USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Smoky Canyon Mine

CARIBOU-TARGHEE NATIONAL FOREST

Introduction

The U.S. Forest Service, an agency of the U.S. Department of Agriculture, is proposing a plan for the cleanup of the Smoky Canyon Mine (Site) in Caribou County, Idaho, and is inviting the public to review and comment on the Proposed Plan. The Site is a former phosphate mine located in the Phosphate Resource Area of Southeast Idaho.

Operation of the mine resulted in the contamination of soils, surface water, vegetation, sediments/soils, and groundwater.

This Proposed Plan provides background information on the Site and the cleanup process, describes the cleanup alternatives that were evaluated, identifies the Forest Service's preferred cleanup alternative, and explains the reasons for this preference. A Proposed Plan is a document that the Forest Service is required to issue under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund, and the regulations that implement CERCLA, known as the National Contingency Plan (NCP). The Forest Service is issuing this Proposed Plan consistent with the statutory and regulatory requirements of CERCLA § 117(a) (42 U.S.C. § 9617(a)) and the NCP § 300.430(f)(2) (40 C.F.R. § 300.430(f)(2)).

This Proposed Plan is based on information collected, evaluated, and summarized in reports prepared by the J.R. Simplot Company (Simplot) with direction and oversight provided by the Forest Service, the lead agency. Support agencies are: the U.S. Environmental Protection Agency (USEPA), the Idaho Department of Environmental Quality (IDEQ), the U.S. Fish and Wildlife Service (USFWS), the Bureau of Land Management (BLM) and the Shoshone-Bannock Tribes.

This Proposed Plan highlights key information from the remedial investigation (RI) and feasibility study (FS) reports. The reader should consult the RI/FS reports and documents in the administrative record for more information regarding the proposed remedial action.

Public Comment Period:
April 2023

Documents used in this Proposed Plan may be viewed during the Public Comment Period at:

Soda Springs Ranger District
410 East Hooper Ave.
Soda Springs, ID 83276-1496

The Forest Service will accept comments on the Proposed Plan during the public comment period (April 26, 2023 - May 26, 2023), which may be submitted three ways. (See Community Involvement Section for more details.)

By Mail:

Attn: Smoky Canyon Mine
Comments
Sherri Stumbo
USDA Forest Service
4350 Cliffs Drive
Pocatello, ID 83204

By E-mail: sherri.stumbo@usda.gov ***and*** sarah.wheeler2@usda.gov

During Public Meeting:

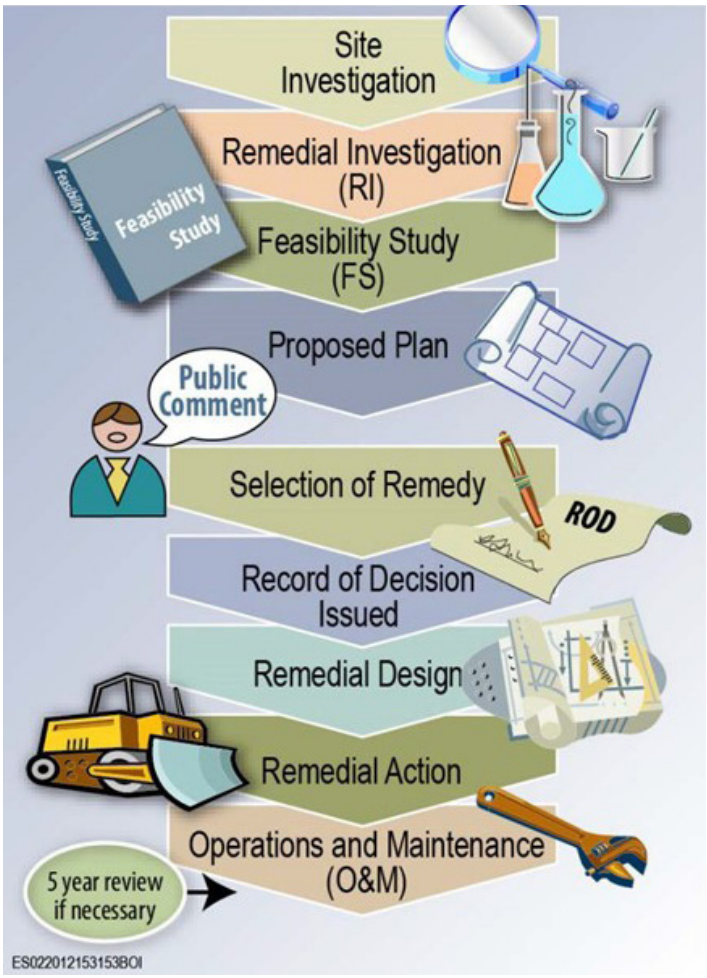
- The Forest Service will hold a virtual public meeting. The Forest Service will present the Proposed Plan. There will be an opportunity to provide written or oral comments during this meeting.
- You can find the link to the meeting here and on our website: https://bit.ly/41umb54

The Forest Service is inviting input from the public on all alternatives and on the rationale for the Preferred Alternative. After considering public comments and any new information, the Forest Service, in coordination with support agencies, will issue a Record of Decision (ROD) that selects a final remedy to be implemented.

Information on how to provide comments or questions to the Forest Service is presented in the inset on page 2 and on page 22. A list of environmental terms and abbreviations used in this Proposed Plan, along with referenced project Attachments, are provided at the end of the document.

The Superfund Process

The Superfund process is a structured process, established by CERCLA and the NCP, to guide the cleanup of contaminated sites. The process includes various steps, illustrated below, leading from discovery of a site, through investigation, remedy selection, and implementation of a remedy.



Site Background

The Smoky Canyon Mine is located in Caribou County, Idaho (within the Southeast Idaho Phosphate Mining Resource Area). The mine is located approximately 24 miles due east of Soda Springs, Idaho and is accessed by traveling 10 miles generally west from Afton, Wyoming (Attachment 1). Mining and milling operations are contained within 2,600 acres of federal phosphate mineral leases (Federal Phosphate Leases No. I-012890, I-026843, I-027801, I-27512, and I-30369) administered by the Pocatello Field Office of the Bureau of Land Management and approximately 1,200 acres of Special Use Permit administered by the Caribou-Targhee National Forest.

Phosphate ore is extracted from a series of pits, referred to as mine panels, located on the eastern slope of the Webster Range between Smoky Canyon and South Fork Sage Creek (Attachment 2). Specific mining and mine-related areas of the Site include backfilled Panels A, B, C, D, and E; the external overburden disposal areas (ODA) associated with these mine panels; and the Pole Canyon ODA. The mill and administrative and maintenance facilities are located in Smoky Canyon near the northern end of the mining operations.

Mining activities began at Smoky Canyon in 1983 and are ongoing today. Ore is recovered through open pit mining practices that follow the north-south trending Phosphoria Formation outcrop as it dips to the west. The overburden, which consists of Dinwoody, chert, limestone, and center waste shale, is used to backfill the previously mined pits and has also been placed in external ODAs just east of the pits.

In 2001, IDEQ assumed leadership of an area-wide investigation of contamination from phosphate mining, with participation by other state and federal agencies and the mining companies with operations in southeast Idaho. These area-wide investigations led the agencies to conclude that site-specific investigations were warranted on the larger historic and active open-pit mines located in the mining district, including the Smoky Canyon Mine.

In 2009, the USEPA, the IDEQ, the Forest Service, and Simplot (the latter as Respondent) entered into a mine-specific legal agreement calling for

Simplot to conduct investigations and develop Remedial Investigation (RI) and Feasibility Study (FS) reports for the Site. The Forest Service was designated the lead agency to oversee this work.

The area disturbed by mining is owned by the United States and administered by the Forest Service. Nearby adjoining lands consists of privately owned ranching and farming properties.

Sources of Contamination

Overburden disposed in backfilled mine pits and external ODAs is the source of selenium and other contaminants of potential concern (COPCs) to the environment. Selenium and other COPCs are released from overburden materials to infiltrating and percolating water. Transport to the Wells Formation groundwater and discharge to surface water via Hoopes Spring and South Fork Sage Creek Springs is considered the primary mechanism for selenium transport to the environment.

The physical setting of the different backfilled pits and external ODAs at the Site and the type of reclamation completed on each influences the relative importance of these sources in terms of selenium and other COPCs released and transported. For example, less protective covers (including direct revegetation) allow greater infiltration of precipitation, which results in larger contributions of selenium and other COPCs to the underlying groundwater.

The Pole Canyon ODA is distinct from the other ODAs at the Site because of the cross-valley fill setting with Pole Canyon Creek flowing through the ODA prior to 2006, the implementation of the Non-time Critical Removal Actions (NTCRAs), and the presence of an underlying shallow alluvial groundwater system associated with Pole Canyon Creek.

Release and Transport

Pathways for potential transport of selenium identified at the Site are:

- Release from backfilled pits and external ODAs is transported downward to the underlying Wells Formation groundwater at the Site. Selenium is then transported in the groundwater and discharged to surface water via springs and, when pumping, discharged at the Industrial Well in the northern portion of the Site. Selenium concentrations in the culinary well, used as a water source for the mining operation, are unaffected by mine operations and are below the MCLs.
- Releases from the Pole Canyon ODA travel to alluvial groundwater beneath the Pole Canyon Creek channel. This alluvial groundwater continues into northern Sage Valley and likely discharges to downgradient surface water, but the associated selenium load addition is too small to detect.
- Surface water flowed through the base of the Pole Canyon ODA and into Pole Canyon Creek prior to implementation of the 2006 NTCRA and during an isolated event in 2011 when the bypass pipeline was operated at less than design capacity. Surface water runoff from other ODAs (i.e., storm water runoff and seeps from ODA toes) is contained in ponds and does not reach Site streams via the surface pathway.
- Sediment transported from ODAs primarily during active mining and immediately afterwards (before reclamation). Sediment is contained in storm water detention basins and does not reach Site streams. The exception is the Pole Canyon ODA where sediment was transported to the Pole Canyon Creek channel, primarily by a slope failure in spring 1996.
- Direct uptake by plants growing on overburden.

