Explanation of Significant Differences
Community Soils Operable Unit
Anaconda Smelter NPL Site
May 2017

1.0 Introduction

This Explanation of Significant Differences (ESD) describes two changes to the remedy for the Community Soils Operable Unit (OU) of the Anaconda Smelter Superfund Site as identified in the 1996 Community Soils OU Record of Decision (ROD) and the 2013 Community Soils ROD Amendment. This ESD provides information about these changes (one to the 1996 ROD and one to the 2013 ROD Amendment) and includes the site history, selected remedy, basis for the changes, support agency comments, statutory determinations and documentation of public participation compliance.

The U.S. Environmental Protection Agency (EPA) is the lead agency for this ESD, with support from the Montana Department of Environmental Quality (DEQ). The basis for the changes to the remedy is supported by data and technical analysis provided in the *Final Residential Soils and Dust Remedial Action Work Plan/Final Design Report* (Atlantic Richfield 2015).

EPA will publish a notice of availability and a brief description of the ESD in local newspapers (as required by Code of Federal Regulation 40 Section 300.435(c)(2)(i)(B)). This ESD and supporting documents referenced herein will become a part of the Anaconda Smelter Administrative Record file and information repository (as required by CFR 40, Section 300.435(c)(2)(i)(A) and 300.825(a)(2)).

Comprehensive information on the Anaconda Smelter Superfund site is available at:

U.S. Environmental Protection Agency
Region VIII Superfund Record Center
10 West 15th Street, Suite 3200
Helena, MT 59626

and

Arrowhead Foundation
Technical Assistance Group
118 East 7th Street
Anaconda, MT

2.0 Site History and Enforcement Activities

The site is located in the Deer Lodge Valley in southwestern Montana, in and around the city of Anaconda. Milling and smelting activities conducted in the Anaconda area for nearly 100 years resulted in the contamination of soils, surface water, and ground water

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in the surrounding area, primarily through airborne emissions and disposal practices from smelting operations. The primary contaminants are arsenic, cadmium, copper, lead, and zinc.

The site was added to EPA's National Priorities List (NPL) in 1983, under Superfund authority. Atlantic Richfield (AR) was identified as the primary potentially responsible party. Since then, AR has been actively involved in investigation and cleanup and has conducted five cleanup actions to date:

1. Mill Creek OU. This first clean-up action involved relocating residents from Mill Creek and other soil stabilization and removal efforts.

2. Flue Dust OU. The second clean-up action addressed flue dust through removal, treatment, and containment. At the same time, AR removed the Arbiter and beryllium wastes and contaminated residential yard materials from portions of Anaconda.

3. Old Works/East Anaconda Development Area (OW/EADA) OU. The third clean-up action addressed waste sources within the OW/EADA OU.

4. Community Soils OU. The fourth clean-up action addresses all remaining residential and commercial soils in Anaconda, Opportunity and the surrounding area.

5. Anaconda Regional Water, Waste and Soils OU. The fifth and final OU addressed all remaining contamination at the site, including large volumes of wastes, slag, tailings, debris, and contaminated soil, ground water, and surface water that are spread over 300 square miles of agricultural, pasture, rangeland, forests, and riparian and wetland areas.

3.0 Selected Remedy and Summary of Work

The Community Soils OU remedy was documented in a 1996 ROD. The ROD addressed all remaining residential and commercial/industrial soils of the Site, and brought closure to previous removal actions. Major components of the remedy included: 1) removal of residential soils with arsenic concentrations above an action level of 250 parts per million (ppm) to a maximum depth of 18 inches; 2) treatment or covering commercial/industrial soils with arsenic concentrations above an action level of 500 ppm; 3) constructing an engineered cover over contaminated railroad bed materials on the active line through Anaconda; 4) cleanup of future residential and commercial/industrial soils, at the time of development, through the Anaconda-Deer Lodge County (ADLC) Development Permit System (DPS); and 5) implement ICs to provide educational information to residents describing potential risks and recommendations to reduce exposure to residual contamination.

In 2002, EPA and DEQ approved the Residential Soils Remedial Action Work Plan/Final Design Report for the Community Soils OU. Since then, approximately 1,740 residences in Anaconda and the surrounding rural area have been sampled with approximately 350 yards cleaned up where the area-weighted average arsenic concentration exceeded the 250 ppm action level in the surface soil. Approximately 39 acres of commercial properties exceeding the 500 ppm action level were also cleaned up.

An engineered cover consisting of crushed rock was placed on the active railroad line through Anaconda, including the active west and east rail yards. After the ROD was issued, EPA became aware of several abandoned or historic rail and/or trolley lines within Anaconda. Consistent with the 1998 Anaconda Regional Water, Waste and Soils OU ROD, waste materials associated with these abandoned lines were removed and consolidated into designated waste management areas at the Site.

