U.S. Environmental Protection Agency Announces Source Control Proposed Plan

The Purpose of this Proposed Plan is to:

- Identify the United States Environmental Protection Agency's Preferred Alternative to address the Source Areas identified at the Wilcox Oil Company Superfund Site, and the reasons for the selection;
- Provide general background information and the data collected during the Remedial Investigation field events;
- Describe the other remedial alternatives evaluated in the Feasibility Study Screen;
- Solicit public review and comment on all of the remedial alternatives and information contained in the Administrative Record file; and
- Provide information on how the public can be involved in the remedy selection process.

This Source Control Proposed Plan identifies the Preferred Alternative for cleaning up the refinery tank waste and the lead additive area at the Wilcox Oil Company Superfund Site (site), Bristow, Oklahoma. This action is limited in scope to addressing tank waste and lead additive area sources through excavation, treatment, and offsite disposal. By taking this source control action, significant human health and ecological risk reduction will be accomplished through the removal of primary sources located throughout the site at or near the soil surface, specifically residential properties. In addition, further migration and environmental degradation of adjacent waterways (e.g., Sand Creek and the East Tributary), wetlands, and stream riparian areas is mitigated.

Because this action does not constitute the final remedy for the site, subsequent actions to address fully the threats posed by conditions at this site will be documented in a future final site decision document. This Plan provides the rationale and includes summaries of other cleanup alternatives evaluated for use under this source control action. This document is issued by the U.S. Environmental Protection Agency (EPA), the lead agency for site activities, and the Oklahoma Department of Environmental Quality (ODEQ), the support agency. The EPA consulted with the Muscogee (Creek) Nation, Cherokee Nation, and Sac and Fox Nation to coordinate review and discussion of this proposed action. The source control remedy for the site will be selected after reviewing and considering all information submitted during the 30-day public comment period. The Preferred Alternative may be modified or another response action presented in this plan can be selected based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Source Control Proposed Plan.

The EPA is issuing this Source Control Proposed Plan as part of its public participation responsibilities under Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and Section 117(a) of the Comprehensive, Environmental, Response, Compensation, and Liability Act (CERCLA) § 9617(a). This Source Control Proposed Plan summarizes information that can be found in greater detail in the documents contained in the Administrative Record file for this site. The EPA and the State encourage the public to review these documents to gain a more comprehensive understanding of the site and Superfund activities that have been conducted at the site.

Community Participation

The ODEQ and EPA will provide information regarding the proposed source material cleanup at the Wilcox Oil Company Superfund Site. The ODEQ and EPA encourage the public to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted at the Site.

Dates to Remember

Public Comment Period: June 28, 2018 – through July 31, 2018
The EPA and ODEQ will accept written comments on the Source Control Proposed Plan during the public comment period.

Public Meeting: July 10, 2018
U.S. EPA will hold a public meeting to explain the Source Control Proposed Plan and all of the alternatives. Oral and written comments will also be accepted at the meeting. The meeting will be held at Bristow Public Library, 111 West 7th Avenue from 6:00 - 7:00 p.m.

For more information, see the Administrative Record at the following locations:

Bristow Public Library, 111 West 7th Avenue Phone: 918-367-6562
Hours: Monday - Friday 9:00 a.m. to 6:00 p.m.
Saturday 9:00a.m. to 1:00 p.m.
Closed: Sunday and Monday

Oklahoma Department of Environmental Quality, Central Records
707 N. Robinson – 2nd Floor, Oklahoma City, Oklahoma 73102
(405) 702–1188, E-mail: centralrecords@deq.ok.gov Hours: Monday - Friday 8:00a.m. to 4:30 p.m.

SITE HISTORY AND BACKGROUND

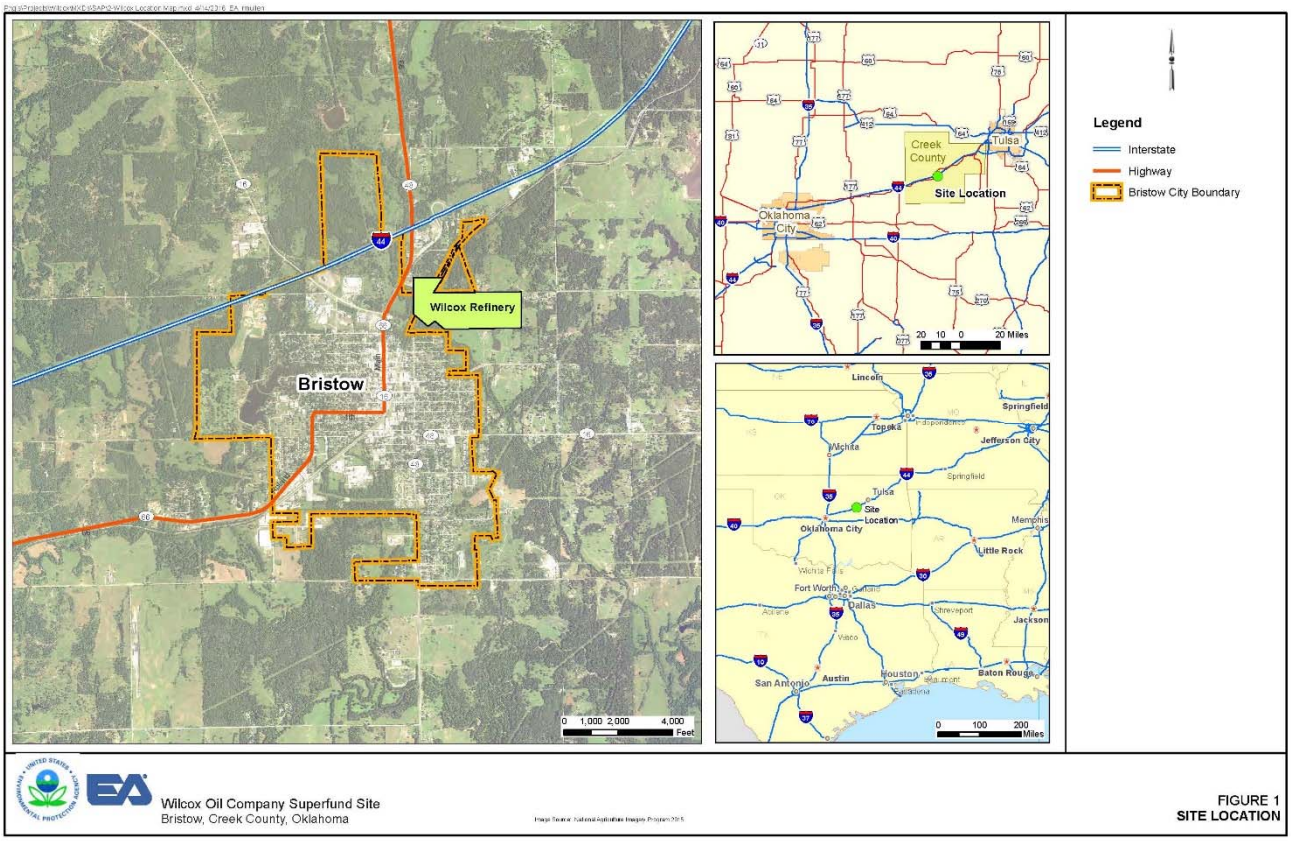
The site is an abandoned and mostly demolished oil refinery located northeast of Bristow, Creek County, Oklahoma (Figure 1; EPA, 2013). The approximate geographic coordinates for the site are 35°50’31” North latitude and 96°23’02” West longitude. The site spans approximately 140 to 150 acres located in the N ½ of the NW ¼ of S29 T16N R9E and the SW ¼ of the SW ¼ of S20 T16N R9E in Creek County, Oklahoma (EA, 2016).

