



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8**

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Ref: 8SEM-EMR

ACTION MEMORANDUM

SUBJECT: Approval, Funding and Exemption from \$2 Million Statutory Limit for a Removal Action at the Bauer Tailings Site in Stockton, Tooele County, Utah

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TO: Betsy Smidinger, Director
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Site ID# A8LC

I. PURPOSE

The purpose of this Action Memorandum is to request funding as well as document approval and exemption from the \$2 million statutory limit for the removal action described herein for the Bauer Tailings Site (Site) in Stockton, Tooele County, Utah. This time-critical removal action involves the regrading and capping of nearly 160 acres of mill tailings contaminated with arsenic and lead.

An exemption from the \$2 million statutory limit on removal actions is required due to the scale of the project and costs associated with capping such a large area.

Conditions existing at the Site present a threat to public health or welfare or the environment and meet the criteria for initiating a removal action under 40 CFR 300.415(b)(2) of the National Contingency Plan (NCP).

This removal action involves no nationally-significant or precedent-setting issues. This time-critical removal action will not establish any precedent for how future response actions

will be taken and will not commit the US Environmental Protection Agency (EPA) to a course of action that could have a significant impact on future responses or resources.

II. SITE CONDITIONS AND BACKGROUND

Site Name:	Bauer Tailings
Superfund Site ID (SSID):	A8LC
NRC Case Number:	Not applicable.
CERCLIS Number:	UTD980635528
Site Location:	Stockton, Tooele County, Utah
Lat/Long:	40.4711/-112.3688
Potentially Responsible Party (PRP):	
NPL Status:	Non NPL
Removal Start Date:	11/1/2021

A. Site Description

1. Removal Site Evaluation

Mining for lead and silver began in the area in the 1860's. In the early 1900's, the Honerine Mining Company bought many of the mines in the area and drove a lengthy tunnel at a depth of about 1200 ft to de-water the active operations. The Bullion Coalition Company purchased the Honerine drain tunnel and associated prospects in 1910 and constructed a gravity concentrating mill at the portal of the tunnel. This facility, located just northwest of Stockton, Utah came to be known as Bauer and was both purchased and expanded by the Combined Metals Reduction Company in the 1920's. The facility became a very successful milling and processing operation and exemplified advancements in the milling and processing of lead-silver ores¹.

Ore was shipped to the mill from other mines via a newly constructed railroad and the processes of fine grinding and selective flotation that were utilized at Bauer became standard procedures for the industry. The Combined Metals Reduction Company operated the mill until 1979, when the facility was closed and abandoned².

Tailings from the historic mill cover approximately 160 acres. Fine waste deposits, dozens of feet thick with no vegetative cover, are blowing across the landscape and creating migrating dunes of contamination. Aerial imagery reveal that the berms once constructed to dry and contain waste from the mill have failed and contaminated deposits have migrated roughly $\frac{3}{4}$ miles to the northwest outside the original footprint of the historic facility. Recent exploratory excavations by the EPA found that these migrated deposits are in excess of 15 feet thick. In addition to the berms that failed, several of the

¹ Source: <https://utahrails.net/mining/combined-metals.php>

² Source: <https://utahrails.net/mining/combined-metals.php>

remaining berms and impoundments on the historic facility still collect and temporarily hold contaminated surface water after rainstorms.³

Recent and extensive Utah Department of Environmental Quality (UDEQ) sampling efforts over the past few months indicate that the waste deposits commonly exceed 10,000 mg/kg for lead and 1,000 mg/kg for arsenic. Levels as high as 30,000 mg/kg lead and 8,000 mg/kg arsenic were reported.⁴ Access to the Site is unrestricted and frequented by off road enthusiasts. Evidence of other use (illegal dumping, graffiti, spent firearm shells, paintball remnants) is common.⁵

