



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX

75 Hawthorne Street
San Francisco, CA 94105

June 7, 2016

MEMORANDUM

SUBJECT: Request for Approval of a Non Time Critical Removal Action, a Ceiling Increase in excess of \$6 Million, and Emergency Exemption from the \$2 Million Statutory Limit, to continue the Removal Action at the Eureka Smelters Site (aka Town of Eureka), Eureka NV

FROM: Enrique Manzanilla, Director
Superfund Division

THRU: Reggie Cheatham, Director
Office of Emergency Management

James E. Woolford, Director
Office of Superfund Remediation and Technology Innovation

TO: Mathy Stanislaus, Assistant Administrator
Office of Land and Emergency Management

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the Non-Time Critical Removal Action (NTCRA), and to request a Ceiling Increase to a level in excess of \$6 million and an Emergency Exemption from the \$2 Million Statutory Limit, described herein to mitigate threats to human health and the environment posed by the presence of lead and arsenic in soil at the Eureka Smelters Site, aka Town of Eureka, (the "Site") located in Eureka, NV. The work to be performed under this NTCRA will be a continuation of work initiated under a previous Time Critical Removal Action. Approval of this request will bring the total approved removal action ceiling to \$8,950,000¹.

¹ "Removal Action Ceiling Costs," as defined by EPA guidance OSWER 9360.0-42 (November 5, 2001), includes only direct extramural costs. As discussed in this memorandum, additional costs may be incurred as recoverable as "incurred response costs."

As per section 300.415(b)(4) of the National Oil and Hazardous Substances Pollution Contingency Plan, "Whenever a planning period of at least six months exists before on-site activities must be initiated, and the lead agency determines, based on a site evaluation, that a removal action is appropriate: (i) The lead agency shall conduct an engineering evaluation/cost analysis (EE/CA) or its equivalent." This Action Memorandum is based on the U.S. Environmental Protection Agency's (EPA's) March 2016 EE/CA for the Eureka Smelters Site, public comments received pursuant to 40 CFR 300.415(n)(4), and the administrative record for the Site. The EE/CA is included as Attachment G.

The EE/CA identified five separate Operable Units (OUs) at the Site, and evaluated removal action alternatives for each OU. This Action Memorandum identifies the selected removal actions for each of the five OUs – OU-1: Residential Properties, OU-2 Slag Piles, OU-3: Undeveloped Parcels within or adjacent to former smelter and mill sites, OU-4 Eureka Creek and OU-5 Contaminated Material Disposal.

Prior to completion of the EE/CA, cleanup of residential properties (OU-1) was initiated under three previous Time Critical Action Memoranda. The work conducted to date included cleanup of 43 residential properties, and a portion of the Eureka Elementary School. Currently, EPA is in the field conducting cleanup of residential properties, using funding from the June 12, 2015 Time Critical Action Memorandum. This Non Time-Critical Action Memorandum would provide partial funding to continue work on OU-I and to initiate work on OU-3 and OU-5. Specifically, removal actions would be conducted at approximately 40 Tier I and Tier II residential properties (OU-1). In addition, a removal action would be performed at a former smelter location (Hillside No. 2 – OU-3). Lead and arsenic concentrations in soil at Hillside No. 2 are in excess of 100,000 mg/kg and 32,000 mg/kg respectively. Contaminated soil excavated as part of the work conducted related to OU-1 and OU-3 would be disposed of at a locally constructed landfill (OU-5). With regard to both OU-I and OU-3, Institutional Controls (ICs) and outreach and Education Programs would be implemented by the County and State. At present it is anticipated that this NTCRA will be conducted incrementally by EPA as a fund lead response action over a period of years; however, future work on this Site is contingent upon available funding.

EPA previously approved a response action in the July 30, 2013 Request for a Time-Critical Removal Action at the Eureka Smelters Site Action Memorandum, included as Attachment A to this memorandum. On April 9, 2014, EPA approved a Ceiling Increase Action Memorandum, which included an exemption from the \$2 million statutory limit, included as Attachment B to this memorandum. On June 12, 2015, EPA approved a Ceiling Increase Action Memorandum, which included an exemption from the 12-month statutory limit, included as Attachment C to this memorandum. On April 28, 2016, EPA approved a Ceiling Increase Action Memorandum, included as Attachment D to this memorandum. The total removal action ceiling authorized under the previous Time-Critical Action Memorandums was \$5,950,000.

Emergency conditions persist at this site which, if not addressed by implementing the response action documented in this Action Memorandum, may lead to continued exposures to hazardous substances, lead and arsenic, which may pose an imminent and substantial endangerment to the public health or welfare or the environment. Pursuant to EPA delegation

14-2 and Regional Delegation 1290.03A, the authority to approve a removal action ceiling greater than \$6 million and requiring an emergency waiver rests with the Assistant Administrator of the Office of Land and Emergency Management.

II. SITE CONDITIONS AND BACKGROUND

Site Status: Non-NPL
Category of Removal: Non Time-Critical
CERCLIS: NVN000909500
SITE ID: 09YJ

A. Site Description

1. Physical location

The Town of Eureka (Eureka) is an unincorporated community located in Eureka County, Nevada. The town occupies approximately 480 acres of land in the southern part of Eureka County, at an elevation of approximately 6,900 feet above sea level. The geographical coordinates for the approximate center of Eureka are 39° 30' 45" Latitude North and 115° 57' 39" Longitude West. A Site location map is provided as Figure 1.

2. Site characteristics

Eureka is situated in a historical mining district with at least seven known former ore milling and smelter operations located throughout the town (see Figure 2). Eureka is bisected by U.S. Highway 50 and a narrow intermittent creek, which are oriented north-south and extend the full length of the town. Eureka Creek flows down gradient to the north (Figure 8). The residential, commercial and public properties in Eureka are primarily situated in the hills along the east west sides of U.S. Highway 50. The historic wind direction through the town is predominately from the south to the north. The area directly to the north is hilly terrain that opens into a broad alluvial plain. There is a large open-pit gold mine located approximately one mile north-northwest of the town. The mine has been inactive since 2014.

There are two large slag piles located on both the north and south ends of town. Two smaller slag piles have been identified at other locations within the town. These slag piles are associated with former smelter sites. There are more than 400 residential, public, and commercial parcels in Eureka that are either on, adjacent to, or in close proximity to the sites of the former ore smelters and milling operations.

According to information obtained from the United States Bureau of Land Management (BLM) document *A Historic View of the ELM Shoshone-Eureka Resource Area, Nevada, Technical Report 7* (BLM, 1991), between 1866 and 1910, mining for geological deposits of silver and lead took place in the Ruby Hill area, which is located approximately 2 miles west of Eureka. During this period, over one-million tons of ore was extracted from Ruby Hill primarily by the Eureka Consolidated Mining Company and Richmond Consolidated Mining Company. The ore mined from Ruby Hill was then transported via railcar to various milling

and smelter operations historically located throughout Eureka. The following historic ore milling and smelter operations were identified in Eureka and are shown in Figure 2.

- Lemon Mill
- McCoys Mill
- Eureka Consolidated Smelter
- Matamoras Smelter
- Hoosac Smelter
- Atlas Smelter
- Richmond Company Smelter
- Jackson Smelter
- Silver West Smelter
- Lemon Mill
- McCoys Mill
- Taylor Mill

As a result of ore processing at these former mills and smelter sites, waste product known as slag was produced and consolidated into a number of separate piles located throughout Eureka. Due to the extensive amount of historic ore processing operations in Eureka, it has been reported that air emissions from these operations have historically resulted in health problems among residents and former smelter workers. The documents also described dead vegetation in and around Eureka resulting from air emissions from these operations (Paher 1970, BLM 1991). According to *Nevada Ghost Towns and Mining Camps* by Stanley Paher, 1970, Nevada Publications:

"On the outskirts of town, 16 smelters with a daily capacity of 745 tons treated ore from over fifty producing mines. Furnaces poured forth dense clouds of black smoke which constantly rolled over the town and deposited soot, scales and black dust everywhere, giving the town a somewhat somber aspect and killing vegetation. The "Pittsburgh of the West," Eureka was indeed the foremost smelting district in the entire West."

