GRAPHIC SCALE IN FEET

NO.	DATE	BY	DESCRIPTION

REVISIONS

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL
REGISTERED PROFESSIONAL ENGINEER OKLAHOMA
STANLEY D. WALLACE 18698
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN
CREEK COUNTY, OKLAHOMA

DEMOLITION, CLEARING, AND SITE ACCESS - KEYMAP

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019
PROJECT NUMBER: 14342169

C-101
SHEET: 3 OF 21

GENERAL NOTES

1. PIPELINE OWNER: MAGELLAN PIPELINE COMPANY.
2. A MINIMUM COVER OF 3.0 FT MUST BE PROVIDED OVER THE GAS PIPELINE. THE MAXIMUM ALLOWABLE VEHICLE WEIGHT ON ANY GAS PIPELINE CROSSING IS 80,000 POUNDS, WITH A MAXIMUM AXLE WEIGHT OF 20,000 POUNDS.
3. PRIOR TO COMPLETION OF THE GAS PIPELINE CROSSING, CONTACT MAGELLAN PIPELINE COMPANY FIELD SERVICES TECHNICIAN JASON BEGUIN TO MAKE FINAL INSPECTION ON BEHALF OF PIPELINE OWNER.
EMAIL = JASON.BEGUIN@MAGELLANLP.COM
PHONE = 918-720-5837

LEGEND

- IMPROVED ACCESS ROAD
- STABILIZED ACCESS ROAD
- DEMOLITION / TREE CLEARING

CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
NT1-AR-1	310983.64	2447128.25
NT1-AR-2	311005.89	2447146.55
NT1-AR-3	311011.12	2447163.88
NT1-AR-4	311023.61	2447236.90
NT1-AR-5	311054.54	2447292.92
NT1-AR-6	311098.54	2447328.10
NT1-AR-7	311132.44	2447338.64
NT1-AR-8	311161.46	2447339.97
NT1-AR-9	311219.80	2447321.87
NT1-AR-10	311238.04	2447302.16
NT1-AR-11	311254.14	2447258.40
NT1-AR-12	311270.24	2447214.65
NT1-AR-13	311324.51	2447199.21
NT1-AR-14	311322.97	2447255.62
NT1-AR-15	311278.55	2447286.25

ESTIMATED QUANTITIES

IMPROVED ACCESS ROAD = 697 LF
CLEARING = 0.21 ACRE

0 15 30 60
GRAPHIC SCALE IN FEET

REVISIONS
NO. DATE BY DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL
STANLEY D. WALLACE 15898
REGISTERED PROFESSIONAL ENGINEER OKLAHOMA
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN
CREEK COUNTY, OKLAHOMA

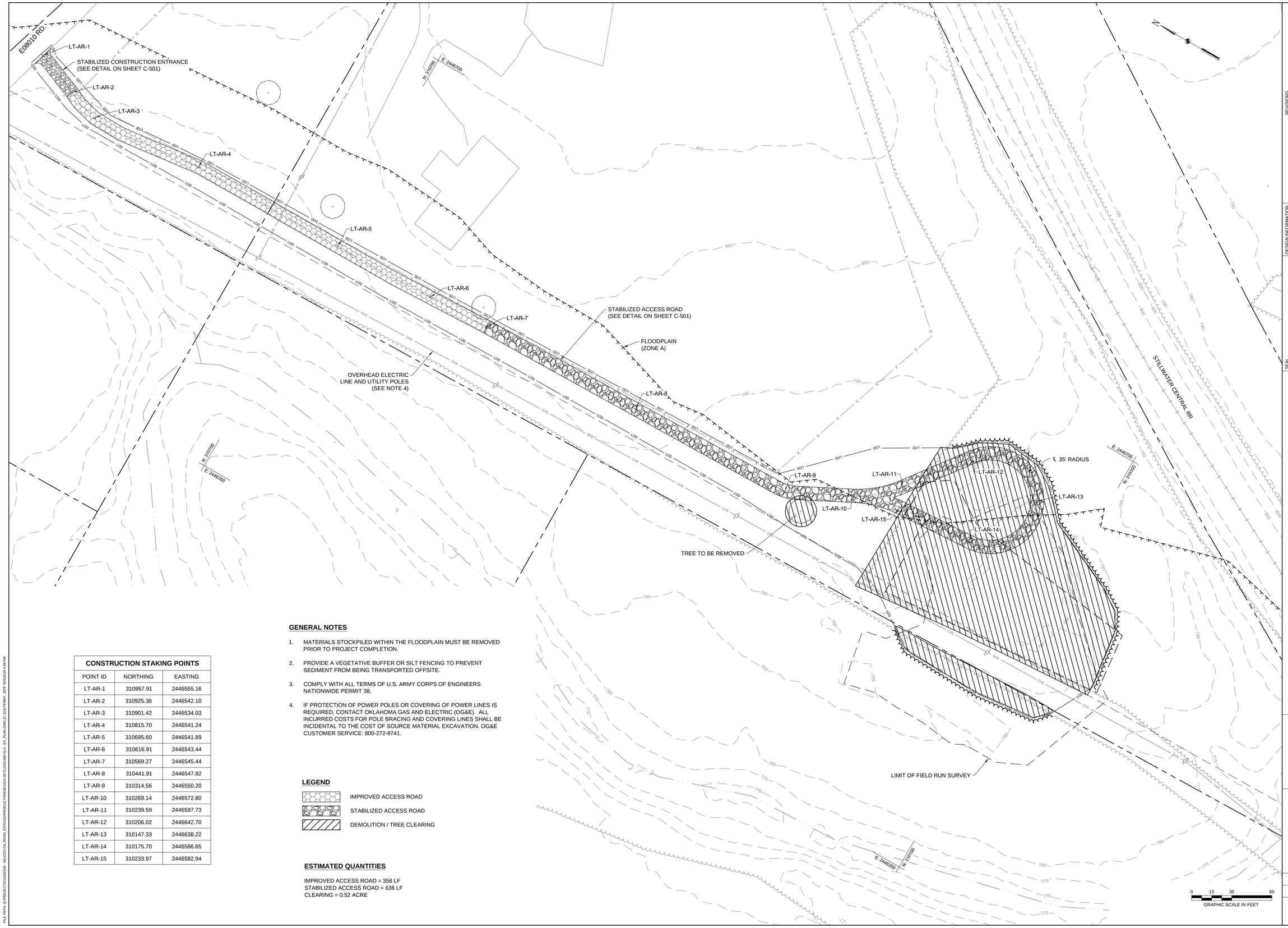
NORTH TANK FARM 1 DEMOLITION, CLEARING, AND SITE ACCESS

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019
PROJECT NUMBER: 14342169
C-102
SHEET: 3 OF 21

FILE PATH: Q:\PROJECTS\14342169 - WILCOX OIL ROAD_EPA\CAD\PRODUCTION\DESIGN SET\14342169-01-0 - EX_PLAN.DWG [C-102] PERRY, JEFF 9/25/2019 5:08 PM



CONSTRUCTION STAKING POINTS		
POINT ID	NORTHING	EASTING
LT-AR-1	310957.91	2446555.16
LT-AR-2	310925.36	2446542.10
LT-AR-3	310901.42	2446534.03
LT-AR-4	310815.70	2446541.24
LT-AR-5	310695.60	2446541.89
LT-AR-6	310616.91	2446543.44
LT-AR-7	310569.27	2446545.44
LT-AR-8	310441.91	2446547.82
LT-AR-9	310314.56	2446550.20
LT-AR-10	310269.14	2446572.80
LT-AR-11	310239.59	2446597.73
LT-AR-12	310206.02	2446642.70
LT-AR-13	310147.33	2446638.22
LT-AR-14	310175.70	2446586.65
LT-AR-15	310233.97	2446582.94

GENERAL NOTES

1. MATERIALS STOCKPILED WITHIN THE FLOODPLAIN MUST BE REMOVED PRIOR TO PROJECT COMPLETION.
2. PROVIDE A VEGETATIVE BUFFER OR SILT FENCING TO PREVENT SEDIMENT FROM BEING TRANSPORTED OFFSITE.
3. COMPLY WITH ALL TERMS OF U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT 38.
4. IF PROTECTION OF POWER POLES OR COVERING OF POWER LINES IS REQUIRED, CONTACT OKLAHOMA GAS AND ELECTRIC (OG&E). ALL INCURRED COSTS FOR POLE BRACING AND COVERING LINES SHALL BE INCIDENTAL TO THE COST OF SOURCE MATERIAL EXCAVATION. OG&E CUSTOMER SERVICE: 800-272-9741.

LEGEND

- IMPROVED ACCESS ROAD
- STABILIZED ACCESS ROAD
- DEMOLITION / TREE CLEARING

ESTIMATED QUANTITIES

IMPROVED ACCESS ROAD = 358 LF
STABILIZED ACCESS ROAD = 636 LF
CLEARING = 0.52 ACRE

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION

DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL

REGISTERED PROFESSIONAL ENGINEER
STANLEY D. WALLACE
18598
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

LORRAINE TANK DEMOLITION, CLEARING, AND SITE ACCESS

PREPARED FOR:

EPA
REGION 6

2101 Elm Street, Suit 500
Dallas, Texas 75270

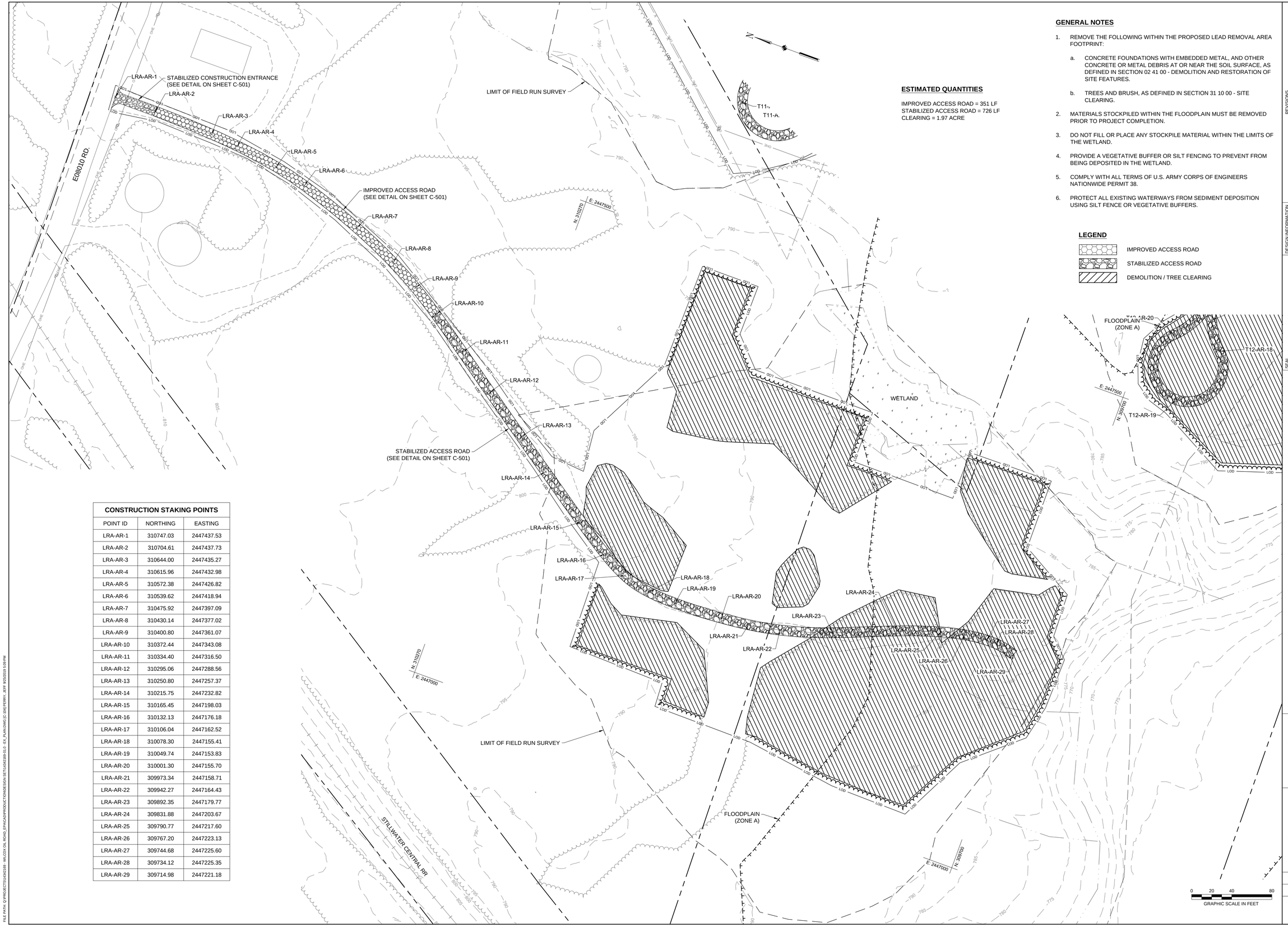
EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019

PROJECT NUMBER: 14342169

C-103

SHEET: 3 OF 21



CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
LRA-AR-1	310747.03	2447437.53
LRA-AR-2	310704.61	2447437.73
LRA-AR-3	310644.00	2447435.27
LRA-AR-4	310615.96	2447432.98
LRA-AR-5	310572.38	2447426.82
LRA-AR-6	310539.62	2447418.94
LRA-AR-7	310475.92	2447397.09
LRA-AR-8	310430.14	2447377.02
LRA-AR-9	310400.80	2447361.07
LRA-AR-10	310372.44	2447343.08
LRA-AR-11	310334.40	2447316.50
LRA-AR-12	310295.06	2447288.56
LRA-AR-13	310250.80	2447257.37
LRA-AR-14	310215.75	2447232.82
LRA-AR-15	310165.45	2447198.03
LRA-AR-16	310132.13	2447176.18
LRA-AR-17	310106.04	2447162.52
LRA-AR-18	310078.30	2447155.41
LRA-AR-19	310049.74	2447153.83
LRA-AR-20	310001.30	2447155.70
LRA-AR-21	309973.34	2447158.71
LRA-AR-22	309942.27	2447164.43
LRA-AR-23	309892.35	2447179.77
LRA-AR-24	309831.88	2447203.67
LRA-AR-25	309790.77	2447217.60
LRA-AR-26	309767.20	2447223.13
LRA-AR-27	309744.68	2447225.60
LRA-AR-28	309734.12	2447225.35
LRA-AR-29	309714.98	2447221.18

GENERAL NOTES

1. REMOVE THE FOLLOWING WITHIN THE PROPOSED LEAD REMOVAL AREA FOOTPRINT:
   a. CONCRETE FOUNDATIONS WITH EMBEDDED METAL, AND OTHER CONCRETE OR METAL DEBRIS AT OR NEAR THE SOIL SURFACE, AS DEFINED IN SECTION 02 41 00 - DEMOLITION AND RESTORATION OF SITE FEATURES.
   b. TREES AND BRUSH, AS DEFINED IN SECTION 31 10 00 - SITE CLEARING.
2. MATERIALS STOCKPILED WITHIN THE FLOODPLAIN MUST BE REMOVED PRIOR TO PROJECT COMPLETION.
3. DO NOT FILL OR PLACE ANY STOCKPILE MATERIAL WITHIN THE LIMITS OF THE WETLAND.
4. PROVIDE A VEGETATIVE BUFFER OR SILT FENCING TO PREVENT FROM BEING DEPOSITED IN THE WETLAND.
5. COMPLY WITH ALL TERMS OF U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT 38.
6. PROTECT ALL EXISTING WATERWAYS FROM SEDIMENT DEPOSITION USING SILT FENCE OR VEGETATIVE BUFFERS.

ESTIMATED QUANTITIES

IMPROVED ACCESS ROAD = 351 LF
STABILIZED ACCESS ROAD = 726 LF
CLEARING = 1.97 ACRE

LEGEND

- IMPROVED ACCESS ROAD
- STABILIZED ACCESS ROAD
- DEMOLITION / TREE CLEARING

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL
REGISTERED PROFESSIONAL ENGINEER
STANLEY D. WALLACE
18588
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

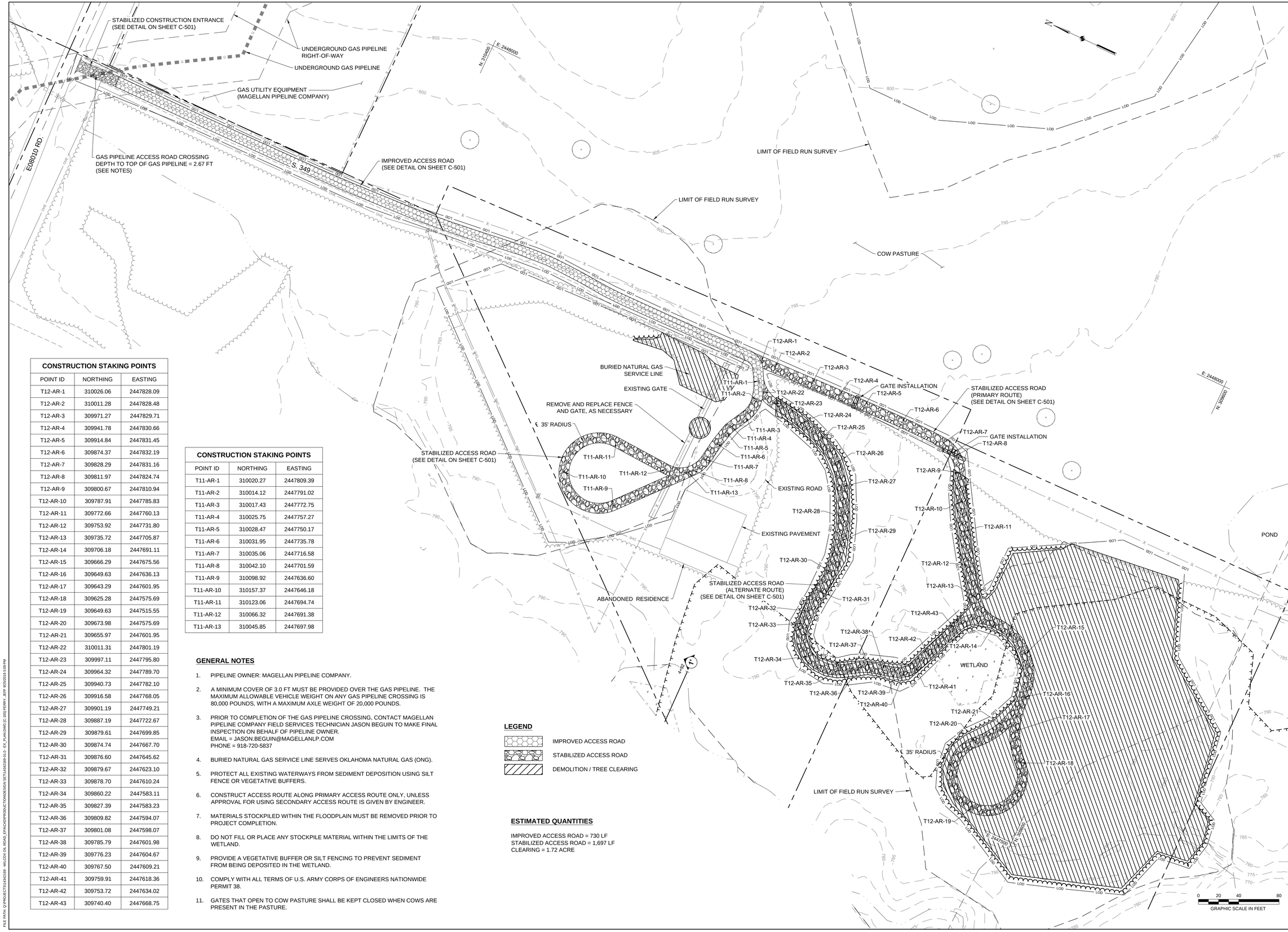
LEAD REMOVAL AREA DEMOLITION, CLEARING, AND SITE ACCESS

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019
PROJECT NUMBER: 14342169

C-104
SHEET: 3 OF 21



CONSTRUCTION STAKING POINTS		
POINT ID	NORTHING	EASTING
T12-AR-1	310026.06	2447828.09
T12-AR-2	310011.28	2447828.48
T12-AR-3	309971.27	2447829.71
T12-AR-4	309941.78	2447830.66
T12-AR-5	309914.84	2447831.45
T12-AR-6	309874.37	2447832.19
T12-AR-7	309828.29	2447831.16
T12-AR-8	309811.97	2447824.74
T12-AR-9	309800.67	2447810.94
T12-AR-10	309787.91	2447785.83
T12-AR-11	309772.66	2447760.13
T12-AR-12	309753.92	2447731.80
T12-AR-13	309735.72	2447705.87
T12-AR-14	309706.18	2447691.11
T12-AR-15	309666.29	2447675.56
T12-AR-16	309649.63	2447636.13
T12-AR-17	309643.29	2447601.95
T12-AR-18	309625.28	2447575.69
T12-AR-19	309649.63	2447515.55
T12-AR-20	309673.98	2447575.69
T12-AR-21	309655.97	2447601.95
T12-AR-22	310011.31	2447801.19
T12-AR-23	309997.11	2447795.80
T12-AR-24	309964.32	2447789.70
T12-AR-25	309940.73	2447782.10
T12-AR-26	309916.58	2447768.05
T12-AR-27	309901.19	2447749.21
T12-AR-28	309887.19	2447722.67
T12-AR-29	309879.61	2447699.85
T12-AR-30	309874.74	2447667.70
T12-AR-31	309876.60	2447645.62
T12-AR-32	309879.67	2447623.10
T12-AR-33	309878.70	2447610.24
T12-AR-34	309860.22	2447583.11
T12-AR-35	309827.39	2447583.23
T12-AR-36	309809.82	2447594.07
T12-AR-37	309801.08	2447598.07
T12-AR-38	309785.79	2447601.98
T12-AR-39	309776.23	2447604.67
T12-AR-40	309767.50	2447609.21
T12-AR-41	309759.91	2447618.36
T12-AR-42	309753.72	2447634.02
T12-AR-43	309740.40	2447668.75

CONSTRUCTION STAKING POINTS		
POINT ID	NORTHING	EASTING
T11-AR-1	310020.27	2447809.39
T11-AR-2	310014.12	2447791.02
T11-AR-3	310017.43	2447772.75
T11-AR-4	310025.75	2447757.27
T11-AR-5	310028.47	2447750.17
T11-AR-6	310031.95	2447735.78
T11-AR-7	310035.06	2447716.58
T11-AR-8	310042.10	2447701.59
T11-AR-9	310098.92	2447636.60
T11-AR-10	310157.37	2447646.18
T11-AR-11	310123.06	2447694.74
T11-AR-12	310066.32	2447691.38
T11-AR-13	310045.85	2447697.98

GENERAL NOTES

1. PIPELINE OWNER: MAGELLAN PIPELINE COMPANY.
2. A MINIMUM COVER OF 3.0 FT MUST BE PROVIDED OVER THE GAS PIPELINE. THE MAXIMUM ALLOWABLE VEHICLE WEIGHT ON ANY GAS PIPELINE CROSSING IS 80,000 POUNDS, WITH A MAXIMUM AXLE WEIGHT OF 20,000 POUNDS.
3. PRIOR TO COMPLETION OF THE GAS PIPELINE CROSSING, CONTACT MAGELLAN PIPELINE COMPANY FIELD SERVICES TECHNICIAN JASON BEGUIN TO MAKE FINAL INSPECTION ON BEHALF OF PIPELINE OWNER.
   EMAIL = JASON.BEGUIN@MAGELLANLP.COM
   PHONE = 918-720-5837
4. BURIED NATURAL GAS SERVICE LINE SERVES OKLAHOMA NATURAL GAS (ONG).
5. PROTECT ALL EXISTING WATERWAYS FROM SEDIMENT DEPOSITION USING SILT FENCE OR VEGETATIVE BUFFERS.
6. CONSTRUCT ACCESS ROUTE ALONG PRIMARY ACCESS ROUTE ONLY, UNLESS APPROVAL FOR USING SECONDARY ACCESS ROUTE IS GIVEN BY ENGINEER.
7. MATERIALS STOCKPILED WITHIN THE FLOODPLAIN MUST BE REMOVED PRIOR TO PROJECT COMPLETION.
8. DO NOT FILL OR PLACE ANY STOCKPILE MATERIAL WITHIN THE LIMITS OF THE WETLAND.
9. PROVIDE A VEGETATIVE BUFFER OR SILT FENCING TO PREVENT SEDIMENT FROM BEING DEPOSITED IN THE WETLAND.
10. COMPLY WITH ALL TERMS OF U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT 38.
11. GATES THAT OPEN TO COW PASTURE SHALL BE KEPT CLOSED WHEN COWS ARE PRESENT IN THE PASTURE.

LEGEND

- IMPROVED ACCESS ROAD
- STABILIZED ACCESS ROAD
- DEMOLITION / TREE CLEARING

ESTIMATED QUANTITIES

IMPROVED ACCESS ROAD = 730 LF
STABILIZED ACCESS ROAD = 1,697 LF
CLEARING = 1.72 ACRE

GRAPHIC SCALE IN FEET
0 20 40 80

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL
REGISTERED PROFESSIONAL ENGINEER
STANLEY D. WALLACE
18598
OKLAHOMA
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN
CREEK COUNTY, OKLAHOMA

TANK 11 & TANK 12 DEMOLITION, CLEARING, AND SITE ACCESS

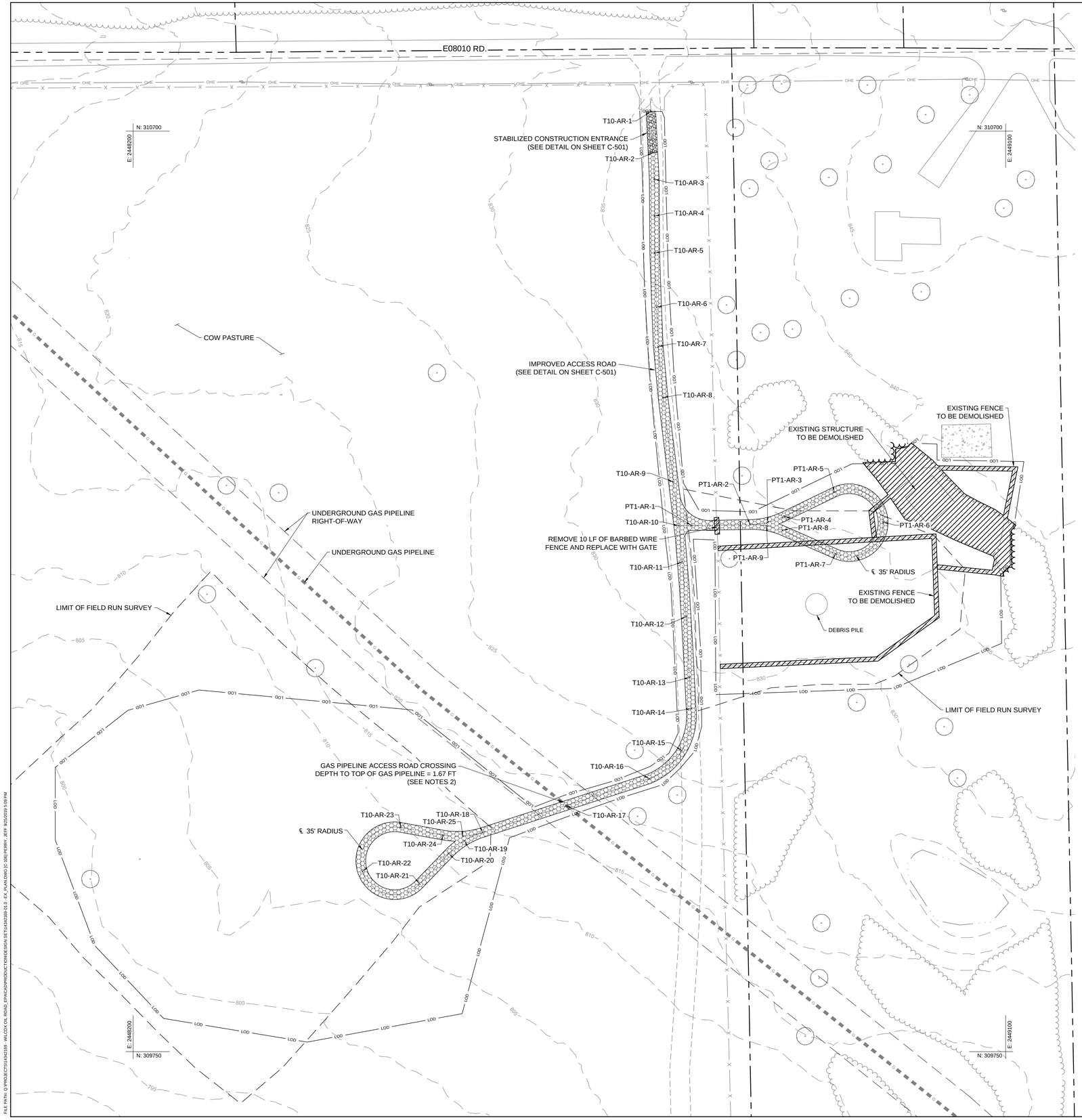
PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019
PROJECT NUMBER: 14342169

C-105
SHEET: 3 OF 21

FILE PATH: Q:\PROJECTS\14342169 - WILCOX OIL ROAD, EPA\CAD\PRODUCTION\DESIGN SET\14342169-XLD - EX_PLAN.DWG [C-105] PERRY, JEFF 9/25/2019 5:09 PM



GENERAL NOTES

1. PIPELINE OWNER: MAGELLAN PIPELINE COMPANY.
2. A MINIMUM COVER OF 3.0 FT MUST BE PROVIDED OVER THE GAS PIPELINE. THE MAXIMUM ALLOWABLE VEHICLE WEIGHT ON ANY GAS PIPELINE CROSSING IS 80,000 POUNDS, WITH A MAXIMUM AXLE WEIGHT OF 20,000 POUNDS.
3. PRIOR TO COMPLETION OF THE GAS PIPELINE CROSSING, CONTACT MAGELLAN PIPELINE COMPANY FIELD SERVICES TECHNICIAN JASON BEGUIN TO MAKE FINAL INSPECTION ON BEHALF OF PIPELINE OWNER.
   EMAIL = JASON.BEGUIN@MAGELLANLP.COM
   PHONE = 918-720-5837
4. GATES THAT OPEN TO COW PASTURE SHALL BE KEPT CLOSED WHEN COWS ARE PRESENT IN THE PASTURE.
5. FENCE MATERIAL INDICATED FOR REMOVAL ON THIS SHEET ONLY SHALL BE DISPOSED OF OR SALVAGED OFFSITE.

ESTIMATED QUANTITIES

IMPROVED ACCESS ROAD = 1,565 LF
CLEARING = 0.27 ACRE

LEGEND

- IMPROVED ACCESS ROAD
- STABILIZED ACCESS ROAD
- DEMOLITION / TREE CLEARING

CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
T10-AR-1	310720.13	2448734.00
T10-AR-2	310677.51	2448736.14
T10-AR-3	310650.21	2448737.51
T10-AR-4	310612.18	2448737.74
T10-AR-5	310574.02	2448737.97
T10-AR-6	310518.04	2448739.96
T10-AR-7	310477.32	2448741.63
T10-AR-8	310424.74	2448746.62
T10-AR-9	310337.76	2448757.23
T10-AR-10	310292.46	2448762.80
T10-AR-11	310255.20	2448766.34
T10-AR-12	310198.71	2448770.34
T10-AR-13	310136.02	2448773.86
T10-AR-14	310103.91	2448775.52
T10-AR-15	310060.47	2448765.87
T10-AR-16	310031.47	2448732.42
T10-AR-17	310003.76	2448646.43
T10-AR-18	309976.04	2448560.45
T10-AR-19	309967.26	2448541.54
T10-AR-20	309954.15	2448525.34
T10-AR-21	309922.92	2448495.23
T10-AR-22	309935.73	2448436.39
T10-AR-23	309981.20	2448475.87
T10-AR-24	309973.32	2448519.16
T10-AR-25	309972.13	2448539.98

CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
PT1-AR-1	310292.70	2448776.16
PT1-AR-2	310293.81	2448836.38
PT1-AR-3	310296.12	2448854.55
PT1-AR-4	310302.27	2448871.81
PT1-AR-5	310327.20	2448923.38
PT1-AR-6	310296.33	2448973.61
PT1-AR-7	310263.64	2448924.55
PT1-AR-8	310287.60	2448869.87
PT1-AR-9	310292.40	2448853.44

0 25 50 100
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL
REGISTERED PROFESSIONAL ENGINEER
STANLEY D. WALLACE
18598
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

TANK 10 & PIT 1 DEMOLITION, CLEARING, AND SITE ACCESS

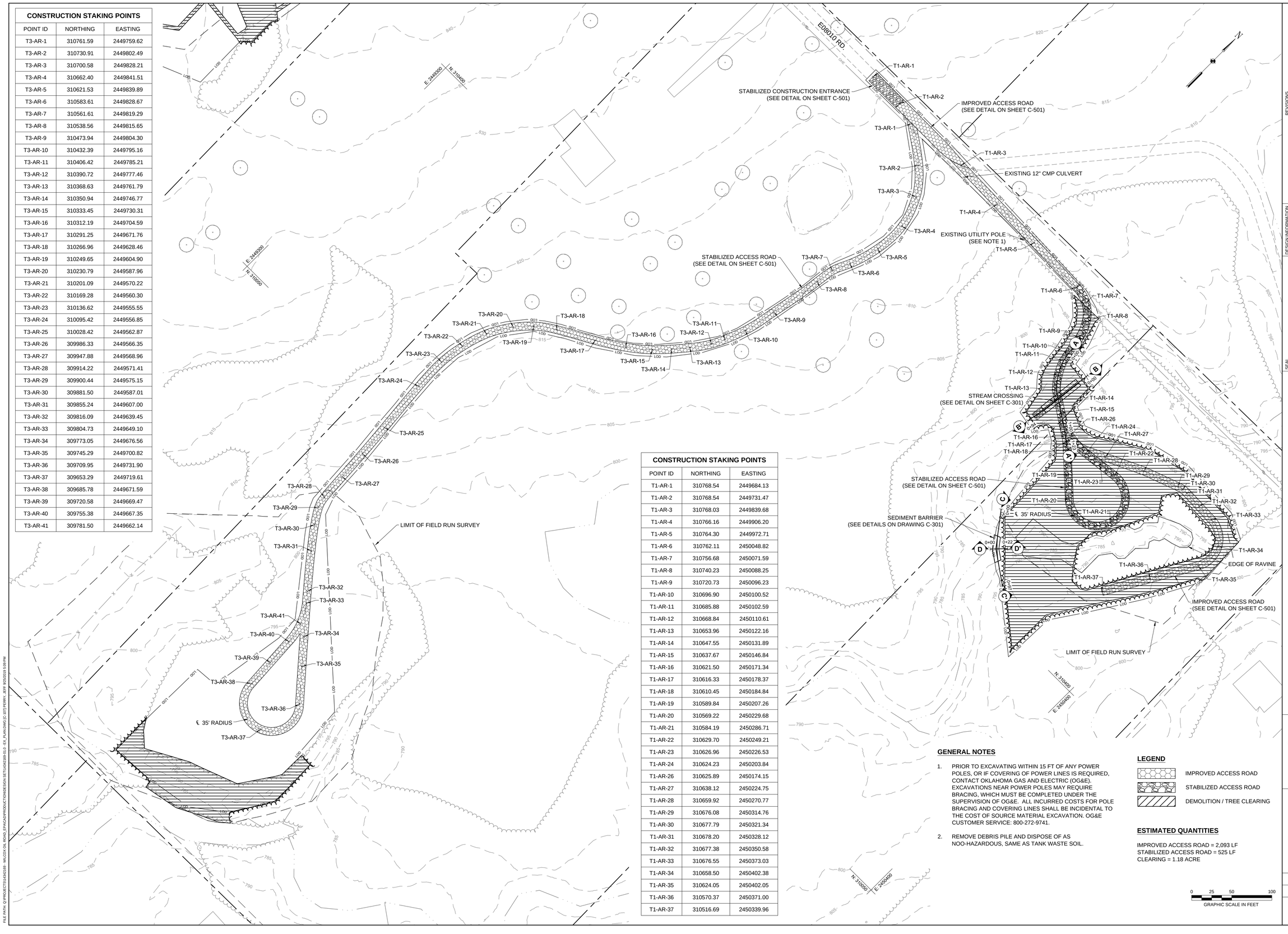
PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019
PROJECT NUMBER: 14342169

C-106
SHEET: 3 OF 21

CONSTRUCTION STAKING POINTS		
POINT ID	NORTHING	EASTING
T3-AR-1	310761.59	2449759.62
T3-AR-2	310730.91	2449802.49
T3-AR-3	310700.58	2449828.21
T3-AR-4	310662.40	2449841.51
T3-AR-5	310621.53	2449839.89
T3-AR-6	310583.61	2449828.67
T3-AR-7	310561.61	2449819.29
T3-AR-8	310538.56	2449815.65
T3-AR-9	310473.94	2449804.30
T3-AR-10	310432.39	2449795.16
T3-AR-11	310406.42	2449785.21
T3-AR-12	310390.72	2449777.46
T3-AR-13	310368.63	2449761.79
T3-AR-14	310350.94	2449746.77
T3-AR-15	310333.45	2449730.31
T3-AR-16	310312.19	2449704.59
T3-AR-17	310291.25	2449671.76
T3-AR-18	310266.96	2449628.46
T3-AR-19	310249.65	2449604.90
T3-AR-20	310230.79	2449587.96
T3-AR-21	310201.09	2449570.22
T3-AR-22	310169.28	2449560.30
T3-AR-23	310136.62	2449555.55
T3-AR-24	310095.42	2449556.85
T3-AR-25	310028.42	2449562.87
T3-AR-26	309986.33	2449566.35
T3-AR-27	309947.88	2449568.96
T3-AR-28	309914.22	2449571.41
T3-AR-29	309900.44	2449575.15
T3-AR-30	309881.50	2449587.01
T3-AR-31	309855.24	2449607.00
T3-AR-32	309816.09	2449639.45
T3-AR-33	309804.73	2449649.10
T3-AR-34	309773.05	2449676.56
T3-AR-35	309745.29	2449700.82
T3-AR-36	309709.95	2449731.90
T3-AR-37	309653.29	2449719.61
T3-AR-38	309685.78	2449671.59
T3-AR-39	309720.58	2449669.47
T3-AR-40	309755.38	2449667.35
T3-AR-41	309781.50	2449662.14



CONSTRUCTION STAKING POINTS		
POINT ID	NORTHING	EASTING
T1-AR-1	310768.54	2449684.13
T1-AR-2	310768.54	2449731.47
T1-AR-3	310768.03	2449839.68
T1-AR-4	310766.16	2449906.20
T1-AR-5	310764.30	2449972.71
T1-AR-6	310762.11	2450048.82
T1-AR-7	310756.68	2450071.59
T1-AR-8	310740.23	2450088.25
T1-AR-9	310720.73	2450096.23
T1-AR-10	310696.90	2450100.52
T1-AR-11	310685.88	2450102.59
T1-AR-12	310668.84	2450110.61
T1-AR-13	310653.96	2450122.16
T1-AR-14	310647.55	2450131.89
T1-AR-15	310637.67	2450146.84
T1-AR-16	310621.50	2450171.34
T1-AR-17	310616.33	2450178.37
T1-AR-18	310610.45	2450184.84
T1-AR-19	310589.84	2450207.26
T1-AR-20	310569.22	2450229.68
T1-AR-21	310584.19	2450286.71
T1-AR-22	310629.70	2450249.21
T1-AR-23	310626.96	2450226.53
T1-AR-24	310624.23	2450203.84
T1-AR-26	310625.89	2450174.15
T1-AR-27	310638.12	2450224.75
T1-AR-28	310659.92	2450270.77
T1-AR-29	310676.08	2450314.76
T1-AR-30	310677.79	2450321.34
T1-AR-31	310678.20	2450328.12
T1-AR-32	310677.38	2450350.58
T1-AR-33	310676.55	2450373.03
T1-AR-34	310658.50	2450402.38
T1-AR-35	310624.05	2450402.05
T1-AR-36	310570.37	2450371.00
T1-AR-37	310516.69	2450339.96

GENERAL NOTES

1. PRIOR TO EXCAVATING WITHIN 15 FT OF ANY POWER POLES, OR IF COVERING OF POWER LINES IS REQUIRED, CONTACT OKLAHOMA GAS AND ELECTRIC (OG&E). EXCAVATIONS NEAR POWER POLES MAY REQUIRE BRACING, WHICH MUST BE COMPLETED UNDER THE SUPERVISION OF OG&E. ALL INCURRED COSTS FOR POLE BRACING AND COVERING LINES SHALL BE INCIDENTAL TO THE COST OF SOURCE MATERIAL EXCAVATION. OG&E CUSTOMER SERVICE: 800-272-9741.
2. REMOVE DEBRIS PILE AND DISPOSE OF AS NOO-HAZARDOUS, SAME AS TANK WASTE SOIL.