2. Physical Location

The Site is located in Tooele County, Utah, approximately 40 miles west of Salt Lake City. The Site lies on the south side of the Tooele Valley, west of the Oquirrh Mountains, and northeast of South Mountain. It is bound on the north by the Tooele Army Depot, on the south by the Town of Stockton, on the west by agricultural land, and on the east by State Road 36. The region is characterized by sparse vegetation, a semi-arid climate, and numerous round ridges and outcrops that slope westward. The Site rests on alluvial deposits and sediments from the Quaternary epoch of Lake Bonneville and the alluvial fill is approximately 100 to 1,000 feet thick.⁶

Stockton has an estimated population of 683 and has grown 10% in the last decade. The town's population density is roughly 405 people per square mile. Local sources indicate that the winds in the area predominantly blow to the north. Communities that are both downwind and down gradient of the Site include employees at the Tooele County landfill (less than ½ mile to the northeast), employees at the Geneva Rock gravel pit (less than ½ mile to the northwest, Tooele Army Depot (2.5 miles to the northeast) with a reported population of 44,310 in 2019, Tooele proper (3 miles to the northeast) with a reported population of 35,535 in 2019, Erda (10 miles to the north-northeast) with a reported population of 2,635 in 2019 and Grantsville (10 miles northwest) with a population of 11,021 in 2019.⁷

3. Site Characteristics

Groundwater is primarily in the alluvial deposit and sediment layers and is at a depth of 100 feet. The primary aquifer of concern is approximately 250 feet below ground surface and ranges in thickness from 3,000 to 7,000 feet. Groundwater flow is believed to be north toward the Great Salt Lake; however, investigations suggest that local hydrogeological conditions may be more

³ Source: EPA OSC field investigation.

⁴ Source: UDEQ sampling results.

⁵ Source: EPA OSC field investigation.

⁶ Source: ATSDR Public Health Assessment.

⁷ Source: Wikipedia.

complex than regional groundwater data indicate. The nearest drinking water well is owned by the Tooele Army Depot and is approximately two miles north and downwind of the Site. Eight additional drinking water wells are within four miles of the Site. Two of those wells are owned and operated by the Tooele Army Depot, and the remainder are owned and operated by Tooele County. No impacts to these drinking water resources have been detected at this time.⁸

The annual mean precipitation is reported to be 10.47 inches per year, with a net annual precipitation of 3.43 inches. On-Site precipitation infiltrates rapidly because of the high permeability of the on-Site soil. Overland flow from heavy precipitation is likely to flow in a northerly direction (the gradient is less than 1%). Rush Lake is located approximately 1.5 miles up gradient (south) of the Site. Soldier Creek, the primary source of drinking water for the town of Stockton, is southeast and also upgradient of the Site.⁹

The Site is subject to an extremely dry climate and does not support adequate vegetative cover; therefore, the tailings are easily blown off-Site. The average annual windspeed for the nearest town, Stockton, is 19 miles per hour.¹⁰ The closest downwind populations to the Site are the employees at the Tooele County Landfill and Geneva Rock gravel pit and personnel and families residing at the Tooele Army Depot.

4. Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant, or Contaminant

The presence and migration of mine waste containing lead and arsenic presents a release of hazardous substances to the environment. Lead and arsenic are listed hazardous substances in 40 CFR §302.4 and Section 101(14) of CERCLA. The Agency for Toxic Substances and Disease Registry (ATSDR) reported in 2006 that:

Two completed exposure pathways by which people have been exposed to contaminants from the Site include (1) ingesting or inhaling contaminated smelter waste and tailings on-Site, and (2) ingesting or inhaling contaminated dust that has migrated off-Site. The contaminants of concern are arsenic and lead. Exposures to high levels of lead and arsenic can cause damage to blood cells and to the gastrointestinal, kidney, reproductive, and nervous systems. Both lead and arsenic are capable of crossing the placental barrier and causing harm to the fetus. Available evidence indicates that arsenic is a human

⁸ Source: ATSDR Public Health Assessment.

⁹ Source: ATSDR Public Health Assessment.

¹⁰ Source: <http://www.usa.com/rank/utah-state--average-wind-speed--city-rank.htm>.

carcinogen. Based on animal studies, lead is classified as a probable human carcinogen.¹¹

Recent Site visits confirm nearby residents, workers and trespassers to the Site are still being exposed to contaminants.

