

**THIRD FIVE-YEAR REVIEW REPORT FOR
OMAHA LEAD SUPERFUND SITE
DOUGLAS COUNTY, NEBRASKA**



**Prepared by
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LIST OF ABBREVIATIONS & ACRONYMS

ASARCO	American Smelting and Refining Company, Inc.
ATSDR	Agency for Toxic Substances and Disease Registry
CDC	Centers for Disease Control and Prevention
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DCHD	Douglas County Health Department
EPA	U.S. Environmental Protection Agency
FYR	Five-Year Review
HEPA	high efficiency particulate air
HHRA	Human Health Risk Assessment
IA	Interagency Agreement
ICs	institutional controls
ISA	Integrated Science Assessment
IEUBK	Integrated Exposure Uptake Biokinetic
IROD	Interim Record of Decision
NPL	National Priorities List
NTP	National Toxicology Program
OLEM	EPA Office of Land and Emergency Management
OLMS	Omaha Lead Management System
OLS	Omaha Lead Site
OSWER	EPA Office of Solid Waste and Emergency Response
OU	operable unit
Pb	lead
PbBs	lead blood levels
ppm	parts per million
RA	remedial action
RAO	remedial action objectives
RBA	relative bioavailability
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
TBC	to be considered
µg/dL	micrograms per deciliter
µm	micrometer
USACE	U.S. Army Corps of Engineers
UU/UE	unlimited use and unrestricted exposure
VCP	Voluntary Cleanup Program

I. INTRODUCTION

The purpose of a Five-Year Review is to evaluate the implementation and performance of a remedy to determine whether the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation and Liability Act Section 121, consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Section 300.430(f)(4)(ii)) and considering EPA policy.

This is the third FYR for the Omaha Lead Superfund site. The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The site consists of two operable units, and both OUs will be addressed in this FYR. The two OUs addressed in this FYR are:

- OU 1, Contaminated Soils, addressed child high impact areas such as child daycare facilities, and the most highly contaminated residential properties exceeding 800 parts per million (ppm).
- OU 2, Final Remedial Action, addresses the remaining residential-type properties that exceed risk-based soil lead levels established during the final remedy selection process.

The Omaha Lead Superfund site FYR was led by Peyton Witham, EPA Remedial Project Manager (RPM). Participants included:

- Stacey Stricker, Nebraska Department of Environment and Energy (NDEE)
- Daniel Kellerman, EPA RPM
- Kristen Nazar, EPA Region 7 Office of Regional Counsel
- Elizabeth Kramer, EPA Community Involvement Coordinator
- Elizabeth Cole, EPA Human Health Risk Assessor

The review began on July 6, 2023.

Site Background

The city of Omaha, Nebraska, covers an area of approximately 130 square miles. According to the 2020 census, the city has a population of 485,153. The site encompasses 27 square miles with a population of approximately 130,000. Appendix B shows the location and extent of the site. The site is centered around downtown, bordered on the east by the Missouri River, where two former lead-processing facilities operated. American Smelting and Refining Company, Inc., or ASARCO, operated a lead refinery at 500 Douglas Street in Omaha, Nebraska, for over 125 years, from the early 1870s until 1997.

The Aaron Ferer & Sons Company, or Aaron Ferer, and later the Gould Electronics, Inc., or Gould, lead battery recycling plant were located at 555 Farnam Street. Aaron Ferer operated from the early 1950s until 1963, at which point the facility was purchased by Gould, which operated the facility until it closed in 1982. Both the ASARCO and Aaron Ferer/Gould facilities released lead-containing particulates to the atmosphere from their smokestacks which were deposited on surrounding residential properties.

The site was proposed for the EPA’s National Priorities List on February 24, 2002. The proposed NPL listing became final on April 30, 2003. The site includes only those residential properties where the EPA determines through soil sampling that soil lead levels represent an unacceptable risk to human health. Residential properties where soil sampling indicates that soil lead concentrations are below a level of concern are not considered part of the site. Commercial and industrial properties are also excluded from the site. Properties where the former ASARCO and Aaron Ferer/Gould facilities were located have been remediated during prior response actions and are not a part of the site.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Omaha Lead Superfund Site		
EPA ID: NESFN0703481		
Region: 7	State: NE	City/County: Omaha/Douglas
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	Has the site achieved construction completion? No	
REVIEW STATUS		
Lead agency: EPA		
Author name (Federal or State Project Manager): Peyton Witham		
Author affiliation: U.S. EPA Region 7		
Review period: 7/6/2023 - 6/20/2024		
Date of site inspection: 7/18/2023		
Type of review: Statutory		
Review number: 3		
Triggering action date: 8/26/2019		
Due date (five years after triggering action date): 8/26/2024		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The Human Health Risk Assessments performed in 2004 and 2008 identified lead as the primary contaminant of concern for soil. The HHRAs for lead focused on young children seven years of age and younger (0 to 84 months) who are residents within the site. Young children are most susceptible to lead exposure because they have higher contact rates with soil or dust, absorb lead more readily than adults and are more sensitive to the adverse effects of lead than older children and adults. The effect of greatest concern in children is impairment of the nervous system, including learning deficiencies, reduced intelligence, and adverse effects on behavior.

In accordance with the EPA's recommended risk assessment approach for lead, potential health risks to children from lead were evaluated using the EPA's Integrated Exposure Uptake Biokinetic model. The IEUBK model uses measures or estimates of lead concentrations in environmental media (soil, dust, water, air and food) to estimate the probability that a child's blood lead level might exceed a health-based standard of 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$). The IEUBK results identified several homes or parcels within the site have soil lead levels that are of potential health concern to children who may reside there now or in the future.

Response Actions

In 1998, the Omaha City Council requested assistance from the EPA in addressing the problems with lead contamination in the area. The EPA initiated an investigation into the lead contamination under the authority of CERCLA in 1999. A response action was initiated under CERCLA removal authority and began in August 1999 through an Interagency Agreement with the U.S. Army Corps of Engineers. The initial removal response actions consisted of excavation and replacement of soil exceeding 800 ppm lead at residential properties and exceeding 400 ppm lead at childcare centers and residences where children with elevated blood lead levels resided.