There were several flood events, including a major flood event in 1874 that reportedly washed out much of the town and smelter facilities. The intermittent creek in Eureka flows from south to north and eventually discharges to a flat, alluvial plain located approximately 5 miles north of Eureka.

There is one federally-listed threatened or endangered species, and 16 species that are protected by Nevada state legislation with potential habitat in Eureka County. These species are specifically identified in the EE/CA. EPA is not aware of the presence of any of these species in the areas affected by the proposed removal actions. EPA is not aware of ecologic risks associated with the site.

The Duckwater Shoshone Indian Reservation is located approximately 50 miles to the east of Eureka. EPA Region 9 has met with the Duckwater Tribal Executive Director and the Tribal

Environmental staff regarding the Removal Action in Eureka. Based on that discussion, no further consultation was found to be necessary.

3. Removal site evaluation

In 1978, the United States Department of Interior Geological Survey collected 593 samples that identified a 3-kilometer (km) by 6-km area of contamination within the Eureka mining district. The data were published in a 1978 report titled *Geochemical Analyses of Rock and Soil Samples, Eureka Mining District and Vicinity, Eureka and White Pine Counties* and discussed in a 2004 U.S. Geological Survey publication, *Hydrogeochemical Studies of Historical Mining Areas in the Humboldt River Basin and Adjacent Areas, Northern Nevada*.

In April 2012, EPA and Nevada Division of Environmental Protection (NDEP) personnel collected five slag and soil samples from publically accessible locations within Eureka. These samples were analyzed by x-ray fluorescence (XRF) instrumentation and high levels of arsenic and lead (in excess of 12,000 mg/kg and 44,000 mg/kg respectively) were identified.

In May 2012, EPA and NDEP personnel collected 38 additional surface soil samples from publically accessible locations around Eureka for lead and arsenic analysis. The analytical results for arsenic indicated that five samples had arsenic concentrations below 60 mg/kg, 23 samples had arsenic concentrations between 60 mg/kg and 600 mg/kg, and 10 samples had arsenic concentrations above 600 mg/kg. The arsenic concentrations in samples ranged from 10 mg/kg to 6,700 mg/kg. The analytical results for lead indicated that 10 samples had lead concentrations below 400 mg/kg, 20 samples had lead concentrations between 400 mg/kg and 5,000 mg/kg, and 8 samples had lead concentrations above 5,000 mg/kg. The lead concentrations ranged from 44 mg/kg to 45,000 mg/kg. The highest lead soil concentrations were detected at the slag piles located on both the north and south ends of Eureka, and at former smelter site locations.

In October 2012, EPA conducted a Removal Assessment in Eureka. Surface and shallow subsurface soil samples were collected from residential and public properties located throughout Eureka where access was granted by the owner to EPA and NDEP. For sampling purposes, residential properties were generally divided into front yard, back yard, side yard and driveway decision units. A total of 268 decision units from 106 individual residential and public properties were sampled during this removal assessment.

Results from the Removal Assessment indicated that the majority of sampled residential properties had significant concentrations of both lead and arsenic. The mean lead concentration was estimated at 1,880 mg/kg, and the mean arsenic concentration was estimated at 327 mg/kg. In background samples, the mean lead concentration was 47 mg/kg and the mean arsenic concentration was 25 mg/kg. Isoconcentration maps depicting the concentration of lead and arsenic in surface soils are presented in Figures 3 and 4. Approximately 20 properties were identified where arsenic and lead soil concentrations exceeded initial Removal Action levels of 600 mg/kg arsenic and 3,000 mg/kg lead. Over seven percent of all soil samples collected exceeded the initial Removal Action level for

arsenic, and over 10 percent of all soil samples exceeded the initial Removal Action level for lead.

In order to estimate the bioavailability percentage of lead and arsenic in soil samples collected from Eureka, a cross-section of 43 soil samples was selected and analyzed using bio-accessibility extraction procedure EPA 9200.2-86. Of the selected 43 soil samples, 65% were from residential properties, 26% were from vacant or undeveloped properties, 7% were from commercial properties, and 2% were from the Eureka Consolidated (north) slag pile.

In addition to the bioaccessibility testing that was performed by the EPA Region 9 Laboratory, EPA shipped six Eureka soil samples to EPA's Office of Research and Development (ORD) for bioavailability/bioaccessibility testing. Samples were also shipped to the EPA ORD for *in vivo* mouse assays and total arsenic analysis by Instrumental Neutron Activation Analysis (INAA) at North Carolina State University's Nuclear Reactor Program. Based on these results, for purposes of the Streamlined Risk Assessment in the EE/CA and for calculating soil cleanup levels EPA chose to use the 95th percentile of the arsenic *in vivo* Relative Bioaccessibility (RBA), which is 16.5%, and an average *in vitro* bioaccessibility (IVBA) of 76% for lead.

In May 2013, EPA conducted a second Removal Assessment in Eureka. Surface and shallow subsurface samples were collected at an additional 19 residential and vacant properties. Sampling results indicated extremely high levels of arsenic and lead at several properties (arsenic in excess of 38,000 mg/kg and lead in excess of 100,000 mg/kg). During the event EPA analyzed composite soil samples from residential properties for extractable metals by two EPA leachate procedures, the toxicity characteristic leaching procedure (TCLP) and the synthetic precipitation leaching procedure (SPLP). The total and extractable concentrations for the three composite samples were all below the RCRA criteria. These results indicate that the soil excavated from residential properties does not constitute a RCRA characteristic waste.

In 2014, concurrent with removal activities, EPA evaluated samples from the Eureka Consolidated slag pile and the Richmond Company slag pile for extractable metals using the TCLP and SPLP procedures. In addition, these samples were also evaluated for extractable metals using the meteoric water mobility procedure (MWMP). This procedure is typically used at mine sites in Nevada to determine the nature and quantities of soluble constituents that may be washed from materials under natural precipitation conditions. For all three extractable metals analyses performed, slag material samples exceeded applicable benchmarks for lead and arsenic. These results indicated that slag material may meet the definition of a RCRA characteristic waste; however, slag material from lead mining and smelting operations are not regulated as a hazardous waste under RCRA. 40 CFR §261.4(b)(7).

All sampling activities at the site have been performed pursuant to the Eureka Smelters Site Sampling and Analysis Plan, which included a Quality Assurance and Quality Control (QA/QC) Plan. The original version of this plan, dated September 2012, has been amended several times to reflect changes and updates to the sampling plan

4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant

Lead and arsenic are present throughout the town of Eureka at elevated levels. See information presented above. High concentrations of lead and arsenic have been documented in surface and near-surface soils at residences and at undeveloped parcels including former mill and smelter sites, and slag piles. Due to the fact that high concentrations of lead and arsenic have been documented at residential properties and at undeveloped parcels in close proximity to residential properties, many residents are experiencing actual exposure. The maximum residential arsenic soil concentration detected at the Site is 32,000 mg/kg, which is associated with a 2×10^{-2} cancer risk and a non-carcinogenic Hazard Index of 116. The maximum residential lead soil concentration is over 100,000 mg/kg, which exceeds the residential site-specific cleanup value (425 mg/kg) by more than a factor of 235 times.

5. National Priorities List ("NPL") status

The Site is not on the NPL, nor has it been proposed to the NPL. If the scope of this Action Memorandum and the EE/CA are fully implemented, EPA does not anticipate proposing the Site for the NPL.

6. Maps, figures and other graphic representations

The following maps and figures are attached to this document.