The wind dispersion and air deposition potential pathway was identified and deemed insignificant at the Site based on findings of the site investigation. Therefore, this potential pathway was not addressed in the FS.

The following metals and metalloids were identified as COPCs at Smoky Canyon Mine:

- Surface water – cadmium and selenium
- Groundwater – aluminum, arsenic, iron, manganese, and selenium
- Soil – arsenic and selenium.

Current and Future Land Uses

Much of the Smoky Canyon Mine is on National Forest System land, including the leased areas where mining takes place. Private ranch land owned by Simplot is located in Sage Valley immediately east of the mine panels. Other private lands (ranches and vacation homes) are located in the Crow Creek Valley south and southeast of the Site. The predominant land uses are associated with agriculture and natural resources and include crop production (primarily hay) on private lands along with cattle and sheep ranching on private and public lands. Phosphate mining, while not a dominant land use in terms of acreage, is economically important.

On National Forest System land, recreational activities include hunting, fishing, camping, hiking, skiing, and snowmobiling, among others. Additionally, these lands may be used for Tribal hunting, fishing, and ceremonial activities consistent with the heritage of the Shoshone-Bannock Tribes. No residential use occurs at or adjacent to the Site. The closest population center is the Star Valley community, which includes the town of Afton, Wyoming, and is 10 miles directly east of the Site. The town of Afton has a population of approximately 2,172 (United States Census Bureau 2020). The reasonably anticipated future uses of the land at the Site include mining, seasonal ranching (grazing of cattle), recreation, and Tribal use.

Scope and Role of the Proposed Plan

This Proposed Plan describes actions that address threats to human health and the environment posed by contaminants at the Site. This document is based on information and analyses that were prepared by Simplot pursuant to an Administrative Settlement Agreement and Order on Consent/Consent Order (2009 ASAOC/CO). This Remedial Action is being conducted as a final remedy for the Smoky Canyon Mine.

Summary of Site Risks

Human health, ecological and livestock risk assessments were conducted to evaluate the risks to people and the environment from exposure to contaminants originating from the historic mining activities at Smoky Canyon Mine. A detailed description of site risks can be found in the Smoky Canyon Mine Remedial Investigation / Feasibility Study Site-Specific Human Health, Ecological, and Livestock Risk Assessment Reports.

Human Health Risks

Arsenic was identified as a human health chemical of concern (HHCOC) for the recreational camper, Native American, and hypothetical resident receptor scenarios, with contributions from several environmental media.

Potentially unacceptable future (recreational camper) and current and future (Native American) risks are from arsenic in surface water. Surface water locations associated with seeps (DS-7 and LP-1) and detention basins (DP-7 and EP-2) contain arsenic concentrations that exceed the Idaho drinking water standard (0.01 mg/L). These locations contributed to exposure and lifetime cancer risks in excess of 1E-05. Arsenic concentrations at all other surface water and groundwater sampling locations are lower than the drinking water standard.

Potentially unacceptable future risks for future residents on private land are from selenium and arsenic in ground water. Although land use and population statistics indicate that the Site is unlikely to convert to residential use, the hypothetical resident receptor was assessed for private lands. Selenium concentrations in groundwater exceeded the USEPA Maximum Contaminant Level (MCL) and Idaho drinking water standard (both at 0.05 mg/L) at several wells immediately downgradient of the Pole Canyon ODA (Attachment 3), but concentrations in groundwater from all other locations were lower than the drinking water standard. These wells also contained arsenic concentrations that exceeded the Idaho drinking water standard (0.01 mg/L). Both locations are immediately downgradient of the Pole Canyon ODA and are known to be affected by past infiltration of water into the ODA, and downgradient transport in alluvial and Wells Formation groundwater.

Ecological Risks

Selenium is the primary risk driver for both current and future aquatic and terrestrial biota. Conclusions for aquatic receptors are presented by media type to reflect the risk analysis organization and regulatory framework for aquatic environments. Terrestrial risk analysis is based on ingestion of ecological chemicals of concern (ECOC) from multiple exposure media within each habitat.

Aquatic

Selenium is the primary risk driver in surface waters across several drainages. Other ECOCs that exceeded Toxicity Reference Values (TRVs) primarily in surface waters included aluminum, arsenic, cadmium, iron, nickel, and zinc. Where elevated, these ECOCs do not likely represent unacceptable risk because of the limited potential for exposure (e.g., seeps or ephemeral habitats) of receptors to these environments. Locations where elevated selenium concentrations exist and pose risk to aquatic receptors correspond to areas of known inputs such as Hoopes Spring and South Fork Sage Creek and their downstream receiving waters, and Pole Canyon Creek (Attachment 4).

Selenium in fish tissue is the most reliable measure of exposure and potential risk for fish and other aquatic receptors. Whole body selenium fish tissue concentrations downstream of Hoopes Spring and South Fork Sage Creek springs exceed the Idaho site-specific whole body fish tissue criterion for Sage Creek and Hoopes Spring (13.6 mg/kg dw) (IDAPA 58.01.02.287, July 2019). The cleanup level for selenium in the water column where fish tissue is not available is 16.7 ug/l.

The Idaho site-specific whole body fish tissue criterion for Crow Creek is 12.5 mg/kg dw, which is currently exceeded at Crow Creek locations downstream of Sage Creek. The cleanup level for selenium in surface water in the water column in Crow Creek is 4.2 ug/l.

Pole Canyon Creek at the LP-1 seep poses unacceptable risks to higher trophic level organisms that may obtain food or water from that location; however, the physical habitat does not support any fish due to lack of connectivity to fish bearing waters. North Fork Sage Creek (NSV-6) likely supports fish, but tissue levels were not quantified for this stream due to flow limitations during sampling.

Sediment

Selenium in sediments from Hoopes Spring (HS-3) and North Fork Sage Creek (at NSV-6), and at Pole Canyon Creek (LP-PD, LPT-1, LPT-2, and LPT-3) exceeded the sediment TRV. Although sediment in upper Sage Creek (upstream of inflow from Hoopes Spring) was identified as posing a risk, it was a function of a single location (SV-1, an irrigation ditch) where consistently higher selenium concentrations were found.

In addition to selenium in sediments, other ECOCs that were elevated above TRVs included barium, cadmium, chromium, nickel, manganese, silver, and zinc. The concentration of selenium in biotic and abiotic media exceeds TRVs for aquatic receptors at certain locations. ECOCs at the LP-1 seep and at LSV-1 pose unacceptable risks; however, whether these concentrations represent significant ecological risk is a function of habitat

and connectivity of surface water to source areas or accessibility by terrestrial organisms. The LP-1 seep at the toe of the Pole Canyon ODA is isolated and typically disconnected from the main stream due to installation of the Pole Canyon Creek bypass pipeline (under the 2006 NTCRA). Therefore, the potential for exposure to these concentrations is limited for aquatic ecological receptors. For LSV-1, which is located in an irrigation ditch near Sage Creek, downgradient of detention basin DP-2, flow is ephemeral at best. Because permanent aquatic habitat is limited or absent, no adverse effects on aquatic populations is likely due to the lack of exposure.

Terrestrial Upland

Elevated concentrations of ECOCs were observed primarily in mined areas with either no cover (i.e., direct revegetation of overburden) or topsoil-only reclamation and elevated concentrations of ECOCs in soils corresponded with higher exposure and risks. Risks are highest in Panel A Area 2, Panel D North and South, and on the Pole Canyon ODA (prior to construction of the cover system in 2015 under the 2013 NTCRA) which represent areas where exposure to selenium bearing overburden materials is expected to be highest. Exposure and risks were considerably lower for northern Sage Valley, Panel A Area 1, and Panel E. Risks were lowest in the areas with a Dinwoody / Chert cover and highest in the areas with no cover. Risks to sub-populations of small mammal (deer mouse, eastern cottontail) and bird (northern harrier, northern bobwhite, American robin) receptors inhabiting Panel A Area 2, and Panel D North and South may exist using the available data, but it is unknown whether any actual effects are occurring to the populations inhabiting those areas.

While no detailed population studies were conducted in those areas, small mammal sampling was successful in both 2010 and 2016 suggesting the presence of a functioning small mammal community. In 2010, a total of seven species of small mammals, dominated by deer mice (*Peromyscus maniculatus*) and, to a lesser extent, three vole species (meadow, long-tailed, and montane), were captured in the upland areas of the mine and in Sage Valley. Both male and female deer mice and voles were captured. For the more abundant deer mice, representative animals from the juvenile, sub-adult, and reproductive adult age classes were captured. In limited sampling during 2016, both deer mice and meadow voles were captured that included age classes of both species ranging from juvenile to reproductive adults. These data suggest that an adequate source of food and habitat is present on the ODAs to support a small mammal community containing all age classes of animals. Concentrations of selenium in surface soil are lower than concentrations at nearby mine sites which have shown no adverse effects on small mammal populations. This combined with the presence of a small mammal community indicate that risks to small mammal populations at the Site are likely to be low.

Riparian

Similar to the upland areas of the Site, selenium is the primary risk driver. Elevated selenium concentrations in semi-aquatic habitats at the Site were limited to a few sampling locations. Selenium exposures were much higher at seeps DS-7 (east of Panel D) and ES-4 (east of Panel E), as well as riparian location LP-PD (Pole Canyon). Risk was lowest at seep ES-3 (east of Panel E).

Livestock Receptors

Selenium is the primary risk driver for livestock. While exposure to several other chemicals of concern (COCs) including barium, iron, manganese, and molybdenum exceeded risk benchmarks in some areas, the elevated concentrations coincided with selenium exposures in most cases. Exposure to these other COCs was described as likely representing background conditions. Risks to livestock from selenium were calculated for vegetation, surface water, and groundwater (if used for stock watering in the future) and were not found to be a concern.

Basis for Action

It is the Forest Service's judgment that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

Remedial Action Objectives and Goals

Remedial Action Objectives (RAOs):

For Ground Water, the RAOs are:

- Prevent future use of alluvial or Wells Formation groundwater with selenium concentrations above the MCL as a drinking water source until cleanup levels are met.
- Reduce or eliminate concentrations of selenium in contaminated alluvial or Wells Formation groundwater to below the MCL within a reasonable time frame given the circumstances of the Site.
- Reduce or eliminate loading of selenium from groundwater to surface water so that it does not result in concentrations that represent an unacceptable risk to aquatic life and complies with ARARs (IDAPA 58.01.02 – Water Quality Standards) in the lower Sage Creek and Crow Creek watersheds.