From 1999 through 2002, excavation of contaminated soil and placement of uncontaminated backfill was completed at 257 properties by the USACE under the IA. In August 2002, a second removal action was initiated at all other residential-type properties where the maximum non-foundation soil lead concentration exceeded an action level of 2,500 ppm. Residential-type properties include single- and multi-family dwellings, apartment complexes, childcare centers and vacant lots in residential areas, schools, churches, community centers, parks, greenways and any other areas where children may be exposed to site-related contaminated media. As cleanups were completed at the most highly contaminated residential properties, the soil lead action level was sequentially reduced to 1,200 ppm and eventually 800 ppm so that soil cleanups could continue under CERCLA removal authority at the properties remaining with the highest mid-yard soil lead levels. At properties determined to be eligible for response under either of the removal actions, soils exceeding the cleanup level of 400 ppm lead were excavated and replaced with clean soil and disturbed areas were revegetated.

The EPA completed excavation of contaminated soil and replacement of uncontaminated backfill at a total of 144 properties through 2003. The EPA and the USACE completed a combined total of 310 properties in 2004. The removal action was completed by the EPA and the USACE at 773 properties in 2005 as work was transitioning to CERCLA remedial authority.

In August 2005, ASARCO filed for bankruptcy protection under Chapter 11 of the Bankruptcy Code in the Southern District of Texas, Corpus Christi Division. The United States filed a proof of claim in the bankruptcy action to cover all past and future costs associated with the site. The claim with ASARCO for the site was resolved by the court on July 5, 2009 (Case 05-21207). As a result of the settlement, ASARCO paid \$186,500,000 plus interest to the EPA. As a result of subsequent court actions, ASARCO paid an additional \$16,500,000 to the EPA, for a total of \$220,000,000.

Pursuant to Consent Decrees, Union Pacific Railroad Company paid \$3.15 million to the Omaha Healthy Kids Alliance and \$21.35 million to the EPA in August 2011 (8:11-cv-00195-LSC-FG3); Gould Electronics Inc. paid \$1.1 million to the EPA in August 2011 (8:11-cv-00195-LSC-FG3); NL Industries paid \$624,000 to the EPA in March 2012 (8:12-cv-00059-JMG-CRZ) and Aaron Ferer & Sons Company paid \$480,000 to the EPA in February 2013 (8:12-cv-00406-RGK-CRZ).

2004 Interim Record of Decision

In December 2004, the EPA signed the OU 1 Interim Record of Decision (IROD) for the site.

The Remedial Action Objective (RAO) for the selected interim remedy is:

- To reduce the risk of exposure of young children to lead such that an individual child, or group of similarly exposed children, have no greater than a five percent chance of having a blood-lead concentration exceeding 10 µg/dL.

The remedy components for the interim remedy selected are:

- Excavation, backfilling and revegetation of lead-contaminated residential soils in an estimated 5,600 residential-type properties exceeding 800 ppm, and properties exceeding 400 ppm in areas considered high child-impact areas or with a residing child exhibiting an elevated blood-lead level;
- Participation in a comprehensive remedy with other organizations and agencies to characterize and address all identified sources of lead exposure at the site;
- Stabilization of exterior lead-based paint that threatens the long-term protectiveness achieved through excavation and replacement of lead-contaminated surface soils;
- Removal of interior dust in instances where contaminated soils contribute to interior lead dust loadings; and
- Health education for the Omaha community and medical professionals to support public awareness; exposure prevention programs; in-home assessments; blood-lead screening programs and diagnosis, treatment, and surveillance programs.

2009 ROD

In May 2009, the EPA signed the OU 2 final ROD for the site.

The RAOs for the selected final remedy are:

- To reduce the risk of exposure of young children to lead in (or derived from) outdoor yard soil such that, given typical exposures to lead in air, water and food, the IEUBK model predicts there is no greater than a five percent chance an individual child, or group of similarly exposed children, will develop a blood-lead concentration exceeding 10 µg/dL.

The remedy components for the final remedy selected are:

- Excavation, backfilling and revegetation of lead-contaminated residential soils in an estimated 9,966 residential-type properties exceeding 400 ppm;
 - As noted in the ROD, excavation would continue until the lead concentration at the exposed surface of the excavation is less than 400 ppm in the initial one foot below the surface, or less than 1,200 ppm at depths greater than one foot. Visual barriers are placed when the 1,200 ppm not-to-exceed cleanup level at depth is exceeded below one-foot.
- Participation in a comprehensive remedy with other organizations and agencies to characterize and address all identified sources of lead exposure at the site;
- Stabilization of exterior lead-based paint that threatens the long-term protectiveness achieved through excavation and replacement of lead-contaminated surface soils;
- Response to interior dust involving a high efficiency particulate air (HEPA) vacuum program and health education at remediated properties with interior dust lead levels exceeding eligibility criteria;
- Health education for the Omaha community and medical professionals to support public awareness, exposure prevention programs, in-home assessments, blood-lead screening programs and diagnosis, treatment, and surveillance programs; and
- Operation of a Local Lead Hazard Registry as a type of Institutional Control.

Table 1: Cleanup Levels Selected in the OU 1 IROD and OU 2 ROD

OU	Media	Cleanup Level
OU 1	Soil	800 ppm lead at any residential-type property; 400 ppm lead in high child-impact areas; 400 ppm lead at properties with a child exhibiting an elevated blood-lead level
OU 2	Soil	400 ppm lead for all residential and residential-type properties

Status of Implementation

Implementation of the final remedy began in 2009 and remains ongoing. Initial work was completed by the EPA and in 2015, under a Cooperative Agreement, transitioned to the city of Omaha and the Douglas County Health Department. At the time the EPA transitioned work, lead-contaminated soil had been remediated at 13,090 properties (93%) of the properties eligible for soil remediation, and lead-based paint stabilization was completed on 6,249 (92%) of the eligible properties. The city of Omaha began remediating additional residential properties in September 2017. As of June 2024, cleanup activities were completed at 569 properties by the city of Omaha. Within the boundary of the site, 145 properties remain that have not been sampled and 362 properties where access to the property for remediation has been unsuccessful or denied. Visual barriers should also be placed when the 1,200 ppm not-to-exceed cleanup level at depth is exceeded below one-foot. However, this component of the remedy has not been implemented for the past few years. It is currently unknown how many properties exceed 1,200 ppm lead at depths greater than one foot and do not have visual barriers in place.

