

REUSE ASSESSMENT

Former Smelter Property
Iron King Mine/Humboldt Smelter Superfund Site
Dewey-Humboldt, Arizona

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INTRODUCTION

Beginning in September 2018, EPA Superfund Redevelopment and Region 9 sponsored a reuse assessment for the former Humboldt Smelter property (the property) to help inform the evaluation of Superfund cleanup approaches. The property is part of the larger Iron King Mine/Humboldt Smelter Superfund site, which is located in the small town of Dewey-Humboldt, about 85 miles north of Phoenix, Arizona.

Site Overview

The Iron King Mine/Humboldt Smelter Superfund site encompasses areas of contamination from two separate former facilities: the Iron King Mine and the Humboldt Smelter (see Figure 1). The Iron King Mine was an active mine from 1906 to 1969. The Humboldt Smelter operated from the late 1800s to 1937. Other small operations continued at the smelter property into the early 1960s. These mining and smelting operations left behind large quantities of tailings and other wastes that contain high levels of arsenic and lead. Some wastes have washed into the Chaparral Gulch, contaminating sediments and surface water. EPA has completed a Superfund investigation of the nature and extent of the contamination (the remedial investigation) and is in the process of conducting a feasibility study that will inform a final decision on how to address site contamination (which EPA refers to as the cleanup remedy). The feasibility study will evaluate many factors, including potential locations for a waste repository. A waste repository is an enclosed, engineered disposal unit designed to safely store contaminated material. The Feasibility Study Report is expected in 2021.

Planning for the Reuse of Superfund Sites

EPA does not choose or pay for the future land use of properties. However, understanding current and anticipated future land use (or reuse) helps EPA ensure the cleanup remedy will protect human health and the environment. With this information, EPA can evaluate whether and to what degree cleanup options would be compatible with reuse.

The purpose of this reuse assessment for the former smelter property is to:

- Confirm community reuse goals and a list of appropriate uses for the property.
- Explore how the design and location of a waste repository could inform reuse potential.
- Identify recommendations to preserve reuse options, to the extent feasible, during development of the cleanup options in EPA's feasibility study.

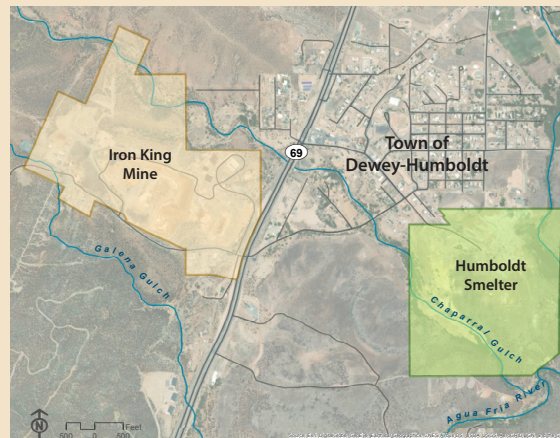


Figure 1. Location Map

Reuse Planning Process

This reuse assessment summarizes information gathered during interviews, public input and background research. Community input comes from the following events:

- September 25, 2018 - Briefing to Town Council to discuss redevelopment goals and considerations and gather information about the area.
- May 15, 2019 - Community workshop with over 30 participants to gather community input on reuse goals and potential future uses.
- Summer/Fall 2020 - Finalization and presentation of the reuse assessment to Town Council.

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REUSE CONSIDERATIONS FOR THE FORMER SMELTER PROPERTY

Land Use Considerations

The following considerations can inform the reuse of the property:

Zoning and Surrounding Land Uses – The property is adjacent to downtown Dewey-Humboldt and surrounded by rural residential and federal lands to the east and south. The central upland area or plateau is zoned for industrial land uses and the surrounding area is zoned for rural residential uses.

Access – After cleanup, the only public access to the property is by way of Main Street, an existing residential street that extends from downtown Dewey-Humboldt to the property.

Utilities – Water and electricity are available from Main Street but would need to be extended to the property to support any future development.

Topography – The majority of the smelter property is a plateau with steep slopes located between the Chaparral Gulch and the Aqua Fria River.

Remnant Structures – The brick smelter stack is highly visible. It is also deteriorating and poses a safety risk. Remnant concrete pads and sidewalks from the former residential community are located on the central plateau, referred to as Nob Hill.