- Figure 1. Regional location map
- Figure 2. Site location map
- Figure 3. Lead isoconcentration map
- Figure 4. Arsenic isoconcentration map
- Figure 5. OU-I. Residential properties
- Figure 6. OU-2. Slag piles.
- Figure 7. OU-3. Undeveloped parcels
- Figure 8. OU-4. Eureka Creek

B. Other Actions to Date

1. Previous Actions

From September 2013 through early November 2013 and from April 2014 through July 2014, EPA's Emergency Response Program conducted the following removal activities at the Site:

- Excavation of one foot of contaminated soil at 43 residential properties and at a portion of the Eureka Elementary School, replacement of excavated soil with clean backfill, and replacement of landscaping that was damaged during the excavation.
- Sampling and analysis of excavated areas to document contaminant levels at the base of the excavation.
- Placement of barrier tape at the base of excavation areas where soil contaminant concentrations remained above the site cleanup levels of 425 mg/kg lead or 234 mg/kg arsenic.
- Placement of excavated soil in temporary storage areas located at the north end of town.
- Air sampling and monitoring of all operations to monitor for off-site emissions of hazardous substances.
- Sampling of 90 additional residential properties.

2. Current Actions

On June 21, 2015, prior to the completion of the EE/CA, EPA signed a Ceiling Increase and Exemption from the 12-month Statutory Limit Action Memorandum. Field activities were not able to be performed during the 2015 construction season. Approximately \$1,100,000 in funding remain from that Action Memorandum. On April 28, 2016 EPA signed an additional Ceiling Increase Action Memorandum. EPA initiated field work pursuant to those Action Memorandum, beginning in May 2016. The work to be performed is consistent with the actions identified in the EE/CA and includes the following response activities:

- Initiation of construction of a repository to accept contaminated soil excavated from residential properties;
- Cleanup of additional Tier I and Tier II residential properties;
- Sampling of other residential properties.

C. State and Local Authorities' Roles

1. State and local actions to date

On May 4, 2012, NDEP submitted a request for Federal assistance at the Eureka Smelters Site. NDEP assisted EPA in performing the initial assessment activities conducted in 2012 and has been an active partner in communicating results to the community and elected officials.

2. Potential for continued state/local response

NDEP and Eureka County have supported the EPA Removal Actions conducted to date. Both NDEP and Eureka County participated in the preparation of a draft Institutional Controls document, which was included as an attachment to the EE/CA, and both have agreed to implement an Institutional Controls program.

Eureka County purchased a parcel of land to be used by EPA as a repository for contaminated soil excavated from residential properties, and will provide long-term repository O&M. The purchase price of the parcel, including a land survey, was \$12,000. Eureka County has also offered EPA access to areas from which borrow material and rock could be obtained. These in kind services represent substantial cost-savings (approximately \$5.5M for transportation and disposal at an off-site facility, and \$2.0M for borrow material) for the overall project.

NDEP has implemented an ongoing blood lead testing program, which offers free blood testing to all Eureka residents. EPA has also engaged NDEP about response activities that could be performed by NDEP in the future. EPA and NDEP are continuing to discuss possible roles for further NDEP engagement.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Conditions at the Site represent a release, and substantial threat of release, of CERCLA hazardous substances threatening the public health, or welfare, or the environment based on the factors set forth in the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. § 300.415(b)(2). These factors include:

A. Actual or potential exposure to nearby populations, animals or the food chain from hazardous substances or pollutants or contaminants

High concentrations of lead and arsenic have been documented in surface and near-surface soils at residences and at undeveloped parcels including former mill and smelter sites, and slag piles. Due to the fact that high concentrations of lead and arsenic have been documented at residential properties and at undeveloped parcels in close proximity to residential properties, many residents are experiencing actual exposure. The maximum residential arsenic soil concentration detected at the Site is 32,000 mg/kg, which is associated with a 2×10^{-2} cancer risk and a non-carcinogenic Hazard Index of 116. The maximum residential lead soil concentration is over 100,000 mg/kg, which exceeds the residential site-specific cleanup value (425 mg/kg) by more than a factor of 235 times. As discussed in the Streamlined Risk Assessment presented in the EE/CA, the primary exposure route identified in the Conceptual Site Model is ingestion of soil and dust at current and potential future residential properties.

Actual exposure to lead was documented in July 2013. The Nevada State Health Division, in coordination with the Eureka County Health Clinic, conducted initial blood lead level testing using finger stick methodology. Of the 158 people that participated in the initial testing, 101 live in Eureka and of these 101 participants, 10 were less than 5 years of age. Results showed 25 people with blood lead levels between 2 and 5 µg/dL, six people with blood lead levels between 5 and 10 µg/dL, and three people with lead levels greater than 10 µg/dL.

Subsequent to the initial blood lead testing, the Eureka County Health Clinic initiated blood lead testing under a grant administered by NDEP. For the quarter ending December 2013, five Eureka residents had blood lead levels measured. The results are presented in the table below. The Centers for Disease Control and Prevention's (CDC's) 2012 report on childhood

blood lead poisoning recommended that a reference value based on the 97.5th percentile of the blood lead level distribution in children 1-5 years old (currently 5 micrograms per deciliter of blood [$\mu\text{g/dL}$]) be used to identify children with elevated blood lead levels (CDC 2012).

December 2013 Eureka Blood Lead Results

Age	Blood Lead Result ($\mu\text{g/dL}$)
9	3.8
6	5.8
3	8.8
4	10.3
1	3.5

$\mu\text{g/dL}$ - micrograms lead per deciliter of blood

Lead exposure through ingestion and/or inhalation can affect almost every organ in the human body. The main target for lead toxicity is the nervous system and it affects adults and children. Children are more vulnerable to lead poisoning than adults. A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness and brain damage. If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur. Even at much lower levels, lead can affect a child's mental and physical development. Exposure to lead is more dangerous for young and unborn children. Harmful effects include premature births, smaller babies, and decrease in mental ability in infants, learning difficulties, and reduced growth.

The Department of Health and Human Services (DHHS) and EPA have determined that arsenic is a known human carcinogen. Studies have shown that ingestion of inorganic arsenic can increase the risk of skin cancer and cancer in the liver, bladder and lungs. Inhalation of inorganic arsenic can cause increased risk of lung cancer. Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, and damage to blood vessels. Ingesting or breathing low levels of inorganic arsenic for a long time can cause darkening of the skin and appearance of small corns or warts.

B. Actual or potential contamination of drinking water supplies

Actual or potential contamination of drinking water supplies has not been adequately assessed, but is not believed to be an imminent threat. The town of Eureka is serviced by a municipal drinking water system. The primary sources of the drinking water are municipal wells that are located at least one mile from the Site. It is EPA's understanding that private drinking water wells are no longer permissible within the town of Eureka. Periodic testing of the municipal drinking water is performed by Eureka County. Reported results are within drinking water standards.

C. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate

High levels of lead and arsenic in surface and near surface soils and in slag have been documented during the Removal Assessment. Aerial transport of contaminated soil and slag is currently ongoing. Sampling performed during the Removal Assessment documented aerial deposition of high levels of arsenic and lead downwind of the smelter sites. In addition, the two large slag piles are located along a stream that flows through town. Removal Assessment sampling documented migration of arsenic and lead in the floodplain downstream of the slag piles. The potential for migration of lead and arsenic to groundwater has not been assessed.

D. Weather conditions may cause hazardous substances or pollutants or contaminants to migrate or be released

The Site is located in an area of Nevada that is characterized by extremely variable winds with high velocities throughout much of the year. High winds could contribute to the migration of lead and arsenic present in surface and near surface soil. Removal Assessment sampling documented aerial deposition of high levels of lead and arsenic downwind of the smelter sites. This area of Nevada is also periodically subjected to flooding and runoff due heavy rain fall or snow melt events. The area was flooded a hundred years ago. A significant flood event may cause the migration of site contaminants; however, since the State and County made infrastructure improvements to the creek bed, the creek has not overflowed its banks during storm events.