Based on data collected during the remedial action and concerns raised during the five-year review, EPA completed a ROD amendment in 2013 to incorporate fundamental changes to the original remedy to ensure protection of human health. Changes were primarily due to concentrations of lead in residential soil being significantly higher than those reported in the original remedial investigation/feasibility study (RI/FS) as well as changes to the extent and distribution of contamination within certain residential areas of the Site. The amended remedy included the addition of a cleanup level for lead in residential soils (400 ppm) and cleanup levels for arsenic and lead in accessible interior dust (250 and 400 ppm, respectively) as well as the expansion of ICs to provide for a health education program through the ADLC Community Protective Measures Program (CPMP). All other components of the original remedy were unchanged.

4.0 Basis for and Description of Significant Differences

Following the issuance of the 2013 ROD Amendment, AR submitted a draft of the Community Soils OU Residential Soils and Interior Dust Remedial Action Work Plan/Final Design Report (RAWP/FDR) to EPA and DEQ with data and technical analysis supporting changes to both the original 1996 ROD and 2013 ROD amendment. The data and technical analysis included the following:

1. Anaconda Community Soils Remedial Action Work Plan Technical Memorandum #1 – Basis for Excluding Living Space Dust and Addressing Only Accessible Attic Dust through Analysis of the Existing Data; and

2. Anaconda Community Soils Remedial Action Work Plan Technical Memorandum #2 – Modifying the Sample Depth Intervals used to make Remedial Decisions for Arsenic and Lead in Yard Soils.

These two technical memorandums provide the basis for the two significant differences in this ESD. Each is discussed below.

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4.1 Significant Difference #1 – Address Interior Dust Contamination through a Comprehensive Interior Dust IC Program

The 2013 ROD Amendment required the development of an interior dust abatement program to sample and cleanup interior dust exceeding the lead and arsenic concentrations of 400 and 250 ppm, respectively, in all living spaces. Sampling would be conducted when soil sampling was required under the remedy. This remedial component has been modified to continue to address the primary sources of interior dust contamination (soils and attic dusts) through sampling and cleanup but rely on a comprehensive health and education program, including an interior dust program, to address residual interior dust contamination in the living space for all residents at the Site.

This change to the 2013 ROD Amendment is supported by AR's data analysis, in technical memorandum #1, which showed that only one of the 52 homes sampled for interior dust exceeded the 250 mg/kg action level for arsenic. That home (built after 1980 when the smelter closed) is located in the Aspen Hills Subdivision, and had non-vegetated soils with an area weighted average arsenic concentration of 801 ppm. This affirms the risk conceptual model presented in the 1996 ROD that the principle source of arsenic to interior dust is from soils. Other homes with vegetated yards did not follow this model.

Although data collected by EPA in 2007 (2008 Residential Soils Data Interpretation and Analysis Report) showed that the correlation between arsenic and lead in soils was statistically significant, AR's data analysis showed that there was no correlation between arsenic and lead in interior dust in the available data set. AR's postulated thesis was that the likely source of the elevated lead in interior dust (12 out of the 52 homes sampled) was from deteriorating lead paint in older homes.

The technical memorandum provides ratios of the geometric means of arsenic and lead concentrations of soil, interior dust, and attic dust, and notes that while the soil and attic dust ratios are similar, the interior dust is skewed towards lead. Review of the 12 residences where lead in interior dust exceeds 400 mg/kg show that they are older homes in Anaconda with one exception. That exception is a home built in 1978, located in Crackerville, in a generally non-vegetated area impacted by fluvial tailings exceeding lead concentrations of 400 ppm in soils.

With the exception of rural residences clearly impacted by elevated arsenic and/or lead concentrations in non-vegetated soils, lead in interior dust, primarily in older residences in Anaconda, appears to be impacted by multiple sources of contamination (smelter and non-smelter, i.e., lead paint). Based on this data analysis, EPA is modifying the remedy to address interior dust contamination through a comprehensive health and education program rather than sampling and remediation.

The remedy will continue to address all residential soils, regardless of vegetation, exceeding the arsenic and lead concentrations in soils of 250 and 400 ppm, respectively. Attic dust exceeding the action levels will also be remediated where there is an obvious exposure pathway (resident access and use of attic or ceilings (or other barriers to the attic) that are in disrepair).

EPA believes that addressing interior dust contamination through the comprehensive interior dust program proposed by Anaconda-Deer Lodge County (ADLC), under the Community Protective Measures Program, will better address the multiple sources of lead contamination and exposures that potentially affect the residences living in older homes in Anaconda.