Views – Significant views of the town and surrounding area are available from the property and the smelter stack is a prominent iconic element visible from Arizona State Route 69.

Cleanup Considerations

EPA completed a Superfund remedial investigation and now is conducting a feasibility study to evaluate remedial cleanup options for the entire site. The following areas of concern identified at the former smelter property may inform the property's reuse:

-  Tailings are consolidated in this area along the Chaparral Gulch. Tailings are powdery wastes that remain after the crushing and concentrating of mine ore.
-  The dross waste area is located at the north end of the smelter plateau. Dross is a fine-grained, grey color waste from dye-casting plants.
-  The slag area is located along the Aqua Fria River. Slag is a black, solid smelter waste (like hardened lava).

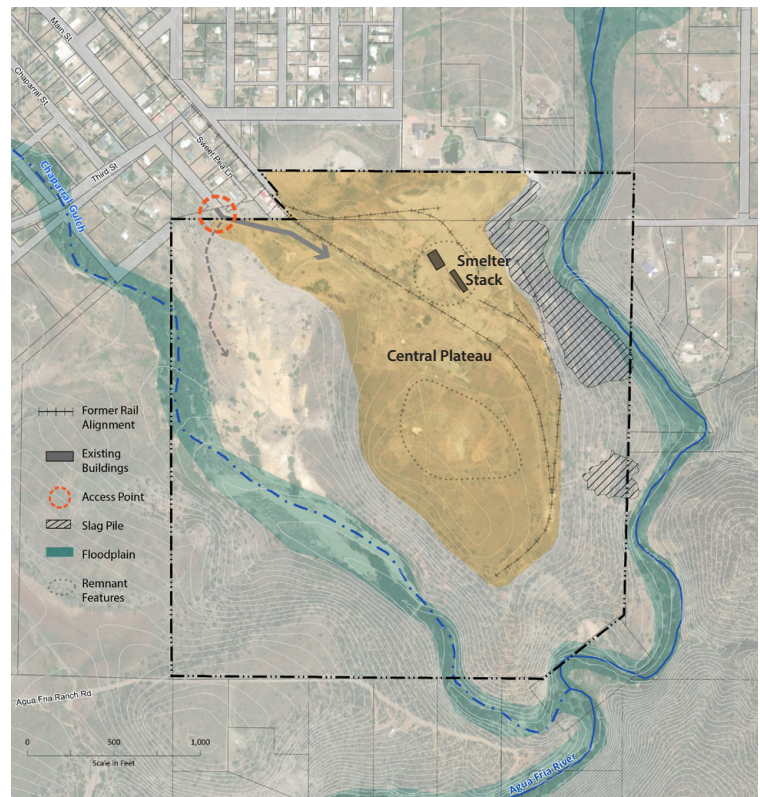


Figure 2. Site Features Map

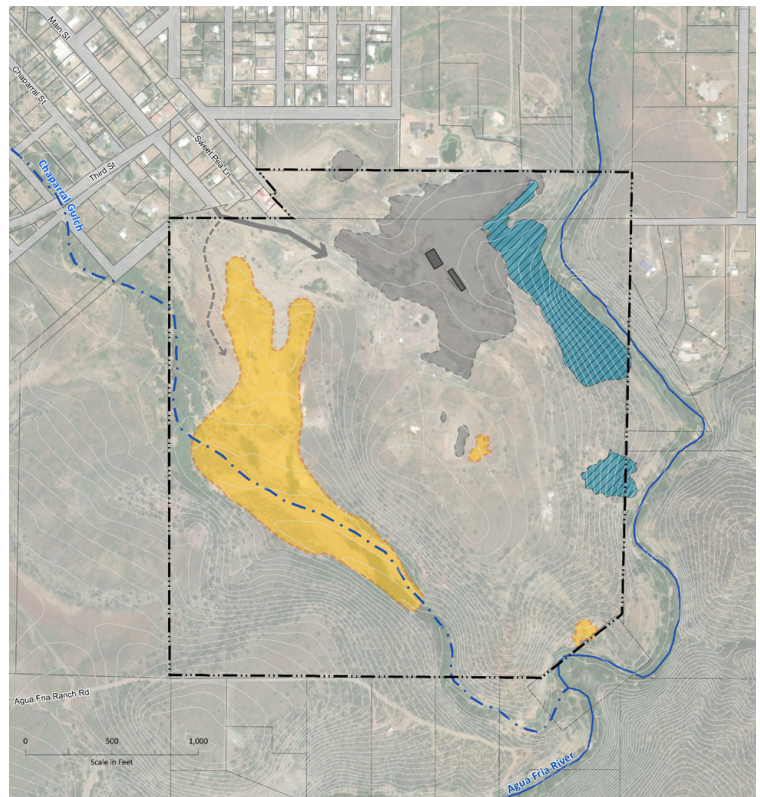


Figure 3. Remedial Considerations Map

Contaminated soils (metals) are located throughout the southern part of the plateau. Based on information from the remedial investigation and feasibility study, EPA will develop a Proposed Plan that explains the cleanup option EPA has selected for the entire site. EPA will issue the Proposed Plan for public comment and host a community meeting.

During the reuse assessment process, community members shared their goals and ideas for the reuse of the property. These goals and ideas are summarized below as reuse themes and reuse ideas.

Reuse Themes

The community identified the following reuse themes as appropriate for the former smelter property:

Cultural Heritage – Celebrate local industrial heritage as a destination for locals and visitors by showcasing facility remnants with trails and interpretative signage.

Recreation and Open Space – Leverage the area's views and natural beauty by providing trails, habitat and recreation amenities for locals and visitors.

Mixed-Use Economic Development – Encourage development that is compatible with residential and recreational uses to provide revenue for the town.

Reuse Principles

In addition to the reuse themes, community members identified the following principles to help guide reuse of the former smelter property:

- Preserve rural, small town character.
- Maintain views of the natural beauty.
- Celebrate mining heritage.
- Promote watershed health and ecological habitat.
- Attract visitors to Dewey-Humboldt.
- Provide amenities for locals and visitors.
- Foster connections to other area attractions.
- Ensure future uses are safe after site cleanup.

Community Ideas for Reuse

Community members suggested a range of uses, including recreation, open space, cultural heritage and mixed-use development. Community members noted that the area is not well suited for heavy industrial uses, given its proximity to residences and the views (both from and to the property).

Specific reuse ideas include:

- Walking trails and trailheads to connect to other public lands.
- Cultural heritage signage (with images of the mine).
