Natural Resource Damage Assessment

Preassessment Screen Determination

for

Barker Hughesville Mining District National Priority List Site

Cascade and Judith Basin Counties, Monarch, Montana

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1.0 INTRODUCTION, AUTHORITIES, AND DELEGATIONS

This preassessment screen (PAS) concerns potential damage claims for injuries to natural resources and their services resulting from the release of hazardous substances at and from the Barker Hughesville Mining District (BHMD) National Priorities List (NPL) Site (Site) located in Cascade and Judith Basin Counties near Monarch, Montana. Natural Resource Damage Assessment and Restoration (NRDAR) authority for this Site is pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. §9601, *et seq*., and the State of Montana has additional authority pursuant to the Comprehensive Environmental Cleanup and Responsibility Act, § 75-10-701, *et seq*. This PAS recognizes that there is a reasonable probability that a claim for damages to natural resources and resource services within the trusteeship of the U.S. Department of Interior (DOI), acting through the U.S. Fish and Wildlife Service (USFWS), the U.S. Department of Agriculture (USDA), acting through the U.S. Forest Service (USFS), and the Governor of the State of Montana, acting through the Montana Natural Resource Damage Program (NRDP) as his representative, (collectively, Trustees) exists based on relevant information gathered as of this date.

This PAS was prepared by the Trustees for natural resources under the authority of Section 107(f) of CERCLA, as amended, 42 U.S.C. §9607(f); the National Contingency Plan, 40 C.F.R. Part 300; the CERCLA NRDAR Regulations, 43 C.F.R. Part 11, and other applicable Federal and state statutes, regulations, and directives which serve to designate Federal, State, and Tribal natural resource trustees and which authorize the restoration of lost natural resources and their associated services to baseline.

The intent of this PAS is to determine whether a discharge or release of a hazardous substance warrants conducting a formal natural resource damage assessment (NRDA). It is intended to be based on "a rapid review of readily available information….[to] ensure that there is reasonable probability of making a successful claim" [43 C.F.R. § 11.23(b)]. This PAS is not intended as an assessment of natural resource injuries at or from the Site or a quantification of damages associated with injuries to natural resources or the lost uses and services that may be attributable to harmed natural resources.

Several quantitative and qualitative data sources were relied on for this review of readily available information. The References section of this report contains literature and data sources that were relied upon for the preparation of this PAS.

The content and requirements of a PAS are described in 43 C.F.R. § 11.23. As described in the CERCLA NRDAR Regulations, the Trustees evaluate whether all the following criteria have been met [43 C.F.R. § 11.23(e)]:

1. a release of a hazardous substance has occurred;
2. natural resources for which the Trustees may assert trusteeship have been or are likely to have been adversely affected by the release;
3. the quantity and concentration of the released hazardous substance are sufficient to potentially cause injury to those natural resources;

4. data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost; and

5. response actions carried out or planned will not sufficiently remedy the injury to natural resources without further action.

A review of readily available information pertaining to the five criteria above has led the Trustees to conclude that elevated concentrations of hazardous substances at the Site, including in Site soils and groundwater, the water, soil, and biota in the Galena Creek watershed, Otter Creek, Dry Fork of Belt Creek, Belt Creek, and a portion of their respective floodplains and tributaries have occurred. Accordingly, the Trustees have determined that an assessment for this release should be performed.

1.1 Description of the Assessment Area

The assessment area is defined in the CERCLA NRDAR regulations as:

> *the area or areas within which natural resources have been affected directly or indirectly by the discharge of oil or release of a hazardous substance and that serves as the geographic basis for the injury assessment* (43 C.F.R. § 11.14(c)).

The Site is located within west-central Montana (Little Belt Mountains), approximately 45 miles south of Great Falls, 48 miles north of White Sulphur Springs, and due east of Monarch, MT (southeastern portion of Cascade and western portion of Judith Basin Counties) (Fig. 1). The Site includes two operable units (OU):

1. **OU1** is located within the eastern portion of the Site and encompasses approximately 3,050 acres in the portion of the BHMD Superfund Site within Judith Basin County and includes the drainage basins of Galena Creek and its tributaries down to the Gold Run Creek confluence (Fig. 1). OU1 includes mining-related contaminant sources including, but not limited to, abandoned mines, fluvial tailings deposits, underground mine workings, and discharging adits, seeps and mine-influenced water. Most of the OU1 land containing the mine-impacted areas is privately owned.

2. **OU2** begins below the confluence of Gold Run Creek and includes mining-related contaminant sources within the remainder of the Galena Creek drainage basin (including Block P Mill Tailings Site and Repository) and the drainage basins of Pride of the West Creek and Dry Fork Belt Creek down to the Dry Fork Belt Creek confluence with Belt Creek at Monarch, Montana. OU2 does not have identified waste piles or discharging seeps or adits. However, this OU is heavily impacted by mine waste transported downstream in flood events (fluvial tailings) and during seasonal runoff (CDM Smith 2016). Most of OU2 is on federal lands administered by the USFS with isolated homestead claims along Dry Fork Belt Creek.