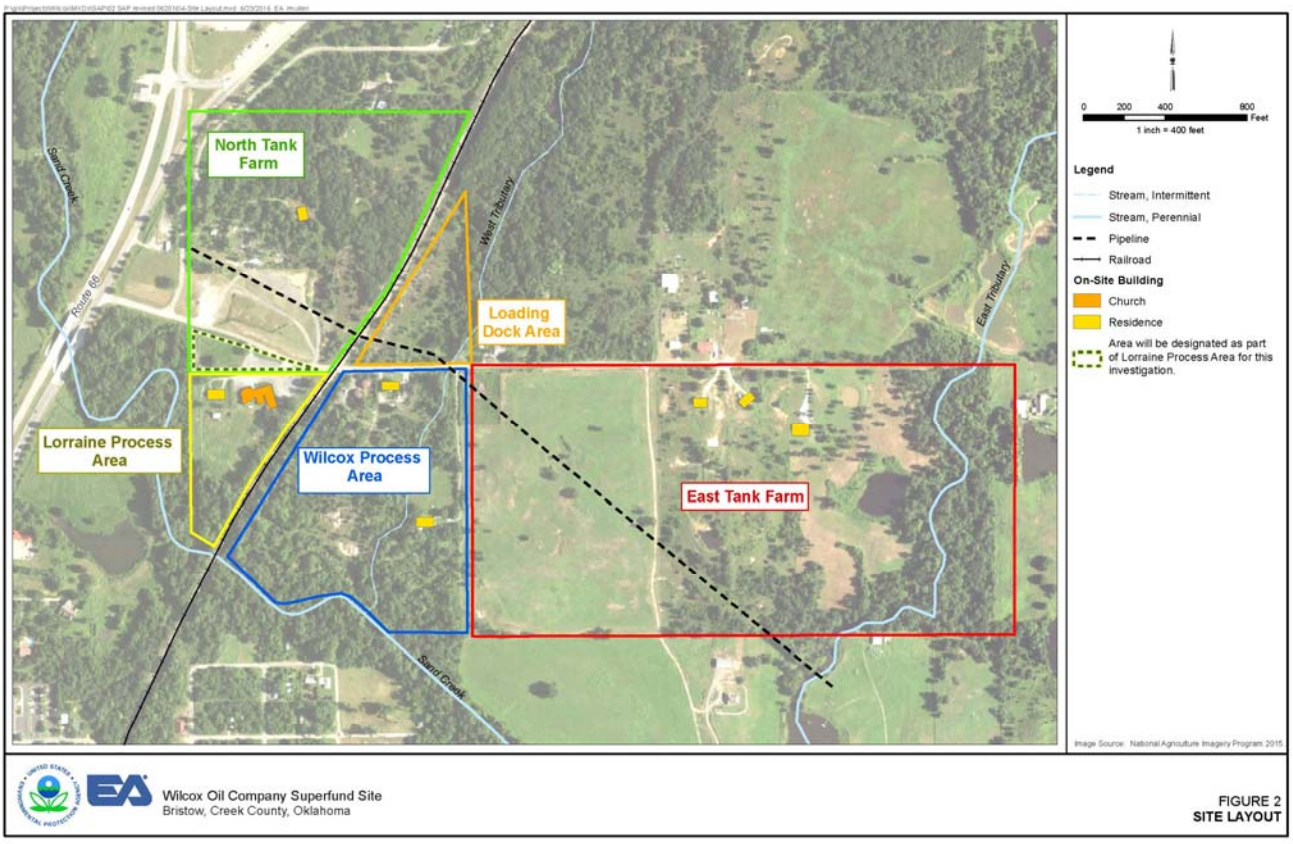
Records indicate the property was used for oil refinery operations from 1915 until November 1963 (ODEQ, 1994), and consisted of two refinery process areas and two tank farm storage areas (Figure 2). Oil refining began in 1915 at the Lorraine Refinery followed by operations at the Wilcox Oil Refinery. A modern skimming and cracking plant with an operating capacity of 4,000 barrels of crude oil per day was constructed for the Wilcox Oil Refinery in 1929 (Reid, 1930). The main components of the plant consisted of a skimming plant, cracking unit, and re-distillation battery with a vapor recovery system and treatment equipment (ODEQ, 1994). The Wilcox Oil Company expanded when it acquired the Lorraine Refinery in 1937.

Sanborn Fire Insurance Maps (EA, 2016) show the properties contained approximately 80 storage tanks of various sizes, a cooling pond, and approximately 10 buildings housing refinery operations. The maps also indicate that crude oil, fuel oil, gas oil, distillate, kerosene, naphtha, and benzene (petroleum ether) were all stored on the property (ODEQ, 1994).

Wilcox Oil Company sold the property to private individuals in 1963. Most of the equipment and storage tanks were auctioned or salvaged for scrap metal. Wilcox Oil Company no longer operates in Oklahoma, and based on information from the Oklahoma Secretary of States’ office, the company merged with Tenneco Oil Company in 1967 (ODEQ 1994).

The EPA and the ODEQ have conducted multiple investigations at the site since 1994. The associated historical documents are listed below.


Wilcox Refinery
Bristow
Creek County
Tulsa
Site Location
Oklahoma City
20 10 0 20 Miles
Lincoln
Springfield
Topeka
Wichita
Jefferson City
Tulsa
Site Location
Oklahoma City
Memphis
Little Rock
Fort Worth
Dallas
Shreveport
Jackson
San Antonio
Austin
Houston
Baton Rouge
0 100 200 Miles
0 1,000 2,000 4,000 Feet
Legend
Interstate
Highway
Bristow City Boundary
Wilcox Oil Company Superfund Site
Bristow, Creek County, Oklahoma
FIGURE 1
SITE LOCATION


North Tank Farm
Sand Creek
Route 66
West Tributary
Loading Dock Area
East Tributary
Lorraine Process Area
Wilcox Process Area
East Tank Farm
Sand Creek
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
Wilcox Oil Company Superfund Site
Bristow, Creek County, Oklahoma
FIGURE 2
SITE LAYOUT

- Preliminary Assessment of the Wilcox Oil Company (ODEQ, 1994)
- Expanded Site Inspection (ESI) Report – Wilcox Oil Company (Weston, 1997)
- Site Assessment Report for Wilcox Refinery (Ecology and Environment, Inc., 1999)
- Preliminary Assessment of the Lorraine Refinery Site (ODEQ, 2008)
- Site Inspection Report – Lorraine Refinery (ODEQ, 2009)
- ESI Report – Lorraine Refinery (ODEQ, 2010)
- ESI Report – Wilcox Refinery (ODEQ, 2011)
- Supplemental Sampling Report for Wilcox ESI (ODEQ, 2012)

On May 24, 2013, EPA proposed the site to the National Priorities List (NPL). On December 12, 2013, the site officially became a Federal Superfund Site (EPA Identification No. OK0001010917), when it was added to the NPL.

Following site listing on the NPL, the EPA, in conjunction with ODEQ, performed additional site investigations.

- *Removal Assessment Report for Wilcox Oil Company* (Weston Solutions Inc., 2016). During May/June/July 2015, EPA performed residential soil sampling and fenced potential exposure areas to restrict access.
- *Trip Report: November 30 through December 16, 2015, Wilcox Oil Company Superfund Site* (LMS, 2016). In 2015, EPA conducted a geophysical survey, a Rapid Optical Scanning Tool (ROST) laser-induced fluorescence (LIF) survey, and a field-portable X-ray fluorescence (XRF) survey across portions of Wilcox and Lorraine Process Areas and the East Tank Farm.
- Phase 2 – Mobilization 1, Field Events 1, 2, 3, and 4 August 2016-April 2017: Passive Soil Gas Sampling, Vapor Intrusion Sampling, Residential Well Sampling, Soil Sampling, Naturally Occurring Radioactive Material Survey, and Sand Creek Surface Water Sampling (Field Event Sampling Data, unpublished).
- Removal Action – September/October 2017: removal of approximately 1349 tons of tank waste was removed from a residential property. The area was backfilled with clean dirt, graded, and reseeded.
- Phase 2 – Mobilization 2, Field Event 5 October/November 2017: Soil, sediment and surface water sampling (Field Event Sampling, unpublished).
- Phase 2 – Mobilization 2, Field Event 6 March 2018: Soil sampling in the North Tank Farm (Field Event Sampling, unpublished).

The EPA completed two searches for potentially responsible parties, and identified five. Information request letters and special notice letters were issued requesting specific site information and notifying the parties of potential liability for site response activity. The EPA offered the parties the option to negotiate performance of the work. All parties declined. Based on these responses and site research, the Agency determined that further negotiations would not move the project forward in a timely manner; therefore, the site remedial investigation

(RI) and feasibility study (FS) is being completed as an EPA fund-lead project.

Throughout the investigation process, the community, particularly the residents living within the site boundaries, continue to be updated on site activity through fact sheets, door-to-door meetings, and open houses.

