

Explanation of Significant Differences + Public Comment Period, Operable Unit 1, Colorado Smelter Superfund Site

Pueblo, Colorado

Introduction and Statement of Purpose

This Explanation of Significant Differences (ESD) plus public comment period presents the details of a proposed change to the remedy selected in the September 26, 2017, Early Interim Action Residential Property Cleanups Operable Unit 1 Record of Decision (OU1 i-ROD) for residential soils and indoor dust located in Operable Unit 1 (OU1) of the Colorado Smelter Superfund Site located in Pueblo, Colorado. Public comments will be accepted for a minimum of 30 days, and the EPA will prepare a Responsiveness Summary responding to all public comments received, which will be included in the final ESD. The OU1 selected remedy identified in the 2017 OU1 i-ROD is herein referenced as the “Existing Remedy.”

The EPA is the lead agency for the Colorado Smelter Superfund Site (Site) and has prepared this ESD in conjunction with the Colorado Department of Public Health and the Environment (CDPHE), the support agency. This ESD documents EPA’s action of updating the Existing Remedy. Specifically, this ESD is proposing to update the remedial action cleanup level for lead in OU1 residential soils and indoor dust and to implement new layers of protection to achieve protectiveness. An update to the Existing Remedy is needed to implement EPA’s *Residential Soil Lead Directive for CERCLA Sites and RCRA Hazardous Waste Cleanup Facilities* ([2025](#) Lead Directive).

