

# Bonita Peak Mining District Innovative Technologies

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**COLORADO**  
Department of Public  
Health & Environment



## Innovative Approaches

The U.S. Environmental Protection Agency (EPA) is committed to exploring innovative approaches to investigating and cleaning up the Bonita Peak Mining District (BPMD) Superfund site. These approaches may reduce costs, accelerate remediation, improve outcomes or be preferred by the community. Increasing the use of state-of-the-art technologies is one of the recommendations made by EPA's Superfund Task Force to improve the Superfund program.

Innovative technologies can be used throughout the Superfund process both in investigating the nature and extent of contamination at the site and conducting cleanup activities. The EPA is looking for opportunities to test these innovative technologies in the field.

### Adaptive Management

The site team is using an adaptive management approach to site investigation and cleanup, which emphasizes making informed decisions throughout the remedial process. As part of a comprehensive site strategy, actions can be taken to address immediate risks, prevent source migration and return portions of sites to use before more detailed evaluations on other parts of site are complete. Monitoring data collected about the effectiveness of these actions can be used to refine future cleanup efforts. Therefore, innovative strategies can be implemented for early, interim actions before a final site remedy is chosen. Information gathered regarding the effectiveness of the strategies can be used to inform future decision making at the site.



### Needs Assessment

The site team is trying to solve a number of site-specific problems related to remediation, such as high altitude conditions, steep terrain and a very short field season. The investigative issues the site team is addressing include understanding the potential surface water impacts from the Bonita Peak Groundwater System and assessing the stability of underground mine workings. The site team will be evaluating various innovative data collection technologies to address these issues.

The site team will be evaluating cleanup options for a variety of media, including mine-impacted waters of varying chemistries and flow volumes, contaminated soils, waste rock, mine tailings and sediments from mine-

impacted water. In particular, EPA and state of Colorado are seeking alternatives to traditional lime treatment for mine-impacted water, such as passive or in-situ treatment technologies.

### Additional Considerations

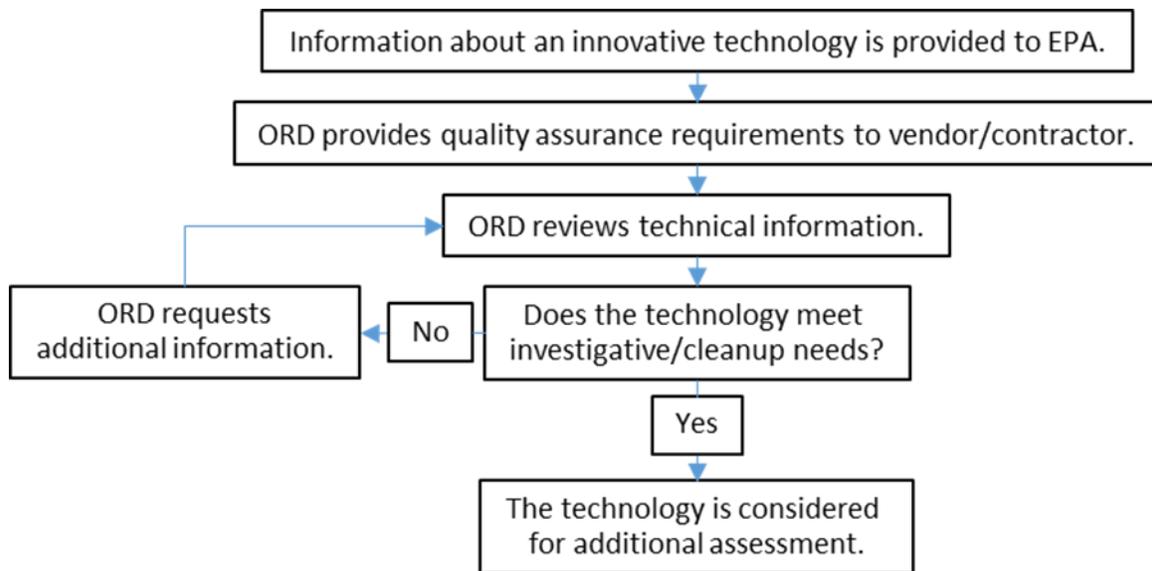
Rather than providing a total solution to addressing a particular mine-impacted media, the use of innovative technologies can also be used as part of a treatment chain strategy. When used in this fashion, the technology need only provide incremental improvement.

