Ballard Mine Superfund Site

Tell us what you think about the Proposed Cleanup Plan

EPA

Caribou County, Idaho

EPA Region 10, April 2018

This fact sheet summarizes EPA's Proposed Plan for cleanup of the Ballard Mine Site in Caribou County, Idaho.

P4 Production LLC, with oversight by the United States Environmental Protection Agency, have been investigating contamination resulting from phosphate mining. We've gathered and evaluated the data, and carefully considered the cleanup options.

The Proposed Plan walks you through our planning process, and shows why we identified what we believe to be the best path forward.

As a resident and area stakeholder, your knowledge and perspective are important to select a cleanup remedy. EPA requests your input before we can confidently move forward with cleanup of Ballard Mine. Please, tell us what you think!

Public Comment Period

April 2 - May 1, 2018

You can provide public comment in one of three ways:

1. **By Mail:**
   ATTN: Ballard Mine Comments
   Kay Morrison
   US EPA Region 10
   1200 Sixth Ave., Suite 900
   Mail Code: RAD-202-3
   Seattle, WA 98101
2. **By email:**
   morrison.kay@epa.gov
3. **In person, during the public hearing (see details on back cover):**
   Wednesday, April 11, 6 p.m.
   Soda Springs City Hall
   9 W 2nd S

During mining, waste rock that had been buried beneath the earth's surface was uncovered, and piled at the surface. Physical processes, such as weathering, released contaminants such as selenium to the environment.

Investigations to assess impacts of phosphate mining in Southeast Idaho on people's health and the environment increased when several horses (pastured in another part of the mining district) died after being diagnosed with selenium poisoning in 1996.

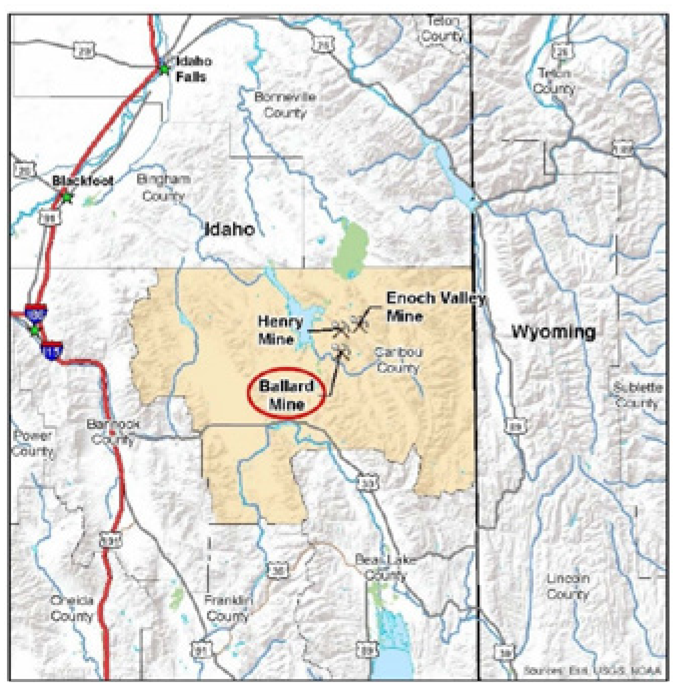
Since then state and federal agencies and mining companies have been investigating contamination at inactive mine sites and working to determine the best path forward for cleanup actions.

About Ballard Mine

Ballard Mine site is a former open-pit phosphate mine located in the Phosphate Resource Area of Southeast Idaho, where phosphate-rich rock is present near the surface and has been mined for more than 100 years. There are many historical mines within the mining district, four active mines, and a number of proposed mines.

The Ballard site covers approximately 534 acres, and is located about 13 miles north-northeast of Soda Springs, Idaho, in Caribou County. Monsanto operated the Ballard Mine from 1951 to 1969. During that time, workers mined phosphate-rich rock and hauled it to Monsanto's processing plant near Soda Springs.

Phosphate mining has created some negative environmental consequences.