Arsenic: Arsenic is a naturally occurring ubiquitous element with concentrations in soils reflecting the geology of the region. Toxicity of arsenic is related to its chemical form, with inorganic forms being considered more toxic than the organic form. According to the ATSDR, ingestion of lower levels of inorganic arsenic causes irritation of the stomach and intestines with symptoms such as nausea, vomiting and diarrhea. Other effects include decreased production of red and white blood cells which may cause fatigue, abnormal heart rhythm, blood-vessel damage resulting in bruising, and impaired nerve function. Long-term ingestion of inorganic arsenic causes a pattern of skin changes including patches of darkened skin and small warts. Skin cancer may also develop. Swallowing arsenic has also been reported to increase the risk of cancer in the liver, bladder, and lungs.

The Department of Health and Human Services has determined that inorganic arsenic is known to be a human carcinogen. Eisler wildlife publication indicates that it poses potent ecological dangers and oral doses of elevated arsenic are fatal to birds and animals. Chronic exposure to arsenic via diet and other sources have been associated with liver, kidney, and heart damage. A comprehensive review in Ecotoxicology and Environmental Safety indicates that wildlife toxicity resulting from arsenic exposure is linked to an imbalance between pro-oxidant and antioxidant homeostasis that results in oxidative stress.

According to Beyers and Clements, arsenic is a toxic trace element that can induce physiological and biochemical changes in fish that lead to growth inhibition. Arsenic exposure in the aquatic environment causes bioaccumulation in aquatic organisms and can lead to physiological and biochemical disorders such as poisoning, liver lesions, decreased fertility, cell and tissue damage, and cell death.

Lead: The ATSDR indicates that lead is a naturally occurring element but is not considered an essential nutrient to humans or wildlife species. Once exposed, lead is widely distributed throughout the body and toxic effects of lead have been observed in every organ system that has been studied. Health effects include neurological, renal, cardiovascular, hematological, immunological, reproductive, and developmental effects. Neurological effects of lead are of greatest concern because effects are observed in infants and children and may result in life-long decrements in neurological function. Neurological effects include decreased cognitive function; memory, altered mood and behaviors that

¹¹ Source: ATSDR Public Health Assessment.

may contribute to learning deficits; altered neuromotor and neurosensory function, peripheral neuropathy, and encephalopathy. Many other severe effects to animals are associated with lead poisoning including behavioral, heme, rapid and labored breathing, anorexia, weight loss, decreased milk production, dehydration, emaciation, fetal death, paraplegia, impaired postnatal growth, reduced pregnancy rate, and interference with resistance to infectious disease.

Dissolved lead is acutely toxic to aquatic invertebrates and fish, with young stages of fish more susceptible to lead than adults or eggs. Typical signs of lead toxicity include spinal deformity and blacking of the caudal region. The acute toxicity of lead is highly dependent on presence of other ions in solution.

5. NPL Status

This Site is neither on nor currently being considered for inclusion on the NPL.

6. Maps, Pictures, Other Geographic Representations

Site maps and images are included in Attachment 1.

B. Other Actions to Date

1. Previous Actions

In 1984, the Utah Department of Health (UDOH) conducted a preliminary assessment at the Site. This assessment outlined the presence of contaminated tailings at the Site and the associated potential hazard of blowing dust and off-Site migration of contamination.

In 1985, a Site inspection was conducted by the EPA. Heavy metals were detected in tailings samples collected from the surface down to 22 feet.

In 1995, Utah Department of Environmental Quality (UDEQ) conducted an expanded Site inspection. Analysis of source characterization samples demonstrated elevated levels of aluminum, arsenic, calcium, cadmium, copper, iron, lead, magnesium, manganese, potassium, and zinc. Arsenic concentrations up to 7,000 mg/kg and lead concentrations up to 15,000 mg/kg were observed in mill tailings samples.