LEGEND

- IMPROVED ACCESS ROAD
- STABILIZED ACCESS ROAD
- DEMOLITION / TREE CLEARING

ESTIMATED QUANTITIES

IMPROVED ACCESS ROAD = 2,093 LF
STABILIZED ACCESS ROAD = 525 LF
CLEARING = 1.18 ACRE

0 25 50 100
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT MANAGER:
ND	JAP	SW	PA

SEAL

REGISTERED PROFESSIONAL ENGINEER
STANLEY D. WALLACE
18598
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

TANK 1 & TANK 3 DEMOLITION, CLEARING, AND SITE ACCESS

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019

PROJECT NUMBER: 14342169

C-107

SHEET: 3 OF 21

N: 311500
E: 2450250
McDONALD DR.
US 66
E08010 RD.
STILLWATER CENTRAL RR.
ESTIMATED EXTENT OF EXCAVATION
POND
ACCESS ROAD
STABILIZED CONSTRUCTION ENTRANCE
NORTH TANK FARM (NTF) 1 AREA
(SEE DRAWING C-109)
BENCHMARK
EL. 815.32
N: 310823.68
E: 2447007.50
EXISTING 36" CMP CULVERT
GAS UTILITY EQUIPMENT
(MAGELLAN PIPELINE COMPANY)
UNDERGROUND GAS PIPE LINE
RIGHT-OF-WAY
UNDERGROUND GAS PIPE LINE
GATE
FIRST ASSEMBLY OF
GOD CHURCH
S. 349
TANK 11 AREA
(SEE DRAWING C-112)
PIT 1 AREA
(SEE DRAWING C-115)
EXISTING 12" CMP CULVERT
EXISTING UTILITY POLE
RESERVOIR
TANK 1 AREA
(SEE DRAWING C-117)
COW PASTE
WETLAND
LORRAINE TANK AREA
(SEE DRAWING C-110)
LEAD REMOVAL AREA
(SEE DRAWING C-111)
TANK 10 AREA
(SEE DRAWING C-114)
TANK 12 AREA
(SEE DRAWING C-113)
TANK 3 AREA
(SEE DRAWING C-116)
FLOODPLAIN
(ZONE A)
E. 12th AVE.
E. 11th AVE.
N. CHESTNUT ST.
N. POPLAR ST.
N. HICKORY ST.
N: 309250
E: 2446250
0 75 150 300
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL
STANLEY D. WALLACE 18598 REGISTERED PROFESSIONAL ENGINEER OKLAHOMA
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

EXCAVATION PLAN - KEYMAP

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

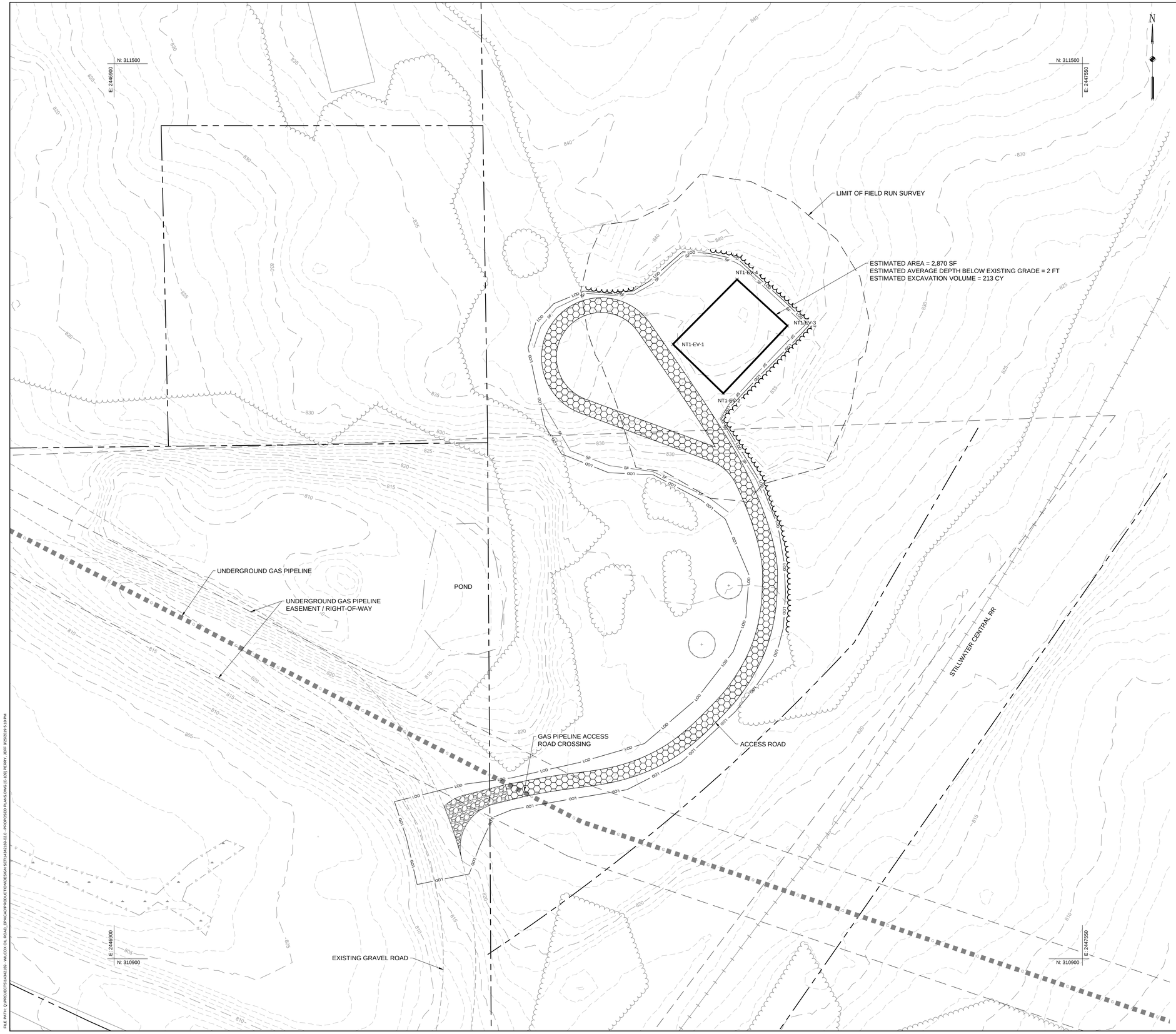
DATE: SEPTEMBER 2019
PROJECT NUMBER: 14342169

C-108
SHEET: 4 OF 21

GENERAL NOTES

1. PIPELINE OWNER: MAGELLAN PIPELINE COMPANY.

CONSTRUCTION STAKING POINTS		
POINT ID	NORTHING	EASTING
NT1-EV-1	311311.82	2447274.95
NT1-EV-2	311278.83	2447308.75
NT1-EV-3	311324.16	2447351.76
NT1-EV-4	311355.22	2447318.00



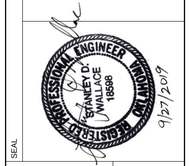
REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT MANAGER:
ND	JAP	SW	PA

SEAL



WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

NORTH TANK FARM 1 EXCAVATION PLAN

PREPARED FOR:

EPA

REGION 6

2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019

PROJECT NUMBER: 14342169

C-109

SHEET: 13 OF 21

N: 310350
E: 2446350

N: 310350
E: 2446800

N

OVERHEAD ELECTRIC LINE AND UTILITY POLES OWNED AND MANAGED BY OKLAHOMA GAS & ELECTRIC.

ACCESS ROAD

LT-EV-1
LT-EV-11
LT-EV-10
LT-EV-2
LT-EV-3
LT-EV-4
LT-EV-9
LT-EV-5
LT-EV-8
LT-EV-7
LT-EV-6

LIMIT OF FIELD RUN SURVEY

PROTECT EXISTING UTILITY POLE (SEE NOTE 5)

FLOODPLAIN (ZONE A)

STILLWATER CENTRAL RR.

ESTIMATED AREA = 5,170 SF
ESTIMATED AVERAGE DEPTH BELOW EXISTING GRADE = 2 FT
ESTIMATED EXCAVATION VOLUME = 380 CY

SAND CREEK

N: 309950
E: 2446350

N: 309950
E: 2446800

GENERAL NOTES

1. MATERIALS STOCKPILED WITHIN THE FLOODPLAIN MUST BE REMOVED PRIOR TO PROJECT COMPLETION.
2. DO NOT FILL OR PLACE ANY STOCKPILE MATERIAL WITHIN THE LIMITS OF THE WETLAND.
3. PROVIDE A VEGETATIVE BUFFER OR SILT FENCING TO PREVENT SEDIMENT FROM BEING TRANSPORTED OFFSITE.
4. COMPLY WITH ALL TERMS OF U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT 38.
5. PRIOR TO EXCAVATING WITHIN 15 FT OF ANY POWER POLES, OR IF COVERING OF POWER LINES IS REQUIRED, CONTACT OKLAHOMA GAS AND ELECTRIC (OG&E). EXCAVATIONS NEAR POWER POLES MAY REQUIRE BRACING, WHICH MUST BE COMPLETED UNDER THE SUPERVISION OF OG&E. ALL INCURRED COSTS FOR POLE BRACING AND COVERING LINES SHALL BE INCIDENTAL TO THE COST OF SOURCE MATERIAL EXCAVATION. OG&E CUSTOMER SERVICE: 800-272-9741.

CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
LT-EV-1	310201.95	2446563.13
LT-EV-2	310171.40	2446555.32
LT-EV-3	310162.16	2446539.69
LT-EV-4	310131.61	2446530.45
LT-EV-5	310094.67	2446540.40
LT-EV-6	310052.04	2446553.19
LT-EV-7	310058.43	2446526.19
LT-EV-8	310074.06	2446507.01
LT-EV-9	310116.69	2446502.74
LT-EV-10	310173.53	2446503.45
LT-EV-11	310194.13	2446521.22

0 10 20 40
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL

REGISTERED PROFESSIONAL ENGINEER
STANLEY D. WALLACE
18598
OKLAHOMA
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

LORRAINE TANK EXCAVATION PLAN

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

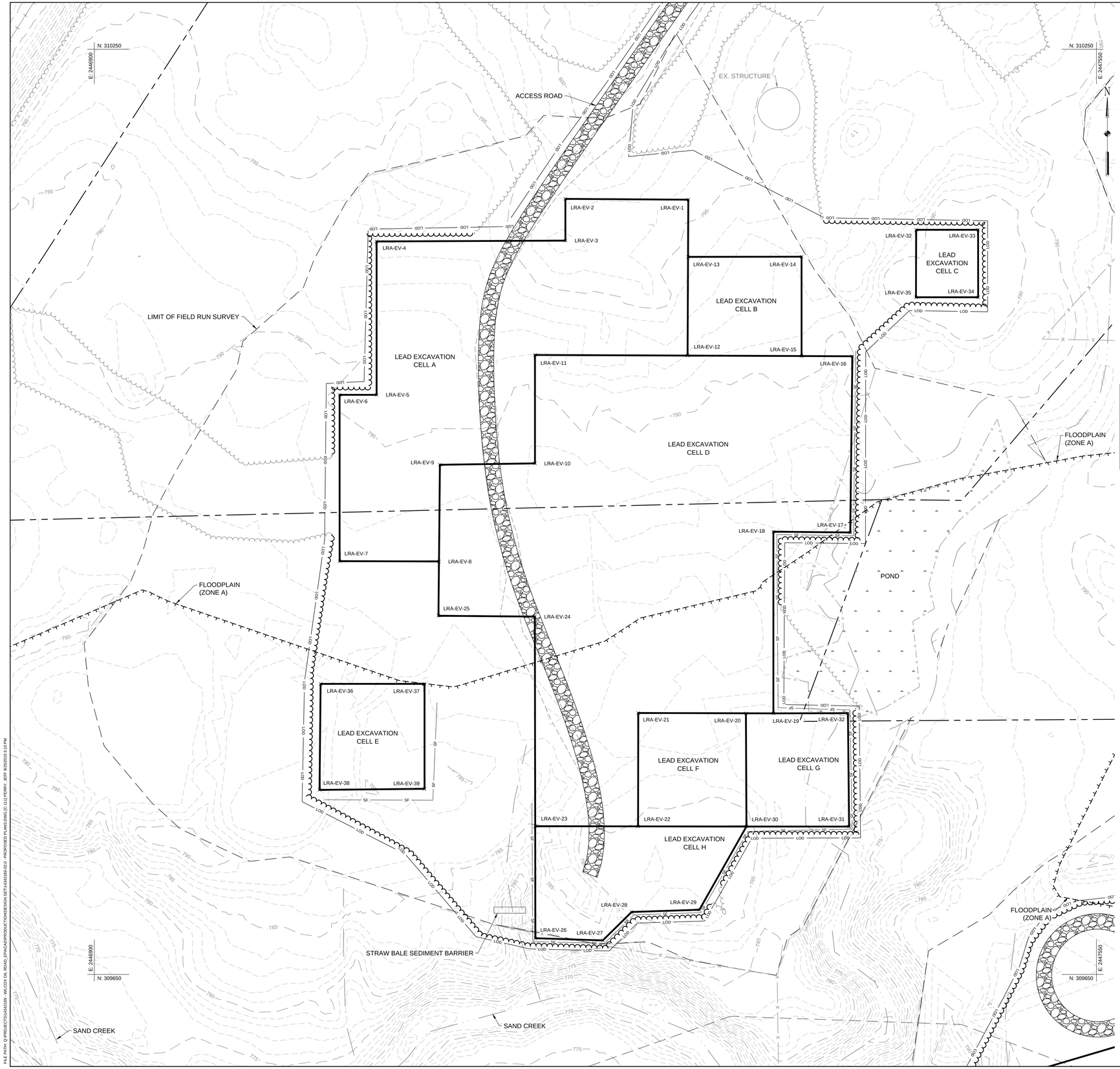
EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019

PROJECT NUMBER: 14342169

C-110

SHEET: 12 OF 21



GENERAL NOTES

1. REMOVE THE FOLLOWING WITHIN THE PROPOSED LEAD REMOVAL AREA FOOTPRINT:
   a. CONCRETE FOUNDATIONS WITH EMBEDDED METAL, AND OTHER CONCRETE OR METAL DEBRIS AT OR NEAR THE SOIL SURFACE, AS DEFINED IN SECTION 02 41 00 - DEMOLITION AND RESTORATION OF SITE FEATURES.
   b. TREES AND BRUSH, AS DEFINED IN SECTION 31 10 00 - SITE CLEARING.
2. MATERIALS STOCKPILED WITHIN THE FLOODPLAIN MUST BE REMOVED PRIOR TO PROJECT COMPLETION.
3. DO NOT FILL OR PLACE ANY STOCKPILE MATERIAL WITHIN THE LIMITS OF THE WETLAND.
4. PROVIDE A VEGETATIVE BUFFER OR SILT FENCING TO PREVENT FROM BEING DEPOSITED IN THE WETLAND.
5. COMPLY WITH ALL TERMS OF U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT 38.
6. PROTECT ALL EXISTING WATERWAYS FROM SEDIMENT DEPOSITION USING SILT FENCE OR VEGETATIVE BUFFERS.
7. WHERE TEMPORARY ACCESS ROADS INTERSECT EXCAVATION AREAS, THE CONTRACTOR SHALL INSTALL THE ACCESS ROAD WITHOUT DISPLACING THE SOIL TO BE EXCAVATED. THE EXCAVATION SHALL TAKE PLACE FROM THE FARTHEST LOCATION TO THE NEAREST LOCATION, SUCH THAT THE ROAD CAN BE USED TO ACCESS THE FARTHEST AREAS, THEN DISMANTLED AS EXCAVATION PROGRESSES. PROCEDURE FOR INSTALLING AND REMOVING TEMPORARY ACCESS ROADS OVER EXCAVATION AREAS:
   a. PROTECT UTILITY LOCATION MARKINGS OR OTHERWISE PRESERVE THE LOCATIONS SO THEY MAY BE REMARKED AFTER BEING COVERED UP.
   b. COMPLETE CLEARING AND GRUBBING.
   c. WITHOUT DISTURBING THE SURFACE OF THE EXCAVATION AREA, PLACE GEOTEXTILE OVER THE AREA WHERE THE TEMPORARY ACCESS ROUTE WILL BE INSTALLED.
   d. INSTALL ON SITE ACCESS ROADS, IN ACCORDANCE WITH ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.
   e. ONCE WORK HAS PROGRESSED, REMOVE AGGREGATE AND GEOTEXTILE FROM EXCAVATION AREAS. REMARK UTILITIES, AS NECESSARY.
   f. REMOVE ONLY ENOUGH ACCESS ROAD MATERIAL TO ACCESS THE NEXT EXCAVATION CELL OR SUBAREA.

EXCAVATION CELL ID	A	B	C	D	E	F	G	H	TOTAL
DEPTH OF EXCAVATION (INCHES)	6	8	6	24	6	12	6	18	N/A
AREA OF EXCAVATION (SQUARE FEET)	29,485	4,755	1,761	52,614	4,631	5,140	4,873	7,648	110,907
VOLUME OF EXCAVATION (CUBIC YARD)	546	117	33	3,897	86	190	90	425	5,385
WEIGHT OF EXCAVATED SOIL* (TON)	803	173	48	5,729	126	280	133	625	7,915
WEIGHT OF REAGENT REQUIRED (TON)	41	9	3	287	7	14	7	32	400
* NOTE: WEIGHT OF EXCAVATED SOIL BASED ON PRELIMINARY TESTING SHOWING BULK DENSITY OF SOIL = 1.47 TON / CY									

CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
LRA-EV-1	310152.61	2447284.93
LRA-EV-2	310153.13	2447205.25
LRA-EV-3	310126.05	2447205.25
LRA-EV-4	310125.53	2447082.85
LRA-EV-5	310026.05	2447082.85
LRA-EV-6	310026.05	2447058.89
LRA-EV-7	309918.23	2447058.89
LRA-EV-8	309918.05	2447123.30
LRA-EV-9	309980.74	2447123.90
LRA-EV-10	309981.61	2447185.53
LRA-EV-11	310051.92	2447185.53
LRA-EV-12	310051.52	2447284.48
LRA-EV-13	310115.53	2447284.77
LRA-EV-14	310115.63	2447358.37
LRA-EV-15	310051.22	2447358.37
LRA-EV-16	310051.09	2447391.34
LRA-EV-17	309936.83	2447389.93
LRA-EV-18	309937.35	2447340.10
LRA-EV-19	309819.55	2447340.10
LRA-EV-20	309819.51	2447322.29

CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
LRA-EV-21	309819.80	2447252.50
LRA-EV-22	309746.26	2447252.37
LRA-EV-23	309746.36	2447185.67
LRA-EV-24	309882.30	2447185.46
LRA-EV-25	309882.82	2447122.96
LRA-EV-26	309673.75	2447185.78
LRA-EV-27	309672.33	2447229.45
LRA-EV-28	309690.76	2447248.24
LRA-EV-29	309692.19	2447292.12
LRA-EV-30	309746.16	2447322.64
LRA-EV-31	309746.14	2447389.19
LRA-EV-32	310133.08	2447432.67
LRA-EV-32	309819.66	2447388.44
LRA-EV-33	310133.09	2447472.82
LRA-EV-34	310089.32	2447472.86
LRA-EV-35	310089.34	2447432.55
LRA-EV-36	309838.67	2447046.56
LRA-EV-37	309838.67	2447113.92
LRA-EV-38	309769.92	2447045.86
LRA-EV-39	309770.61	2447113.92

0 15 30 60
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL

PROFESSIONAL ENGINEER
STANLEY D. WALLACE
18598
REGISTERED
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

LEAD REMOVAL AREA EXCAVATION PLAN

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019

PROJECT NUMBER: 14342169

C-111

SHEET: 11 OF 21

GENERAL NOTES

1. BURIED NATURAL GAS SERVICE LINE SERVES OKLAHOMA NATURAL GAS (ONG).
2. PROTECT ALL EXISTING WATERWAYS FROM SEDIMENT DEPOSITION USING SILT FENCE OR VEGETATIVE BUFFERS.
3. WHERE TEMPORARY ACCESS ROADS INTERSECT EXCAVATION AREAS, THE CONTRACTOR SHALL INSTALL THE ACCESS ROAD WITHOUT DISPLACING THE SOIL TO BE EXCAVATED. THE EXCAVATION SHALL TAKE PLACE FROM THE FARTHEST LOCATION TO THE NEAREST LOCATION, SUCH THAT THE ROAD CAN BE USED TO ACCESS THE FARTHEST AREAS, THEN DISMANTLED AS EXCAVATION PROGRESSES. PROCEDURE FOR INSTALLING AND REMOVING TEMPORARY ACCESS ROADS OVER EXCAVATION AREAS:
   a. PROTECT UTILITY LOCATION MARKINGS OR OTHERWISE PRESERVE THE LOCATIONS SO THEY MAY BE REMARKED AFTER BEING COVERED UP.
   b. COMPLETE CLEARING AND GRUBBING.
   c. WITHOUT DISTURBING THE SURFACE OF THE EXCAVATION AREA, PLACE GEOTEXTILE OVER THE AREA WHERE THE TEMPORARY ACCESS ROUTE WILL BE INSTALLED.
   d. INSTALL ON SITE ACCESS ROADS, IN ACCORDANCE WITH ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.
   e. ONCE WORK HAS PROGRESSED, REMOVE AGGREGATE AND GEOTEXTILE FROM EXCAVATION AREAS. REMARK UTILITIES, AS NECESSARY.
   f. REMOVE ONLY ENOUGH ACCESS ROAD MATERIAL TO ACCESS THE NEXT EXCAVATION CELL OR SUBAREA.

CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
T11-EV-1	310035.21	2447748.71
T11-EV-2	310070.47	2447809.09
T11-EV-3	310114.39	2447801.22
T11-EV-4	310203.65	2447755.92
T11-EV-5	310216.66	2447719.39
T11-EV-6	310183.14	2447702.26
T11-EV-7	310124.48	2447716.05
T11-EV-8	310082.45	2447702.75
T11-EV-9	310046.20	2447711.58

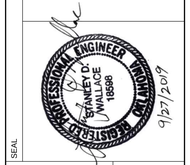
REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT MANAGER:
ND	JAP	SW	PA

SEAL



WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

TANK 11 EXCAVATION PLAN

PREPARED FOR:

EPA

REGION 6

2101 Elm Street, Suit 500
Dallas, Texas 75270

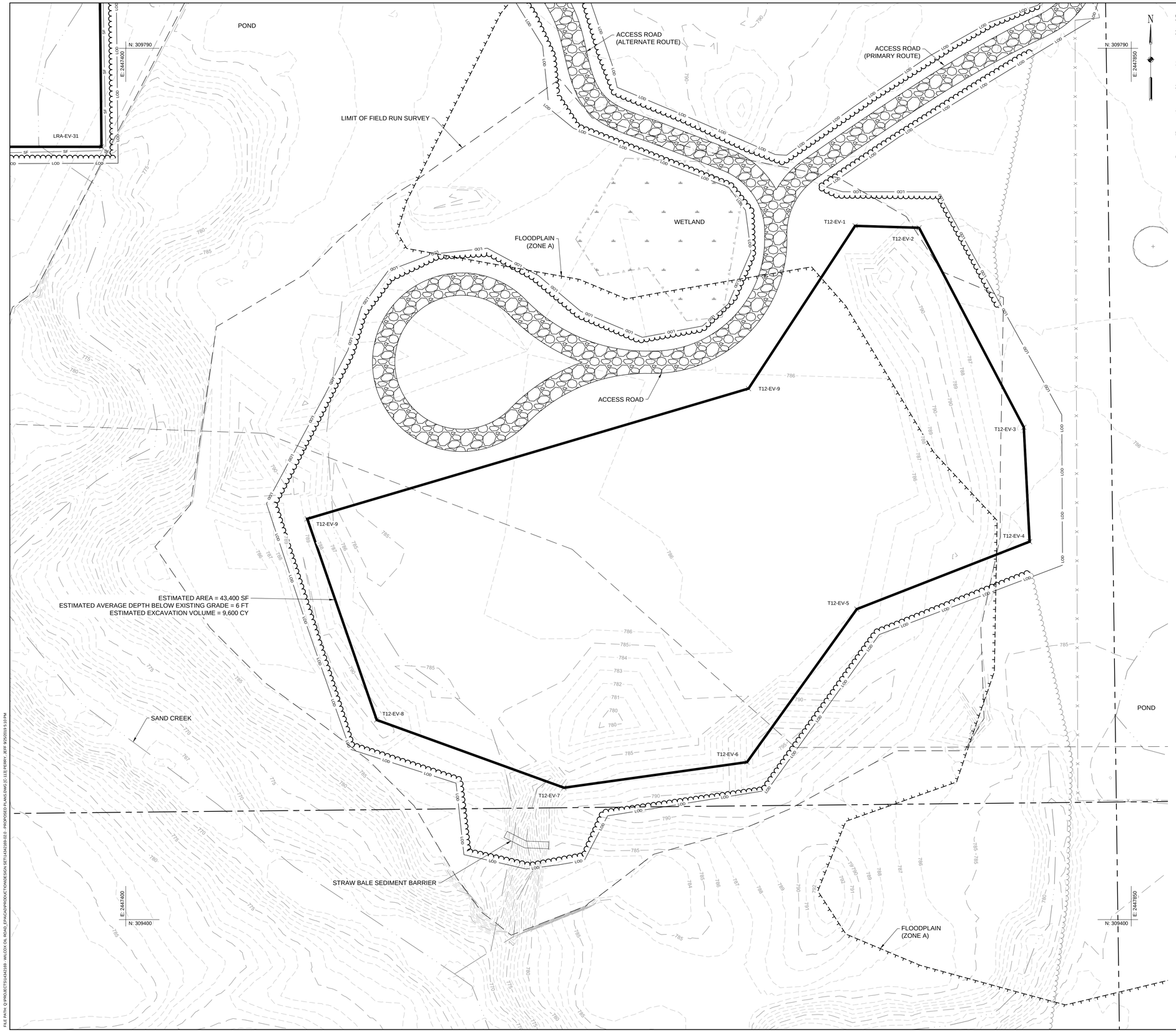
EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019

PROJECT NUMBER: 14342169

C-112

SHEET: 9 OF 21



GENERAL NOTES

1. CONSTRUCT ACCESS ROUTE ALONG PRIMARY ACCESS ROUTE ONLY, UNLESS APPROVAL FOR USING SECONDARY ACCESS ROUTE IS GIVEN BY ENGINEER.
2. MATERIALS STOCKPILED WITHIN THE FLOODPLAIN MUST BE REMOVED PRIOR TO PROJECT COMPLETION.
3. DO NOT FILL OR PLACE ANY STOCKPILE MATERIAL WITHIN THE LIMITS OF THE WETLAND.
4. PROVIDE A VEGETATIVE BUFFER OR SILT FENCING TO PREVENT SEDIMENT FROM BEING DEPOSITED IN THE WETLAND.
5. COMPLY WITH ALL TERMS OF U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT 38.
6. GATES THAT OPEN TO COW PASTURE SHALL BE KEPT CLOSED WHEN COWS ARE PRESENT IN THE PASTURE.

CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
T12-EV-1	309710.73	2447726.66
T12-EV-2	309709.87	2447755.31
T12-EV-3	309620.46	2447802.18
T12-EV-4	309569.24	2447804.78
T12-EV-5	309539.03	2447727.42
T12-EV-6	309470.46	2447678.22
T12-EV-7	309459.00	2447596.28
T12-EV-8	309489.37	2447512.43
T12-EV-9	309637.82	2447678.92
T12-EV-9	309579.48	2447481.35

0 10 20 40
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL
REGISTERED PROFESSIONAL ENGINEER STANLEY D. WALLACE 18598 OKLAHOMA
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

TANK 12 EXCAVATION PLAN

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019
PROJECT NUMBER: 14342169

C-113
SHEET: 10 OF 21

GENERAL NOTES

1. GATES THAT OPEN TO COW PASTURE SHALL BE KEPT CLOSED WHEN COWS ARE PRESENT IN THE PASTURE.

N: 310250
E: 2448950

N: 310250
E: 2448700

LIMIT OF FIELD RUN SURVEY

UNDERGROUND GAS PIPELINE

UNDERGROUND GAS PIPELINE
EASEMENT / RIGHT-OF-WAY

UNDERGROUND GAS PIPELINE
ACCESS ROAD CROSSING

ACCESS ROAD

T10-EV-1
T10-EV-2
T10-EV-3
T10-EV-4
T10-EV-5
T10-EV-6
T10-EV-7
T10-EV-8
T10-EV-9
T10-EV-10

ESTIMATED AREA = 48,500 SF
ESTIMATED AVERAGE DEPTH BELOW EXISTING GRADE = 3 FT
ESTIMATED EXCAVATION VOLUME = 5,400 CY

N: 309650
E: 2448950

N: 309650
E: 2448700

0 15 30 60
GRAPHIC SCALE IN FEET

CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
T10-EV-1	309930.74	2448428.57
T10-EV-2	309882.23	2448409.56
T10-EV-3	309856.30	2448380.89
T10-EV-4	309833.75	2448327.71
T10-EV-5	309846.43	2448233.43
T10-EV-6	309877.77	2448192.41
T10-EV-7	309951.73	2448155.85
T10-EV-8	310025.36	2448166.41
T10-EV-9	310084.01	2448207.47
T10-EV-10	310107.39	2448266.67

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT MANAGER:
ND	JAP	SW	PA

SEAL

PROFESSIONAL ENGINEER
REGISTERED
STANLEY D. WALLACE
18598
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

TANK 10 EXCAVATION PLAN

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

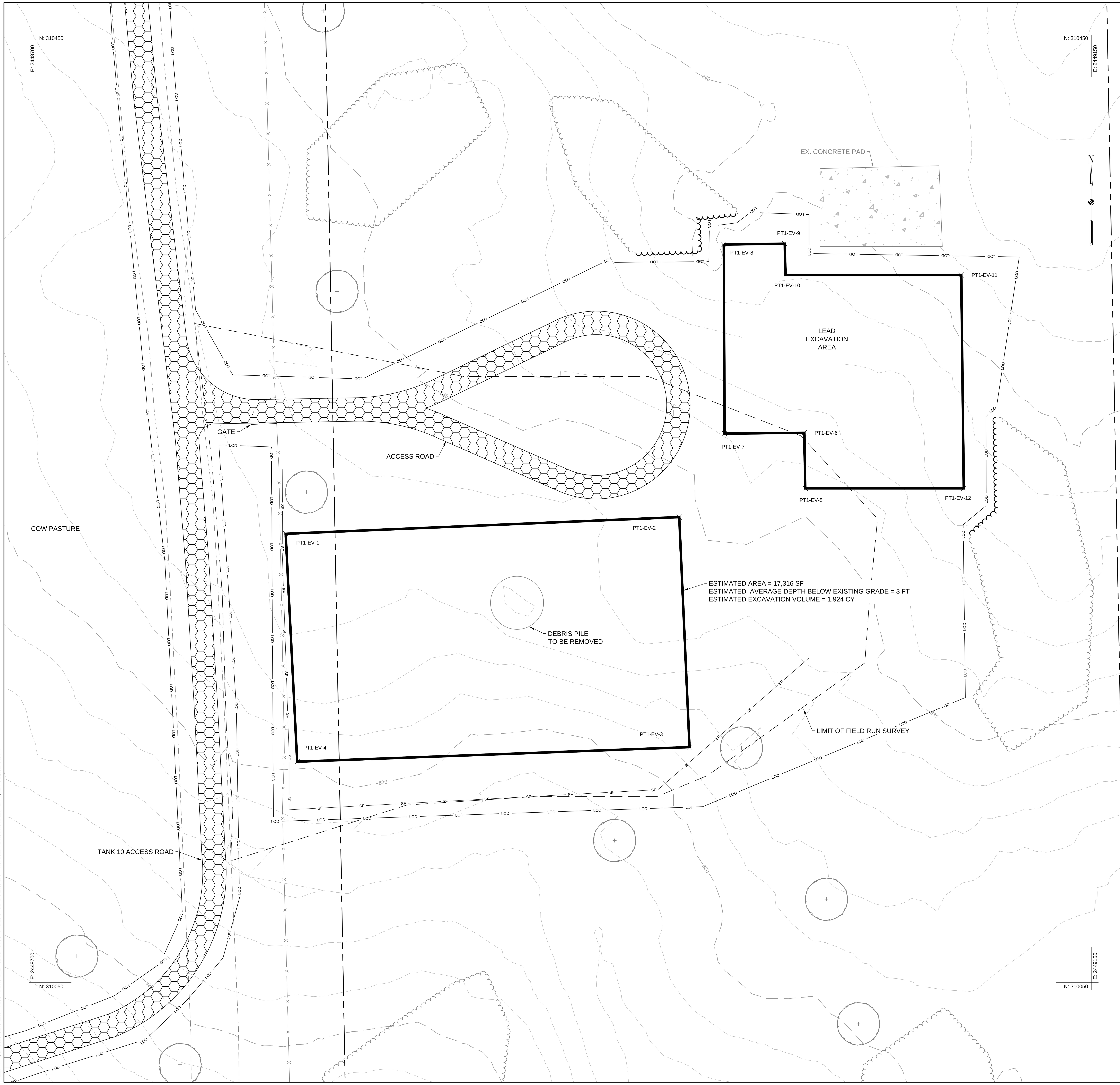
EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019

PROJECT NUMBER: 14342169

C-114

SHEET: 8 OF 21



ESTIMATED AREA NOTES

1. REMOVE DEBRIS PILE AND DISPOSE OF AS NON-HAZARDOUS. PAYMENT FOR EXCAVATION VOLUME WILL BE MEASURED BASED ON BULK VOLUME OF DEBRIS AND PAID AT THE SAME RATE AS TANK WASTE EXCAVATION. PAYMENT FOR DISPOSAL WILL BY MEASURED BASED ON WEIGHT AND PAID AT THE SAME RATE AS TANK WASTE DISPOSAL.
2. GATES THAT OPEN TO COW PASTURE SHALL BE KEPT CLOSED WHEN COWS ARE PRESENT IN THE PASTURE.
3. FENCE MATERIAL INDICATED FOR REMOVAL ON THIS SHEET ONLY SHALL BE DISPOSED OF OR SALVAGED OFFSITE.
4. REMOVE DEBRIS PILE AND DISPOSE OF AS NON-HAZARDOUS. PAYMENT FOR EXCAVATION VOLUME WILL BE MEASURED BASED ON BULK VOLUME OF DEBRIS. PAYMENT FOR DISPOSAL WILL BY MEASURED BASED ON WEIGHT AND PAID AT THE SAME RATE AS TANK WASTE DISPOSAL.