E. Availability of other appropriate federal or state response mechanisms to respond to the release

There is not another federal response mechanism available to address high levels of lead and arsenic present in surface and near-surface soils. Eureka County and NDEP were initially engaged in discussions regarding potential cleanup actions that might be implemented by the County or State. Eureka County and NDEP have been supportive of the EPA response actions, and the County has provided in kind services, but are not likely able to perform significant work at the Site.

IV. ENDANGERMENT DETERMINATION

High concentrations of lead and arsenic have been documented in surface and near-surface soils at residences and at undeveloped parcels including former mill and smelter sites, and slag piles. Due to the fact that high concentrations of lead and arsenic have been documented at residential properties and at undeveloped parcels in close proximity to residential properties, many residents are experiencing actual exposure. The maximum residential arsenic soil concentration detected at the Site is 32,000 mg/kg, which is associated with a 2×10^{-2} cancer risk and a non-carcinogenic Hazard Index of 116. The maximum residential lead soil concentration is over 100,000 mg/kg, which exceeds the residential site-specific cleanup value (425 mg/kg) by more than a factor of 235 times.

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response actions selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. EXEMPTION FROM STATUTORY LIMITS

A. Emergency Exemption from the \$2 Million Statutory Limit

1. There is an immediate risk to public health or welfare or the environment.

There is an immediate risk to public health or welfare due to current, ongoing exposure to high levels of lead and arsenic. The maximum residential arsenic soil concentration is 32,000 mg/kg, which is associated with a 2×10^{-2} cancer risk and a non-carcinogenic Hazard Index of 116. The maximum residential lead soil concentration is over 100,000 mg/kg, which exceeds the residential site-specific value (425 mg/kg) by more than a factor of 235 times and is clearly unacceptable. Residents continue to be exposed to both arsenic and lead, as discussed above in Section III.A.

2. Continued response actions are immediately required to prevent, limit, or mitigate an emergency

There is insufficient funding available under the existing Time Critical Removal Action ceiling to mitigate the emergency associated with exposure to high levels of lead and arsenic. This NTCRA will allow EPA to continue to mitigate high levels of lead and arsenic in soil at residential properties. The ongoing removal action also includes construction of a repository to accept contaminated soil excavated from the properties. Continued response actions are immediately required to prevent, limit or mitigate the emergency. If the Emergency Exemption is not approved, work at the site will be suspended upon exhaustion of funding available under the existing Time Critical Action Memorandum. If this were to occur, Eureka residents would continue to be exposed to high levels of lead and arsenic in soil. Due to the fact that high concentrations of lead and arsenic have been documented at residential properties and at undeveloped parcels in close proximity to residential properties, many residents are experiencing actual exposure. The maximum residential arsenic soil concentration detected at the Site is 32,000 mg/kg, which is associated with a 2×10^{-2} cancer risk and a non-carcinogenic Hazard Index of 116. The maximum residential lead soil concentration is over 100,000 mg/kg, which exceeds the residential site-specific value (425 mg/kg) by more than a factor of 235 times.

3. Assistance will not otherwise be provided on a timely basis

If this Action Memorandum is not approved, assistance will not otherwise be provided on a timely basis. The ongoing time critical removal action will terminate upon exhaustion of the current funding authority. Neither the County nor the State are able to provide assistance, and no other federal programs or agencies are able to provide assistance on a timely basis. If the scope of this Action Memorandum and the EE/CA are fully implemented, EPA does not anticipate proposing listing the Site for the NPL.

VI. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Action

1. Proposed Action Description

This Action Memorandum identifies the selected removal actions for all five OUs identified in the EE/CA. The proposed action will not impede future responses, based on available information. This Action Memorandum provides partial funding for OU-1, OU-3 and OU-5. At present, it is anticipated that this NTCRA will be conducted incrementally by EPA as a Fund-lead cleanup action; however, future work on this Site is contingent upon available funding.

OU-1: RESIDENTIAL PROPERTIES (Section 8.1 of the EE/CA).

A residential property is defined by the Superfund Lead-Contaminated Residential Sites Handbook (OSWER 9285.7-50, August 2003) as any area with high accessibility to sensitive populations, and includes properties containing single- and multi-family dwellings, apartment complexes, vacant lots in residential areas, schools, day-care centers, community centers, playgrounds, parks, green ways, and any other areas where children may be exposed to site-related contaminated media.

Based on the Removal Assessment data, site-specific bioavailability data, and EPA guidance and policy documents, EPA has identified OU-1 residential site-specific cleanup levels and associated prioritization tiers. The rationale for development of these site-specific cleanup levels and prioritization tiers is discussed in the EE/CA (Section 5.3.4 - Preliminary Remediation Goals and Tiered Response).

Tier I - Consists of residential properties containing soil lead concentrations greater than 3,000 mg/kg or soil arsenic concentrations greater than 600 mg/kg. In addition, Tier I residential properties would also include any Tier II residential properties where a pregnant woman is living, where children under 6 years of age are living, or where a resident has had a blood lead concentration in excess of 5 µg/dL.

Tier II - Consists of residential properties containing soil lead concentrations between 1,275 mg/kg and 3,000 mg/kg, or arsenic soil concentrations between 326 mg/kg and 600 mg/kg.

Tier III - Consists of residential properties containing soil lead concentrations between 425 mg/kg and 1,275 mg/kg, or arsenic soil concentrations between 234 mg/kg and 326 mg/kg. As such, 425 mg/kg lead and 234 mg/kg arsenic constitute the cleanup levels for the Site.

The following table identifies the current total number of expected OU-1 properties based on sampling data, the current number of projected OU-1 properties, and the associated volumes

within each of the three tiers. Prioritization tiers for those properties that were not directly sampled are based on evaluations of isoconcentration contour maps created using sampling data from nearby properties and commercially available contouring. The location of these properties are also generally depicted in Figure 5.

Summary of OU-1 Residential Property Tiers

Tier Level	Number of Known Properties	Number of Projected Properties	Total Tier Properties	Total Estimated Volume of Waste (CY)
Tier I	23	27	50	12,500
Tier II	38	82	120	30,000
Tier III	31	26	57	7,125
Totals	92	135	227	60,225

The total volume total includes the approximately 10,600 CY already excavated and stored in a temporary stockpile.

The selected removal action for OU-I Residential Property is Alternative 3 – Soil Removal and Capping at Tier I, Tier II, and Tier III properties; Institutional Controls; and Outreach and Education Programs. This includes soil removal to a depth of one foot and capping at Tier I, Tier II and Tier III residential properties. Barrier tape will be placed at the base of any excavated areas where soil contaminants remain in excess of the site cleanup levels. The total estimated cost of the selected removal alternative for OU-I Residential Property is \$18,986,000 assuming 90% of the Tier I, II and III property owners accept cleanup. Cleanup pursuant to this removal action would be conducted at approximately 40 Tier I and Tier II residential properties.

In accordance with the Superfund Lead-Contaminated Residential Sites Handbook, in select areas such as vegetable gardens or children's play areas, an additional 1 foot of soil may be excavated. Soils would not be excavated from beneath permanent structures such as houses, or semipermanent structures such as rock walls, storage sheds, or gravel driveways. Excavated areas would be covered with 1 foot of imported clean fill material(s) (e.g., soil; humus, sod, rock). ICs would be implemented by Eureka County and the NDEP. These ICs and the manner in which they would be implemented are described in the Draft Institutional Control Planning Document (ICPD), which is attached as Appendix C to the EE/CA.