In 1999, UDEQ investigated the Site under CERCLA authority in coordination with the EPA. It was determined that the Site did not qualify for further remedial assistance under CERCLA due to minimal documented groundwater impact. However, it was recognized that windblown tailings potentially posed a significant threat.

In 2006, Agency for Toxic Substances and Disease Registry (ATSDR) conducted a Public Health Assessment (PHA) of the Site.

2. Current Actions

In 2021, UDEQ and the EPA's Site Assessment Program initiated a Site reassessment. Contamination at the Site was further characterized using surface soil samples and XRF equipment. These sampling efforts indicate that the waste deposits commonly exceed 10,000 mg/kg for lead and 1,000 mg/kg for arsenic. Levels as high as 30,000 mg/kg lead and 8,000 mg/kg arsenic were reported.

C. State and Local Authorities' Role

1. State and Local Actions to date

Extensive Site investigations have been conducted by the State of Utah Department of Environmental Quality.

The Mayor of Stockton has toured the Site with EPA and DERR officials on numerous occasions.

2. Potential for Continued State/Local Response

State and local entities do not have the resources or authority to conduct this removal action but will continue to provide input and on-site consultation.

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

Conditions at the Site present a threat to public health and the environment and meet the criteria for initiating a removal action under 40 CFR 300.415(b)(2) of the NCP.

EPA has considered all the factors described in 40 CFR 300.415(b)(2) of the NCP and determined that the following factors apply at the Site.

“(i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, or pollutants or contaminants:”

In 2006, the ATSDR classified the Site as a public health hazard due to concentrations of lead and arsenic in the soil and surface water. ATSDR's findings were that adult and young adult trespassers who use the Site for recreation are at risk for exposure to contaminated mine tailings and surface water.

Site visits by locals, State and EPA have revealed off-road recreationists and other trespassers frequent the Site. The Tooele County Landfill operates just east of the Site and employs approximately 20 full-time workers. Several gravel pits also operate near the Site:

two are within a one-mile radius, two are within a two-mile radius and three are within a four-mile radius. Of the two gravel pits within a mile of the Site, the downwind facility employs a half dozen workers and operates year-round, five days per week. The gravel pit upwind of the Site employs approximately 20 workers, five days per week. The Tooele Army Depot is located 2.5 miles directly north of Bauer and employs approximately 750 personnel and their families. These residents and workers could be exposed to off-Site contamination through dust blowing into their homes and workplaces.

“(iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.”

Recent and extensive UDEQ sampling efforts over the past few months indicate that the waste deposits at the surface commonly exceed 10,000 mg/kg for lead and 1,000 mg/kg for arsenic. Levels as high as 30,000 mg/kg lead and 8,000 mg/kg arsenic were reported.

Aerial imagery and site investigations show that the berms that were once constructed to dry and contain the waste during the smelting process have failed and contaminated waste deposits exceeding 15 feet in depth have now migrated to the northwest outside the original footprint of the milling facility.

“(v) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.”

The Site is adjacent to a ridge known as the Stockton Bar. The Stockton Bar is a mile-long, north facing feature which consistently funnels wind across the Site and is a popular hang gliding spot due to its consistent wind patterns. Dust clouds blowing off the Site are a common occurrence.

“(viii) The availability of other appropriate federal or state mechanisms to respond to the release.”

Local and State governments do not have the resources to address the Site and have requested EPA’s assistance.

IV. EXEMPTION FROM STATUTORY LIMITS

Exemption from the statutory limit of \$2 million is necessary to complete the Removal Action. This request meets the three criteria for the emergency exemption.

There is an immediate risk to public health or welfare or the environment. The tailings and waste are highly mobile due to their homogenous, fine-grained character and location of the deposition on the ground surface directly in the path of high wind patterns. Residents and workers could be exposed to off-Site contamination through dust blowing into their homes and workplaces.

Response actions are immediately required to prevent, limit or mitigate an emergency. The berms and impoundments on the historic facility that collect and temporarily hold contaminated surface water after rainstorms are old and have failed. Mass failure of these impoundments in the past have contributed to the off-Site migration of deposits that are in excess of 15 feet. Further failure of these impoundments could impact nearby workers and residences.