LEAD EXCAVATION AREA NOTES

1. REMOVE THE FOLLOWING WITHIN THE PROPOSED PIT 1 LEAD REMOVAL AREA FOOTPRINT:
   a. CONCRETE FOUNDATIONS WITH EMBEDDED METAL, AND OTHER CONCRETE OR METAL DEBRIS AT OR NEAR THE SOIL SURFACE, AS DEFINED IN SECTION 02 41 00 - DEMOLITION AND RESTORATION OF SITE FEATURES.
   b. TREES AND BRUSH, AS DEFINED IN SECTION 31 10 00 - SITE CLEARING.
2. MATERIALS STOCKPILED WITHIN THE FLOODPLAIN MUST BE REMOVED PRIOR TO PROJECT COMPLETION.
3. DO NOT FILL OR PLACE ANY STOCKPILE MATERIAL WITHIN THE LIMITS OF THE WETLAND.
4. PROVIDE A VEGETATIVE BUFFER OR SILT FENCING TO PREVENT FROM BEING DEPOSITED IN THE WETLAND.
5. COMPLY WITH ALL TERMS OF U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT 38.
6. PROTECT ALL EXISTING WATERWAYS FROM SEDIMENT DEPOSITION USING SILT FENCE OR VEGETATIVE BUFFERS.
7. WHERE TEMPORARY ACCESS ROADS INTERSECT EXCAVATION AREAS, THE CONTRACTOR SHALL INSTALL THE ACCESS ROAD WITHOUT DISPLACING THE SOIL TO BE EXCAVATED. THE EXCAVATION SHALL TAKE PLACE FROM THE FARTHEST LOCATION TO THE NEAREST LOCATION, SUCH THAT THE ROAD CAN BE USED TO ACCESS THE FARTHEST AREAS, THEN DISMANTLED AS EXCAVATION PROGRESSES. PROCEDURE FOR INSTALLING AND REMOVING TEMPORARY ACCESS ROADS OVER EXCAVATION AREAS:
   a. PROTECT UTILITY LOCATION MARKINGS OR OTHERWISE PRESERVE THE LOCATIONS SO THEY MAY BE REMARKED AFTER BEING COVERED UP.
   b. COMPLETE CLEARING AND GRUBBING.
   c. WITHOUT DISTURBING THE SURFACE OF THE EXCAVATION AREA, PLACE GEOTEXTILE OVER THE AREA WHERE THE TEMPORARY ACCESS ROUTE WILL BE INSTALLED.
   d. INSTALL ON SITE ACCESS ROADS, IN ACCORDANCE WITH ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.
   e. ONCE WORK HAS PROGRESSED, REMOVE AGGREGATE AND GEOTEXTILE FROM EXCAVATION AREAS. REMARK UTILITIES, AS NECESSARY.
   f. REMOVE ONLY ENOUGH ACCESS ROAD MATERIAL TO ACCESS THE NEXT EXCAVATION CELL OR SUBAREA.

PIT 1 LEAD EXCAVATION AREA	
DEPTH OF EXCAVATION (INCHES)	12
AREA OF EXCAVATION (SQUARE FEET)	8,770
VOLUME OF EXCAVATION (CUBIC YARD)	327
WEIGHT OF EXCAVATED SOIL* (TON)	481
WEIGHT OF REAGENT REQUIRED (TON)	65

* NOTE: WEIGHT OF EXCAVATED SOIL BASED ON PRELIMINARY TESTING SHOWING BULK DENSITY OF SOIL = 1.47 TON / CY

CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
PT1-EV-1	310240.84	2448806.23
PT1-EV-2	310247.95	2448973.98
PT1-EV-3	310149.94	2448978.36
PT1-EV-4	310143.73	2448811.13
PT1-EV-5	310260.21	2449027.69
PT1-EV-6	310283.86	2449027.26
PT1-EV-7	310283.53	2448993.30
PT1-EV-8	310364.11	2448992.97
PT1-EV-9	310364.44	2449018.94
PT1-EV-10	310351.12	2449019.27
PT1-EV-11	310351.12	2449094.19
PT1-EV-12	310260.21	2449095.25

0 10 20 40
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL
REGISTERED PROFESSIONAL ENGINEER OKLAHOMA
STANLEY D. WALLACE
18586
9/27/2019

WILCOX OIL SUPERFUND SITE SOURCE CONTROL EARLY/INTERIM ACTION REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

PIT 1 EXCAVATION PLAN

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019
PROJECT NUMBER: 14342169

C-115

SHEET: 7 OF 21

N: 309900
E: 2449400

ACCESS ROAD

LIMIT OF FIELD RUN SURVEY

N: 309900
E: 2449900

ESTIMATED AREA = 12,200 SF
ESTIMATED AVERAGE DEPTH BELOW EXISTING GRADE = 8 FT
ESTIMATED EXCAVATION VOLUME = 3,600 CY

T3-EV-1
T3-EV-2
T3-EV-3
T3-EV-4
T3-EV-5
T3-EV-6
T3-EV-7
T3-EV-8
T3-EV-9

EAST TRIBUTARY

RESERVOIR

N: 309500
E: 2449400

N: 309500
E: 2449900

CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
T3-EV-1	309653.60	2449747.92
T3-EV-2	309654.93	2449784.85
T3-EV-3	309606.76	2449786.58
T3-EV-4	309559.45	2449757.50
T3-EV-5	309530.37	2449723.21
T3-EV-6	309522.37	2449672.10
T3-EV-7	309519.08	2449619.05
T3-EV-8	309575.61	2449619.68
T3-EV-9	309583.56	2449682.17

0 10 20 40
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL
PROFESSIONAL ENGINEER REGISTERED STANLEY D. WALLACE 18598
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

TANK 3 EXCAVATION PLAN

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019

PROJECT NUMBER: 14342169

C-116

SHEET: 6 OF 21

GENERAL NOTES

1. WHERE TEMPORARY ACCESS ROADS INTERSECT EXCAVATION AREAS, THE CONTRACTOR SHALL INSTALL THE ACCESS ROAD WITHOUT DISPLACING THE MATERIAL TO BE EXCAVATED. THE EXCAVATION SHALL TAKE PLACE FROM THE FARTHEST LOCATION TO THE NEAREST LOCATION, SUCH THAT THE ROAD CAN BE USED TO ACCESS THE FARTHEST AREAS, THEN DISMANTLED AS EXCAVATION PROGRESSES. PROCEDURE FOR INSTALLING AND REMOVING TEMPORARY ACCESS ROADS OVER EXCAVATION AREAS:

   a. PROTECT UTILITY LOCATION MARKINGS OR OTHERWISE PRESERVE THE LOCATIONS SO THEY MAY BE REMARKED AFTER BEING COVERED UP.

   b. COMPLETE CLEARING AND GRUBBING.

   c. WITHOUT DISTURBING THE SURFACE OF THE EXCAVATION AREA, PLACE GEOTEXTILE OVER THE AREA WHERE THE TEMPORARY ACCESS ROUTE WILL BE INSTALLED.

   d. INSTALL ON SITE ACCESS ROADS, IN ACCORDANCE WITH ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.

   e. ONCE WORK HAS PROGRESSED, REMOVE AGGREGATE AND GEOTEXTILE FROM EXCAVATION AREAS. REMARK UTILITIES, AS NECESSARY.

   f. REMOVE ONLY ENOUGH ACCESS ROAD MATERIAL TO ACCESS THE NEXT EXCAVATION CELL OR SUBAREA.

CONSTRUCTION STAKING POINTS

POINT ID	NORTHING	EASTING
T1-EV-1	310603.01	2450192.97
T1-EV-2	310598.78	2450268.09
T1-EV-3	310530.01	2450269.15
T1-EV-4	310484.52	2450303.01
T1-EV-5	310407.28	2450300.89
T1-EV-6	310448.54	2450249.05
T1-EV-7	310500.39	2450198.26

ESTIMATED AREA = 12,500 SF
ESTIMATED AVERAGE DEPTH BELOW EXISTING GRADE = 3 FT
ESTIMATED EXCAVATION VOLUME = 1,400 CY

0 10 20 40
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL
REGISTERED PROFESSIONAL ENGINEER
STANLEY D. WALLACE
18598
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN
CREEK COUNTY, OKLAHOMA

TANK 1 EXCAVATION PLAN

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

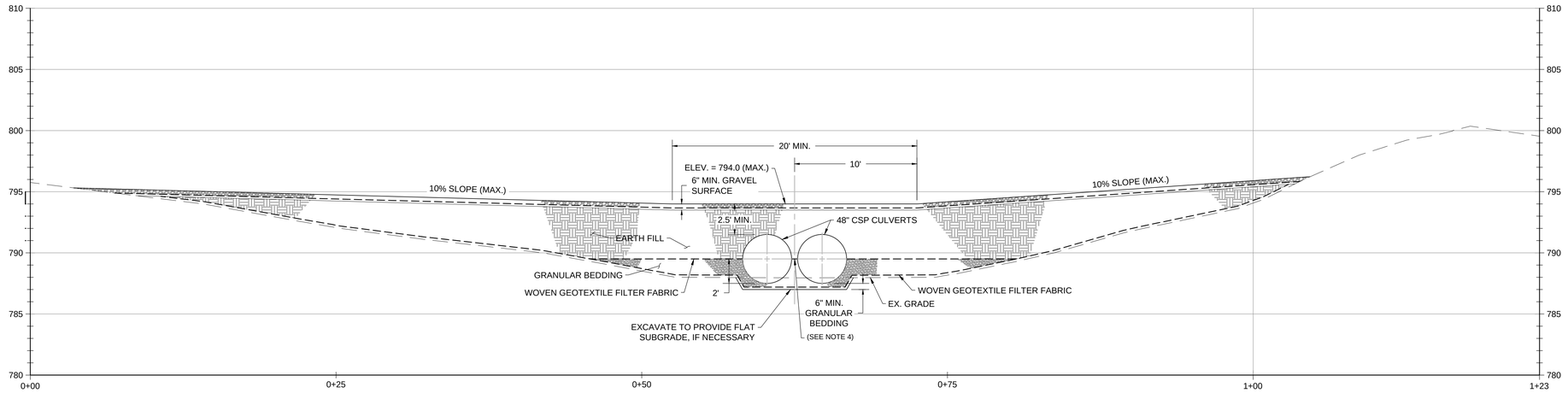
EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019

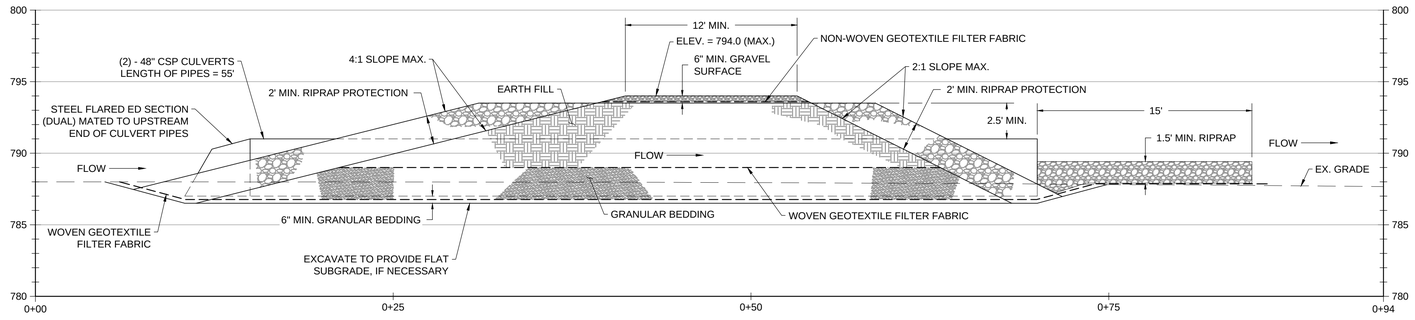
PROJECT NUMBER: 14342169

C-117

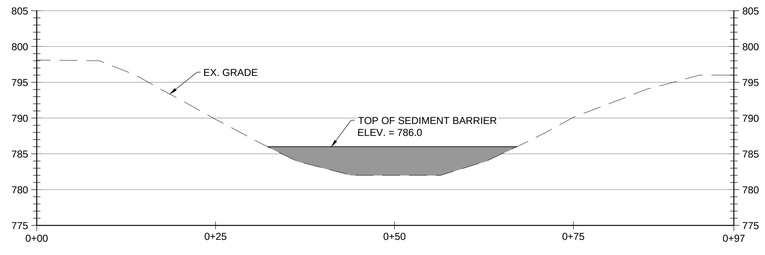
SHEET: 5 OF 21



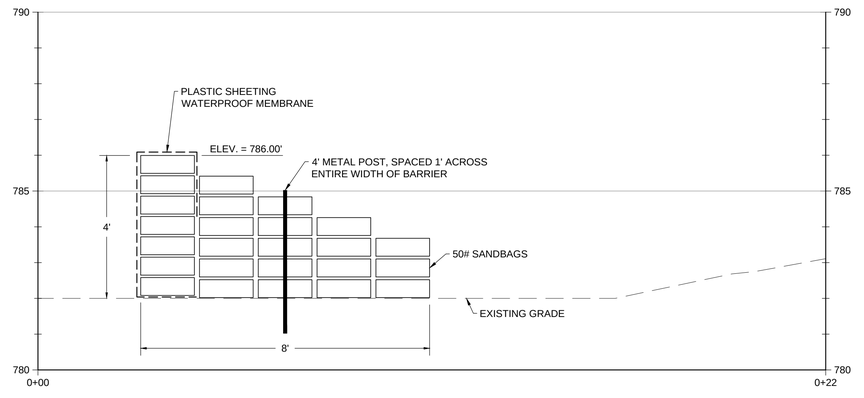
A-A' STREAM CROSSING PROFILE
HORIZONTAL SCALE: 1"=5'
VERTICAL SCALE 1"=5'



B-B' STREAM CROSSING PROFILE
HORIZONTAL SCALE: 1"=5'
VERTICAL SCALE 1"=5'



C-C' TANK 1 AREA SEDIMENT BARRIER PROFILE
HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE 1"=10'



D-D' TANK 1 AREA SEDIMENT BARRIER PROFILE
HORIZONTAL SCALE: 1"=2'
VERTICAL SCALE 1"=2'

STREAM CROSSING (PROFILES A-A' & B-B') NOTES

1. CULVERT SLOPE SHALL MATCH THE EXISTING STREAM SLOPE.
2. EARTH FILL SHALL BE IMPORTED CLEAN BACKFILL. SEE SECTION 31 23 23 - FILL.
3. 6" GRAVEL SURFACE TO MATCH SURFACE AGGREGATE OF ACCESS ROADS
4. SPACING BETWEEN CULVERTS SHALL BE AS REQUIRED FOR FLARED END SECTION (DUAL) INSTALLATION.

ESTIMATED QUANTITIES FOR SEDIMENT BARRIER:

13 TONS SAND IN POLY BAGS
150 SQ. FT. PLASTIC SHEETING
35 METAL POSTS

0 5 10 20
GRAPHIC SCALE IN FEET

0 2.5 5 10
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION
DESIGNED BY: ND
DRAWN BY: JAP
CHECKED BY: SW
PROJECT MANAGER: PA

SEAL
PROFESSIONAL ENGINEER
STANLEY D. WALLACE
18598
REGISTERED
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN

CREEK COUNTY, OKLAHOMA

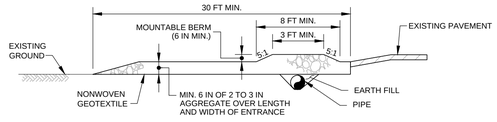
PROFILES

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

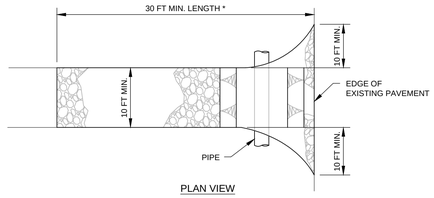
EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019
PROJECT NUMBER: 14342169

C-301
SHEET: 14 OF 21

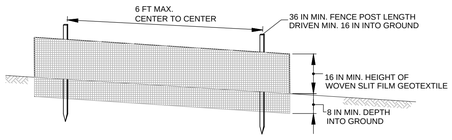


PROFILE

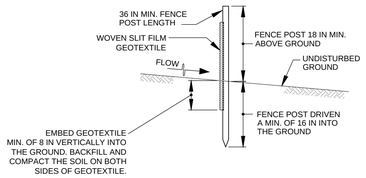


PLAN VIEW

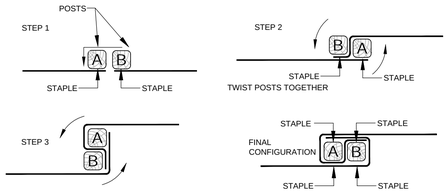
STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



ELEVATION

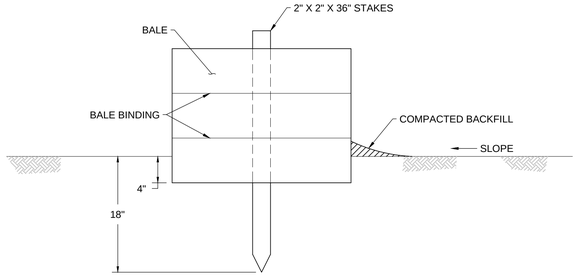


CROSS SECTION



JOINING TWO ADJACENT SILT
FENCE SECTIONS (TOP VIEW)

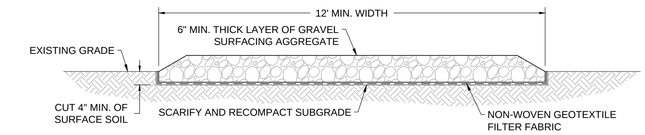
SILT FENCE
NOT TO SCALE



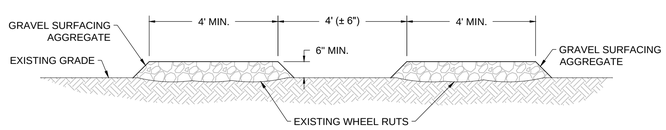
STRAW BALE BARRIERS
NOT TO SCALE

STRAW BALE BARRIERS NOTES

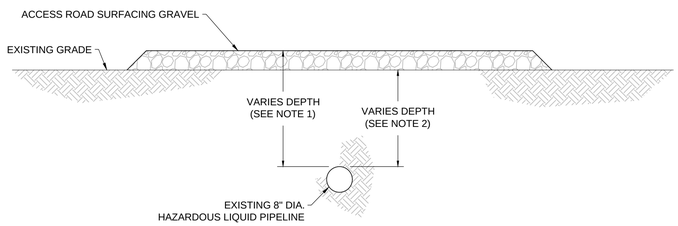
1. STRAW BALE BARRIERS SHOULD NOT BE USED FOR MORE THAN 3 MONTHS.
2. STRAW BALE BARRIERS SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.
3. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE ABOVE GROUND HEIGHT OF THE BARRIER.
4. ANY SECTION OF STRAW BALE BARRIER WHICH HAS BEEN UNDERMINED OR TOPPED SHALL BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET.



STABILIZED ACCESS ROAD
NOT TO SCALE



IMPROVED ACCESS ROAD
NOT TO SCALE



GAS PIPELINE CROSSING
NOT TO SCALE

GAS PIPELINE CROSSING

1. MINIMUM TOTAL COVER FOR CROSSING SHALL BE 3 FEET. REPLACE SURFACING GRAVEL, AS NECESSARY, TO MAINTAIN MINIMUM TOTAL COVER FOR DURATION OF THE PROJECT.
2. DEPTH TO PIPELINE WAS BEEN MEASURED BY J. BEGUIN (MAGELLAN PIPELINE COMPANY) ON JULY 9, 2019.
3. PRIOR TO COMPLETION OF GAS PIPELINE CROSSING, CONTRACTOR MUST CONTACT MAGELLAN PIPELINE COMPANY FIELD SERVICES TECHNICIAN JASON BEGUIN TO MAKE FINAL INSPECTION ON BEHALF OF PIPELINE OWNER.
   EMAIL = JASON.BEGUIN@MAGELLANLP.COM
   PHONE = 918-720-5837
4. THE MAXIMUM ALLOWABLE VEHICLE WEIGHT ON ANY GAS PIPELINE CROSSING IS 80,000 POUNDS, WITH A MAXIMUM AXLE WEIGHT OF 20,000 POUNDS.
5. DO NOT COMPACT EXISTING SOILS OR FILL MATERIALS DIRECTLY OVER THE PIPELINE.

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT MANAGER:
ND	JAP	SW	PA

SEAL

PROFESSIONAL ENGINEER — STANLEY D. WALLACE — 18598 — REGISTERED — OKLAHOMA
9/27/2019

WILCOX OIL SUPERFUND SITE
SOURCE CONTROL EARLY/INTERIM ACTION
REMEDIAL DESIGN
CREEK COUNTY, OKLAHOMA

DETAILS

PREPARED FOR:
EPA
REGION 6
2101 Elm Street, Suit 500
Dallas, Texas 75270

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067
(972) 315-3922

DATE: SEPTEMBER 2019

PROJECT NUMBER: 14342169

C-501

SHEET: 15 OF 21

Appendix B

Technical Specifications

Remedial Design
Technical Specifications

Wilcox Oil Company Superfund Site
Bristow, Creek County, Oklahoma

United States Environmental Protection Agency
Region 6
Contract: EP-W-06-004
Task Order: 169

Prepared for

U.S. Environmental Protection Agency
Region 6
1201 Elm Street
Dallas, Texas 75270

Prepared by

EA Engineering, Science, and Technology, Inc., PBC
405 State Highway 121 Bypass
Suite C-100
Lewisville, Texas 75067

September 2019
Revision: 00
EA Project No. 14342.169

TABLE OF CONTENTS

SCHEDULE OF VALUES
WILCOX OIL COMPANY SUPERFUND SITE
INTERIM/EARLY ACTION REMEDIAL DESIGN

Item	Description	Measurement for Payment	Estimated Quantity	Unit Price	Total Cost
1	Mobilization and Demobilization	LS	1		
2	Traffic Control	LS	1		
3	Temporary Erosion and Sediment Control	LS	1		
4	Clearing and Grubbing	AC	5.9		
5	Tree Removal, 12" - 23"	EA	66		
6	Tree Removal, 24" +	EA	40		
7	Stabilized Construction Entrance	EA	6		
8	Improved Access Road	LF	4,750		
9	Stabilized Access Road	LF	3,590		
10	Chain Link Fence Removal	LF	1,260		
11	Chain Link Fence Restoration	LF	380		
12	Fence Gate Installation	EA	4		
13	Sediment Barrier	LS	1		
14	Stream Crossing	LS	1		
15	Lead Area Excavation	CY	5,800		
16	Lead Stabilization	TON	420		
17	Lead Transportation and Disposal	TON	8,900		
18	Tank Waste Excavation	CY	25,000		
19	Tank Waste Transportation and Disposal	TON	36,700		
20	Seeding and Vegetation Restoration	AC	8.9		
21	Backfill	TON	31,000		
22	Topsoil	TON	5,170		
23	Excavation Material Dewatering	CY	17,500		
			Total	$_____	

Note: No tax exemption certificate is available. Taxes are incidental to bid items.

Total Amount in Words: _____ *Dollars*

Signed by: _____ Date: _____

Title: _____

Representing: _____

SECTION 01 10 00 - SUMMARY

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Submittals

B. Project Description

C. Definitions

D. Description of Source Control Action

E. Engineer’s Authority

F. Contractor's Use of Site

G. Tank Waste Source Material Removal

H. Lead Additive Area Source Material Removal

I. Permits

J. Contractor Superintendent

K. Site Safety Officer

L. Order of Precedence

M. Daily Reports

1.2 SUBMITTALS

A. Daily Reports.

B. Progress Photographs.

C. Name and qualifications of Site Superintendent and Site Health and Safety Officer.

1.3 PROJECT DESCRIPTION

A. This Technical Specifications Section provides a general description of the Work. The Contractor shall refer to the appropriate Sections for project specifics.

B. The Project is classified as a Source Control Remedial Action (RA) at the Wilcox Oil Company Superfund Site (Site), Bristow, Oklahoma. The Site EPA ID is OK0001010917.

C. The RA is authorized per the Source Control Record of Decision (ROD) for the Site, dated September 2018. This Source Control RA is limited in scope and does not constitute the final cleanup of the site, as detailed investigation is ongoing.

D. The project will require the Contractor to complete these general tasks:
   1. Clear vegetation and debris from areas where tank waste source material and lead additive area source material are located;
   2. Construct temporary roads to access the excavation areas, including a temporary culverted stream crossing and stabilized construction entrances;
   3. Excavate lead source material and mix with stabilizing reagent;
   4. Excavate tank waste source material;
   5. Haul and dispose of all excavated material at a landfill as non-hazardous waste;
   6. Import clean backfill and topsoil and revegetate and restore all disturbed areas.

E. Known locations of source material are based on field investigations and are shown on the Drawings. Contractor shall be prepared to remediate and manage tank waste source material excavation at areas not shown on Drawings.

1.4 DEFINITIONS

A. Definitions of contractual or associated parties, referenced herein on the Drawings and in the specifications, are listed below:
   1. Owner—The U.S. Environmental Protection Agency (EPA).
   2. Engineer—Owner's on-site representative.
   3. Contractor—A person, company, or organization who has contracted with Owner and is directly responsible for performance of the Work referenced in the specifications and drawings or as included herein.
   4. Subcontractor—A person, company or organization who has contracted with the Contractor for the purpose of supplying services, materials, assemblies, or other items as required to perform the Work referenced in the specifications, drawings, or as included herein.

1.5 ENGINEER'S AUTHORITY

A. Engineer does not have contractual authority between the Owner and Contractor.

B. Engineer will review submittals and make recommendations to Owner for approval, rejection, or approval as noted.

C. Engineer will observe Contractor's field activities and report activity to Owner.

1.6 CONTRACTOR'S USE OF SITE

A. Limit use of Site to areas within the Limits of Disturbance (LOD) shown on the Drawings. Additional area may be available with approval of property owners and project Owner.

B. Maximum LOD are shown on the Drawings. Contractor shall not disturb areas within LOD unless necessary. Contractor shall not disturb areas outside LOD without express approval of Owner.

1.7 DESCRIPTION OF SOURCE CONTROL REMEDIAL ACTION

A. The target health-based concentration for the lead has been established as 800 milligrams per kilogram lead, and tank waste 0.11 milligrams per kilogram of benzo(a)pyrene. These concentrations have been used as criteria for determining the quantity of source material to be

removed. The source material removal areas are identified in the Drawings in order to accomplish numerical Remedial Action Objectives to the greatest extent possible.

Final soil cleanup levels will be established during the risk assessment and final Site-wide remedy selection process. After removal of the source materials in the RA, remaining soil will be sampled and evaluated in accordance with the RAOs and remediation goals identified for soil and established as part of the final Site-wide selected remedy.

1.8 TANK WASTE SOURCE MATERIAL REMOVAL

A. *Tank waste source material* is defined as any of the following:
   1. an oily, tar-like, viscous liquid that flows freely from disturbed soil; or
   2. a black, dry, hardened solid that coats the surface, like asphalt.

B. Tank waste source material will be excavated everywhere and anywhere that it is positively identified in the field by the Owner and the Engineer.

C. Field observations will be conducted across the entire estimated excavation area identified in the Drawings. Adjacent areas may be surveyed for tank waste source material if it is suspected to be present by the Owner or the Engineer. Field observations will continue as excavation takes place in order to identify tank waste source material below the ground surface.

D. Once tank waste source material is identified, excavation will be carried out within a *cell* of pre-defined size, centered on the location where the material is identified. If tank waste is identified outside of the original cell, a new cell will be excavated. See Section 02 61 00 – Removal and Disposal of Contaminated Materials for full details of tank waste source material excavation.

1.9 LEAD ADDITIVE AREA SOURCE MATERIAL REMOVAL

A. Lead additive area source material will be excavated to the extent and depth identified on the Drawings.

B. The horizontal extent and depth of excavations shall be controlled via pre-excavation and post-excavation surveys, which shall be conducted in accordance with Section 02 61 00 – Removal and Disposal of Contaminated Materials.

1.10 PERMITS

A. Contractor is not required to apply for or obtain permits for this construction. The Contractor shall meet all substantive requirements of relevant permits, including:
   1. OPDES Storm Water General Permit for Construction Activities within the State of Oklahoma (OKR10).
   2. U.S. Army Corps of Engineers Nationwide Permit 38 – Cleanup of Hazardous and Toxic Waste Sites.
   3. Air quality permit.

1.11 CONTRACTOR SUPERINTENDENT

A. Contractor shall provide an on-site representative hereafter referred to as the Contractor Superintendent who is responsible for implementation of the RA consistent with the Contract Documents.

B. The Contractor shall submit the name and qualification of the Contractor Superintendent at least 20 days prior to Contractor mobilization.

C. The Contractor Superintendent has the following responsibilities and authority:
   1. The Contractor Superintendent or approved alternate shall be onsite whenever Work is in progress. If the Contractor Superintendent must be absent when Work is in progress, he/she shall notify the Engineer in advance and arrange for or appoint an alternate acceptable to the Engineer.
   2. Maintain and enforce safety regulations and emergency procedures required by the Contractor's Site Safety and Health Plan (SSHP).
   3. Represent the Contractor onsite.
   4. Make decisions concerning Contractor's Work including sequencing and quality of Work.
   5. Answer questions from Engineer and Owner representatives.
   6. Attend weekly progress meetings, provide updated schedule and cost information at the request of Engineer.
   7. Receive and inspect materials and supervise the Work of the Contractor personnel.
   8. Order additional manpower, equipment, materials, and other resources, if necessary, to meet schedules and complete the Work as described herein.

1.12 SITE SAFETY OFFICER

A. Contractor shall provide a full time, on-site representative, hereafter referred to as the Site Safety Officer (SSO), with authority to maintain and enforce safety regulations and emergency procedures contained herein and the Contractor's SSHP, answer questions from Engineer and Owner representatives, provide written documentation of activities to Owner as requested by the Owner, and attend weekly progress meetings. The SSO is an employee of the Contractor and reports to the Contractor superintendent.

B. The Contractor shall submit the name and qualifications of the SSO at least 20 days prior to Contractor mobilization. The Contractor Superintendent may also act as the SSO with approval of the Engineer.

C. The SSO, or approved alternate, shall be on site whenever Work is in progress. If the SSO must be absent when Work is in progress, he/she shall notify the Engineer in advance and arrange for or appoint an alternate.

D. The Contractor shall perform health and safety responsibilities in accordance with the submitted SSHP. See Section 01 35 29.13 for requirements of the SSHP.

1.13 ORDER OF PRECEDENCE

A. In the event of a conflict in the execution of Work, the following order of precedence shall apply.
   1. Contract Documents

2. Technical Specifications
3. Design Drawings
4. Supporting Documents

1.14 DAILY REPORTS

A. Contractor shall submit a daily report to Engineer no later than 12:00 noon on the day following the date of the report. Reporting shall commence upon mobilization to the site and continue through Contractor demobilization.

B. Report shall:
   1. Discuss Work performed in relation to specific pay items.
   2. Identify all issues and concerns with construction and existing conditions.
   3. Be signed by Contractor Superintendent and SSO.

C. Contractor shall discuss those issues and concerns in the next weekly meeting or sooner if Contractor believes they are time critical.

D. Submit photographs in accordance with Section 01 70 00 – Execution and Closeout Requirements on at least a weekly basis.

PART 2 PRODUCTS – Not Used

PART 3 EXECUTION – Not Used

END OF SECTION

SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Schedule of Values.

B. Application for Payment.

C. Change procedures.

D. Unit prices.

E. Schedule of Supplies and Services Items

F. Alternates.

1.2 DESCRIPTION

A. The items listed in this section refer to and are the same pay items listed on the Schedule of Values Form. They constitute all pay items for the completion of the Work. Compensation for all such services and materials shall be included in the prices stipulated for the lump sum and unit price pay items listed herein. Items of Work not specifically included in this Section for measurement and payment as described herein will not be measured for payment but will be considered subsidiary to the cost of the related work items. Minor items and incidentals necessary to complete the work in a workman-like manner and provide complete, serviceable facilities shall be included in the sum of the work items and furnished even if not specifically called for in the Drawings and Specifications.

1.3 SUBMITTALS

A. The Contractor shall submit to the Engineer a complete Schedule of Values Form including unit prices for each bid item.
   1. Include within each line item overhead, profit, bid bond, and all other expenses that are expected to be incurred.
   2. Bids that deviate from the Schedule of Values format or leave items blank may be considered non-responsive.
   3. This Schedule of Values Form shall be used as the basis for the Contractor’s Application for Payments.

1.4 SCHEDULE OF VALUES

A. Submit Schedule of Values with initial bid.

B. Include within each line item amount of Contractor's overhead and profit.

C. Revise schedule to list approved Change Orders with each Application for Payment.

1.5 APPLICATION FOR PAYMENT

A. Submit Applications for Payment to Engineer using an Engineer-approved format.

B. Submit updated construction schedule with each Application for Payment.

C. Payment Period: Monthly.

D. Submit Application for Payment with a transmittal letter as specified in Section 01 33 00 - Submittal Procedures.

E. Substantiating Data: When Engineer requires information, submit data justifying dollar amounts in question. Include the following with Application for Payment:

1. Current construction photographs.
2. Partial release of liens from major Subcontractors and vendors.
3. Record Documents, which will be returned to Contractor.
4. Affidavits, delivery tickets, or invoices attesting to off-Site stored products.
5. Construction Progress Schedule.

F. No payment shall be made for work performed by the Contractor to replace defective work, work which is not required by the Contract Documents, work outside the limits of the contract, and additional work necessary due to actions of the Contractor, unless ordered by the Engineer in writing.

G. Items of Work not specifically included in this Section for measurement and payment as described herein will not be measured for payment but will be considered subsidiary to the cost of the related work items. Minor items and incidentals necessary to complete the work in a workman-like manner and provide complete, serviceable facilities shall be included in the sum of the work items and furnished even if not specifically called for in the Drawings and Specifications.

H. Final payment for work governed by unit prices will be made on basis of actual measurements and quantities accepted by Owner multiplied by unit sum/price for work incorporated in or made necessary by the work.

1.6 CHANGE PROCEDURES

A. Submittals: Submit name of individual who is authorized to receive change documents and is responsible for informing Contractor of changes to the Work.

B. Carefully study and compare Contract Documents before proceeding with installation of Work. Promptly advise Engineer of any error, inconsistency, omission, or apparent discrepancy.

C. Clarifications: Allot time in construction scheduling for liaison with Engineer; establish procedures for handling queries and clarifications.

D. Engineer will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions on Field Change Form.

E. Engineer may issue Notice of Change including a detailed description of proposed change with supplementary or revised Drawings and Specifications. Contractor will prepare and submit Cost Change estimate, if applicable, within 10 working days.

F. Contractor may propose changes by submitting a Request for Change to Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change and the effect on Contract Sum/Price and Contract Time with full documentation.

G. Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the Contract. Engineer will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.

H. Correlation of Contractor Submittals:
   1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
   2. Incorporate changes in the next construction schedule update to reflect change in Contract Time and revise subschedules to adjust times for other items of Work affected by the change.
   3. Promptly enter changes in Record Documents.

1.7 ESTIMATED QUANTITIES

A. Various estimated quantities are furnished within the Contract Documents to assist the Contractor in reviewing the Project prior to bidding. The estimated quantities are not intended to be used by the Contractor as the sole basis for determining the scope and volume of the work. The Contractor is responsible for verifying all quantities necessary to submit bids for the construction of a proper and complete project.

1.8 UNIT PRICES

A. Measurement methods delineated in individual Specification Sections complement criteria of this Section. In event of conflict, requirements of this Specification Section govern.

B. Take measurements and compute quantities. Engineer will verify measurements and quantities.

C. Estimated Unit Quantities and measurements indicated on Schedule of Values Form are for Contract bidding purposes only. Quantities and measurements supplied or placed in the Work shall determine payment.
   1. When actual Work amounts to greater or lesser quantities than those quantities indicated on the Schedule of Values Form, provide those actual Work amounts at contracted unit prices.

D. Payment Includes: Full compensation for required labor, products, tools, equipment, plant and facilities, transportation, services and incidentals; erection, application, or installation of item of the Work; overhead and profit.

E. Final payment for Work governed by unit prices will be made on basis of actual measurements and quantities accepted by Engineer multiplied by unit sum/price for Work incorporated in or made necessary by the Work.