The Problem

Why is phosphate found in Idaho?

During the Permian Geologic Period, around 250 million years ago, Southeast Idaho was beneath a shallow sea. The sedimentary rocks formed during this period include the Phosphoria Formation, which includes layers of rock enriched in phosphate-bearing minerals.

Why do we mine for phosphate?

Phosphate has many agricultural and industrial uses. It is an important ingredient in fertilizer and in herbicides.

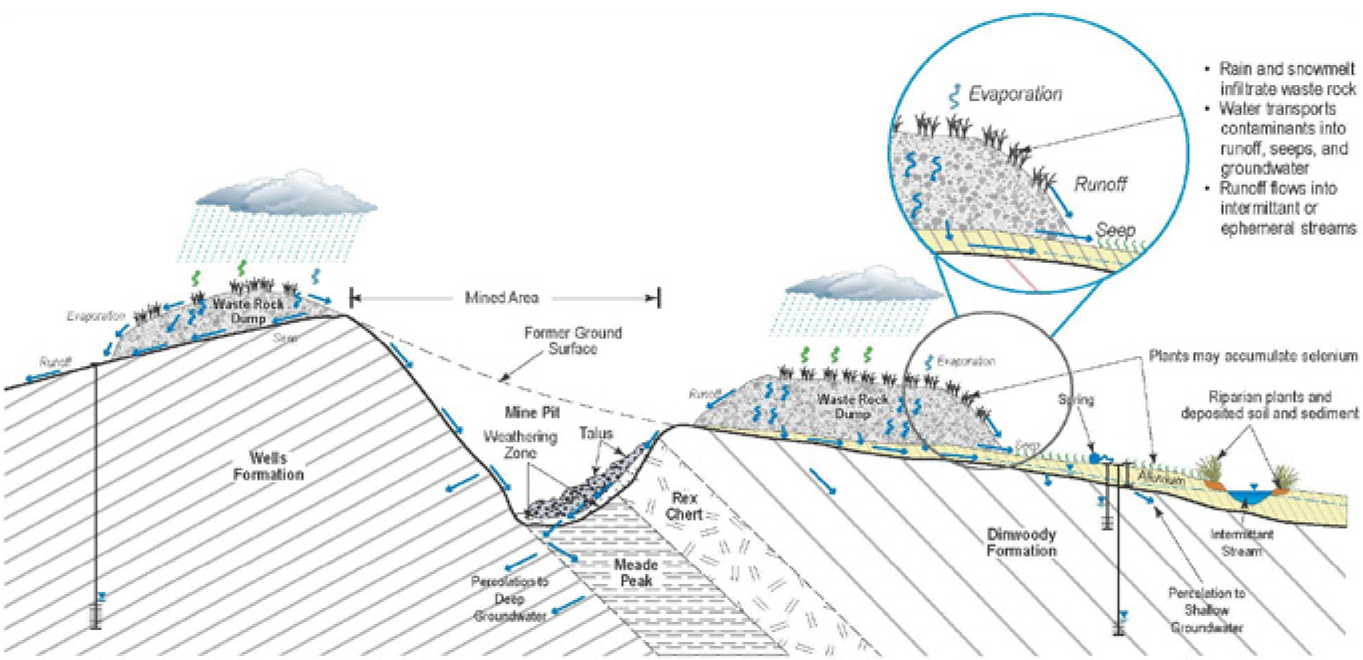
What causes contamination?

The phosphate-containing rock that is mined in Caribou County also contains small amounts of elements such as selenium, arsenic and uranium, which are considered contaminants. Selenium is the primary contaminant of concern at Ballard Mine, with arsenic and uranium decay products also contributing to risk to people and the environment. Selenium is easily leached from exposed rocks and can be toxic.

Selenium is a naturally occurring element that is an essential nutrient in small doses but which in high levels can cause adverse effects in humans and animals.

At the Ballard Mine site, mined rock deemed phosphate-poor was placed in mine pits and dumps, leaving the contaminants exposed and subject to the elements, such as rain and snow. Rain and melting snow carry the contamination into the surface water and groundwater.