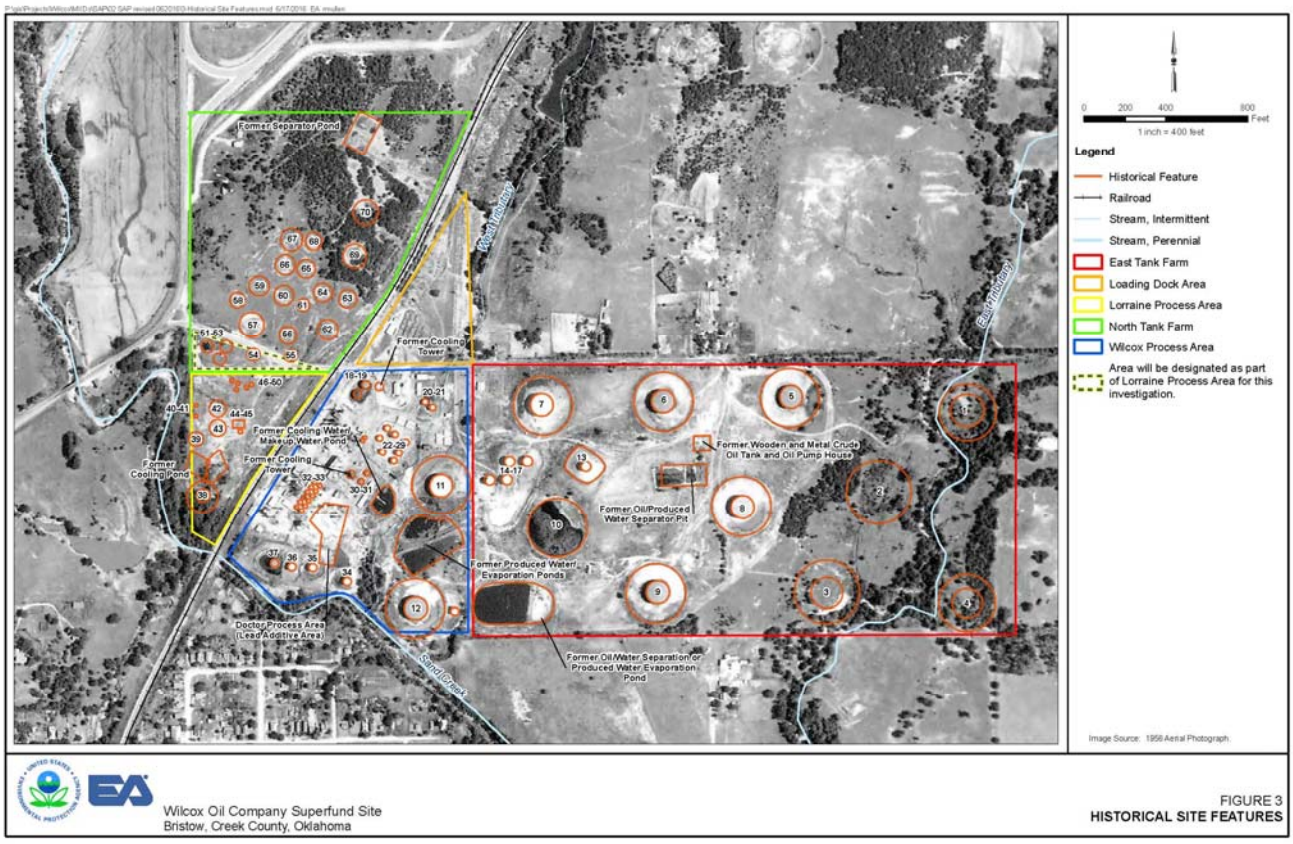
SITE CHARACTERISTICS

This section summarizes the current information available about site characteristics. The EPA is currently working on the site-wide RI to fully characterize the nature and extent of contamination, potential transport pathways, and potential human health and environmental risks. This information will be provided in the final RI and Risk Assessment reports for the site.

General Description

After the refinery operations ceased and most of the tanks and buildings were demolished and sold for scrap, the property was sold to private interests (ODEQ, 1994). Beginning in 1975 with the construction of a church and parsonage, private residences were constructed on six parcels of land that were part of the former refinery operations, with the most recent being constructed in 2003/2004. One of these residences is the former office/lab building associated with the refinery. As a result, there are seven residential properties located within former tank or refinery operation areas, three of which are occupied and one periodically rented. In addition, two occupied residential properties on the eastern portion of the site (East Tank Farm) use water from domestic/private wells (ODEQ, 1994).

The site is flanked by Route 66 to the west; a residential area and Turner Turnpike to the northwest and north; Sand Creek to the west and southwest; and residential, agricultural, and wooded areas to the east and south (Figure 2). The topography in the vicinity of the site slopes to the south. The drainage pattern of the property is primarily towards Sand Creek. An intermittent stream (West Tributary), a perennial stream (East Tributary), and several drainage channels transect the property east of the railroad



(Wilcox Process Area and East Tank Farm), all of which flow into Sand Creek (EA, 2016).

The facility can be divided into five (5) major former operational areas (Figure 2): the Wilcox and Lorraine Process Areas, the East and North Tank Farms, and the Loading Dock Area (EA, 2016). An active railroad divides the two former process areas and product storage areas. Historical waste management practices are not known at this site. Historical Sanborn maps are available for some areas of the site and were reviewed to identify the possible locations where contamination may have originated (Figure 3). Waste associated with crude oil refining may include the following: petroleum-related compounds, tank sludges/solids, crude oil, fuel oil, gas oil, petroleum distillate, kerosene, benzene, petroleum ether, brine, acid and caustic sludge, heavy metals, coke, sulfur compounds, solvents, and naturally-occurring radioactive material. Hexavalent chromium may be present where activities associated with cooling towers and cooling ponds took place (EA, 2016).

Source material is defined as material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, to surface water, to air, or acts as a source for direct exposure (EPA, 1991). Site investigation activities identified the two source materials, tank sludge/solids and the lead additive area solids, that are the focus of this plan. These are described in the following paragraphs.

Tank Sludge/Solid Waste

Data collected during historic and current site investigations show that refinery operations resulted in the presence of tank sludge/solid waste that can be either a contaminated oily tar-like viscous liquid and/or a black dry solid (Figures 4a - c). The tank sludge/solid waste is found throughout the property at various locations, primarily associated with former tank storage locations (Figure 5). Both the liquid and solid forms are found at and below the surface to depths estimated as deep as 6 feet below ground surface (bgs). The oily tar-like viscous liquid

Figure 4a: Waste material at surface.

Figure 4b: Waste material at surface.

Figure 4c: Waste material at surface.

Figure 4d: Lead Sweetening Area

present at or just below a thin layer of soil migrates to the surface and spreads out when heated by the summer sun. Throughout this document, the tank sludge/solid waste will be referred to as tank waste.

The Hazard Ranking System (HRS; EPA, 2013) document identified ten (10) potential source areas with associated releases of polycyclic aromatic hydrocarbons (PAHs) and metals to the nearby wetlands and Sand Creek. The RI investigation verified the presence of tank waste at eight (8) former tank areas and one separation pit (Figure 5). Due to its proximity to a residential home, the EPA performed a removal action in October 2017, at one of the former tank locations to address approximately 1,349 tons of tank waste. In 2015, fencing was constructed around the separation pit and the church property to restrict access to source areas. The remaining former tank areas (7) and separation pit are source materials being proposed due to the presence of high contaminant concentrations, proximity to residential homes, and the proximity to the creek.

Results for samples collected from the tank waste are as high as 3,660 milligrams per kilogram (mg/kg) lead, 20 mg/kg Benzo(a)pyrene, 1,400 mg/kg 2-methylnaphthalene, and 875,000 mg/kg total petroleum hydrocarbons (Table 1). These wastes are not identified as listed hazardous wastes and data results indicate that the tank waste is not a characteristic hazardous waste.

During August 2016 to August 2017 Phase 2 field events, passive soil gas and indoor air data were collected. The passive soil gas data show the tank waste has the potential to generate soil gases that can contain contaminants (Beacon, 2016), while the indoor air data from all three sampled structures show some contaminants, including benzene and ethylbenzene, are present above indoor air health-based screening numbers (Table 2).