- Preservation of portions of the stack to highlight mining heritage.
- Observation and viewpoints of the surrounding area, including the Aqua Fria River, with interpretive signage about the area's ecology.
- Picnic/BBQ areas.
- Disc golf.
- Mountain bike trails.
- RV and tent camping.
- Amphitheater or event space.
- Museum (the Dewey-Humboldt Historical Society is moving forward with a museum at another location).
- Nature preserve.
- Conservation of the "green ribbon" of the Aqua Fria stream corridor with restricted access.
- Markets and retail that could be combined with park amenities to support a multi-use approach on the property.
- Some community members mentioned the need for a wastewater treatment system to support local development and suggested the lower gulch area of the smelter property could be an option for consideration.



Remnant sidewalks from the former Nob Hill residential area .



The Humboldt Smelter stack structure.

Reuse Zones

Many of the reuse ideas could likely be compatible with the cleanup remedy but would need to be configured differently based on the location of the waste repository. The reuse framework below identifies areas suitable for different uses. The following page provides additional considerations based on the waste repository location.

Downtown Mixed Use

The area closest to downtown could accommodate a mix of uses, including commercial uses, light industrial uses compatible with surrounding residential areas, recreation and open space amenities (such as restrooms), and cultural heritage interpretation. The area closest to the property entrance would likely be best suited for higher-intensity uses given the access and connection to downtown.

If EPA builds a waste repository on the smelter plateau, it would limit future post-cleanup land use options in this area. The table on the adjacent page provides additional information.

Central Plateau

With its prominent views to and from the area, the central plateau could serve as a recreation destination with amenities to support this use. The town's Master Plan identifies the former smelter property as part of the town's open space amenities and recreational uses in this area would support that vision.

Access to this area would need to be provided through the Main Street entrance. The former railroad alignment may present an opportunity for a trail and highlight former mining history through signage.

Slag Area

The slag area on the steep banks of the Aqua Fria River will likely need to be restricted from public access and therefore will have minimal impact on the reuse of the property. Signage could be provided to inform visitors about the history of the slag pile and past industrial uses while preventing direct access to the area.

Tailings Swale

EPA is considering the tailings swale as a potential location for a waste repository in the feasibility study. If EPA instead removes all waste from this area, it may be best suited for open space or ecological uses. The top of the slope in this area might allow for supporting uses such as parking for adjacent uses or a trailhead.