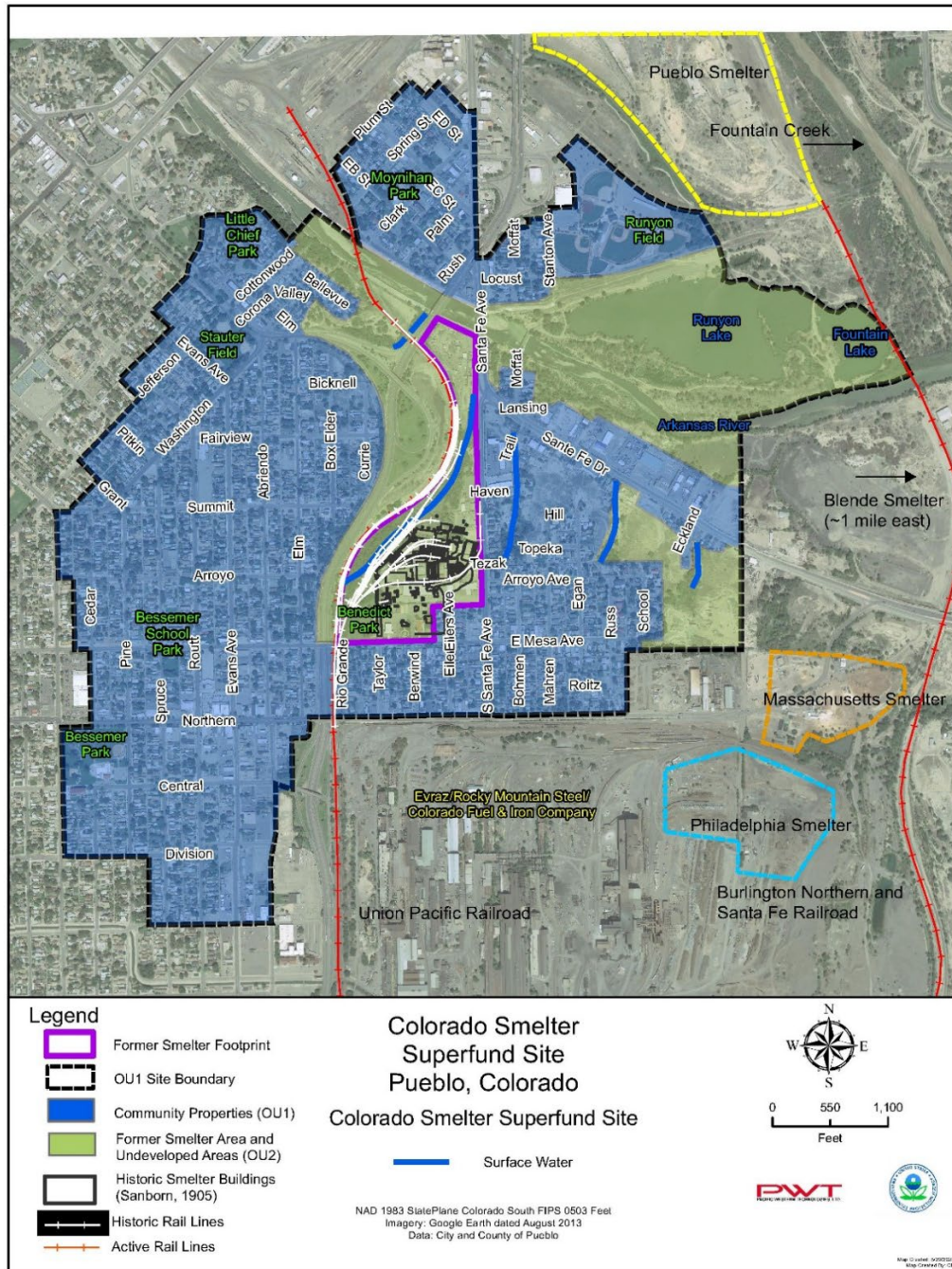
Background and Site History

The Colorado Smelter Superfund Site (Colorado Smelter Site or Site) is in south central Pueblo, Colorado, and includes the historic Colorado Smelter, previously owned and operated by the American Smelting and Refining Company (ASARCO). The Site is organized into two geographic operable units. Operable Unit 1 (OU1) consists of community properties within an approximate one-half-mile radius surrounding the former smelter facility, an area encompassing approximately 700 acres. There are approximately 2,060 residential parcels and another 250-350 non-residential parcels within OU1, including vacant properties, commercial businesses, schools, parks, and city-owned alleys and rights-of-way. This ESD only addresses OU1 residential parcels. Operable Unit 2 (OU2) is south of the Arkansas River, west of Santa Fe Avenue, north of Mesa Avenue and east of Interstate 25. OU2 consists of the former smelter area, including slag piles and several more acres of active commercial businesses overlying the former smelter footprint. A map depicting the Site boundary is included below, in Figure 1.

Pueblo, Colorado is about 4,700 feet above mean sea level in a high desert region of southern Colorado at the confluence of the Arkansas River and Fountain Creek. Precipitation is generally low, with the winter months receiving very little moisture. The region is arid and at times windy, making bare soils prone to movement and creating dusty conditions in the study area and

throughout Pueblo. The dry conditions increase the mobility of metals-contaminated soils throughout the community. The drinking water in the study area is from municipal water sources that are not contaminated with lead or arsenic. Potential groundwater contamination will be addressed under OU2.

Figure 1: Colorado Smelter Superfund Site Boundary



In 2024, EPA modified the Existing Remedy via an ESD (2024 ESD). In the 2024 ESD, the EPA recognized the OU1 study area as the final OU1 Boundary, which reflects the nature and extent of Colorado Smelter-related contamination in residential soils, and modified the Existing Remedy to implement institutional controls (ICs) for residential properties within the OU1 Boundary where contaminated soil is left in place above levels acceptable for unlimited use and unrestricted exposure. The EPA does not anticipate expanding the OU1 Boundary.

Nature and Extent of Residential Soils and Interior Dust Contamination

The historic Colorado Smelter was a silver and lead smelter that operated in the Eilers and Bessemer neighborhoods from 1883 to 1908. The Colorado Smelter historical footprint is bound by Santa Fe Avenue to the east, Mesa Avenue to the south, Interstate 25 to the west, and the Arkansas River to the north. The Bessemer, Eilers, and Grove neighborhoods are adjacent to the former Colorado Smelter site, which now consists of building remains and an approximately 700,000-square-foot slag (waste) pile. Some slag from the facility was used as track ballast for the D&RG track constructed between Florence and Cañon City; and, in 1923, bricks from the blast furnace smokestack were used to construct St. Mary School. Pueblo was once home to five ore smelters and is still home to one active steel mill, which is not a part of the Superfund site.

In the early 1990s, the Colorado Department of Public Health and Environment (CDPHE) discovered the contamination at the Colorado Smelter Site during an inspection of the Santa Fe Bridge Culvert site, who then initiated a series of additional investigations at the Site. In 2010, the CDPHE inspected properties surrounding the Colorado Smelter. This study found the presence of elevated lead and arsenic levels which pose a threat to current and future residents. In December 2014, the EPA listed the site on the National Priorities List due to the high levels of arsenic and lead (metals) identified in smelter slag and neighborhood soils from aerial deposition and slag. The EPA then divided the Site into two operable units (OUs), OU1 (Community Properties) and OU2 (Former Smelter Area).