As part of the Cooperative Agreement, the DCHD compiles childhood blood-lead data, collects interior dust samples from residences and provides HEPA vacuum cleaners to address historic releases to home interiors. As of June 2024, 7,206 properties have had dust inspections conducted at the residence between the EPA and the DCHD. The DCHD also conducts education and outreach to homeowners and health care providers to increase awareness of the health effects of lead.

Institutional Controls

The institutional control program at the site is executed through the city of Omaha's Lead Registry (www.omahalead.org). This website is a publicly available resource that depicts the status of each of the residential properties within the boundary of the site. As properties are remediated, the status of the property is changed in an internal database referred to as the Omaha Lead Management System. The city retrieves selected data from the OLMS database for use in the Omaha Lead Registry. The Omaha Lead Registry identifies the properties where the soil has been remediated and any lead-based paint has been stabilized. The city of Omaha is the primary data manager for the Omaha Lead data. The EPA pulls data from the city-owned database to ensure that the EPA's internal database continues to be updated.

Table 2: Summary of Implemented ICs

Media, engineered controls and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Soil	Yes	Yes	Properties remediated	Provide additional protection of human health by making information available to the public about conditions at individual site properties.	Omaha Lead Registry, 2012

Partial Deletions

As properties are cleaned up pursuant to the ROD for the site and it is determined that no further response action under CERCLA is appropriate, the properties are eligible for deletion from the NPL. The partial deletion process is conducted in accordance with 40 CFR Section 300.425(e) and is consistent with the Notice of Policy Change: Partial Deletion of sites Listed on the National Priorities List 60 FR 55466. As of 2023, the EPA deleted a total of 2,294 properties from the site. These property deletions occurred in 2013, 2017, 2018, 2019, 2020, 2021, 2022 and 2023.

System Operations/Operation & Maintenance

Because the primary mechanism of contamination was deposition of airborne contaminants from lead smelting operations, the lead concentration found in the soil generally decreases with depth. Surface soil at these properties was excavated and removed, and the excavated soil was replaced with a minimum of one foot of clean soil and revegetated. The clean fill prevents exposure to the remaining underlying contaminated material. The EPA anticipates Operation & Maintenance activities for properties remediated under OU 1 and OU 2 to include maintenance of the soil cap and revegetated areas for those properties where lead-contaminated soils are left at depth. In addition, the remedy for both OU 1 and OU 2 includes the implementation and maintenance of institutional controls (ICs) that identify properties where elevated lead soils remain after Remedial Actions are completed.

The city of Omaha currently conducts post-remedy evaluation inspections at properties where soil remediation was completed to document the integrity of the remedy where contamination was left at the surface or at depth. The purpose of the inspections is to evaluate if the soil clean-up and revegetation (or other selected ground cover) replacement remedy outlined in the ROD continues to be effective. Approximately 300 sites are inspected annually using criteria established during the second FYR published on August 26, 2019. The city’s staff conduct a visual inspection of each property and identify areas where the replaced soil or revegetation (or selected ground cover) are in a state of distress. Distress includes, but is not limited to, dead grass, visibly different vegetation, eroded soil, collapse or settling and holes. It is also evaluated if site conditions have changed, such as a structure being demolished, that may expose new lead-contaminated soil. If the property is deemed qualified for sampling of the remediated quadrants, the property information is referred to the city of Omaha’s field

sampling team to determine if recontamination has occurred. If recontamination of a remediated property has occurred, the property will then be added to the list of properties to be remediated in the future.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the most recent FYR as well as the recommendations from the most recent FYR and the status of those recommendations.

Table 3: Protectiveness Determinations/Statements from the 2019 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Protective	The remedy for OU 1 is protective of human health and the environment.
2	Protectiveness Deferred	The remedy at OU 2 is expected to be protective upon completion of the RA once the EPA assesses risks associated with soil cleanup levels and associated target blood-lead levels in light of new scientific information. Additionally, some properties have a change in site conditions, and it is currently unknown whether the change in site conditions created an exposure pathway. In the interim, soil excavation activities completed to date have removed the contaminated soils and addressed interior dust and paint exposures. The cooperative agreements with the city of Omaha and DCHD ensure residential properties continue to be evaluated, remediated, and health education delivered as warranted.

Table 4: Status of Recommendations from the 2019 FYR

OU	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
2	Properties may have a change in site conditions, such as the structure being demolished that may create an exposure pathway.	To develop an approach to assess the potential recontamination at properties with a change in site conditions.	Completed	The approach was developed in 2019 and implemented under the existing cooperative agreement with the city. The city of Omaha conducts post-remedy evaluation inspections to document the integrity of the remedy and resamples properties where there may have a change in site conditions.	2019

2	The cleanup levels selected for residential yards may not protect children to current CDC-acceptable reference value blood-lead concentrations.	Region 7 is supporting the reexamination of protectiveness of the OU 2 RA in light of OLEM Directive 9200.2-167. The results of the reexamination will be used to determine the continued protectiveness of the OU 2 RA and whether additional actions should be taken to further reduce the risk of future elevated blood-lead levels in young children at the site.	Under Discussion	Following the updated EPA soil lead guidance (EPA 2024a), EPA Region 7 will evaluate the residential soil cleanup level for lead at the site. The EPA will determine whether additional actions should be taken to further reduce the risk of future elevated blood levels in young children at the site.	12/31/2027
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IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice was made available by local newspapers posting in both English and Spanish. The EPA published a Public Notice in the Omaha World Herald newspaper on August 20, 2023 and the Mundo Latino newspaper on August 25, 2023, stating that there was a FYR ongoing and inviting the public to submit any comments to the EPA. The public notice published on August 20, 2023, and August 25, 2023, is listed in Appendix C – Public Notice. A public notice will be issued following the completion of this FYR, and a copy of this completed FYR will be published on the Omaha Lead Superfund Site Profile Page. The Omaha Lead Superfund Site Profile Page can be accessed at the following link: <http://www.epa.gov/superfund/omahalead>.