Assistance will not otherwise be provided on a timely basis. There are no other federal or state mechanisms that are available to respond to the release.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed Action Description

Approximately 160 acres of mill tailings and historic impoundments (note: the impoundments only hold water after heavy rainfall) will be regraded so that the area no longer retains surface water and surface runoff is directed away from the contaminated area. Lined and rocked drainage ditches will be constructed as necessary to control runoff that originates on the tailings area.

Once regraded, approximately 160 acres of tailings will be capped with local alluvium and/or gravel that is procured from nearby gravel pits and/or excavated from nearby areas. Compost or other organic material will be applied to the top few inches of the alluvium cap and the cap will be revegetated to the extent practical with rabbit brush and other native, drought tolerant plant species.

Erosion control structures will be constructed to prevent future wind and surface water erosion. Physical barriers will be constructed to limit off-road use to the extent practical and appropriate post removal site controls, such as a deed restriction or environmental covenant will be established.

2. Contribution to Remedial Performance

This effort will, to the extent practical, contribute to any future remedial effort at the Site. However, no further federal action is anticipated at this time.

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

An EE/CA is not required for a time-critical removal action.

4. Applicable or Relevant and Appropriate Requirements (ARARs)

This Action Memorandum addresses the proposed time-critical removal action at the Bauer Tailings Site. Lead and arsenic are the principal contaminants of concern. Removal actions conducted under CERCLA are required, to the extent practicable considering the exigencies of the situation, to attain ARARs. In determining whether compliance with an ARAR is practicable, the lead agency may consider appropriate factors, including the urgency of the situation and the scope of the removal action to be conducted. A table containing potential Site-specific ARARs is provided in Attachment 2 to this Action Memorandum.

5. Project Schedule

This removal action is proposed to start in Fall of 2021 and be completed by the Spring of 2022.

B. Estimated Costs*

	Estimated Costs
ERRS contractor	\$4,140,000
START contractor	\$185,000
SUBTOTAL	\$5,325,000
Contingency Costs	\$500,000
Total Removal Project Ceiling	\$ 5,825,000

*EPA direct and indirect costs, although cost recoverable, do not count toward the Removal Ceiling for this removal action. Liable parties may be held financially responsible for costs incurred by the EPA as set forth in Section 107 of CERCLA

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

A delay in action or no action at this Site would increase the actual or potential threats to the public health and/or the environment.

VII. OUTSTANDING POLICY ISSUES

None

VIII. ENFORCEMENT

A separate Enforcement Addendum has been prepared providing a confidential summary of current and potential future enforcement activities.

IX. RECOMMENDATIONS

This decision document represents the selected removal action for the Bauer Tailings Site in Tooele County, Utah, 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)(2) criteria for a removal action and the CERCLA Section 104(c) emergency exemption from the \$2 million limitation, and I recommend your approval of the proposed removal action. The total project ceiling, if approved, will be \$5,825,000; this amount will be funded from the Regional removal allowance.

APPROVE

Betsy Smidinger, Director
Superfund and Emergency Management Division

Date

DISAPPROVE

Betsy Smidinger, Director
Superfund and Emergency Management Division

Date

Attachments:

Attachment 1: Maps, Pictures and Other Graphic Representations
Attachment 2: ARARs Table