Steep Slopes

The steep slopes along the banks of the Chaparral Gulch and Aqua Fria River are likely best suited for preserved open space to reduce erosion. Areas with moderate slopes could be considered for trail extensions.

Remnant Mining Features

Preservation or interpretation of the smelter stack, nearby associated structures, and remnant residential features could support cultural heritage goals. However, the stack and structure are in poor structural condition. If these structures collapse, anyone near the structures would be in danger of severe injury or death. Cleanup of the wastes in the areas surrounding these structures may require their demolition. It is likely the structures cannot be preserved due to safety and contamination concerns. Even so, it is possible that a piece of the structure could be saved and moved to another location as a historical artifact to celebrate the community's industrial heritage. EPA cannot pay to preserve these structures; therefore, the town or an entity other than EPA would need to lead those efforts.

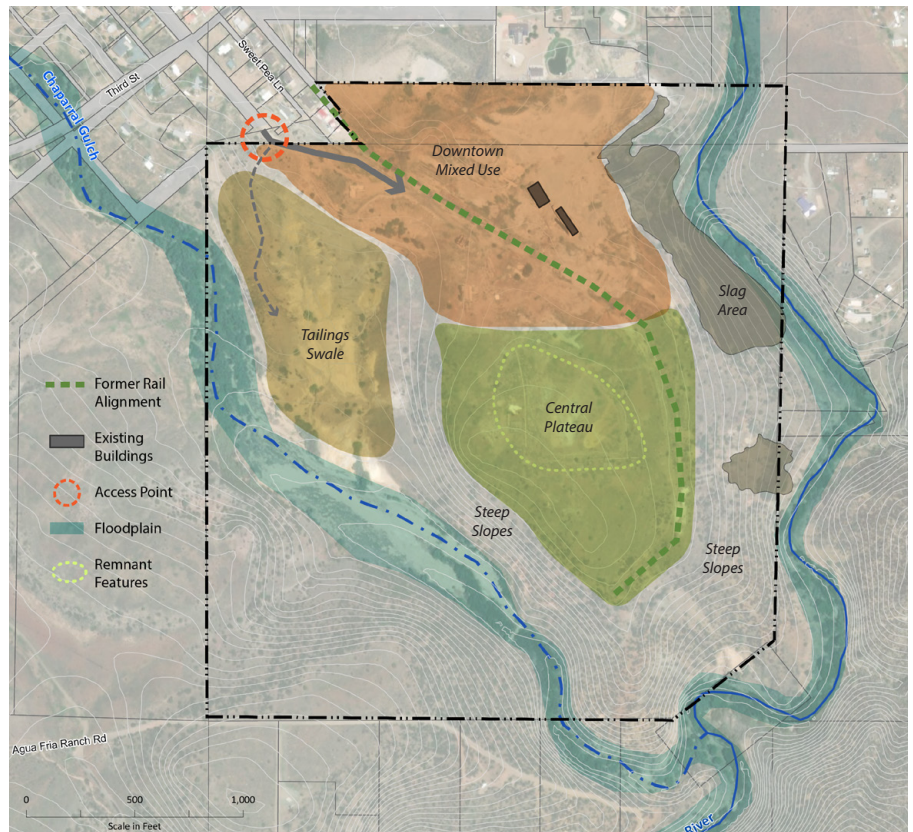


Figure 4. Reuse Framework

POTENTIAL CLEANUP COMPONENTS

Aligning Reuse with Potential Cleanup Remedy Approaches

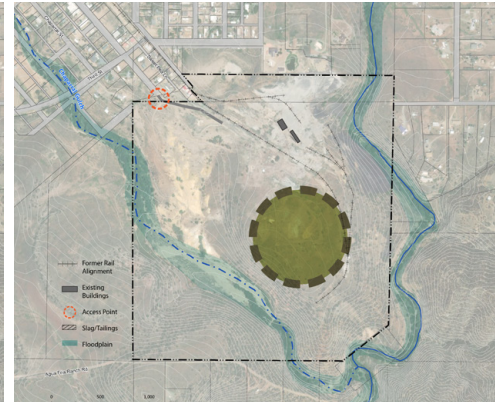
As part of the feasibility study, EPA is considering a range of waste repository options where contaminated soil can be safely contained and permanently sealed and capped on the property. The diagrams below show three of the potential waste repository locations under evaluation as well as related reuse considerations. Portions of the property may be subject to different land use restrictions based on the cleanup approach selected. For example, the type of waste repository cover system could restrict future structural development on top of a waste repository area.



