Superfund Program
Source Control Proposed Plan
Wilcox Oil Company Site Region 6
Bristow, Oklahoma Date, Year

EPA ANNOUNCES SOURCE CONTROL PROPOSED PLAN

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. Because this action does not constitute the final remedy for the site, subsequent actions planned to address fully the threats posed by conditions at this site will be documented in a 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 action 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 can be selected in this Plan 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.

Comment [D1]: Please include a statement about additional Proposed Plan for the final site remedy. A decision document would be issued following public comment period.

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.

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. 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 (EPA, 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).

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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.

- 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).
- Phase 2 – Mobilization 2, Field Event 5 October/November 2017: Soil, sediment and surface water sampling (Field Event Sampling, unpublished).
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Comment [D2]: 2017 Include Removal action from residential property in the East Tank Farm.

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 ~~the church~~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 (EPA, 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 (EPA, 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 (EPA, 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 two source materials, tank sludge/solids and the lead additive area solids. 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 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 1349 tons of tank waste. 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.

Comment [D3]: Please include mention of fencing around non-occupied residences and Church.

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.

Comment [D4]: TCLP data results

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 for the generation of contaminated soil gas (Beacon, 2016), while the indoor air data show some gasses, including benzene and ethylbenzene, are present above indoor air health-based screening numbers (Table 2).

Comment [D5]: Only From the church and parsonage. Please clarify.

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. 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 55,049 mg/kg (Weston 1997; ODEQ, 2012). 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

Comment [D6]: DEQ proposes excavation depth of 2 feet based on this data.

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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).

Comment [D7]: Based on this, per the EPA guidance on Principal Threat Waste, is the lead additive area considered Principal Threat Waste??

Temporary piezometers were installed within the lead additive area and associated Tank 12 area in an attempt to collect water encountered when installing soil borings within the lead additive area. Currently, the water is defined as perched water because it is present in limited quantities as thin layers interspersed with thick clay layers. The water is present in an area underlain by clay with limited areal extent, 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, 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 µg/l, 2,4 dimethylphenol as high as $1.3x10^6$ µg/l, and benzene as high as 2400 µg/l (LMS, 2016).

Comment [D8]: Oklahoma does not separate "perched water" from groundwater. Therefore, perched water must be protected.

Migration and Exposure Pathways

Comment [D9]: GW data gap. Might mention that GW has not been investigated fully.

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.

Comment [D10]: A release to groundwater is likely. Additionally, visible seeps and impacts to Sand Creek have been observed.

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 southwest ~~into Sand~~towards 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 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 2016/2017). 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

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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 OPERABLE UNIT OR 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 planned 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, they are not identified as principal threat wastes (Tables 1 and 3). This proposed source control action addresses these sources through removal and offsite disposal. Addressing tank waste and the lead additive area early in the remedial process eliminates sources that present~~are a~~ continual sources 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 removes limitations on reuse and redevelopment, specifically the use of the properties as residential.

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 and lead additive area are not listed hazardous wastes nor are they identified as a characteristic hazardous waste under 40 CFR § 261.24 based on current site data. Treatment prior to disposal in an appropriately permitted and regulated offsite RCRA landfill is not necessary; therefore, the preference for treatment will not be met. Treatment of source materials will increase cost, increase volume, increase schedule and time to meet cleanup levels, and will require offsite residual disposal. The increase in cost and schedule far exceeds risk reduction benefit when compared with other technologies (EPA, 2018).

The estimates of the volume of contaminants and the associated estimates for cleanup costs for each source area are described 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.

SITE RISKS

The site is a residential community, with some agricultural land use, 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 has not been completed, which will more fully define the extent of human health risk at the site. Based on data collected during R~~r~~emedial I~~i~~nvestigation (RI) activities,

Comment [D11]: Perhaps this should say "to be planned" otherwise those plans should be included in this document.

Comment [D12]: DEQ believes that waste material is principal threat waste based on EPA guidance on Principal Treat Waste (9380.3-06FS, November 1991)

Comment [D13]: Does not eliminate the risk to groundwater.

Comment [D14]: This could change based on March 2018 TCLP sampling results.

Comment [D15]: DEQ has concerns about the estimated costs compared to other remediation sites.

Comment [D16]: Residential properties should be prioritized.

Comment [D17]: The site is partially a residential community. The site parcels are not all occupied residential. (The church, Circle B property, Loading dock area)

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 threat to human and ecological receptors.

