"The project was a partnership effort that benefited our community and our environment. The engineering plan was designed to remove the sources of excess copper leaching into the West Branch of the Eagle River to restore the cold-water trout stream, while at the same time protect the remaining historic assets of the lower Cliff Mine. The project also contributed to the local economy since most of the project budget was used to employ local contractors for construction, fencing, seeding, and other restoration activities."

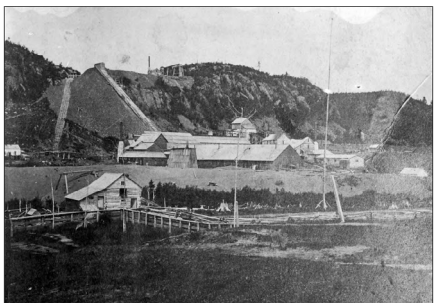
—GINA NICHOLAS
Chairperson, Houghton Keweenaw Conservation District

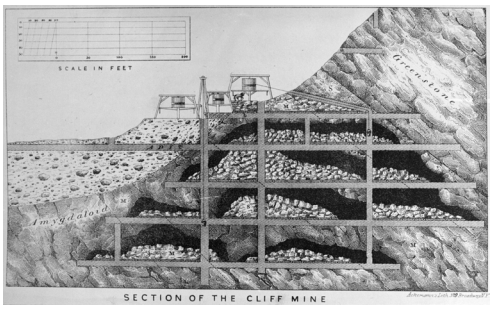
Photos: Above, La Roche Verte on Hay's Point, Copper Harbor, MI. The green and white vein of copper silicate was one of the most visible clues to the mineral wealth of the Keweenaw Peninsula. (photo by Sean Gorman); Right, Cliff Mine in1862 at the peak of production; underground drawing from Foster and Whitney's *Report on the Geology and Topography of a Portion of the Lake Superior Land District* (photos courtesy Reeder Photograph Collection, Michigan Tech Archives, Copper Country Historical Collections)

106 SUCCESS STORY

Environmental Restoration Project Redesign Produces Preservation Success

Keweenaw County, Michigan





THE STORY

Michigan's Keweenaw Peninsula has a 1 billion-year-old lava flow with fissures and voids where geologic activity deposited veins of 97 percent pure native copper. Beginning in the 1840s, Cliff Mine exploited these veins and operated the first economically successful mine in Michigan's Copper Country for 115 years with six periods of activity and technological change, which necessitated infrastructure alterations. Cliff Mine is defined by its geography. All related infrastructure including the waste rock pile and stamp sands are in proximity to one another because the large cliff at the north edge of the mining area prevented expansion. Mining was the main source of employment attracting Irish, German, French Canadians, and Cornish immigrants to the town of Clifton that grew up around the mine. Although the remains of more than 120 buildings and structures associated with Cliff Mine lie hidden amid the trees, the waste rock pile and stamp sands were the most visible remnants of the mine's infrastructure on the landscape when the abandoned Cliff Mine was determined eligible for the National Register of Historic Places in 2011.

THE PROJECT

In 2010, the Environmental Protection Agency (EPA) launched the Great Lakes Restoration Initiative, providing funding to protect and restore the Great Lakes Ecosystem. The Michigan Department of Environmental Quality (DEQ) received a grant from the EPA and funded the Houghton Keweenaw Conservation District (HKCD) to complete several restoration projects in the Upper Peninsula with the goal of removing copper contamination from mining areas within the Great Lakes watershed. The primary source of the contamination from Cliff Mine, the stamp sands, was slated for removal. The HKCD hired a local Natural Resources Conservation Service engineer to design the Cliff Mine River Corridor Project.

THE 106 PROCESS

EPA, the federal agency that provided funding, in cooperation with the Michigan DEQ, completed the Section 106 process under the National Historic Preservation Act. Section 106 requires that federal agencies identify historic properties and assess the effects

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Photos: Top left, Robert S. Duncanson's "Cliff Mine, Lake Superior" 1848 (F. Ward Paine, owner); Bottom, overview of completed project in 2015 (photo courtesy Gina Nichols); Right, view from the east of the Howe Shaft's Steam Stack 1912, with rock piles in the background (photo from Reeder Photograph Collection, Michigan Tech Archives, Copper Country Historical Collections)

of the projects they carry out, fund, or permit on those properties. Federal agencies also are required to consult with parties that have an interest in the property when adverse effects are likely to ensue. The DEQ consulted with the Michigan State Historic Preservation Officer (SHPO) about the restoration of the area including the removal of the contaminated stamp sands. The SHPO encouraged the DEQ and its partners to recognize the waste rock and stamp sands as part of the cultural landscape surrounding the mine and important historic features in determining the site eligible for the National Register. The redesign of the project altered the stamp sand deposits only enough to accomplish the goal of removing the copper contamination from the stream flowing through the site and left the majority of the large landscape feature in place. As a direct result of the redesign, the Michigan DEQ and the SHPO agreed the project would not affect the historic resources.

Consulting Parties:

- Environmental Protection Agency
- Michigan Department of Environmental Quality
- Michigan State Historic Preservation Officer
- Houghton Keweenaw Conservation District
- Natural Resources Conservation Service-Michigan
- Keweenaw County Road Commission
- Michigan Technological University
- Keweenaw National Historical Park
- Keweenaw County Historical Society

THE SUCCESS

The surrounding community is proud of this cultural heritage and appreciative of the natural environment in which they live and work. Thanks to the Section 106 review and consultation with the SHPO, the public, and other stakeholders, the project preserved the cultural landscape and restored the natural environment for the enjoyment of the people of Michigan. Mining was a major driver in the settlement and occupation of Michigan's Upper Peninsula, and Cliff Mine illustrates its significant contribution to the nation's history.

For more about Section 106 and the ACHP go to **www.achp.gov**

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