F. Measurement of Quantities:
   1. Weigh Scales: Inspected, tested, and certified by applicable weights and measures department.
   2. Measurement by Volume: Measured by cubic dimension using mean length, width, and height or thickness.
   3. Measurement by Area: Measured by square dimension using mean length and width or radius.
   4. Linear Measurement: Measured by linear dimension, at item centerline or mean chord.
   5. Lump Sum: Measured by percent complete of work completed.
   6. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as completed item or unit of the Work.

G. Tank Waste Quantity Variance
   1. If the actual completed quantity for Bid Item 18 Task Waste Excavation or Bid Item 19 Tank Waste Transportation and Disposal results in a variance of 25 percent more or less than the estimated amount shown on the Schedule of Values Form, the Owner or Contractor may claim a Contract Price adjustment and the two parties shall renegotiate the unit price of that bid item.
   2. To clarify, if the final measured quantity for Bid Items 18 or 19 are between 75 and 125 percent of the estimated quantity, the actual quantity shall be paid for at the Contractor proposed unit price. Otherwise, either party may claim an adjustment and shall be renegotiated.

1.9 SCHEDULE OF SUPPLIES AND SERVICES ITEMS

The items listed in this section refer to and are the same pay items listed on the Schedule of Values Form. They constitute all of the pay items for the completion of the Work. Compensation for all such services and materials shall be included in the prices stipulated for the lump sum and unit price pay items listed herein. Items of Work not specifically included in this Section for measurement and payment as described herein will not be measured for payment but will be considered subsidiary to the cost of the related work items. Minor items and incidentals necessary to complete the work in a workman-like manner and provide complete, serviceable facilities shall be included in the sum of the work items and furnished even if not specifically called for in the Drawings and Specifications.

Bid Item 1: Mobilization and Demobilization
   1. Measurement: On a lump sum basis.
   2. Payment: At the Contractor proposed lump sum price in accordance with the Contract Documents.
   3. Description of Work: Includes all bonds, insurance, materials, labor, and equipment to complete work activities for mobilization and demobilization and ancillary costs. The Work shall include, but not be limited to, preparing and submitting to the Engineer all required pre-construction plans, staging area cleanup, utility clearance and coordination with utility owners, moving onto the site of all equipment, transportation to and from the site, site security, plan and shop drawing preparation, reporting, submittals, administration, all costs for providing temporary utilities, storage buildings, field offices including the Engineer's office, operating supplies, detailed construction layouts (construction staking), final as-built surveying, preparation of record drawings, construction photographs, final cleaning, and coordination necessary for the Contractor to provide and maintain a construction force at the project site complete and ready to perform all work required under the Contract.

Bid Item 2: Traffic Control

1. Measurement: On a lump sum basis.
2. Payment: At the Contractor proposed lump sum price in accordance with the Contract Documents.
3. Description of Work: Includes all effort and materials necessary to implement traffic control in accordance with the Contract Documents.

Bid Item 3: Temporary Erosion and Sediment Control

1. Measurement: On a lump sum basis.
2. Payment: At the Contractor proposed lump sum price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials needed to meet the substantial requirement of OPDES Construction Storm Water Permit and implement the temporary erosion and sediment controls required by the Drawings and Specifications.

Bid Item 4: Clearing and Grubbing

1. Measurement: On a per acre basis.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to complete vegetation clearing and grubbing as described in the Contract Documents. The Work shall include, but not be limited to, cutting, chipping, transporting, and disposal of vegetation.

Bid Item 5: Tree Removal, 12" – 23"

1. Measurement: On a per each basis.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to complete tree clearing as described in the Contract Documents. The Work shall include, but not be limited to, cutting, chipping, transporting, and disposal of vegetation.

Bid Item 6: Tree Removal, 24" +

1. Measurement: On a per each basis.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to complete tree clearing as described in the Contract Documents. The Work shall include, but not be limited to, cutting, chipping, transporting, and disposal of vegetation.

Bid Item 7: Stabilized Construction Entrance

1. Measurement: On a per each basis.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to construct, maintain, and remove Stabilized Construction Entrances accordance with the Contract Documents. The Work shall include, but not be limited to, excavation, grading, geotextile, bedding material, and periodic inspection and cleaning entrance areas and public roadways.

Bid Item 8: Improved Access Road

1. Measurement: On a per linear foot basis.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to construct Improved Access Roads accordance with the Contract Documents. The Work shall include, but not be limited to surface preparation and aggregate placement.

Bid Item 9: Stabilized Access Road

1. Measurement: On a per linear foot basis.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to construct Stabilized Access Roads accordance with the Contract Documents. The Work shall include, but not be limited to excavation and grading, geotextile placement, and aggregate placement.

Bid Item 10: Chain Link Fence Removal

1. Measurement: On a per linear foot basis.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to remove chain link fence lines in accordance with the Contract Documents. The Work shall include, but not be limited to, demolition of the fence posts, fabric, and any accessories, and either salvaging and storing materials at the site or proper offsite disposal of the fence.

Bid Item 11: Chain Link Fence Restoration

1. Measurement: On a per linear foot basis.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to install chain link fence lines in accordance with the Contract Documents. The Work shall include, but not be limited to, site restoration and constructing chain link fence out of salvaged or new materials as described in the Drawings.

Bid Item 12: Fence Gate Installation

1. Measurement: On a per each basis.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to install fence gates accordance with the Contract Documents. The Work shall include, but not be limited to, restoration of adjacent fencing, site restoration, and construction of fence gates, including all accessories as described in the Drawings.

Bid Item 13: Sediment Barrier

1. Measurement: On a lump sum basis.
2. Payment: At the Contractor proposed lump sum price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to install, maintain, and dismantle an in-stream sediment barrier in accordance with the Contract

Documents. The Work shall include, but not be limited to, excavation, site preparation, materials, final disposal, and restoration.

Bid Item 14: Stream Crossing

1. Measurement: On a lump sum basis.
2. Payment: At the Contractor proposed lump sum price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to construct, maintain, and dismantle a culverted stream crossing in accordance with the Contract Documents. The Work shall include, but not be limited to, materials testing, grading, site preparation, geotextile, aggregate, culvert pipe and all accessories, backfill, riprap, surfacing gravel, excavation and removal of all materials from the stream, and proper disposal of culvert and aggregate materials.

Bid Item 15: Lead Area Excavation

1. Measurement: On a per in-place (bank) cubic yard of excavated material basis, as calculated by the Drawings.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to excavate lead source material accordance with the Contract Documents. The Work shall include, but not be limited to, excavation of lead source material to the depths shown in the Drawings and stockpiling outside of the regulated floodplain.

Bid Item 16: Lead Stabilization

1. Measurement: On a per ton of stabilization reagent used basis. Quantity of stabilization reagent is not to exceed 5% w/w basis using the average lead source material density value of 1.47 tons per cubic yard.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to stabilize lead source material in accordance with the Contract Documents. The Work shall include, but not be limited to, purchasing treatment reagent and transportation to the site, distributing reagent and mixing into lead source material at the rate prescribed in the Drawings and Specifications, storage and protection of stockpiles, allowing for analytical testing, and downtime while awaiting testing results and clearance for transportation and disposal.

Bid Item 17: Lead Transportation and Disposal

1. Measurement: On a per ton of disposed material basis, as determined from landfill disposal weight tickets.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to transport and dispose of lead source material after stabilization in accordance with the Contract Documents. The Work shall include, but not be limited to, loading, final inspection, transportation planning and notifications, coordination with the landfill including testing required by the landfill with may not be described in the Drawings and Specification, fuel and mileage, and testing and disposal fees from the landfill.

Bid Item 18: Tank Waste Excavation

1. Measurement: On a per in-place (bank) cubic yard of excavated material basis, as measured by post-excavation survey.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to excavate tank waste, as defined in the Specifications and identified in the field, in accordance with the Contract Documents. The Work shall include, but not be limited to, excavation of tank waste source material with normal effort, required sloping or shoring to meet safety standards, and stockpiling outside of the regulated floodplain.

Bid Item 19: Tank Waste Transportation and Disposal

1. Measurement: On a per ton of disposed material basis, as determined from landfill disposal weight tickets.
2. Payment: At the Contract unit price proposal in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to transport and dispose of tank waste in accordance with the Contract Documents. The Work shall include, but not be limited to, loading, final inspection, transportation planning and notifications, coordination with the landfill including testing required by the landfill with may not be described in the Drawings and Specification, fuel and mileage, and testing and disposal fees from the landfill.

Bid Item 20: Seeding and Vegetation Restoration

1. Measurement: On a per acre basis.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to seed and revegetate all disturbed areas in accordance with the Contract Documents. The Work shall include, but not be limited to, final grading, substrate preparation, seeding, fertilizer, mulch, and management (i.e. watering) until final stabilization, as described in the Drawings and Specifications, has been achieved.

Bid Item 21: Backfill

1. Measurement: On a per finished in-place cubic yard basis.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to backfill excavated areas with clean soil in accordance with the Contract Documents. The Work shall include, but not be limited to, purchase and transportation of acceptable materials, unloading, and compaction.

Bid Item 22: Topsoil

1. Measurement: On a per finished in-place cubic yard basis.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to place topsoil in accordance with the Contract Documents. The Work shall include, but not be limited to, purchase and transportation of acceptable materials, unloading, and placement to final lines and grades described in the Drawings and Specifications.

Bid Item 23: Excavated Material Dewatering

1. Measurement: On a per in-place (bank) cubic yard of excavated material requiring dewatering basis, as measured by post-excavation survey.
2. Payment: At the Contractor proposed unit price in accordance with the Contract Documents.
3. Description of Work: Includes all labor, equipment, and materials necessary to complete extra steps necessary to prepare for transport and disposal of all excavated materials. The Work shall include, but not be limited to, gravity dewatering and associated downtime, extra handling and on site transport required to achieve dewatering, and any costs associated with onsite or landfill-required solidification of excavated materials.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION – Not Used

END OF SECTION

SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SUBMITTALS

A. Meeting minutes

1.2 PRE-CONSTRUCTION MEETING

A. Engineer will schedule and preside over meeting after Notice of Award.

B. Attendance Required: Engineer, Owner, Contractor, Contractor's superintendent, Contractor's project manager, and major Subcontractors.

C. Minimum Agenda:
1. Submission of executed bonds and insurance certificates
2. Distribution of Contract Documents
3. Review permit requirements and conditions
4. Submission of Contractor's affidavit of permit requirements
5. Submission of list of Subcontractors, list of products, schedule of values, and Progress Schedule
6. Designation of personnel representing parties in Contract, and Engineer
7. Communication procedures
8. Procedures and processing of requests for interpretations, field decisions, field orders, submittals, substitutions, Applications for Payments, proposal request, Change Orders, and Contract closeout procedures
9. Scheduling
10. Critical Work sequencing
11. Traffic Control, security, and housekeeping procedures
12. Procedures for maintaining record documents

D. Contractor shall record and distribute minutes within two days after meeting to participants and those parties affected by decisions made. Engineer may provide changes to minutes and Contractor shall then submit final minutes.

1.3 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at weekly intervals.

B. Contractor shall make arrangements for meetings, prepare agenda with copies for participants, and preside over meetings.

C. Attendance Required: Contractor Superintendent, major Subcontractors, Engineer**,** and additional personnel as appropriate to agenda topics for each meeting.

D. Minimum Agenda:
1. Review minutes of previous meetings
2. Health and Safety
3. Review of Work progress

4. Review of daily reports
5. Review of quality control actions and issues
6. Field observations, problems, and decisions
7. Identification of problems impeding planned progress
8. Review of submittal schedule and status of submittals
9. Maintenance of Progress Schedule
10. Corrective measures to regain projected schedules
11. Planned progress during succeeding Work period
12. Coordination of projected progress
13. Maintenance of quality and Work standards
14. Effect of proposed changes on Progress Schedule and coordination
15. Other business relating to Work

E. Contractor: Record minutes and distribute draft minutes to participants within two days after meeting, to Engineer, Owner, and other parties affected by decisions made. Engineer and Owner will provide required changes to minutes and Contractor shall submit final minutes.

PART 2 PRODUCTS – Not Used

PART 3 EXECUTION – Not Used

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUBMITTAL PROCEDURES

A. Contractor shall review all content of required submittals for compliance with Drawings and Specifications and approve submittals before transmitting to Engineer.

B. Contractor is responsible for:
   1. Determination and verification of field measurements and field construction criteria
   2. Determination of accuracy and completeness of dimensions and quantities
   3. Confirmation and coordination of dimensions and field conditions at Site
   4. Construction means, techniques, sequences, and procedures
   5. Safety precautions

C. Do not begin Work for which submittals are required until approved submittals have been received from Engineer.

D. Transmit each submittal with Engineer-approved form, include:
   1. Project name.
   2. Contractor's name.
   3. Subcontractors and/or supplier.
   4. Relevant Drawing and detail number.
   5. Relevant Specification Section number.
   6. Apply Contractor's signature certifying their review, approval, and verification of products and field dimensions according to the requirements of the Work and Drawings and Specifications.
   7. Allow space for Engineer's review signature.

E. Submit electronically as PDF files via email or web-based FTP site.

F. Schedule major submittals with Engineer, which may take up to 10 working days for review. Coordinate submission of related items.

G. Identify any variations from Drawings and Specifications and any limitations that may affect performance of completed Work.

1.2 PRODUCT DATA

A. Submit requested product data for review of conformance with the project information given and design concepts expressed in the Drawings and Specifications.

B. Mark product data sheets to identify applicable products, options, and other relevant data.

C. Certifications shall be provided by product manufacturers or installation Subcontractors. Certifications shall indicate that a material or product conforms to or exceeds specified requirements. Submit supporting reference data, test data, and affidavits, as appropriate.

D. Samples shall be delivered to the Project Site for inspection and review by the Engineer. Related information and documentation shall be provided electronically. Include identification on each sample. Engineer may retain all or a portion of the sample.

1.3 WORK PLAN

A. Submit requested detailed work plans for review of conformance with the project information given and design concepts expressed in the Drawings and Specifications.

B. Describe means and methods that will be used by the Contractor to accomplish the activity for which the Work Plan submittal is required.

C. Describe all items required to complete the activity, including:
   1. Labor effort (number of staff and duration);
   2. Equipment;
   3. Materials;
   4. Anticipated support from Subcontractors;
   5. Permits;
   6. Sequence of activities and total duration;
   7. Phasing with adjacent work.

1.4 OTHER SUBMITTALS

A. Permits
   1. Submit required permits before related work begins. Provide Engineer with notice of permit approval from authorizing agency.

B. Closeout Submittals
   1. Comply with Section 01 70 00 – Execution and Closeout Requirements.

1.5 ENGINEER REVIEW

A. Engineer will review submittals and provide comments comparing submittals to Drawings and Specifications. Incomplete or unrequested submittals may not be reviewed and there may be no action by the Engineer.

B. Submittal approval does not authorize changes to Contract requirements unless accompanied by Contract Modification from Owner.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

JOB NAME:	Wilcox Oil Early/Interim Remedial Action
LOCATION:	Bristow, Creek County, Oklahoma
CONTRACT NO:	No.
CONTRACTOR:	

SUBMITTAL REGISTER - Comprehensive

							CONTRACTOR SCHEDULE DATES		**CONTRACTOR ACTION**		**ENGINEER ACTION -1st SUBMITTAL**		**ENGINEER ACTION - 2nd SUBMITTAL**		
(a)	**(b)**	**(c)**	**(d)**	**(e)**	**(f)**	**(g)**	**(h)**	**(i)**	**(j)**	**(k)**	**(l)**	**(m)**	**(n)**	**(o)**	**(p)**
Line	Transmittal No.	Specification Section	Paragraph #	Description of Item Submitted	Type of Submittal	Due:	Submittal Date	Approval Needed By	Action Code	Date Of Action	Action Code	Date Of Action	Action Code	Date Of Action	Remarks
1		01 10 00	1.2.A	Daily Reports	Report	Daily, throughout project									Contractor shall submit a daily report to Engineer no later than 12:00 noon on the day following the date of the report. Reporting shall commence upon mobilization to the site and continue through Contractor demobilization.
2		01 10 00	1.2.B	Weekly Photographs	Photographs	Weekly, throughout project									Submit photographs in accordance with Section 01 70 00 – Execution and Closeout Requirements.
3		01 10 00	1.11.B	Contractor Superintendent	Name and Qualification	20 days prior to mobilization									The Contractor shall submit the name and qualification of the Contractor Superintendent.
4		01 10 00	1.12.B	Site Safety Officer	Name and Qualification	20 days prior to mobilization									The Contractor shall submit the name and qualifications of the SSO. The Contractor Superintendent may also act as the SSO with approval of the Engineer.
5		01 20 00	1.3.A	Schedule of Values	Schedule	With initial bid; update upon change order acceptance									The Contractor shall submit to the Engineer a complete Schedule of Values Form including unit prices for each bid item. Include within each line item overhead, profit, bid bond, and all other expenses that are expected to be incurred. Bids that deviate from the Schedule of Values format or leave items blank may be considered non-responsive. This Schedule of Values Form shall be used as the basis for the Contractor's Application for Payments. Revise to list approved Change Orders with each Application for Payment
6		01 20 00	1.5	Application for Payment	Application	Monthly									Submit using an Engineer-approved format, include updated construction schedule and transmittal letter. Payment Period: Monthly.
7		01 20 00	1.6.A	Change Procedures	Name	Prior to mobilization									Submit name of individual who is authorized to receive change documents and is responsible for informing Contractor of changes to the Work
8		01 20 00	1.6.E	Notice of Change	Cost Change Estimate	Within 10 working days									Engineer may issue Notice of Change including a detailed description of proposed change with supplementary or revised Drawings and Specifications. Contractor will prepare and submit Cost Change estimate, if applicable, within 10 working days.
9		01 20 00	1.6.F	Request of Change	Request	Throughout project as needed									Contractor may propose changes by submitting a Request for Change to Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change and the effect on Contract Sum/Price and Contract Time with full documentation.
10		01 20 00	1.6.G	Post Change Order	Itemized account and supporting data	After completion of change. within time limits indicated in Conditions of the Contract.									Engineer will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.
11		01 30 00	1.2.D	Pre-Construction Meeting Minutes	Meeting Minutes	Within 2 days after meeting									Contractor shall record and distribute minutes meeting to participants and those parties affected by decisions made. Engineer may provide changes to minutes and Contractor shall then submit final minutes.
12		01 30 00	1.2	Product Data	Data, Data Sheets, Certifications	As requested									Submit requested product data for review of conformance with the project information given and design concepts expressed in the Drawings and Specifications. Certifications shall be provided by product manufacturers or installation Subcontractors. Certifications shall indicate that a material or product conforms to or
13		01 30 00	1.3	Work Plan	Plan	As requested									Submit requested detailed work plans for review of conformance with the project information given and design concepts expressed in the Drawings and Specifications.
14		01 35 29.13	1.2.A	HAZWOPER	Certificates	20 days prior to mobilization									40 Hours certificates for all workers, including applicable 8 Hours Refresher Training certificates and 8 Hours Supervisor Training certificates.
15		01 35 29.13	1.2.A	CPR	Certificates/Cards	20 days prior to mobilization									First aid and cardiopulmonary resuscitation (CPR) certificates/cards.
16		01 35 29.13	1.2.A	Physician Certification	Certification	20 days prior to mobilization									Physician's certification for each onsite employee.
17		01 35 29.13	1.2.B	Daily Safety Meeting Logs	Logs	Daily, throughout project									Logs of daily Tailgate Safety Meetings, including attendance and topics covered, shall be included with daily reports submitted to Engineer.
18		01 35 29.13	1.2.C	Personnel and perimeter air monitoring records.	Records	Within 24 hours of data receipt									The Contractor shall submit to the Engineer

19		01 35 29.13	3.1.A	Site Safety and Health Plan	Plan	Prior to mobilization									The Contractor must develop a detailed SSHP based on the Contractor's own written Health and Safety program and site-specific requirements. The Contractor must submit the SSHP to the Engineer before any work is performed at the Site. Revisions to the SSHP may be required during the execution of the project. All revisions to the SSHP must be submitted to the Engineer. In addition, the Contractor must make corrections and amendments to the SSHP that are mutually agreed upon by the Contractor and the Engineer. The review of the SSHP by the Engineer will only be to ascertain that all necessary elements are included.
20		01 35 29.13	3.4	Accident Report Form	Form and verbal communication	Reported to the Engineer within 24 hours of the occurrence									Any work-related lost time illness or injury must be verbally reported to the Engineer within 24 hours of the occurrence of any such illness or injury and a written description of the illness or injury must be provided to the Engineer on an Accident Report Form.
21		01 35 29.13	3.4	Return to Work Form	Form	Before the employee may return to work									After any work-related lost time illness or injury a copy of the physician-signed return to work form must be submitted to the Engineer
22		01 50 00	1.1.B.1	Erosion and Dust Control	Methods and Materials	Prior to mobilization									
23		01 50 00	1.1.B.2	Erosion Control and Stormwater Management Plans	Plans	Prior to mobilization									
24		01 57 00	1.2.A	Storm Water Pollution Prevention Plan (SWP3)	Plan	Prior to mobilization									Submit to Engineer only
25		01 57 00	1.2.B	Product data for filter fabric used in Silt Fences.	Product Data	Submit with SWP3									
26		01 57 00	1.2.C	Product data for geotextile and aggregate used for Stabilized Construction Entrances.	Product Data	Submit with SWP3									
27		01 70 00	1.2.A	Construction Photographs	Photographs	One week prior to comprehensive site inspection by engineer									Submit to Engineer
28		01 70 00	1.2.B	Substantial completion inspection and initial punch list	Inspection/Punch List	One week prior to comprehensive site inspection by engineer									Submit to Engineer
30		01 70 00	1.2.D	Record Documents	Documents	One week prior to comprehensive site inspection by engineer									Submit to Engineer
31		01 70 00	1.4.A	Final survey data	Data	One week prior to comprehensive site inspection by engineer									Submit to Engineer
32		01 70 00	1.5.A	Work Complete Certification	Written Certification	When Contractor considers Work to be Complete									Submit written certification that: 1.Contract Documents have been reviewed. 2.Work has been examined for compliance with Contract Documents. 3.Work has been completed according to Contract Documents. 4.Work is completed and ready for final inspection.
33		01 70 00	1.5.B	Final Completion Submittals	Various	When Contractor considers Work to be Complete									Submit following: 1.Final punch list indicating all items have been completed or corrected. 2.Project record documents. 3.Final payment request. 4.Contractor's affidavit of payment of debts and claims. 5.Contractor affidavit of release of liens. 6.Consent of surety to final payment.
34		01 72 00	3.2	Detailed discussion/procedures of personal hygiene and decontamination facilities and procedures	Procedures	Prior to personnel entering EZ, CRZ, or other exposure areas									To be followed by site workers as part of the Site Safety and Health Plan
35		01 72 00	3.4	Decontamination plan and procedures for off-site decontamination.	Plan/Procedures	Prior to starting excavation									Off-site decontamination of some materials may be required if frozen conditions are encountered. Engineer may approve of off-site decontamination if frozen conditions are encountered
36		02 55 00	1.2.A	Comprehensive work plan for mixing and sampling	Plan	Within 14 days of Notice to Proceed									In accordance with Section 01 33 00 – Submittal Procedures
37		02 55 00	3.4.A	Record for each mixing batch for stabilization and solidification of source material	Records	Daily during related activities									Mixing time, mixing speed, amount of source material, amount of reagent, and water added to each batch shall be recorded by the Contractor for each mixing batch and cell excavated.

38		02 55 00	3.4.B	Source material composite samples collected	Samples	Prior to transporting away from the site and final disposal.									Required tests to include toxicity characteristic leaching procedure (TCLP) for lead.
39		02 61 00	1.2.A	Pre-characterization sampling, excavation, and transport Work Plan	Work Plan	Within 14 days of Notice to Proceed									In accordance with Section 01 33 00 – Submittal Procedures. Work plan shall describe the Contractor's proposed means and methods for completing the excavation and hauling of source material, including: a.Sampling equipment and methods; b.List of equipment; c.Full description of means and methods for excavation, onsite hauling, final transport, and disposal; d.Names and roles of major Subcontractors; e.On site locations where excavated materials will be stockpiled (if any); f.Decontamination of excavation and hauling equipment and personnel; g.Chosen landfill, contact name and number.
40		02 61 00	1.2.B	Preliminary plans for sampling, excavation, transport, and disposal	Plans	With initial proposal									Provided in the Contractor's initial proposal
41		02 61 00	1.2.C	Results of Pre-Characterization tank waste sampling.	Results	Prior to beginning tank waste excavation									
42		02 61 00	1.2.D	Transporter certifications	Certifications	Prior to transporting material offsite									
43		02 61 00	1.2.E	Certificates of disposal and disposal weigh tickets	Certificates	Within two days of disposal of each load									
44		02 61 00	1.2.F	Surveys Plan	Plan	Before any excavation activities begin									Outlining survey methods, standard operating procedures, and schedule
45		02 61 00	1.2.G	Pre-removal survey	Survey	At least 2 days prior to beginning excavation									
46		02 61 00	1.2.H	Post-removal survey	Survey	Within 2 days of completion of excavation									Include quantity calculations to quantify materials for payment. Post-excavation and final restoration grade surveys shall be submitted to Engineer for approval. See Section 02 61 00 – Removal and Disposal of Contaminated Sediments for full survey requirements.
47		02 61 00	1.2.I	Excavation Logs	Logs	Within 5 days of completion of excavation for each sub-area									
48		31 10 00	1.2.A	Site Clearing Boundaries	Boundaries	5 days prior to mobilization									Boundaries of equipment laydown areas, equipment laydown areas, field office areas, parking areas, staging areas, access roads and any other areas needed to complete the Work.
49		31 23 23	1.3.A	Fill material data and certification that materials are not contaminated (clean) and preliminary compaction test results.	Data and Test Results	Prior to transporting materials to site									
50		31 23 23	1.3.B	Surveys: Post-excavation and post-backfill survey data.	Data	Within 2 days of completing backfill activities									To quantify materials for payment. Post-excavation and final restoration grade surveys shall be submitted to Engineer for approval. See Section 02 61 00 – Removal and Disposal of Contaminated Sediments for full survey requirements.
51		31 23 23	1.3.C	Materials Source: Submit name of commercial suppliers of imported fill materials.	Name	At least 10 days prior to material transported to site									
52		31 23 23	1.3.D	Sample and required test reports of imported topsoil.	Sample and Report	At least two days prior to material transport to site									Submit minimum 10 oz. sample
53		31 23 23	1.3.E	Sample and required geotechnical analysis of imported clean backfill	Sample and Report	At least two days prior to material transport to site									Submit minimum 10 oz. sample
54		31 23 23	1.3.F	Sample and required geotechnical analysis of Sand Bedding	Sample and Analysis	At least two days prior to material transport to site									Submit minimum 10 oz. sample
55		31 23 23	1.3.G	Sample and required geotechnical analysis of Road Surface Aggregate.	Sample and Analysis	At least two days prior to material transport to site									Submit minimum 10 oz. sample
56		31 23 23	2.1.B.2	Loss on Ignition Method testing results	Results	At least two days prior to material transport to site									Amend topsoil with locally sourced organic compost or similar if required to meet organic matter requirement.
58		31 49 19	1.2	Filter fabric manufacturer's literature	Literature	Two days prior to installation									Discussing physical characteristics, application, and installation instructions for geotextile materials.
59		31 37 00	1.2	Source, method of production, material data, and gradation data for Riprap.	Source, Method, and Data	Two days prior to transport to site									

60		32 92 19	1.2.A	Product Data and certificates for seed mixes.	Product Data	10 days prior to seeding									Including: percentage of seed mix, germination percentage, inert matter percentage, weed percentage, year of production, net weight of packages, date of packaging, and location of packaging.
61		32 92 19	1.2.B	Product Data and certificates for mulch.	Product Data	10 days prior to seeding									
62		32 92 19	3.1.C	Proposed variance seeding operation times	Times	Within 30 days of Notice to Proceed									Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the seeding operations, proposed times shall be submitted to and approved by the Engineer.
63		33 42 13	1.2.B	Product Data on culvert pipe and accessories.		At least 10 days prior to transport to site									
64		33 42 13	1.2.C	Manufacturer's installation instructions and any special procedures required to install the pipe culverts.	Instructions and Procedures	At least 10 days prior to transport to site									
65		33 42 13	1.2.D	Qualifications statements for manufacturer and installer	Qualifications Statements	At least 10 days before completing the Work of this Section.									
66		33 42 13	1.2.E	Preliminary soil density testing for Granular Bedding and proposed Native Earth Backfill materials	Field Compaction Testing Results	within two days of tests taking place.									

SECTION 01 35 29.13 - HEALTH, SAFETY & EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES

PART 1 GENERAL

1.1 DESCRIPTION

Site-specific health and safety procedures, emergency procedures, and contingency planning are required to protect the health and safety of workers and visitors on site and the public from the known and potentially hazardous conditions at the Site.

Procedures shall be described in a Site Safety and Health Plan (SSHP), specifically addressing health and safety procedures for activities to be performed by the Contractor's personnel, including Subcontractor personnel. The Contractor's SSHP shall contain site-specific emergency procedures and contingency planning.

The responsibility for the development, implementation, and enforcement of a documented health and safety program for their work lies with the Contractor. The health and safety program must clearly identify, evaluate, and describe procedures to control health and safety hazards and describe emergency response procedures for remedial action activities. The Contractor is responsible for ensuring full compliance with all applicable portions of 29 Code of Federal Regulations (CFR) 1910, 29 CFR 1926 and any federal, state, or local health and safety requirements.

1.2 SUBMITTALS

A. At least 20 days prior to any work at the site, the following items must be submitted for review and approval:
   1. Site Safety and Health Plan (SSHP).
   2. 40 Hours Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations (HAZWOPER) certificates for all workers, including applicable:
      a. 8 Hours Refresher Training certificates;
      b. 8 Hours Supervisor Training certificates.
   3. First aid and cardiopulmonary resuscitation (CPR) certificates/cards.
   4. Physician's certification for each onsite employee.
   5. Personnel experience, certificates, and documentation of qualifications as required in this Section.

B. Logs of daily Tailgate Safety Meetings, including attendance and topics covered, shall be included with daily reports submitted to Engineer.

C. Within 24 hours of data receipt, the Contractor shall submit to the Engineer personnel and perimeter air monitoring records.

1.3 REFERENCES

A. 29 CFR 1910 Occupational Safety and Health Standards

B. 29 CFR 1926 Safety and Health Regulations for Construction

C. NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

D. Standard Operating Safety Guides (EPA, June 1992)

PART 2 MATERIALS – Not Used.

PART 3 EXECUTION

3.1 SITE SAFETY AND HEALTH PLAN REQUIREMENTS

A. The Contractor must develop a detailed SSHP based on the Contractor's own written Health and Safety program and site-specific requirements. The Contractor must submit the SSHP to the Engineer before any work is performed at the Site. Revisions to the SSHP may be required during the execution of the project. All revisions to the SSHP must be submitted to the Engineer. In addition, the Contractor must make corrections and amendments to the SSHP that are mutually agreed upon by the Contractor and the Engineer. The review of the SSHP by the Engineer will only be to ascertain that all necessary elements are included.

B. Full responsibility for developing and implementing the health and safety program is the responsibility of the Contractor. The Contractor must ensure that all personnel, equipment, and procedures are following the provisions of the SSHP during all activities at the work area.

C. At a minimum, the SSHP must address the following topics:
1. Project description
2. Health and safety program responsibilities
3. Medical surveillance
4. Employee training and qualifications
5. Project task hazard analysis
6. Site control measures
7. Personal protection requirements and methods
8. Monitoring requirements
9. Personnel and equipment decontamination
10. Emergency Response/Contingency Plan.

3.2 PROJECT DESCRIPTION

A. The SSHP must include a brief description of this remedial action project. The project description must include an overview of the property, the types of contamination, and the general types of health and safety considerations of which personnel at the work area must be aware.

3.3 HEALTH AND SAFETY PROGRAM RESPONSIBILITIES

A. The Contractor shall designate personnel with responsibility to carry out the SSHP and continuously implement the Contractor's written health and safety program. The Contractor's organizational structure with regards to implementing the SSHP, must be included with the SSHP.

B. The Contractor shall designate which personnel will have the following responsibilities:
   1. Overall preparation, implementation, and enforcement of the SSHP
   2. Coordination of the medical surveillance program
   3. Performance of the task hazard analysis
   4. Direction or supervision of the employee training program
   5. Coordination of the development of the personnel air monitoring program
   6. Day-to-day functional responsibility for the implementation and enforcement of the SSHP
   7. Periodic onsite supervision and continued evaluation of the effectiveness of the plans and their implementation and enforcement
   8. Authority to act on all health and safety concerns and establish new controls as needed
   9. Authority to suspend work activities, upgrade personnel protection levels, or to suspend individuals from field activities for infractions of the SSHP.

3.4 MEDICAL SURVEILLANCE

A. Medical Surveillance requirements of OSHA (1910.120(f)) must be identified in the SSHP. The SSHP must show how the Contractor will comply with the requirements, including, but not limited to:
   1. The Occupational Physician must certify, in writing, that all Contractor personnel required to wear a respirator are medically qualified to do so.
   2. All medical surveillance records of personnel which are required under the SSHP must be maintained by the Contractor in compliance with 29 CFR 1910.20, "Access to Employee Exposure and Medical Records."
   3. Any work-related lost time illness or injury must be verbally reported to the Engineer within 24 hours of the occurrence of any such illness or injury and a written description of the illness or injury must be provided to the Engineer on an Accident Report Form. Any Contractor employee who develops a work-related lost time illness or injury must be evaluated by a physician before the employee can be readmitted to the work area. A copy of the physician-signed return to work form must be submitted to the Engineer before the employee may return to work.

3.5 EMPLOYEE TRAINING AND QUALIFICATIONS

A. The SSHP must include documentation of Health and Safety training, in accordance with 29 CFR 1910.120(e), to all onsite workers, including supervisory personnel, who may be exposed to onsite hazardous substances, health hazards, or safety hazards. The training must be provided before personnel are permitted to engage in work area operations that could expose them to hazardous substances. At a minimum, the following training will be required:
   1. 40-Hour Training — Contractor personnel requiring 40-hour HAZWOPER worker training include equipment operators, general laborers, and supervisory personnel. These workers are regularly onsite and engaged in work area operations that could expose them to hazardous substances.
   2. Supervisor Training — An individual qualified to supervise the activities of the Contractor's employees must be present in the work area during the remedial action. The Contractor's supervisory personnel and personnel providing health and safety oversight must have an additional 8-hour HAZWOPER supervisor's training.
   3. 24-Hour Training — A minimum of 24 hours of training is required for general site workers regularly onsite who work in areas where:
      a. Exposures will be under permissible or published exposure limits
      b. Respirators will not be necessary

c. Health hazards are not present
d. There is no possibility of an emergency developing
e. Workers onsite occasionally for a specific limited task and who are unlikely to be exposed over permissible exposure limits can also have 24-hour training. Workers receiving this level of training will not be permitted in the exclusion zone.

4. On-the-Job Training — A minimum of 24 hours of on-the-job training must be provided for each employee in conformance with the requirements of 29 CFR 1910.120(e). Field experience may be gained during onsite activities under the direct supervision of a qualified supervisor.
5. Annual 8-Hour Refresher Training — Applicable Contractor personnel must complete an 8-Hour refresher course annually in accordance with 29 CFR 1920.120(e).
6. Excavation Competent Person Training — In accordance with 29 CFR 1926 Subpart P, the Contractor must have an individual certified in OSHA Excavation Competent Person Training at the work area to supervise excavation activities conducted by the Contractor.
7. Tailgate Safety Training — "Tailgate" safety meetings must be held daily. Personnel who work solely in a support zone will not be required to attend tailgate safety training sessions. These meetings must inform employees of the day's activities and individual responsibilities, inherent hazards, changes in levels of protection, emergency procedures, and approved changes to the SSHP.
8. Visitor Training — The Contractor must define the extent of training that visitors to the work area will receive prior to gaining access to the work area.

B. Documentation of training shall include:
1. Certification by the training instructor that personnel have successfully completed the necessary training courses.
2. Copies of certificates for OSHA 40-hour, 8-hour Refresher, 8-hour Supervisor, Excavation Competent Person, or other site-specific training for all Contractor personnel who will enter the exclusion zone.
3. Contractor employee training records required by OSHA must be maintained by the Contractor until site closure or until 3 years from the date the employee last worked onsite, whichever occurs first.

3.6 CONTRACTOR PERSONNEL

A. The Contractor shall retain the following personnel or their equivalent as part of the project health and safety team. Resumes, certifications, and documentation of training for each must be included in the SSHP.
1. A health and Safety Officer (HSO) with a minimum of 5 years of total industrial hygiene experience, with a minimum of 2 years of pertinent experience in the hazardous waste management or chemical industry with hazards like those anticipated on this project. The HSO must have formal training in occupational safety and health and a broad working knowledge of both Federal and State occupational safety and health regulations. The HSO must have demonstrated expertise in air monitoring techniques and the development of respiratory protection programs. The HSO shall provide guidance to the SSO and approve the SSHP and any modifications to it.
2. A Site Safety Officer (SSO) with a minimum of 2 years of experience in the hazardous waste management or chemical industry, a sound working knowledge

of both Federal and State occupational safety and health regulations, a minimum of 2 years of formal training in occupational safety and health, and demonstrated experience in air monitoring techniques and the administration of respiratory protection programs. The SSO shall be onsite during all construction activities. The SSO shall be responsible for environmental monitoring, implementing the SSHP, conducting daily Tailgate Safety Meetings, and ensuring all site workers meet the training and medical requirements. The SSO position may be filled by someone who has other project responsibilities.