No site interviews were conducted for the third FYR. The EPA, city of Omaha and DCHD have had a continuous presence at the site during the Remedial Action process. Multiple outreach events are held each year by the city of Omaha and the DCHD to provide sampling and remediation information and lead health education to residents within the OLS. Residents can ask questions and express concerns at these events. Property owners also fill out satisfaction surveys as part of the remediation process and have generally expressed support of the remedy.

Data Review

In general, for activities completed at OU 1 and OU 2, under the cooperative agreement with the city of Omaha, the city is conducting a visual inspection of soil covers and recording exterior lead-based paint stabilization observations at residential properties where the soil remediation remedy is at least five years old. The inspections involve a detailed evaluation of the historic soil and exterior lead-based paint activities at each property, a site visit for the evaluation of the status of each historic activity, and photos of the existing conditions at each property. The inspection data collected is summarized below and displayed in Table 1 of Appendix D – Post-Remedy Evaluation Inspections of this document.

Since the last FYR, the city has inspected 1,206 properties where soil remediation was conducted. Of the 1,206 properties, 284 had soil lead concentrations over the action level of 400 ppm left behind and

52 were unknown to have contamination left behind. For the 1,206 properties inspected, it has been determined that 98% of the remedy has been disturbed to some extent. The disturbances range from having mostly weeds present instead of grass, to having large bare areas, to the structure being demolished since remediation. Properties noted as having weeds, bare spots, etc., are still considered to be effective in preventing exposure.

Following the recommendation for Issue 2 from the last FYR, the city has sampled 32 properties that qualified in the 76-100% remedy disturbed category due to the demolition of a residential structure on the property. Properties where structures are demolished may expose soil contamination or re-contaminate the soil with lead-based paint if the structure was constructed prior to 1978. Of the 32 properties resampled by the city, only six properties had a single quadrant greater than the 400 ppm action level for the site. This small sample set indicates that the soil remediation remedy is generally protective; however, more data should be collected to support this conclusion.

Site Inspection

The inspection of the site was conducted on July 18, 2023. In attendance were Peyton Witham and Dan Kellerman, EPA, Stacey Stricker, NDEE, and Jodi Rapp, city of Omaha. The purpose of the inspection was to assess the protectiveness of the remedy.

Attendees conducted a visual inspection of eight properties of the 1,206 properties the city of Omaha had inspected from 2019 to 2023. No significant deficiencies or concerns were noted for remediated properties observed during the site inspection. The FYR site inspection and a table displaying the condition of the properties where the remedy was implemented is displayed in Appendix E – FYR Site Inspection of this document.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

The OU 1 and OU 2 remedies are functioning as intended for the 13,583 residential properties that have been remediated. Since additional properties are continually being sampled and remediated, the OU 2 remedy is ongoing. To date, 42,859 residential properties have been sampled and only 162 properties remain unsampled. The EPA continues to work cooperatively with the city of Omaha and DCHD to implement the remedy documented in the OU 2 ROD, including establishing ICs as well as performing outreach and education activities.

Remedial Action Performance

The OU 2 remedy is still under construction. For the 13,583 residential yards that have been remediated, the remedy is functioning as intended by the decision documents for OU 1 and OU 2. Approximately 145 residential properties have not been sampled due to property access refusal or no response from the property owners and approximately 362 properties require remediation, but access

has been unsuccessful or denied. The additional residential properties will continue to be sampled and remediated throughout the next FYR period.

System Operations/O&M

The city of Omaha currently conducts inspections on properties where the soil remediation remedy is at least five years old with a priority on properties where contamination was left behind on the surface or at excavation depth. The purpose of the inspections is to evaluate if the soil clean-up and revegetation (or other selected ground cover) replacement remedy outlined in the ROD continues to be effective. Properties are also evaluated for changes in site conditions, such as a structure being demolished, that may expose new lead-contaminated soil.

Implementation of Institutional Controls and Other Measures

Operation of a Local Lead Hazard Registry is a type of institutional control for the site. The Omaha Lead Registry (www.omahalead.org) is the online, publicly accessible database that identifies the status of properties in the site, including properties where soil has been remediated and any lead-based paint has been stabilized. Property owners are also able to identify if their property is within the site boundary and if it is eligible for soil sampling and/or remediation.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Question B Summary:

The 400 ppm lead soil cleanup level for the site was based on directives from the EPA Office of Solid Waste and Emergency Response (OSWER) issued in 1994 and 1998, which identified 10 µg/dL as the blood lead level of concern. Since the 1994 and 1998 guidance documents were completed, comprehensive reviews of the updated human health scientific literature were conducted. These publications demonstrate sufficient evidence of significant adverse health effects in young children at blood lead levels below 5 µg/dL. If the blood-lead level of concern is revised to a value less than 10 µg/dL, the resulting cleanup level for lead in soil in the OU 2 ROD that is based on potential health risks to a child receptor would need to be examined for continued protectiveness. Additionally, for residential yards in OU 1 that were cleaned up to 800 ppm per the IROD, the current remedy may not be protective of the 10 µg/dL child blood-lead level of concern considered in the final ROD for OU 2, when using updated IEUBK model input parameters and risk assessment approaches.

The EPA recently published updated soil lead guidance for CERCLA sites (EPA 2024a) to lower regional screening levels (RSL) and strengthen guidance for investigating and cleaning up lead-contaminated soil in residential areas where children live and play. The EPA will make cleanup decisions specific to each site, using site-specific factors, including risk factors and community input that can vary from site to site.

Ecological routes of exposure have not changed. The site is located entirely within an urban area in eastern Omaha and includes only residential properties. A residential soil cleanup level of 400 ppm for lead has been determined to be protective of ecological receptors that would utilize urban

environments. This conclusion is based on modeled risks to wildlife from ecological risk assessments for lead sites across Region 7. These risk assessments have evaluated sensitive ecological receptors, such as the American Robin, which tend to be highly exposed to contaminated soil due to ingestion of soil invertebrates. Soil clean-up levels protective of sensitive species, such as robins, are expected to be protective of less sensitive species as well. Residential soil clean-up levels above 400 ppm may not be protective of ecological receptors, as potential impacts to growth, reproduction and survival are indicated above this clean-up level.