The ICPD primarily focuses on and outlines the long-term management and stewardship activities for the proposed removal actions. As discussed in the EE/CA, the proposed cleanup of properties in the Site does not provide complete removal of contaminated soil and slag. Instead, cleanup efforts focus on creating "barriers" (e.g., clean soil, vegetation, and gravel) between lead and arsenic impacted material and people. Therefore, maintaining the integrity of these clean barriers is critical to minimize human exposure to site contaminants. Eureka County has committed to placing environmental covenants on properties it owns within OUs 1, 2 and 3. The County properties include residences, recreational areas that the public can access, former smelter sites containing slag and impacted soil, and open space for potential

future development. NDEP and Eureka County will perform outreach to other property owners within OUs 1, 2 and 3 to request that they voluntarily place environmental covenants on the parcels that: 1) have already received some form of soil removal, disposal and capping support as a result of removal actions already completed by EPA; or 2) have removal actions taken in the future. The final Institutional Control Plan (ICP) will be a locally controlled and maintained plan with an element of enforcement by NDEP designed to ensure the integrity of clean soil and other protective barriers placed over contaminants left in place throughout the Site. The ICP will also describe services and resources for current and future landowners and residents in town, including education and outreach, technical assistance on soil sampling methods and requirements, clean replacement soil for small residential projects and a permanent disposal site for contaminated soils generated Site wide.

OU-2: SLAG PILES (Section 8.2 of the EE/CA).

Four individual slag piles are present within Eureka (Figure 6). These slag piles require special consideration due to their public accessibility, historic value as a cultural resource related to the area's mining history, and elevated contaminant concentrations: Lead concentrations in excess of 44,000 ppm and arsenic concentrations in excess of 25,000 ppm have been detected in slag. The elevated lead and arsenic concentrations at the slag piles suggest there are ongoing contaminant sources through wind-borne or water-borne entrainment of fine particles. The following table identifies each slag pile and the estimated volume(s).

Summary of Slag Pile Volumes and Areal Extents

OU-2 Slag Piles	Foot Print Area (acres)	Estimated Slag Waste Volume (CY)	Estimated Volume of 2-ft Soil Layer Beneath Slag (CY)	Total Waste Volume (CY)
Eureka Consolidated Slag Pile	3.25	18,400	10,500	28,900
Richmond Company Slag Pile	2.87	38,200	9,300	47,500
Matamoras Slag Pile	0.04	800	130	930
Atlas Slag Pile	0.28	3,500	900	4,400
TOTALS	6.44	60,900	20,830	81,730

The selected removal action for OU-2 Slag Piles is Alternative 4 – Limited Use of Richmond Company and or Eureka Consolidated Slag Piles as Consolidated Waste Repositories; Grading and In-Place Capping of Slag Piles with 2 Feet of Soil Cover; and Institutional Controls.

Slag at each slag pile site would be used to fill in existing holes, voids, and low-lying areas, and to reduce slope angles in available areas where existing slopes are steeper than approximately 3:1 horizontal to vertical slope ratio (H:V). In addition, a limited volume of contaminated wastes (approximately 5,000CY), likely generated from the Matamoras or Atlas Slag Piles, would be used to fill in existing holes, voids, and low-lying areas. After grading and placement of the imported wastes, the slag pile(s) would then be capped in place using either 2 feet of compacted clean fill material, or a high density polyethylene (HDPE) geomembrane liner and 2 feet of compacted clean fill material. Clean fill would be imported as necessary to establish grades and surface water drainage patterns. Portions of the drainages adjacent to each slag pile would need to be excavated, armored with rip-rap (boulders), and otherwise stabilized to reduce erosion.

The total estimated cost of the selected removal alternative for OU-2 Slag Piles is \$2,644,000 based on actual costs incurred during the performance of field work during the 2016 field season. However funding for OU-2 is not being authorized at part of this Action Memorandum.

OU-3: UNDEVELOPED PARCELS WITHIN OR ADJACENT TO FORMER SMELTER AND MILL SITES (Section 8.3 of the EE/CA).

EPA has identified OU-3 as four individual undeveloped parcels totaling 20.62 acres within or adjacent to the footprints of former smelter and mill sites. The individual OU-3 parcels are shown on Figure 7 and identified as Hillside No. 1, Hillside No. 2, Hillside No. 3, and Hillside No. 4. These parcels require special consideration due to their relatively steep slopes, location near or adjacent to residential properties and schools, common recreational usage, public accessibility, and high contaminant concentrations that suggest these parcels may be ongoing contaminant sources through potential wind-borne entrainment of fine particles or runoff that contains lead and arsenic. An approximate 4.0-acre portion of Hillside No. 2 is relatively flat and suitable for residential development. Therefore, although this area is in OU-3, remedies proposed for this sub-area are similar to those proposed for other residential properties (i.e., excavate 1 foot of contaminated soil and cap with clean materials).

Summary of OU-3 Areal Extents

OU-3 Location	Total Area (acres)	Total Volume (sq. ft.)
Hillside 1	0.61	26,369
Hillside 2	3.56	154,896
Hillside 3	10.19	443,966
Hillside 4	6.26	272,586
TOTAL AREA	20.62	897,817
Total volume for disposal assuming 1 foot depth of excavation		33,250 cy

The selected removal action for OU-3 is Alternative 3 – Smelter and Mill Footprint Area Slope Capping With 1 Foot Of Rock (Rock Slope Protection); Limited 1-Foot Soil

Excavation and Removal With 1-Foot Soil Cap in Residential Areas; and Institutional Controls.

Contaminated soil at the four hillside land parcels identified within OU-3 would generally be covered with a minimum of 1 foot of clean imported 4-inch to 8-inch rock. However, given the intent of potential residential development at undeveloped land parcels within Hillside No. 2, contaminated soil (5,736 CY) would generally be excavated to 1 foot bgs, and covered either with 1 foot of clean fill in relatively level areas, or covered with a minimum of 1 foot of clean imported 4-inch to 8-inch rock in areas where slopes exceed approximately 10%.

The total estimated cost of the selected removal alternative for OU-3 is \$3,192,000 based on actual costs incurred during the performance of field work during the 2016 field season. This Action Memorandum authorizes partial funding for OU-3, which would address Hillside No. 2. Lead and arsenic concentrations in soil at Hillside No. 2 are in excess of 100,000 mg/kg and 32,000 mg/kg respectively.

Institutional Controls would be implemented by Eureka County and the NDEP. These ICs and the manner in which they would be implemented are described generally above in the OU-1 proposed action description and in more detail in the Draft Institutional Control Planning Document (ICPD), which is attached as Appendix C to the EE/CA.

OU-4: EUREKA CREEK (Section 8.4 of the EE/CA).

Sediments in Eureka Creek, which flows through the Town of Eureka, contain lead and arsenic at concentrations above the site-specific action levels for residential soil (See Figure 8.) The exact vertical and horizontal extent of contaminants has not been fully characterized; however, for purposes of the EE/CA it was assumed that 6,200 linear feet of the Eureka Creek channel located within the Town of Eureka would need to be addressed. Three removal alternatives for Eureka Creek were evaluated in the EE/CA. These included OU-4 Removal Alternative 1 - No Action, OU-4 Removal Alternative 2 - Limited Excavation and Removal of 1.5 Feet of Soil/Sediments and Rip Rap Armoring and OU-4 Removal Alternative 3 - Excavation and Removal of 2.5 Feet of Soil/Sediments; In-Place Capping with 1 Foot of Clean Fill; and Rip Rap Armoring of Soil/Sediments and Rip Rap Armoring. Removal Alternative 2 would require excavation of an estimated 12,028 CY of soil/sediments; while Removal Alternative 3 would require excavation of an estimated 21,050 CY of soil/sediments.

Flow in Eureka Creek, a heavily vegetated drainage ditch located primarily on County property, is intermittent. The creek terminates into an alluvial fan just north of town. The creek is not swimmable or fishable, and is not used for drinking water or irrigation. Since infrastructure improvements have been made to the creek bed, the creek has not overflowed its banks during storm events. These improvements included installation of a large box culvert at the highway 50 intersection by the State nearly 40 years ago, and installation of similar box culverts at creek and road intersections throughout town by the County. EPA observations and discussion with the County and members of the community indicate that the creek is not used for recreational purposes, children do not play in the creek bed, and the

creek bed is not used as a source of fill material. Two areas of the streambed with elevated sediment levels are immediately adjacent to the two slag piles (maximum concentrations were 3300 mg/kg lead and 400mg/kg arsenic.) These areas will be addressed, and the costs were included, as part of the selected removal action for OU-2: Slag Piles. Consequently, although there are other areas with elevated levels of lead and arsenic in the creek bed, the conditions in the creek bed do not appear to warrant a removal action at this time; therefore, the selected action for OU-4 is No Action. EPA will discuss the conditions and risks associated with contamination in the creek bed with the State and County and encourage those entities to evaluate the contamination as part of any subsequent consideration of flood control measures by the State or County, should they determine that additional flood control measures may be warranted.