For Surface Water, the RAOs are:

- Reduce or eliminate unacceptable risks to Recreational Campers or Native Americans from ingestion of non-regulated surface water (seeps and detention ponds) due to arsenic and cadmium.
- Reduce selenium concentrations in lower Sage Creek and Crow Creek watersheds to below levels that pose unacceptable risks for aquatic life and comply with ARARs (IDAPA 58.01.02 – Water Quality Standards).

For Soils, the RAO is:

- Reduce or eliminate unacceptable risks to birds from overburden with elevated selenium concentrations in soil on Panel A's ODAs.

This remedial action at the Smoky Canyon Mine represents a final action. Ground water ARARs are projected to be met in downgradient wells around the year 2060, which reflects a reasonable timeframe in that there is no current human

consumption of the groundwater. Effects of the covers on reducing selenium concentrations in surface water are predicted to be seen around 2035 (due to the travel time in Wells Formation groundwater to the Hoopes Spring Complex). Contaminated ground water in the Wells Formation downgradient of the overburden disposal areas and expressed at Hoopes Springs will be captured and treated.

Acceptable concentrations of selenium in the surface water column are projected to be met shortly after construction of the water treatment plant. Fish tissue selenium concentrations are expected to be reduced in the future as a result of these actions. Because the remedial action will leave waste in place at the Site, a review of the remedy will be conducted at least every five years to gauge its effectiveness at meeting the RAOs. Data trends for individual remedy components would be evaluated and if they are not achieving the RAOs within a reasonable time frame, other remedial actions would be considered.

Summary of Remedial Alternatives

Remedial Alternative Evaluation

This section summarizes and presents the remedial alternatives evaluated in detail in the FS. Cleanup methods and technologies were evaluated for each of the following media: soils and waste rock, vegetation, surface water, and groundwater.

The first alternative is the No Further Action alternative, which is required by the NCP and is used as a baseline for comparison to other alternatives. The remaining alternatives consist of water treatment and source control options (Attachment 5).

Except for Alternative 1 (the No Action Alternative), all other alternatives are expected to be protective of human health and the environment and to comply with ARARs within a reasonable timeframe given the circumstances at the site.

Elements Common to All Action Alternatives

This section describes the various common elements that are included in each action alternative. The common elements are:

- Institutional Controls
- Revegetation
- Operations and Maintenance
- Monitored Natural Attenuation
- Long-Term Monitoring.

Institutional Controls

Grazing controls and land-use controls (e.g., restrictions on timing and duration of grazing or closure of grazing allotments and land-use controls to restrict access to cover areas during construction and while vegetation matures) would be implemented by the Forest Service on National Forest System land managed by the Caribou-Targhee National Forest, as needed, to restrict access to areas where a cover was installed, while the cover vegetation matures to protect the integrity of the remedial action. Grazing controls and land-use controls are included as institutional controls (ICs) for all the source control cover alternatives.

Deed restrictions would be included in the ROD and then specified as restrictions on the property deed for private land in Sage Valley to prevent access or use of alluvial or Wells Formation groundwater as a drinking water source until cleanup levels are met.

Revegetation

Revegetation would be used to limit soil erosion and to increase evapotranspiration at the surface of target areas on Panels D and E (D-1, D-ODA, and E-1n) and on a portion of Panel A. Revegetation areas would be seeded with native seed mixes and plant species that are not known to be selenium accumulators. Seed mixes would undergo final selection and approval by the Forest Service during the remedial design process.

Operations and Maintenance

Periodic O&M of the covers would be implemented to ensure their effectiveness over the long term. Inspections of covers, stormwater control systems and any fencing would be performed annually. Any fencing installed as part of a remedial alternative would be inspected to ensure that the posts and wires are stable and in working order.

Monitored Natural Attenuation

All the alternatives, with the exception of Alternative 3e, which is a soil-only alternative, would include some level of MNA in groundwater, which relies on natural physical, geochemical, or biological processes to reduce contamination in alluvial and Wells Formation groundwater in conjunction with other source control and/or water treatment alternatives and ICs. The performance monitoring program would consist of a network of existing wells that provide adequate areal and vertical coverage to verify that the selenium plume in alluvial and Wells Formation groundwater remains static.

Long-Term Monitoring

Groundwater and surface water monitoring would be required to evaluate the effectiveness of the action alternatives. The LTM results would be used to support the protectiveness evaluations during the CERCLA 5-year review process. The monitoring network for the Mine outside of Pole Canyon would likely be a combination of existing locations (e.g., existing monitoring wells and historical surface water sampling stations) and additional locations depending on the nature and requirements of the selected remedy.

Alternative 1 – No Further Action

Under Alternative 1, the No Action alternative, the biological water treatment system pilot study at Hoopes Spring would be terminated and the pilot Hoopes water treatment plant (WTP) would be dismantled and removed. No remedial actions would be implemented. O&M and groundwater and surface water monitoring for the 2006 and 2013 NTCRAs at the Pole Canyon ODA would continue, as well as industrial controls.

Alternative 2a – Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/ Limestone Covers on Seeps and Ponds, O&M, MNA, LTM

Alternative 2a consists of treating contaminated water emanating from the Spring Complex to reduce the concentration of selenium in surface water downstream in Sage Creek and Crow Creek. This alternative would entail continued operation of the existing 2,000 gpm capacity Hoopes WTP, which was constructed in 2015 for a biological water treatment pilot study and expanded to a full-scale treatment plant in 2017.

The Hoopes pilot WTP is constructed of pumping stations located at the Spring Complex, which pump spring water with elevated selenium concentrations to the Hoopes WTP. The treatment system uses two treatment trains that consist of ultrafine filtration (UF) to remove particulate material and reverse osmosis (RO) and fluidized bed reactors (FBRs) to remove selenium at a maximum design flow rate of approximately 2,000 gpm. Polishing steps used in the existing treatment system are aeration, clarification, sand filtration, and iron coprecipitation. The FBR effluent is treated using an activated sludge post-treatment system prior to discharge to the outfall.

Chert/limestone covers (rock covers) would be placed on seep areas (DS-7 and LP-1) and detention ponds (DP-7 and EP-2) to prevent the ingestion of surface water with arsenic and cadmium concentrations above the MCL by recreational campers and Native Americans.

Common elements for this alternative would include ICs (i.e., deed restrictions), MNA with associated performance monitoring, and long-term Site-wide groundwater and surface water monitoring (LTM).

Alternative 2b – Water Treatment at the Hoopes WTP (4,000 gpm), ICs, Chert/ Limestone Covers on Seeps and Ponds, O&M, MNA, LTM

Alternative 2b consists of treating contaminated water from the Spring Complex to reduce the concentration of selenium in surface water at the Spring Complex and downstream in Sage Creek and Crow Creek. This alternative would use the existing Hoopes WTP, which was installed for a biological water treatment pilot study, but would double the size of the WTP by adding additional treatment to increase the maximum design flow rate to approximately 4,000 gpm. Alternative 2b would also include placement of chert/limestone covers (rock covers) on seep areas (DS-7 and LP-1) and detention ponds (DP-7 and EP-2) as described for Alternative 2a.

Common elements would be the same as Alternative 2a.

Alternative 2c – PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM

Alternative 2c consists of a subsurface permeable reactive barrier (PRB) downgradient of the Pole Canyon ODA to treat LP-1 seep water before it reaches alluvial groundwater. The PRB technology is an in-situ permeable system that uses reactive media to passively treat intercepted contaminated water.

The type of reactive material selected for the PRB depends on local hydrogeologic conditions and types of contaminants in the water. The reactive media is placed in a trench and seep water flows through the media to be treated. Biological and chemical reactions between the reactive media and contaminated water flowing through the media result in the transformation or immobilization of the contaminants. O&M of the PRB would involve visual inspections and optimization and monitoring of the treatment system.

Long-term monitoring to evaluate the performance and determine the effectiveness of the PRB would be conducted using existing and/or new wells or piezometers.

Alternative 3a – Dinwoody/Chert Covers Over Target Areas, ICs, O&M, MNA, LTM

Under Alternative 3a, Dinwoody/Chert covers would be constructed on the target cover areas (194 acres) at Panels D and E (D-1, D-ODA, and E-1n). From surface to base, the Dinwoody/Chert cover consists of:

- 2 feet of loose Dinwoody Formation
- 1 foot of compacted Dinwoody Formation
- 2 feet of chert or limestone
- Graded overburden.

Target areas would be graded to a maximum 3:1 slope to provide a uniform surface for cover construction and to promote drainage. Slope stabilization methods (e.g., buttresses or retaining walls), would be used in steeper areas to reduce the grade of the slope. Erosion protection (e.g., riprap and geosynthetic fabrics) would be used to reduce or eliminate erosion of solid media by stormwater runoff and would be installed after the surface has been regraded. The covers would consist of an approximately 2-foot layer of chert or limestone overlain by an approximately 3-foot soil layer of Dinwoody Formation (or Salt Lake Formation material or equivalent depending on the availability and geotechnical properties of the materials). Efforts would be made to utilize cover materials from the active mine, although it is uncertain if the required volumes will be available. The lower 1-foot of Dinwoody material would be compacted, and the upper 2-foot layer would be loose (not compacted). The covers would be revegetated with native low-selenium-accumulating grass/forb species to control erosion, as described in the common elements. Erosion control measures (e.g., wattles, silt fences, etc.) would be used to prevent damage to the cover due to snowmelt and surface runoff.

Stormwater run-on and runoff controls would be used to convey water off or around the backfilled pits and ODAs in the target cover areas at Panels D and E (D-1, D-ODA, and E-1n) via channels, spillways, sedimentation basins, and/or infiltration basins. Channels and spillways on overburden would be constructed of low permeability materials and lined with geosynthetic fabrics and riprap as needed to prevent infiltration and erosion.