3. An alternate SSO to fulfill the duties of the SSO when the SSO is not onsite. The Alternate SSO position may be filled by someone who has other project responsibilities. The Alternate SSO must have training in the use of all applicable safety and monitoring equipment described in the SSHP.
4. One or more Occupational Physicians for medical surveillance secured by the Contractor who must be responsible for performing medical surveillance functions required by the SSHP.

3.7 PROJECT TASK HAZARD ANALYSIS

A. The Contractor must perform a project task hazard analysis to identify any health and safety hazards that may be incurred in performing the work. Physical, chemical, and biological hazards must be identified based on the specific technical approach proposed by the Contractor for performing various elements of the work. Work procedures for mitigating hazards must be prepared for all tasks for which potential safety hazards are identified. The SSHP must comply with the latest OSHA confined space entry and lock-out/tag-out procedures. Chemical hazards must include the various chemicals of concern, routes of entry, signs and symptoms, and permissible exposure limits or threshold limit values.

3.8 SITE CONTROL MEASURES

A. The Contractor must establish a site control program that is to be included in the SSHP. The site control program must define the various work zones and categories of personnel who will have access to various work zones.
   1. Dust suppression must be implemented immediately to control visible dust emissions. Dust suppression techniques and procedures to be implemented must be included in the SSHP.
   2. Odor suppression must be implemented immediately to control odors detected at the site perimeter. Odor suppression techniques and procedures to be implemented must be included in the SSHP.
   3. Work zones must be delineated by the Contractor to control the flow of personnel and equipment and to reduce the potential for the spread of contaminated soil and debris from contaminated areas to clean areas. The establishment of work zones must ensure that personnel are properly protected where they are working, that work activities and contamination are confined to the appropriate areas, and that personnel can be located and evacuated in an emergency.
   4. The SSHP must define work zones and have provisions for establishing the boundaries of each work zone. The SSHP must include detailed drawings of the Site that identify the boundaries of each work zone. Persons entering each of these zones must comply with the applicable personal protective equipment, medical surveillance, and training

requirements described in the SSHP. The Contractor must clearly and physically mark and identify each work zone.

5. The onsite control program must include the use of the "buddy system," communications and mechanisms for alerting personnel of emergencies, use of standard operating procedures or safe working practices, and the identification of the nearest medical assistance. Wherever practical, the Contractor may reference other portions of the SSHP that satisfy these requirements.

3.9 PERSONAL PROTECTION REQUIREMENTS AND METHODS

A. The SSHP must specify levels of personal protection to be required and utilized during remediation activities. The selection of appropriate personal protective equipment (PPE) during activities and within each work zone must be determined by the Contractor and must be in accordance with OSHA regulations (29 CFR Part 1910.120). The SSHP must include minimal equipment requirements for personal protection as described in publications such as the Interim Standard Operating Safety Guides (EPA, November 1984) and the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (NIOSH/OSHA/USCG/EPA, October 1985).

1. The SSHP must define minimum PPE requirements that cannot be reduced unless the Contractor's air monitoring or other data support a change in protection level. A description of levels of protection and the PPE required for each level must be included in the SSHP. Methods of monitoring and defining the appropriate levels of protection must be included in the SSHP. The Contractor shall describe in the SSHP the coordination between the HSO and the HSO of any PPE downgrades or upgrades. The Contractor must define the appropriate PPE to be used for each work activity at the work area. The Contractor must ensure that appropriate PPE is being used in the exclusion zone(s) and the contamination reduction zone(s).
2. To ensure that the appropriate PPE is available for use, the Contractor must include a list of PPE available and a description of its proper use in the SSHP.
3. The Contractor must perform all work during the project at the appropriate level of protection for workers defined in the SSHP. No claims for extra payment for equipment, material, or loss of productivity will be allowed because of PPE requirements, other than those considerations defined in Section 01 20 00 – Price and Payment Procedures.

3.10 MONITORING REQUIREMENTS

A. A description of the monitoring techniques and equipment must be included in the SSHP. Monitoring must, at a minimum, meet the requirements of 29 CFR 1910.120. Monitoring must be conducted to evaluate the following hazards:

1. Total suspended particulate
2. Airborne constituents of concern (COCs)
3. Volatile organic compounds (VOCs)
4. Heat stress
5. Noise
6. Other hazards identified in the task hazard analysis.

B. The Contractor must design, implement, and oversee an air monitoring program for work areas and for personnel. Data from the air monitoring program will be used to make decisions regarding worker protective measures, routine work procedures, and appropriate

responses to emergency events. An air monitoring plan that contains the following elements must be prepared as a component of the SSHP:

1. Personnel air sampling
2. Air sampling equipment
3. Air sampling methods and procedures
4. Action levels and responses
5. Air sampling equipment calibration procedures and frequencies
6. Air sampling equipment maintenance procedures and frequencies.

C. Results from the Contractor's air monitoring program must be compared with action levels consistent with OSHA guidance in order to protect worker health and safety at the time of field work. These action levels must be specified in the SSHP and the selection of the appropriate level of protection should be based on sustained airborne exposure levels. The SSHP must define the actions required if these action levels are exceeded. All air monitoring data records must be maintained by the Contractor. Reports of the area and personnel air monitoring results must be transmitted to the Engineer.

3.11 PERSONNEL AND EQUIPMENT DECONTAMINATION

A. The SSHP must describe implementation of the following responsibilities of the Contractor:
   1. Provide and maintain decontamination facilities for personnel and equipment. Personnel decontamination stations must be positioned at each exclusion zone exit.
   2. Provide all respirators required by the Contractor's staff. All respirators must be cleaned and inspected in accordance with manufacturer's recommendations. The SSHP must describe procedures for performing daily maintenance in accordance with the appropriate OSHA standards (29 CFR 1910.134).
   3. All disposable PPE and other contaminated materials generated by personnel decontamination must be placed in containers for temporary storage in a designated area at the work area. Containers must be labeled to identify their contents and be sealed. All used PPE and containers used for storing PPE must be disposed of offsite.
   4. Personnel decontamination facilities and equipment decontamination facilities must be described in detail and their layout shown in the SSHP. Wastewater disposal from the personnel and equipment decontamination facilities must comply with federal, state, and local requirements.

3.12 EMERGENCY RESPONSE/CONTINGENCY PLAN

A. The Contractor must develop and implement an emergency response/contingency plan in accordance with the requirements of 29 CFR 1910.120 (L) that describes the appropriate actions of project personnel in the event of an emergency such as fire, explosion, or spill/release of hazardous constituents. The following requirements shall be included and/or incorporated by reference into the SSHP:
   1. Provide appropriate emergency response equipment
   2. Provide a supply list in the work area of onsite emergency equipment and equipment available from local emergency response agencies
   3. Specify the chain of command by name and title
   4. Specify equipment and signals to be used to notify site personnel of an emergency
   5. Specify emergency response actions
   6. Provide evacuation routes and assembly points
   7. Provide descriptions and maps of routes to local hospitals with emergency services or nearest trauma center

8. Describe plans for coordination with local emergency response agencies
9. Provide employee emergency response plan training
10. Specify by name and title the emergency coordinator and alternates, including telephone/pager numbers for 24-hour/day coverage and the authority of the emergency coordinators to commit resources and direct emergency actions
11. Identify the physical location of the plan onsite during operations
12. List local emergency response agencies and telephone numbers
13. Specify emergency equipment and supply inspection frequency (i.e. good condition, ready to use, and easily accessible)
14. Accident/incident reporting program.

END OF SECTION

SECTION 01 45 00 - QUALITY CONTROL

PART 1 GENERAL

1.1 QUALITY REQUIREMENTS

A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce work of specified quality.

B. Before ordering any material or doing any work, verify all measurements at the project site. No additional compensation will be allowed because of differences between actual dimensions and the measurements indicated on the Drawings. Report any discrepancy immediately to the Engineer for instructions before proceeding with the work.

C. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.

D. Comply with manufacturers' instructions, including each step in sequence. When manufacturer's instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

E. Perform work using persons qualified to produce required and specified quality.

F. Supervise performance of work in such manner and by such means to ensure that work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

G. Contractor Superintendent or on-site alternate shall maintain oversight of work being performed and ensure work is implemented in accordance with Contract Documents as discussed in Section 01 10 00 - Summary.

1.2 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards; comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current as of date for receiving solicitations except where specific date is established by code.

C. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Owner before proceeding.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Summary

B. Submittals
   1. Methods and materials for erosion and dust control
   2. Erosion Control and Stormwater Management Plans

C. Temporary Utilities:
   1. Temporary electricity
   2. Temporary sanitary facilities

D. Construction Facilities:
   1. Field offices
   2. Vehicular access
   3. Progress cleaning and waste removal
   4. Project identification
   5. Traffic regulation

E. Temporary Controls:
   1. Security
   2. Water control
   3. Erosion and sediment control

F. Removal of utilities, facilities, and controls

1.2 SUMMARY

A. Contractor shall determine the temporary facilities required to execute the Work in addition to those required.

B. Do not place any temporary facilities within the floodplain boundaries shown on the Drawings.

1.3 TEMPORARY ELECTRICITY

A. Provide and pay for power service from utility for construction operation and Field Offices.

1.4 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of Project mobilization.

1.5 CONTRACTOR'S FIELD OFFICES AND STORAGE

A. Acceptable locations for Field Offices and storage are within the Limits of Disturbance as shown on the Drawings. Locate field offices and storage buildings at a maximum practical distance from existing homes.

B. Portable or mobile buildings, weather-resistant, sturdy, secure, and with proper environmental controls.

C. Employee Residential Occupancy within any facility at the project Site is not allowed.

D. Maintain pedestrian areas free of mud, water, snow, and the like.

E. At completion of Work remove buildings, foundations, utility services, and debris. Restore areas to same or better condition as original condition.

1.6 ENGINEER'S OFFICE

A. The Contractor shall provide one fully insulated office trailer for the entire duration of the project. At least 10 days before mobilization, the Contractor shall provide a floor plan, specification sheet, and furniture list to Engineer.
   1. Minimum Dimensions:
      a. Interior area: 250 square feet.
      b. Width: 8 feet wide.
      c. Ceiling height: 8 feet.
   2. Trailer Specifications:
      a. Exterior deadbolt locks with keys provided to the Engineer.
      b. Vinyl flooring and paneled walls.
      c. Minimum of 3 windows.
      d. Minimum of four (4) 110-volt, 60 Hz duplex electrical service outlets, power to be provided by Contractor.
      e. Ceiling-mounted interior lighting and an exterior porch light.
      f. Automatic equipment to maintain 68 °F (heating) and 76 °F (cooling), with adjustable thermostat.
      g. All-weather platform and steps for access.
   3. Equipment:
      a. Conference table and seating to accommodate 8 persons.
      b. Work desk (minimum 8 square feet of work space) with storage cabinet or closet.
      c. Refrigerator (minimum 15 cubic feet capacity), microwave, and trash containers.
      d. Fire extinguisher.

B. The Engineer's office space must be physically separated from the Contractor's office space. The Engineer's office space shall have locks with keys that are not available to the Contractor.

C. Contractor shall provide internet service, including all equipment and service fees, a wireless access point (router), and a conference phone system. All internet data charges shall be the responsibility of the Contractor. Data transmission speeds shall be rated at least:
   1. 15 Mb/s download.
   2. 5 Mb/s upload.

1.7 VEHICULAR ACCESS

A. Construct temporary access roads from public thoroughfares to serve construction area, of width and load-bearing capacity to accommodate unimpeded traffic for construction purposes.

B. Locate access roads and construction entrances as indicated on Drawings. Contractor may re-locate access roads and other Work with Engineer approval. New locations shall minimize the disturbed areas of the project.

C. Relocate vehicular access as Work progress requires and provide signage and clearance as necessary for unimpeded traffic flow for emergency vehicles on all public roads.

D. Construct stabilized construction entrances at each intersection of temporary access roads and public roads.
   1. Use coarse aggregate or reclaimed or recycled concrete equivalent, as described in the Drawings and Specifications.
   2. Not less than 6 inches compacted thickness, unless approved by Engineer.
   3. Surface water flowing or diverted toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.
   4. Maintain construction entrances in a condition that will prevent tracking or flowing of sediment and materials onto adjacent public roads. This may require periodic topdressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All soils or materials spilled, dropped, washed, or tracked onto roads must be removed immediately.
   5. Periodic inspection and required maintenance shall be provided after each rain and other times when stone voids have been filled with soil or sediment.

E. Strip topsoil under Stabilized Access Roads in accordance with Section 31 10 00 – Site Clearing.

F. Construct culverts to span low areas and allow unimpeded drainage.

G. The Contractor must keep public roads in the construction area clean and promptly remove all tracked dirt.

H. Damage to Refinery Road shall be repaired to relevant county standards if damage is caused by heavy equipment.

1.8 PARKING

A. Use First Assembly of God Church lot for parking.

B. Parking will not be allowed on grassed or soft areas. Parking shall be on paved surfaces.

C. If Site space is not adequate, provide additional off-Site parking.

D. Provide temporary surface parking areas to accommodate construction personnel only if parking in designated areas as shown on the Drawings is inadequate. Locate as approved by Engineer.

E. Do not allow tracked or heavy vehicles or construction equipment in parking areas or pavement to remain.

F. Maintenance:
   1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, ice, and the like.
   2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original condition.

G. Removal, Repair:
   1. Remove temporary materials and construction before Substantial Completion.
   2. Repair existing facilities damaged by use, to original condition.

H. Mud from Site vehicles: Provide means of removing mud from vehicle wheels before entering streets.

1.9 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.

1.10 TRAFFIC REGULATION

A. Coordinate traffic control with Creek County Highway District #3.
   1. 620 Industrial Rd., Bristow, OK 74010
   2. 918-367-3231.

B. Provide and maintain identifying signage and features to inform and control public traffic through the public roads within the construction area.

C. Signs, Signals, and Devices:
   1. Post-Mounted and Wall-Mounted Traffic Control and Informational Signs.
   2. Traffic Cones, Drums, Flares, and Lights.
   3. Flag Person Equipment.

D. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations on public traffic lanes necessitates using one.

E. Haul Routes:
   1. As described in Section 02 61 00 – Removal and Disposal of Contaminated Sediments.
   2. Consult with state and county authorities to determine restriction for hauling vehicles along route. Obtain approval for haul routes public roads.
   3. Confine construction traffic to designated haul routes.
   4. Provide traffic control at critical areas of haul routes to regulate traffic and to minimize interference with public traffic.

F. Traffic Signs:
   1. Provide signs at approaches to Site and on-Site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
   2. Relocate signs and signals as Work progresses, to maintain effective traffic control.

1.11 SECURITY

A. Security Program:
   1. Prevent theft, vandalism, and unauthorized entry into Work site.
   2. Initiate program at Project mobilization.

B. Entry Control:
   1. Restrict entrance of persons and vehicles to all work areas, equipment and material storage areas, decontamination facilities, and temporary haul routes. Allow entrance only to authorized persons with proper identification.
   2. Use orange construction fencing around unsecured areas.
   3. Use additional signage at all points of ingress to work areas.
   4. Maintain log of workers and visitors and make available to Engineer on request.

1.12 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials before Final Construction Inspection. Clean and repair damage caused by installation or use of temporary Work. Restore areas disturbed during construction to original condition.

B. Remove Stream Crossing and restore streambanks to original condition.

C. Do not remove erosion and sediment controls until authorized by OPDES Permit and Engineer.

PART 2 PRODUCTS

2.1 PROJECT IDENTIFICATION SIGN

A. One, 20-square feet area, bottom 6 feet aboveground.

B. Content:
   1. Project number, title, logo, and name of U.S. EPA Region 6.
   2. Titles and logo of EA Engineering, Science, and Technology, Inc., PBC
   3. Titles and logo of Engineer.
   4. Name and logo of Prime Contractor.

C. Graphic Design, Colors, and Style of Lettering: Approved by Engineer.

D. Design sign and structure to withstand 60-mph wind velocity.

E. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

F. Installation:
   1. Install Project identification signs at project mobilization.
   2. Erect at locations shown on Drawings or as approved by Engineer.
   3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
   4. Install sign surface plumb and level, with butt joints. Anchor securely.

5. Paint exposed surfaces of sign, supports, and framing.

G. Maintenance: Maintain clean signs and supports; repair deterioration and damage.

H. Removal: Remove signs, framing, supports, and foundations at completion of Project and restore area.

PART 3 EXECUTION – Not Used

END OF SECTION

SECTION 01 57 00 – TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. The Contractor shall furnish all labor, equipment, and materials associated with the requirements of this Section, including:
   1. Submittals
   2. Erosion and sediment control
   3. Dewatering
   4. Silt Fence
   5. Stabilized Construction Entrance (SCE)
   6. Straw Bale Sediment Barrier
   7. Dewatering Equipment
   8. Installation
   9. Maintenance
   10. Inspections
   11. Removal

B. Temporary Erosion and Sediment Control measures are not intended to be used as or replace proper decontamination measures. See Section 01 72 00 – Decontamination of Personnel and Equipment.

C. References:
   1. Stormwater General Permit for Construction Activities with the State of Oklahoma. Permit No. OKR10. Oklahoma Department of Environmental Quality. 18 October 2017. http://www.deq.state.ok.us/wqdnew/stormwater/construction/2017/Final CGP 2017.pdf

1.2 SUBMITTALS

A. Storm Water Pollution Prevention Plan (SWP3).

B. Product data for filter fabric used in Silt Fences.

C. Product data for geotextile and aggregate used for Stabilized Construction Entrances.

1.3 EROSION AND SEDIMENT CONTROL

A. Contractor will be responsible for carrying out the substantive requirements of the OPDES General Permit (Permit), however application for and obtaining the permit is not required. The Contractor is solely responsible for the placement, maintenance, and removal of the erosion and sediment control measures until permanent stabilization is established. All erosion and sediment control work shall comply with applicable requirements of the Permit.

B. All land-disturbing activities shall be planned and conducted to minimize the size of the area exposed at any one time and the length of the time of exposure. As soon as feasible, but not more than 14 days after work has ended, disturbed areas should be temporarily stabilized or be permanently restored according to the Drawings and Specifications.

C. Onsite areas that are subject to severe erosion shall be identified and receive special attention. Rapid stabilization will be required in locations adjacent to existing wetlands and surface water bodies.

D. Surface water runoff originating upgradient of exposed areas shall be controlled to reduce erosion and sediment loss during the period of exposure.

1.4 DEWATERING

A. Remove free water via gravity from excavated soils to permit disposal of soils without need for solidification to be performed at the landfill disposal site. See Section 02 61 00 – Removal and Disposal of Contaminated Soils.

B. Utilize Erosion and Sediment Control measures during soil draining. Do not allow uncontrolled runoff to enter any surface water body or wetland. Manage runoff in accordance with the OPDES Permit.

1.5 SURFACE WATER CONTROL

A. Definition: Removal of surface water within open excavations.

B. Provide surface water control system to permit excavation to be completed on dry and stable subgrade. Utilize ditches, berms, and other devices to divert and drain surface water from excavations.

C. Utilize Erosion and Sediment Control measures during excavation dewatering. Do not allow uncontrolled discharges from dewatering activities to enter any surface water body or wetland.

D. Divert surface water and seepage water within excavation areas into sumps and manage discharged water in accordance with the OPDES General Permit.

E. Operate pumps only during normal operating times when needed to dewater excavations or excavated soils.

1.6 STREAM CROSSING SEDIMENT CONTROL

A. The Contractor shall take measures to prevent excessive disturbance to the stream bed and banks during the stream crossing installation. Excessive cutting of native soil along the stream banks will not be allowed.

B. Any soils that are disturbed during construction of the crossing shall be stabilized as soon as possible with a cover crop of annual rye and mulch and revegetated as rapidly as practicable.

C. Complete construction of the stream crossing during periods of low water velocity and depth in the stream. Temporarily bypass the stream flow using pumps during pipe placement. Utilize erosion control measures at the outlet of any dewatering equipment.

D. Install temporary silt fencing across the stream during construction and removal of the stream crossing, if water levels and velocities allow.

PART 2 PRODUCTS

2.1 GENERAL

A. All erosion and sediment control materials shall conform to the substantive requirements of the Oklahoma Construction Stormwater Permit (OKR05), Drawings, and this Section.

2.2 SILT FENCES

A. Fabric
   1. Provide woven geotextile filter fabric that meets the following requirements:

PHYSICAL PROPERTY	TEST PROCEDURE	STRENGTH REQUIREMENT
Grab Tensile Strength	ASTM D 4632	100 lbs. (min.)
Elongation (percent)	ASTM D 4632	30 percent (max.)
Trapezoid Tear	ASTM D 4533	55 lbs. (min.)
Permittivity	ASTM D 4491	0.2 sec-1 (min.)
AOS (U.S. Std Sieve)	ASTM D 4751	20-100

B. Stakes
   1. Metal or wood posts with a minimum length of 36 inches.
   2. Wood posts shall be made of hardwood and cut with a minimum cross-section of 3.0 square inches.
   3. Metal posts shall be “T” or “U” section steel posts weighing not less than 1.0 pound per linear foot.

2.3 STABILIZED CONSTRUCTION ENTRANCE

A. Aggregate
   1. Crushed stone or recycled concrete, without rebar
   2. Nominal size: 2 – 3 inches

B. Geotextile
   1. Provide non-woven geotextile that meets the following requirements:

PHYSICAL PROPERTY	TEST PROCEDURE	STRENGTH REQUIREMENT
Grab Tensile Strength	ASTM D 4632	160 lbs. (min.)
Elongation (percent)	ASTM D 4632	50 percent (max.)
Trapezoid Tear	ASTM D 4533	60 lbs. (min.)
Puncture Strength	ASTM D 6241	90 lb. (min.)
Permittivity	ASTM D 4491	1.2 sec-1 (min.)
AOS (U.S. Std Sieve)	ASTM D 4751	60-100

2.4 STRAW BALE SEDIMENT BARRIER

A. Straw Bales:
   1. Composition: Stalks of oats, wheat, rye, barley, rice, or grasses such as byhalia, bermuda, etc., furnished in air dry condition.
   2. Size: Cross section of 14 by 18 inches.
   3. Binding: Wire-bind or string-tie all bales. Bindings shall be oriented around the sides rather than along the tops and bottoms of the bales to prevent deterioration of the bindings.

B. Anchors:
   1. Wooden stakes; minimum 2 by 2 inches in cross section and a minimum length of 3 feet; or
   2. Steel posts; standard "U" or "T" section, minimum weight of 1.33 pounds/linear foot and a minimum length of 3 feet.

2.5 IN-STREAM SEDIMENT BARRIER

A. Sand Bags:
   1. Heavy Duty Polypropylene fabric, minimum weight: 3.2 oz./sq. yd.
   2. Steel tie wire closure.
   3. Filled with at least 50 lbs. clean sand.

B. Water Barrier Film:
   1. 10 mil Plastic Sheeting.

2.6 DEWATERING EQUIPMENT

A. Portable submersible or centrifugal pumps and electric generation power units.

B. Furnish strainer at end of suction pipe.

C. 10 mil plastic sheeting to separate subgrade from excavated material undergoing gravity draining.

PART 3 EXECUTION

3.1 EXTENT OF WORK

A. Contractor shall implement Erosion and Sediment controls as required to meet the substantive requirements of applicable storm water pollution prevention permits. Field changes and minor adjustments from the Drawings are permissible if the installation meets the requirements of the Permit.

3.2 INSTALLATION

A. Silt Fences:
   1. Provide Silt Fences where shown on the Drawings.
   2. Install silt fences prior to initiating each phase of work where erosion might occur (e.g., clearing and grubbing, excavation, and grading).
   3. Place silt fence parallel with grading contour.
   4. Drive stakes 16 inches (minimum) into stable ground, no more than 6 feet apart.
   5. Fasten filter fabric securely to upstream side of stakes with wire ties or staples at top and mid-section.
   6. Embed filter fabric a minimum of 8 inches into the ground, backfilling and compacting soil around it.
   7. Where two sections of filter fabric are joined, overlap, twist, and fasten according to the Drawings.
   8. Extend ends of Silt Fence five feet (minimum) upslope at 45 degrees to prevent runoff from going around the ends of the Silt Fence.

B. Stabilized Construction Entrance (SCE)
   1. Place SCE where shown on the Drawings.
   2. SCEs should be placed anywhere temporary access roads meet existing permanent public roadways to prevent soil tracking and dust generation on public roadways.
   3. Installed SCE shall meet the minimum dimensions shown on the Drawings.
   4. When necessary, pipe all surface water flowing to or diverted towards the SCE under the entrance to maintain positive drainage. Use appropriate piping materials and at least 12 inches of stone over the pipe.
   5. Place geotextile over the prepared subgrade and then top with a layer of aggregate at least 6 inches thick over the entire length and width of the SCE.

C. Straw Bale Sediment Barrier
   1. Place the straw bales in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. At the end of each row, turn bales upstream to retain sediment.
   2. Entrench and backfill the barrier. Excavate a trench the width of a bale and the length of the barrier to a minimum depth of 4 inches. After the bales are staked and chinked (gaps filled by wedging with straw), backfill the excavated soil against the barrier. Conform the backfill soil with the ground level on the downstream side and build up to 4 inches against the upstream side of the barrier. Scatter loose straw over the area immediately upstream from a barrier. Securely anchor each bale by driving at least two anchors through the bale to a minimum depth of 18 inches into the ground.

D. In-Stream Sediment Barrier
   1. Determine height of barrier by measuring elevation and comparing to minimum barrier design elevation as shown in drawings. The barrier shall be made of sand bags and built in a triangular shape with the base width being at a minimum 1.5 times the maximum height of the barrier.
   2. Place sandbags tightly together and stagger them to construct a solid sandbag barrier.
   3. Install the Water Barrier Film against the side that faces the stream. Anchor underneath the bottom layer of sandbags and drape the film over the top layer, anchoring between layers of sandbags on the opposing face of the barrier.
   4. If subgrade is not stable, anchor backside of barrier with wood or metal posts to resist hydrostatic water pressure and displacement of the barrier.

3.3 MAINTENANCE

A. Maintain the erosion and sediment control measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, and repair of erosion and sediment control measures. Use the following procedures to maintain the protective measures.
   1. Inspect silt fences in accordance with the paragraph titled "Inspections." Any required repairs shall be made promptly. Pay close attention to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective when the barrier is still necessary, replace the fabric promptly. Remove sediment deposits when deposits reach one-third of the height of the barrier.
   2. SCE
      a. Maintain entrances in a condition that minimizes tracking of soils. Add stone or make other repairs as conditions demand to maintain clean surface and specified dimensions.
      b. Immediately remove stone and or soils that are spilled, dropped, or tracked onto adjacent public roadways. Using wash water to remove tracked soils is not acceptable unless the water is directed to an appropriate sediment control structure.

3. Straw Bale Sediment Barrier
    a. Inspect barrier and downstream drainageways for damage. Repair or replace damaged straw bales.
    b. Remove sediment accumulated behind barrier, as needed, to ensure functionality of the barrier.

3.4 INSPECTIONS

A. General
1. Inspect the following areas at least once every seven (7) calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site:
    a. disturbed areas of the construction site;
    b. areas that have not been finally stabilized;
    c. areas used for storage of materials;
    d. areas exposed to precipitation, stabilization practices, structural practices, or other controls;
    e. areas where vehicles exit the site.

B. Inspections Details
1. Inspect:
    a. Disturbed areas for evidence of, or the potential for, sediment entering waterways;
    b. Erosion and sediment control measures identified in the General Permit to ensure that they are operating correctly;
    c. Locations where water is discharged from the construction site to determine whether erosion control measures are effective in preventing significant impacts to receiving waters;
    d. Locations where vehicles exit the site for evidence of offsite sediment tracking.

C. Inspection Reports
1. For each inspection conducted, prepare a report that includes:
    a. A summary of the scope of the inspection
    b. Name of personnel making the inspection
    c. Date of the inspection
    d. Major observations
    e. Maintenance performed
    f. Actions taken.
2. Maintain Erosion and Sediment Control Inspection logs and reports.

3.5 REMOVAL

A. Following completion of the project, all materials shall be removed from the site. All areas where temporary controls are placed shall be restored to their pre-existing conditions.

B. The removal of any erosion and sediment control measure shall only be performed upon receiving approval that final stabilization of the site has been achieved.

END OF SECTION

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittals

B. Construction Photographs

C. Closeout Procedures

D. Project Record Documents

E. Final Cleaning

1.2 SUBMITTALS

A. Construction Photographs

B. Substantial completion inspection and initial punch list

C. Final completion inspection

D. Record Documents

1.3 CONSTRUCTION PHOTOGRAPHS

A. Provide photographs of Site and construction throughout progress of Work.

B. Take photographs and video as evidence of pre-existing Project conditions prior to initiating on-site Work on public and private roads, staging area(s), excavation areas, and critical work areas.

C. Take photographs throughout the work to document the activities performed each day and show project progress.

D. Deliver digital photographs weekly to Engineer and provide a complete set with the Project Record Documents via compact disc (CD) or private file transfer protocol download.

E. Digital photographs:
   1. File name: Short description of the subject of image.
   2. File type and size: JPEG, uncropped size of at least 16 megapixels.
   3. Date and Time: Include in metadata for each image.

1.4 SUBSTANTIAL COMPLETION PROCEDURES

A. Submit final survey data, Project record documents, construction photographs, and other final record data.

B. Contractor shall conduct an inspection to establish that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected and date of anticipated completion for each item.

C. Submit initial punch list to Engineer.

D. Remove temporary facilities and services from Project Site, along with construction tools and equipment.

E. Within 5 days, Engineer will make a comprehensive site inspection to determine whether Work is substantially complete.

F. If Engineer finds that Work is not substantially complete:
   1. Engineer will promptly notify Contractor with reasons for its decision.
   2. Contractor shall remedy deficiencies in Work and send second notice to Engineer.
   3. Engineer will reinspect Work.

G. When Engineer finds that Work is substantially complete, they will provide notice to Owner and Contractor, accompanied by Contractor's list of items to be completed or corrected (final punch list).

H. Contractor shall complete remaining Work within time period stipulated.

1.5 FINAL COMPLETION PROCEDURES

A. When Contractor considers Work to be complete, submit written certification that:
   1. Contract Documents have been reviewed.
   2. Work has been examined for compliance with Contract Documents.
   3. Work has been completed according to Contract Documents.
   4. Work is completed and ready for final inspection.

B. Submit following:
   1. Final punch list indicating all items have been completed or corrected.
   2. Project record documents.
   3. Final payment request.
   4. Contractor's affidavit of payment of debts and claims.
   5. Contractor affidavit of release of liens.
   6. Consent of surety to final payment.

C. Perform final cleaning for Contractor-soiled areas.

D. Within 5 days, Engineer will make inspection to determine whether Work is complete.

E. If Engineer finds Work to be incomplete or defective:
   1. Engineer will promptly notify Contractor with reasons for its decision.
   2. Contractor shall remedy stated deficiencies and send second notice to Engineer.
   3. Engineer will reinspect Work.

1.6 PROJECT RECORD DOCUMENTS

A. Maintain on Site one set of the following record documents:
   1. Drawings
   2. Specifications
   3. Addenda
   4. Change Orders and other modifications to the Contract
   5. Reviewed Submittals

B. Ensure entries are complete and accurate, enabling future reference by Owner; record actual revisions to the Work.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress, not less than weekly.

E. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:
   1. Manufacturer's name and product model and number
   2. Product substitutions or alternates used
   3. Changes made by Addenda and modifications

F. Record Drawings: Legibly mark each item to record actual construction as follows:
   1. Include Contract modifications such as Addenda, change directives, field orders, minor changes in the Work, and change orders.
   2. Identify actual excavation and final grades and limits.
   3. Identify and locate existing buried or concealed items encountered during Project.
   4. Measured horizontal and vertical locations of any underground utilities.
   5. Field changes of dimension and detail.
   6. Details not on original Drawings.
   7. Scale drawings showing limits of each excavation, limits of contamination, sample locations, and sample identification numbers. On-site stockpile, storage, mixing, decontamination, loading, and disposal areas shall also be shown on the drawings.

G. Submit marked-up paper copy documents and PDF files to Engineer before Final Completion. Final payment will not be authorized until receipt and final acceptance.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 FINAL CLEANING

A. Execute final cleaning prior to final completion inspection:
   1. Clean Site
   2. Sweep paved areas.
   3. Remove waste and surplus materials, rubbish, and equipment.

END OF SECTION

SECTION 01 72 00 – DECONTAMINATION OF PERSONNEL AND EQUIPMENT

PART 1 GENERAL

1.1 DECONTAMINATION FACILITIES

A. Locate within the Limits of Disturbance as shown on the Drawings.

B. Locate near excavation, mixing, and loading areas to prevent spreading contamination to Temporary Access Roads, public rights-of-way, and areas outside the Limits of Disturbance.

1.2 GENERAL

A. Contractor shall collect, contain, and transport all water generated during decontamination activities for disposal.

B. All personnel shall be decontaminated before leaving the site, as specified in the Health and Safety Plan. “Leaving the site” is defined as leaving the exclusion zone and entering the contamination reduction zone. Decontamination shall be required prior to breaks, when picking up tools, equipment, or materials in the support zone, or any other activities where the potential exists for contaminant transfer.

C. Equipment shall be cleaned and decontaminated prior to use onsite, and prior to leaving the site.

D. Equipment shall be cleaned of all dirt/mud before entering public roadways.

PART 2 PRODUCTS

2.1 GENERAL

A. The Contractor shall furnish all equipment and supplies necessary for the decontamination process such as clean water supply tank, non-phosphate detergent, a mobile steam cleaner or hot water high pressure washer, buckets, brushes, etc., as required.

B. The Contractor shall furnish sealable United States Department of Transportation (U.S. DOT)-approved containers (55-gallon drums) having watertight lids stored in a containment area as required, or poly tank for the storage of decontamination water.

C. Tanks or drums shall be stored in a lined containment area or on a containment pad.

D. The Contractor shall supply all required labeling materials.

E. The Contractor shall provide all protective clothing and the equipment necessary for its own personnel to comply with the decontamination procedures as specified in Health and Safety Plan.

PART 3 EXECUTION

3.1 PREPARATION

A. Install access roads in accordance with Section 01 50 00 – Temporary Facilities and Controls.

B. Strip topsoil under decontamination pads in accordance with Section 31 10 00 – Site Clearing.

3.2 PERSONAL HYGIENE AND DECONTAMINATION

A. Personnel entering the Exclusion Zone (EZ) or Contamination Reduction Zone (CRZ) or otherwise exposed to hazardous chemical vapors, gases, liquids, or contaminated solids must decontaminate themselves and their equipment prior to exiting the CRZ and entering the support zone. Consult Chapter 10.0 of NIOSH 85-115 when preparing decontamination procedures. Submit a detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by site workers as part of the Site Safety and Health Plan. Train employees in the procedures and enforce the procedures throughout site operations.

3.3 EQUIPMENT DECONTAMINATION

A. The vehicles and equipment used in the EZ shall be decontaminated in the CRZ prior to leaving the site. Construct decontamination pads which meet the site decontamination needs for all vehicles and larger equipment decontamination. Construct the pad to capture decontamination water, including overspray, and allow for collection and removal of the decontamination water using sumps, dikes and ditches as required.

B. Wheels shall be cleaned to remove soil and source material prior to entrance onto public roads. When washing is required, it shall be done on a wash pad or decontamination pad.

3.4 PROCEDURES

A. Procedures for equipment decontamination must be developed and utilized to prevent the spread of contamination into the safety zone (SZ) and offsite areas. These procedures must address disposal of contaminated products and spent materials used on the site, including containers, fluids, oils, etc. Assume any item taken into the EZ is to be contaminated, and perform an inspection and decontaminate. Vehicles, equipment, and materials must be cleaned and decontaminated prior to leaving the site. Handle construction material in such a way as to minimize the potential for contaminants being spread and/or carried offsite. Prior to exiting the site, vehicles and equipment must be monitored to ensure the adequacy of decontamination.

B. Off-site decontamination of some materials may be required if frozen conditions are encountered. Engineer may approve of off-site decontamination if frozen conditions are encountered, and Contractor submits decontamination plan and procedures for off-site decontamination.

END OF SECTION

SECTION 02 41 00 - DEMOLITION AND RESTORATION OF SITE FEATURES

PART 1 GENERAL

1.1 SUMMARY

A. This work shall consist of demolishing, segregating, hauling, and disposing of site features as indicated on the Contract Drawings. Disposal may occur either at an approved offsite site facility or in onsite locations designated for this purpose.

B. If materials are in contact with source materials intended for removal, wash off source material before moving away from the original location. This work item shall also include the return or replacement of site features that were demolished or relocated. Concrete shall be handled as described in Paragraph 3.3.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PREPARATION

A. Identify utilities and perform clearing in accordance with Section 31 10 00 – Site Clearing. Request underground utilities to be located and marked within and surrounding all construction areas.

B. Protect utilities indicated to remain from damage. Contractor is responsible for all repairs to damaged utilities and all associated reparations at no cost to the project Owner or utility Owner. Contractor is responsible for removal and disposal of abandoned utilities encountered during excavation.

C. Protect benchmarks, survey control points, existing structures, fences, and paving from excavating equipment and vehicular traffic except as proposed by Contractor and approved by Owner.