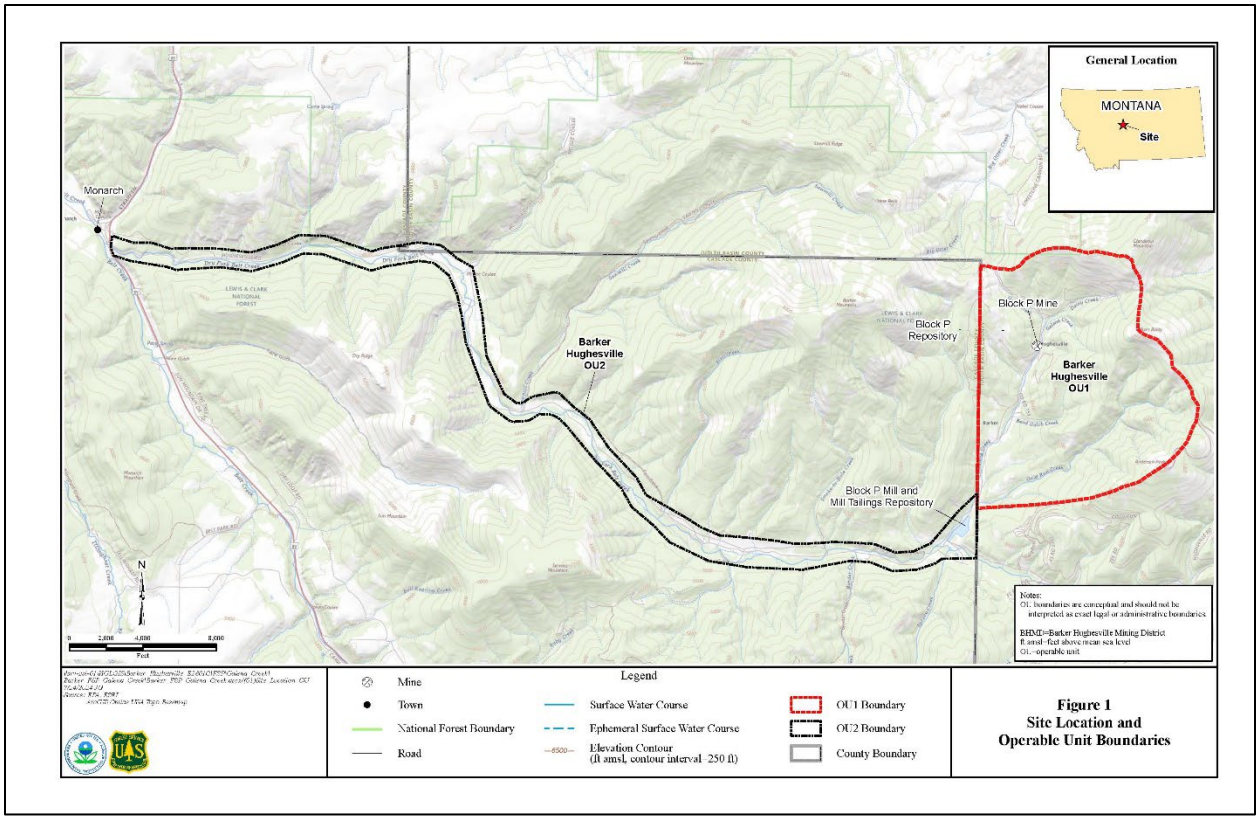

Figure 1. Barker Hughesville Mining District (BHMD) National Priorities List (NPL) Site (Site) located in Cascade and Judith Basin Counties near Monarch, Montana.

2.0 INFORMATION ON THE SITE AND THE RELEASE OF HAZARDOUS SUBSTANCES

2.1 Time and Quantity of the Release

Silver and lead ore deposits in the Galena Creek watershed were discovered in 1879, resulting in a subsequent boom in hundreds of mining claims. Barker and Hughesville smelting facilities were in operation for a limited time (< 3 years) resulting in over 934 tons of ore, before being shut down in 1883 as a result of falling silver prices and depletion of near-surface ore deposits (CDM Smith 2016). However, the construction of smelters in Great Falls and Neihart (1888) as well as a rail line between Barker and Monarch (1891) resulted in a resurgence of mining in this region until 1893 when mining ceased as a result of another decline in the price of silver. Intermittent mining occurred throughout the 20th century, primarily at the Block P Mine (formally known as the Barker Mine). All mines were abandoned and left in various states of disrepair, as well as discharging adits and large volumes of un-reclaimed mining waste remaining throughout the Site.

2.2 Hazardous Substances Released

Hazardous substances (Table 302.4 at 40 C.F.R. § 302.4) have been and continue to be released due to historic mining operations at the Site and contaminant concentrations are elevated in soil,

sediments, surface water, and groundwater. Based upon findings in the Belt Total Maximum Daily Load (TMDL) Plan under Section 303(d) of the Clean Water Act (CWA) (Schade 2011), and contaminants of concern identified in the Site Remedial Investigation (RI) Report (CDM Smith 2016), hazardous substances at the Site may include, but may not be limited to:

