



Lukachukai Mountains Mining District Regional EE/CA Proposed Plan Fact Sheet

U.S. Environmental Protection Agency

Region 9

San Francisco, CA

May 2026

The U.S. Environmental Protection Agency (USEPA) is proposing a plan to address **mining-impacted material** at abandoned uranium mines within the **Lukachukai Mountains Mining District (LMMD) Site**. This **proposed plan** fact sheet presents the regional **engineering evaluation/cost analysis (EE/CA)** approach and describes USEPA's recommended alternatives for the LMMD Site and rationale for further evaluation in mine-specific **recommended removal alternative** reports. This fact sheet also describes the opportunities for public involvement in the decision-making process. **Bold text** indicates terms defined in the glossary near the end of this fact sheet.

PUBLIC INVOLVEMENT OPPORTUNITIES:

A 60-day public comment period will begin on May 30, 2026, and end on July 30, 2026.

Find information:

1. **Hard copies:** Reports and fact sheets are available for review at Chapter Houses in LMMD
2. **Electronic reports:**
<https://www.epa.gov/navajo-nation-uranium-cleanup/lukachukai>
3. **Administrative Record:**
<https://www.epa.gov/navajo-nation-uranium-cleanup/administrative-records>

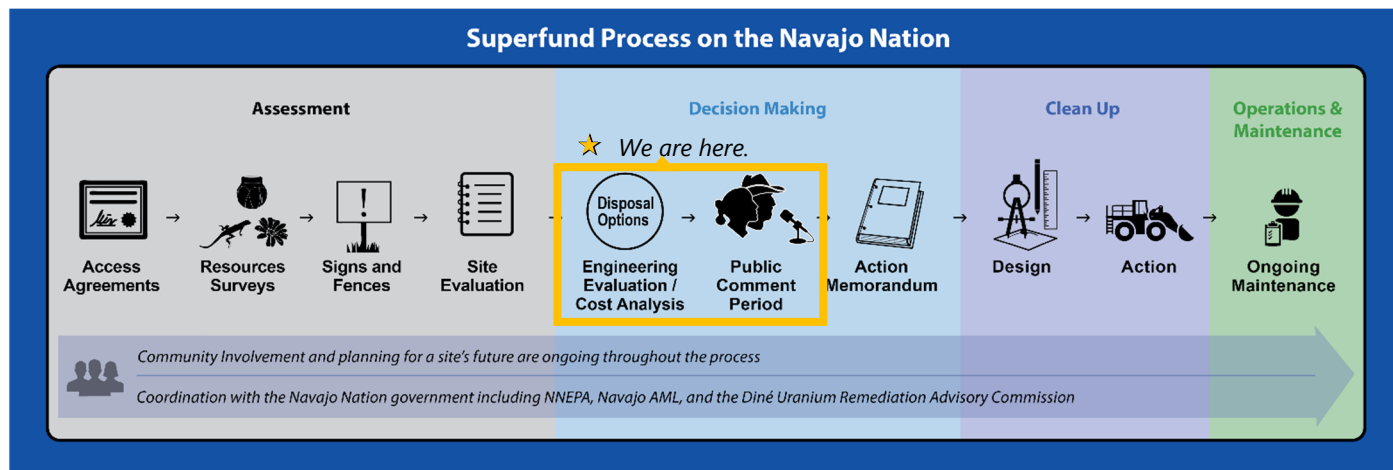
Submit comments:

- At the May 30, 2026 public meeting
- Email: brown.krista@epa.gov
- Post mail:
U.S. Environmental Protection Agency
2255 N. Gemini Drive
Flagstaff, AZ 86001-1637
- Toll-Free voicemail:
(833) 484-4384

After the 60-day public comment period, USEPA will review all public comments on the **LMMD regional EE/CA** and publish a responsiveness summary addressing significant comments.

In the future, USEPA will provide mine-specific recommended removal alternative reports for public comment. The final decision for conducting a mine-specific **removal action** will be announced in a mine-specific **Action Memorandum**, which will contain responses to comments received on the mine-specific recommended removal alternative report.

WHERE ARE WE IN THE CLEANUP PROCESS?



WHAT IS AN EE/CA?