There are approximately 2,060 residential parcels and between 300-400 commercial and vacant non-residential properties in the OU1 study area, which covers slightly larger than an approximate half-mile radius from the former smelter's tallest smokestack. They are predominantly single-family, detached homes, many with bare-soil yards. It is assumed approximately ninety-five percent of the homes are pre-1978 (before the lead paint ban) so lead-based paint hazards may also be present. Since 2015, the Pueblo Department of Public Health and Environment (PDPHE) has helped share lead education and outreach materials, characterize lead-based paint hazards, and complete blood lead screening in the study area through their EPA Cooperative Agreement.

From 2015 to the present day, residential sampling has been ongoing. In 2016, the EPA commenced indoor dust cleanups in OU1 and commenced residential soil cleanups in OU1 in 2018. OU2 (former smelter area) is currently in the Remedial Investigation/Feasibility Study (RI/FS) phase of the Superfund process. Additional OU2 sampling will help determine the type and scope of cleanup

activities that may be needed for those areas.

In July 2018, the EPA expedited funding for the OU1 residential cleanup based on risk to residents in the study area from Colorado Smelter-related lead and arsenic contamination. The expedited remedial funding strategy provided up to \$15 million in annual cleanup funding through 2022, more than double the amount originally budgeted. The EPA used this funding to expedite the EPA's work to remove lead at homes in the Bessemer, Eilers, and Grove neighborhoods. As a result of the expedited funding, the EPA estimated residential cleanups would cost approximately \$75 million to remediate 850 residential properties and take four to six years to complete, instead of the ten-year or more timeframe that EPA originally estimated in the OU1 i-ROD. As of January 1, 2026, residential soils at 815 properties have been remediated and 548 interior dust remediations have been completed.

Existing Remedy

The OU1 i-ROD for residential properties was signed on September 26, 2017. Under the OU1 i-ROD, the cleanup level is 350 parts per million (ppm) for lead and 61 ppm for arsenic. If contamination remained at depth, visual barriers were placed. The language in the OU1 i-ROD is as follows: "Soil Removal and Replacement to 18 Inches Below Ground Surface with Indoor Dust Cleanup." Remedial Action Objectives (RAOs) are statements regarding the objectives to be achieved by the final remedial action. The EPA developed the following OU1-specific RAOs for arsenic and lead in residential soil and indoor dust in order to protect human health from lead and arsenic at the Site and to describe what the cleanup will accomplish. The OU1 RAOs and Existing Remedy Components per the 2017 OU1 i-ROD are as follows in Table 1.

Table 1: OU1 RAOs and Existing Remedy Components

OU1 RAOs	Existing Remedy Components
The RAOs for arsenic and lead in soil are intended to reduce human exposure to residential soils with contamination exceeding health based cleanup levels.	The arsenic cleanup level is 61 parts per million (ppm) and the lead cleanup level is 350 ppm. The Hotspot or NTE cleanup level for arsenic is 1,000 ppm and for lead is 1,918 ppm. Institutional controls will be needed for properties where contaminated soil is left in place above levels safe for unlimited use and unrestricted exposure.
The RAOs for arsenic and lead in dust are intended to reduce human exposure to indoor dust exceeding the health based cleanup levels for residential arsenic and lead in indoor dust.	The indoor dust arsenic cleanup level is 61 ppm and the indoor dust lead cleanup level is 275 ppm.

This ESD does not change these RAOs presented in the 2017 OU1 i-ROD but further clarifies the RAOs and CULs.

Revising the Lead Cleanup Levels for Residential Soils and Indoor Dust

The EPA is the lead agency for oversight of the investigations, feasibility studies, remedial designs, and remedial actions at the Site. The CDPHE is the support agency, and the PDPHE is a critical lead education and outreach partner for this project. When documenting significant changes made to a selected remedy, the lead agency must comply with CERCLA §117(c) and NCP §§300.435(c)(2)(i) and 300.825(a)(2).

This ESD + public comment period is issued in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, (CERCLA), 42 U.S.C. 9617(c) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Section 300.435(c)(2)(i), which require the lead agency to publish an explanation of significant differences when the differences in the remedial action significantly change but do not fundamentally alter the remedy selected in the ROD with respect to scope, performance, or cost. The proposed changes described in this ESD significantly change, but do not fundamentally alter, the Existing Remedy with respect to scope, performance, or cost of the selected remedy.

This ESD and its supporting documentation will be incorporated into the Administrative Record maintained for this Site, as required by the NCP Section 300.825(a)(2). All documents making up the Administrative Record are available for public review on the [Colorado Smelter site profile page](#). A notice containing a summary of this ESD will also be published in a local newspaper, as required by NCP Section 300.435(c)(2)(i)(A) & (B).