-Antimony (CAS # 7740-36-0) and compounds
-Arsenic (CAS # 7740-38-2) and compounds
-Cadmium (CAS # 7740-43-9) and compounds
-Chromium (CAS # 7740-47-3) and compounds
-Copper (CAS # 7740-50-8) and compounds
-Lead (CAS # 7439-92-1) and compounds
-Manganese compounds
-Mercury (CAS # 7439-97-6 & 7782-86-7) and compounds
-Thallium (7440-28-0) and compounds
-Zinc (CAS # 7440-66-6) and compounds

2.3 History of the Current and Past Use of the Site Identified as the Source of the Discharge of a Hazardous Substance

Over 45 abandoned mines, mills, and tailings locations within the Site are the sources of hazardous substance discharges. Mining and ore-processing operations produced hazardous waste containing metal sulfide minerals that, when exposed to water and air, released acids and metals. These materials are the main source of contamination to the environment and are concentrated in waste rock dumps, mill tailings, discharging mine adits/seeps, and streamside (fluvial) tailings deposits throughout the Site. These hazardous substances began discharging into the environment during the late 1800's - early 1900's as mining activity peaked, and many are still being discharged as a result of continued erosion and runoff.

Regulatory actions began in 1963 with the State of Montana identifying that abandoned mines within the Site were adversely affecting the water quality and biological conditions of Dry Fork of Belt Creek. During this time, unsuccessful attempts were made to encourage mine owners to voluntarily collect and treat acid mine drainage. Follow-up investigations did not occur until the 1990's and in 1998, when the USFS and Environmental Protection Agency (EPA) implemented an Administrative Order of Consent (AOC) to conduct an engineering evaluation/cost analysis (EE/CA) at the Site. In 2001, the Site was added to the NPL due to the contamination and risks to public health and the environment. From 2004 to 2006, the consolidation and capping of tailings impoundments were completed at the Block P Mill Site and in 2012 an additional removal action of waste rock was completed at the Block P Mine. Additional, but smaller scale, removal actions have been completed at the Site since 2012 (See Section 4.5).

2.4 Potentially Responsible Parties (PRPs)

EPA has identified Doe Run Resources Corporation (Doe Run), Emerald Resources Company, Hecla Limited, and Mount Emmons Mining Company (a subsidiary of Freeport McMoRan) as potentially responsible parties (PRPs). EPA and Doe Run have entered into two AOCs to investigate the Site, perform an EE/CA, and subsequently clean up portions of the Site under the

oversight of EPA and the Montana Department of Environmental Quality (DEQ). The AOCs required Doe Run contractors to excavate and consolidate contaminated mine wastes into a repository located on Doe Run property. The USFS issued Doe Run a Unilateral Administrative Order (UAO) in 2004 which required the completion of a removal action at the Block P Mill Site.

2.5 Damages Excluded from Liability under CERCLA

Under the CERCLA NRDAR regulations at 43 C.F.R. §11.24, the Trustees must determine whether the damages being considered are barred by specific defenses or exclusions from liability under CERCLA or the CWA. The Trustees must determine whether the damages from the discharge or release:

> (1) Have been specifically identified as an irreversible and irretrievable commitment of natural resources in an environmental impact statement (EIS) or other comparable environmental analysis, that the decision to grant the permit or license authorizes such commitment of natural resources, and that the facility or project was otherwise operating within the terms of its permit or license, so long as, in the case of damages to an Indian tribe occurring pursuant to a Federal permit or license, the issuance of that permit of license was not inconsistent with the fiduciary duty of the United States with respect to such Indian tribe; or
> (2) And the release of hazardous substance from which such damages have occurred wholly before the enactment of CERCLA; or
> (3) Resulted from the application of a pesticide product registered under the Federal Insecticide, Fungicide, and Rodenticide Act 7 U.S.C. 135-135k; or
> (4) Resulted from any other federally permitted release, as defined in section 101 (10) of CERCLA; or
> (5) Resulted from the release or threatened release of recycled oil from a service station dealer described in section 107 (a)(3) or (4) of CERCLA if such recycled oil is not mixed with any other hazardous substance and is stored, treated, transported or otherwise managed in compliance with regulations or standards promulgated pursuant to section 3014 of the Solid Waste Disposal Act and other applicable authorities.

The Trustees have determined that none of the potential injuries resulting from hazardous substance releases at the Site meet any of the above exclusion criteria, nor are they subject to any of the exceptions to liability provided for in 107(f), (i), and (j), and 114(c) of CERCLA. Therefore, the continuation of an assessment of injuries to natural resources is not precluded.

In addition to exemptions under CERCLA, the Trustees must determine whether the discharge meets one or more of the exclusions provided in section 311(a)(2) or (b)(3) of the CWA. Excluded discharges in the CWA are:

> (1) Discharges in compliance with a permit under section 402 of the CWA;
> (2) Discharges resulting from circumstances identified and reviewed and made a part of the public record with respect to a permit issued or modified under section 402 of the CWA, and subject to a condition in such permit;
> (3) Continuous or anticipated intermittent discharges from a point source, identified in a

> permit or permit application under section 402 of the CWA, which are caused by events occurring within the scope of relevant operating or treatment systems;
> (4) Discharges incidental to mechanical removal authorized by the President under subsection (c) of this section; and
> (5) Discharges into the waters of the contiguous zone or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson-Stevens Fishery Conservation and Management Act of 1976), where permitted under the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, and where permitted in quantities and at times and locations or under such circumstances or conditions as the President may, by regulation, determine not to be harmful.