## EPA Office of Research and Development

EPA has partnered with its Office of Research and Development (ORD) to facilitate gathering information about innovative remedial technologies. ORD is maintaining a database of technologies and vendors and is evaluating technologies that may be appropriate for use at the site. ORD also provides information about EPA’s quality assurance criteria so any data gathered during field testing can be included in the site’s remedial investigation.

EPA is committed to a fair and open process for evaluating innovative technologies for use in the BPMD Superfund Site. The same criteria will be applied to all technologies as well as vendors/contractors.

### ORD Innovative Technology Evaluation Process



## Technology Selection:

### Treatability Study

EPA may use innovative technologies to conduct treatability studies at select source areas within the BPMD. Treatability studies are laboratory or field tests designed to provide critical data needed to evaluate and, ultimately, to implement one or more treatment technologies. Treatability studies provide data to support treatment technology selection and remedy implementation.

Considerations used when selecting technologies to include in a treatability study are often site-specific. However, some general considerations are effectiveness, quantity and characterization of waste generated, and if the technology is easily scalable to larger applications.

Treatability studies can be undertaken at any time during Superfund process. Because the treatability study does not constitute a remedy, the approval process for including a technology in a treatability study can be much shorter than that for an interim or final remedy.

## Interim/Final Remedy

Cleanup remedies can be chosen for interim or final response actions. Interim response actions can be taken while the site investigation is underway and are documented in an Interim Record of Decision. Final response actions are taken when the site-wide remedial investigation and feasibility study have been completed and are documented in a Record of Decision.

Since most remedies in the BPMD will be specific to individual source areas, EPA anticipates that they will be constructed as part of interim response actions. The approval process for inclusion of an innovative technology as an interim remedy can range from several months to a number of years.



*Red and Bonita Mine*

Any cleanup technology that is selected as an interim or final remedy at the site must meet nine criteria as set out in National Contingency Plan. Any innovative technology that is a component of a remedy must demonstrate progress towards achieving the criteria. The criteria are:

1. Overall Protection of Human Health and the Environment
2. Compliance with ARARs
3. Long-term effectiveness and permanence
4. Reduction of toxicity, mobility, or volume through treatment
5. Short-term effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

## FAQs

**Note:** By taking actions related to investigative or cleanup activities at the BPMD, you and/or your company may incur liability. Consult with legal counsel for specific advice regarding planned activities.

- How can I obtain information about where to find contaminated media for testing an innovative technology?
- The BPMD website (<http://www.epa.gov/superfund/bonita-peak>) has information about the 48 source areas within the site. Sampling Activities Reports for the site are also available from the website.
- How can I obtain permission to place equipment or to collect water, sediment, soil, waste rock or other media needed for testing an innovative technology?
  - Public Lands – Contact the appropriate federal land management agency (BLM or U.S. Forest Service) to obtain an access agreement and to ensure that: 1) your actions won't cause any exacerbation of harm or a release or threat of release; and 2) you will maintain the integrity of investigative and/or

response actions being taken under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

- Private Lands – Contact the private property owner for permission to access the property. Contact the EPA to ensure that: 1) your actions won't cause any exacerbation of harm or a release or threat of release, and 2) you will maintain the integrity of investigative and/or response actions being taken under CERCLA.
- Can EPA ship material offsite for use by vendors/contractors in investigating innovative technologies.  
No, EPA cannot ship material to offsite locations.
- Can EPA protect confidential business information (CBI)?  
Yes, at the request of the CBI provider.

## Resources:

- Bonita Peak Mining District website  
<http://www.epa.gov/superfund/bonita-peak>
- Key Principles of Superfund Remedy Selection  
<https://www.epa.gov/superfund/key-principles-superfund-remedy-selection>
- Reference Guide to Treatment Technologies for Mining-Influenced Water  
<https://www.epa.gov/remedytech/reference-guide-treatment-technologies-mining-influenced-water>

## Contacts:

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## Background:

On Dec. 8, 2017, EPA Administrator Scott Pruitt named the BPMD to a list of 21 Superfund sites across the nation that are receiving his immediate and intense attention.



In May 2017, Administrator Scott Pruitt established a task force to restore EPA's Superfund program to its rightful place at the center of the Agency's core mission to protect health and the environment.

<https://www.epa.gov/superfund/superfund-task-force>