Basis for this ESD + Public Comment Period

CERCLA Section 121 establishes requirements to select remedies that are protective of human health and the environment. The implementing regulation for CERCLA, the NCP, further details protection of human health and the environment, indicating that the protection of human health and the environment is to be maintained over time.¹ After the EPA selects a remedy in a Record of Decision (ROD), new information may be identified that could affect the implementation or the long-term protectiveness of the selected remedy.² In this case, the EPA issued the *Residential Soil Lead Directive for CERCLA Sites and RCRA Hazardous Waste Cleanup Facilities* (October, 2025)³ (2025 Lead Directive), and the Superfund Lead-Contaminated Residential Sites Handbook⁴ (Handbook). Collectively, the recommendations in these key guidance documents have prompted the EPA to reevaluate the residential lead cleanup level at this site.

Given the program's statutory responsibility to maintain protectiveness, it is essential that new information or changed conditions be evaluated for impacts on human health and the

¹ 40 CFR 300.430(a)(1)(i)

² *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (OSWER 9200.1-23P, July 1999)

³ Residential Lead Directive for CERCLA Sites and RCRA Hazardous Waste Cleanup Program Facilities. October 2025. <https://www.epa.gov/superfund/residential-soil-lead-directive-cercla-sites-and-rcra-hazardous-waste-cleanup-facilities>

⁴ <https://www.epa.gov/superfund/lead-superfund-sites-guidance#residentialsites>

environment. As stated in the 2025 Lead Directive, evaluations of previously addressed sites could be conducted in support of a CERCLA five-year review or other technical review. When the 2017 i-ROD was issued for Colorado Smelter Operable Unit 1, the target blood-lead level associated with the selected cleanup level was 6.24 µg/dL. The 2025 Lead Directive recommends that regions should use the most current version of the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) with 5 µg/dL as the 95th percentile target blood-lead level and site-specific environmental data (e.g., lead concentrations in various media and bioavailability) to develop protective preliminary remediation goals (PRGs) and cleanup levels (CULs) for residential land use.

Considering the 2025 Lead Directive, Handbook, and the site-specific risk evaluation, the EPA evaluated whether the current remedy is still protective. Based on recommendations in the EPA's 2025 Lead Directive, the CUL for this site will now be based on a target blood-lead level of 5 µg/dL.³

The EPA calculated a new risk-based PRG for lead using EPA's IEUBK [version 2], incorporating site-specific values as appropriate. The results indicate that the revised site-specific risk-based residential soil PRG for lead should be 241 ppm⁵. The site-specific risk-based residential soil PRG for lead was derived incorporating site-specific bioavailability and a target blood-lead level. Consistent with Agency policy, the risk-based PRG may be adjusted based on ARARs or to account for uncertainty, technical limitations (i.e., detection and/or quantification limits), and site-specific soil lead background levels.⁶

Because the EPA generally does not establish cleanup levels lower than background concentrations, the EPA conducted a background study to determine whether both naturally occurring and urban background concentrations of lead in soils are below the site-specific risk-based residential soil PRG value of 241 ppm. Following the implementation of the background study, the EPA determined that both naturally occurring and urban background concentrations of lead in soils are both below the calculated PRG value of 241 ppm.⁸ Therefore, the proposed CUL for lead in residential soils is 240 ppm and interior dust is 110 ppm, rounded from the calculated values of 241 ppm and 115 ppm, respectively, for implementation purposes. The final cleanup levels will be documented in the final ESD after a public comment period and responsiveness summary.

This ESD documents the EPA's proposal to modify the Existing Remedy to lower the OU1 residential soil and indoor dust lead cleanup levels from 350 ppm and 275 ppm, respectively, to 240 ppm and 110 ppm. The determining factors for indoor dust actions will require an exceedance of the revised lead cleanup level for indoor dust (110 ppm) and a request from the resident for an indoor dust remediation. This ESD does not modify the not-to-exceed values determined in the 2017 i-ROD.

⁵*Calculation of Updated Residential Soil Lead Risk-Based Preliminary Remediation Goals for Colorado Smelter Operable Unit 1 Memo, October 22, 2024*

⁶*Role of Background in the CERCLA Cleanup Program (OSWER 9285.6-07P, April 26, 2002)*

⁷*Assessment of Interior Lead (Pb) Dust Remediations at the Colorado Smelter site under the 2025 OLEM Directive Memo, February 4, 2026*

The 2025 Lead Directive emphasizes the use of layers of protection to achieve protectiveness, including physical removal or capping of contaminated soils, institutional controls to restrict land use that would expose contamination, and informational devices to educate the public about potential lead exposure and ways to limit that exposure. This ESD documents the EPA’s proposal to add additional layers of protection to the Existing Remedy through this ESD to include pairing new informational devices and community outreach efforts with the existing remedy of physical removal and ICs.