Plants growing on waste rock dumps or in river banks near impacted streams absorb selenium through their root systems. The selenium travels up through the plant and into the leaves. Some plants can absorb much more selenium than others- these are called hyper-accumulating plants. Animals that graze on these plants may die.



Conceptual cross-section of mining processes and potential for long-term contamination at the Ballard Mine site.

What is at Stake

How people and wildlife may be exposed

People who use or recreate at the Site can be exposed to contamination by inhaling dust; ingesting contaminated water, soil, sediment, or vegetation; or by direct exposure to naturally occurring radiation from uranium and its decay products. For example, Tribal members may spend time at the site and harvest plants for traditional uses.

Wildlife can be exposed to selenium by ingesting soil and surface water contaminated by the mine site. Animals that graze on plants which have absorbed selenium from the soil may be fatally poisoned.

Current and future land uses

In addition to mining, farming and seasonal ranching are the other dominant land uses in the general area. The public may hunt on private and public lands in the area, and fish on the Blackfoot Reservoir and Upper Blackfoot River. There are no residents at or near the site.

We anticipate future land use to include agriculture, seasonal grazing of cattle and sheep, recreation, and usual and accustomed Tribal use.

Finding a Solution

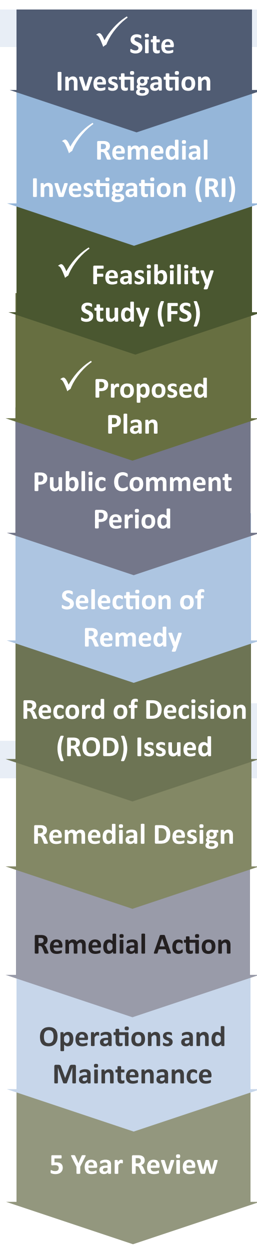
Why clean it up?

People that use the Site, such as seasonal ranchers and Tribal members, are exposed to contamination and may experience adverse effects under some exposure scenarios if no cleanup action is taken. Wildlife exposed to selenium at the Site may experience adverse effects- up to and including death. It is important to address this contamination to protect people and animals from exposure.

The Proposed Plan describes actions that will address threats posed to people and the environment by contaminants at the Site. The preferred cleanup approach involves cost-effective and long-term solutions that will leave the Site safe and ready for reuse.

Who is involved?

P4 Production LLC (P4, a wholly owned subsidiary of Monsanto), with direction and oversight by EPA, has performed extensive research on the contamination at Ballard Mine. This research forms the basis of the Proposed Plan. The Idaho Department of Environmental Quality, the U.S. Fish and Wildlife Service, and the Shoshone-Bannock Tribes helped EPA oversee this work.



What is CERCLA and Superfund?

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), known as Superfund, is a federal law that guides the cleanup of some of the most contaminated sites in the United States.

The Superfund process includes various steps, shown in our illustrated timeline, leading from discovery of a site, through investigation, remedy selection, and cleanup. Decisions are based on sound science, and cleanup actions will ultimately protect people and the environment.

Where are we in the cleanup process?

We are in the public comment phase of the Superfund process. Although we have identified a cleanup alternative we prefer, we will not select a final cleanup method until we have received and evaluated your input.

Once we have determined the path forward, we will issue a Record of Decision (ROD) to make our selection known and final.