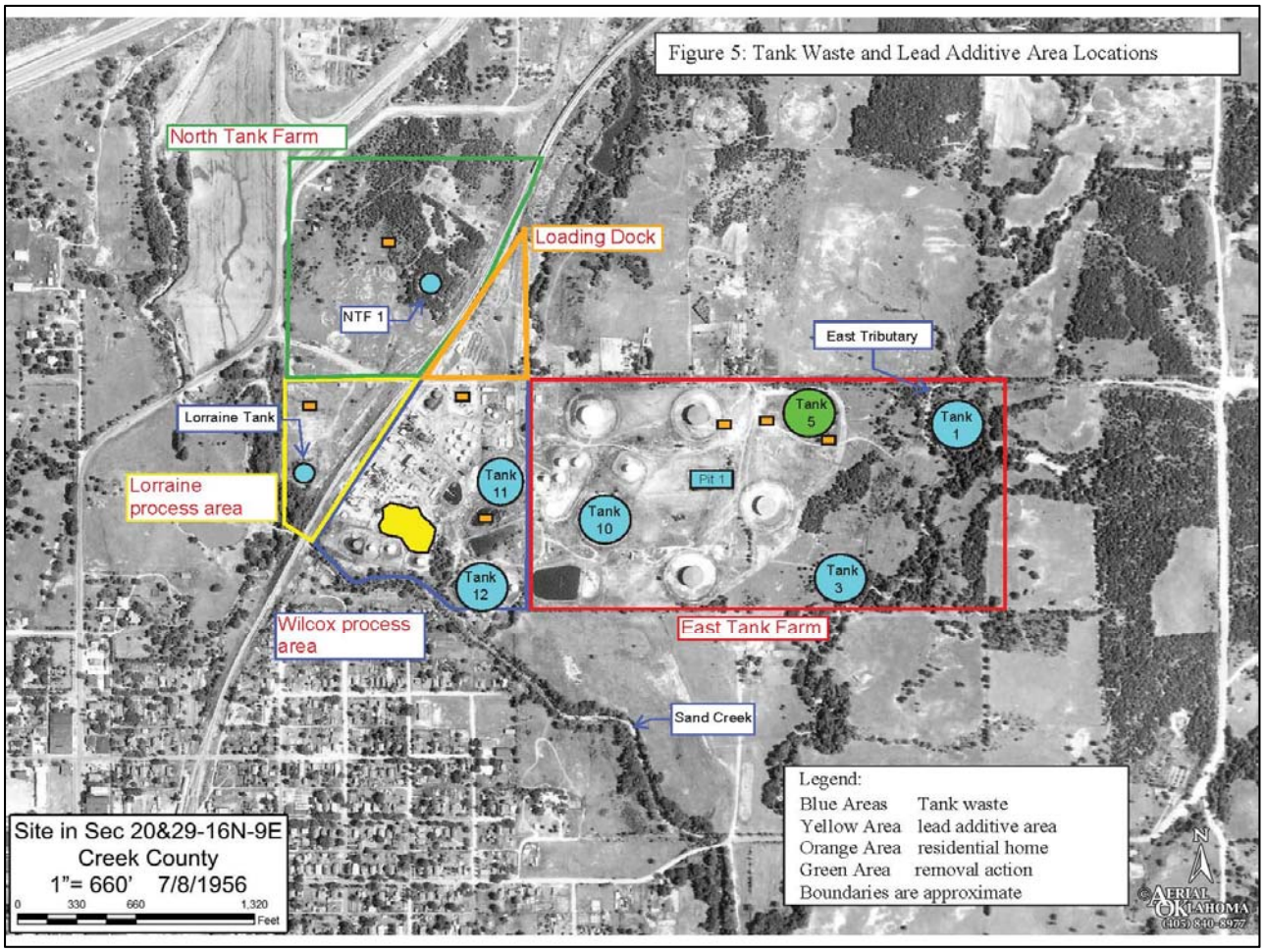


Table 1: Summary of Data and Potential Exposure Scenarios				
Description	**Locations**	**Data Results[1]**	**Potential Impacts/Exposure Scenarios**	**Data Source(s)**
Lead Additive Area	Lead Additive Area	Lead 43,200 – 105,000 mg/kg Shallow Water: 2-methylphenol $1.5x10^6$ µg/l Phenol 270,000 µg/l 2,4 dimethylphenol $1.3x10^6$ µg/l Lead >752 µg/l Benzene 2400 µg/l	Sand Creek (direct discharge/migration to surface water and sediment) Ecological and Human Receptors (direct exposure) Human Receptors (indoor air)	RI Field Data, 2016 LMS, 2016 Removal Assessment, 2016 ESI Wilcox Oil, 1997 ESI Wilcox/Lorraine 2011 Lorraine Refinery SI, 2009 ESI Wilcox Oil, 2012 EPA, unpublished, 2017 EPA, unpublished, 2018
Tank Waste	Lorraine Process Area Tank 1 Tank 3 NTF-1 Tank 10 Tank 11 Tank 12 Pit 1	TPH 23,200 - 875,000 mg/kg Lead 513 – 3,660 mg/kg total xylenes 0.28 – 0.45 mg/kg toluene 0.27 mg/kg **PAHs** Benzo(a)anthracene 0.76 - 12 mg/kg Benzo(a)pyrene 1.2 - 12 mg/kg Benzo(b)fluoranthene 2.4 - 20 mg/kg Benzo(k)fluoranthene 7.5 mg/kg Chrysene 13 - 37 mg/kg Fluoranthene 2.5 - 17 mg/kg Indeno(1,2,3-cd)pyrene 3.1 – 4.4 mg/kg phenanthrene 27 - 520 mg/kg pyrene 2.1 - 230 mg/kg 2-methylnaphthalene 49 - 1,400 mg/kg		

1 This column is not all inclusive. This is a limited summary of detected contaminants, specifically listing those with the highest concentrations.

Abbreviations: TPH=total petroleum hydrocarbon mg/kg=milligram per kilogram µg/l=micrograms per liter
NTF=north tank farm ESI=Expanded Site Investigation SI=Site Investigation
RI=remedial investigation PAHs=polycyclic aromatic hydrocarbons
LMS= Lockheed Martin SERAS ERT=Environmental Response Team

Soil data collected within close proximity to the tank waste show elevated levels of PAHs with minor concentration of other semivolatile organics. Benzo(a)pyrene ranges from 0.018 – 12 mg/kg, benzo(a)anthracene ranges from 0.16 to 11 mg/kg, and benzo(b)fluoranthene ranges from 0.16 to 20 mg/kg.

Lead additive area

In addition to the tank waste, an area located on the Wilcox Process area is contaminated with high levels of lead and phenols (Figures 4d and 5; LMS, 2016). This area is denuded of vegetation and covered by silty sparkling sand and a white, salt-like substance (LMS, 2016). Significant surface erosion from this area extends to the south towards Sand Creek. According to the Sanborn Maps, acid tanks were located in this area as well. Throughout this document, this area will be referred to as the lead additive area.

According to a 1930 article published in, *The Refiner and Natural Gasoline Manufacturer*, the Wilcox Oil Company refinery used sodium plumbite (Na_2PbO_2) as an additive for gasoline to remove sulfur impurities and meet corrosion specifications (Reid, 1930). The presence of high levels of phenols in conjunction with high levels of lead in this area appears to indicate that chemicals from the additive process are the sources for the contamination (LMS, 2016).

The source area was tested extensively using a field portable sampling device, called an x-ray fluorescence device (XRF). When tested with XRF, the sand and white, salt-like substance tested very high for lead content. Readings were above the calibration range, indicating percent levels of lead are present (LMS, 2016). Lead results for samples collected during site investigations range as high as 43,200 to 105,000 mg/kg (Weston 1997; ODEQ, 2012; EPA, unpublished). In general, lead appears to attenuate quickly with depth falling to <100 mg/kg at about 1-foot depth (LMS, 2016). This is based on data collected from 3 boring locations; therefore, a more comprehensive vertical delineation is needed throughout this area. This area is likely impacting Sand Creek due to high lead concentrations at the surface throughout this area and associated drainages that flow to Sand Creek (LMS, 2016). Lead in sediment has been detected at levels exceeding two times the ecological screening level of 17 mg/kg with concentrations of 37 mg/kg (ODEQ, 2009), 117 mg/kg (Weston 1997), and 83 mg/kg (ODEQ, 2011).

Table 2: Passive Soil Gas and Indoor Air/Sub-slab Data

Passive Soil Gas Results	
COMPOUNDS	Result: ng
Benzene	8652
Toluene	2,682
Ethylbenzene	8,453
p & m-Xylene	15,656
o-Xylene	6,326
Naphthalene	2,145
2-Methylnaphthalene	10,027

Results are nanograms (ng). There are no screening numbers for mass comparison. Data presented are the highest recorded results.

Indoor Air/Sub-slab		
Analyte	Result: ($\mu g/m^3$)[1]	Health-Based Screening Level ($\mu g/m^3$)[2]
Chloroform	0.93	0.12
1,4-Dichlorobenzene	1.08	0.26
Benzene	5.57	0.36
Ethylbenzene	1.44	1.1
1,3-Butadiene	11.7	0.094
Trichlorofluoromethane	43.4	--

(--): no health based screening number available.
1-Results are micrograms per cubic meter ($\mu g/m^3$). Data presented are the highest recorded results.
2-Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2017

Temporary piezometers were installed within the lead additive area and associated Tank 12 area in an attempt to collect shallow water encountered when installing soil borings within the lead additive area. The shallow water is present in an area underlain by clay, it's quantity appears to be directly related to rainfall events, and the piezometers were slow to recharge or did not recharge at all. Only three piezometers yielded enough water for a sample, albeit not enough to satisfy the entire volume required by the laboratory. High concentrations of contaminants were detected in samples (Table 1), including total and dissolved lead as high as 752 micrograms per liter (µg/l), 2-methylphenol as high as $1.5x10^6$ µg/l, phenol as high as 270,000 u/l, 2,4 dimethylphenol as high as $1.3x10^6$ µg/l, and benzene as high as 2400 µg/l (LMS, 2016).

Migration and Exposure Pathways

Previous and current site investigations document releases of hazardous substances to indoor air, sediment, and soil. These migration pathways are a major concern because of the potential for direct exposure for human and ecological receptors, the proximity to residential homes, and the proximity to surface water bodies. At this time, impacts to ground water and surface water have not been fully evaluated; however, it is noted that shallow water samples had concentrations of contaminants and there is evidence of water migration through the banks of Sand Creek.

Tank waste is present in numerous areas across the site either at the surface or just below the surface. During the warm summer months, the liquid wastes migrate to the surface and spread

across the soil. The heat softens the tank waste facilitating migration. In addition, heavier objects (e.g., human, cow, deer, vehicle) that travel across these sources will sink into or push the tank waste to the surface. This has been observed during site investigation activities.

Runoff from the Wilcox site flows south and southwest into Sand Creek. Sand Creek flows southeast until it merges with Little Deep Fork Creek approximately 3.5 miles from the site (EPA, 2013). According to the State of Oklahoma, Sand Creek is considered a Habitat Limited Aquatic Community, and a Secondary Body Contact Beneficial Use, as well as having agricultural and aesthetic beneficial uses. Little Deep Fork Creek downstream from Sand Creek is considered a Warm Water Aquatic Community, and a Primary Body Contact Beneficial Use, as well as having agricultural and aesthetic beneficial uses. Also, within 15-miles of the site is the Heyburn Wildlife Management Area. This area and its associated watershed are considered to be sensitive areas by the Oklahoma Department of Wildlife Conservation (ODEQ, 2011).