 Potential Smelter Tailings Swale Repository



 Potential Northern Plateau Repository



 Potential Southern Plateau Repository

Potential Repository Location	Potential Cleanup Remedy Impacts on Reuse Opportunities	Considerations to Support Community Reuse Goals
SMELTER TAILINGS SWALE	- Consolidates waste in less visible and less developable area, potentially leaving more reuse options open for the plateau area. - Reduces access to repository as a less visited area.	If the waste repository is sited in this location: - Depending on location and accessibility, the waste repository area could be used as a trailhead, gulch observation point and parking area for trail access. - Consider protection of the gulch in waste repository design and maintenance. - Consider native plants as vegetative cover for the waste repository area.
NORTHERN PORTION OF PLATEAU NEAR DOWNTOWN	- May limit reuse and economic development options near downtown with road and utility access. - Depending on height and configuration, may block view or access to the southern plateau.	If the waste repository is sited in this location: - Consider the waste repository shape and side slopes that allow for access to and use on top consistent with cap protection. - Consider waste repository siting options that avoid dividing or reducing the developable area. - Consider whether the waste repository could support low-impact uses such as parking, open space and lightweight structures. - Consider extending utility and road access during design of the cleanup approach to support reuse opportunities on the southern plateau.
SOUTHERN PORTION OF PLATEAU	- Most visible from surrounding area. - Depending on size and configuration, may limit open space/recreational views and uses. - Potential loss of remaining historic features and footprints. - May limit deep-rooted vegetation (trees for shade or screening) envisioned for open space and recreational uses.	If the waste repository is sited in this location: - Consider designing the waste repository's shape and side slope to allow for access to and use on top consistent with cap protection. - Consider waste repository siting options that avoid dividing or reducing developable area. - Consider whether the waste repository could support low-impact uses such as parking, open space and lightweight structures.

REUSE EXAMPLES

The following examples are from other communities similar to Dewey-Humboldt that have returned a Superfund site to productive use.

Interpretive Signage

The Wycoff Eagle Harbor Superfund site in Bainbridge Island, Washington, is an example of different ways to commemorate industrial heritage using remnant pieces and interpretative signage. If it is not feasible to save the smelter stack, using remnant pieces of the stack or related structures for future exhibits might be an option.



Recreational Reuse

The following examples of recreational reuse at Superfund sites were informed by community reuse goals and implemented in a manner compatible with the cleanup remedies:

Trails and Open Space - The DuPage County Landfill in Warrenville, Illinois, is a 40-acre capped landfill that now hosts year-round recreation.

BMX Bike Park - A public-private partnership supports this community bike park at the Libby Asbestos Superfund site in Libby, Montana.



Recreation and Tourism

The Palmerton Zinc Superfund site in Palmerton, Pennsylvania, is an example of open space and a regional trail with educational signage. Signs provide background on the site's history and how the cleanup supported ecological restoration. To achieve this recreational reuse, a nonprofit formed to develop a wildlife habitat refuge and trails for bikers, hikers and wildlife enthusiasts.



Cultural Heritage and Recreation

At the Roebling Steel Co. Superfund site in Florence Township, New Jersey, the local historical society worked with EPA, the town and the State Historic Preservation Office to create a museum, interpretive exhibits, open space and trails. Industrial relics were retained and turned into interpretive exhibits. In some cases, access roads put in as part of the cleanup remedy can be reused as trails or roads as part of the site's reuse, underscoring the importance of considering reuse throughout the cleanup process.



Community Amenities

At the Davis Timber site in Lamar County, Michigan, a community-based reuse assessment identified community needs. The site owner donated a 3-acre area for use as a community center and voter polling location. The Hub City Humane Society operates an animal shelter and the Fields of Barktopia Dog Park on site. Other site uses include parking, connections to the adjacent Longleaf Trace recreation trail and restored habitat for pollinators.

EPA's in-depth reuse case study is available here: <https://semspub.epa.gov/work/04/11053844.pdf>.