Remedial Alternatives for Ballard Mine Cleanup

Cleanup methods and technologies were evaluated for soil, sediment, surface water, and groundwater. In each case, Alternative 1 is "no action." Some other alternatives, which don't appear in the tables below, did not achieve the necessary levels of cleanup and were not retained for detailed consideration. Alternatives were considered for detailed evaluation against a list of criteria (see tables, below). In addition to the criteria shown in the tables below, we will evaluate State, Tribal, and community acceptance before selecting a final cleanup method.

The EPA's Preferred Alternative for the Site is a combination of the media-specific preferred alternatives described below. The methods described will work together to protect people and the environment.

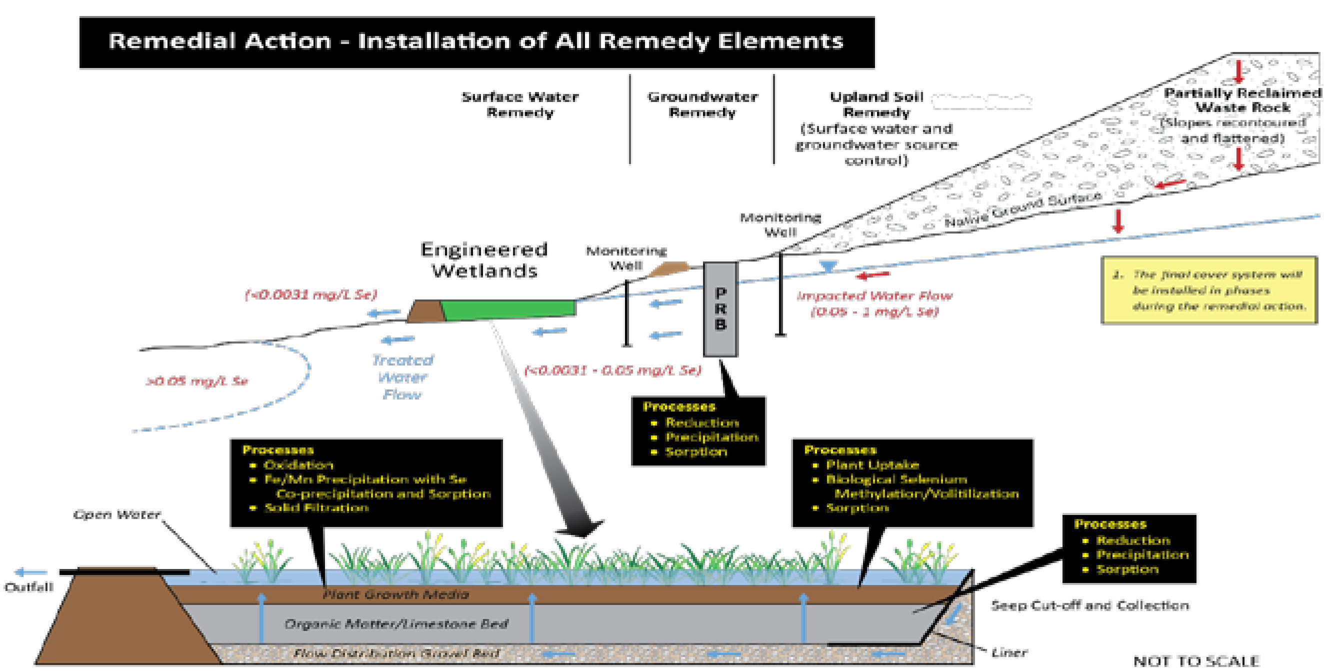
Upland Soil/Waste Rock Alternatives

Evaluation Criteria	***Alternative 4***	***Alternative 6*** (Preferred Alternative)	***Alternative 7***
	• *Grading and consolidation* • *Evapotranspiration cover system* • *Institutional controls* • *Operations and maintenance/long-term monitoring*	• *Incidental ore recovery* • *Grading and consolidation* • *Evapotranspiration cover system* • *Institutional controls* • *Operations and maintenance/long-term monitoring*	• *Total consolidation of existing upland soil/ waste rock into the pits* • *Evapotranspiration cover system* • *Institutional controls* • *Operations and maintenance/long-term monitoring*
Overall protection of human health and the environment	All three alternatives would protect people and the environment.		
Compliance with ARARs	All three alternatives would comply with key Applicable or Relevant and Appropriate Requirements. ARARs include standards, requirements, criteria, or limitations that are legally applicable or are relevant and appropriate considering the circumstances at the site.		
Long-term effectiveness and permanence	All alternatives would function effectively and be resilient in the long-term, including under various climate change scenarios. All involve excavation, consolidation, or grading, followed by construction of a cover system made of natural material for long-term durability.		
		Would allow for mining of remaining phosphate ore during implementation of cleanup actions. Waste rock generated during mining would be used to backfill existing mine pits and create a landscape that more effectively sheds rain and snow.	
Reduction of toxicity, mobility, or volume of contaminants through treatment	All alternatives reduce contaminant mobility by isolating the contaminant-bearing waste rock beneath a soil cover. None of the alternatives use treatment to reduce toxicity, mobility, or volume of contamination.		