The Trustees have likewise evaluated the discharge or releases into the Site and will not be pursuing damages for any discharge(s) that meet any of the criteria listed above.

3.0 PRELIMINARY IDENTIFICATION OF RESOURCES POTENTIALLY AT RISK

3.1 Preliminary Identification of Pathways

Pathway is an essential component of the determination of injury to natural resources. Pursuant to 43 C.F.R. § 11.14(dd), a pathway is defined as:

> *The route or medium through which ... a hazardous substance is or was transported from the source of the discharge or release to the injured resource.*

Actual or potential sources of hazardous substance releases from the Site include waste rock dumps, mill tailings, discharging mine adits/seeps, and streamside (fluvial) tailings deposits. Exposure pathways that may transport hazardous substances released from sources to other natural resources include direct contact, surface water/sediments, groundwater, aerial transport, soil, and aquatic-terrestrial food web linkages. Pathways of hazardous substance transport at the Site are described briefly in the sections below.

3.1.1 *Direct contact of Biota with Hazardous Substances*

Terrestrial and aquatic biota may come in direct contact with hazardous substances through dermal and ingestion exposure of waste rock, mill tailings, discharging mine adits/seeps, streamside (fluvial) tailings deposits, and metal-contaminated surface water, soil, and sediment at the Site.

For terrestrial wildlife, incidental ingestion of contaminated soil at some waste rock and streamside (fluvial) tailings deposit locations is a plausible exposure pathway for small home range terrestrial receptors such as masked shrews (*Sorex cinereus*), American robins (*Turdus migratorius*), and similar species due to elevated concentrations of lead and arsenic (CDM Smith 2016). Ingestion of lead and zinc-contaminated sediments is also a significant exposure pathway to semi-aquatic receptors such as American Dippers (*Cinclus mexicanus*) and Mallards (*Anas platyrhynchos*), as well as plants and soil-dwelling organisms that are in direct contact with hazardous waste present in the soil profile (CDM Smith 2016). Additionally, amphibians and

reptiles can be exposed to contaminants, particularly zinc and manganese, through the ingestion of contaminated surface water (CDM Smith 2016).

For aquatic organisms, ingestion and dermal contact with discharging mine adits/seeps and contaminated surface water and sediments are important exposure pathways. Direct exposure to surface water and mine adit discharges can be toxic to fish and other aquatic organisms due to elevated metals, particularly cadmium, manganese, copper, and zinc (CDM Smith 2016). Elevated concentrations of hazardous substances, mainly arsenic, cadmium, copper, lead, manganese, silver, and zinc in streambed sediments can expose some benthic organisms directly and cause toxicity (CDM Smith 2016). Much of Galena Creek is devoid of aquatic life and aquatic communities are impaired compared to reference locations in the Lower Dry Fork of Belt Creek (CDM Smith 2016).

3.1.2 *Surface Water/Sediment Pathway*

Surface water and associated sediments are exposed to hazardous substances released from a variety of hazardous waste sources present throughout the Site. For instance, numerous mine adits/seeps, many of which are characterized as having a low pH and high concentration of metals, metal(loid)s, and sulfate, discharge water either directly to a surface water source or near a surface water source. In addition, contaminated groundwater can contribute metal and metal(loid) loads to surface water and sediments in areas where the aquifer is constricted. The RI identified contaminated groundwater associated with flooded underground mines at the Block P Mine Complex as the largest contributor of surface water contamination to Galena Creek (CDM Smith 2016) and this Complex also interacts with the stream hyporheic zone. During runoff and other precipitation events, metals and metal(loid)s originating from mill tailings, streamside (fluvial) tailings deposits and waste rock piles that do not infiltrate to groundwater can be transported overland, contributing additional contamination to surface water and sediments.

3.1.3 *Groundwater Pathway*

Both alluvial and bedrock aquifers have been contaminated with mine waste throughout the Site. The infiltration of precipitation and snow melt through mill tailings, streamside (fluvial) tailings deposits, and waste rock have leached and transported hazardous substances from those sources to alluvial groundwater. When water enters underground mine workings either as direct surface infiltration or as discharge from bedrock fracture zones and interacts with air, acid mine drainage is produced. This contaminated groundwater located in bedrock aquifers is characterized by low pH and high concentrations of metals, metal(loid)s, and sulfate. In some areas, mine wastes are in direct contact with groundwater which causes contamination to occur directly to groundwater.

3.1.4 *Aerial Transport Pathway*

Under certain conditions, air overlying the Site may become contaminated with waste originating from contaminant sources such as mill tailings, streamside (fluvial) tailings deposits, and waste rock dumps. For instance, during dry windy periods contaminated dust particles may be transported to the air. Although periods of air contamination are likely brief, the aerial transport

pathway will expose a variety of natural resources to contaminants by transporting metal- and metal(loid)-associated dust particles from source areas at the Site to other exposure pathways.