Attachment 1: Maps, Pictures, Other Geographic Representations

Figure 1: Site Location

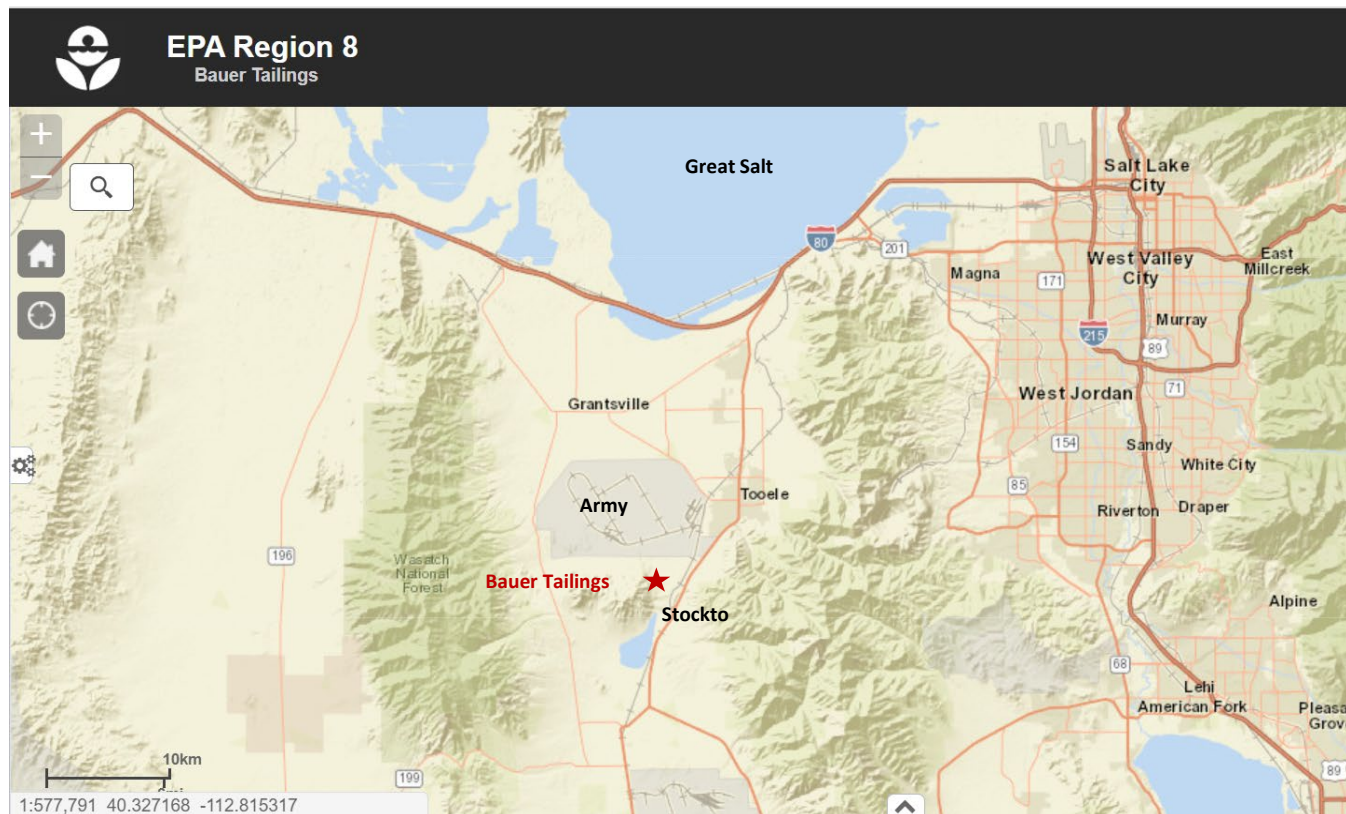


Figure 2: Migration of historic tailings to the northwest.