Common elements for this alternative would include ICs (i.e., deed restrictions, grazing controls, and land use controls), revegetation, O&M of the covers and stormwater control components, MNA with associated performance monitoring, and long-term Site-wide groundwater and surface water monitoring (LTM).

Alternative 3b – Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM

Under Alternative 3b, capillary covers would be constructed on target areas (194 acres) at Panels D and E (D-1, D-ODA, and E-1n). A key component of a capillary cover system consists of drainage benches, which remove infiltrated water from the cover system at the capillary interface and promote lateral flow of clean water off the cover to original ground.

From surface to base, the capillary cover would consist of:

- 2 feet of loose Dinwoody Formation (with drainage benches)
- Filter fabric
- 12 inches of screened chert or limestone (drainage layer)
- 6 inches of graded Dinwoody Formation
- Graded overburden.

Target areas at Panels D and E would be graded to a maximum 3:1 slope for cover construction. Slope stabilization methods (e.g., buttresses or retaining walls) and erosion protection (e.g., riprap and geosynthetic fabrics) would be used where appropriate. The covers would consist of an approximately 6-inch barrier layer of graded Dinwoody (or Salt Lake Formation material or

equivalent), overlain by a 12-inch drainage layer of either screened chert or limestone to remove infiltration as interflow, or lateral percolation. Filter fabric would be placed on this drainage layer to act as a root barrier. Approximately two-feet of uncompacted soil from the Dinwoody Formation would be placed on top of the fabric. Cover material sources would be the same as Alternative 3a.

Drainage benches, a key component of a Capillary cover, remove infiltrated water that accumulates as lateral flow (or interflow) at the capillary interface (e.g., between the Dinwoody and screened chert), from the cover system and moves the clean water off the reclaimed slope to original ground. A geomembrane liner would be placed at the bottom of the bench below the drainage material. Spacing of drainage benches would vary due to the slope of the reclamation cover. In general, the flatter the slope the closer the bench spacing. Stormwater run-on and runoff controls and common elements would be the same as Alternative 3a.

Alternative 3c – Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM

Alternative 3c consists of Enhanced Dinwoody covers that would be constructed on target areas at Panels D and E (D-1, D-ODA, and E-1n). As with capillary covers, drainage benches are a key component of Enhanced Dinwoody covers, as well as the addition of a bentonite amended Dinwoody barrier layer.

The Enhanced Dinwoody covers would consist of (from surface to base):

- 1 foot of topsoil
- 2 feet of loose Dinwoody Formation (with drainage benches)
- Filter fabric
- 12 inches of screened chert or limestone (drainage layer)
- 6 inches of enhanced Dinwoody (screened Dinwoody with 5% bentonite)
- 6 inches of screened Dinwoody (3-inch screened material)
- Graded overburden.

The target areas would be graded to a maximum 3:1 slope to provide a uniform surface for cover construction and to promote drainage. Slope stabilization methods and erosion protection would be used where needed. Graded Dinwoody Formation would be screened and compacted to a minimum 6-inch thickness above the overburden material to provide a working base layer for the construction. The enhanced Dinwoody layer would consist of screened Dinwoody (3-inch minus) amended with 5% bentonite.

Chert/limestone would be screened or crushed in the field (size between 1-inch and 4-inches) and placed in one lift to minimize segregation and compaction. A filter layer would be placed between the chert drainage layer and loose Dinwoody layer. Two (2) feet of Dinwoody Formation material would be placed loosely following installation of the filter fabric in either two 1- foot lifts, or one 2-foot lift. Testing specifications for the filter geotextile and various cover layers would be stipulated in the remedial design. Sources of cover material are the same as Alternative 3a. Revegetation and erosion control measures (e.g., wattles, silt fences, etc.) would be the same as Alternative 3a.

Drainage benches would be the same as Alternative 3b. Stormwater run-on and runoff controls and common elements would be the same as Alternative 3a.

Alternative 3d – Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM

Alternative 3d involves construction of Geomembrane covers on the target areas at Panels D and E (D-1, D-ODA, and E-1n). Geomembrane covers include drainage benches.

The Geomembrane covers would consist of (from surface to base):

- 1 foot of topsoil
- 2 feet of loose Dinwoody Formation (with drainage benches)
- 6 inches of screened chert or limestone (drainage layer)
- Geosynthetic layer (geomembrane)
- 1 foot of weathered Dinwoody Formation (protective subgrade)
- Graded overburden.

Target areas would be graded to a maximum 3:1 slope for cover construction. Slope stabilization methods (e.g., buttresses or retaining walls) and erosion protection (e.g., riprap and geosynthetic fabrics) would be used where appropriate. A minimum 1-foot thickness of weathered soil material would be placed above the overburden material to provide a protective subgrade for the geomembrane. A geomembrane would be placed between the chert drainage layer and loose Dinwoody layer. Chert/limestone would be screened or crushed in the field (size between 1-inch and 4- inches) and placed in one lift to minimize segregation and compaction. Two (2) feet of Dinwoody Formation material would be placed loosely following installation of the filter fabric in either two 1-foot lifts, or one 2-foot lift. Testing specifications for the geomembrane and various cover layers would be stipulated in the remedial design. Sources of cover material are the same as Alternative 3a. Revegetation and erosion control measures (e.g., wattles, silt fences, etc.) would be the same as Alternative 3a.

Drainage benches would be the same as Alternative 3b. Stormwater run-on and runoff controls and common elements would be the same as Alternative 3a.

Alternative 3e – Dinwoody Cover Over a Portion of Panel A, ICs, O&M, LTM

If needed, Alternative 3e involves construction of a 2-foot thick Dinwoody cover over a portion of the Panel A overburden. The actual area would be determined by sampling during remedial design. The cover would be intended to lower the selenium concentrations at the surface to reduce the potential risk to birds. The cover would not require surface water controls other than to protect the cover from erosion.

From surface to base, the cover would consist of:

- 2 feet of loose Dinwoody Formation
- Graded overburden (as necessary).

A portion of Panel A would be graded as necessary to support cover construction. Slope stabilization methods and erosion protection would be used if needed. Sources of cover material, revegetation, and erosion control measures during construction (e.g., wattles, silt fences, etc.) would be the same as Alternative 3a.

Comparative Evaluation of Alternatives

The Superfund regulations require that alternatives be evaluated using the nine criteria presented below. As described below, the nine criteria are organized into three groups: Threshold Criteria; Primary Balancing Criteria; and Modifying Criteria.

Overall protection of human health and the environment and compliance with ARARs serve as threshold determinations in that they must be met by any alternative to be selected for the final remedy. The balancing criteria (long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost) generally require the most discussion because the major tradeoffs among alternatives will frequently relate to one or more of these five criteria. State, Tribal, and community acceptance will be addressed in the ROD once formal comments on the Proposed Plan are received and a remedy is selected.

Nine Remedy Selection Criteria

Threshold Criteria (2)—Must be Addressed

1. Overall Protection of Human Health and the Environment evaluates whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the Site, or whether a waiver is justified.

Primary Balancing Criteria (5)

1. Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
2. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal threat contaminants, their ability to move in the environment, and the amount of contamination present.
3. Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.
4. Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
5. Cost includes estimated capital and annual operations and maintenance costs, as well as present value cost. Present value cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

Modifying Criteria (2) —The modifying criteria will be evaluated following comments received during the public comment period and will be addressed in making the final remedy decision and discussed in the ROD.

1. State/Tribal Acceptance considers whether the State and Tribes agree with the Forest Service's analyses and recommendations, as described in the RI/FS and Proposed Plan.
2. Community Acceptance considers whether the local community agrees with the Forest Service's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Water Treatment Alternatives (Surface Water)

This section provides the comparative analysis using the seven primary CERCLA evaluation criteria of the alternatives that address elevated selenium concentrations in Wells Formation groundwater expressed as surface water in Hoopes Springs, and in surface water in Sage Creek and Crow Creek. The primary differences among the alternatives are time required to meet the RAO for surface water for overall protection of the environment and the associated costs. The No Action Alternative does not meet the threshold criterion and, therefore, is not considered further for the surface water alternatives.

Overall Protection of Human Health and the Environment

Alternative 2b (4,000 gpm capacity WTP) provides the highest level of performance with respect to protection of the environment. It provides an immediate reduction of selenium concentrations in surface water in the water column and is predicted to meet water quality standards for the water column in the shortest time frame (by approximately 2030, when the load reduction resulting from the Pole Canyon NTCRAs arrives at the Spring Complex).

Alternative 2a (2,000 gpm capacity WTP) provides a lower level of performance with the surface water standard being met later than for Alternative 2b (4,000 gpm capacity WTP).

Compliance with ARARs

The primary difference between Alternatives 2a and 2b is the time frame needed to meet chemical-specific ARARs (Idaho surface water standards in Sage Creek and Crow Creek and MCLs in Wells Formation groundwater). There are no significant differences in performance relative to action-specific and location-specific ARARs. In addition to the surface water quality ARARs, other important ARARs are requirements for discharge under the Clean Water Act Section 402 and Idaho regulations and Idaho rules for management of solid waste generated.

Long-Term Effectiveness and Permanence

Both Alternative 2a and 2b provide protection and permanent solutions in the long-term to aquatic life. The primary differences between the alternatives relate to the time frame needed to provide protection, which is discussed above.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives 2a and 2b satisfy the statutory preference for treatment. Alternative 2b is ranked highest for reduction of toxicity, mobility, or volume through treatment by implementation of a 4,000 gpm capacity WTP at Hoopes Spring. Alternative 2a provides a lower reduction of toxicity, mobility, or volume through treatment with the existing 2,000 gpm capacity WTP.

Short-Term Effectiveness

There are minimal potential risks to the community because of the relatively remote location of the actions. Standard health and safety protocols and BMPs would protect workers and the environment during implementation. The primary differences between the alternatives for short-term effectiveness are the differences in the time until the surface water RAO is achieved. Alternative 2b is ranked higher because it includes a 4,000 gpm treatment system that would achieve the RAO in downstream surface water around 2030 compared to Alternative 2a which includes 2,000 gpm treatment and would meet the RAO by around 2050.