3.1.5 *Soil Pathway*

Soil has been exposed to hazardous substances at waste rock dumps, mill tailings' locations, and streamside (fluvial) tailings depositional areas. Concentrations of contaminants in soils are at levels that are known to be phytotoxic and areas of denuded vegetation in contaminated areas are apparent. Soil contaminant concentrations are at levels known to be toxic to soil dwelling invertebrates and reduced growth in earthworms was observed in site-specific earthworm toxicity tests (CDM Smith 2016). Furthermore, incidental ingestion of contaminated soil at some waste rock and streamside (fluvial) tailings deposit locations is a plausible exposure pathway for small home range terrestrial receptors such as masked shrews, American robins, and similar species due to elevated concentrations of lead and arsenic. (CDM Smith 2016).

3.1.6 *Aquatic-terrestrial Food Web Pathway*

Aquatic-terrestrial food web exposures occur when prey organisms accumulate contaminants within their tissues and are subsequently consumed by a predator. Benthic macroinvertebrates collected at various sites across the Site had concentrations above levels known to cause adverse effects in organisms that prey upon them. For instance, semi-aquatic receptors such as American dippers and mallards are exposed to toxic levels of aluminum, arsenic, and zinc from dietary exposures in Galena Creek, Lower Dry Fork of Belt Creek, and in some instances, Belt Creek. In addition to American dippers and mallards, other semi-aquatic receptors like the belted kingfisher (*Megaceryle alcyon*) and tree swallow (*Tachycineta bicolor*) are exposed to toxic levels of lead from dietary exposures along Galena Creek and Lower Dry Fork of Belt Creek. Terrestrial invertebrates collected at various sites across the Site also had concentrations above levels known to cause adverse effects in organisms that prey upon them. For example, small home range terrestrial receptors like American robins are exposed to toxic levels of lead and arsenic at many locations across the Site through dietary exposures.

3.2. Sampling of Exposed Areas and Potentially Injured Natural Resources

Contamination has been documented from the headwaters of Galena Creek and extending through Belt Creek below the confluence of Dry Fork of Belt Creek (CDM Smith 2016). Environmental sampling has confirmed the presence of elevated metals and metal(loid)s within surface water and sediments, groundwater, soils, and biota. The following provides a brief description of each exposure area and examples of concentrations of hazardous substances that have been measured in each identified area of potential exposure. This information is based on readily available information and is not a comprehensive review of all investigations that have been conducted at or near the Site.

3.2.1 *Surface Water and Sediment*

Galena Creek and tributaries

Galena Creek flows for approximately 3.25 miles (tributaries not included) before reaching Dry Fork of Belt Creek. Surface water and sediments are highly contaminated in the Galena Creek drainage and in many locations water quality is too poor to support aquatic macroinvertebrates and fish. These elevated contaminant concentrations also have the potential for increased exposure to terrestrial wildlife that interact with the aquatic environment. This area is also a significant contaminant source for downstream areas. Within Galena Creek, DEQ-7 Circular Numeric Water Quality Standards (DEQ-7) acute aquatic life criteria were consistently exceeded for cadmium, copper, lead, and zinc; exceedances were also observed for iron, aluminum, selenium, and thallium, but not at the same rate as cadmium, copper, lead, and zinc (CDM Smith 2016). Water quality criteria exceedances were also commonly observed in tributaries to Galena Creek like Green and Silver Creeks (CDM Smith 2016). The contaminant levels in surface water were compared to the 2013 DEQ-7 standards in the Remedial Investigation (CDM Smith 2016). The current Circular DEQ-7 Numeric Water Quality Standards are all the same or slightly lower than the 2013 standards; accordingly, a use of current DEQ-7 standards would show the same exceedances if compared to the data in the Remedial Investigation (Montana DEQ 2019). In addition, sediment concentrations of arsenic, cadmium, copper, iron, lead, manganese, and zinc consistently exceed sediment probable effect concentration levels throughout Galena Creek (CDM Smith 2016).

Lower Dry Fork of Belt Creek

Below Galena Creek, the lower portion of Dry Fork of Belt Creek flows for approximately 11 miles before joining Belt Creek. The entire length of the Lower Dry Fork of Belt Creek has been contaminated through the fluvial transport of dissolved and particulate waste, and to a lesser extent aerial transportation of waste, from source areas in the Galena Creek drainage. Surface water concentrations of various metals in Lower Dry Fork of Belt Creek remain elevated compared to a reference location on the Upper Dry Fork of Belt Creek immediately upstream of the confluence with Galena Creek. CDM Smith (2016) reported that zinc readily exceeded DEQ-7 aquatic life standards and exceedances were also less frequently observed for cadmium, copper, and lead. Similar to Galena Creek, sediment concentrations of arsenic, cadmium, copper, iron, lead, manganese, and zinc consistently exceed sediment probable effect concentration levels throughout the Lower Dry Fork of Belt Creek.

Belt Creek

Dry Fork of Belt Creek converges with Belt Creek in Monarch, Montana. As part of the RI, two locations on Belt Creek downstream of Dry Fork of Belt Creek and one location above the confluence of Dry Fork of Belt Creek were sampled. Elevated levels of metals were observed at all three sites. The elevated concentrations detected at the site upstream of Dry Fork of Belt Creek can be attributed to the Carpenter Snow Creek NPL Site located farther up the Belt Creek watershed and concentrations below the confluence likely reflect a mixture of the two sites. Nonetheless, surface water concentrations detected downstream for cadmium, copper, lead, and

zinc continue to exceed DEQ-7 aquatic life standards (DEQ 2013) and sediment concentrations for cadmium, copper, lead, manganese, and zinc are also detected above probable effect concentrations. Surface water DEQ-7 standard and sediment effect exceedances are observed at both downstream sites, including the furthest downstream site that is 7.5 miles below the confluence of Dry Fork of Belt Creek.