OU-5: CONTAMINATED MATERIAL DISPOSAL (Section 8.5 of the EE/CA).

The selected removal action for OU-5 is Alternative 3B -Disposal of Residential Soil at a Locally Constructed Landfill. Soils excavated from OU-I and any soils excavated as part of OU-3 would be hauled to a repository constructed by EPA in the Town of Eureka. Eureka County has provided a parcel of land, to be used for this purpose. The location of the repository is within the Site boundaries and within the area of contamination. Elevated levels of lead and arsenic have been documented throughout the entire town of Eureka. As such, EPA considers the entire town of Eureka to be a single area of contamination. As per 40 CFR Section 300.400(e), "no federal, state, or local permits are required for on-site response actions conducted pursuant to CERCLA sections 104, 106, 120, 121, or 122." However, as per 40 CFR Section 300.415(j), the removal must attain applicable or relevant and appropriate requirements for both state and federal environmental laws "to the extent practicable considering the exigencies of the situation." Since all material will be disposed of onsite, compliance with the Superfund Off-Site Rule is not an issue. Eureka County has agreed to operate and maintain the repository. An evapotranspiration (ET) cap will be constructed over the waste. A rock-lined channel will be constructed around the downslope edges of the repository to stabilize the toe and prevent erosion.

The cost of construction of the locally constructed repository is incorporated into the disposal costs in OU-I.

2. Contribution to remedial performance

This Action Memorandum identifies the selected removal actions for all five OUs identified in the EE/CA. If the scope of this Action Memorandum and the EE/CA are fully implemented, EPA does not anticipate proposing listing the Site for the National Priorities List (NPL). These actions are anticipated to be consistent with any additional future remedial actions, should such actions be necessary. This Action Memorandum provides partial funding for OU-I, OU-3 and OU-5. It is anticipated that the remaining funding, if approved, will be incrementally funded over a period of years.

3. Engineering Evaluation/Cost Analysis (EE/CA)

The EE/CA Approval Memo (Attachment E) was signed on February 26, 2014 and the EE/CA (Attachment F) was completed in March 2016. During the preparation of the EE/CA, EPA met periodically with an advisory panel appointed by Eureka County, so that the community could have input on the EE/CA as it was being prepared.

EPA held a sixty day public comment period for the EE/CA. EPA received comments from five individuals. Appendix E of the EE/CA includes EPA responses to all of the comments received. One commenter supported the work. One commenter offered a suggestion for public outreach. One commenter provided specific suggestions regarding private land owner's use of their property, during and after cleanup. One commenter suggested that there were no health problems in Eureka, and that the cost of the cleanup was not worth the benefit to the community. This commenter provided extensive comments opposing the cleanup. The commenter raised several points including the lack of local hiring for the cleanup work, the cost of the cleanup, concern that the site would become a Superfund Site, and concern that the slag piles did not pose a significant risk. EPA previously made limited efforts to hire local personnel and contractors. EPA has committed to expand the effort to hire local contractors and personnel during the cleanup work. However, due to the remote location of Eureka, resources and available personnel are often limited.

The EE/CA identified the following five Operable Units (OUs) at the Site, and evaluated removal action alternatives for each OU:

- OU-1: Residential Properties,
- OU-2: Slag Piles,
- OU-3: Undeveloped Parcels within or adjacent to former smelter and mill sites,
- OU-4: Eureka Creek,
- OU-5: Contaminated Material Disposal.

A discussion of alternative actions considered for these OUs is provided below. Note that this action memorandum reflects updated cost estimates based on actual costs during the performance during the 2016 field season; therefore, the costs of OU-1, OU-2 and OU-3 are lower than those identified in the EE/CA which is summarized below.

OU-1: Residential Properties (Section 8.1 of the EE/CA).

The EE/CA evaluated three removal alternatives for residential properties.

1. No Action
2. Soil Removal and Capping at Tier I and Tier II Properties ICs; and Outreach and Education Programs
3. Soil Removal and Capping at Tier I, Tier II, and Tier III Properties; Cs; and Outreach and Education Programs

Due to the high levels of lead and arsenic in residential soil, the No Action alternative was not considered protective of human health. Alternative 2 involves soil removal and capping at approximately 170 Tier I and Tier II residential properties at an estimated cost of \$20,473,000 (assuming disposal at a locally constructed landfill). Alternative 3 involves soil removal and capping at approximately 227 Tier I, Tier II and Tier III residential properties at an estimated cost of \$20,986,000. This estimate includes the cost of disposal (assuming disposal at a locally constructed landfill). Since Alternative 2 did not meet the long-term cleanup levels for lead and arsenic at Tier III properties, it was not considered protective of human health.

The selected removal action for OU-1 is Alternative 3 Soil Removal and Capping at Tier I, Tier II, and Tier III Properties; ICs; and Outreach and Education Programs. This Action Memorandum authorizes partial funding for OU-1. Cleanup pursuant to this removal action would be conducted at approximately 40 Tier I and Tier II residential properties. Cs and Outreach and Education Programs will be implemented by the County and State.

OU-2: Slag Piles (Section 8.2 of the EE/CA).

The EE/CA evaluated five alternatives for the slag piles.

1. No Action
2. Removal of Slag Piles to an Existing Landfill; and ICs
3. Consolidation, Grading, and In-Place Capping of Slag Piles with a 2-Foot Soil Cover; and ICs
4. Limited Use of RCS and/or ECS Slag Piles as Consolidated Waste Repositories; Grading and In-Place Capping of Slag Piles with a 2-Foot Soil Cover; and ICs
5. Maximized Use of RCS and/or ECS Slag Piles as Consolidated Waste Repositories; Grading and In-Place Capping of Slag Piles with a 2-Foot Soil Cover; and ICs

Due to the high levels of lead and arsenic in slag, Alternative 1 - No Action alternative is not considered protective of human health. The total estimated cost for Alternative 2, which would involve disposal at an existing offsite landfill is estimated to be \$22,431,000. EPA deemed this alternative to be cost prohibitive. Alternatives 3, 4 and 5 are similar in that they all involve grading and capping in place of the slag piles. Alternative 4 involves limited use of the slag piles as consolidated waste repositories, while Alternative 5 involves maximized use of the slag piles as consolidated waste repositories. The total estimated cost for Alternative 3 is \$3,550,000. The total estimated cost for Alternative 4 is \$3,640,000. The total estimated cost for Alternative 5 is \$5,450,000. Due to physical and engineering constraints, Alternative 5 was deemed to have the lowest technical and administrative implementability.

The selected removal action for OU-2 Slag Piles is Alternative 4; however, funding for OU-2 is not being in this Action Memorandum.

OU-3: Undeveloped Parcels within or adjacent to former smelter and mill sites (Section 8.3 of the EE/CA).

The EE/CA evaluated three alternatives for undeveloped parcels within or adjacent to former smelter and mill sites. These parcels include approximately 20 acres at four separate hillside locations. Three of the four parcels are surrounded by residential properties. These parcels have extremely high levels of lead and arsenic.

1. No Action
2. Smelter and Mill Footprint Area I-Foot Soil Excavation and Removal with a I-Foot Soil and/or Rock Cover on >10% Slopes; and ICs
3. Smelter and Mill Footprint Area Slope Capping with I Foot of Rock (Rock Slope Protection); Limited I-Foot Soil Excavation and Removal with a I-Foot Soil Cap in Residential Areas; and ICs

Due to the extremely high lead and arsenic levels and proximity to residences, the No Action alternative is not considered protective of human health. Alternatives 2 and 3 are similar. Alternative 2 includes I-foot soil excavation and removal across the four hillsides and placement of a I-foot soil or rock cover; whereas Alternative 3 includes capping of the four hillsides with I foot of rock and limited I-foot soil excavation and removal (in areas likely to be developed as residential).