D. Install access roads in accordance with Section 01 50 00 – Temporary Facilities and Controls.

E. Install decontamination pads in accordance with Section 01 72 00 – Decontamination of Personnel and Equipment.

F. Identify required lines, levels, contours, and datum.

G. Install dewatering systems and dewater excavation areas in accordance with Section 31 23 19 - Dewatering. Dewater excavated material *in situ* as much as practicable.

3.2 EXISTING SITE FEATURES TO BE PROTECTED

A. Prior to the start of excavation activities, the Contractor and the Engineer shall make a joint

existing conditions survey. Following the survey, the Contractor will prepare a brief existing condition survey report describing the features requiring protection, which may or may not specifically identified on the Drawings. Photographs shall be taken of the existing condition of site features, including roads, driveways, sidewalks, houses, structures (i.e., garages, utility sheds), and any other miscellaneous surface fixtures. Post-construction photographs shall also be taken to demonstrate the protection of features and post-construction condition.

B. The Contractor shall repair damaged site features at no cost to the Owner. If the Contractor or Engineer determines that damage cannot be repaired to original condition, then the damaged feature shall be replaced-in-kind at no cost to the Owner.

C. Permanent site features that are not moveable shall be protected in-place, which include, but are not limited to culverts, water supply lines, overhead powerlines and utility poles, telecommunications cables, and oil and gas pipelines. Take necessary precautions and install protection measures to avoid damage to permanent features, as indicated on the Drawings. Any permanent item damaged during construction activities shall be repaired or replaced-in-kind at the Contractor's expense.

3.3 CONCRETE

A. The former concrete foundations, driveways, walkways, existing manholes, concrete septic tanks, and other miscellaneous concrete debris indicated for removal on the Drawings shall be decontaminated of visible soil or source material and broken down and disposed of at the approved offsite facility. Embedded metal parts may be extracted and recycled at an approved facility after decontamination and removal of source material.

3.4 SCRAP METAL

A. Recycle scrap metal generated during demolition activities, including metal fences, copper piping, etc. If scrap metal contacts source material, wash off source material before offsite disposal. Provide separate containers to collect scrap metal, transport, and recycle at an approved offsite facility.

3.5 MISCELLANEOUS SUBSURFACE FEATURES

A. Maintain utility services to each home. If utilities need to be disconnected temporarily, contact the applicable utility entity to coordinate the disconnection of the service. Provide temporary utilities in the event of a loss of service. If damages to underground utilities during excavation activities occur, contact the utility entity and the Engineer immediately. Complete all utility repairs at no additional cost to the Owner.

B. Subsurface utilities that interfere with excavation activities shall be disconnected, cut, and replaced, and the service shall be returned to a functioning service, including the performance of flushing/pressure tests when required. Coordinate these actions with the respective utility entity prior to work. Any debris generated during these activities shall be decontaminated and disposed of at an approved offsite facility, if segregation from source materials is practicable.

3.6 EXCAVATION

A. Do not interfere with 45 degree bearing splay of foundations.

B. Trim excavation. Remove loose matter.

C. Notify Engineer of unexpected subsurface conditions.

D. Remove excavated material from site and dispose of at approved offsite facility.

E. Do not spread contaminated sediment during excavation and loading operations.

F. A private georeferenced utility locate will be completed prior to excavation as required in Section 31 10 00 - Site Clearing, which will identify location and depth of abandoned oil and gas wells. Contractor shall sweep excavation areas near identified location of wells with a metal detector to confirm the location immediately prior to excavation. Contractor shall not disturb abandoned oil and gas wells.

3.7 TRANSPORTATION AND DISPOSAL

A. Furnish labor, materials, and equipment necessary to store, transport, and dispose of waste materials in accordance with Federal, State, and local requirements.

B. Source materials shall be separated from structural materials generated during demolition activities. Transportation and disposal of source materials is discussed in Section 02 61 00 – Removal and Disposal of Contaminated Materials.

C. Transportation
   1. Inspect transportation equipment for leaks.
   2. Transport waste materials in accordance with Federal and State requirements. Drain materials that may contain water.
      a. Perform and document decontamination of materials prior to leaving the Work site.

D. Dispose of all waste at approved facilities.

3.8 FIELD QUALITY CONTROL

A. Engineer shall monitor demolition and removal activities and ensure excavations do not exceed excavation limits.

END OF SECTION

SECTION 02 55 00 – STABILIZATION OF LEAD AREA SOURCE MATERIAL

PART 1 GENERAL

1.1 SUMMARY

A. This section includes treatment of lead additive area source material via chemical stabilization.

1.2 SUBMITTALS

A. Within 14 of Notice to Proceed, submit comprehensive work plan for mixing and sampling in accordance with Section 01 33 00 – Submittal Procedures.

B. Preliminary plans for excavation, mixing, sampling, transport, and disposal shall be provided in the Contractor's initial proposal.

C. Lead Stabilization Amendment composition data and certificates for each truck load delivered to the site.

D. Daily proportion and mixing quality control data.

E. Daily records during mixing activities.

1.3 PROJECT CONDITIONS

A. The physical conditions indicated on the Drawings and in the Specifications are the results of site investigations. While the site investigations data is representative of subsurface conditions at a specific location, variations in the contaminated materials and subsurface conditions are expected to exist.

B. Stabilization shall not take place in an ambient temperature below 40 degrees F without approval. Contaminated material shall not be treated if any part is frozen. Stabilization shall not be performed during periods of heavy rainfall if this will result in the addition of excess water to the mixture.

PART 2 PRODUCTS

2.1 LEAD STABILIZATION AMENDMENT

A. Reagent Name: FF-100

B. Manufacturer: Free Flow Technologies, Ltd.
   1. Contact Name: Timothy Danzer
   2. Contact Phone Number: 815-636-0166

C. SDS provided as Attachment 1 to this Section

D. Material properties:
   1. Appearance: Brown granular material

2. Density: 80-85 pounds per cubic ft
3. pH: 6.0 – 12.0
4. Flashpoint: Noncombustible
5. Odor: None
6. Packaging: 2000-pound supersack

E. Lead Stabilization Amendment shall be stored in a dry location and/or covered during non-production periods and during rain events.

F. Application and mixing are intended render the lead additive area source material as non-hazardous. Transportation and disposal shall occur as described in Section 02 61 00 – Removal and Disposal of Contaminated Materials.

2.2 MIXING EQUIPMENT

A. The mixing equipment shall have sufficient capacity to meet performance and schedule requirements.

B. Equipment shall have means to control depth of excavation and rate of mixing.

PART 3 EXECUTION

3.1 PREPARATION

A. Excavate lead additive area source material in accordance with the Drawings and Section 02 61 00 – Removal and Disposal of Contaminated Materials.

B. Provide measures to prevent stockpiled material, whether mixed with reagent or not, from contacting rainfall or surface waters in accordance with Section 01 57 00 – Temporary Erosion and Sediment Control.

3.2 MIXING DESIGN

A. Lead Stabilization Amendment shall be mixed with lead source material to reduce leachable lead concentration to levels appropriate for disposal in a Subtitle D landfill facility. To meet disposal requirements, the toxicity characteristic leaching procedure (TCLP) leachable lead concentration shall be below 5 ppm, as determined by the testing methodology described in Paragraph 3.5 of this Section.

B. Amendment shall be added *up to* the rate listed. The Contractor is responsible for developing an amendment dosage and mixing methodology that consistently demonstrates materials have been rendered as non-hazardous waste, as determined by TCLP lead leachability.

C. Preliminary pilot testing has been performed on material excavated from the lead additive area using the Lead Stabilization Amendment. Based on testing, the approved mix design is:
1. Add Lead Stabilization Amendment at a rate of 5% of source material weight. Higher rates shall be approved by Engineer.
2. Source material weight shall be determined based on volume excavated and the known lead source material density, which is based on preliminary geotechnical testing.
3. Lead source material density: 1.47 ton/cubic yard.

3.3 MIXING OF LEAD ADDITIVE AREA SOURCE MATERIAL

A. Excavate lead source material in cells to the target depth, which is shown on the Drawings. Size of cells will vary based on the target depth and the irregular dimensions of the Lead Removal Area and subareas. Cells should be kept to a manageable size that will allow the entire cell to be excavated, mixed, sampled, and covered or otherwise stored on a single day. See Section 02 61 00 – Removal and Disposal of Contaminated Materials.

B. Place excavated materials in a designated mixing area or complete mixing *in situ*. All excavated materials shall have stabilization performed by mixing Lead Stabilization Amendment. Mixing method (equipment used and procedures) shall be provided in the Contractor Proposal, and any changes to the procedure or equipment used must be approved by the Engineer. Mixing methodology shall produce a uniformly mixed condition to distribute the amendment throughout the thickness requiring removal and disposal.

C. Mix in batches to ensure the amendment dosage rate is consistent and uniform throughout the material after mixing.

D. Determine batch weight by completing pre- and post-excavation survey or precise measurement of excavation cell under supervision of the Engineer.

E. Add Lead Stabilization Amendment per the mixing design in Paragraph 3.2 of this Section. Mix thoroughly using mechanical means and methods.

F. Control dust generation during mixing by spraying water.

G. After a batch is mixed and uniform distribution of the amendment is achieved, the material shall be sampled in accordance with Paragraph 3.5 of this Section.

H. Batches shall be isolated from each other until sampling confirms the batch is non-hazardous. Only after confirmation is received and with Engineer approval, batches may be mixed or stored in a single stockpile before loading.

I. Generate daily reports during the mixing activities and submit to the Engineer by the end of the day following the activities:
   1. Excavated material volume and amendment proportion data.
   2. Mixing quality control data.

J. Sample testing must be completed in accordance Paragraph 3.5 of this Section prior to transportation and disposal to ensure the material is non-hazardous.

3.4 QUALITY CONTROL

A. Mixing time, mixing speed, amount of lead source material, amount of reagent, and water added to each batch shall be recorded by the Contractor for each mixing batch and cell excavated. Records shall be submitted to the Engineer daily.

3.5 ANALYTICAL TESTING

A. Lead source material shall be sampled prior to transporting away from the site and final disposal.

B. Composite samples shall be collected by the Contractor and submitted to an Engineer-approved testing facility. Required tests are as follows:
   1. Toxicity characteristic leaching procedure (TCLP) for lead.

C. One composite test sample shall be collected, at a minimum, for each 1000 cubic yard batch that is to be transported and disposed. Contractor may propose an alternative sampling plan that is acceptable to the landfill.

D. The leachable lead concentration in the mixed source material must be below 5mg/L prior to hauling and disposal.

E. The disposal landfill is identified in Section 02 61 00 – Removal and Disposal of Contaminated Materials. The landfill may request other testing before final disposal, which the Contractor shall complete.

3.6 REPROCESSING

A. Reprocessing (remixing) shall be performed, at no cost to Owner or Engineer, for treated material that does not meet the landfill's requirements for disposal.

END OF SECTION

Free Flow -
Rockford, L.L.C.
A Free Flow Technologies, Ltd. Company

SAFETY DATA SHEET (SDS)

OSHA Hazard Communication Standard 29 CFR 1910.1200. Prepared to GHS

SECTION 1 – PRODUCT AND COMPANY IDENTIFICATION

Trade Name: **Free Flow 100®, Free Flow 200®, Free Flow 300®**
Product CAS: None

Recommended use: Stabilize RCRA Metals

Company Identification:

Free Flow Technologies, Inc.
4920 Forest Hills Rd, Suite 200
Loves Park, Illinois 61111

For information call: (815) 636-0166
Emergency Contact: Timothy Danzer
Fax: (815) 636-0560

SECTION 2 – HAZARD(S) IDENTIFICATION

GHS07 Acute Toxicity

Classification of the substance:

- H303 Acute Toxicity, category 5 (oral)
- H313 Acute Toxicity, category 5 (dermal)
- H332 Acute Toxicity, category 4 (inhalation)
- H315 Skin, eye irritation, category 2
- H317 Skin sensitization, category 1
- H335 Specific Target Organ Toxicity, category 3 (single exposure, respiratory tract irritation)

WARNING

Hazard Statements:

- H303 May be harmful if swallowed
- H313 May be harmful in contact with skin
- H332 Harmful if inhaled
- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H335 May cause respiratory irritation

Precautionary Statements:

Prevention

P261 Avoid breathing dust.
P264 Wash hands thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.

SECTION 2 – HAZARD(S) IDENTIFICATION (CONT.)

Prevention cont. P280 Wear protective gloves, safety glasses, and protective clothing such as long sleeves and pant cuffs over shoes to minimize skin contact.

Response
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P321 Specific treatment, see supplemental first aid information.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362+P364 Take off contaminated clothing and wash it before reuse.

Storage/Disposal
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P501 Dispose of container in accordance with local, regional, national, and/or international regulations.

Hazards Ratings HMIS

SECTION 3 – COMPOSITION, INFORMATION ON INGREDIENTS

Chemical Name	CAS	Approx. % (w/w)	LD50	LC50
Phosphate Compounds	7758-23-8	0 - 80	Not Available	Not Available
Calcium Oxide	1305-78-8	10 - 70	Not Available	Not Available
Sulfur Trioxide	7446-11-9	0 - 40	Not Available	Not Available
Silicon Dioxide	60676-86-0	2.5 – 15	Not Available	Not Available
Aluminum Oxide – Non-fibrous	1344-28-1	0.5 - 5	Not Available	Not Available
Iron Oxide	1309-37-1	0.5 - 5	Rat, oral, >5000 mg/kg	Not Available
Sodium Bicarbonate	144-55-8	0 - 70	Mouse, oral, 3360 mg/kg	Not Available
Magnesium Oxide	1309-48-4	0 - 60	Not Available	Not Available

SECTION 4 – FIRST AID MEASURES

After Eye Contact: Flush eyes with water while lifting lids. Seek medical attention.

After Skin Contact: Wash skin with soap and water, remove contaminated clothing and shoes. If irritation develops, seek medical attention.

After Ingestion: Dilute with water, fruit juice or vinegar. Seek medical attention.

After Inhalation: Remove to fresh air, if irritation develops, seek medical attention.

Most important symptoms and effects, both acute and delayed.
Refer to Section 11 – Toxicological Information

Indication of any immediate medical attention and special treatment needed.
All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

SECTION 5 – FIRE FIGHTING MEASURES

Suitable extinguishing equipment:
This material is noncombustible.

Extinguishing equipment that is not appropriate for a particular situation:
Do not use water on adjacent fires. Extinguish adjacent fires with dry chemical or CO_2.

Specific hazards that develop from the chemical during the fire:
No specific hazards are identified.

Protective equipment or precautions for firefighters:
No special measures required.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:
Wear protective equipment to prevent skin exposure and inhalation. Keep unprotected persons away.

Environmental Precautions:
Avoid runoff to waterways and sewers.

Methods and materials used for containment and cleanup:
Use appropriate protective equipment while using dry cleanup methods (sweep/shovel) which minimize dusting. Reclaim in watertight containers. Small amounts may be flushed with water to drain.

SECTION 7 – HANDLING AND STORAGE

Precautions for safe handling:
Swells when wet, may expand the container. Keep eyewash bottles available throughout work area.

Conditions for safe storage, including any incompatibilities:
Store away from water or acids.

SECTION 8 – EXPOSURE CONTROLS AND PERSONAL PROTECTION

Control Parameters

Component	Formula	CAS	PEL	TLV
Phosphate Compounds	$Ca(H_2PO_4)_2H_2O$	7758-23-8	Not established	Not established
Calcium Oxide	CaO	1305-78-8	5 mg/m^3	2 mg/m^3
Sulfur Trioxide	SO_3	7446-11-9	1 mg/m^3	0.2 mg/m^3
Silicon Dioxide**	SiO_2	60676-86-0	0.1 mg/m^3*	0.1 mg/m^3*
Aluminum Oxide	Al_2O_3	1344-28-1	10 mg/m^3+	10 mg/m^3+
Iron Oxide**	Fe_2O_3	1309-37-1	15 mg/m^3	5 mg/m^3
Sodium Bicarbonate	$NaHCO_3$	144-55-8	15 mg/m^3*	10 mg/m^3*
Magnesium Oxide	MgO	1309-48-4	15 mg/m^3*	10 mg/m^3*

* Respirable Dust
+ 5 mg/M^3 as Respirable Fraction
**Silicon Dioxide and Iron Oxide are listed by IARC as potential carcinogens.

Exposure Controls

Engineering Controls:
Use general and local exhaust to keep dust levels within acceptable limits.

Personal Protective Equipment Pictograms:

Breathing Protection:
Use NIOSH approved dust respirator when exposure limits exceeded.
Hand Protection:
Wear gloves to minimize skin contact.
Eye Protection:
Wear tight fitting goggles.
Skin Protection:
Wear long sleeves, gloves, and pant cuffs over shoes to minimize skin contact.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White-gray powder.	Boiling Point:	N/A
Odor:	Odorless	Flammable, Lower Limit:	N/A
Odor Threshold:	N/A	Flammable, Upper Limit:	N/A
Solubility:	N/A	Flash Point:	N/A
Partition Coefficient:	Not determined.	Auto Ignition Temperature:	N/A
pH:	6.0 – 12.0	Freezing/Melting Point:	N/A
Density:	80 – 85 lbs/ft^3	Viscosity:	N/A
Vapor Pressure:	N/A	Decomposition Temp.:	N/A
Vapor Density:	N/A	Evaporation Rate:	N/A
Molecular Formula:	Mixture		

SECTION 10 – STABILITY AND REACTIVITY

Reactivity:
No dangerous reactions known under conditions of normal use.

Chemical Stability:
Stable, keep dry.

Thermal decomposition/conditions to be avoided:
Avoid extreme temperatures.

Possibility of hazardous reactions:
Contains calcium oxide and may react with water or acid to produce heat.

Incompatible materials:
Water, strong acids.

SECTION 11 – TOXICOLOGICAL INFORMATION

Toxicological Effects

Component	Formula	LD50	LC50
Phosphate Compounds	$Ca(H_2PO_4)_2H_2O$	Not Available	Not Available
Calcium Oxide	CaO	Not Available	Not Available
Sulfur Trioxide	SO_3	Not Available	Not Available
Silicon Dioxide**	SiO_2	Not Available	Not Available
Aluminum Oxide	Al_2O_3	Not Available	Not Available
Iron Oxide**	Fe_2O_3	rat, oral, >5000 mg/kg	Not Available
Sodium Bicarbonate	$NaHCO_3$	mouse, oral, 3360 mg/kg	Not Available
Magnesium Oxide	MgO	Not Available	Not Available

**Silicon Dioxide and Iron Oxide are listed by IARC as potential carcinogens.

SECTION 11 – TOXICOLOGICAL INFORMATION (CONT.)

Routes of exposure
Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Potential health effects

Eye: Acute: May cause mild eye irritation
Chronic: No data available

Skin: Acute: Causes skin irritation
Chronic: Repeated and prolonged exposure may cause dermatitis

Ingestion: Acute: May cause irritation
Chronic: No data available

Inhalation: Acute: May cause respiratory irritation
Chronic: No data available

Symptoms from exposure

Target Organs: Eyes, respiratory passages, skin, digestive tract. Pre-existing respiratory diseases including asthma and emphysema may also be aggravated.

Eye: May cause irritation/inflammation and tissue damage.

Skin: May cause irritation to moist skin.

Ingestion: May cause ulceration to the digestive tract.

Inhalation: May cause irritation/inflammation to nasal and upper respiratory passages.

SECTION 12 – ECOLOGICAL INFORMATION

Toxicity:
No further relevant information available.

Persistence and degradability:
No further relevant information available.

Bioaccumulative potential:
No further relevant information available.

Mobility in soil:
No further relevant information available.

SECTION 13 – DISPOSAL CONSIDERATIONS

Recommended Waste Treatment Methods:
No treatment necessary.

Recommended Package Disposal:
Dispose of in container in accordance with local, regional, national, and/or international regulations.

SECTION 14 – TRANSPORT INFORMATION

UN Number:	N/A
UN proper shipping name:	N/A
Transport Hazard class:	N/A
Packing group number:	N/A
Environmental hazards:	N/A
Special Precautions:	To prevent dust, cover product with tarp if not in bulk bag container.

SECTION 15 – REGULATORY INFORMATION

SARA Title III - Section 302 Extremely Hazardous Material - None

SARA Title III – Section 31/312 – Hazard Categories:
Fire Hazard – No
Sudden Release of Pressure – No
Reactivity Hazard – Yes
Immediate Health Hazard – Yes
Delayed Health Hazard - Yes

SARA Title III – Section 313 - This material is not subject to the toxic chemical reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

SECTION 16 – ADDITIONAL INFORMATION

Information herein is based on data believed to be accurate at the time of the preparation. No warranty or representation, express or implied, is made to the accuracy or completeness of the SDS. No responsibility can be assumed by vendor for any damage or injury resulting from misuse, failure to follow recommended practices, or from any hazards inherent in the nature of the product.

SECTION 16 – ADDITIONAL INFORMATION (CONT.)

SDS Effective: 12/1/2014

SECTION 02 61 00 - REMOVAL AND DISPOSAL OF CONTAMINATED MATERIALS

PART 1 GENERAL

1.1 SUMMARY

A. This section describes pre-characterization sampling, excavation, handling, dewatering, loading, transportation, and disposal of the lead additive area source material and tank waste source material.

1.2 SUBMITTALS

A. Within 14 days of Notice to Proceed, submit comprehensive Work Plan for pre-characterization sampling, excavation, and transport in accordance with Section 01 33 00 – Submittal Procedures. Work plan shall describe the Contractor's proposed means and methods for completing the excavation and hauling of source material, including:
   a. Sampling equipment and methods;
   b. List of equipment;
   c. Full description of means and methods for excavation, onsite hauling, final transport, and disposal;
   d. Names and roles of major Subcontractors;
   e. On site locations where excavated materials will be stockpiled (if any);
   f. Decontamination of excavation and hauling equipment and personnel;
   g. Chosen landfill, contact name and number.

B. Preliminary plans for sampling, excavation, transport, and disposal shall be provided in the Contractor's initial proposal.

C. Results of Pre-Characterization tank waste sampling.

D. Transporter certifications.

E. Certificates of disposal and disposal weigh tickets.

F. Surveys Plan.

G. Pre-removal survey.

H. Post-removal survey with quantity calculations.

I. Excavation Logs

1.3 DEFINITIONS

A. Characteristically hazardous waste: Source materials or other material containing 5 milligrams per liter (mg/L) or greater leachable Lead based on toxicity characteristic leaching procedure (TCLP) testing.

B. Non-hazardous waste: Source material or other materials containing less than 5 mg/L leachable Lead based on TCLP testing. All tank waste source material is non-hazardous waste.

1.4 CHARACTERISTICALLY HAZARDOUS WASTE

A. The Lead Removal Area outlined in the Drawings show where there is known characteristically hazardous waste.

B. Characteristically hazardous waste shall be mixed with the Lead Stabilization Amendments to render non-hazardous and shall be disposed of at a Subtitle D Landfill approved by Owner. Stabilizing amendment and mixing are described in Section 02 55 00 - Stabilization of Lead Area Source Material.

1.5 NON-HAZARDOUS WASTE

A. Non-hazardous waste shall be disposed of at a Subtitle D Landfill approved by Owner.

1.6 OTHER DEBRIS AND WASTE

A. Access road and decontamination pad materials and any other construction debris and wastes shall be properly disposed of at the landfill before demobilization is complete.

B. Temporary materials used during construction may be reused by the Contractor if they are decontaminated and approved by Owner in writing. Temporary materials including access road material, if uncontaminated, may be stockpiled onsite for use during site-wide RA.

1.7 PREFERRED LANDFILL

A. American Environmental Landfill has been identified as the nearest landfill option. It is a Resource Conservation and Recovery Act (RCRA) Subtitle D regulated facility.

B. The transportation and disposal requirements described in this Section have been developed in conjunction with that landfill.

C. American Environmental Landfill: 212 N 177th W Avenue, Sand Springs, Oklahoma 74063.

PART 2 PRODUCTS

2.1 SPILL RESPONSE MATERIALS

A. Provide appropriate spill response materials including, but not limited to the following: containers, absorbents, hydrophobic absorbent booms and pads, shovels, leak-proof disposal containers, and personal protective equipment.

B. Spill response materials shall always be available when contaminated materials/wastes are being handled or transported. Spill response materials shall be compatible with the type of materials and contaminants being handled.

2.2 STABILIZATION AMENDMENTS

A. See Section 02 55 00 – Stabilization of Lead Area Source Material..

2.3 STORAGE AND TRANSPORTATION EQUIPMENT

A. All products used to store and transport source materials either on site or off site shall be enclosed and/or covered to prevent dispersion of the materials.

PART 3 EXECUTION

3.1 PREPARATION

A. Request underground utilities to be located and marked within and surrounding construction areas.
   1. Call Local Utility Line Information service (811) not less than three working days before performing Work.
   2. Complete a private utility locate completed via ground penetrating radar. Private utility locate shall be comprehensive and cover all proposed excavation areas. If excavation areas are expanded in the field to areas where the utility locate was not performed, the Contractor shall not excavate until the private utility locate has been performed in the expanded excavation area.

B. Protect utilities from damage. Contractor is responsible for all repairs to damaged utilities and all associated reparations at no cost to the Owner. Contractor shall remove and dispose of abandoned utilities encountered during excavation, if necessary to complete the excavation.

C. Protect benchmarks, survey control points, existing structures and fences from excavating equipment and vehicular traffic.

D. Remove existing structures in accordance with the Drawings and Section 02 41 00 – Demolition and Restoration of Site Features.

E. Remove trees and vegetation in accordance with the Drawings and Section 31 10 00 – Site Clearing.

F. Install decontamination pads in accordance with Section 01 72 00 – Decontamination of Personnel and Equipment.

G. Identify required lines, levels, contours, and datum.

3.2 PRE-CHARACTERIZATION SAMPLING

A. Complete geotechnical borings to collect representative samples of the source materials in the tank waste areas prior to beginning excavation. The purpose will be to provide the landfill with waste characterization in advance of hauling the source materials to the disposal facility.

B. The number and location of the samples shall be as shown on the drawings or as approved by Engineer. The samples shall be analyzed by a third-party laboratory acceptable to the Engineer and landfill management. All costs for the borings, sample collection, analysis, and landfill coordination shall be the responsibility of the Contractor and will be considered ancillary to the cost of tank waste excavation.

3.3 OFFSITE HAUL ROUTES

A. Haul routes shall be as described in this Section unless Engineer approves of alternate haul routes.

B. Hauling trucks will exit the site and travel north on Oklahoma State Highway 48 for approximately 500 feet and then enter I-44 East Turner Turnpike (Toll road) and travel for approximately 19 miles before exiting to Oklahoma State Highway 97 North. After approximately 9 miles, at Sand Springs, travel west on U.S. Highway 64 for approximately 4.5 miles and turn north on S 177th W Ave. The landfill is located approximately 0.5 mile north.

C. Final haul route must be approved by the Engineer and the Owner and must be followed on all routes between the site and the landfill, in both directions.

3.4 ONSITE ACCESS ROADS

A. All construction traffic (other than personal or light vehicles) shall limit their movements to sections of public roads and the private or temporary access roads shown in the Drawings. Do not drive or stage equipment or materials outside of public rights-of-way or the Limits of Disturbance shown on the Drawings.

B. Contractor shall repair any damaged asphalt on Refinery Road (E 0810 Rd.) to its original condition and to meet Creek County Highway Department District standards.

C. Where temporary access roads intersect excavation areas, the Contractor shall install the access road without displacing the source material to be excavated. The excavation shall take place from the farthest location to the nearest location, such that the road can be used to access the farthest areas, then dismantled as excavation progresses.

D. Procedure for installing and removing Temporary Access Roads over excavation areas:
   1. Protect utility location markings or otherwise preserve the locations so they may be remarked after being covered up.
   2. Complete clearing and grubbing.
   3. Without disturbing the surface of the excavation area, place geotextile over the area where the temporary access route will be installed.
   4. Install on site access roads in accordance with the Drawings.
   5. Once work has progressed, remove aggregate and geotextile from excavation areas. Remark utilities, as necessary.
   6. Remove only enough access road material to access the next excavation cell or subarea.

3.5 SURVEYS

A. A survey plan outlining survey methods, standard operating procedures, and schedule shall be submitted to the Engineer before any excavation activities begin.

B. Surveys shall be performed in accordance with Section 01 70 00 - Execution and Closeout Requirements.

C. Surveys may not be completed via Unmanned Aerial Vehicle (UAV), aka drone surveying. Surveys means and methods should be described in the survey plan.

D. Surveys shall be performed prior to and after removal lead additive area and tank waste source materials to determine the volume of material removed. Pre-removal surveys shall be approved by Engineer prior to excavation. Post-excavation surveys shall be approved by Engineer prior to approval of payment items.

E. Perform detailed surveys of any tank waste that is discovered and left in place. Notify engineer of locations and include details on Record Drawings.

F. Surveys shall be performed after backfilling to determine quantity of clean backfill and topsoil applied.

3.6 EXISTING STRUCTURES AND UTILITIES

A. See Section 02 41 00 – Demolition and Restoration of Site Features.

3.7 SPILLS

A. In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), pollutant, contaminant, or oil (as governed by the Oil Pollution Act, 33 U.S.C. 2701 et seq.), notify the Owner immediately. Immediate containment actions shall be taken to minimize the effect of any spill or leak. Cleanup shall be in accordance with applicable federal, state, and local regulations.

B. Subgrade material under decontamination pads, amendment mixing areas, and access roads that is found to contain visible contaminants shall be removed and disposed of at no cost to the Owner.

3.8 REMOVAL LIMITS – LEAD ADDITIVE AREA SOURCE MATERIAL

A. Lead additive area source material and debris shall be excavated to depth and areal extent as shown on the Drawings. Excavation shall be completed in cells of varying size to facilitate batch mixing of stabilizing reagent. See Section 02 55 00 – Stabilization of Lead Area Source Material..

B. Pre- and post-excavation surveys shall be completed by the Contractor, with data available for immediate review to the Engineer. In lieu of surveying the pre-excavation and post-excavation surface of the Lead Additive Area, precise physical measurements may be made that ensure the design depths and volumes are met.

C. Payment for excavation quantities that exceed design quantities for the Lead Contamination Area will not be made unless the Engineer gives prior approval and pre-excavation and post-excavation surveys are completed and approved by the Engineer.

D. Excavation shall be performed in a manner that will limit spills and the potential for source material to be mixed with other material not intended for disposal. Soil below the excavation depth, as shown on the Drawings, shall not be excavated or disturbed.

E. For every cell or subarea that is excavated, a separate excavation log shall be prepared, which shall include:
   1. Name and location of project;
   2. Weather conditions including any recent rain;

3. Name of personnel present and person preparing log;
4. Excavation location (coordinates or relative position);
5. Date and time excavation begins and ends;
6. Equipment used for excavation;
7. Depth and area of completed excavation;
8. Initial observations of contamination at excavation area surface;
9. Description of material excavated;
10. Description of any ground water encountered;
11. Description of any dewatering measures implemented before, during, or after excavation;
12. Decontamination procedures used for personnel and equipment;
13. Final elevation of excavation floor (include reference datum);
14. Location of stockpiled material and stockpile protection measures used.

3.9 REMOVAL LIMITS – TANK WASTE SOURCE MATERIAL

A. The Engineer shall make visual field observations of surface soils within the estimated excavation areas shown on the Drawings. The areas defined on the Drawings have had historical observations of tank waste source material, however the entire area may not be excavated.

B. Excavation will occur only in locations where tank waste source material is positively identified in the field, which may include areas outside the excavation areas defined in the Drawings.

C. Where tank waste is identified, the Contractor shall excavate tank waste source material in a *cell* centered on the area where contamination is identified. The cell shall have the following dimensions:
   1. Depth: 2 feet
   2. Area: 10 feet by 10 feet square

D. Once a cell is excavated, the Engineer shall continue to make visual field observations of exposed soils adjacent to and below the previously excavated cell. That is, observations shall be made of the excavation floor and sidewalls, as well as the surrounding surface. If additional tank waste source material is identified, the Contractor shall excavate the cell where it is identified.

E. Where tank waste source material is observed, an entire cell shall be excavated, except at the direction of the Engineer.

F. Excavation shall continue until the entire Proposed Excavation Area shown on the Drawings has been observed and it is determined by the Engineer that no observable tank waste source material is left in place.

G. Excavations exceeding 8 feet below ground surface shall not be conducted without the express approval of the Engineer.
   1. Shoring, dewatering, or other protection measures for deep excavations shall be provided by the Contractor.

H. If tank waste source material is discovered and it is decided by the Engineer to leave it in place, a detailed survey shall be conducted of the locations and any relevant details shall be included in the Record Drawings.

I. For every cell or subarea that is excavated, a separate excavation log shall be prepared, which shall include:

1. Name and location of project;
2. Weather conditions including any recent rain;
3. Name of personnel present and person preparing log;
4. Excavation location (coordinates or relative position);
5. Date and time excavation begins and ends;
6. Equipment used for excavation;
7. Description of any excavation protection measures used;
8. Depth and area of completed excavation;
9. Initial observations of contamination at excavation area surface;
10. Description of material excavated;
11. Observation of contaminants during excavation;
12. Observations of contamination present after excavation of the cell or subarea is complete;
13. Description of any ground water encountered;
14. Description of any dewatering measures implemented before, during, or after excavation;
15. Decontamination procedures used for personnel and equipment;
16. Final elevation of excavation floor (include reference datum);
17. Presence of any remaining contamination not able to be excavated;
18. Location of stockpiled material and stockpile protection measures used;

J. Excavation shall be performed in a manner that will limit spills and the potential for tank waste source material to be mixed with other material not intended for disposal.

3.10 EXCAVATION

A. Contractor shall sweep excavation areas near identified location of utilities with a metal detector to confirm the location of buried utilities immediately prior to excavation.

B. Do not interfere with 45 degree bearing splay of foundations.

C. Trim excavation. Remove loose matter.

D. Notify Engineer of unexpected subsurface conditions.

E. Repair or replace items indicated to remain that are damaged by Contractor.

F. Do not spread excavated source material during excavation and loading operations.

3.11 EXCAVATION PROTECTION

A. If workers must enter any excavation, it shall be evaluated by a competent person and shored, sloped, or braced as required by 29 CFR 1926.

3.12 EXCAVATION PIT DEWATERING

A. Provide ditches, berms, and other devices to divert and drain surface water from excavations.

B. Divert surface water and seepage water within excavation areas into sumps and pump water into receiving areas in accordance with requirements of OPDES permit.

C. Discharge water into existing or improved drainage channels, utilizing Erosion and Sediment Control measures. Do not allow uncontrolled discharges to enter any surface water body or wetland.

D. Operate mechanical dewatering systems only during normal operating times when needed to dewater excavations or excavated materials. Observe dewatering system during operation and perform required repairs and maintenance.

E. Install erosion and sediment control measures as specified by Section 01 57 00 – Temporary Erosion and Sediment Control.

F. Ensure dewatering operations do not affect any other portion of the work or have detrimental effects on wildlife or existing surface water bodies.

3.13 EXCAVATED MATERIAL DEWATERING

A. Use gravity draining or stockpile turning for dewatering. Other methods of dewatering shall require Engineer approval.

B. The Contractor shall demonstrate that material to be hauled offsite passes the paint filter tests prior to being transported for disposal.

C. The following requirements shall be met:
   1. Paint filter tests shall be performed on excavated materials at 2 sample locations per 1000 cubic yards. Sample locations will be jointly selected by the Contractor and Engineer. This frequency of samples may be revised by the Engineer or disposal landfill.

D. Deep excavations or those from near surface water bodies may require source materials to be dewatered from their *in situ* state. Those source materials which require additional treatment or dewatering time will be paid for at the Contractor proposed rate per volume as measured in the field.

E. Contractor shall request approval by Engineer prior to undertaking additional dewatering measures and requesting payment under Bid Item 23. Payment will be made for the actual quantity of source material that requires additional dewatering, as approved to by the Engineer.

3.14 MATERIAL STORAGE

A. Excavated materials shall meet applicable landfill and transportation requirements prior to final loading for disposal. Excavated materials must be stored within a designated area prior to final loading.

B. Store excavated materials as near as practical to the excavation site. All storage stockpiles shall have plastic sheeting placed over a flat subgrade before placing the material.

C. Minimize rainwater impact by covering stockpiles with plastic sheeting prior to rain events.

D. Excavated materials shall not be stored within the identified floodplain.

E. Manage untreated liquid that drains from excavated material stockpiles, dewatering measures, decontamination pads, and excavations by capturing or treating the liquid. Do not allow to drain

directly into adjacent water bodies or wetlands. Use sediment barriers (silt fence or straw bale) to retain runoff.

3.15 TRANSPORTATION AND DISPOSAL

A. Furnish labor, materials, and equipment necessary to store, transport, and dispose of excavated materials in accordance with Federal, State, and local requirements. Prepare and maintain waste shipment records and manifests required by the RCRA, U.S. Federal Department of Transportation (DOT), and State transportation department.

B. Transportation
   1. Transport lead additive area and tank waste source materials in vehicles with automatically-actuated tarp covers. This applies to vehicles hauling materials to staging areas and vehicles hauling materials offsite for disposal.
      a. Inspect and document vehicles and containers for proper operation and covering. Repair or replace damaged containers.
      b. Inspect vehicles and containers for proper markings, manifest documents, and other requirements for waste shipment.
      c. Perform and document decontamination procedures prior to leaving the Work site and again before leaving the disposal site. See Section 07 72 00 – Decontamination of Personnel and Equipment.