3.2.2 *Groundwater*

Alluvial and bedrock aquifers exist throughout the Site. Due to the steep topography and high stream gradient in much of the Galena Creek drainage, alluvial aquifers are often thin, discontinuous, and discharge to the adjacent stream. Alluvial aquifers are thicker and more continuous where the floodplain is broader and the stream gradient is less steep, similar to the Dry Fork of Belt Creek drainage and the lower portion of Galena. Nonetheless, contamination is evident in alluvial aquifers throughout portions of Galena Creek and lower. In addition, contaminated groundwater adjacent to Dry Fork of Belt Creek is also expected to interact with the surface water impacting the creek's instream sediments and surface water.

Bedrock aquifers at the Site can be separated into two different concepts based upon geology. In the western portion of the Site that includes the town of Monarch, the Jefferson formation is a regional aquifer that provides a significant source of water to users and appears to be unimpacted. Groundwater samples were collected as part of the 2016 RI from well heads and taps at nine residential properties in Monarch that are likely drawing water from the Jefferson Formation. Concentrations of metals and metal(loid)s were all below levels of concern (CDM Smith 2016). No bedrock aquifer wells exist along Dry Fork of Belt Creek, however, surface water and pore water samples were collected at a location that is a known losing reach to bedrock aquifers below the stream. Dissolved concentrations were low suggesting that the contamination remaining within the water at this location is associated with suspended material or bed sediment. Based on this information, EPA expects that little contamination is being transported to the bedrock aquifers, but no data has been collected from the bedrock aquifer to confirm this.

3.2.3 *Soils*

Soil can be classified as a geologic resource as defined by 43 C.F.R. § 11.14(s). For the Site, soils can be divided into four separate geographic groups: Galena Creek Watershed Uplands, Galena Creek Floodplain, Dry Fork of Belt Creek Floodplain, and Belt Creek Floodplain.

Galena Creek Watershed Uplands

Approximately 400,000 yd^3 of waste has been released into the Site primarily from waste rock dumps, the majority of which are located in the Galena Creek watershed (CMD 2016). Waste rock dumps can expose terrestrial wildlife and plants to elevated metals and metal(loid)s and can contribute contaminant loads to other natural resources such as surface water, sediments, and groundwater.

Galena Creek Floodplain

Although narrow, steep valleys within this drainage prevent significant floodplain development in some areas, wider areas of the valley along Galena Creek allow much more significant distribution of waste in near-stream soil. The area or volume of waste has not been formally estimated, but visually impacted floodplain soils are evident throughout much of the developed floodplain of Galena Creek. This waste has and continues to expose terrestrial wildlife to elevated levels of metals and metal(loid)s, and remains a source of contamination to surface water and groundwater. Elevated concentrations of metals within streamside (fluvial tailings) deposits have been observed throughout the Galena Creek floodplain, as well as many of its tributaries and Otter Creek.

Lower Dry Fork of Belt Creek Floodplain

Most of the significant sources of solid waste are located in the Galena Creek watershed, however, periodic flooding has and continues to transport and deposit waste in near-stream soils along Dry Fork of Belt Creek below Galena Creek. Although the sizes of these depositional areas are variable throughout the floodplain of lower Dry Fork of Belt Creek, terrestrial wildlife and plants are exposed to elevated levels of metals and metal(loid)s across sections of the entire stream reach. Copper, manganese, mercury, and silver were all detected at concentrations above reference, and median concentrations of arsenic, cadmium, lead, and zinc were all 10 times greater than background concentrations (CDM Smith 2016).

Belt Creek Floodplain

Below the confluence of Dry Fork of Belt Creek, Belt Creek receives contaminant loads from both the Site and Carpenter Snow Creek NPL Site. Near-stream soils were sampled in multiple areas extending to 15.5 miles below the Dry Fork of Belt Creek confluence. Elevated concentrations were detected for a variety of metals with concentrations exceeding 10 times background for cadmium and zinc (CDM Smith 2016).

3.2.4 *Biota*

As part of the 2016 RI, various biotic components of the Site's ecosystem were sampled (CDM Smith 2016). For the aquatic environment, fish and benthic macroinvertebrates were sampled at impacted locations including Lower Dry Fork of Belt Creek and Belt Creek, although Belt Creek is influenced by both the Site and Carpenter Snow Creek NPL Site, and from a reference location in the Upper Dry Fork of Belt Creek outside of the mining-influenced Sites. Galena Creek is devoid of fish and macroinvertebrate abundance is very low due to high levels of contamination. Thus, fish and macroinvertebrate samples were not collected from this location. Although many of the contaminants associated at the Site are not highly bioaccumulative, various contaminants such as cadmium, lead, and manganese have accumulated in fish tissues at higher concentrations compared to reference samples. Similarly, contaminants such as arsenic, cadmium, copper, lead, manganese, and zinc are elevated in composite macroinvertebrate tissues when compared to reference samples (CDM Smith 2016).