The estimated cost for Alternative 2 is \$6,634,000 and the estimated cost for Alternative 3 is \$4,192,000. As compared to Alternative 3, Alternative 2 is significantly more expensive, would be difficult to implement and is not considered significantly more protective. Fe;< these reasons, the selected removal action for OU-3 is Alternative 3 - Slope Capping with I Foot of Rock (Rock Slope Protection); Limited I-Foot Soil Excavation and Removal with a I-Foot Soil Cap in Residential Areas; and ICs.

This Action Memorandum authorizes partial funding for OU-3, which would address Hillside No. 2. Lead and arsenic concentrations in soil at Hillside No. 2 are in excess of 100,000 mg/kg and 32,000 mg/kg respectively. ICs and Outreach and Education Programs would be implemented by the County and State.

OU-4: EUREKA CREEK (Section 8.4 of the EE/CA).

The EE/CA evaluated three alternatives for Eureka Creek.

1. No Action
2. Limited Excavation and Removal of I.5 Feet of Soil/Sediments; and Rip Rap Armoring
3. Excavation and Removal of 2.5 Feet of Soil/Sediments; In-Place Capping with 1 Foot of Clean Fill; and Rip Rap Armoring

Sediments in Eureka Creek, which flows through the Town of Eureka, contain lead and arsenic at concentrations above the site-specific action levels for residential soil. Two areas

of the stream bed with elevated sediment levels are immediately adjacent to the two slag piles (maximum concentrations were 3300 mg/kg lead and 400mg/kg arsenic.) These areas will be addressed, and the cost was included, as part of the removal action for OU-2: Slag Piles. There is no cost associated with Alternative 1-No Action. The estimated cost for Alternative 2 is \$3,959,700; while the estimated cost for Alternative 3 is \$5,072,975. EPA believes that there is minimal exposure risk associated with creek sediments and water.

OU-5: Contaminated Material Disposal (Section 8.5 of the EE/CA).

The EE/CA evaluated four alternatives for contaminated material disposal.

1. Offsite Disposal of Removal Waste at an Existing Landfill
2. Disposal of Soil at a Locally Constructed Landfill, and Offsite Disposal of Slag Piles at an Existing Landfill Facility
- 3A. Disposal of Maximum Estimated Soil from OU-1, OU-3, and OU-4 at a Locally Constructed Landfill
- 3B. Disposal Alternative 3B - Disposal of Residential Soil from OU-1 and OU-3 at a Locally Constructed Landfill

The EE/CA estimated that the maximum volume of soil associated with excavation of Tier I, II, and III residential properties is 60, 225 cubic yards. With regard to soil excavated from residential properties, the EE/CA evaluated two different disposal options. One alternative assumed that contaminated material excavated from residential properties would be loaded and transported to an existing landfill facility permitted to receive contaminated material (RCRA Subtitle D)². (This option was evaluated under EE/CA Alternative 1.) A second alternative involved disposal of soil excavated from residential properties at a locally constructed landfill. (This option was evaluated under EE/CA Alternatives 2, 3A, and 3B). The excavated residential soil primarily comes from OU-1, but a limited amount of residential soil may be excavated from OU-3. Since excavation of slag was not selected as the removal action for OU-2, excavation of hillside contaminated soil was not selected as the removal action for OU-3 and excavation of creek sediments was not selected as the removal action for OU-4, Alternatives 2 and 3A were not relevant.

The cost of disposal of soil excavated from residential properties at an existing offsite RCRA Subtitle D landfill was more than double the cost of disposal at a locally constructed, onsite landfill. The estimated cost for disposal at an existing offsite landfill was \$9,285,000; while the estimated cost for disposal at a locally constructed landfill was \$4,336,000. The locally constructed landfill would meet the requirements of a State Class III solid waste landfill. For this reason, the selected removal alternative is disposal at a locally constructed, onsite landfill.

² Slag material from lead mining and smelting operations are not regulated as a hazardous waste under RCRA. 40 CFR §261.4(b)(7)

4. Applicable or relevant and appropriate requirements (ARARs)

Applicable or relevant and appropriate requirements (ARARs) for the Eureka Smelters Site NTCRA include the substantive requirements for the chemical, location and action-specific ARARs summarized in the following tables.

Chemical Specific ARARs and To Be Considered (TBC)				
MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	STATUS AND RATIONALE
Solid Waste	FEDERAL EPA Region 9 Site-Specific Cleanup Levels	TBC	Establishes health based screening levels for soils and other media	Use to determine Site-Specific Cleanup Levels for lead and arsenic in contaminated soils

TBC. To be considered.

Location Specific ARARs and TBC				
MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	STATUS AND RATIONALE
Cultural Resources	FEDERAL The Native American Graves Protection And Repatriation Act – 25 U.S.C. § 3001 <i>et seq</i> ; 43 CFR Part 10.	Applicable	Protects Native American graves from desecration through the removal and trafficking of human remains and cultural items including funerary and sacred objects.	Substantive requirements applicable if Native American burials or cultural items are identified within area to be disturbed. To date, no evidence of Native American burials or cultural items have been identified within areas of disturbance.
Cultural Resources	FEDERAL National Historic Preservation Act – 16 U.S.C. § 470 <i>et seq</i> ; 36 CFR Part 800	Applicable	Provides for the protection of sites with historic places and structures.	Substantive requirements applicable if eligible resources identified within area to be disturbed. EPA has coordinated closely with the SHPO and an archeologist is present onsite during excavation.
Cultural Resources	FEDERAL Archeological Resources Protection Act of 1979 – 16 U.S.C. § 470aa; 43 CFR Part 7	Applicable	Prohibits removal of or damage to archaeological resources unless by permit or exception.	Substantive requirements applicable if eligible resources are identified within area to be disturbed. An archeologist is present onsite during excavation.
Archeological Resources	FEDERAL Archeological and Historic Preservation Act 16 U.S.C. § 469-469c-2	Applicable	Establishes procedures for preservation of historical and archeological data that might be destroyed through alteration of terrain.	May be applicable if archeological data must be preserved as a result of the cleanup.
Endangered Species	FEDERAL Endangered Species Act	Applicable	Regulates the protection of threatened and endangered species or	Substantive requirements applicable if protected species are identified within area to be

Location Specific ARARs and TBC				
MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	STATUS AND RATIONALE
	- 16 U.S.C. §§1531-1548; Title 50 CFR Parts 17 and 402		critical habitat of such species.	disturbed. To date, no such species have been identified in the work areas.
Flood Plains	FEDERAL Executive Order 11988	TBC	Flood Plain Management	May apply if the flood plain is altered as a result of the cleanup. Portions of the slag piles may be within the floodplain
Stream or river bed alteration	FEDERAL Fish and Wildlife Coordination Act - 16 U.S.C. § 661 <i>et seq</i>	Applicable	Provides for protection of water bodies	May apply if the cleanup will impact streams or rivers. Armoring of the slag pile could impact Eureka Creek