Wetland areas are present onsite (EA, 2017), in the downstream segments of Sand Creek and further downgradient in Little Deep Fork Creek. There is no documentation or evidence to indicate that the tank areas had or maintained a run-on control system or runoff management system (including treatment of diked liquids), liner, or an engineered cover (EPA, 2013). These conditions remain a concern as the presence of tank waste and metals contamination has been verified along Sand Creek (Figure 5). The tank

Table 3: Comparison of site data to Health Based Screening Levels[1]

	Contaminant	**Data Results (mg/kg)**	**Health-Based Screening Level (mg/kg)**	**Health-Based Screening Level Basis**
Lead Additive Area	Lead	105,000	800	Protection of blood lead levels in workers
Tank Waste	Benzo(a)anthracene	12	1.1	Residential Cancer Screening Number at 10-6 Risk
	Benzo(a)pyrene	12	0.11	Residential Cancer Screening Number at 10-6 Risk
	Benzo(b)fluoranthene	20	1.1	Residential Cancer Screening Number at 10-6 Risk
	Indeno(1,2,3-cd)pyrene	4.4	1.1	Residential Cancer Screening Number at 10-6 Risk
	2-methylnaphthalene	1400	240	Residential Non-cancer Screening Number at Hazard Index=1
	Naphthalene	14	3.8	Residential Cancer Screening Number at 10-6 Risk
	Shallow Water (result of migration from source material)			
		Data Results (µg/l)	**Health-Based Screening number (µg/l)**	**Health-Based Screening Number Basis**
	2-methylphenol	1.5×10^6	930	Residential Non-Cancer Screening Number at Hazard Index=1 for Drinking Water
	Phenol	270,000	5800	Residential Non-Cancer Screening Number at Hazard Index=1 for Drinking Water
	2,4 dimethylphenol	1.3×10^6	360	Residential Non-Cancer Screening Number at Hazard Index=1 for Drinking Water
	Lead	>752	15	Action Level for Drinking Water
	Benzene	2400	5	Maximum Contaminant Level for Drinking Water

1- Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2017
mg/kg=milligram per kilogram µg/l=micrograms per liter Data presented are the highest recorded results.

waste areas at the site have limited or no containment features for floods and many of the original berms have either been leveled or cut to allow drainage from the sources to run off (Weston 1997 and field observations, unpublished, 2016-2018). In addition, the lead additive area has no containment features and runoff drains directly to a ditch that flows to Sand Creek.

A total of 9 source areas are identified for source control action under this proposal: Two (2) are within 225 - 300 feet of a residence, 5 are within 225 feet of either Sand Creek or the East Tributary that drains to Sand Creek, 1 is located on a residential property, and the last is located within a cow pasture. Fencing currently restricts and limits direct exposure for the short-term.

SCOPE AND ROLE OF RESPONSE ACTION

This action is an early action limited in scope to address tank waste and an interim action limited in scope to address the lead additive area. This action is considered an early final action for the tank waste due to the complete removal of the tank waste source material. This action is considered an interim action for lead because only source material in the lead additive area is being addressed. Final site-wide remediation with respect to lead will be addressed in the final remedy selected for the site. Because this action does not constitute the final remedy for the Site, subsequent actions to address fully the threats posed by conditions at this Site will be documented in a final site decision document. Addressing these sources early in the process is consistent with current regulations and guidance and will not preclude or be inconsistent with the implementation of a final site remedy. The EPA will continue to investigate the nature and extent of contamination during the site-wide RI.

The tank waste and lead additive area are source materials; however, only the lead source is identified as principal threat waste (Tables 1 and 3). This proposed source control action addresses these sources through removal, treatment of the lead additive area, and offsite disposal.

Addressing tank waste and the lead additive area early in the remedial process eliminates sources that are a continual source of direct exposure to humans living on or near these areas, eliminates immediate human health and ecological risk, eliminates a continual source of migration to wetland and surface water body environments, and reduces limitations on reuse and redevelopment, specifically the use of the properties as residential. In addition, removal of these source materials eliminates the migration of contaminants to ground water.

What is a "Principal Threat"?

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in ground water may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

The EPA expects to use treatment to address the principal threats posed by a site, wherever practicable, and engineering controls for waste that poses a relatively low long-term threat or where treatment is impracticable (40 C.F.R. § 300.430(a)(l)(iii)(A)). The tank waste is not a listed hazardous waste nor is it identified as a characteristic hazardous waste under 40 CFR § 261 Subpart C based on current site data. Treatment prior to disposal in an appropriately permitted and regulated offsite Resource Conservation and Recovery Act (RCRA) landfill is not necessary. Treatment of tank waste will

increase cost, increase volume, and increase schedule and time to meet cleanup levels. The increase in cost and schedule far exceeds risk reduction benefit (EPA, 2018).

The lead additive area is not a listed hazardous waste; however, it is identified as a characteristic waste under 40 CFR § 261.24 based on current site data. Toxicity Characteristic Leaching Procedure results show that lead leaches from the lead additive area source material above criteria that would allow for land disposal. Because of this, the lead additive area source material will need to be treated such that the lead does not leach above land disposal criteria. The use of treatment will meet the statutory preference for treatment.

The volume estimates for each source area are provided in Table 4. Because these are distinct source areas, each area can be addressed independently; therefore, if all areas are not addressed under one action, then these areas can be prioritized based on potential exposure risk and addressed as funding is available. Source areas would be addressed in accordance with the selected source control action remedial alternative, albeit on different schedules. For the purposes of this proposed action, it is assumed that all areas will be addressed during one remedial action.

SITE RISKS

The site includes residential, agricultural, and business property that drains directly to two perennial waterbodies. The current residential land use and surface water uses are not expected to change. In addition, the owner of the agricultural land indicated that this property may be used as residential property in the future. Tank waste has been verified within 300 feet of two residential properties, within 225 feet of the perennial waterbodies, and within one cow pasture.

The final Human Health Risk Assessment which will define the full extent of human health risks at the site has not been completed. Based on data collected during RI activities, concentrations of contaminants associated with the tank waste and the lead additive area exceed residential cancer and noncancer screening levels by orders of magnitude (Table 3). In addition, RI data show that the indoor air and direct exposure pathways are complete for the tank waste while the direct exposure pathway is complete for the lead additive area. If no action is taken, these sources will continue to pose a long-term health threat to human and ecological receptors.

Table 4: Areas of Remediation – Estimated Volume

Area Name	Volume Estimated (cubic yards)
Lorraine Waste	953
Lead Additive Area	2,269
Tank 1	3,323
Tank 3	3,608
NTF-1	818
Tank 10	9,902
Tank 11	431
Tank 12	4,788
Pit 1	4,270
Total	30,362 (5 Acres)

NTF=north tank farm

The final Ecological Risk Assessment which will define the full extent of ecological risks at the site has not been completed. Based on data collected during RI activities, contaminants from the tank waste and the lead additive area have migrated to soil and sediment. These sources are found on or near the ground surface. The source areas have limited or no containment features for floods and many of the original berms have either been leveled or cut to allow drainage from the sources to surrounding areas. No containment features are present around the lead additive area allowing runoff to drain directly to a ditch that discharges to Sand Creek. If no action is taken, these sources, present at or near the ground surface, will continue to pose a long-term threat of release of hazardous substance to the environment, specifically the perennial water bodies.

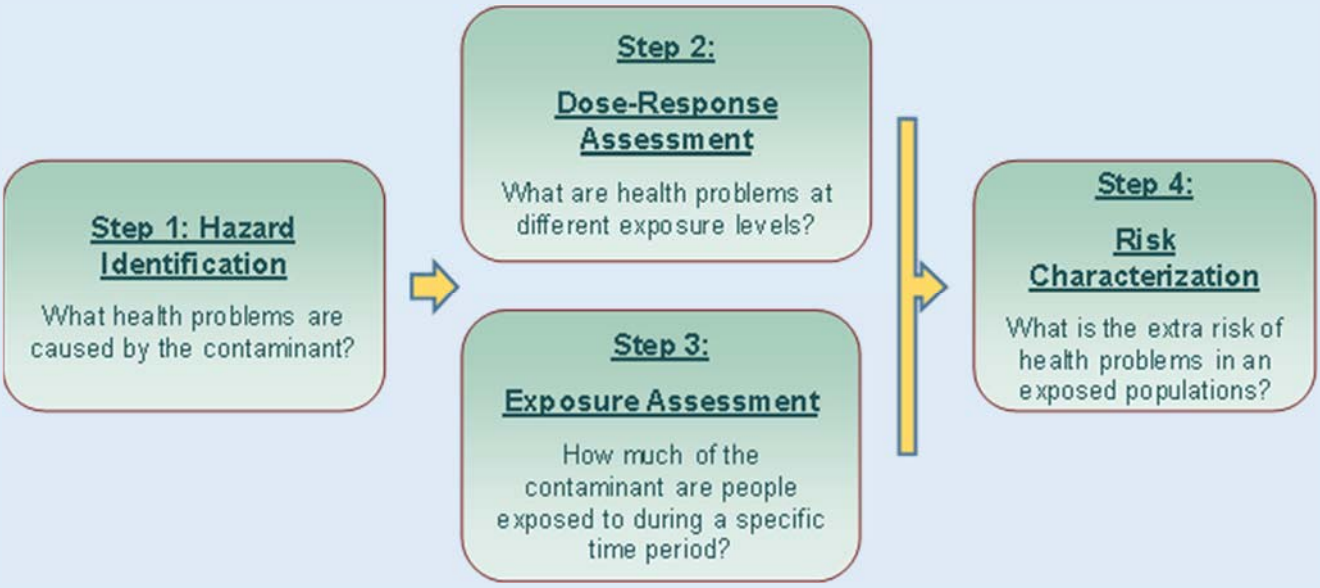
What is Risk and How is it Calculated?

In Step 1, the concentrations of contaminants found at a site are examined as well as past scientific studies that demonstrate the effects these contaminants may have on people (or animals, when human studies are unavailable). Comparisons between site-specific concentrations and concentrations reported in past studies help determine which contaminants are most likely to pose the greatest threat to human health.

In Step 2, "concentration-response" (or dose-response) relationships of the contaminants and different potential health effects are examined. These relationships describe how the likelihood and severity of adverse health effects (the responses) are related to the amount and condition of exposure to a contaminant (the dose provided). Typically, as concentration or dose of a contaminant increases, so does the response. This step relies primarily on examination of past studies, however, site-specific studies are sometimes performed. Upon considering all available studies, the response that leads to an adverse effect, that occurs at the lowest dose is selected as the critical effect for risk assessment. The underlying assumption is that if the critical effect is prevented from occurring, then no other effects of concern will occur.