Implementability

There are no significant differences between the alternatives relative to implementability. The 2,000 gpm WTP (Alternative 2a) has already been implemented at the Site (a high performance against the criterion of implementability) and expansion of the capacity to 4,000 gpm for Alternative 2b would be straight-forward to implement (a moderate-high rating).

Cost

Alternative 2a entails continued operation of the 2,000 gpm capacity WTP at Hoopes Springs and has a present worth cost of $64.6 Million. For Alternative 2b, the existing WTP would be expanded to 4,000 gpm capacity at a present worth cost of $106.8 Million.

Water Treatment Alternatives (Alluvial Groundwater)

This section provides the comparative analysis using the seven primary CERCLA evaluation criteria between the No Further Action and Alternative 2c to address elevated selenium concentrations in alluvial groundwater.

The only source of selenium to alluvial groundwater is the Pole Canyon ODA. Two NTCRAs have resulted in a significant reduction of selenium releases from the Pole Canyon ODA. Concentrations of selenium in alluvial groundwater are above the MCL, but decreasing as a result of the NTCRAs.

The key differences between the alternatives are how long it takes to meet the MCL and whether implementation of a PRB at the Pole Canyon ODA toe seep (LP-1) (Alternative 2c) provides additional cost-effective solution over the effects of the NTCRAs alone.

Overall Protection of Human Health and the Environment

There are no significant differences between the alternatives for this criterion as both alternatives will meet the MCL. Human health risks are mitigated by deed restrictions in the short term, which is a common element. There are no environmental risks directly associated with alluvial groundwater.

Compliance with ARARs

Alternative 2c is ranked higher than Alternative 1 for compliance with ARARs. The selenium concentrations in alluvial groundwater are predicted to decrease over time with the No Further Action alternative, such that by 2060, the area with concentrations above the MCL would be limited to a small area in Pole Canyon, immediately downgradient of the ODA. When a PRB is implemented, it is predicted that concentrations will sharply decline resulting in MCLs being met outside Pole Canyon within one to two years. Concentrations are still predicted to remain above the MCL in a small area in Pole Canyon near the PRB.

No Further Action would not trigger any action-specific or location-specific ARARs. Construction of a PRB in Pole Canyon would trigger laws or regulations associated with testing and proper disposal of solid waste and laws intended to protect wetlands and streams; however, compliance with these ARARs outside of Pole Canyon would be achieved.

Long-Term Effectiveness and Permanence

Residual risks related to the potential use of alluvial groundwater would be lower for Alternative 2c than for Alternative 1; however, other components would be similar.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternative 2c meets the statutory preference for reduction of toxicity, mobility, or volume through treatment. Alternative 1 does not.

Short-Term Effectiveness

Construction of a PRB would entail minimal environmental impacts and any risks to workers would be mitigated using standard BMPs. The RAO for alluvial groundwater would be met sooner for Alternative 2c.

Implementability

PRBs have been constructed and tested at other similar sites and use readily available equipment and water treatment media so a PRB would be relatively straight-forward to implement.

Cost

The present worth cost of Alternative 2c is estimated at $2.3 Million.

Source Control Cover Alternatives (Wells Formation Groundwater and Surface Water)

The primary differences are the cover profiles and materials used to construct the covers and whether the cover systems incorporate drainage benches (Attachment 6). Alternative 3a is a Dinwoody/Chert cover without drainage benches. The other three covers, Alternative 3b (Capillary cover), Alternative 3c (Enhanced Dinwoody cover), and Alternative 3d (Geomembrane cover) include drainage benches to remove infiltrated water (interflow) and surface run-on water before reaching run-of-mine overburden.

Overall Protection of Human Health and the Environment

Source control through construction of covers on the target areas would reduce selenium concentrations in surface water in Sage Creek and Crow Creek, which would reduce risks to aquatic life. Effects of the covers on reducing selenium concentrations in surface water are predicted to be seen around 2035 (due to the travel time in Wells Formation groundwater to the Hoopes Spring Complex). All covers result in reductions in predicted selenium concentrations after this time. The Enhanced Dinwoody and Geomembrane covers provide an equivalent and relatively high reduction in predicted selenium concentrations and would provide protection slightly earlier than the other covers. The Capillary cover provides a relatively moderate reduction, and the Dinwoody/Chert cover provides the least reduction.

Compliance with ARARs

The alternatives provide a similar performance in terms of compliance with ARARs. The primary difference between the alternatives is the time frame to meet chemical-specific ARARs (Idaho surface water standards in Sage Creek and Crow Creek and MCLs in groundwater). There are no differences in performance relative to action-specific and location-specific ARARs for Alternatives 3a through 3d. Alternative 1 would not trigger action-specific or location-specific ARARs. In addition to the surface water and ground water standards, other ARARs include Idaho regulations governing the management of solid waste.

Long-Term Effectiveness and Permanence

On a relative basis, the Enhanced Dinwoody and Geomembrane covers provide the highest reductions in selenium concentrations in Wells Formation groundwater at well GW-25 (i.e., compared to the Dinwoody/Chert and Capillary covers). Human health risks are mitigated by ICs in the short term and all covers are reliable to varying degrees over the long term.

Reduction of Toxicity, Mobility, or Volume Through Treatment

There are no significant differences between the cover alternatives and the No Further Action alternative for the reduction of toxicity, mobility, or volume through treatment because none of the cover alternatives include a treatment component. However, the mobility of selenium would be reduced by the installation of covers. The Geomembrane and Enhanced Dinwoody covers would reduce long-term average percolation to less than 1 inch per year (in/yr) resulting in infiltrations of 0% and 3%, respectively. The Capillary cover would reduce the long-term average percolation to about 5.7 in/yr resulting in an estimated infiltration of 24%, whereas the long-term average percolation into the Dinwoody/Chert cover would reduce to about 10 in/yr resulting in estimated infiltration of 42%. Alternative 1 would not reduce the mobility of selenium.

Short-Term Effectiveness

There are no significant differences between the cover alternatives for short term effectiveness. All the source control alternatives protect human health in the short term by deed restrictions preventing the use of Wells Formation groundwater with selenium concentrations above the MCL as a domestic water supply on Simplot's land in Sage Valley. Potential risks to

workers, the community, or the environment would be mitigated by standard engineering practices. Alternative 3a (Dinwoody/Chert cover) is ranked slightly higher than the other cover alternatives because any environmental impacts would be over a period of three years rather than eight years (the time to construct the other cover types). There would be no risks to communities or workers and no environmental impacts due to construction related to Alternative 1; however, it would take longer for RAOs to be achieved.

Implementability

Alternatives 3a (Dinwoody/Chert cover) and 3c (Enhanced Dinwoody covers) would be constructed using standard equipment and rank high for implementability. Both cover types have been constructed at the Smoky Canyon Mine. Alternatives 3b (Capillary cover) is unproven and 3d (Geomembrane cover) can be constructed with specialty equipment. Both ranked slightly lower for implementability (moderate to high).

Constructability issues are related to the drainage layer. Slope angles must be steep enough to allow lateral interflow in the drainage layer within the cover system and the drainage benches must be constructed at frequent intervals (e.g., every 100 to 150 feet) along the slope to remove this water. Geomembrane covers have been installed at South Maybe Canyon Mine (a CERCLA action on a cross-valley fill). Temperature fluctuations during installation can make welding of seams difficult and result in wrinkles in the fabric. During cover installation on slopes, instability may result from slippage at the interface between the geosynthetic layer and the overlying or underlying material. Geomembrane cover systems can be unstable over long steep slopes, which could result in sliding of the liner and the topsoil downslope. For slopes of 3:1, additional anchoring of the geomembrane is required as well as angular gravel or rock placement above the geotextile for stability of this layer.

Alternative 3a (Dinwoody/Chert cover) can be constructed over a larger area per year (approximately 75 acres/year on average) than Capillary, Enhanced Dinwoody and Geomembrane covers (approximately 25 acres/year on average). As a result, construction of the Dinwoody/Chert cover on the target areas would require approximately three years to complete, while construction of the Capillary, Enhanced Dinwoody, and Geomembrane covers would require approximately eight years. No construction would be implemented for Alternative 1.

Cost

There are no costs associated with Alternative 1. Dinwoody / Chert and Capillary cover alternatives would entail relatively lower costs ($18.9 and $17.5 Million, respectively). Enhanced Dinwoody covers would entail a cost of $30.8 Million and Geomembrane covers would see the highest cost at $39.1 Million.

Source Control Cover Alternatives (Soils)

This section provides the comparative analysis using the seven primary CERCLA evaluation criteria of the alternatives that address source control for soils.

Overall Protection of Human Health and the Environment

There are no human health risks associated with Panel A soils. The key issue addressed by these alternatives is the potential risk to birds at Panel A due to elevated selenium concentrations in surface soils (overburden). The Panel A habitat is unlikely to be large enough or of high enough quality to serve as an attractive nuisance that would result in significant habitat sinks for the regional populations of common bird species in the area. This reason, coupled with:

- the relatively small number of birds using the habitats on Panel A relative to the number of birds required to support a self-sustaining habitat;
- the limited number of samples that exceeded the bird PRG and;
- the significant effect of the single outlier

selenium concentration that drives the 95UCL of the mean concentration above the bird PRG;

risks to bird populations at the Site from selenium in surface soils are likely to be low under the No Action Alternative. Additional sampling will occur during the remedial design to better ascertain the surface soil concentrations at Panel A. Additional actions may be needed in the future if the concentrations of selenium in soil is elevated and not attributable to a single outlier of selenium concentration.

Compliance with ARARs

There are no chemical-specific ARARs associated with soils. No Further Action would not trigger any action-specific or location-specific ARARs. Construction of covers would trigger laws and regulations for reclamation of mined areas and control of fugitive dust during construction activities. Requirements would be met by remedial design.

Long-Term Effectiveness and Permanence

There are no significant differences between the remedial alternatives in terms of long-term effectiveness and permanence. Alternatives 1 and 3e provide protection, and the magnitude of residual risk is similar under both alternatives.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Neither of the remedial alternatives include treatment and therefore there is no difference in performance against this criterion.

Short-Term Effectiveness

Alternative 1 performs the highest against the short-term effectiveness criterion. Alternative 3e would entail higher risks to workers during cover construction of covers. Also, habitat at the Dinwoody borrow area would be negatively affected. The soil RAO is met immediately by both alternatives.