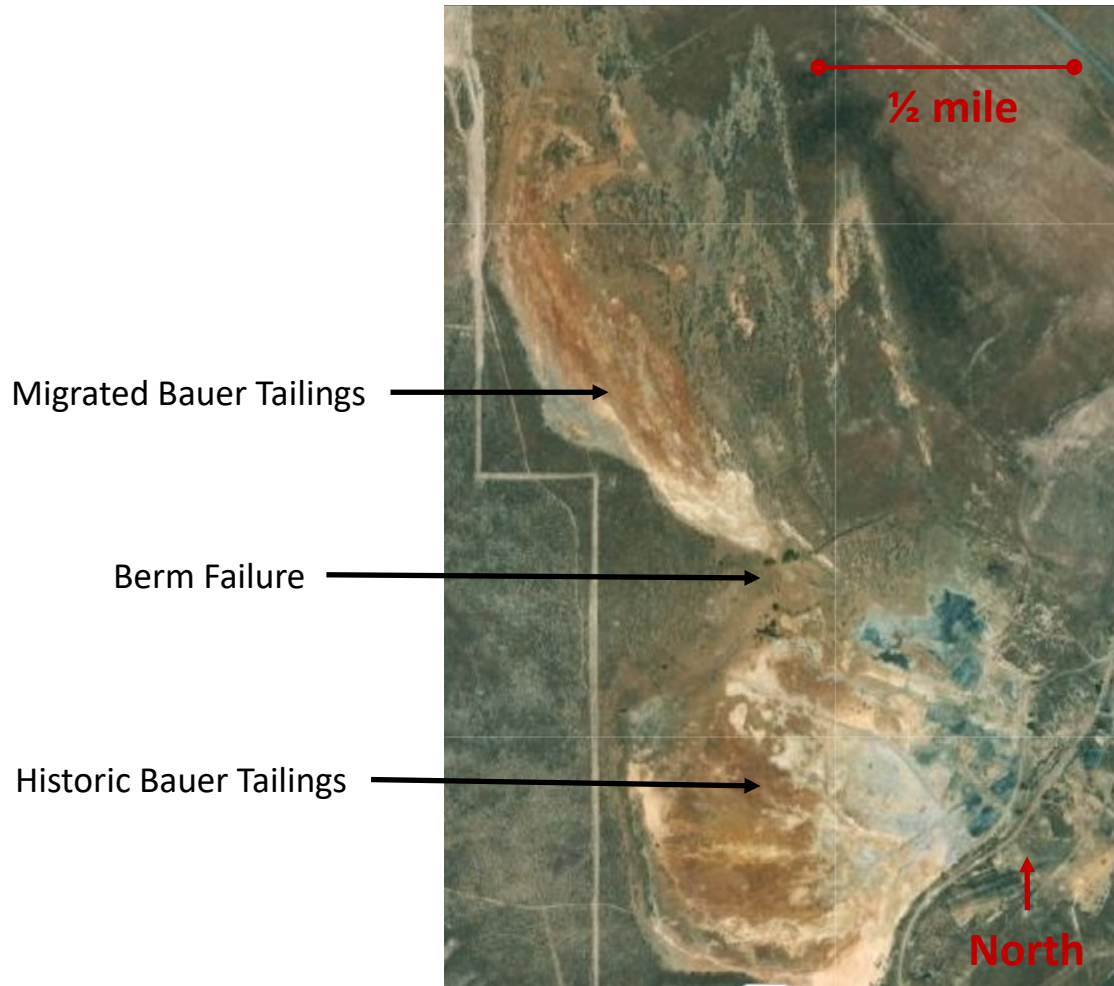


Figure 3: Surface concentrations of arsenic (mg/kg soil).