Changes in Standards and TBCs

The EPA's OSWER Directives 9355.4-12 (EPA 1994) and 9200.4-27P (EPA 1998) as components of EPA Revised Interim Soil-lead guidance were identified as federal chemical-specific to be considered (TBC) guidance documents. However, since 1994 and 1998 when those documents were issued, increasing evidence has shown that blood lead levels below 10 µg/dL may also have negative health impacts. Comprehensive reviews of the updated human health scientific literature are presented in the NTP Program Monograph on Health Effects of Low-Level Lead (NTP 2012), the EPA's ISA for Lead (EPA 2013 and 2024b), and the ATSDR Toxicological Profile for Lead (ATSDR 2020).

The EPA's updated soil lead guidance for CERCLA sites (EPA 2024a) recommends EPA regions to use an RSL of 200 ppm. However, EPA regions should use an RSL of 100 ppm if additional sources of lead are identified, such as lead water service lines, lead-based paint, or non-attainment areas where the air lead concentrations exceed National Ambient Air Quality Standards. The recommended RSL of 100 ppm considers aggregate lead exposure and increased risk to children living in communities with multiple sources of lead contamination.

A potential state TBC identified at the time of the ROD was the Nebraska Voluntary Cleanup Program (VCP) Remediation Goals, which included a 400 ppm for residential lead soil exposure based on the EPA's IEUBK model at the time. While this guidance has been updated to a 2021 version, the Nebraska VCP cleanup level continues to be 400 ppm (NDEQ 2021). The EPA is not aware of any standards identified as Applicable or Relevant and Appropriate Requirements, newly promulgated standards, and/or changes in TBCs that impact the protectiveness of the remedy at this time.

Changes in Toxicity and Other Contaminant Characteristics

In January 2024, the EPA updated the 2013 Lead ISA as part of the review of the primary (health-based) and secondary (welfare-based) lead national ambient air quality standards that reflects a current scientific understanding of a relationship between lead exposure and health effects (EPA 2024b). The updated ISA generally affirms conclusions from the previous ISA and the existing body of evidence indicating causality between early life to childhood lead exposure and child cognitive decrement. The 2024 ISA supports causality between lead exposure and several other adverse health effects, including cardiovascular-related mortality and adult cognitive function. Additionally, the ISA indicates that current scientific evidence adequately suggests that children, people living in proximity to lead sources, specific genetic variants, increased stress, and populations with certain nutritional or residential factors may be at disproportionate risk for lead-related health effects (EPA 2024b).

An increasing body of evidence, including analysis from the EPA, NTP and the ATSDR, support the understanding that significantly adverse health effects are associated with blood-lead levels less than 10 µg/dL. It is not yet known if the cleanup levels specified in the ROD will be protective of the updated Centers for Disease Control and Prevention (CDC) blood-lead reference value concentration of 3.5 µg/dL. EPA Region 7 will re-examine the need to revise the soil cleanup levels based on the updated EPA soil lead guidance and determine whether additional actions should be taken to further reduce the risk of future elevated blood levels in young children at the site.

Changes in Risk Assessment Methods

The site risk assessment, which utilized site-specific parameters for relative bioavailability (RBA) and airborne lead concentrations in the IEUBK model calculations, served as the basis of the cleanup levels for residential soil (EPA 2004). Changes in methodology since the ROD may have impacted the protectiveness of the remedy pertaining to 800 ppm cleanup goals specified in the OU 1 IROD.

Changes in risk assessment methodology have occurred since the site risk assessment. For example, the EPA has updated many of the standard default exposure factors (EPA 2014b); thus, some of the exposure assessment input parameters in the original risk assessment are different than values currently recommended. The IEUBK model was updated from version 1.1 to 2.0 in 2021, which continues to be the current version (EPA 2021a).

These changes in risk assessment methods will be incorporated in any revision of the lead cleanup numbers as the updated EPA lead guidance is implemented.

Changes in Exposure Pathways

The EPA is not aware of any changes in land use, routes of exposure, contaminants or toxic byproducts that could impact the protectiveness of the remedy.

Expected Progress Towards Meeting RAOs

The remedy is progressing towards meeting the RAO through ongoing remediation of residential properties. The combined efforts of removal and Remedial Actions have resulted in 13,583 residential property cleanups to date.

QUESTION C: Has any **other** information come to light that could call into question the protectiveness of the remedy?

The EPA is not aware of any impacts from natural disasters in this FYR period, such as significant flooding that caused soil erosion and redistribution of lead contaminated soils. Changes in climate may affect the implementation of the remedy. Precipitation delays cleanup activities until construction areas are sufficiently dry for work to continue, and changing weather patterns may lead to more frequent and/or intense rainfall events which would prolong the duration of cleanup activities. An increase in the annual precipitation at the site may also lead to more erosional damage to active cleanups due to runoff and potentially result in the redistribution of lead-contaminated soils. Additionally, higher summer temperatures and times of prolonged drought require remediation

contractors to hydrate high traffic work areas more frequently and water newly planted grass seed and sod more often, which could also prolong the duration of the construction activities. Extreme drought conditions may impact vegetation that prevents soil from eroding and exposes contaminated soil left at depth. EPA will continue to monitor the potential affects from climate change. EPA will adapt cleanup strategies during ongoing cleanup activities as necessary.

The EPA is not aware of any additional information that could impact the protectiveness of the remedy at this time.

VI. ISSUES/RECOMMENDATIONS

Issues and Recommendations Identified in the Five-Year Review:				
OU(s): 1 & 2	Issue Category: Remedy Performance			
	Issue: The soil cleanup level for lead may not be protective based on the updated EPA soil lead guidance.			
	Recommendation: EPA Region 7 will evaluate the residential soil cleanup level for lead to ensure it is consistent with the updated EPA soil lead guidance and risk assessment methods. The EPA will determine whether additional actions should be taken to further reduce the risk of future elevated blood levels in young children at the site.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	EPA	EPA	12/31/2027

Issues and Recommendations Identified in the Five-Year Review:				
OU(s): 1 & 2	Issue Category: Remedy Performance			
	Issue: Visual barrier is not being placed when contamination exceeds 1,200 ppm lead at depths greater than one foot.			
	Recommendation: A visual barrier should be placed when the 1,200 ppm not-to-exceed cleanup level at depth is exceeded below one foot in accordance with the OU 2 ROD and Superfund Residential Lead Sites Handbook. This will provide property owners with visual information that lead contamination resides below the barrier. Properties where contamination was left behind and no barrier was placed during past remediation efforts will be identified based on available data. These property owners will then be contacted to educate them on the depth at which contamination resides.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	EPA	EPA	8/26/2025