Elements of ADLC's Interior Dust Program include the following:

- Education. ADLC will provide information regarding potential sources of arsenic and lead in the home, including non-smelter sources. This includes lead paint (present in the majority of housing stock in anaconda), products, and food sources that could create exposure to arsenic and lead.

- Cleaning, Hygiene, and Diet Guidance. ADLC will provide information regarding best practices for cleaning dust, including regular hand washing to prevent contamination of food, and best diet sources to reduce the effects of contamination exposure.

- HEPA Vacuum Cleaner Loaner Program. ADLC will offer standard upright vacuum cleaners with HEPA filters for a more thorough house cleaning, and two types of canister shop -type vacuums with HEPA filter for cleaning during and after home improvement projects.

- Renovation Starter Kits. ADLC will provide kits containing products designed to both educate and get home owners started on a home improvement project to minimize the effects of dust. ADLC will also provide best management practices for working with materials in the home that likely contain lead paint, including various abatement methods the property owner can implement.

- Home Inspections. ADLC will conduct home inspections, similar to an energy audit, to identify sources of air infiltration (windows, doors, cracks in the ceilings and walls, gaps around fixtures, etc.) where dust from walls and attics may be entering the home. ADLC will provide guidance on how to best seal these gaps.

Through the educational awareness and outreach components of the Community Protective Measures Program, high risk groups such as low income residents and residents with children will be targeted on how to reduce the risk of exposure to residual arsenic and lead, including interior dust.

4.2 Significant Difference #2 – Modifying the Maximum Remediation Depth of Arsenic Contaminated Yard Soils.

The 1996 ROD required removal of residential soils exceeding 250 ppm arsenic to a maximum depth of 18 inches. This remedy is modified to remove arsenic contaminated soils in gardens to a maximum depth of 24 inches and 12 inches for other areas of a residential yard. This change makes the remediation of arsenic contaminated soils consistent with the remediation of lead contaminated soils under the 2013 ROD Amendment.

AR's technical memorandum #2 noted that the 18-inch soil removal criteria identified in the 1996 Community Soils OU ROD was an artifact from criteria originally developed for minimum plant growth media thickness placed over waste material. It was also assumed that 18 inches would represent the depth of typical yard activities, including gardens. Current EPA guidance (2003) provided in the Lead (Pb) Handbook identified a 12 inch cover as being protective of human health in residential yards with a recommended 24-inch depth for gardens. Changing the arsenic cleanup requirement to be consistent with the Pb Handbook is appropriate.

EPA, therefore, is changing the 1996 ROD criteria for removal/replacement depth of arsenic contaminated residential yard soils from of 18 inches to 12 inches. For gardens, EPA is also changing the arsenic removal criteria from a depth of 18 inches to 24 inches. Note that visible waste materials below the depth criteria will also be removed and consolidated into a waste management area at the Site. Additionally, future gardens will be addressed through the ADLC Community Protective Measures Program which includes clean soil swaps/garden boxes to achieve 24 inches of adequate soil.

6.0 Support Agency Comments

The Montana Department of Environmental Quality concurs with these remedy changes.

7.0 Statutory Determinations

EPA has determined that these remedy changes, as amended herein, are protective of human health and the environment, comply with all federal and state requirements that are applicable or relevant and appropriate to this remedial action, meet the remedial action objectives, are cost effective, utilize permanent solutions and alternative technologies to the extent practicable, and satisfy the requirements in section 121 of CERCLA.

The remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. However, contaminated soils present at the Community Soils OU do not represent a principal threat, and treatment would be significantly more expensive due to the very large quantities of materials impacted. Although they are present in large volumes, the soils within the Community Soils OU are low in toxicity and can be reliably contained.

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Because implemented remedies have resulted in mining/smelting contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure, statutory five-year reviews have been initiated at the Site and will continue to ensure that remedies remain protective of human health and the environment. The five-year reviews will continue to focus on areas where waste has been left in place or where remaining concentrations do not allow for unlimited use of the property.

7.0 Public Participation Process

A formal public comment period is not required for an ESD. EPA will publish a notice of availability and a brief description of the ESD in the *Anaconda Leader* and *Montana Standard* (as required by Code of Federal Regulation 40, Section 300.435(c)(2)(i)(B). This ESD and supporting documents will become a part of the Anaconda Smelter Administrative Record file and information repository (as required by CFR 40, Section 300.435(c)(2)(i)(A) and 300.825(a)(2)).

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U.S. Environmental Protection Agency Region 8

Date

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