C. Shipping Documentation
   1. The Contractor shall utilize electronic waste manifest and transportation records, when available.
   2. Before transporting Characteristically Hazardous Waste, Engineer will sign and date the manifests on behalf of the Owner. Ensure that the manifest accompanies the waste at all times. Submit transporter certification of notification to EPA of their waste activities and EPA identification numbers. Within 35 days from shipment date, the transporter shall provide a copy of the manifest signed and dated by the disposer.

D. Certificate of Disposal
   1. Submit certificate of disposal to the Engineer within 10 calendar days of the date that the disposal of the contaminated material and debris was completed. Include:
      a. The identity of the disposal facility, by name, address, and EPA identification number.
      b. The identity of the waste affected by the Certificate of Disposal including reference to the manifest number for the shipment.
      c. A statement certifying the fact of disposal of the identified waste, including the date(s) of disposal, and identifying the disposal process used.

E. Dispose of all waste at the facilities approved in the technical proposal.

3.16 POST-EXCAVATION SAMPLING

A. The Engineer will collect soil samples after excavation is completed. Samples will be collected from the sidewalls and the bottom floor of the excavation area, at a frequency and spacing to be determined by the Engineer. The Contractor shall inform the Engineer when excavation begins, ends, and when it may be acceptable to collect the samples. The Contractor shall cease work within the excavation area and support the collection of samples, including providing for protection of Engineer or Owner personnel when entering excavations. Costs for providing such support shall be incidental to the cost of excavation and will not be paid for directly.

B. The post-excavation sampling is not considered *confirmation sampling*, thus shall not be used as a basis for additional excavation or be related to any payment items.

3.17 FIELD QUALITY CONTROL

A. The Engineer shall monitor excavations and ensure excavations do not exceed authorized excavation limits. The Contractor shall not begin excavation of a new cell or subarea without approval from the Engineer. Payment will not be made for unauthorized excavations.

3.18 PROTECTION

A. Prevent loose soil from falling into excavation; maintain soil stability.

B. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, inundation, washout, freezing conditions, and other hazards created by earth operations.

3.19 CONDITIONS

A. The Contractor should anticipate adverse excavation conditions. Saturated compressible soils with low shear strength, excavation areas contaminated with organic compounds and metals, strong petroleum odor typical of oil and refinery waste material, and potential for sheen generation, contact with groundwater and surface water, woody debris, organic muck, and ice are anticipated. No additional payment shall be made for adverse conditions of excavation or delay or work associated with those conditions.

END OF SECTION

SECTION 31 10 00 - SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

A. SECTION INCLUDES:
   1. Utility locating and clearance.
   2. Clearing, topsoil stripping and stockpiling of equipment laydown areas, field offices, parking areas, staging areas, access roads, and access ramps.
   3. Removing and salvaging designated trees, shrubs, and other plant life.

1.2 SUBMITTALS

A. Submit boundaries of equipment laydown areas, equipment laydown areas, field office areas, parking areas, staging areas, access roads and any other areas needed to complete the Work.

PART 2 PRODUCTS

2.1 PLASTIC SHEETING

A. A temporary cover with minimum thickness of 10 mils, free of holes or other damage to prevent precipitation from entering and minimize dust from exiting stockpiles.

PART 3 EXECUTION

3.1 PREPARATION

A. Identify salvage area for placing removed vegetation, trees, and debris.

B. Request underground utilities to be located and marked within and surrounding construction areas.
   1. Call Local Utility Line Information service (811) not less than three working days before performing Work.
   2. Complete a private utility locate completed via ground penetrating radar. Private utility locate shall be comprehensive and cover all proposed excavation areas.
   3. Contact Magellan Pipeline Company to locate and determine depth of gas pipeline shown on Drawings.

C. Place construction staking layout flags or stakes at limits of site clearing and approximate floodplain boundary within limits of disturbance as shown on Drawings.

D. Inspect Work areas prior to and during soil disturbance for potential archaeological items. Stop Work if potential archaeological items are found and notify Engineer. Work shall not resume until obtaining written authorization from Engineer.

E. Tree removal survey
   1. Before clearing any trees, schedule a site survey in conjunction with the Engineer and the property owners.

2. Identify and flag all trees to be removed at least 48 hours prior to removal.
3. Additional requirements listed in Section 01 30 00 – Administrative Requirements.

3.2 PROTECTION

A. Protect trees, plant growth, and other vegetation not required to be removed to complete the Work.

B. Protect benchmarks and existing structures from damage or displacement.

3.3 CLEARING

A. Clear areas required for access to site and execution of Work to minimum depth of 6 inches. Take care not to transport soils around the site during clearing activities.

B. Remove trees and shrubs as authorized by Engineer during the Tree removal survey. Remove stumps, main root ball, and root system to depth of 6 inches. Loose soil shall be dislodged as near as practical to the point of extraction.

C. Clear undergrowth and deadwood without disturbing subsoil.

3.4 REMOVAL

A. Continuously clean-up and remove waste materials from work areas. Do not allow materials to accumulate onsite.

B. Do not burn or bury materials on site. Leave site in clean condition.

3.5 TREE PROCESSING

A. Trees with a trunk diameter of 12 inches or greater at 2 feet above the ground shall be stockpiled at a location within the LOD as directed by the Engineer.

B. All other debris shall be disposed of off site.

3.6 TOPSOIL EXCAVATION AND STOCKPILING

A. Excavate topsoil from stabilized access roads, stabilized construction entrances, staging area(s), decontamination pads, and other Work areas to a depth of 6 inches and stockpile within the Limits of Disturbance as shown on the Drawings without mixing with foreign materials for use in finish grading.

B. Coordinate stockpile locations with affected property owners.

C. Do not excavate any topsoil within known or suspected source material areas.

D. Do not excavate wet topsoil.

E. Cover stockpiles with plastic sheeting and ballast to prevent contact with stormwater and minimize dust. Maintain plastic sheeting and ballast throughout construction.

END OF SECTION

SECTION 31 23 23 - FILL

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:
   1. Submittals
   2. Fill materials
   3. Backfilling
   4. Finish grading
   5. Stockpiling
   6. Protection of finished Work

1.2 REFERENCES

A. ASTM International:
   1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 [600 kN-m/m3]).
   2. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
   3. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   4. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

A. Product Data:
   1. Submit fill material data and certification that materials are not contaminated (clean).
   2. Submit preliminary compaction test results.

B. Surveys: Post-excavation and post-backfill survey data.

C. Materials Source: Submit name of commercial suppliers of imported fill materials.

D. Submit minimum 10 oz. sample and required test reports of imported topsoil.

E. Submit minimum 10 oz. sample and required geotechnical analysis of imported clean backfill.

F. Submit minimum 10 oz. sample and required geotechnical analysis of Sand Bedding.

G. Submit minimum 10 oz. sample and required geotechnical analysis of Road Surface Aggregate.

PART 2 PRODUCTS

2.1 FILL MATERIALS

Contractor shall provide fill materials. All imported fill materials shall be certified clean by borrow source provider.

as well as any additional requirements listed below.

Material shall not be transported until Engineer has approved source and material samples.

A. Topsoil:
   1. For topsoil already stockpiled, two composite samples shall be collected for every 20,000 cubic yards. Each composite will be made up of at least 5 aliquots. For undisturbed topsoil, a 5-point composite will be taken in 50 ft by 50 ft. sampling grids. Composite samples include the corners and the center for each sampling grid. Samples shall be collected in at least two different intervals depending on the depth of excavation. Analyses must include SVOCs, VOCs, Metals, and TPH.
   2. Imported friable loam or silty loam; minimum 10 percent organic matter (by Loss on Ignition Method); no deleterious concentrations of salts, free of subsoil, roots, grass, weeds, large stone, and foreign matter.
   3. Submit Loss on Ignition Method testing results. Amend topsoil with locally sourced organic compost or similar if required to meet organic matter requirement.

B. Imported Clean Backfill:
   1. For materials that have already been stockpiled, two composite samples shall be collected for every 20,000 cubic yards. Each composite will be made up of at least 5 aliquots. For backfill that have not been disturbed, a 5-point composite will be taken in 50 ft by 50 ft. sampling grids. Composite samples include the corners and the center for each sampling grid. Samples shall be collected in at least two different intervals depending on the depth of excavation. Shallow samples consist of those at 3-24 in and deep samples of 24-48in. Analyses must include SVOCs, VOCs, Metals, and TPH.
   2. Shall consist of clean, ML, CL, or CH material with liquid limit less than 45 and a plasticity index less than 20, SM or SC.
   3. May consist of a mix of organic and inorganic material.
   4. Shall be free of foreign material larger than 3 inches and appreciable amounts of roots, rock or debris.
   5. Moisture content sufficient to obtain compaction: between -5% and +3% of optimum.

C. Granular Bedding:
   1. Granular Bedding shall consist of clean, well graded, hard particles of crushed limestone, quartzite or dolomite. Sources shall be on the latest revision of the Oklahoma DOT Approved Aggregate Supplier List.
   2. Material shall conform to Oklahoma DOT Standard Specification Section 703.06 for Coarse Cover Aggregate.
   3. Gradation: Granular Bedding shall conform to Table 703:9.

Sieve Size	Percent Passing
0.5 inch	100
3/8 inch	90 - 100
No. 4	20 - 55
No. 8	0 - 25

No. 16	0 - 10
No. 50	0 - 5

D. Access Road Surface Aggregate
   1. Access Road Surface Aggregate shall consist of clean, well graded, hard particles of crushed limestone, quartzite or dolomite. Sources shall be on the latest revision of the Oklahoma DOT Approved Aggregate Supplier List.
   2. Material shall conform to Oklahoma DOT Standard Specification Section 703.05 for Traffic-Bound Surface Course, Type A.
   3. Gradation: Surfacing Aggregate shall conform to Table 703:8 for Type A.

Sieve Size	Percent Passing
1 inch	100
3/4 inch	95-100
No. 4	5-75
No. 20	0-30
No. 200	0-10

PART 3 EXECUTION

3.1 PREPARATION

A. Verify that any post-excavation soil samples have been collected, that additional excavation of source material is not required, and Owner has authorized backfill to proceed.

B. Unless otherwise noted on Drawings or these Specifications, prepare subgrade as specified here.

C. Lead additive source material excavation area shall not be backfilled with Imported Clean Backfill. The subgrade shall be graded to drain by minimizing low spots and steep slopes prior to topsoil placement. In order to maintain the condition of the soil below the source material excavation, take care not to excessively mix or displace the remaining soil during the grading activities.

D. Compact subgrade to non-yielding condition.

E. Proof roll to identify soft spots; fill and compact soft spots to non-yielding condition.

F. Any large rocks encountered which may constitute a hazard, due to size or protrusion from the finished subgrade, shall be removed from the subgrade and disposed of as directed by Engineer.

G. The finished subgrade surface shall be firm and uniform and shall be approved by the Owner before placing subsequent material thereon.

3.2 SURVEY

A. Contractor shall survey post-excavation and final restoration grade to quantify materials for payment. Post-excavation and final restoration grade surveys shall be submitted to Engineer for approval. See Section 02 61 00 – Removal and Disposal of Contaminated Sediments for full survey requirements.

3.3 BACKFILL

A. Backfill tank waste excavation areas to pre-existing contours and elevations shown in the Drawings and as determined by pre-excavation surveys, ensuring there are no remaining low spots or steep slopes after backfill and topsoil placement are complete.

B. Do not place Imported Clean Backfill within the lead additive source material excavation area. Grade to drain and place Imported Topsoil only.

C. Place material in continuous layers as follows:
   1. Topsoil Backfill: Maximum 6 inches compacted depth.
   2. Imported Clean Backfill: Maximum 10 inches compacted depth.
   3. Granular Backfill: Maximum 12 inches compacted depth.
   4. Aggregates: Maximum 10 inches compacted depth.

D. Maintain moisture content of backfill materials within allowable limits to attain required compaction density. When moisture is deficient, the material shall be watered and mixed until acceptable moisture content is attained. When excess moisture exists, the material shall be worked and aerated until acceptable moisture content is attained.

E. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.

F. Make gradual grade changes. Blend slope into level areas.

3.4 IMPORTED TOPSOIL

A. Place a layer of topsoil to a minimum thickness of 6 inches everywhere that experienced surface grading, change of grade, degradation of surface soil, or significant erosion of surface soils throughout the course of the project.

B. Prior to placement of topsoil, any high traffic areas or other areas with soil compaction from equipment shall be restored to approximate original density to prepare for vegetation establishment.

C. Compact using excavator or other equipment to a uniformly consistent density. Avoid a loose condition of topsoil and avoid over-compacting topsoil. Compaction testing is not required.

3.5 IMPORTED CLEAN BACKFILL

A. Place backfill over all exposed subgrade in the tank waste excavation areas.

B. Final grade shall meet the pre-existing grade (less 6 inches for topsoil) while maintaining positive drainage everywhere.

3.6 AGGREGATES

A. Place aggregates for Access Roads as shown in the Drawings. Do not clear vegetation from subgrade before placing aggregates for Improved Access Roads.

B. Proof load access roads with unloaded haul truck to provide compaction. Ensure settlement does not result in loss of aggregate over areas of soft soils.

C. Proof load the completed access road using a partially loaded haul truck and again with the haul truck loaded to the typical load level to jointly assess the performance with the Engineer. The performance of the access road under load will be used to determine acceptable loading conditions for haul trucks.

D. Aggregates shall be replenished as needed to maintain access roads.

3.7 FINISH GRADING

A. After earthwork is completed, the disturbed areas shall be finish graded. Any roots, rocks larger than 3 inches in size, or other undesirable material shall be removed from the surface immediately and the surface shall be prepared for vegetative stabilization.

B. Perform grading operations as shown on the Contract Drawings so that the ground surface will be well-drained at all times. Maintain drainage ditches and keep them open and free from soil, debris, and leaves until final acceptance of the Work. Finish all grading on neat, regular lines conforming to the sections, lines, grades, and contours shown on the Contract Drawings, or if not shown, in accordance with the criteria set forth herein. Perform the grading work in proper sequence with all other associated operations.

3.8 STOCKPILING

A. Stockpile materials on site at locations within limits of disturbance or approved by Owner. Prevent intermixing of soil types or source materials.

B. Stockpile materials in upland areas, do not place any stockpiles within the regulated floodplain or within the water bodies and wetlands shown on the Drawings. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.9 STOCKPILE CLEANUP

A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

3.10 ACEESS ROAD CLEANUP

A. Where the Drawings call for Access Road to be removed after use, confirm that all work is complete before beginning any deconstruction activities.

B. Remove and stockpile on site any salvageable aggregate materials. Stockpile location shall be as directed by Engineer.

C. Remove and properly dispose of filter fabric and other remaining materials.

D. Grade out any ruts or erosion rills and restore surface to pre-existing conditions as directed in the Drawings.

3.11 FIELD QUALITY CONTROL

A. Employ a qualified geotechnical engineering firm licensed in Oklahoma to perform compaction testing.

B. Contractor's soil testing firm shall test fill materials in accordance with the following:
   1. Material Classification: 1 per 500 cubic yards (CY).
   2. Moisture Tests.
   3. Density Tests.

C. When tests indicate work does not meet specified requirements, remove work, replace and retest.

3.12 PROTECTION OF FINISHED WORK

A. Prohibit construction traffic over finished fill.

B. Reshape and recompact fills subjected to vehicular traffic.

C. Seed finished areas within 7 days in accordance with Section 32 92 19 – Seeding to prevent erosion and dust. Contractor shall apply water to suppress dust until seeded. Contractor shall restore any eroded areas to existing contours and elevations prior to seeding.

END OF SECTION

SECTION 31 34 19 – GEOSYNTHETIC SOIL REINFORCEMENT

PART 1 GENERAL

1.1 SUMMARY

A. Woven filter fabric as described in this Section shall be used for backfill stabilization and layer separation for the stream crossing.

B. Non-woven filter fabric as described in this Section shall be used for Temporary Access Roads, riprap energy dissipator, and below layers of fill where shown on the Drawings.

1.2 SUBMITTALS

A. The Contractor shall submit filter fabric manufacturer's literature discussing physical characteristics, application, and installation instructions for geotextile materials.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Filter fabric shall be delivered in rolls packaged from the manufacturer. Each roll shall be wrapped in plastic during shipment and storage and shall not be removed until deployment. Each roll shall be labeled with the manufacturer's name, geosynthetic type, and roll dimensions. No hooks, tongs, or other sharp instruments shall be used, and rolls shall not be dragged along the ground.

B. Prior to use, filter fabric shall be stored out of direct sunlight and in a clean, dry place. It should not be subject to extreme temperatures of either hot or cold and be stored with manufacturer's protective cover in place.

C. Filter fabric damaged as a result of storage or handling shall be repaired or replaced.

PART 2 PRODUCTS

2.1 WOVEN FILTER FABRIC

A. Woven filter fabric shall be Mirafi HP-series Model HP370, or an approved equivalent that shall meet or exceed the following minimum average roll values when measured in the weakest principal direction:

Fabric Properties	Requirements	Test Method
Ultimate Strength, lbs/ft.	2700 (min.)	ASTM D 4595
Strength @ 2% Strain, lbs/ft.	540 (min.)	ASTM D 4595
Apparent opening size (US Sieve)	30	ASTM D 4751
Permittivity, sec-1	0.52	ASTM D 4491

2.2 NON-WOVEN FILTER FABRIC

A. Non-woven filter fabric shall be Mirafi N-series Model 170N, or an approved equivalent that shall meet or exceed the following minimum average roll values when measured in the weakest principal direction:

Fabric Properties	Requirements	Test Method
Grab tensile strength, lbs.	180 (min.)	ASTM D 4632
Elongation @ Failure, %	50 (min.)	ASTM D 4632
Puncture strength, lbs.	105 (min.)	ASTM D 4833
Apparent opening size (US Sieve)	100	ASTM D 4751
Permittivity, sec-1	1.2	ASTM D 4491
Ultraviolet radiation stability, %	70 (min.)	ASTM D 4355

2.3 SECURING PINS

A. Unless otherwise recommended by the manufacturer, securing pins shall be steel or fiberglass formed as a "U", "L", or "T" shape or contain "ears" to prevent total penetration. Steel washers shall be used on all but the "U" shaped pins.

PART 3 EXECUTION

3.1 PREPARATION OF SURFACE/SUBGRADE

A. Complete clearing, grubbing, and excavation or fill. Slopes shall be trimmed to uniform grades and depressions shall be filled with suitable material to provide a smooth subgrade.

B. Soft or overly wet subgrade materials shall be removed and replaced with suitable material which shall be thoroughly tamped or otherwise compacted.

C. Erosion features such as rills and gullies must be graded out of the surface before fabric deployment.

3.2 INSTALLATION

A. Install at specified locations and in accordance with the Drawings and in accordance with manufacturer's recommendations. Loosely lay (do not stretch) material such that it will conform to surface irregularities when material is placed against it. Filter fabric may be folded and overlapped to permit proper placement in the designated area.

B. Join adjacent sections by overlapping a minimum of 18 inches and securing against the underlying foundation material. The upstream or up-slope layer shall overlap the abutting downstream or down-slope layer.

C. Place securing pins along the edge of the fabric panel or roll the fabric in such a way to adequately hold it in place during installation.

D. Fill material must not be dropped on uncovered filter fabric from a height greater than 2 feet.

E. Should the filter fabric be torn or otherwise damaged, Contractor shall repair damage and correct disturbances. Repairs shall consist of a patch of the same type of material, which. shall extend a minimum of 18 inches beyond the damaged area, in all directions.

3.3 REMOVAL

A. All geosynthetic materials used in any temporary facilities or areas shall be removed from the Site prior to project completion in accordance with Section 02 41 00 Demolition and Restoration of Site Features. This material includes, but is not limited to:
   1. Woven-filter fabric;
   2. Non-woven filter fabric;
   3. Securing pins.

END OF SECTION

SECTION 31 37 00 – RIPRAP

PART 1 GENERAL

1.1 SUMMARY

A. This section describes the requirements for riprap used in erosion and sediment control measures, for slope armoring, and culvert outlet energy dissipation.

1.2 SUBMITTALS

A. Contractor shall submit source, method of production, material data, and gradation data for Riprap.

PART 2 PRODUCTS

2.1 MATERIALS

A. Riprap
   1. The rock shall be limestone or other approved hard stone of good quality that will not disintegrate under action of air and water. It shall be clean and free from earth, clay, or refuse.
   2. The bulk specific gravity shall be at least 2.25.
   3. Ensure the loss of soundness after 20 cycles is no greater than 15 percent when tested in accordance with the U.S. Army Corps of Engineers test method CRD-C 144.
   4. Riprap pieces shall have a width and thickness at least one-third the length (no flat stones).
   5. Each load of rock shall be reasonably well graded from the largest to the smallest size specified. The rock shall be angular in shape to permit interlocking between the various rock sizes.
   6. Control of gradation shall be by visual inspection to verify that the rock is reasonably well graded and does conform to the maximum, mean and minimum weights as specified.
   7. Oklahoma DOT Stone for Plain Riprap (Type I):
      a. Maximum stone weight: 300 pounds.
      b. Average stone weight: 70-125 pounds.
      c. Not more than 20% of stones less than: 30 pounds.

PART 3 EXECUTION

3.1 INSPECTION

A. Prior to placement, verify that materials to be installed meet Specifications.

B. Verify subgrade preparation has been completed as specified and approved by the Engineer.

3.2 PREPARATION OF SURFACE/SUBGRADE

A. Slopes shall be trimmed to uniform grades as shown in the Drawings. All depressions shall be filled with suitable material (soil) at optimum moisture content which shall be thoroughly tamped or otherwise compacted to insure stability. Soft, unstable materials shall be removed and replaced with suitable material which shall be thoroughly tamped or otherwise compacted to insure stability.

3.3 PLACEMENT OF RIPRAP

A. Place geosynthetic materials over substrate where shown on the Drawings and in accordance with Section 31 34 19 – Geosynthetic Soil Reinforcement.

B. Approved material shall be dumped or otherwise placed in a manner as to produce a reasonable solid mass of material within the limits indicated on the Drawings or specified by the Engineer. All material shall be placed and distributed so that there are no large accumulations of either the larger or smaller sizes of rock.

C. Material should not be dropped onto geotextile from a height of greater than 2 feet.

D. Any appreciable variation from the specified thickness of the riprap shall be corrected by redistributing the material.

E. Installed Thickness: As indicated on Drawings.

3.4 TOLERANCES

A. A finished subgrade shall be provided that is reasonably smooth, compacted as specified, and free from irregular surface changes.

B. Finished surfaces shall conform to slope specified and be reasonably uniform and level. Finished surfaces shall match surrounding surfaces to the extent practical. The thickness of the finished surface shall be as indicated on the Drawings. Any appreciable variation from the specified thicknesses or the specified finished elevations shall be corrected by the Contractor.

3.5 REMOVAL

A. All materials shall be removed from the floodplain and within the stream banks, including, but not limited to:
   1. Riprap;
   2. Geotextile filter fabric;
   3. Accumulated sediment.

END OF SECTION

SECTION 32 92 19 – SEEDING

PART 1 GENERAL

1.1 SUMMARY

A. Seed all areas that are disturbed during the course of the Work to provide permanent stabilization and erosion control.

B. Hydroseeding is acceptable if completed by commercial hydroseed professional.

C. Contractor shall complete vegetation management period and receive written approval from the project Owner to end vegetation management.

1.2 SUBMITTALS

A. Submit Product Data and certificates for seed mixes, including: percentage of seed mix, germination percentage, inert matter percentage, weed percentage, year of production, net weight of packages, date of packaging, and location of packaging.

B. Submit Product Data and certificates for mulch.

PART 2 PRODUCTS

2.1 SEED MIXTURE

A. Only native, local ecotype seeds shall be used.

B. Seed Mix:

Species	**Variety**	**% PLS in Mixture**
Big bluestem	Earl; Kaw	20
Blue grama	Lovington; Hachita	10
Indiangrass	Osage; Cheyenne; Lometa	20
Little bluestem	Aldous	20
Sideoats grama	El Reno; Haskell	20
Switchgrass	Blackwell; Caddo	10

Add Annual Rye Grass at 20 pounds per acre when seeding:

- outside of the specified months;
- in Critical Areas; or
- areas requiring rapid stabilization.

PLS = Pure Live Seed

2.2 MULCH

A. Rolled mulch is required where seed is drilled or distributed and shall be contained in a single-net erosion control blanket.

B. Hydroseed shall contain mulch within the mix.

C. Mulch shall be straw or hay mulch suitable for its intended use. Mulch shall be free from weeds, mold, or other deleterious materials.
   1. Native grass hay (certified noxious weed free) with viable seed; 4,000 lb/acre
   2. Native or introduced grass hay (certified noxious weed free); 4,000 lb/acre
   3. Legume hay (certified noxious weed free); 4,000 lb/acre
   4. Straw (certified noxious weed free); 4,000 lb/acre

2.3 FERTILIZER

A. Apply fertilizer with equal part Nitrogen, Phosphate (as P_2O_5), and Potassium (as K2O). Total application rate shall be 120 pounds per acre.

B. Do not use fertilizer adjacent to, or in areas where runoff is likely to reach, surface water bodies or wetlands.

PART 3 EXECUTION

3.1 PREPARATION

A. Verify prepared soil base is ready to receive the Work of this section. Apply topsoil where required to the specified thickness.

B. Prepare seeding surface to a smooth and equipment- track-free surface.

C. Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the seeding operations, proposed times shall be submitted to and approved by the Engineer.

3.2 SEEDING

A. Seeding dates should be from December 1 to June 15, with the months of March and April being the optimum dates. Do not seed immediately following rain, when ground is too dry, or when the wind velocity will prevent uniform seed distribution.

B. Prior to seeding, any areas compacted or damaged by rain, traffic, or other cause, shall be reworked to restore to satisfactory condition.

C. Apply at least 30 pounds Pure Live Seed (PLS) per acre, or 50 pounds PLS per acre if adding Annual Rye Grass to mix.

D. Immediately following seeding, apply rolled mulch product. Do not seed areas in excess of that which can also be covered with mulch on same day.

3.3 CRITICAL AREA SEEDING

A. Critical areas are all areas with a slope greater than 6:1 or within 30 feet of a surface water body or wetland.

B. Critical areas shall be seeded and mulched within 48 hours of final grading.

3.4 MULCH

A. The mulch shall be fixed in place with mechanical anchoring by a V-type-wheel land packer, a scalloped-disk land packer designed to force mulch into the soil surface, or other suitable equipment.

B. Straw or hay mulch shall be spread uniformly at the rate of 2 tons per acre. Mulch shall be spread by hand, blower-type mulch spreader or other approved method. All seeded areas shall be mulched on the same day as the seeding.

3.1 VEGETATION ESTABLISHMENT PERIOD

A. Seeded and planted areas shall be watered at a minimum as follows:

	Frequency	**Amount**
Week 1	Two times per day	¼ inch (minimum) per watering
Week 2	One time per day	¼ inch (minimum) per watering
Weeks 3-6	Three times per week	1 inch (minimum) per week

Skip the next watering event if a rain event occurs that is greater than the amount to be applied during that water event.

B. Areas compacted from equipment during watering events shall be repaired.

C. Control growth of weeds. Apply herbicides to seeded areas. Remedy damage resulting from improper use of herbicides. Manually or mechanically remove weeds from seeded areas or complete weed removal by other methods in these areas as approved by Owner.

D. Control pests that may hinder vegetation establishment.

E. Immediately reseed and water areas showing bare spots.

F. Repair erosion washouts or gullies.

G. Vegetation Establishment Period execution shall continue until:
   1. Minimum watering events have been completed; and
   2. Vegetative cover is established over 80 percent of seeded areas; and
   3. Less than 10 percent invasive species are present within seeded areas; and
   4. Contractor receives written approval from Owner.

END OF SECTION

SECTION 33 42 13 - PIPE CULVERTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Submittals
   2. Corrugated Steel Pipe (CSP) Culvert.
   3. Bedding and Cover Materials
   4. Installation
   5. Erection Tolerances
   6. Field Quality Control
   7. Protection of Installed Construction

B. Related Sections:
   1. Section 31 23 23 – Fill.
   2. Section 31 37 00 – Riprap.
   3. 31 34 19 – Geosynthetic Soil Reinforcement.

1.2 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures.

B. Submit Product Data on culvert pipe and accessories.

C. Submit manufacturer's installation instructions and any special procedures required to install the pipe culverts.

D. Submit qualifications statements for manufacturer and installer at least 10 days before completing the Work of this Section.

E. Submit preliminary soil density testing for Granular Bedding and proposed Native Earth Backfill materials. Submit field compaction testing results to Engineer with two days of tests taking place.

1.3 PRE-INSTALLATION MEETING

A. Convene a pre-installation meeting approximately three days before starting Work of this Section. Notify Engineer two days in advance of a proposed meeting date.

B. All parties (Contractor and Subcontractors) affecting the Work shall attend.

C. Contractor shall prepare agenda and preside over meeting:
   1. Review conditions of site conditions, preparation for installation, and installation procedures.
   2. Coordination with related elements of Work.
   3. Safety and Health concerns.

D. Contractor shall record and distribute meeting minutes to participants within two days to Engineer and other parties affected by decisions made.

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing CSP products with minimum five years of experience.

B. Installer: Company specializing in culvert installation with minimum five years of documented experience.

1.5 HANDLING AND STORAGE

A. Pipe shall be delivered to the job site and handled by means that provide adequate support to the pipe and do not subject it to undue stresses or damage. When handling and placing the pipe, care shall be taken to prevent sudden drops, impact blows, abrasion damage, and dragging along the ground. Use pipe slings when lifting or lowering the pipe.

B. The manufacturer's special handling requirements shall be strictly observed. Pipe shall be stored on a relatively flat surface so that the pipe is evenly supported.

1.6 SITE CONDITIONS

A. Verify field measurements prior to fabrication.

B. Do not install piping when bedding is frozen or contains standing water.

1.7 SURFACE WATER CONTROL

A. The culvert is to be installed within a perennial stream where the streambed is composed mostly of exposed bedrock and has a reservoir located less than 0.1 mile upstream.

B. The culvert shall be installed only during favorable stream conditions. Ideal stream conditions to be expected are no flow and approximately 1 foot of standing water within the stream banks.

C. Contractor shall be responsible for installing surface water control measures to permit installation of the bedding layers and culvert to occur in mostly dry conditions.

PART 2 PRODUCTS

2.1 PIPE CULVERT FOR STREAM CROSSING

A. Manufacturer:
   1. Contech Engineered Solutions.
   2. Or approved equivalent.

B. Corrugated Steel Pipe: ASTM A929/A929M, galvanized
   1. The CSP meets the design parameters of the American Association of State Highway and Transportation Officials (AASHTO) Standard Specification for Highway Bridges, AASHTO LRFD Bridge Design, and/or the American Iron and Steel Institute (AISI).
   2. 14 Gauge
   3. Galvanized coating (2.0 oz.) (AASHTO M218 or ASTM A929)
   4. Shape: Circular with nominal diameter of 48 inches

5. Corrugation depth: ½ inch
6. Helical lock seam
7. Coupling bands: Galvanized steel, 18 gauge minimum, no gaskets

C. Tapered Ends: Same material as pipe, machine cut, for joining to pipe end treatments.

2.2 ACCESSORIES

A. Geotextile Filter Fabric: Woven, polypropylene
1. Manufacturers: Tensar Earth Technologies, TenCate Geosynthetics
2. Mirafi HP370.
3. Substitutions: 01 25 00 – Substitutions.

B. Upstream Culvert End Treatment
1. (1) Multiple inlet flared end section OR (2) standard flared end sections.
2. Manufactured to match pipe culvert.
3. 4:1 (H:V) edge slope.
4. No toe plate.

C. Downstream Culvert End Treatment
1. None.

2.3 CULVERT END PROTECTION

A. Slope Protection
1. Riprap armor placed over woven filter fabric to prevent scour around the ends of the culvert pipe.
2. Materials
a. Section 31 37 00 – Riprap.
b. Section 31 34 19 – Geosynthetic Soil Reinforcement.

B. Downstream Energy Dissipater
1. Riprap armor placed over woven filter fabric to prevent stream bed erosion.
2. Materials
a. Section 31 37 00 – Riprap.
b. Section 31 34 19 – Geosynthetic Soil Reinforcement.

2.4 BEDDING AND COVER MATERIALS

A. Pipe Bedding: Granular Bedding, as specified in Section 31 23 23 Fill.

B. Cover: Clean, native earth fill, as specified in Section 31 23 23 Fill. No hard particles larger than 3” and no roots or large masses of vegetation.

C. Gravel Surfacing Aggregate, as specified in Section 31 23 23 Fill.

PART 3 EXECUTION

3.1 PREPARATION

A. Verify site is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

B. Identify required lines, levels, contours, and datum locations.

C. Clear and grub ground surface where access road approaches the stream crossing.

D. Excavate any loose sediment in existing stream bed. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

E. Place woven geotextile filter fabric over prepared subgrade, as shown in Drawings.

3.2 PIPE BEDDING

A. Place and level pipe bedding in layers not exceeding 6 inches.

3.3 INSTALLATION

A. Install culvert pipe with the lowest possible elevation within the stream, while maintaining a minimum bedding layer thickness of 6 inches below the flowline of the pipe. Do not invert slope. Record actual installed elevations of the pipe ends.

B. Lift or roll pipe into position. Do not drop or drag pipe over prepared bedding.

C. Shore pipe to hold it in the required position and restrain it during backfilling and compaction of adjacent fills. Ensure pipe remains in correct position.

3.4 BACKFILL OVER CULVERT PIPE

A. Granular bedding shall be used to backfill around the bottom of the pipe up to the haunch (midpoint). Compact in layers not to exceed 12 inches thick. Ensure jointing materials will not be dislodged during backfilling activities. Ensure no gaps or voids exist in the backfilled area. Compact to within 94% of optimum soil density.

B. After backfilled up to the culvert haunch, install a layer of Woven Filter Fabric over the granular backfill, extending it horizontally to cover the entire layer of granular backfill.

C. Backfill with clean, native earth backfill over the pipe, as shown in the Drawings. Compact in layers not to exceed 6 inches after compaction. Backfill up to elevation necessary to provide required cover over pipe, as shown in the Drawings. Compact to within 94% of optimum soil density.

D. Ensure no damage is sustained by the pipe by compacting equipment.

E. Cover with non-woven filter fabric and surfacing aggregate, as required in the Drawings for Stabilized Temporary Access Road.

3.5 CULVERT PIPE END TREATMENTS

A. Place woven filter fabric over the prepared subgrade, and cover with Granular Bedding such that flared end section is fully supported.

B. Install flared end sections on upstream end of culverts and fasten to pipe with manufacturer's recommended bands or fasteners.

C. The free end shall be weighted down by covering it with oversize riprap that is chosen from the bulk stockpile of riprap. The riprap shall be placed to prevent uplift of the front edge and scour underneath the end section and pipe.

3.6 SLOPE END PROTECTION

A. Install woven filter fabric over the backfill that has been sloped as shown in the Drawings. Place a layer of riprap over the filter fabric to the thickness shown in the Drawings. Cover the entire upstream and downstream slope from end to end and from stream bed up to the layer of the Access Road Surfacing Aggregate.

3.7 CULVERT OUTLET ENERGY DISSIPATOR

A. Install woven filter fabric over the prepared subgrade. Place layer of riprap to the minimum thickness and length shown on the drawings and across the entire stream bed width.

3.8 FIELD QUALITY CONTROL

A. Inspect for damage to pipe lining or coating, or other defects that may be detrimental as determined by the Engineer. Repair damaged piping, or provide new, undamaged pipe.

B. Complete preliminary geotechnical testing on proposed backfill materials to determine optimal compaction and moisture content.

C. Complete field testing of compacted backfill layers:
   1. Two tests in granular bedding layer, one on each side of culvert pipes.
   2. Two tests in separate compaction layers of native earth backfill, at locations within 10 feet of the culvert pipes and on opposing ends of the stream crossing.

D. If field testing of compacted backfill layers shows the backfill does not meet the compaction requirements, the Engineer may require sourcing new materials or reworking the existing materials.

