**Explanation of Significant Differences**
**Community Soils Operable Unit**
**Anaconda Smelter NPL Site**
**November 2016**

## 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 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 data 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 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 in the surrounding area, primarily through airborne emissions and disposal practices from



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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. 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 removes remaining contaminated residential, commercial and industrial soils in Anaconda.

5. Anaconda Regional Water, Wastes 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 specified cleanup of contaminated residential soils with arsenic concentrations above an action level of 250 parts per million (ppm) to a depth of 18 inches. 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.

The third 5-year review for the Site (EPA 2006) cited issues related to finding arsenic concentrations that were significantly higher than anticipated based on previous remedial investigation/feasibility study (RI/FS) data. At the request of the EPA and DEQ, Atlantic Richfield analyzed archived soil samples from Anaconda residential yards where weighted average concentrations were below 250 ppm arsenic. 142 Anaconda yards were selected (approximately 10 percent of the yards evaluated in remedial action Phase 1) from which lead concentrations were determined in surface soils.

Atlantic Richfield also conducted additional sampling and analysis of interior (living space), exterior, and attic dusts in 52 Anaconda and regional residences. Houses were located in Anaconda (east and west of Main Street), Opportunity, and rural areas. Samples were also collected from newer houses (e.g., those built after 1975).

After examination of the data, EPA conducted additional studies to determine the significance of the findings. Three main concerns were identified from these studies:

- Elevated arsenic and lead concentrations are present in deeper soils.
- Elevated lead is present in yards that were not cleaned up.
- Elevated arsenic and lead are present in indoor dust.

Based on these concerns, EPA completed a ROD amendment in 2013 to incorporate fundamental additions to the original remedy to ensure protection of human health. The amended remedy includes the addition of a cleanup level for lead in soils and cleanup levels for arsenic and lead in accessible interior dust. 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, ARAR submitted a draft outline of the Community Soils OU Residential Soils and Interior Dust Remedial Action Work Plan/Final Design Report (RAWP/FDR) to EPA and DEQ (the Agencies) on March 27, 2014. Upon initial review, the Agencies provided a list of discussion items which were discussed with AR on April 23, 2014. Following this meeting, the Agencies submitted comments to the outlines on May 8, 2014.

In response to these comments, on August 15, 2014, AR submitted the following documents:

1. Comment Responses to the Draft CS OU Residential Soils and Attic Dust Remedial Action Work Plan/Final Design Report Annotated Outline;
2. Comment Responses to the Draft CS OU Residential Soils and Attic Dust Sampling and Analysis Plan Annotated Outline;
3. Draft Final CS OU Residential Soils and Attic Dust Remedial Action Work Plan/Final Design Report Annotated Outline;
4. Draft Final CS OU Residential Soils and Attic Dust Sampling and Analysis Plan Annotated Outline;
5. 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

6. 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.

The last two items, Technical Memoranda #1 and 2, form the basis for the two significant differences identified in this ESD. Each are discussed below.

### 5.1 Significant Difference #1 – Exclusion of Living Space Dust Sample and Addressing Only Accessible Attic Dust

AR's technical memorandum #1 analysis of existing data indicates that only one of the 52 homes sampled for interior dust exceeded the 250 mg/kg action level for arsenic. That home is located in the Aspen Hills subdivision, and had soils area-weighted arsenic concentration of 801 mg/kg (the highest arsenic concentration for soils for the 52 residences). This affirms the conceptual site model presented in the 1996 ROD that the principal source of arsenic to interior dust is the soils.

The October 2008 Residential Soils Data Interpretation and Analysis Report (CDM Smith 2008) showed that the correlation between arsenic and lead concentrations in soil was statistically significant. AR's technical memorandum #1 data analysis shows that there is no correlation between arsenic and lead for interior dust in the available data set, with the reasonably postulated thesis that arsenic and lead from the smelter would have been cleaned up, so that the likely source of the elevated lead in interior dust (12 out of the 52 homes sampled) is 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 with one exception. That exception, a home built in 1978, is located in Crackerville, an area previously identified as an elevated lead area due to the presence of fluvial tailings deposited from past Silver Bow Creek flooding. That residence also had lead exceeding 400 mg/kg in the soils.

Based on this data analysis, EPA is requiring that only accessible attics be sampled for dust under the current remedial action. Accessible attics are defined as those that meet one or more of the following criteria:

I. The attic is used as a living space.
II. On average, the resident(s) accesses the attic more than once per week. Criteria based upon *Assessing Intermittent or Variable Exposures at Lead Sites* (EPA, 2003b).
III. There is an obvious exposure pathway (i.e., ceilings in the living space immediately below the attic are in a condition of disrepair) to the attic.



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IV. The resident has contacted Anaconda – Deer Lodge County (ADLC) (per the Community Protective Measures Program (CPMP) public outreach programs) regarding concerns about potential exposure to attic dust, which may result from a home remodeling project.

After RA is complete, future attic dust remediation will be conducted through coordination with the CPMP. The CPMP will also include an interior dust program available to residents who have a concern about potential exposure to elevated concentrations of arsenic and lead, and to those engaged in home renovation, remodeling or demolition activities. The interior dust program will consist of the following components:

- Education. Information regarding potential sources of arsenic and lead in the home, including non-Superfund sources. This includes lead paint (present in the majority of the housing stock in Anaconda), products and food sources that could create exposure to arsenic and lead.

- Cleaning, Hygiene, and Diet Guidance. Information regarding best practices for cleaning dust, regular hand-washing to prevent contamination of food, and best diet sources to reduce effects of contaminant exposure

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

- Renovation Starter Kits. The kits contain 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. These inspections are similar to an energy audit in that we try to identify sources of air infiltration (windows, doors, cracks in ceilings and walls, gaps around light fixtures, etc.) where dust from walls and the attic 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 CPMP, high risk groups such as low income residents and residents with small children will be targeted on how to reduce the risk of exposure to arsenic and lead, including the interior dust program.

### 5.2 Significant Difference #1 – Modifying the Sample Depth Intervals used to make Remedial Decisions for Arsenic and Lead in Yard Soils

AR's technical memorandum #2 memorandum notes that the 18 inch soil removal criteria

identified in the 1996 Community Soils OU Record of Decision was an artifact from criteria original developed for minimum plant growth media thickness placed over waste material. As more recent EPA guidance in 2003 provided in the Lead (Pb) Handbook identified a 12 inch cover as being protective of human health, changing the arsenic cleanup requirement to be consistent with the Pb Handbook is appropriate.

EPA, therefore, is changing the 1996 ROD criteria from a removal/replacement depth of 18 inches for soils in residential yards. EPA is also changing the criteria for vegetable gardens to a depth of removal/replacement to 24 inches for both arsenic and lead concentrations that exceed the 250 and 400 mg/kg action levels, respectively. Note that the arsenic action level for vegetable gardens is based on the arsenic concentration of 250 mg/kg for the garden itself, not an area weighted average for all yard components. This is based on the risk of consumption of soils associated with garden produce, not the soil to dust transfer ratio used in other arsenic risk management decisions.

## 6.0 Support Agency Comments

To be added after once DEQ comment have been received.

## 7.0 Statutory Determinations

EPA has determined that these changes remedy, as it is amended herein, is protective of human health and the environment, complies with all federal and state requirements that are applicable or relevant and appropriate to this remedial action, meets the remedial action objectives, is cost effective, utilizes permanent solutions and alternative technologies to the extent practicable, and satisfies 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.

Because implemented remedies have resulted in mining 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*



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*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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Dated

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xxxxx
Assistant Regional Administrator
US EPA Region 8



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