National Historical Park

The Quincy Smelter Superfund Site in Houghton County, Michigan - is a former smelter turned historical park and underscores the importance of partnerships and teaming with other localities, heritage tourism organizations (in this case, the National Park Service), and state and federal agencies to advance site reuse. Funded by the National Park Service and Congressional appropriations in 2014, the Advisory Commission for the project replaced and restored roofing on the smelter's reverberatory furnace and several other large buildings to preserve historic industrial structures and the area's cultural and industrial heritage.

EPA's in-depth reuse case study is available here: <https://semspub.epa.gov/work/HQ/196768.pdf>.



MOVING FORWARD

The reuse examples on the previous pages are samples from other similar communities that have transformed formerly contaminated industrial lands into productive areas that support local economic development, recreation and tourism. Local governments, community members and regional organizations may want to consider the following key to success shared by these reuse examples:

1. Stay involved in EPA's Superfund cleanup process.

Identify opportunities to align reuse goals with cleanup options throughout the Superfund cleanup process.

2. Build regional, state and federal partnerships.

Identify and collaborate with partners to leverage resources and opportunities and increase project visibility.

3. Look for creative funding sources.

Think outside the box - look for opportunities to combine and leverage resources. While Superfund cleanup may take several years to complete, local governments and organizations can identify funding sources to prepare for redevelopment when the timing is right.

Relevant examples include:

The **Rivers, Trails, and Conservation Assistance Program** (National Park Service) partners with community groups, nonprofits, tribes, and state and local governments to design trails and parks, conserve and improve access to rivers, protect special places, and create recreation opportunities. (<https://www.nps.gov/orgs/rtca/index.htm>)

U.S. Department of Agriculture Rural Development Programs promote rural community development projects and planning. They include Rural Business Enterprise Grants, Rural Business Opportunity Grants, and Rural Economic Development Grants, utility grants and loans. (<https://www.rd.usda.gov/programs-services/programs-services-communities-nonprofits>)

EPA's Recreation Economy for Rural Communities Program helps communities develop strategies and action plans to revitalize their main streets through outdoor recreation. (<https://www.epa.gov/smartgrowth/recreation-economy-rural-communities>)

The **Arizona Downtown Alliance**, a program of the Arizona Preservation Foundation, works with communities across Arizona to implement the Main Street Four-Point Approach® developed by the National Trust for Historic Preservation in 1980. (<http://www.preservationnation.org/main-street/about-main-street/the-approach>)

The **Arizona Commerce Authority** coordinates broadband development activities in partnership with state and local government stakeholders and the private sector to streamline regulatory hurdles and maximizes strategic broadband funding for Arizona. (<https://www.azcommerce.com/broadband>)

The **Small Business Administration** provides entrepreneurs with training materials and opportunities that could support heritage tourism and business development using historic buildings. (<https://www.sba.gov>)

For more information, EPA Superfund Redevelopment and Region 9 provide a range of in-depth case studies that explore Superfund reuse from start to finish. They highlight redevelopment strategies that worked, acknowledge reuse barriers and discuss how communities overcame the barriers to create new reuse outcomes. The case studies also identify innovative tools and approaches and important lessons learned that may help other communities interested in reusing Superfund sites. For more information, please visit: <https://www.epa.gov/superfund-redevelopment-initiative/depth-case-studies-superfund-reuse>.

Conclusion

During the feasibility study phase of the Superfund cleanup, EPA will be developing and evaluating a range of cleanup options to address contamination. This is an optimal time to consider reuse. As part of this reuse assessment, community members, local stakeholders and the primary property owner have identified a range of reuse opportunities for the former smelter property. Many of these uses could be compatible with the cleanup remedy. However, these uses would need to be configured differently based on the location of the waste repository. Moving forward, this reuse assessment can be a tool for evaluating how cleanup options can support or align with the community's reuse goals. It can also help the community identify partnerships and funding resources to realize their vision for the former smelter property.

Acknowledgements

The reuse ideas and considerations in this reuse assessment were provided by community members, local stakeholders and organizations, and local government representatives from Dewey-Humboldt and Yavapai County.

For More Information

For more information about the Iron King Mine/Humboldt Smelter Superfund site, please contact the EPA site team. Additional site information is available on the EPA site profile page at:

<https://www.epa.gov/superfund/ironkingmine>.

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Superfund Redevelopment

For more information about tools and resources to support the redevelopment of Superfund sites, please visit: <https://www.epa.gov/superfund-redevelopment-initiative>.

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