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VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)		
<i>Operable Unit:</i> 1 & 2	<i>Protectiveness Determination:</i> Protectiveness Deferred	<i>Planned Addendum Completion Date:</i> 12/31/2027
<p><i>Protectiveness Statement:</i> A protectiveness determination of the remedy at OU 1 & 2 cannot be made at this time until further information is obtained. Further information will be obtained by applying the updated EPA soil lead guidance and risk assessment methods. For properties that require a visual barrier, EPA will identify the property owners and provide notification. During future remediation, visual barrier will be placed when contamination exceeds 1,200 ppm for lead at depths greater than one foot. Following these steps, a protectiveness determination will be made for OU 1 & 2.</p>		

VIII. NEXT REVIEW

The next FYR report for the Omaha Lead Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

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- US EPA. 2016a. *Recommendations for Sieving Soil and Dust Samples at Lead Sites for Assessment of Incidental Ingestion*, OLEM Directive 9200.1-128. July 1. <https://semspub.epa.gov/work/HQ/100000133.pdf>
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- US EPA. 2021a. *User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Version 2.0. SEMS 400700*. Office of Land and Emergency Management, Washington, D.C.
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- US EPA. 2024b. *Integrated Science Assessment (ISA) for Lead (Final Report)*. Washington, DC, EPA/600/R-23/375. January 31.
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APPENDIX B – SITE MAP

Omaha Lead National Priority List (NPL) Superfund Site



The Environmental Protection Agency does not guarantee the accuracy, completeness, or timeliness of the information shown, and shall not be liable for any injury or loss resulting from reliance upon the information shown.

Basemap: Esri, NASA, NGA, USGS, FEMA, County of Douglas, NE, Pottawattamie County, Iowa, Iowa DNR, Nebraska Game & Parks Commission, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

HM 3/30/2023

APPENDIX C – PUBLIC NOTICE



PUBLIC NOTICE

THIRD FIVE-YEAR REVIEW STARTED RESIDENTIAL LEAD CLEANUP, OMAHA LEAD NPL SUPERFUND SITE

Omaha, Douglas County, Nebraska – August 2023



The U.S. Environmental Protection Agency (EPA) Region 7 has started the **Third Five-Year Review (FYR)** of the remedial action (cleanup) for residential yards at the **Omaha Lead National Priorities List (NPL) Superfund Site** (site). FYRs evaluate the site cleanup decision (remedy) to figure out whether the remedy protects human health and the environment from site hazards. FYRs are required by the Comprehensive Environmental Response, Compensation, and Liability Act (commonly known as the Superfund law) when hazardous substances stay on-site above levels that allow unrestricted use and unlimited exposure. This FYR should be completed by **August 2024**. Site project information is available to the public at web repositories. To view cleanup documents and other FYRs, please see EPA's Site Profile page (see Site Documents & Data) online at:

www.epa.gov/superfund/omahalead

If you do not have internet access, documents are also available for viewing online at the **EPA Region 7 Records Center**, 11201 Renner Blvd., Lenexa KS 66219 (1-800-223-0425); or the **Omaha Public Library**, 3020 S. 84th St., Omaha, NE 68124 (402-444-4800).

FREE Lead Testing and Cleanup Opportunity! To sign up for the **FREE** lead testing and cleanup program, and to ensure that your property is lead-safe, please visit the EPA-funded **Omaha Lead Registry** at <https://lead-registry.cityofomaha-ne.gov/en-US/>, call the **Omaha Lead Hazard Control Program** at 402-444-5150, and/or visit their website at <https://planninghcd.cityofomaha.org/lead-hazard-programs>.



Annual Childhood Blood Lead Testing: Some children in historic lead smelting areas have elevated levels of lead in their blood. This can cause health problems. Children **under 7 years old** living at this site should have annual blood tests. Talk to your pediatrician, general physician, or local health department about testing your child. The **Douglas County Health Department** (at 1111 South 41st Street, Omaha, NE 68105) offers lead screening and can be reached at 402-444-7825. To learn how to protect your family from lead hazards, visit **EPA's Lead page** at www.epa.gov/lead or <https://espanol.epa.gov/plomo> and the **CDC's Lead page** at www.cdc.gov/nceh/lead. For a site map and to learn about the site history, see a case study online: <https://semspub.epa.gov/work/07/30825551.pdf>.

EPA encourages community members to ask questions and report any concerns about this site. Please submit questions and requests for site information to EPA (see mailing address below):

- **Peyton Witham**, Remedial Project Manager, Superfund Division, phone: 913-551-7219; email: witham.peyton@epa.gov, or
- **Elizabeth Kramer**, Community Involvement Coordinator, Office of Public Affairs; phone: 913-551-7186 or toll-free at 1-800-223-0425; email: r7publicaffairs@epa.gov or kramer.elizabeth@epa.gov.

U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard, Lenexa, KS 66219
Toll-free: 1-800-223-0425

APPENDIX D – POST-REMEDY EVALUATION INSPECTIONS

Table 1. Number of remediated properties inspected by the city of Omaha from 2019 through 2023 with the percent of disturbance for the soil remedy. The FYR site inspection data collected on July 18, 2023 is included.

Percent Disturbance	Number of Properties Inspected	Inspection Criteria
Remedy Intact	24	Remedy intact is considered a well-established and maintained lawn with minimal to no weeds or bare spots in the remediated quadrant(s).
Less than 10%	188	Less than 10 percent of the quadrant(s) remediated have some weeds or small areas of spotty or dead vegetation but overall, the vegetation is in good condition.
10-25%	384	10 to 25 percent of the quadrant(s) remediated have bare areas of soil, spotty vegetation cover or areas of mostly weedy vegetation.
26-50%	344	26-50 percent of the quadrant(s) remediated have spotty vegetation, bare areas of soil and/or distressed vegetation.
51-75%	142	51-75 percent of the quadrant(s) remediated have mostly weedy vegetation, some bare spots and/or distressed vegetation throughout the remediated quadrant(s).
76-100%	124	The residential structure on the property has been demolished.
Total Inspected	1206	

APPENDIX E – FYR SITE INSPECTION

Table 1. Inspection observations from the Third FYR inspection conducted on July 18, 2023. These properties are also included Table 1 of Appendix D.