In Step 3, the different ways that people might be exposed to the contaminants identified in Step 1, the concentrations that people might be exposed to, and the potential frequency and duration of exposure are considered. This step may also include estimating future exposures for a contaminant that has not yet been released. An exposure assessment includes some discussion of the size, nature, and types of human populations potentially exposed to contaminants. Exposure can be measured directly, but more commonly is estimated indirectly through consideration of measured concentrations in the environment, consideration of models of chemical transport and fate in the environment, and estimates of human intake over time. Using this information, a "reasonable maximum exposure" (RME) scenario is calculated, which portrays the highest level of human exposure that could reasonably be expected to occur.

In Step 4, the information from previous Steps is combined, evaluated and summarized to assess potential health risks. In this Step, it is determined if site risks are great enough to cause health problems for people at or near the site. Two types of risk, cancer risk and non-cancer risk (or non-cancer hazard), are considered. The likelihood of any kind of cancer resulting from a site is generally expressed as an upper-bound probability; for example, a "1 in 10,000 chance". In other words, for every 10,000 people that could be exposed, one extra cancer may occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected to from all other causes. For non-cancer risks, a hazard index (HI) is calculated. The key concept here is that a "threshold level" exists below which non-cancer health effects are no longer predicted. The potential risks from the individual chemicals are then added up. If cancer or non-cancer risks are found to be unacceptable, the contributing chemicals are then identified as contaminants of concern. For cumulative cancer risks, the EPA has determined increased cancer risk in excess of 10-4 (1 in 10,000) is unacceptable. The risk range of 10-6 to 10-4 may be evaluated to determine whether risk is acceptable for future site conditions (such as land use and potential users). For cumulative non-cancer risks, the EPA has established an HI of less than or equal to 1.0 as acceptable.



Neither a formal RI/FS report nor a human health or ecological risk assessment have been completed. Excess risk exposures to tank waste and lead additive area source materials are not calculated. The contaminants of potential concern are selected using the November 2017 Regional Screening Levels (SLs; Table 5) for residential and industrial exposures to soil (EPA, 2017a). The SLs for residential exposures to soil include exposures by incidental ingestion of soil, dermal contact of soil, and inhalation of fugitive dust generated from soil. The SLs correspond to an excess carcinogenic risk of 1 E-06 or a non-carcinogenic hazard index of 1. Contaminants are considered potential contributors to risk if either the carcinogenic SL or the hazard index SL are exceeded.

Lead and benzo(a)pyrene are selected as the contaminants of potential concern. Lead is present throughout the lead additive area and exceeds the soil health-based target level. Benzo(a)pyrene is a polycyclic aromatic hydrocarbon (PAH) present in the tank waste and is carcinogenic to humans based on strong and consistent evidence in animals and humans (EPA, 2017b). Benzo(a)pyrene is selected as the representative contaminant for the PAH group because of its low soil health-based target level, it is most commonly detected in the tank waste, and it is co-located with the other PAHs.

Table 5: Source Material Health-Based Target Levels[1]

Contaminant	Data Results (mg/kg)	Health-Based Target Level (mg/kg)	Health-Based Target Level Basis
Lead	105,000	800	Protection of blood lead levels in workers
Benzo(a)pyrene	12	0.11	Residential Cancer Screening Number at 10-6 Risk

1- Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2017
mg/kg = milligram per kilogram

Basis for Action

This action is an early action limited in scope to address tank waste and an interim action limited in scope to address the lead additive area. The source control action selected in this proposed plan is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment which may present an imminent and substantial endangerment to public health or welfare or the environment.

What are the Contaminants of Concern?

Lead: Lead is a naturally occurring metal. Its most important use is in the production of lead batteries, but is also used in ammunition, sheet lead, solder, brass pipes, and ceramic glazes. Most of the lead released to the environment was the result of car exhaust from the burning of leaded gasoline which has since been phased out. Lead-based paint is also a source of environmental lead. It has been phased out of production; however, many older homes remain covered with lead-based paint that may be weathering and chipping. Children are most sensitive and vulnerable to the effects of lead. Exposure to large quantities of lead can result in blood anemia, kidney damage, colic, muscle weakness, brain damage, slowed mental and physical growth, prematurely born babies, and slow mental development.

Benzo(a)pyrene: Benzo(a)pyrene is present in the tank waste, and is one of a group of over 100 different chemicals known as Polycyclic Aromatic Hydrocarbons (PAHs). PAHs are formed during the incomplete burning of coal, oil, and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are also found in coal tar, crude oil, creosote, and roofing tar. Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure; however, these effects have not been seen in people. PAHs are probable human carcinogens.

By taking this source control action, significant human health and ecological risk reduction will be accomplished through removal of primary sources located throughout the site at or near the soil surface, specifically residential properties. In addition, further migration and environmental degradation of adjacent waterways (e.g., Sand Creek and the East Tributary), wetlands, and stream riparian areas will be eliminated.

REMEDIAL ACTION OBJECTIVES

Taking appropriate source control actions at sites during the investigation stage of the process is consistent with the 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.

The source control action proposal 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; and,
- be consistent with the final site remedy.

The remedial action objectives for the source materials are listed below.

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

Source Control Remedial Action Objectives (RAOs)
RAO No. 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 mg/kg benzo(a)pyrene and the removal of the lead additive area to reach a target health-based concentration of 800 mg/kg lead.
RAO No. 2 - Prevent further migration to soils, 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 lead.
RAO No. 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.

Tank waste and the lead additive area will be addressed to target health-based concentrations (Table 5). Numeric cleanup levels for soil are not appropriate for this source control action because the scope is limited to source removal. Final soil cleanup levels will be established during the risk assessment and final remedy selection process. After excavation, soil will be sampled to verify concentrations remaining. Soil remaining after this source control action will be evaluated in accordance with the remedial action objectives

and remediation goals identified for soil and established as part of the final selected remedy.

DESCRIPTION OF ALTERNATIVES

The NCP acknowledges that the final remedial investigation (RI), feasibility study (FS), and risk assessments may not be complete and encourages action prior to and concurrent with these processes. In such cases, data from the ongoing RI is used to support the source control action and evaluate an appropriate set of alternatives for the limited source control action.

Because this is a source control remedial response action, a complete feasibility study (FS) was not performed; however, EPA performed and documented the alternatives screening process used to identify cleanup alternatives evaluated in this source control action proposed plan (EPA, 2018). The following paragraphs describe the retained alternatives.

Common Elements of all Alternatives except for Alternative 1 - No Action

- The tank waste and the lead additive area will be addressed as source materials to target health-based concentrations (Table 5). After excavation, soil will be sampled to verify concentrations remaining. Soil remaining after this source control action will be evaluated in accordance with the remedial action objectives and remediation goals identified for soil and established as part of the final selected remedy.
- For cost and alternative evaluation purposes, operations and maintenance (O&M) activities are estimated for a 30-year period. The 30-year time frame is chosen as a comparison timeframe only. In addition, a discount factor of 7% is used to calculate present worth costs.
- Currently, no listed hazardous waste has been identified.
- Based on current data (40 CFR 261 Subpart C), the tank waste is not identified as a characteristic hazardous waste. Treatment prior to disposal in a permitted landfill is not required, and land disposal restrictions (LDRs; 40 CFR 268) do not apply.
- Based on current toxicity characteristic leaching procedure (TCLP) data (40 CFR § 261.24), the lead additive area is identified as a characteristic hazardous waste. Treatment prior to disposal in a permitted landfill is required, and land disposal restrictions (LDRs; 40 CFR 268.34) apply.

Summary of Source Control Remedial Alternatives	
Alternative Designation	**Description**
1	No action
2	Excavation, Treatment, and Offsite Disposal
3	Excavation, Treatment, Consolidation, and Capping

Alternative 1: No Action
Estimated Capital Cost: $0
Estimated O&M Cost: $0
Estimated Present Worth cost: $0
Estimated Construction Timeframe: None

Regulations governing the Superfund program generally require that the "no action" alternative be evaluated to establish a baseline for comparison. Under this alternative, the ODEQ and EPA would take no action at the Site to prevent exposure to or possible migration of contamination. Contaminants and hazardous substances will continue to be or threaten to be released into the environment. Neither RAOs nor applicable or relevant and appropriate requirements (ARARs) will be met.

Alternative 2: Excavation, Treatment, and Offsite Disposal
Estimated Capital Cost: $4,084,124
Estimated O&M Cost: $51,170
Estimated Present Worth cost: $4,135,294
Estimated Construction Timeframe: 4 months
Estimated Time to Achieve RAOs: 4 months

Approximately 30,362 cubic yards (y^3) of source material will be excavated and transported to an offsite permitted non-hazardous disposal facility. The estimated volume of tank waste is 28,093 y^3 while the estimated volume in the lead additive area is 2269 y^3. These source materials are not listed hazardous waste. The tank waste is not a characteristic waste based on site data; however, the lead additive area is identified as a characteristic waste based on TCLP results. The TCLP data indicate that lead leaches above disposal criteria and in order to meet land disposal restrictions (40 CFR 268.34) it must be treated prior to disposal.