Short-term effectiveness	All alternatives protect the community and workers during construction and should meet Remedial Action Objectives (RAOs) upon completion. RAOs are cleanup goals.		
	RAOs would be achieved in 3 to 5 years.	RAOs would be achieved in 6 to 8 years.	
Implementability	Equipment and expertise to build the soil cap is available locally for all alternatives.		
	Ranks higher than Alternative 6 because it is more simple.	Specialized mining expertise and equipment is available. Coordination with BLM for mineral leasing and mine plan approval complicates this alternative.	
Cost	$51 million	$36.9 million	$113 million

Surface Water Alternatives

Preferred Alternative (Alternative 3)

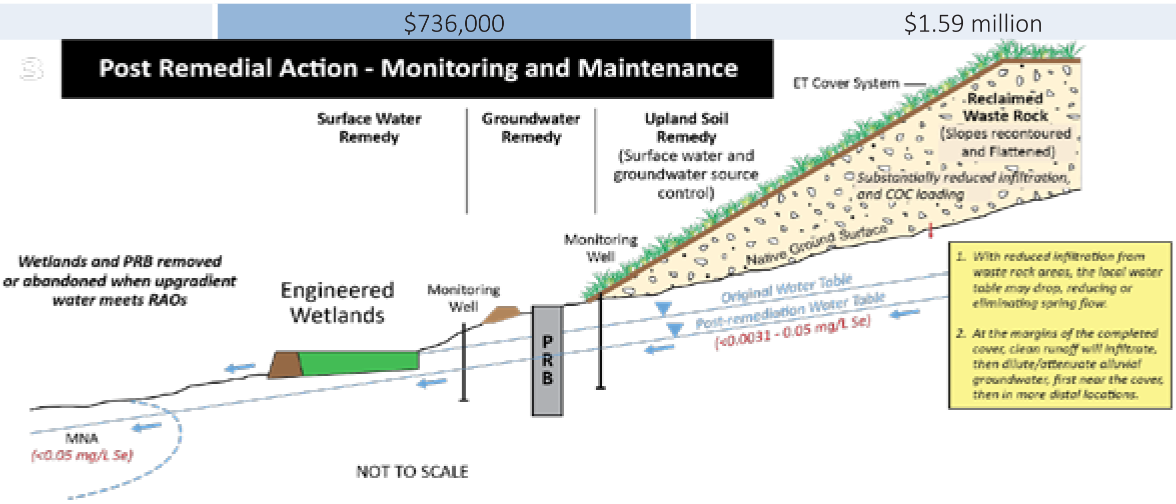
Evaluation Criteria	***Alternative 2*** • *Institutional Controls*	***Alternative 3*** • *In situ biological (wetlands) treatment of source area seepage*
Overall protection of human health and the environment	Both alternatives would protect people and the environment. Both assume a soil cover, which would prevent surface water from coming into contact with contaminants in the waste rock.	
		Would construct wetland treatment cells to treat contaminated seepage.
Compliance with ARARs	Both alternatives would satisfy Applicable or Relevant and Appropriate Requirements.	
Long-term effectiveness and permanence	Storm water flowing from the site should ultimately meet surface water cleanup levels.	
	Relies solely on restricted access to the site and construction of a soil cover.	The constructed wetland cells are temporary, but can be left in place until contaminated surface water from the seeps/springs diminishes.
Reduction of toxicity, mobility, or volume of contaminants through treatment	Does not include treatment.	Surface water would be collected and treated until the seeps and springs either go dry or meet cleanup levels.
Short-term effectiveness	Site access restrictions are easy to implement and prevent contaminant exposures.	Sediment berms/basins and wetland treatment cells make this alternative more effective in the short-term.
Implementability	Both alternatives require a wetlands inventory and assessment, as well as a compliance memorandum to track baseline conditions through remedial action. Most of the services, materials and equipment for both alternatives would be available locally.	
	Ranks higher than Alternative 3 because there would be no technical challenges.	Would involve placement and construction of wetland treatment cells. Specialized services for the engineered wetlands may be difficult to obtain locally.
Cost	$850,000	$1.4 million