Percent Disturbance	Number of Properties Inspected	Inspection Criteria
Remedy Intact	1	Remedy intact is considered a well-established and maintained lawn with minimal to no weeds or bare spots in the remediated quadrant(s).
Less than 10%	4	Less than 10 percent of the quadrant(s) remediated have some weeds or small areas of spotty or dead vegetation but overall, the vegetation is in good condition.
10-25%	3	10 to 25 percent of the quadrant(s) remediated have bare areas of soil, spotty vegetation cover or areas of mostly weedy vegetation.
26-50%	0	26-50 percent of the quadrant(s) remediated have spotty vegetation, bare areas of soil and/or distressed vegetation.
51-75%	0	51-75 percent of the quadrant(s) remediated have mostly weedy vegetation, some bare spots and/or distressed vegetation throughout the remediated quadrant(s).
76-100%	0	The residential structure on the property has been demolished.
Total Inspected	8	

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION										
Site name: <u>OMAHA LEAD</u>	Date of inspection: <u>7/18/2023</u>									
Location and Region: <u>OMAHA, NEBRASKA / EPA REGION 7</u>	EPA ID: <u>NESFN 0703481</u>									
Agency, office, or company leading the five-year review: <u>EPA REGION 7</u>	Weather/temperature: <u>70°F, rain</u>									
Remedy Includes: (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input checked="" type="checkbox"/> Other <u>Excavation & disposal, exterior lead-based paint stabilization, response to lead-contaminated interior duct</u> </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls </td> </tr> </table>		<input type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input checked="" type="checkbox"/> Other <u>Excavation & disposal, exterior lead-based paint stabilization, response to lead-contaminated interior duct</u>	<input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls							
<input type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input checked="" type="checkbox"/> Other <u>Excavation & disposal, exterior lead-based paint stabilization, response to lead-contaminated interior duct</u>	<input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls									
Attachments: <input type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached										
<u>N/A</u> II. INTERVIEWS (Check all that apply) <u>No interviews conducted</u>										
1. O&M site manager _____ <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 40%; text-align: center;">Name</td> <td style="width: 20%; text-align: center;">Title</td> <td style="width: 40%; text-align: center;">Date</td> </tr> <tr> <td colspan="3"> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____ </td> </tr> <tr> <td colspan="3"> Problems, suggestions; <input type="checkbox"/> Report attached _____ </td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____		
Name	Title	Date								
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____										
Problems, suggestions; <input type="checkbox"/> Report attached _____										
2. O&M staff _____ <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 40%; text-align: center;">Name</td> <td style="width: 20%; text-align: center;">Title</td> <td style="width: 40%; text-align: center;">Date</td> </tr> <tr> <td colspan="3"> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____ </td> </tr> <tr> <td colspan="3"> Problems, suggestions; <input type="checkbox"/> Report attached _____ </td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____		
Name	Title	Date								
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____										
Problems, suggestions; <input type="checkbox"/> Report attached _____										

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply) <i>N/A</i>			
1.	O&M Documents <input type="checkbox"/> O&M manual <input type="checkbox"/> As-built drawings <input type="checkbox"/> Maintenance logs Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <i>X</i> N/A <i>X</i> N/A <i>X</i> N/A
2.	Site-Specific Health and Safety Plan <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <i>X</i> N/A <i>X</i> N/A
3.	O&M and OSHA Training Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <i>X</i> N/A
4.	Permits and Service Agreements <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <i>X</i> N/A <i>X</i> N/A <i>X</i> N/A <i>X</i> N/A
5.	Gas Generation Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <i>X</i> N/A
6.	Settlement Monument Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <i>X</i> N/A
7.	Groundwater Monitoring Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <i>X</i> N/A
8.	Leachate Extraction Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <i>X</i> N/A
9.	Discharge Compliance Records <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <i>X</i> N/A <i>X</i> N/A
10.	Daily Access/Security Logs Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <i>X</i> N/A

<i>N/A</i>		IV. O&M COSTS <i>Remedial action ongoing; no O&M</i>	
1. O&M Organization			
<input type="checkbox"/> State in-house			<input type="checkbox"/> Contractor for State
<input type="checkbox"/> PRP <i>in-house</i>			<input type="checkbox"/> Contractor for PRP
<input type="checkbox"/> Federal Facility in-house			<input type="checkbox"/> Contractor for Federal Facility
<input type="checkbox"/> Other _____			
2. O&M Cost Records			
<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date		
<input type="checkbox"/> Funding mechanism/agreement in place			
Original O&M cost estimate _____	<input type="checkbox"/> Breakdown attached		
Total annual cost by year for review period if available			
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
3. Unanticipated or Unusually High O&M Costs During Review Period			
Describe costs and reasons: _____			

V. ACCESS AND INSTITUTIONAL CONTROLS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
A. Fencing			
1. Fencing damaged <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Gates secured <input checked="" type="checkbox"/> N/A			
Remarks _____			

B. Other Access Restrictions			
1. Signs and other security measures <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A			
Remarks _____			

C. Institutional Controls (ICs)			
1.	Implementation and enforcement		
	Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Type of monitoring (e.g., self-reporting, drive by)	<u>Omaha Lead Registry (OLR)</u>	
	Frequency	<u>N/A</u>	
	Responsible party/agency	<u>City of Omaha under CA with EPA</u>	
	Contact	<u>Steve Zivny</u>	<u>Program Manager</u>
		<u>7/18/2023</u>	<u>(402) 444-5150</u>
		Name	Title
		Date	Phone no.
	Reporting is up-to-date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Reports are verified by the lead agency	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
	Specific requirements in deed or decision documents have been met	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
	Violations have been reported	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
	Other problems or suggestions:	<input type="checkbox"/> Report attached	
2.	Adequacy	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A
	Remarks	<u>OLR is kept up-to-date as properties are sampled and/or remediated</u>	
D. General			
1.	Vandalism/trespassing	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No vandalism evident
	Remarks	<u>N/A - residential yards</u>	
2.	Land use changes on site	<input type="checkbox"/> N/A	
	Remarks	<u>None observed during this inspection</u>	
3.	Land use changes off site	<input checked="" type="checkbox"/> N/A	
	Remarks		
	<u>N/A</u>	VI. GENERAL SITE CONDITIONS	
A.	Roads	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Roads damaged	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Roads adequate <input type="checkbox"/> N/A
	Remarks		