The final Ecological Risk Assessment has not been completed, which will more fully define the extent of ecological risk at the site. Based on data collected during RI~~remedial investigation~~ 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.

Neither a formal Remedial Investigation ~~/F~~or Feasibility Study (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 exposures to soil. 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 known to be a human carcinogen. Benzo(a)pyrene is selected as the representative contaminant for the PAH group because of its low soil health-based target level, is most commonly detected in the tank waste, and is co-located with the other PAHs.

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.

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.

Comment [D18]: Can this be included on the first page?

Comment [D19]: How is this the case if it does not address groundwater seeps into Sand Creek?

REMEDIAL ACTION OBJECTIVES

Comment [D20]: See edits below and letter comment #4

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 R~~r~~emedial A~~a~~ction O~~o~~bjectives (RAOs) 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 a target health-based concentration of 0.11 mg/kg benzo(a)pyrene in soil and the removal of the lead additive area to a target health-based concentration range of 400 mg/kg lead in soil.
- Prevent further migration of soils, sediment, and indoor air through the removal of tank waste to a target health-based concentration of 0.11 mg/kg benzo(a)pyrene in soil and the removal of the lead additive area to a target health-based concentration range of 400 mg/kg lead in soil.
- Eliminate and prevent further degradation of the surrounding environment as a result of exposure to 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.

Comment [D21]: This could be changed to 800 or higher to make it more achievable for an early action.

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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 toxicity characteristic leaching procedure (TCLP) data (40 CFR § 261.24), neither the tank waste nor the lead additive area is 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.

Comment [D22]: This could change based on recent TCLP sampling.

Alternative 1: No Action
Estimated Capital Cost: $0
Estimated Annual 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 and Offsite Disposal
Estimated Capital Cost: $5,246,568
Estimated Annual O&M Cost: $13,664
Estimated Present Worth cost: $5,260,232
Estimated Construction Timeframe: 3 months
Estimated Time to Achieve RAOs: 3 months

Approximately 34,622 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 28,089 y^3 while the estimated volume in the lead additive area is 6,533 y^3. These source materials are not listed hazardous waste and are classified as non-hazardous waste based on TCLP data.

Comment [D23]: Further communication with the landfill will be needed.

Comment [D24]: This could change based on recent TCLP sampling.

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 ~~of~~ will continue vertically and horizontally based on field screening methods such as visual observations, photoionization detector (PID), etc. ~~site data and visual observations~~. If buried pipe is encountered during

Comment [D25]: Would a XRF be used in the lead additive area for screening purposes? Please include if this is the case.

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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. All excavation areas will be graded for drainage and erosion control. Depending on the depth of excavation and the soil concentrations remaining, the excavated areas may be backfilled with clean soil and re-vegetated. It is expected that excavated areas with soils meeting the source material target health based concentrations will be backfilled with clean soil while those with soils not meeting the source material target health based concentration may need to be addressed further based on the final soil alternative RAOs and remediation goals developed under the final decision document for the site.

Comment [D26]: Excavated areas should be backfilled with clean soil from an OFFSITE source.
Leaving open excavated areas poses multiple potential safety, erosion and storm water runoff problems. See letter comment #3

Excavated material will be transported to the appropriate offsite permitted 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) do not apply to disposal of non-hazardous wastes.

Comment [D27]: Should include State ARARs. State ARARs will be provided in separate correspondence

Comment [D28]: How will it comply with the Endangered Species Act. Burying Beetle evaluation?

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Excavation 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 and monitoring or the establishment and enforcement of institutional and engineering controls. However, 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 use of residential.

Alternative 3: Excavation, Consolidation, and Capping
Estimated Capital Cost: $4,729,036
Estimated Annual O&M Cost: $799,772
Estimated Present Worth cost: $5,528,808
Estimated Construction Timeframe: 6 months
Estimated Time to Achieve RAOs: 6 months

Approximately 34,622 cubic yards (y^3) of source material will be excavated, consolidated, and capped onsite. The estimated volume of tank waste is 28,089 y^3 while the estimated volume in the lead additive area is 6,533 y^3. These source materials are not listed hazardous waste and are classified as non-hazardous waste based on TCLP data.

Comment [D29]: This could change based on recent TCLP sampling.

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 of will continue vertically and horizontally based on site data 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. All excavation areas will be graded for drainage and erosion control. Depending on the depth of excavation and the soil concentrations remaining, the excavated areas may be backfilled with clean soil and re-vegetated. It is expected that excavated areas with soils meeting the source material target health-based concentrations will be backfilled with clean soil while those with soils not meeting the source material target health based concentration may need to be addressed further based on the final soil alternative RAOs and remediation goals developed under the final decision document for the site.