Stream Channel Sediment and Riparian Soil Alternatives

Preferred Alternative (Alternative 3)

Evaluation Criteria	*Alternative 3*	*Alternative 4*
	• *Sediment traps/basins* • *Monitored natural recovery* • *Institutional controls*	• *Removal and onsite disposal of contaminants* • *Monitored natural recovery* • *Institutional controls*
Overall protection of human health and the environment	Both alternatives would protect people and the environment. Both assume a constructed cover to minimize transportation of contamination.	
	Constructed traps and basins would capture sediment leaving the site during construction of the soil cover. Monitored natural recovery would further reduce contamination. P4 would limit access to impacted areas until cleanup levels are achieved.	Similar to Alternative 3, but includes physical removal of contaminated sediment and riparian soil from the areas close to mine dumps. *Note:* The removal process would disrupt habitat, which may not completely recover.
Compliance with ARARs	All action alternatives would comply with key Applicable or Relevant and Appropriate Requirements with no significant difference between the alternatives.	
Long-term effectiveness and permanence	Both alternatives control land use to minimize access and exposure to people, and to maintain the integrity of the engineered components of the remedy.	
		Ranked higher than Alternative 3 because contaminated sediment is removed. However, its ranking is offset by uncertainty over the recovery of habitat and ecological function and values following excavation.
Reduction of toxicity, mobility, or volume of contaminants through treatment	Neither alternative treats the contamination.	
		Physical removal of contaminated sediment would reduce the amount of contaminants available for remobilization.
Short-term effectiveness	Would take less time to construct, and be less intrusive to stream drainages than Alternative 4.	Removal of contaminated sediment and reconstruction of excavated areas would harm ecological functions in the short-term.
Implementability	Most of the services, materials, and equipment associated with the implementation of both alternatives would be available regionally.	
	Requires less service and material to implement than Alternative 4.	More technically difficult than Alternative 3 due to a higher level of construction activity, effort, and complexity associated with reconstructing excavated corridors. *Note:* Excavation would be performed with equipment used for cover construction.
Cost	$736,000	$1.59 million



Groundwater Alternatives

Preferred Alternative (Alternative 3)

<table>
<tr><th>Evaluation Criteria</th><th>Alternative 2
• Monitored natural attenuation (MNA)
• Institutional controls</th><th>Alternative 3
• Monitored natural attenuation
• Institutional controls
• Limited permeable reactive barrier (PRB) treatment of alluvial groundwater</th><th>Alternative 5b
• Institutional controls
• Groundwater recovery and treatment of both alluvial and wells formation groundwater</th></tr>
<tr><td rowspan="2">Overall protection of human health and the environment</td><td colspan="3">All three alternatives would protect human health and the environment over time. They all depend heavily on construction of a soil cover system to limit infiltration of rainwater and snowmelt.</td></tr>
<tr><td>Includes monitored natural attenuation and restriction of well drilling and groundwater use in impacted areas.</td><td>Includes the elements of Alternative 2 and adds installation of a permeable reactive barrier to treat groundwater.