Implementability

There is no significant difference between the remedial alternatives in terms of implementability. Alternatives 3e is implementable using standard construction methods and materials and there are no administrative obstacles.

Cost

There is no cost associated with Alternative 1. Alternative 3e would have a present worth cost of $1.6 Million.

State and Tribal Acceptance (Modifying Criterion)

The State of Idaho (through IDEQ) has been an active participant and fully engaged throughout the remedial investigation, feasibility study process, and development of the preferred alternative. To date, State concerns have been addressed and the State agrees with the remedial action proposed for the site. IDEQ may provide additional comments on the Proposed Plan during the public comment period. Final State acceptance will be evaluated after the public comment period ends and will be described in the ROD. The Forest Service will carefully consider comments received from the State during the public comment period when selecting a remedy in the ROD.

As a support agency, the Shoshone-Bannock Tribes have been engaged throughout the RI/FS. The Forest Service offered to consult with the Tribes prior to starting the comment period and will carefully consider comments received during the public comment period.

Community Acceptance (Modifying Criterion)

The Forest Service will seek comments on the Proposed Plan during the public comment period. Community concerns will be considered by the Forest Service during preparation of the ROD. The ROD will include a Responsiveness Summary of all comments received on the Proposed Plan.

Preferred Alternative

Summary

Based on information currently available, the Forest Service believes the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Forest Service expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA section 121(b):

- Be protective of human health and the environment
- Comply with ARARs
- Be cost effective
- Use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable
- Satisfy the preference for treatment as a principal element (or explain why the preference for treatment will not be met).

Media specific alternatives were evaluated in the previous sections. In this section, those alternatives deemed most effective were combined to form the following comprehensive Site-wide interim remedy that would employ water treatment and source controls to meet RAOs in a reasonable time frame. The final remedy for the Site will be selected by the Forest Service in coordination with the Support Agencies, based on an evaluation of the information.

The elements of the recommended combined remedy are:

- Water Treatment Alternatives (Surface Water) Alternative 2b – Water Treatment at the Hoopes WTP (4,000 gpm), ICs, Chert/ Limestone Covers on Seeps and Ponds, O&M, MNA, LTM
- Water Treatment Alternatives (Alluvial Groundwater) Alternative 2c – PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM
- Source Control Cover Alternatives (Wells Formation Groundwater and Surface Water) Alternative 3c -- Enhanced Dinwoody Covers Over Target Areas, Revegetations, ICs, O&M, MNA, LTM.

The total present worth cost of the preferred Site-wide remedy is $139.9 Million.

Contribution of Remedial Elements in Meeting RAOs

Water Treatment at the Hoopes WTP (4,000 gpm capacity) would reduce selenium concentrations in downstream surface water in Sage Creek and Crow Creek; surface water would meet the surface water standards shortly after construction of the expanded water treatment plant. Source control is provided by the installation of Enhanced Dinwoody covers at target areas on Panels D and E as well as the completed Pole Canyon NTCRAs. A PRB is a cost-effective alternative that would improve water quality in alluvial groundwater downgradient of the Pole Canyon ODA in a relatively short time frame.

Chert/limestone covers on seeps and detention ponds would prevent people from drinking surface water that contains arsenic and cadmium concentrations above the MCL. Deed restrictions would prevent use of Wells Formation or alluvial groundwater with selenium concentrations above the MCL as a domestic water supply. MNA would result in a reduction of selenium concentrations in alluvial groundwater in Pole Canyon and Sage Valley and in Wells Formation groundwater upgradient of the Spring Complex over time. Long-term groundwater and surface water monitoring would be required to evaluate the effectiveness of the Site-wide remedy at the Smoky Canyon Mine.

Community Involvement

Submitting Comments on the Proposed Plan

Instructions for submitting comments on the Proposed Plan are found on page 2.

Who to Contact with Questions or Concerns:

U.S. Forest Service
Sherri Stumbo, Remedial Project Manager
sherri.stumbo@usda.gov

U.S. Forest Service
Sarah Wheeler, Recreation, Heritage, Lands, Minerals and GIS Staff Officer
sarah.wheeler2@usda.gov

Public Comment Period

The Forest Service will accept written comments on this Proposed Plan beginning on April 26, 2023 and ending on May 26, 2023. The Forest Service will make its final decision on the cleanup only after considering public comments. At the end of the comment period, the Forest Service will include a responsiveness summary addressing the comments in the ROD. The Forest Service will place all written comments and the Responsiveness Summary in the Forest Service's Administrative Record for the Smoky Canyon Mine.

Documents

The Administrative Record for the Site contains the documents that have been used to make decisions on how to clean up the Site. The documents in the Administrative Record can be viewed at:

Soda Springs Ranger District

410 East Hooper Ave.
Soda Springs, ID 83276-1496
(208) 547-4356

Key Guidance Documents

- The Revised Forest Plan for the Caribou National Forest (February 2003)
- The National Contingency Plan regulations, found at 40 CFR Section 300, and the statutory requirements of CERCLA—especially Section 121 of CERCLA, 42 U.S.C. Section 9621—are the mandatory requirements that the Forest Service must follow in selecting a remedy.
- In addition, the Forest Service uses guidance as appropriate in the remedy selection process. Key guidance documents used for the Smoky Canyon Mine are as follows:
  - o "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA," Interim Final, OSWER no. 9355.3-01 (EPA October 1988)
  - o "A Guide to Selecting Remedial Superfund Actions," OSWER No. 9355.0-27FS (EPA April 1990)
  - o "A Guide to Principal Threat and Low Level Threat Wastes," OSWER No. 9380.3-06FS (EPA November 1991)
  - o "Rules of Thumb for Superfund Remedy Selection," OSWER No. 9355.0-69 (EPA August 1997)
  - o "Incorporating Citizen Concerns into Superfund Decision Making," OSWER No. 9230.0-18 (EPA January 1991)
  - o "The Role of Cost in the Superfund Remedy Selection Process," OSWER No. 9200.3-23FS (EPA September 1996)
- These and other guidance documents are available at:
  - o http://www.epa.gov/superfund/resources/remedy/ index.htm
  - o http://www.epa.gov/superfund/resources/policies/ index/html.
- Idaho Administrative Code Section for Water Quality Standards as adopted based on USEPA approval letter of site-specific criteria, Dated July 9, 2019 [USEPA 2019]. IDAPA 58.01.02.287

Smoky Canyon Mine investigation activities and reports include:

- Simplot 2023. Final Feasibility Study Report, Smoky Canyon Mine. Prepared by Formation.

- Simplot 2014. Final Remedial Investigation Report, Smoky Canyon Mine. Prepared by Formation.
- Simplot 2015. Final Human Health Risk Assessment Report, Smoky Canyon Mine. Prepared by Formation.
- Simplot 2015. Final Ecological Risk Assessment Report, Smoky Canyon Mine. Prepared by Formation.
- Simplot 2015. Final Livestock Risk Assessment Report, Smoky Canyon Mine. Prepared by Formation.

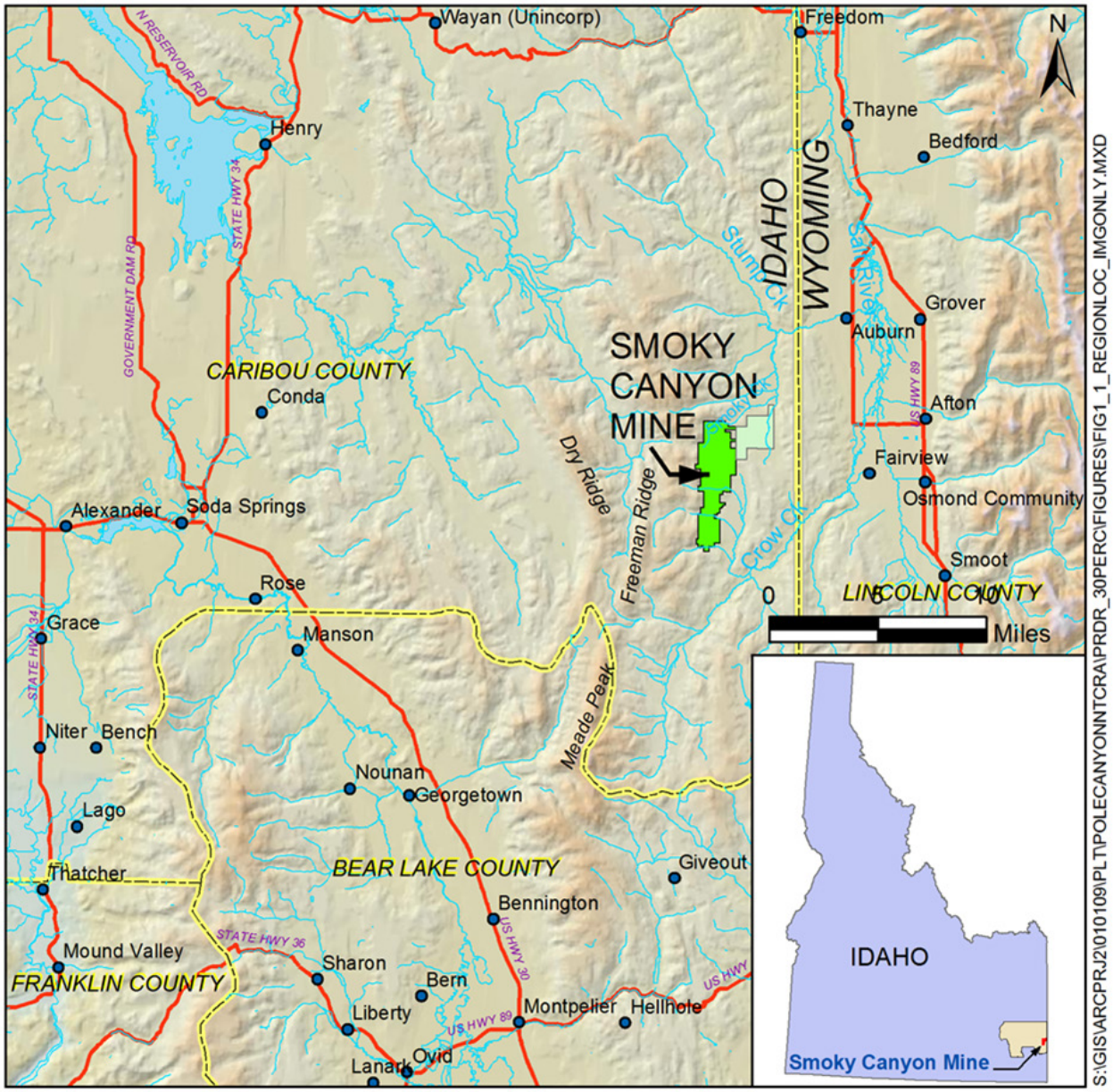
Useful Terms

Understanding environmental cleanup may be confusing for the average person. The following definitions of terms commonly used will assist your understanding of this document.