For the terrestrial environment, small mammals, riparian vegetation, and terrestrial invertebrates were sampled and analyzed for metals and metal(loid)s. Deer mice (*Peromyscus maniculatus*), grasses (*Pseudoroegneria* sp., *Agrostis* sp., *Festuca* sp., *Bromus* sp., and *Phleum* sp.), forbs (*Rosa* sp., *Chenopodium* sp., *Fragaria* sp., and an unknown perennial forb), and terrestrial invertebrates were collected by sweep nets and pit traps from various locations within the Lower Dry Fork of Belt Creek floodplain and from a single reference floodplain location in the Belt Creek watershed outside of mining influence. Many of the constituents detected in mouse tissues throughout the Site were not markedly different from those collected at a reference location, although lead, and to a lesser extent copper, were elevated compared to reference concentrations. For many constituents, maximum concentrations exceeded the reference concentrations, particularly for the grasses. Metal concentrations in insects collected from the Site were generally higher than those observed in samples collected from a reference location.

3.3 Potentially Affected Resources

Natural resources affected or potentially affected include, but are not limited to, the following, all of which fall within the jurisdiction of the Trustees:

- Biotic resources (*e.g.,* aquatic and terrestrial vegetation, fisheries, migratory birds, mammals, and their supporting habitats)
- Surface water and sediment resources, including Galena Creek and tributaries, downstream portions of Dry Fork of Belt Creek, and portions of Belt Creek
- Groundwater resources associated with Galena and Lower Dry Fork of Belt Creeks
- Geologic resources

Services provided by these natural resources include, but are not limited to, the following:

- Habitat for Trustee species (*e.g.,* food, shelter, breeding areas, and other factors essential to survival)
- Recreational uses (*e.g.,* fishing, nature observation, camping, and water-contact recreation)

Loss of services may include the ecological impairment of a resource (*e.g.,* decrease in reproduction) or diminished human use of a resource (*e.g.,* limited opportunity to participate in camping or recreational fishing).

4.0 GENERAL CRITERIA FOR PROCEEDING WITH A DAMAGE ASSESSMENT

In accordance with section 43 C.F.R. § 11.23, the Trustees have determined that all of the following criteria have been met.

4.1 Criterion 1 – A release of a hazardous substance has occurred.

Data collected across the Site have demonstrated that releases of hazardous substances have occurred and continue to occur as a result of historic mine, milling, and smelting operations at the Site. Mining and ore-processing activities throughout the Site have produced waste containing metal sulfide minerals that, when exposed to water and air, release acid and metals. These materials are the main source of contamination to the environment and can be categorized as waste rock dumps, mill tailings, discharging mine adits/seeps, and streamside (fluvial) tailings

deposits. Hazardous substances released include, but may not be limited to antimony, arsenic, cadmium, chromium, copper, lead, manganese, mercury, thallium, and zinc. Investigations have revealed elevated concentrations of hazardous substances in geologic resources, surface water, groundwater, and biota that have resulted from releases of hazardous substances at the Site.

4.2 Criterion 2 - Natural resources for which the Trustees may assert trusteeship under CERCLA have been or are likely to have been adversely affected by the release.

The exposed areas and the natural resources adversely affected by the releases of hazardous substances from the Site are within the purview of the Trustees as defined under CERCLA. The release of hazardous substances from the Site may have affected, and may continue to affect biotic resources (*e.g.,* aquatic and terrestrial vegetation, fisheries, mammals, and migratory birds), floodplain habitat, surface water, and groundwater of the drainage basins of Galena Creek and its tributaries (*e.g.,* Green Creek, Silver Creek, Bend Gulch, and Gold Run Creek), Otter Creek, and Dry Fork of Belt Creek and its floodplains extending to its confluence with Belt Creek. In addition, habitat for Trustee species (e.g., food, shelter, breeding areas, and other factors essential to survival), and a variety of human uses (e.g., fishing, nature observation, camping, water use, and water-contact recreation) may also have been impacted.

4.3 Criterion 3 - The quantity and concentration of the released hazardous substances are sufficient to potentially cause injury.

Various sample types (*e.g.,* biota, soil, and water) were collected from the Site and analyzed for hazardous substances, specifically arsenic and other metal contamination. The data from these samples indicate that contaminant levels (*e.g.,* arsenic, cadmium, copper, lead, manganese, mercury, thallium, and zinc) have exceeded and continue to exceed background concentrations that may potentially cause injury to Trust resources. Further, there are exceedances of the DEQ-7 Standards in the surface water and groundwater.

4.4 Criterion 4 - Data sufficient to pursue an assessment are readily available or likely to be obtained at a reasonable cost.

Data relevant to conducting an assessment of natural resource damages at the Site have been collected as part of past investigations and efforts to collect more Site environmental data are ongoing. Such data include information on hazardous substances sources, releases, pathways, and concentrations in the environment. Since the PAS is intended to determine if there is sufficient cause to pursue a NRDA exists, omission of any information in the PAS does not preclude consideration of such information during a NRDA. Additional data for the purposes of performing a NRDA are expected to be obtainable at a reasonable cost.