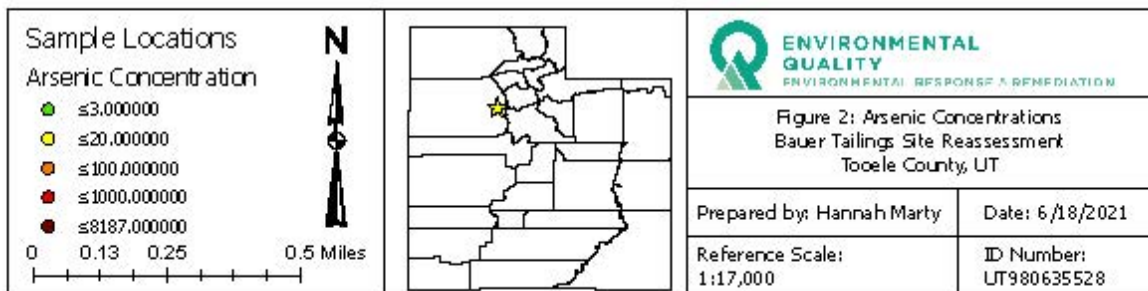
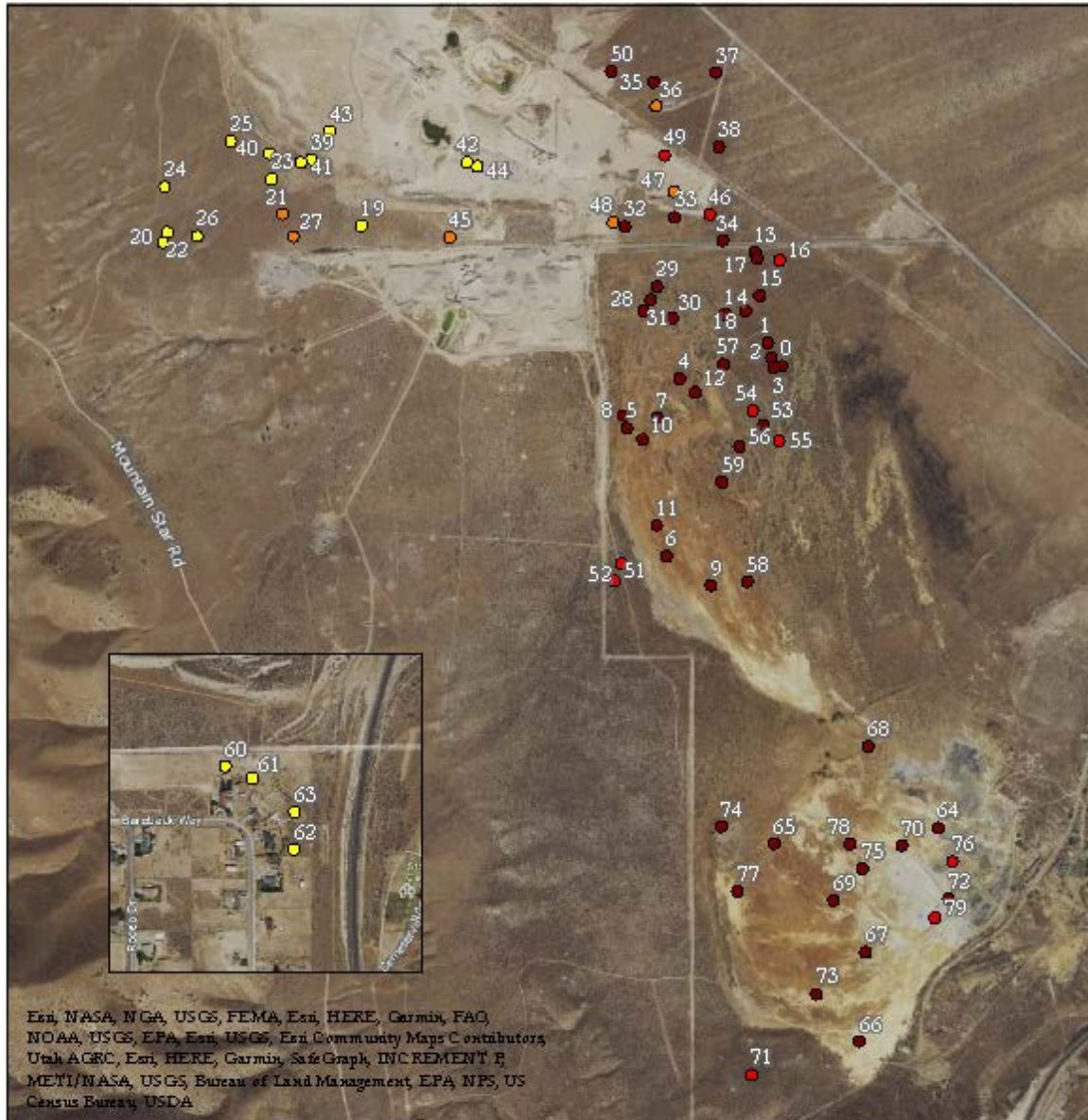


Figure 4: Surface concentrations of lead (mg/kg soil).