B. Other Site Conditions			
Remarks _____ _____ _____ _____ _____			
VII. LANDFILL COVERS <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
A. Landfill Surface			
1.	Settlement (Low spots) Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Settlement not evident
2.	Cracks Lengths _____ Widths _____ Depths _____ Remarks _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Cracking not evident
3.	Erosion Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Erosion not evident
4.	Holes Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Holes not evident
5.	Vegetative Cover <input type="checkbox"/> Grass <input type="checkbox"/> Cover properly established <input type="checkbox"/> No signs of stress <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks _____		
6.	Alternative Cover (armored rock, concrete, etc.) <input type="checkbox"/> N/A Remarks _____		
7.	Bulges Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Height _____	<input type="checkbox"/> Bulges not evident

8.	Wet Areas/Water Damage <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks _____ _____	<input type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map	Areal extent _____ Areal extent _____ Areal extent _____ Areal extent _____
9.	Slope Instability <input type="checkbox"/> Slides Areal extent _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of slope instability	
B. Benches <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	Flows Bypass Bench Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
2.	Bench Breached Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
3.	Bench Overtopped Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
C. Letdown Channels <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	Settlement Areal extent _____ Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of settlement
2.	Material Degradation Material type _____ Areal extent _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of degradation
3.	Erosion Areal extent _____ Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of erosion

4.	Undercutting	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
5.	Obstructions	Type _____	<input type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Size _____		
	Remarks _____		
6.	Excessive Vegetative Growth	Type _____	
	<input type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
D. Cover Penetrations <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	Gas Vents	<input type="checkbox"/> Active <input type="checkbox"/> Passive	
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	
	<input type="checkbox"/> N/A		
	Remarks _____		
2.	Gas Monitoring Probes	<input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition	
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
3.	Monitoring Wells (within surface area of landfill)	<input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition	
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
4.	Leachate Extraction Wells	<input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition	
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
5.	Settlement Monuments	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A
	Remarks _____		

E. Gas Collection and Treatment		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Gas Treatment Facilities <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
2.	Gas Collection Wells, Manifolds and Piping <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
3.	Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____		
F. Cover Drainage Layer		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Outlet Pipes Inspected Remarks _____ _____	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
2.	Outlet Rock Inspected Remarks _____ _____	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
G. Detention/Sedimentation Ponds		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Siltation Areal extent _____ Depth _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____ _____		
2.	Erosion Areal extent _____ Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____		
3.	Outlet Works Remarks _____ _____	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
4.	Dam Remarks _____ _____	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A

H. Retaining Walls		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Deformations	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement _____	Vertical displacement _____	
	Rotational displacement _____		
	Remarks _____		
2.	Degradation	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks _____		
I. Perimeter Ditches/Off-Site Discharge		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Siltation	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident
	Areal extent _____	Depth _____	
	Remarks _____		
2.	Vegetative Growth	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input type="checkbox"/> Vegetation does not impede flow		
	Areal extent _____	Type _____	
	Remarks _____		
3.	Erosion	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Areal extent _____	Depth _____	
	Remarks _____		
4.	Discharge Structure	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		
VIII. VERTICAL BARRIER WALLS		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Settlement	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Areal extent _____	Depth _____	
	Remarks _____		
2.	Performance Monitoring	Type of monitoring _____	
	<input type="checkbox"/> Performance not monitored		
	Frequency _____	<input type="checkbox"/> Evidence of breaching	
	Head differential _____		
	Remarks _____		

IX. GROUNDWATER/SURFACE WATER REMEDIES <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	Pumps, Wellhead Plumbing, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____ _____
2.	Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
B. Surface Water Collection Structures, Pumps, and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	Collection Structures, Pumps, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____

C. Treatment System		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Treatment Train (Check components that apply)	<input type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input type="checkbox"/> Air stripping <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters _____ <input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____ <input type="checkbox"/> Others _____ <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks _____ _____	
2.	Electrical Enclosures and Panels (properly rated and functional)	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance	Remarks _____ _____
3.	Tanks, Vaults, Storage Vessels	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance	Remarks _____ _____
4.	Discharge Structure and Appurtenances	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance	Remarks _____ _____
5.	Treatment Building(s)	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored	Remarks _____ _____
6.	Monitoring Wells (pump and treatment remedy)	<input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A	Remarks _____ _____
D. Monitoring Data <i>Remedial action ongoing; no O&M</i>			
1.	Monitoring Data	<input type="checkbox"/> Is routinely submitted on time <input type="checkbox"/> Is of acceptable quality	
2.	Monitoring data suggests:	<input type="checkbox"/> Groundwater plume is effectively contained <input type="checkbox"/> Contaminant concentrations are declining	

D. Monitored Natural Attenuation			
1.	Monitoring Wells (natural attenuation remedy)		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Good condition
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Routinely sampled	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> Needs Maintenance	
Remarks _____			
X. OTHER REMEDIES			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
XI. OVERALL OBSERVATIONS			
A. Implementation of the Remedy			
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).			
<p><i>This is a residential cleanup for lead-contaminated yards with off-site disposal of soil. The city of Omaha conducts post-remedy evaluation inspections to ensure the remedy is still protective. This data is displayed in the FYR. Yards are inspected for disturbance (distressed vegetation, weeds, bare soil, and/or a residential structure being demolished). This site inspection was conducted under the City's routine inspections. All inspection data is stored on a GIS platform created by the city of Omaha.</i></p>			
B. Adequacy of O&M			
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.			
<p><i>Remedial action is ongoing; no O&M</i></p>			

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Most yards have some form of disturbance to the remedy. During this inspection distressed vegetation and bare areas of soil were observed at the properties. No change in site conditions, such as the demolition of a residential structure, were observed. However, the Site has over 13,000 individual residential properties that have been remediated and this was a very small subset of data collected since the last FYR. Properties noted as having weeds, bare spots, etc., are still considered to be effective in preventing exposure.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

N/A