



## Engineering Evaluation/Cost Analysis (EE/CA) for the Einstein Mine Site, Mark Twain National Forest, Missouri

The United States Department of Agriculture, Forest Service (USFS) has developed an Engineering Evaluation/Cost Analysis (EE/CA) report for the Einstein Mine Site (Site), located ten miles west of the town of Fredericktown, Missouri and consists of approximately 5.65 acres of USFS-managed land adjacent to the Saint Francis River in the Silver Mines Recreation Area.

The USFS Einstein Mine Site is entirely within the USEPA Madison County Mines Superfund Site. The USEPA and USFS entered a Memorandum of Understanding (MOU) in December 2020 that defers assessment and removal action cleanup activities of mine waste impacts on USFS-managed lands to USFS, with coordination between the USFS and the USEPA.

As the lead agency on USFS-managed lands, the USFS conducts response actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The USFS is evaluating a non-time critical removal action (NTCRA) at the Site to address historical mining wastes that contain high levels of metals (primarily arsenic and lead in soil) that may be hazardous to human health and the environment.

### Purpose

The purpose of the NTCRA EE/CA is to identify and evaluate removal action alternatives to reduce the potential risk to human health and the environment posed by the contaminants of concern at the Einstein Mine.

The Site is located within the USFS Silver Mines Recreation Area and accessible from State Highway D. The Site is located on the west side of the St. Francis River and includes ruins of former mine buildings, prospect pits, and waste pile. Access to the Site and former mine workings is limited to pedestrian access via an existing non-motorized hiking trail. The Site access conditions preclude the use of heavy equipment or large-scale efforts to efficiently remove soil from well-forested areas without causing disturbance to un-affected

### Public Review Information

#### 2025 Einstein Mine EE/CA Report

The USDA Forest Service has prepared the Draft-Final EE/CA Report for the Einstein Mine, located within the Silver Mines Recreation Area in Madison County, Missouri. The EE/CA document is available for review and comments from the public following the schedule below.

#### Public Review Schedule

The Einstein EE/CA may be downloaded for review at <https://www.fs.usda.gov>  
The 30-day public comment period begins on May 21, 2025 and ends on June 19, 2025. All public comments must be received by 5:00 pm CST on June 19, 2025.



For questions and concerns regarding the USFS Einstein Mine EE/CA, please contact:  
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areas. In addition, sufficient sources of borrow material for soil covering or replacement are limited amongst the well-forested areas and shallow bedrock conditions.

## **Previous Studies**

Previous studies and investigations were performed in the early 2000's up to 2022. The USFS conducted a CERCLA Site Inspection (SI) in 2023 that included an extensive soil sampling and analysis program. The primary contaminants of concern were identified as arsenic and lead in soil located amongst historical mining waste piles, prospect pits, and historical wagon roads/trails. Several of these features are located within and surrounding the USFS-established hiking trail that leads to the historic dam overlook frequented by recreational visitors.

The EE/CA conceptual site model addresses that the main potential exposure route for recreational visitors is incidental ingestion after hiking or rock-hounding/digging. Potential exposure to contaminants at the Site is limited by the steep slopes off-trail, naturally-occurring forest floor litter, inability to use off-highway vehicles (and attendant lack of dust) and amount of time spent recreating at the Site.

## **Goals for Removal Action**

The Removal Action Objectives (RAOs) for the EE/CA are:

- Reduce exposure to heavy metal contaminants in Site soil to potential receptors without precluding recreational use of this portion of the Silver Mines Recreation Area;
- Minimize collateral resource damage (forest, cultural resources, recreation opportunity); and
- Increase recreational user awareness and avoidance of Site contamination.

## **Removal Action Alternatives**

Based on screening and evaluation of removal action technologies, the removal action alternatives retained for evaluation in the EE/CA include:

- Alternative 1: No Action.
- Alternative 2: Covering Wastes In-Place.
- Alternative 3: Covering Existing Recreational Trail, Including Removal of the Existing Adit Overhead Structure (and supporting institutional controls).

- Alternative 4: Institutional Controls (Special Use Permitting, Interpretive and Advisory Signage, and Physical Barriers).

Pursuant to CERCLA, the EE/CA alternatives are evaluated using three primary criteria: Effectiveness, Implementability, and Cost.

## **Comparison of Alternatives**

Alternative 1, the No Action alternative, is required under CERCLA to be included as a baseline comparison and would have limited effectiveness.

Alternative 2, Covering the Wastes in Place, would involve the highest cost and poses technical implementation challenges, and potential for disturbance of unaffected areas.

Alternative 3, Covering Existing Recreational Trail, Including Removal of the Existing Adit Overhead Structure (and supporting institutional controls), reduces potential for exposure to contaminants in the most-frequented use trail areas.

Alternative 4, Institutional Controls (Special Use Permitting, Interpretive and Advisory Signage, and Physical Barriers), is a lower cost alternative that would be less effective than Alternative 3.

## **Preferred Alternative**

The preferred alternative for the Draft-Final EE/CA is Alternative 3, Covering Existing Recreational Trail, Including Removal of the Existing Adit Overhead Structure (and supporting institutional controls). This alternative provides barriers to soil exposure pathways on the preferred trail, is implementable given the access conditions, provides a considerable level of long-term effectiveness and permanence, minimizes collateral resource damage, and is of moderate cost.

Following the public review and comment period, the USFS intends to finalize the EE/CA report and then move forward with removal action designs.

## **Community Involvement**

The USFS will continue to involve the public in the decision process regarding the status of the removal action. We encourage you to review the Draft-Final EE/CA report to find out more about the work that has been done, the alternatives that have been considered, and the selected approach to remedy the problem.