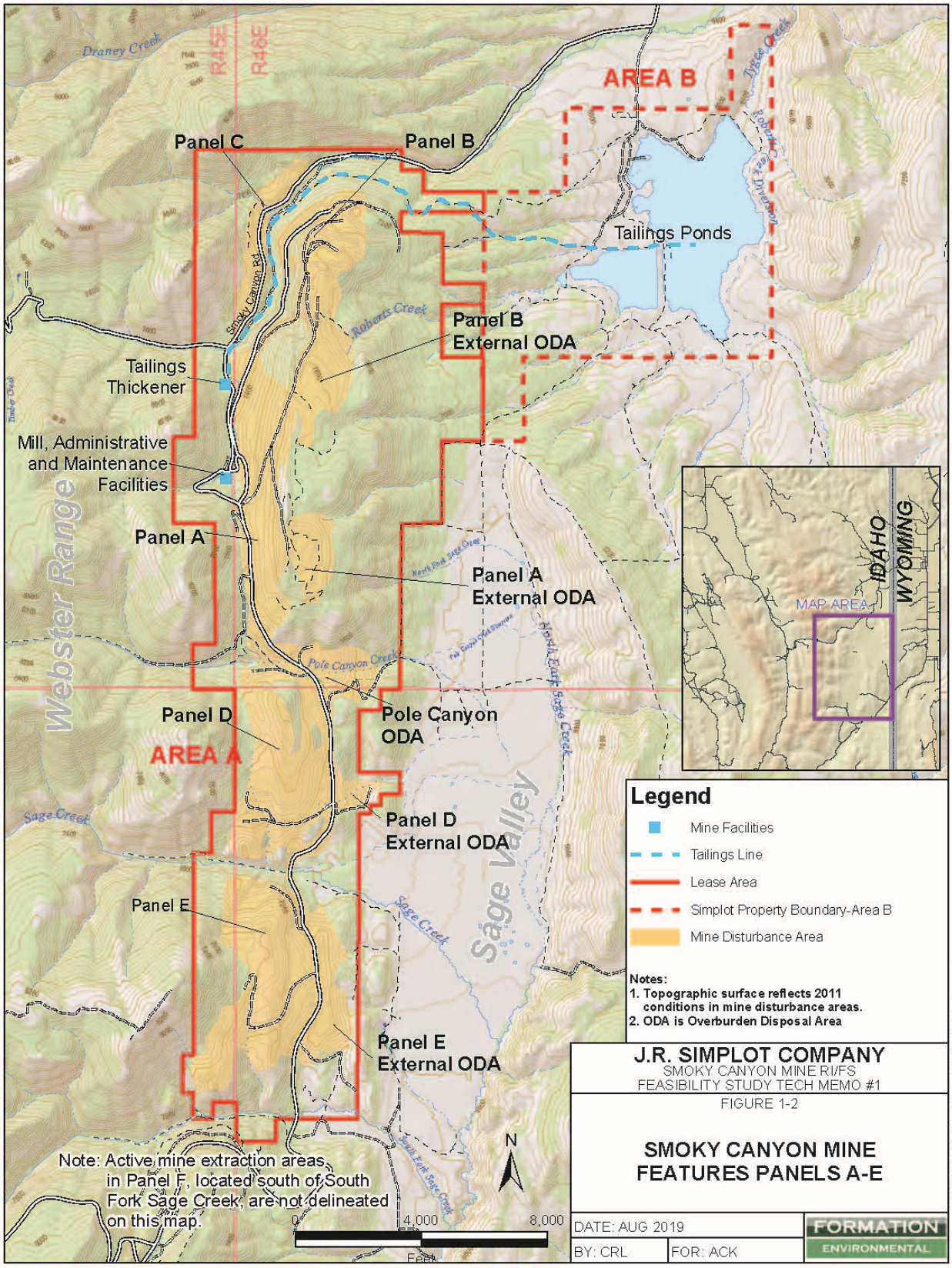
Term	Definition
Access Controls	Physical methods to discourage people from entering a site, including fencing and posting warning and informational signs.
Applicable or relevant and appropriate requirements (ARARs)	Any standard, requirement, criteria or limitation under federal environmental law or more stringent promulgated standard, requirement, criteria or limitation under State environmental or facility siting law that is legally "applicable to the hazardous substance (or pollutant or contaminant) concerned or is "relevant and appropriate" under the circumstances of the release.
Contaminants of Concern (COCs)	Contaminants, such as selenium and arsenic, that were found to exceed EPA's risk thresholds in the human health or ecological risk assessments.
Exposure	The amount of pollutant present in a given environment that represents a potential health threat to living organisms.
Exposure Pathway	How contaminants move from sources to humans and environmental receptors via paths such as dermal contact, ingestion, or inhalation.
Feasibility Study	A process to screen, develop, and evaluate various alternatives being considered for selection of a remedial action.
Institutional Controls (ICs)	Non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy.
Land Use Controls	LUCs typically consist of a combination of institutional controls (legal and administrative controls), access controls (physical controls) and community awareness activities to restrict access and use of contaminated areas and provide awareness of risks from exposure.
Mining-influenced Water	Water affected by mining activities and exposure to mineralized geologic material, that is potentially toxic to the environment, regardless of the pH.
National Priorities List (NPL)	EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under Superfund. A site must be on the NPL to receive money from the Trust Fund for remedial action.
Operation and Maintenance (O&M)	Activities conducted after a Superfund site action is completed to help sustain the effectiveness of the remedial action.
Periodic Costs	Costs that occur every few years on a scheduled basis, such as 5-year site reviews.

Present Value	The present worth (of a sum payable in the future) calculated by deducting interest that will accrue between the present and future date.
Remedial Action (RA)	The actual construction or implementation phase of a Superfund site cleanup that follows remedial design.
Record of Decision (ROD)	A public document that explains which cleanup alternative(s) will be used for the final remedy at the NPL site.
Remedial Investigation (RI)	An in-depth study designed to gather data needed to determine the nature and extent of contamination at a Superfund site; establish site cleanup criteria; identify preliminary alternatives for remedial action; and support technical and cost analyses of alternatives typically described in more detail in a co-associated Feasibility Study (FS).
Superfund	The program that funds and carries out EPA hazardous waste emergency and long-term removal and remedial activities. These activities include establishing the NPL, investigating sites for inclusion on the list, determining their priority and conducting and/or supervising cleanup and other remedial actions.
Watershed	A watershed is literally any sloping surface that sheds water, but the proper definition (Webster's) implies a topographic divide that sheds water into two or more drainage basins. Watershed is synonymous with drainage basin or catchment.

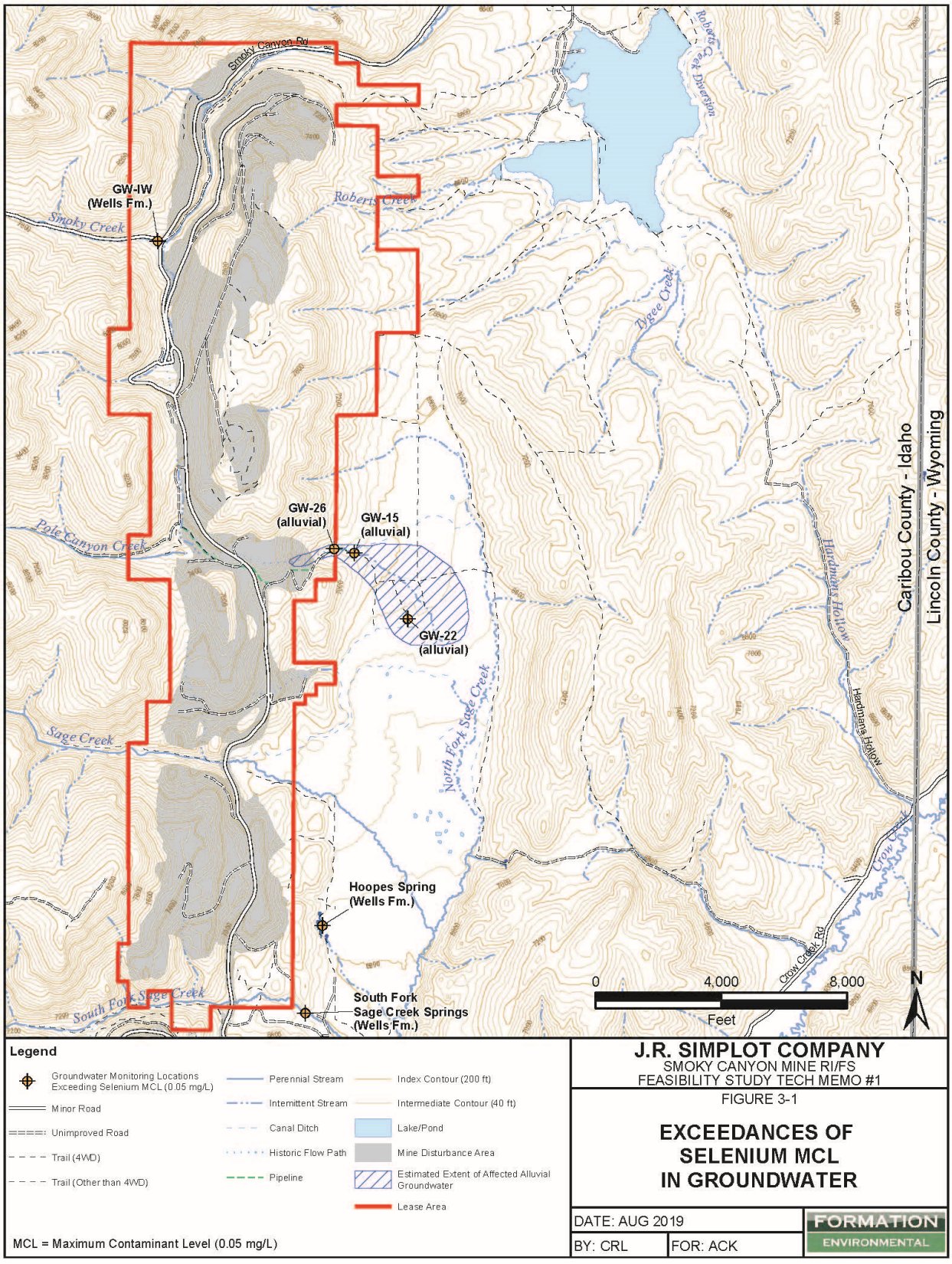
Attachment 1: Location of Smoky Canyon Mine