As of January 1, 2026, 815 residential properties and 548 indoor dust properties in OU1 were remediated. With the proposed revised lead cleanup goal correlating to a blood-lead level of 5 µg/dL, approximately 713 additional exterior soil properties require action. EPA does not anticipate an expansion of the site boundary. In line with the 2025 Lead Directive, which emphasizes focusing CERCLA resources on site-attributable releases⁷, the EPA proposes indoor dust remediation will not be conducted unless the cleanup level has been exceeded and the resident requests remediation.

Description of Significant Differences

This ESD documents the EPA’s decision to modify the residential lead CULs in the Existing Remedy to reflect the most up-to-date science, further protecting human health and the environment. The significant differences from the Existing Remedy and the action that the EPA is proposing in this ESD are to lower the OU1 residential soil and indoor dust lead cleanup levels and implement additional layers of protection to achieve protectiveness. The EPA proposes to lower the OU1 soil cleanup levels for lead to 240 ppm and lower the OU1 dust lead cleanup levels to 110 ppm. The EPA also proposes to add new informational devices, including expanded educational materials and outreach, to the existing remedy of physical cleanup and ICs. The cost of this ESD is estimated to be \$80,000,000. The OU1 remedial action cost, as identified in the 2024 ESD, was approximately \$75M. It is anticipated that this ESD will increase OU1 remedial action costs by \$80M for a total of approximately \$155M.

With the significant estimated number of additional properties that may require re-evaluation for action, additional time to complete the remedial action activities will be necessary. This will expand the originally anticipated timeline described in the Existing Remedy. At this time, the EPA expects that the additional action will require an additional 10 years to complete from today but will actively evaluate efficiencies and project management techniques to expedite the cleanup timeline. The EPA will prioritize the most vulnerable populations, including young children, pregnant women and nursing mothers, in the re-evaluation for remedial actions.

2017 Interim Record of Decision	2024 ESD	2026 ESD
Established lead cleanup goals for exterior soil and indoor dust	- Finalized OU1 Site Boundary - Called for implementation of	- Revise lead action levels per 2025 Lead Directive - Exterior soil cleanup

• Exterior Soil lead cleanup goal of 350 ppm • Interior Dust lead cleanup goal of 275 ppm	institutional controls on residential properties with concentrations above unlimited use/unrestricted exposure	level of 240 ppm • Interior Dust cleanup level of 110ppm* • Implement additional layers of protection including education and outreach
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* The determining factors for indoor dust actions will require an exceedance of the revised lead cleanup level for indoor dust (110 ppm) and a request from the resident for an indoor dust remediation.

Support Agency Comments

The Colorado Department of Public Health and Environment concurs with this ESD. The Colorado Department of Public Health and Environment indicated that the State's 10% remedial action cost share for the additional remediation actions at OU1 could cost approximately \$8 million.

Statutory Determinations

In accordance with CERCLA Section 121, 42 U.S.C. § 9621, the EPA believes that this action is protective of human health and the environment and complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action. This ESD makes no changes to the remedy's use of permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

Because this action will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will continue to be conducted within five years after the remedial action to ensure that the remedy is, or will be, protective of human health and the environment. The most recent five-year review was completed on January 23, 2023. This review found that the remedy will be protective of human health and the environment when the interim remedy is complete based on Pb policy at that time. This modified remedy satisfies CERCLA §121.

Public Participation Requirements

As required by the NCP Section 300.825(a)(2), the EPA has prepared an Administrative Record that includes all the supporting documentation that the EPA relied upon to develop this ESD. The Administrative Record includes the 2017 OU1 i-ROD, 2022 Site Expansion, Background Study, Site Boundary Technical Memo, and the Risk-Based Preliminary Remediation Goals Memo. The Administrative Record will be available for public review at this location <https://www.epa.gov/superfund/colorado-smelter> under the Site Documents & Data tab. As required by NCP Section 300.435(c)(2)(i)(A) & (B), EPA will publish a notice containing a brief summary of this ESD in a major local newspaper. The Site's Community Advisory Group (CAG) will also have the opportunity to discuss this ESD at the monthly CAG meetings. The public participation requirements set out in NCP section 300.435(c)(2)(i)(A)&(B) have been met.