4.5 Criterion 5 - Response actions do not or will not sufficiently remedy the injury to natural resources without further action

Response actions are currently in progress at the Site. A brief summary of the response actions is provided on EPA's "Cleanup Activities" section of the Site website and below:

- *Block P Mill Site waste removal (2004 - 2005):* Approximately 100,000 yd^3 of tailings were excavated and consolidated with an additional 200,000 cy in an onsite repository. Work efforts were implemented under a USFS Action Memorandum and a Unilateral Administrative Order between USFS and Doe Run.
- *Block P Mine waste removal (2010 - 2012):* In 2010, efforts on a removal action design began to support an EPA Action Memorandum and new AOC between EPA and Doe Run. In 2011 and 2012, excavation of approximately 230,000 yd^3 from within and immediately adjacent to the Block P Mine were completed, with disposal at an on-site repository.
- *Dry Fork of Belt Creek Dispersed Campground Treatments (2014):* The USFS used ASARCO bankruptcy settlement money to armor, install fire rings and pit toilets and decommission certain campgrounds. These treatments were completed to encourage the recreating public to dispersed campsites that were known to not be impacted by fluvial mine tailings.
- *Dry Fork of Belt Creek Fish Barrier Installation (2015):* A fish barrier was installed by MT Fish, Wildlife and Parks in the Dry Fork of Belt Creek drainage. The barrier was installed to protect native strains of Westslope Cutthroat Trout (WCT) populations. Water quality in the Dry Fork of Belt Creek is currently poor due to historic hard rock mining, but recent removal actions by the EPA and USFS indicates water quality is improving and may allow for non-native species to migrate upstream and jeopardize the WCT populations as additional removal actions continue.
- *Middle Reach Galena Creek Reconstruction (2017):* Construction of a new 1,120-foot long stream channel was completed that included: installation of a 120-foot long, 6-foot diameter synthetic culvert pipe; demolition of pre-existing culverts; channel drop structures, cobble stream bed, and bank protection as necessary; re-routing of the county road at the location of the new 120-foot culvert to improve grade, width and surface; excavation, investigation and plugging of four primary mine seeps located within the fractured bedrock around Galena Creek.
- *Block P Mine East Slope Toe/Galena Creek Backfill and Re-contour (2017):* Haulage, placement, and compaction of 1,100 yd^3 of bentonite amended soil at the toe of the east-facing Block P Mine slope was completed, followed by haulage, placement, compaction, and final grading of 10,200 yd^3 of common fill.
- *Closure of Uphill Mine Workings (2018):* Numerous near-surface underground workings with surface expression were excavated and closed using backfill and bentonite mat material. These workings were uphill of the former Barker Shaft and 75-foot level adit and were thought to allow conveyance of surface water run-off to the underground workings.
- *Block P Mill Repository (2019):* Reconstruction of a stormwater/seasonal run-off drainage way at the Block P Mill Repository to convey clean water away from the repository was completed.

A final remedy within a Record of Decision (ROD) has not been issued for OU1 or OU2. Based upon experience at other Sites throughout Montana, it is anticipated that response actions will likely not be sufficient to remedy the injuries to natural resources.

5.0 PREASSESSMENT SCREEN DETERMINATION

Based upon the information in this PAS, the Trustees have made the preliminary determination that the criteria specified in 43 C.F.R. § 11.23 have been met. The Trustees further determine that current information indicates that there is reasonable probability of making a successful NRDA claim for injuries to natural resources under their trusteeship pursuant to CERCLA § 107. The Trustees have further determined that an assessment should be carried out within the Site in accordance with the CERCLA NRDAR Regulations 43 C.F.R. Part 11, Subparts C and E. Thus, we the undersigned designated natural resource Trustee agencies, acting on behalf of the public, pursuant to Federal and State law, do find sufficient cause and intend to seek damages for injuries suffered.

6.0 LITERATURE CITED

CDM Smith. 2016. Final Remedial Investigation Report. Barker Hughesville Mining District Superfund Site, Cascade and Judith Basin Counties, Montana. Prepared for the U.S. EPA by CDM Smith. June 2016.

Montana DEQ, Water Quality Division, Water Quality Planning Bureau, Water Quality Standards and Modeling Section. 2019. DEQ-7 Montana Numeric Water Quality Standards. Helena, MT: Montana Dept. of Environmental Quality.

Schade, P. 2011. The Missouri-Cascade and Belt TMDL Planning Area Metals Total Maximum Daily Loads and Framework Water Quality Improvement Plan. Prepared by the Montana Department of Environmental Quality. January 2011.

Natural Resource Trustee:

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Matt Hogan

Regional Director

Authorized Official

U.S. Fish and Wildlife Service

Department of the Interior

Date: _____

Natural Resource Trustee:

_____

State of Montana, through Natural Resource Damage Program

Date: _____

Natural Resource Trustee:

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U.S. Department of Agriculture

Date: _____

Natural Resource Trustee:

Matt Hogan

Regional Director

Authorized Official

U.S. Fish and Wildlife Service

Department of the Interior

Date: _____

Natural Resource Trustee:

State of Montana, through Natural Resource Damage Program

Date: 12/16/2024

Natural Resource Trustee:

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U.S. Department of Agriculture

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