3.9 REMOVAL

A. All pipe culvert materials shall be removed from the Site prior to project completion in accordance with Section 02 41 00 Demolition and Restoration of Site Features. This material includes, but is not limited to:
   1. Pipe culvert
   2. Geosynthetic materials
   3. Riprap
   4. Bedding and cover materials

END OF SECTION

Appendix C

Construction Cost Estimate

CONSTRUCTION COST ESTIMATE
WILCOX OIL COMPANY SUPERFUND SITE
INTERIM/EARLY ACTION REMEDIAL DESIGN

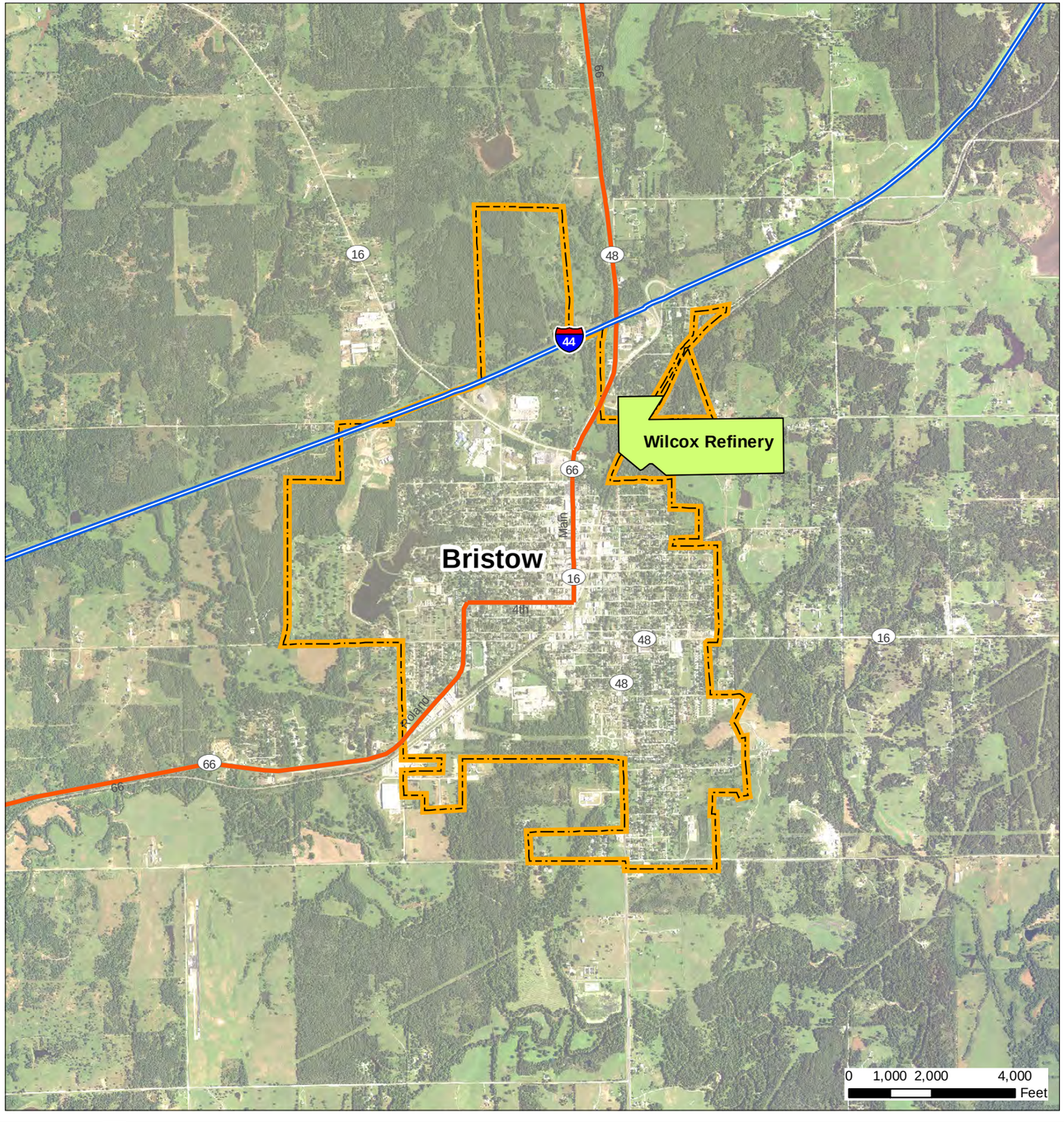
Item	Description	Estimated Quantity	Measurement for Payment	Unit Price	Total Cost
1	Mobilization and Demobilization	1	LS	$77,800	$77,800
2	Traffic Control	1	LS	$16,500	$16,500
3	Temporary Erosion and Sediment Control	1	LS	$9,800	$9,800
4	Clearing and Grubbing	5.9	AC	$7,700	$45,430
5	Tree Removal, 12" - 23"	66	EA	$800	$52,800
6	Tree Removal, 24" +	40	EA	$1,000	$40,000
7	Stabilized Construction Entrance	6	EA	$2,100	$12,600
8	Improved Access Road	4,750	LF	$25	$147,250
9	Stabilized Access Road	3,590	LF	$13	$46,670
10	Chain Link Fence Removal	1,260	LF	$4	$5,040
11	Chain Link Fence Restoration	380	LF	$34	$12,920
12	Fence Gate Installation	4	EA	$800	$3,200
13	Sediment Barrier	1	LS	$6,000	$6,000
14	Stream Crossing	1	LS	$23,100	$23,100
15	Lead Area Excavation	5,800	CY	$22	$127,600
16	Lead Stabilization	420	TON	$710	$294,000
17	Lead Transportation and Disposal	8,900	TON	$40	$356,000
18	Tank Waste Excavation	25,000	CY	$39	$975,000
19	Tank Waste Transportation and Disposal	36,700	TON	$40	$1,468,000
20	Seeding and Vegetation Restoration	8.9	AC	$4,400	$39,160
21	Backfill	31,000	TON	$18	$558,000
22	Topsoil	5,170	TON	$18	$93,060
23	Excavated Material Dewatering	17,500	CY	$8	$140,000
				Subtotal	$4,550,000
				RA Reserve (15%)	$683,000
				Construction Total Cost	$5,233,000

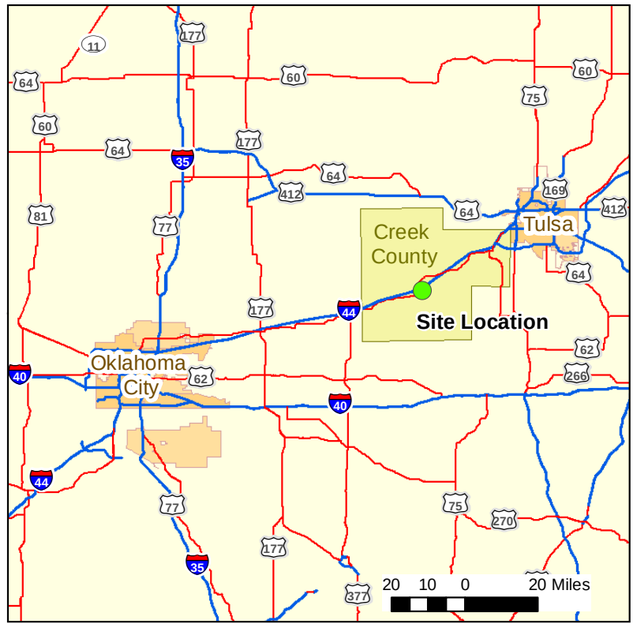
Note: Unit prices and totals have been rounded.

Appendix D

Figures

P:\gis\Projects\Wilcox\MXDs\SAP\2-Wilcox Location Map.mxd 4/14/2016 EA rmullen





Legend

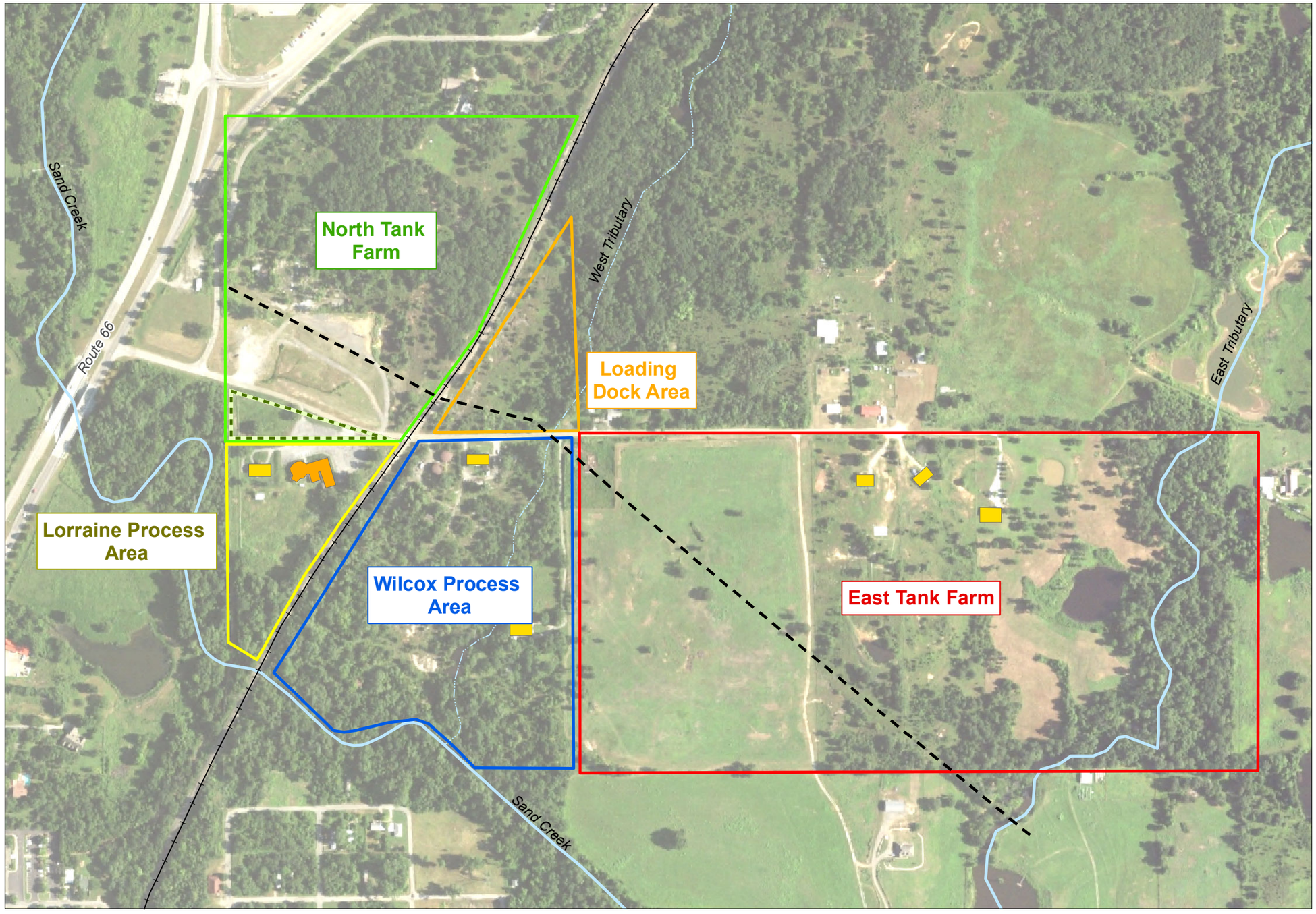
- Interstate
- Highway
- Bristow City Boundary

Source Control Early/Interim Action Remedial Design
for Wilcox Oil Company Superfund Site
Bristow, Creek County, Oklahoma

Image Source: National Agriculture Imagery Program 2015

FIGURE D-1
SITE LOCATION

P:\gis\Projects\Wilcox\MXDs\SAP\02 SAP revised 062016\4-Site Layout.mxd 6/23/2016 EA rmullen



0 200 400 800 Feet

1 inch = 400 feet

Legend

- Stream, Intermittent
- Stream, Perennial
- Pipeline
- Railroad

On-Site Building

- Church
- Residence
- Area will be designated as part of Lorraine Process Area for this investigation.

Image Source: National Agriculture Imagery Program 2015.

Source Control Early/Interim Action Remedial Design
for Wilcox Oil Company Superfund Site
Bristow, Creek County, Oklahoma

FIGURE D-2
SITE LAYOUT

N

0 162.5 325 650 Feet

Legend

- Site Outline
- Historical Feature
- East Tank Farm
- Loading Dock Area
- Lorraine Process Area
- North Tank Farm
- Wilcox Process Area
- Estimated Tank Waste Excavation Area
- Magellan Pipeline
- Proposed Lead Excavation Area
- Drainage
- Stream, Intermittent
- Stream, Perennial

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Source Control Early/Interim Action Remedial Design
for Wilcox Oil Company Superfund Site
Bristow, Creek County, Oklahoma

FIGURE D-3
SITE MAP

Legend

- Historical Feature
- Test Pit Location*
- Waste Sample Location*
- Estimated Tank Waste Excavation Area

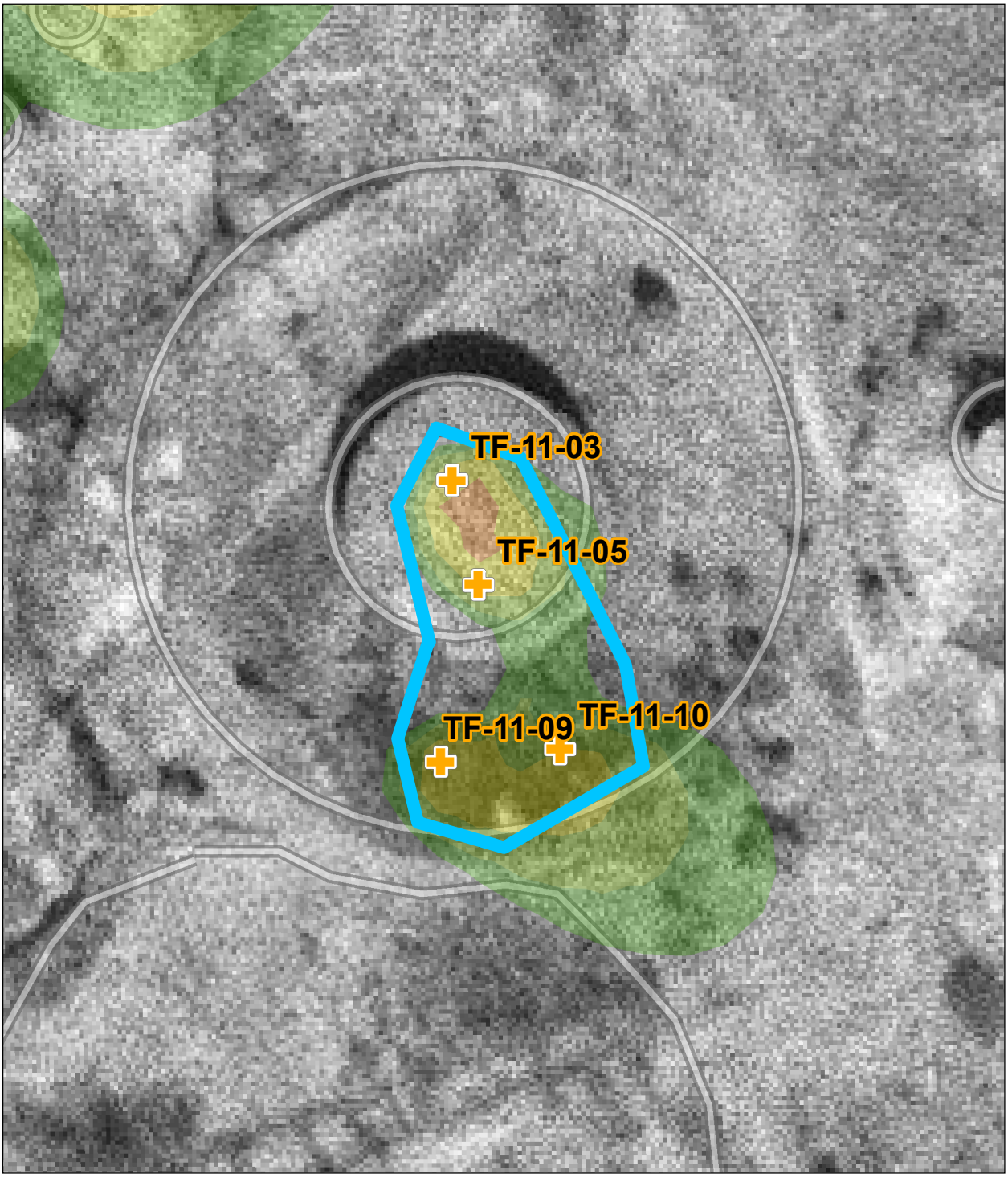
* Source: RI, 2017, data unpublished
Imagery Date: 1956

N

0 50 100 Feet

Source Control Early/Interim Action
Wilcox Oil Company Superfund Site Remedial Design
Creek County, Oklahoma

FIGURE D-4
NTF 1



Legend

Historical Feature

Estimated Tank Waste Excavation Area

ROST Locations*

ROST Fluorescence (% RE)*

<5

5-10

10-25

25-100

>100

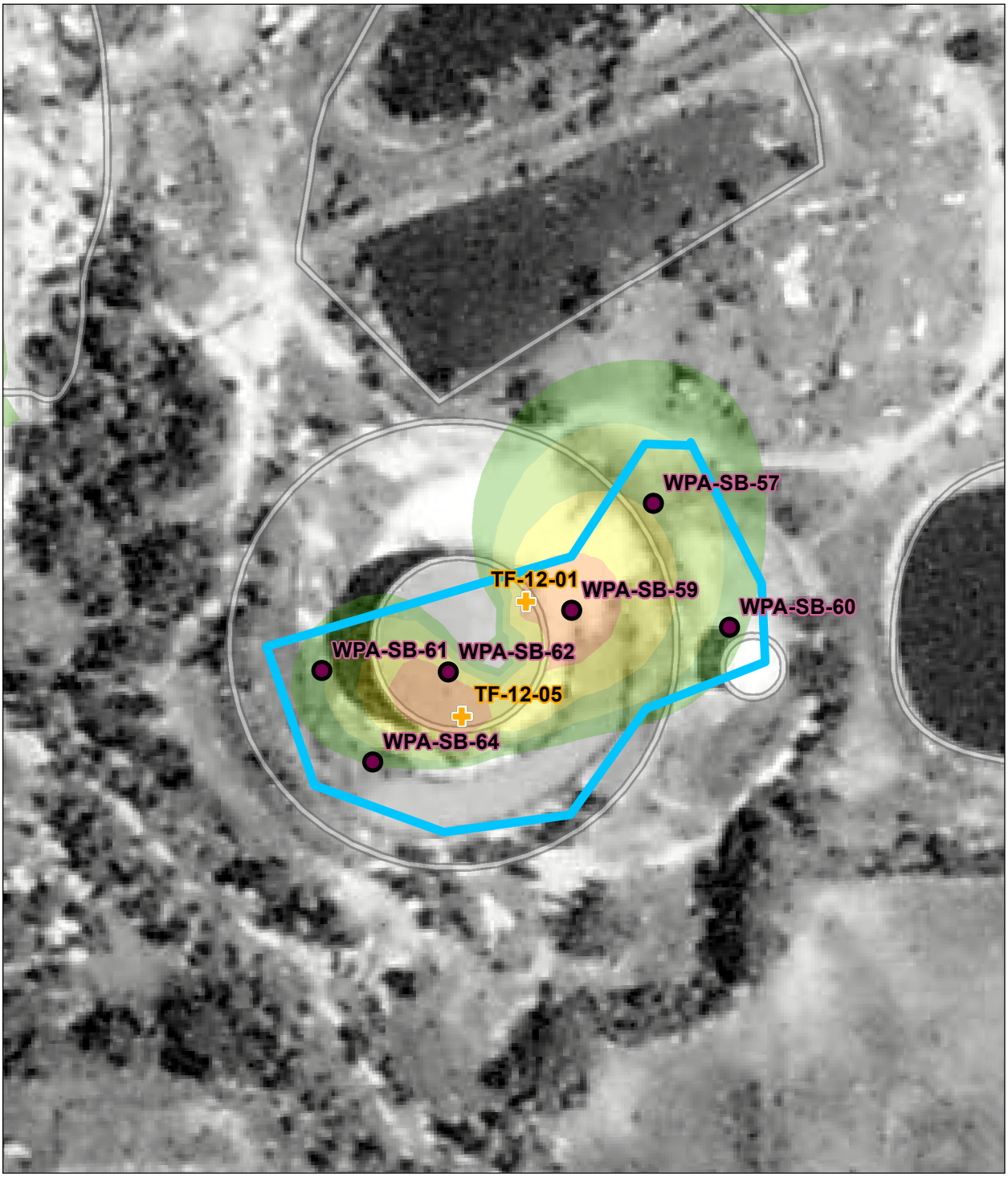
N

0 50 100 Feet

* Source: LMS, 2016
Imagery Date: 1972

Source Control Early/Interim Action
Wilcox Oil Company Superfund Site Remedial Design
Creek County, Oklahoma

FIGURE D-5
TANK 11



Legend

- Historical Feature
- Estimated Tank Waste Excavation Area
- ROST Locations*
- Soil Borings†

ROST Fluorescence (% RE)*

- <5
- 5-10
- 10-25
- 25-100
- >100

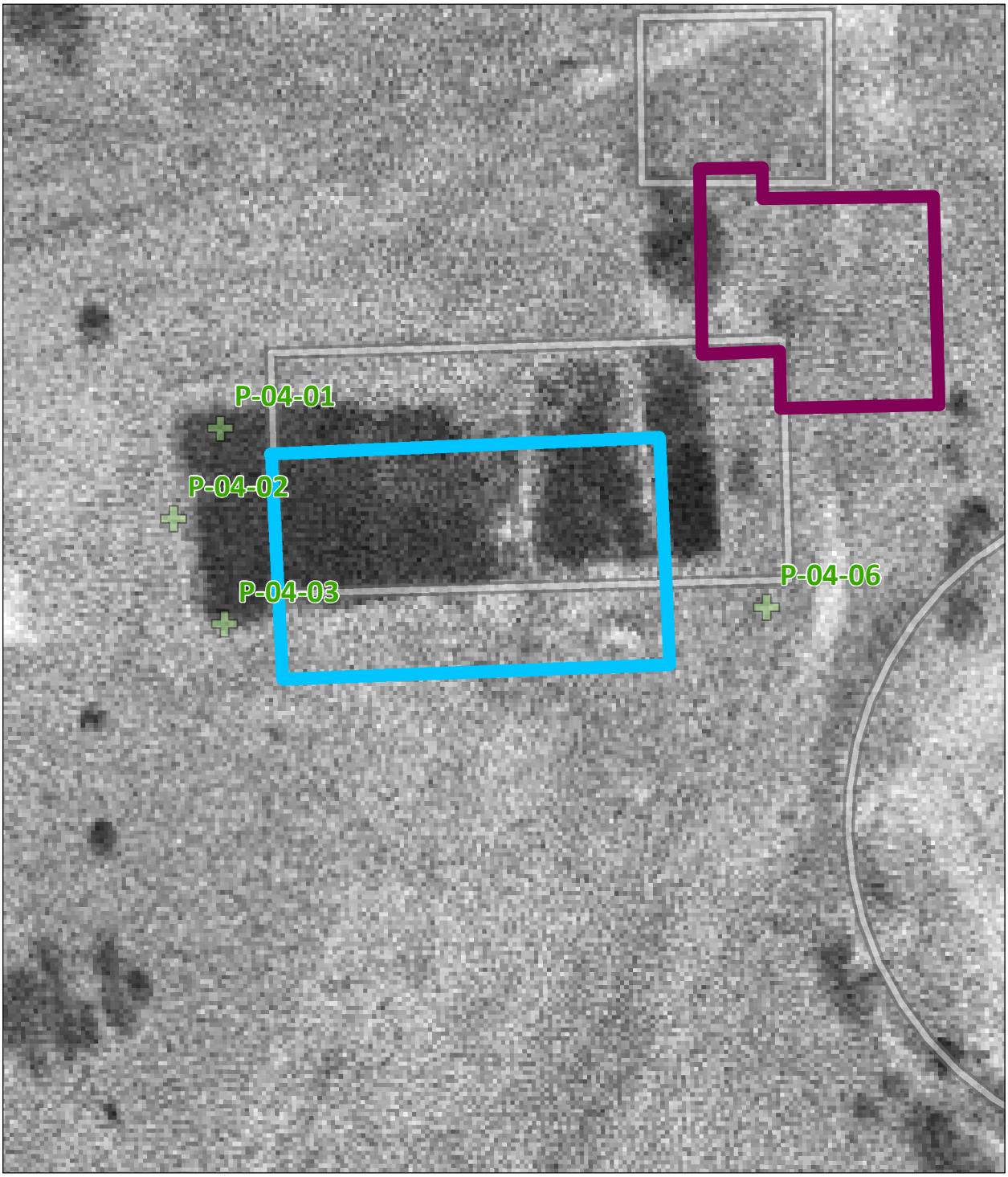
N

0 60 120 Feet

†Source: RI, 2016, data unpublished
* Source: LMS, 2016
Imagery Date: 1956

Source Control Early/Interim Action
Wilcox Oil Company Superfund Site Remedial Design
Creek County, Oklahoma

FIGURE D-6
TANK 12



Legend

- Historical Feature
- Estimated Pit 1 Lead Excavation Area
- Estimated Pit 1 Tank Waste Excavation Area
- 2015 ROST LIF Location*

N

0 50 100 Feet

Imagery Date: 1972

Source Control Early/Interim Action
Wilcox Oil Company Superfund Site Remedial Design
Creek County, Oklahoma

FIGURE D-7
PIT 1

Legend

- Historical Feature
- Test Pit Location
- Waste Sample Location*
- Estimated Tank Waste Excavation Area

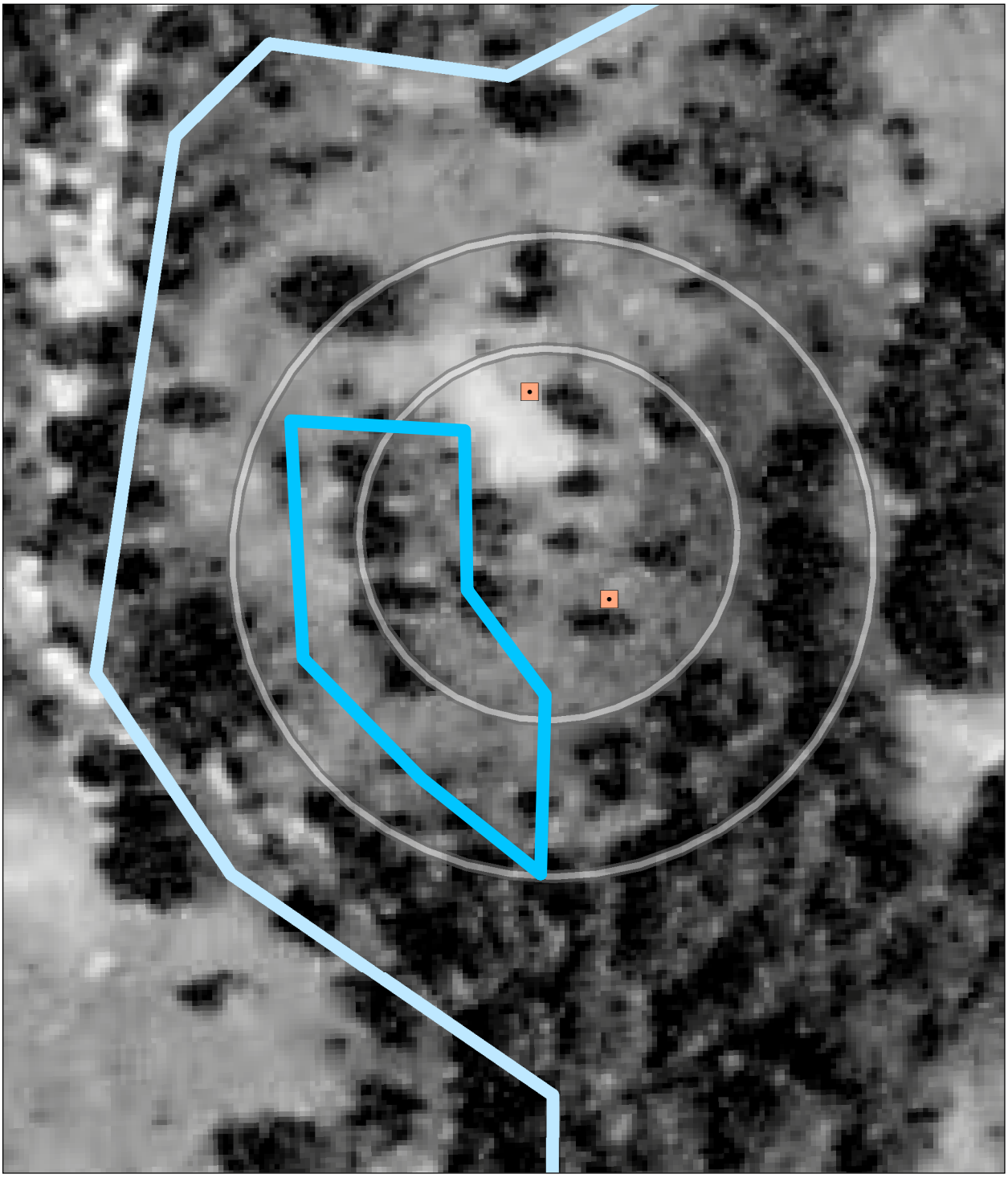
* Source: RI, 2017, data unpublished
Imagery Date: 1956

N

0 50 100 Feet

Source Control Early/Interim Action
Wilcox Oil Company Superfund Site Remedial Design
Creek County, Oklahoma

FIGURE D-8
LORRAINE TANK



Legend

- Historical Feature
- Test Pit Location*
- Estimated Tank Waste Excavation Area
- Stream

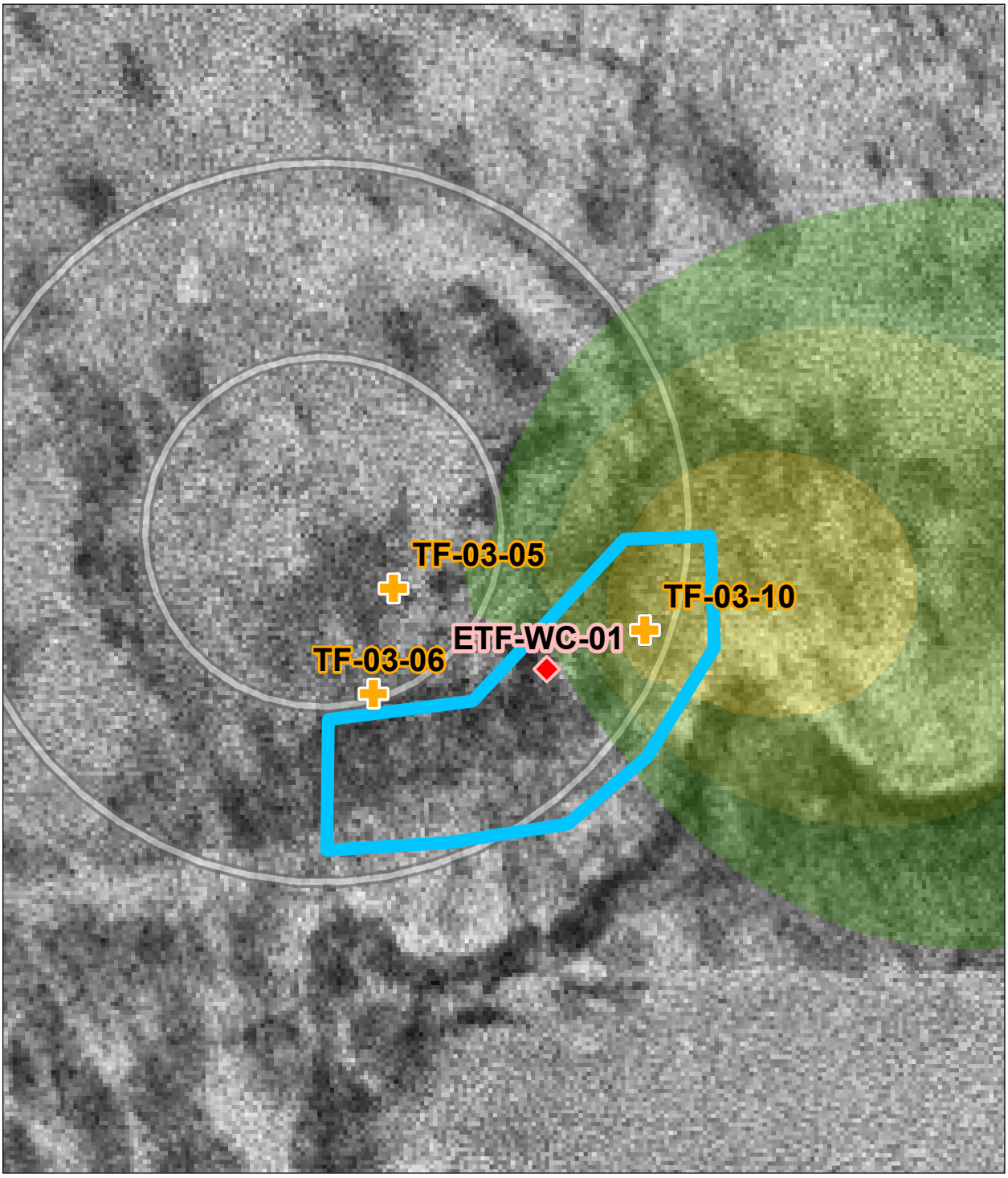
N

0 50 100 Feet

* Source: RI, 2016, data unpublished
Imagery Date: 1956

Source Control Early/Interim Action
Wilcox Oil Company Superfund Site Remedial Design
Creek County, Oklahoma

FIGURE D-9
TANK 1



Legend

- Waste Sample Location†
- Historical Feature
- Estimated Tank Waste Excavation Area
- ROST Locations*

ROST Fluorescence (% RE)*

- <5
- 5-10
- 10-25
- 25-100
- >100

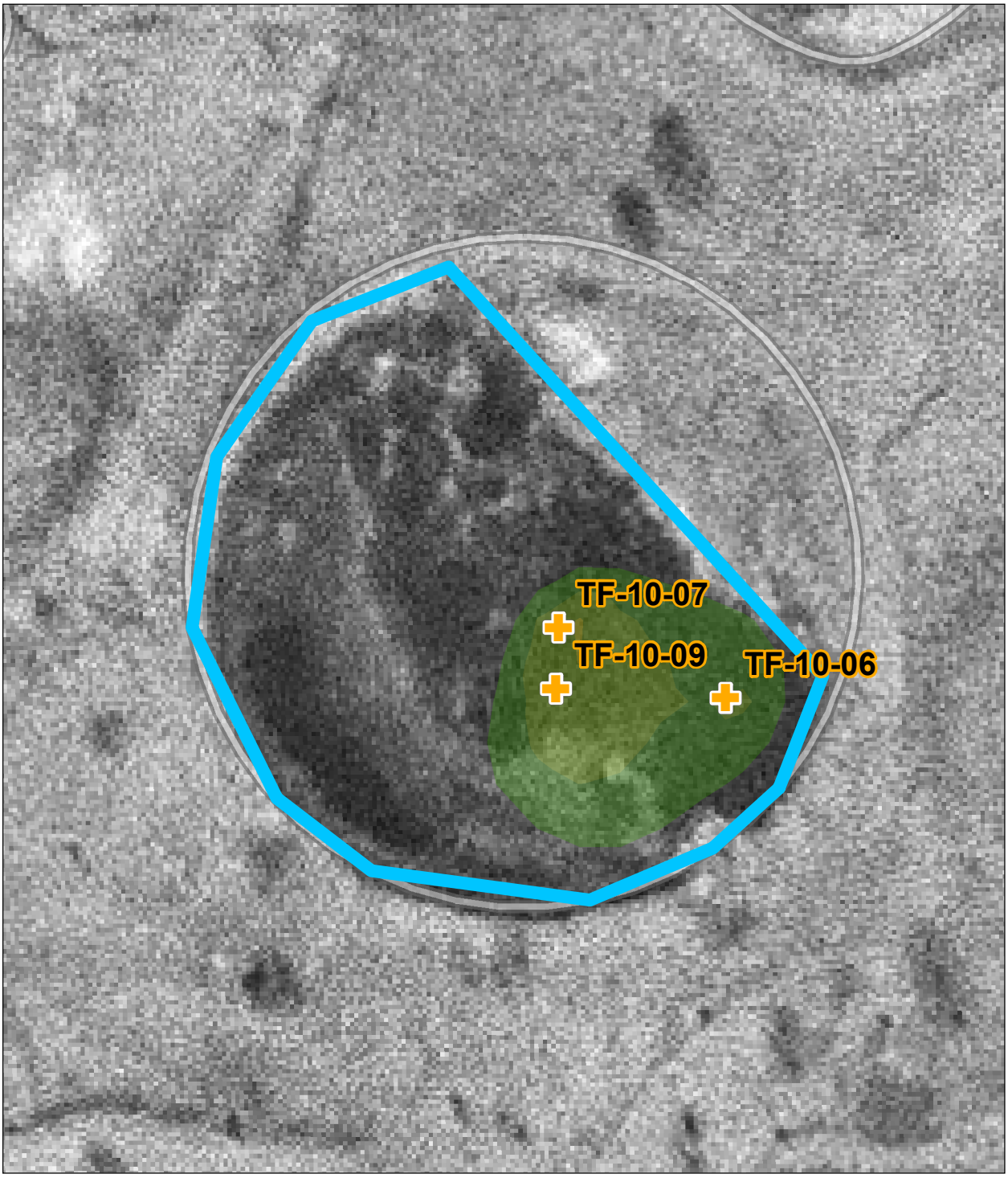
N

0 50 100 Feet

† Source: RI, 2016, data unpublished
* Source: LMS, 2016
Imagery Date: 1972

Source Control Early/Interim Action
Wilcox Oil Company Superfund Site Remedial Design
Creek County, Oklahoma

FIGURE D-10
TANK 3



Legend

- Historical Feature
- Estimated Tank Waste Excavation Area
- ROST Locations*

ROST Fluorescence (% RE)*

- <5
- 5-10
- 10-25
- 25-100
- >100

N

0 50 100 Feet

* Source: LMS, 2016
Imagery Date: 1972

Source Control Early/Interim Action
Wilcox Oil Company Superfund Site Remedial Design
Creek County, Oklahoma

FIGURE D-11
TANK 10