Comment [D30]: Re-vegetation should occur in tank waste areas. See letter comment #3

All excavated source material will be consolidated into an onsite landfill 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).

Comment [D31]: Since "landfill" has a statutory meaning, perhaps the term "repository", "disposal cell", or "capped area" should be used.

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 landfill 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) do not apply to disposal of non-hazardous wastes.

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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.

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 and 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 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 remedy does not require implementation of long-term O&M and monitoring or the establishment and enforcement of institutional and engineering controls. 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 use as~~of~~ residential~~,~~ and will not require any restrictions.

Comment [D32]: O&M may be required for erosion/vegetation inspection.

Alternative 3 (Excavation, 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 and Offsite Disposal) because consolidated source material will be left onsite. This remedy will eliminate the potential for exposure and migration through consolidation 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 and Offsite Disposal) removes source materials from the Site; therefore, toxicity, mobility, and volume with respect to onsite conditions is reduced, although not through treatment. Alternative 3 (Excavation, Consolidation, and Capping) removes source materials from multiple site locations and consolidates it at one location. Toxicity, mobility, and volume are reduced,

Comment [D33]: It might require treatment

although not through treatment, in areas where source material is removed. Toxicity and mobility are managed through engineering controls where source material is capped onsite while volume remains unchanged.

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 and Offsite Disposal) will meet RAOs in approximately 3 months while Alternative 3 (Excavation, Consolidation, and Capping) will meet RAOs in approximately 6 months. [Note: these time frames assume that all areas are addressed during one action.]

Potential risks to the onsite workers and community through excavation and removal of source material and potential dust emissions will be encountered with both alternatives. Alternative 2 (Excavation 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. However, there is additional potential risk due to offsite hauling and disposal. This alternative will be compatible with the expected future use as residential, and will not require any restrictions.

Alternative 3 (Excavation, Consolidation, and Capping) has an increased potential risk to onsite workers and the community as compared to Alternative 2 (Excavation 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 and Offsite Disposal) is a common easily implemented practice where equipment and services are readily and commercially available. This remedy does not involve additional material handling and treatment and is a common construction practice of which most companies are experienced. This remedy does not require specialized equipment, and is a straight-forward implementation process. This remedy does not require implementation of long-term O&M and monitoring or the establishment and enforcement of institutional and engineering controls. 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 residential use. 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, Consolidation, and Capping) is a common cleanup method that requires some expertise in the construction of an onsite landfill and the installation of a geomembrane/soil cap. This remedy will include additional materials handling and specialized equipment to properly install the geomembrane. This remedy requires coordination with the property owners to identify an appropriate location for the landfill. 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 landfill, 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 landfill to accommodate the final cleanup option. This remedy will require

Comment [D34]: May require treatment depending on recent TCLP sampling. May require fly ash if material is too wet to transport. Material will need to pass a paint filter test.

Comment [D35]: O&M may be required for erosion/vegetation inspection, AND IC's are required in Oklahoma via our Notice of Remediation Statute.

Comment [D36]: Mobilizing/demobilizing costs over time should be considered.

Comment [D37]: See previous comment regarding alternative terminology.

Comment [D38]:

Comment [D39]:

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 use as residential. 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 landfill to be effective, efficient, and cost beneficial.

7. Cost

The estimated cost for implementation of Alternative 2 (Excavation and Offsite Disposal) is $5,260,232. The estimated cost for implementation of Alternative 3 (Excavation, Consolidation, and Capping) is $5,528,808.

8. State/Support Agency Acceptance

Statement to be updated after review.

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 and Offsite Disposal. Tank waste and the lead additive area will be excavated and transported to an offsite permitted disposal facility.

By preventing exposure, contaminant migration, and environmental degradation through removal 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 or treatments. The source control action would not require long-term monitoring, site inspections, O&M, or ICs, due to the removal of contamination from the site. However, 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 is compatible with current residential land use and the expected future residential land use.

Comment [D40]: It might require both depending on the TCLP sampling results.

Based on the information currently available, the EPA and the **[State of Oklahoma—confirmation after review]** believe 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 Agencies expect 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 ROD 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

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The ODEQ and EPA 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.

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Comment [D41]: Is EPA expecting DEQ to provide the blank dates and source?

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