Action-specific ARARs and TBC				
MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	STATUS AND RATIONALE
Solid Waste	STATE Nevada Solid Waste Management Systems - NAC §§ 444.6405, 444.641, 444.6415, 444.6419, 444.6426, 444.643, 444.6435, 444.644, 444.645	Applicable	Provision applicable to solid waste management systems. May apply to a locally constructed landfill	Substantive requirements may be applicable to wastes that are subject to the requirement. EPA intends to meet this ARAR to the extent practicable considering the exigencies of the situation.
Solid Waste	FEDERAL Resource Conservation and Recovery Act (RCRA) of 1976, as amended - 42 U.S.C. §§ 6901 <i>et seq.</i> ; 40 CFR §261.4(b)(7).	Applicable	Regulates disposal of hazardous and solid waste in landfills.	Substantive requirements may be relevant and appropriate. Lead slag is excluded as a "hazardous waste" under the Bevill Amendment, 40 CFR §261.4(b)(7), but is still a hazardous substance under CERCLA and a solid waste under RCRA. RCRA is cited as an ARAR in the event that site conditions change. No offsite disposal of slag or soil is expected. Excavated soil that does not fail TCLP is also not considered a
Storm Water	FEDERAL Clean Water Act (CWA) - 40 CFR § 122.26	Applicable	Establishes monitoring and pollutant control requirements for storm water from industrial activities	The substantive requirements would be applicable if construction activities associated with the response action will disturb an area of five acres

Action-specific ARARs and TBC				
MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	STATUS AND RATIONALE
Surface Water	FEDERAL CWA – 33 U.S.C. § 1342; National Pollutant Discharge Elimination System (NPDES); 40 CFR parts 122, 125	Applicable	On-site and off-site discharges from site are required to meet the substantive CWA requirements, including discharge limitations, monitoring and best management practices.	Substantive requirements may be applicable. EPA intends to meet NPDES requirements that pertain to the locally constructed landfill.
Air	STATE NEVADA NAC § 445B.22037 Emissions of particulate matter: Fugitive dust	Applicable	Regulates the generation of particulate matter associated with the handling, transporting or storing of material.	Substantive requirements may be applicable to activities associated with handling, transporting or storing of soil. EPA intends to meet this ARAR.

5. Project Schedule

It is anticipated that the funded work described in this Action Memorandum would be performed in the summer and fall of 2016, as a continuation of the current, ongoing cleanup activities initiated under the Time Critical Removal Action. If additional funding is approved for the remaining work, the full scope of this Action Memorandum and EE/CA may be implemented over a period of years.

B. Estimated Costs

This Action Memorandum identifies the selected removal actions for each of the five OUs. This Action Memorandum authorizes partial funding for OU-I, OU-3 and OU-5. It is anticipated that the remaining funding, if approved, will be incrementally funded over a period of years.

Cost estimates used in this Action Memorandum are based on extramural cleanup costs that were provided in the EE/CA. The types of costs that were assessed were in accordance with the requirements for similar actions found in 40 CFR 300.430 (e)(9)(iii)(G) and include the following:

- Capital costs, including both direct and indirect costs
- Annual O&M costs
- Net present value (NPV) of capital and O&M costs

In accordance with EPA guidance, the cost estimates were prepared to provide accuracy in the range of +50/-30%. For this reason, estimated costs presented in this Action Memorandum do not include a 20% contingency.

The total estimated cost for each of the OUs (as estimated in the EE/CA) is presented below. The EE/CA estimated costs have been updated to reflect more accurate cost estimates based on actual costs incurred during the performance of field work during the 2016 field season, and revised assumptions about the percentage of property owners who would accept cleanups. The EE/CA assumed 100% acceptance and our work to date indicates an acceptance rate of approximately 80%. To be conservative, the cost estimate of OU-1 has only been adjusted downward by 10% to reflect a 90% acceptance rate.

OPERABLE UNIT	EE/CA ESTIMATED COST	UPDATED COST
OU-1 Residential Properties	\$20,986,000	\$18,986,000
OU-2 Slag Piles	\$3,644,000	\$2,644,000
OU-3 Undeveloped Parcels	\$4,192,000	\$3,192,000
OU-4 Eureka Creek	\$0	\$0
OU-5 Disposal	Costs are included in OU-1 costs	
TOTAL	\$28,822,000	\$24,822,000

Funding authorized by this Action Memorandum is presented below.

	Original Cost	Additional Costs	Total Costs
<u>Extramural Costs from the Regional Allowance</u>			
Cleanup Contractor	5,300,000	2,800,000	8,100,000
<u>Extramural Costs not from the Regional Allowance</u>			
START	600,000	200,000	800,000
Pacific Strike Team	50,000	0	50,000
 Total Extramural Removal Ceiling	 \$5,950,000	 \$3,000,000	 \$8,950,000

VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If this Non Time-Critical Action Memorandum is not approved, then removal activities will cease after funding associated with the Time Critical Removal Action is exhausted. Cessation of response activities will result in continued and ongoing exposure by Eureka residents, including children, to high levels of lead and arsenic.

VIII. OUTSTANDING POLICY ISSUES

Given limitations on funding and weather constraints for conducting field work, implementing the full scope of this action memorandum will require ceiling increases over the course of several years.

IX. ENFORCEMENT

Please see the Enforcement Confidential Addendum attached as Attachment G to this Action Memorandum. In addition to the extramural costs estimated for the proposed action, a cost recovery enforcement action also may recover the following intramural costs:

<u>Intramural Costs</u>	<u>Original Cost</u>	<u>Additional Costs</u>	<u>Total Costs</u>
U.S. EPA Direct Costs ³	250,000	75,000	325,000
U.S. EPA Indirect Costs (59.51% of 8,950,000 + 325,000)	3,248,180	2,271,372	5,519,552
Total Intramural Cost	<u>\$3,498,180</u>	<u>\$2,346,372</u>	<u>\$5,844,552</u>

The total EPA extramural and intramural costs for this removal action that will be eligible for cost recovery, based on full-cost accounting practices, are estimated to be \$14,794,552.

$$(\$8,950,000 + \$325,000) + (59.51\% \times \$9,275,000) = \$14,794,552$$

³ Direct costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of Site-specific direct costs, consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation of actual costs from this estimate will affect the United States' right to cost recovery.

X. RECOMMENDATION


This decision document represents the selected non-time critical removal actions for the Eureka Smelters Site (aka Town of Eureka), in Eureka, NV, developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision is based on the administrative record for the site.

Conditions at the site meet the NCP section 300.415(b) criteria for a removal and we recommend your approval of the proposed removal action and a proposed ceiling increase of \$3 million. The total removal action ceiling will be \$8,950,000.

Approval of this decision document would also document and approve the removal action selection for each of the five operable units identified in the EE/CA (OU-1: Residential Properties; OU-2: Slag Piles; OU-3: Undeveloped Parcels within or adjacent to former smelter and mill sites; OU-4: Eureka Creek and OU-5: Contaminated Material Disposal).

This NTCRA would provide partial funding to continue work on OU-1, and to initiate work on OU-3 and OU-5. At present, it is anticipated that this NTCRA will be conducted incrementally by EPA as a Fund-lead response action over a period of years; however, future work at this Site is contingent upon available funding.

Approve:



Mathy Stanislaus, Assistant Administrator
Office of Land and Emergency Management



Date

Disapprove:

Mathy Stanislaus, Assistant Administrator
Office of Land and Emergency Management

Date

Figures:

- Figure 1. Regional location map
- Figure 2. Site location map
- Figure 3. Lead isoconcentration map
- Figure 4. Arsenic isoconcentration map
- Figure 5. OU-1 Residential properties
- Figure 6. OU-2 Slag piles
- Figure 7. OU-3 Undeveloped parcels
- Figure 8. OU-4 Eureka Creek

Attachments:

Attachment A: July 30, 2013 Action Memorandum

Attachment B: April 9, 2014 Ceiling Increase Action Memorandum

Attachment C: June 12, 2015 Ceiling Increase Action Memorandum .

Attachment D: April 28, 2016 Ceiling Increase Action Memorandum

Attachment E: February 26, 2014 EE/CA Approval Memo

Attachment F: March 2016, Engineering Evaluation/Cost Analysis (EE/CA)

Attachment G: Enforcement Confidential Addendum

Attachment H: Index to the Administrative Record

bee: Site File

Larry Bradfish, ORC-3

Tom Dunkelman, SFD-9-2

Bret Moxley, SFD-9-2

Celeste Temple, SFD-9-4

Barbara Lee, SFD-9-4

Ramon Albizu, SFD-9-