Remedial Action Objectives would be achieved sooner than in Alternative 2.</td><td>Includes removal of contaminants and restriction of well drilling and groundwater use.

Remedial Action Objectives would be achieved sooner than Alternative 2.</td></tr>
<tr><td>Compliance with ARARs</td><td colspan="3">All three action alternatives would satisfy key Applicable or Relevant and Appropriate Requirements with no significant difference between alternatives.</td></tr>
<tr><td rowspan="3">Long-term effectiveness and permanence</td><td colspan="3">Elements in the three alternatives would address past and present releases to groundwater until the soil cover system is functioning effectively.</td></tr>
<tr><td></td><td colspan="2">Rank higher than Alternative 2.</td></tr>
<tr><td>Uses monitored natural attenuation to reduce concentration of contaminants already released to groundwater.</td><td>Would reduce the concentration of contaminants already released to groundwater.

Could reduce contaminant mass in a short time frame.</td><td>Could reduce contaminant mass in a short time frame

Extraction and injection technologies are difficult to implement and maintain long-term.</td></tr>
<tr><td>Reduction of toxicity, mobility, or volume of contaminants through treatment</td><td>Does not actively treat groundwater.</td><td>Permeable reactive barriers treat shallow groundwater.</td><td>Includes treatment of contaminated groundwater.</td></tr>
<tr><td rowspan="2">Short-term effectiveness</td><td colspan="3">All three alternatives would require many years to achieve cleanup levels.</td></tr>
<tr><td></td><td colspan="2">Includes removal of contaminants and is likely to achieve Preliminary Remediation Goals faster than Alternative 2.</td></tr>
<tr><td rowspan="2">Implementability</td><td>Ranks higher than Alternatives 3 and 5b because no construction is involved.</td><td colspan="2">More technically difficult than Alternative 2 due to installation of treatment cells, extraction wells, and treatment equipment.</td></tr>
<tr><td></td><td>May need to treat permeable reactive barrier byproduct before placing it in an onsite repository.</td><td>Specialized drilling services and treatment equipment may be difficult to obtain.</td></tr>
<tr><td>Cost</td><td>$1.4 million</td><td>$2.1 million</td><td>$24 million</td></tr>
</table>

We need your help!

EPA will accept comments on the Ballard Mine Proposed Plan beginning on Monday, April 2, 2018 and ending on Tuesday, May 1, 2018.

EPA will make its final decision on the cleanup only after considering public comments.

At the end of comment period, EPA will include a summary of responses, addressing the public comments, in the Record of Decision (ROD).

EPA will place all comments and the Responsiveness Summary in EPA's Administrative Record for the Ballard Mine Site.

For questions about the Ballard Mine Proposed Plan, please contact:

U.S. Environmental Protection Agency
Dave Tomten, Remedial Project Manager
208.378.5763
tomten.dave@epa.gov

Idaho Department of Environmental Quality
Michael Rowe, State Project Manager
208.236.6160
michael.rowe.@deq.idaho.gov

The Proposed Plan, and other documents about the Ballard Mine Superfund site can be found at:
epa.gov/superfund/ballard-mine

Public Comment Period

You can provide public comment in one of three ways:

1. By Mail:
   ATTN: Ballard Mine Comments
   Kay Morrison
   US EPA Region 10
   1200 Sixth Ave., Suite 900
   Mail Code: RAD-202-3
   Seattle, WA 98101

2. By email:
   morrison.kay@epa.gov

3. **In person, during the public hearing:**
   Wednesday, April 11, 6 p.m.
   Soda Springs City Hall
   9 W 2nd S

Stop by during our **open house, April 11 from 3 to 5:30 p.m.,** to learn more about the phosphate patch and the Ballard Mine Site.