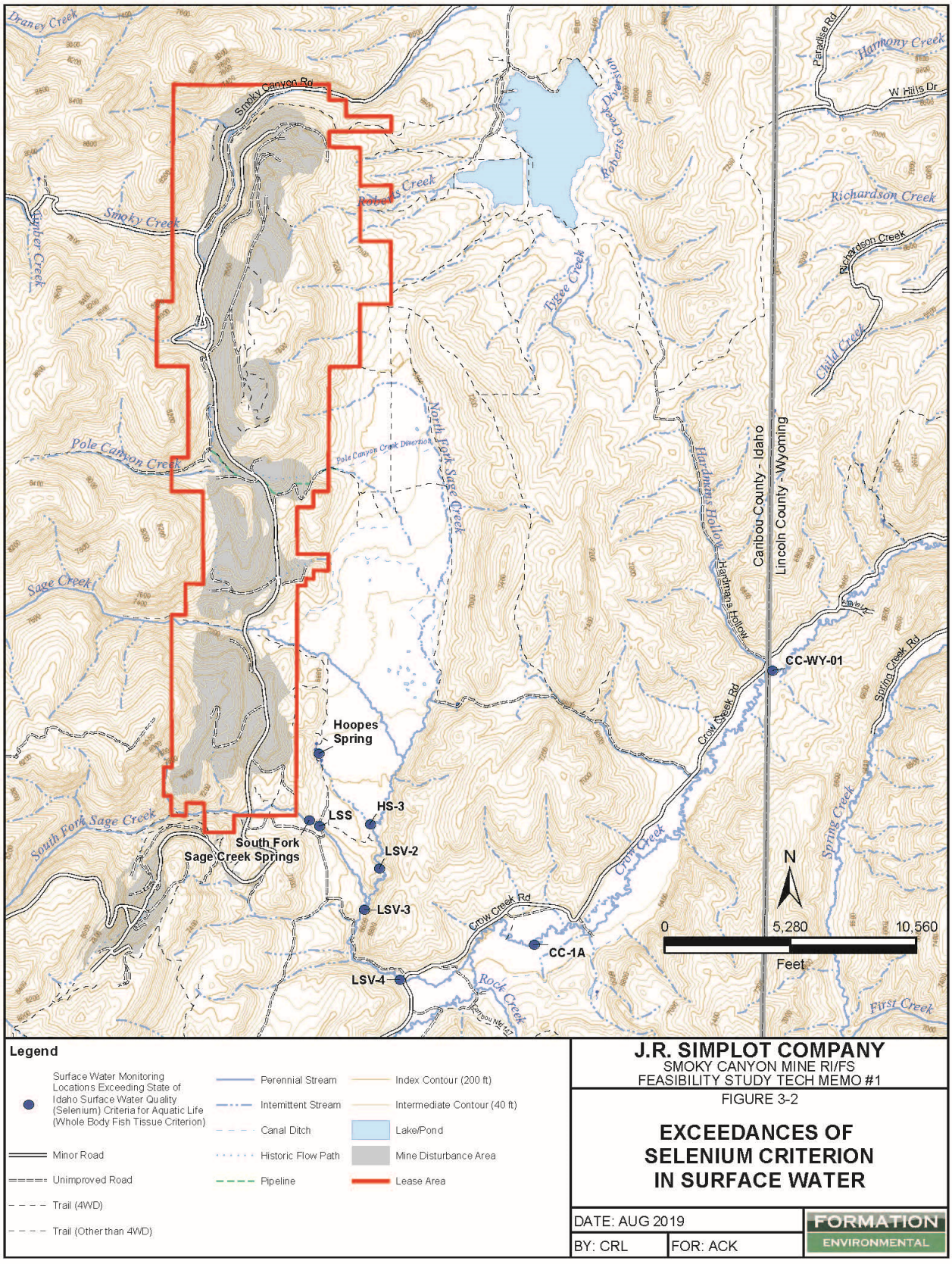
Attachment 2: Mine Features



Attachment 3: Selenium in Ground Water



Attachment 4: Selenium in Surface Water



Attachment 5: Alternatives Components

Components of Alternatives Considered									
Components	Alt 1 (NFA)	Alt 2a	Alt 2b	Alt 2c	Alt 3a	Alt 3b	Alt 3c	Alt 3d	Alt 3e
Water Treatment 2000 gpm		x							
Water Treatment 4000 gpm			x						
Permeable Reactive Barrier				x					
Dinwoody /Chert Cover					x				
Capillary Cover						x			
Enhanced Dinwoody Cover							x		
GeoMembrane Cover								x	
Dinwoody Cover Panel A									x
Institutional Controls		x	x	x	x	x	x	x	x
Covers on Seeps and Ponds		x	x						
Operations and Maintenance		x	x	x	x	x	x	x	x
Monitored Natural Attenuation	x	x	x	x	x	x	x	x	
Long-Term Monitoring	x	x	x	x	x	x	x	x	x

Attachment 6: Cover Alternative Profiles

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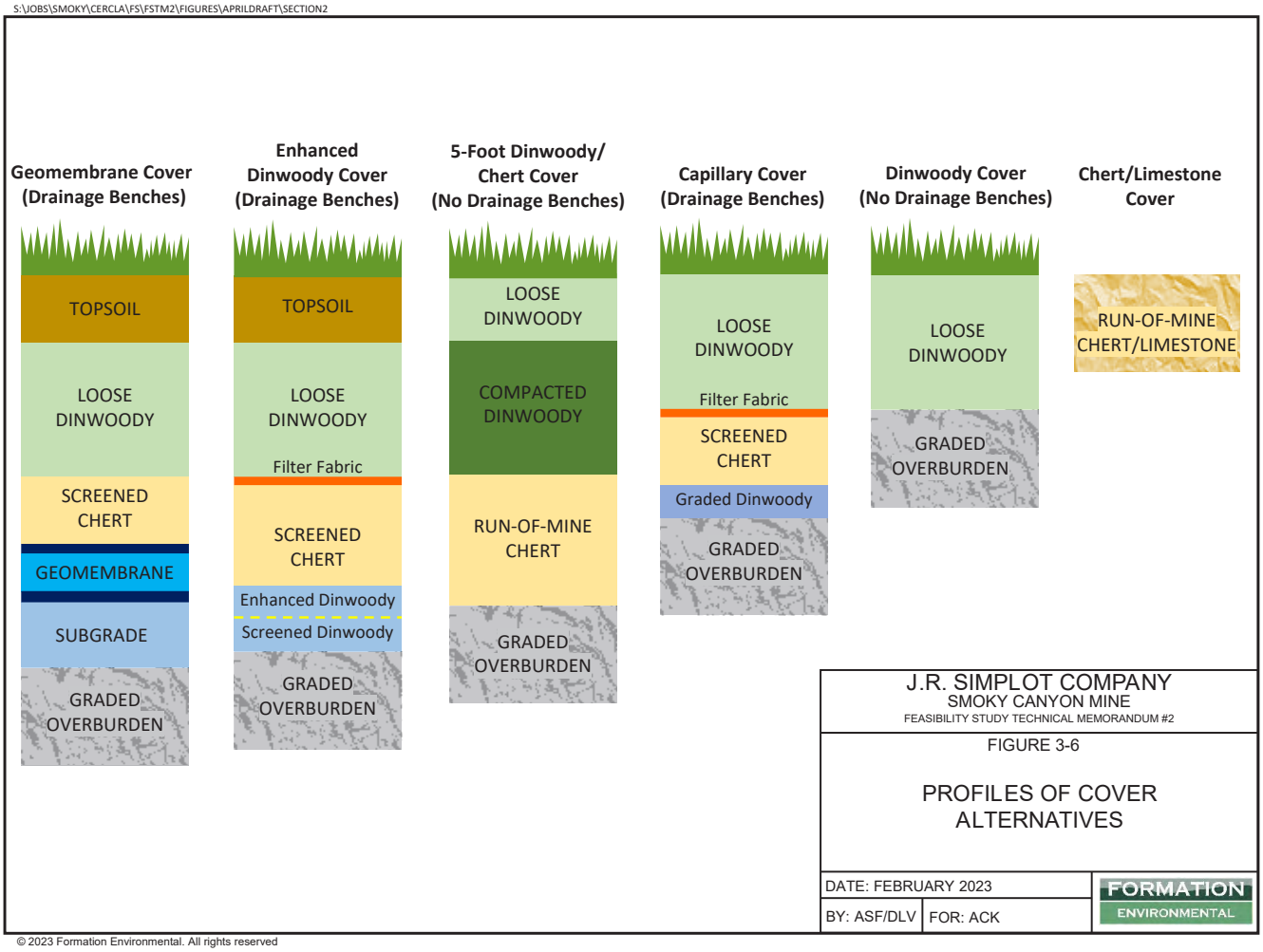

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FIGURE 3-6

PROFILES OF COVER ALTERNATIVES

DATE: FEBRUARY 2023
BY: ASF/DLV
FOR: ACK

FORMATION ENVIRONMENTAL

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