Site preparation activities will include mobilization to the site of personnel, equipment, and subcontractors. Areas requiring excavation will be flagged and cleared of surface vegetation. Excavation will continue vertically and horizontally based on field screening methods and visual observations. If buried pipe is encountered during excavation, the pipe will be cut off at the extent of excavation and sealed. During excavation activities, dust control measures, such as water spray, will be used to mitigate fugitive dust. 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. After removal of source materials, the excavated area will be documented and sampled to determine area, depth, cubic yards removed, and concentrations of soil at base and sides of excavation. The excavated areas will be backfilled with clean soil from an offsite location and re-vegetated. All excavation areas will be graded for drainage and appropriate erosion controls implemented. It is expected that excavated areas meeting the source material target health-based concentrations will not require further action while those that do not meet the source material target health-based concentration may require further action based on the final soil alternative RAOs and remediation goals developed under the final decision document for the site.

The lead additive area source material will be excavated to a depth of no more than 2 feet in depth. This source material will be treated through Solidification/Stabilization. Solidification/stabilization is the process where contaminants are physically and/or chemically bound to produce a final solidified/stabilized mass that restricts the leachability and mobility of the contaminant. There are many treatment and binding additives that can be used to address the lead additive area source material. Common agents include fly ash, lime, polymers, and cement as well as commercially available products. The appropriate mixture will be determined through small treatment studies to determine the most effective and efficient mixture at a reasonable cost. Once treated, samples will be sent to the laboratory for analysis to ensure that the mixture does not leach lead prior to disposal.

Excavated material will be transported to the appropriate offsite permitted RCRA disposal facility by truck. All trucks will be decontaminated prior to leaving the site, will be tarped to contain source materials within the bed of the truck, and will only transport material via the pre-approved transportation route.

This alternative will comply with the Endangered Species Act and will meet substantive requirements of the National Emission Standards for Hazardous Air Pollutants (40 CFR § § 50.6 and 50.7) and the Oklahoma Air Pollution Control Act (OAC 252:100) relevant to particulate matter and air pollutants. This alternative requires transportation of contamination and wastes to an offsite disposal facility and will be conducted pursuant to Federal (Department of Transportation Requirements Governing the Transportation of Hazardous Materials 49 CFR 171 through 180; Standards Applicable to Generators of Hazardous Waste 40 CFR 262; Standards Applicable to Transporters of Hazardous Waste 40 CFR 263) and State (Oklahoma Hazardous Waste Management Act

27A O.S. § 2-7-101 *et seq,* Hazardous Waste Management rules OAC 252:205 and Solid Waste Management rules OAC 252:515) transportation and disposal regulations. Facilities accepting these wastes will be certified to accept the respective wastes (Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities 40 CFR 264 Subparts B and E). Land disposal restrictions (LDRs, 40 CFR 268.34) apply to the disposal of lead additive area source material.

Excavation, treatment, and removal will achieve RAOs by preventing exposure, environmental degradation, and migration due to the removal and offsite disposal of source material. Once source material is removed, these areas will be subject to the final soil alternative RAOs and remediation goals developed under the final decision document for the site. This alternative does not require implementation of long-term O&M or monitoring. However, since the final risk assessment for lead has not been completed, the lead concentrations remaining after the lead interim action may not support residential use. Until a final risk assessment and final decision document are completed, the property will remain fenced and will not be used for residential purposes. In addition, because this is not the final remedy for the site and contaminants will remain onsite until the final remedy is implemented, five-year reviews will be required. This alternative will be compatible with the expected future uses.

<u>Alternative 3: Excavation, Treatment, Consolidation, and Capping</u>
Estimated Capital Cost: $3,548,459
Estimated O&M Cost: $1,084,810
Estimated Present Worth cost: $4,633,269
Estimated Construction Timeframe: 6 months
Estimated Time to Achieve RAOs: 6 months

Approximately 30,362 cubic yards (y^3) of source material will be excavated, consolidated, and capped onsite. The estimated volume of tank waste is 28,093 y^3 while the estimated volume in the lead additive area is 2269 y^3. These source materials are not listed hazardous waste. The tank waste is not a characteristic waste based on site data; however, the lead additive area is identified as a characteristic waste based on TCLP results. The TCLP data indicate that lead leaches above disposal criteria and in order to meet land disposal restrictions (40 CFR 268.34) it must be treated prior to disposal.

Site preparation activities will include mobilization to the site of personnel, equipment, and subcontractors. Areas requiring excavation will be flagged and cleared of surface vegetation. Excavation will continue vertically and horizontally based on field screening methods and visual observations. During excavation activities, dust control measures, such as water spray, will be used to mitigate fugitive dust. 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. After removal of source materials, the excavated area will be documented and sampled to determine area, depth, cubic yards removed, and concentrations of soil at base and sides of excavation. The excavated areas will be backfilled with clean soil from an offsite location and re-vegetated. All excavation areas will be graded for drainage and appropriate erosion controls implemented. It is expected that excavated areas meeting the source material target health-based concentrations will not require further action while those that do not meet the source material target health-based concentration may require further action based on the final soil alternative RAOs and remediation goals developed under the final decision document for the site.

The lead additive area source material will be excavated to a depth of no more than 2 feet in depth. These materials will be treated through Solidification/Stabilization. Solidification/stabilization is the process where contaminants are physically and/or chemically bound to produce a final solidified/stabilized mass that restricts the leachability and mobility

of the contaminant. There are many treatment and binding additives that can be used to address the lead additive area source material. Common agents include fly ash, lime, polymers, and cement as well as commercially available products. The appropriate mixture will be determined through small treatment studies to determine the most effective and efficient mixture at a reasonable cost. Once treated, samples will be sent to the laboratory for analysis to ensure that the mixture does not leach lead prior to disposal.

All excavated tank source material and treated lead additive area source material will be consolidated into an onsite repository and capped with a geomembrane and soil cover. The most appropriate location for the consolidated source materials will be determined during the design. Consolidation will minimize the extent of the capped area allowing for greater reuse of the site, reduce the number of source area locations across the site, and reduce the source areas requiring O&M activities and Institutional Controls (ICs).

Signs will be posted at the property boundary to provide notification of the presence of contamination and to warn against intrusive activities. A fence will be installed around the onsite repository to separate it from the highway, railroad, and adjacent properties. ICs will be required to aid in the management of the contamination capped onsite. ICs will include a deed notice to notify current and potential future deed holders of the presence of contaminants and of the capped area to prevent intrusive activities (i.e., digging) at the property and to ensure protectiveness of the remedy. The deed notices will identify the reason for the notice, the affected property, the remedy, engineering controls, and land use restrictions. The ODEQ will request that the landowner grant an easement for continued remedial response. The deed notice and easement will be filed by the ODEQ. Site inspections will occur on an annual basis to verify that the fencing, soil cap and warning signs remain in place and to replace them, as necessary. ICs will be reviewed and monitored to verify that they remain in place, continue to be effective, are protective, and are enforced. In addition, Five-year reviews will be required to monitor the effectiveness of the remedy.

This alternative will comply with the Endangered Species Act and will meet substantive requirements of the National Emission Standards for Hazardous Air Pollutants (40 CFR § § 50.6 and 50.7) and the Oklahoma Air Pollution Control Act (OAC 252:100) relevant to particulate matter and air pollutants. This alternative requires containment and will have to be conducted pursuant to Federal (Closure and Post Closure Part 264 Subpart G) and State (Oklahoma Hazardous Waste Management Act 27A O.S. § 2-7-101 *et seq,* Solid Waste Management rules OAC 252:515) disposal regulations. Land disposal restrictions (LDRs, 40 CFR 268.34) apply to disposal of the lead additive area source material.

This alternative will achieve all RAOs by preventing exposure through engineering controls, institutional controls, and monitoring for offsite migration.

COMPARISON OF ALTERNATIVES

The EPA uses nine NCP criteria to evaluate alternatives for cleanup. These nine criteria are categorized into three groups: threshold, balancing, and modifying. The threshold criteria must be met in order for an alternative to be eligible for selection. The threshold criteria are overall protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). The balancing criteria are used to weigh major tradeoffs among alternatives. The five balancing criteria are long-term effectiveness and permanence; reduction of toxicity, mobility or volume through treatment; short-term effectiveness; implementability; and cost. The modifying criteria are state acceptance and community acceptance. The following briefly describes the evaluation criteria.

Evaluation Criteria for Superfund Remedial Alternatives
Overall Protectiveness of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with ARARs evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
State/Support Agency Acceptance considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.
Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

In the following analysis, the alternatives are evaluated in relation to each other with regard to the nine criteria noting the relative advantages and disadvantages of each alternative.

1. Overall Protection of Human Health and the Environment

All of the alternatives, except the “no action” alternative, would provide adequate protection of human health and the environment by eliminating, reducing, or controlling risk through excavation, treatment, removal, containment, engineering controls, and/or institutional controls.

Because the “no action” alternative is not protective of human health and the environment, it is eliminated from consideration under the remaining eight criteria.

2. Compliance with ARARS

As noted under the descriptions of the alternatives, each alternative will meet their respective Federal and State Applicable or Relevant and Appropriate Requirements (ARARs).

3. Long-term Effectiveness and Permanence

Alternative 2 (Excavation, Treatment, and Offsite Disposal) will be most effective and permanent in the long-term as the potential for exposure or offsite migration is completely eliminated through removal of contamination from the Site. This alternative does not require implementation of long-term O&M or monitoring. However, since the final risk assessment for lead has not been completed, the lead concentrations remaining after the lead interim action may not support residential use. Until a final risk assessment and final decision document are completed, the property will remain fenced and will not be used for residential purposes. Five-year reviews will be required to monitor the effectiveness of the remedy until a final site-wide remedy is selected. This alternative will be compatible with the expected future uses (residential, industrial, agricultural, etc).

Alternative 3 (Excavation, Treatment, Consolidation, and Capping) will be effective and permanent in the long-term as long as O&M

is performed and institutional and engineering controls are enforced. This remedy will be less effective in the long-term than Alternative 2 (Excavation, Treatment, and Offsite Disposal) because consolidated source material will be left onsite. This remedy will eliminate the potential for exposure and migration through consolidation, treatment, and construction of a barrier provided long-term monitoring, O&M, and enforcement of institutional and engineering controls to assure protectiveness are performed.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

Alternative 2 (Excavation, Treatment, and Offsite Disposal) removes source materials from the Site. Toxicity, mobility, and volume with respect to onsite conditions is reduced for the tank waste, albeit not through treatment. Reduction in toxicity and mobility for the lead additive area is achieved through treatment, however, treatment will increase volume requiring disposal.

Alternative 3 (Excavation, Treatment, Consolidation, and Capping) removes source materials from multiple site locations and consolidates it at one location. Toxicity, mobility, and volume with respect to onsite conditions is reduced for the tank waste, albeit not through treatment. Reduction in toxicity and mobility for the lead additive area is achieved through treatment, however, treatment will increase volume. Toxicity and mobility are managed through engineering controls where source material is capped onsite while volume increases due to treatment.

5. Short-term Effectiveness

Both alternatives are effective in the short-term but vary in the degree of time to reach RAOs and control potential short-term exposure. Alternative 2 (Excavation, Treatment, and Offsite Disposal) will meet RAOs in approximately 4 months while Alternative 3 (Excavation, Treatment, Consolidation, and Capping) will meet RAOs in approximately 6 months.

Potential risks to the onsite workers and the community through excavation, treatment, and removal of source material and potential dust emissions will be encountered with both alternatives. Alternative 2 (Excavation, Treatment, and Offsite Disposal) will pose the least amount of potential risk to onsite workers and community because contaminated source material is removed from the site in a short amount of time and with reduced contamination handling. There is additional potential risk to onsite workers preforming treatment activities, while there is some additional potential risk due to offsite hauling and disposal. This alternative will be compatible with the expected future uses (residential, industrial, agricultural, etc).

Alternative 3 (Excavation, Treatment, Consolidation, and Capping) has an increased potential risk to onsite workers and the community as compared to Alternative 2 (Excavation, Treatment, and Offsite Disposal) due to a slightly longer remediation timeframe. In addition, Alternative 3 presents a higher potential risk to onsite workers, the community, and the environment because of consolidation activities, an extended time period to reach RAOs, contamination being left onsite, and the complexity of enforcing institutional and engineering controls. This option restricts and limits property reuse and is not currently compatible with the expected future use of residential.

6. Implementability

Alternative 2 (Excavation, Treatment, and Offsite Disposal) is a common easily implemented practice where equipment and services are readily and commercially available. This remedy does involve additional material handling and treatment and is a common construction practice of which most companies are experienced. This remedy is not expected to require specialized equipment, and is a straight-forward implementation process. This alternative does not require implementation of long-term O&M or monitoring. However, since the final risk assessment for lead has not been completed, the lead concentrations remaining after the lead

interim action may not support residential use. Until a final risk assessment and final decision document are completed, the property will remain fenced and will not be used for residential purposes. Five-year reviews will be required to monitor the effectiveness of the remedy until a final site-wide remedy is selected. This alternative will be compatible with the expected future uses (residential, industrial, agricultural, etc).

Although the expectation is that all areas will be addressed at the same time, implementation of this alternative is not contingent on the entire estimated alternative cost as each area can be addressed independently. Because these are distinct source areas, the areas can be prioritized based on potential exposure risk and addressed as funding is available. Source areas would be addressed in accordance with the selected source control action remedial alternative, albeit on different schedules.

Alternative 3 (Excavation, Treatment, Consolidation, and Capping) is a common cleanup method that requires some expertise in the construction of an onsite repository and the installation of a geomembrane/soil cap. This remedy will include additional materials handling for treatment and specialized equipment to properly install the geomembrane. This remedy requires coordination with the property owner to identify an appropriate location for the repository. It also requires coordination with ongoing investigation activities since the site-wide RI investigation has not been completed. In addition, there are uncertainties associated with the location of the repository, the quantity of source material needing to be consolidated, the potential for identification of additional source material that may need to managed under this remedy, and the risk of having to close and reopen the repository to accommodate the final cleanup option. This remedy will require implementation of long-term O&M and monitoring, establishment and enforcement of institutional and engineering controls, and completion of five-year reviews. This option restricts and limits property reuse and is not currently compatible with the expected future uses (residential, industrial, agricultural, etc). Implementation of this alternative is contingent on receiving the entire estimated alternative cost as all areas will need to excavated within the same timeframe as the construction of the onsite repository to be effective, efficient, and cost beneficial.

7. Cost

The estimated cost for implementation of Alternative 2 (Excavation, Treatment, and Offsite Disposal) is $4,135,294. The estimated cost for implementation of Alternative 3 (Excavation, Treatment, Consolidation, and Capping) is $4,633,269.

It should be noted the estimate for Alternative 2 (Excavation, Treatment, and Offsite Disposal) assumes total remedy funding. If Alternative 2 (Excavation, Treatment, and Offsite Disposal) is implemented in phases, then the cost will increase due to multiple mobilization/demobilization activities, varying disposal rates for material quantities, varying backfill rates for materials, and multiple oversight and reporting activities.

8. State/Support Agency Acceptance

The State of Oklahoma supports the Preferred Alternative.

9. Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the responsiveness summary in the Source Control Record of Decision.

SUMMARY OF THE PREFERRED REMEDIAL ALTERNATIVE

The Preferred Alternative for the Source Control action at the Wilcox Oil Company Superfund Site is Excavation, Treatment, and Offsite Disposal. Tank waste and the lead additive area source material will be excavated, the lead additive area will be treated, and all source material will be transported to an offsite permitted RCRA disposal facility.

By preventing exposure, contaminant migration, and environmental degradation through removal, treatment, and offsite disposal, this alternative meets the RAOs; reduces toxicity, mobility, and volume; is permanent; and is effective in the long-term. Implementation requires standard construction equipment, utilizes commercially and readily available services, satisfies the RAOs in the least amount of time, and does not require specialized equipment. The source control action would not require long-term monitoring, site inspections, or O&M, due to the removal of contamination from the site. However, since the final risk assessment for lead has not been completed, the lead concentrations remaining after the lead interim action may not support residential use. Until a final risk assessment and final decision document are completed, the property will remain fenced and will not be used for residential purposes. This is not the final remedy for the site and contaminants will remain onsite until the final remedy is implemented; therefore, five-year reviews will be required. This alternative is compatible with current (residential, industrial, agricultural, etc) and expected future uses (residential, industrial, agricultural, etc).

Based on the information currently available, the Preferred Alternatives meets the threshold criteria and provides the best balance of tradeoffs among other alternatives with respect to the balancing and modifying criteria. The Agency expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA Section 121(b): be protective of human health and the environment, comply with ARARs, be cost effective, and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. The Preferred Alternative can change in response to public comment or new information.

This Source Control action is protective of human health and the environment in the long-term and is intended to provide significant risk reduction until a final site-side Record of Decision is signed. Because this is a source control action, review of this site and remedy will be ongoing as EPA continues and completes the remedial investigation, the feasibility study, the site risk assessments, and the final remedy for the site.

COMMUNITY PARTICIPATION

The EPA and ODEQ provide information regarding the cleanup of the Wilcox Oil Company Superfund Site to the public through site meetings, the Administrative Record file for the site, EPA and ODEQ Site-specific web pages, and fact sheets. The ODEQ and EPA encourage the public to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted at the Site.

The dates for the public comment period, the date, location, and time of the public meeting, and the locations of the Administrative Record files are provided on the front page of this Proposed Plan.

Community Participation

For further information on the Wilcox Oil Company Site, please contact:

Katrina Higgins-Coltrain, EPA Remedial Project Manager, (214) 665-8143, coltrain.katrina@epa.gov

Todd Downham, ODEQ Project Manager, (405) 702-5136, todd.downham@deq.ok.gov

Jason McKinney, EPA Community Involvement Coordinator, (214) 665-8132, mckinney.jason@epa.gov

EPA Toll free phone number 1-800-533-3508

Media inquiries should be directed to
Erin Hatfield, ODEQ, 405-702-7119 or EPA Press Office, 214-665-2200

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USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Source Control Proposed Plan for the Wilcox Oil Company Superfund Site is important to the ODEQ and EPA. Comments provided by the public are valuable in helping the ODEQ and EPA select a final cleanup remedy for the Site.

You may use the space below to write your comments. Comments must be postmarked by July 31, 2018.

If you have any questions about the comment period, please contact Todd Downham at (405) 702-5136, or Katrina Higgins-Coltrain at (214) 665-8143, or through EPA's toll-free number at 1-800- 533-3508.

Those with electronic communications capabilities may submit their comments to the ODEQ or EPA via Internet at the following e-mail addresses: todd.downham@deq.ok.gov or coltrain.katrina@epa.gov.

Name_____
Address _____
City_____
State_____ Zip _____