- Provides information about mining history, contaminants, and potential impact on human health and the environment from abandoned uranium mines
- Identifies cleanup goals, mine areas, and mine features and estimates where and how much mining-impacted material needs to be addressed
- Is consistent with Diné Fundamental Law and Superfund
- Develops, evaluates, compares, and recommends potential cleanup alternatives that are:
 - Protective of human health and the environment
 - Effective, implementable, and cost effective
 - Considers community and stakeholder input

LMMD REGIONAL EE/CA AND MINE-SPECIFIC RECOMMENDED REMOVAL ALTERNATIVE APPROACH

USEPA established a regional EE/CA approach for mines within the LMMD Site to get to the cleanup phase faster and improve consistency in the decision-making process between mines. The regional EE/CA approach is a two-step process that uses the similarities in topography, mining practices, and mining contamination to improve consistency, efficiency, and transparency of cleanup decisions for all mines in the LMMD Site.

- Step one: The **LMMD regional EE/CA** identifies, evaluates, and compares the full range of cleanup alternatives based on the shared characteristics of the 88 mines within the LMMD Site.
- Step two: The mine-specific recommended removal alternative report provides a detailed evaluation of the recommended alternatives from the regional EE/CA, recommends an alternative for each area of a mine site, and describes how cleanup would be accomplished.

The LMMD regional EE/CA evaluates seven alternatives and identifies the four alternatives that best address the conditions at mines within the LMMD Site for further evaluation in the mine-specific recommended removal alternative reports.

LMMD SITE CHARACTERISTICS AND TYPICAL MINE CHARACTERISTICS

The LMMD Site includes 88 mines that lie within the Northern Abandoned Uranium Mine Region of the Navajo Nation in Arizona, approximately 40 miles southwest of Shiprock, New Mexico, and 15 miles east of Round Rock, Arizona. Uranium was mined from bedrock deposits in mesas across the LMMD Site. The main source of contamination in the LMMD Site is mining-impacted material excavated from underground mine workings or **rimstrips** that was dumped down steep slopes and over cliffs during mining activities. Mining-impacted material typically occurs as waste piles and surficial mine waste but can also occur as material eroded downslope or in drainages. Mining-impacted material typically contains elevated levels of radionuclides and metals at concentrations that might pose a risk to people or the environment.

The three most common types of mining-impacted areas in the LMMD Site are:

- Mesa tops where exploratory drilling occurred
- Mesa side slopes where mining occurred and mining-impacted material was dumped downslope
- Drainages where mining-impacted material was transported and deposited downstream

Other sources of contamination might include mining-impacted material on rimstrips, highwalls, drill trails, and roads. Some exposed rock and soil are naturally radioactive (not exposed or impacted by mining activity) and will not be cleaned up.

The main transport or movement of mining-impacted material within the LMMD Site is due to seasonal surface water runoff that redeposits mining-impacted material downslope and downstream in local drainages. Material eroding down the steep slopes due to gravity also contributes to the movement of contamination.

In the 1990s, the Navajo Abandoned Mine Lands Reclamation Department conducted some reclamation projects in the LMMD Site to address physical hazards and radiological hazards by consolidating and placing mining-impacted material in burial cells.

DEVELOPMENT OF POTENTIAL CLEANUP ALTERNATIVES

The LMMD regional EE/CA develops cleanup alternatives that best address the typical conditions at the mines within the LMMD Site, and presents a detailed and comparative look at the effectiveness, implementability, and costs of cleanup alternatives. **Table 1** lists the cleanup alternatives evaluated in the LMMD regional EE/CA.

Table 1. Cleanup Alternatives Evaluated in the LMMD Regional EE/CA

Alternative	Alternative Name	Description
1	No Action	No treatment, containment, or removal would occur. All contamination would remain in place. This alternative is required for the evaluation process.
2A	Manage on Site – Capping in Place	Caps mining-impacted material in place with an ET cap or improves existing covers to limit movement of and direct contact with mining-impacted material.
2B	Manage on Site – Excavation, Consolidation, and Capping on Mine Site	Excavates mining-impacted material from various areas and consolidates and caps in one or more locations on the mine site. Constructs an ET cap to limit movement of and direct contact with the mining-impacted material.
3	Excavation and Disposal at Local Repository	Excavates, hauls, and consolidates mining-impacted material in a proposed local repository that will hold mining-impacted material from several mines on the same mesa. Constructs an ET cap to limit movement of and direct contact with the mining-impacted material.
4	Excavation, Hauling, and Disposal at Regional Repository within LMMD Site	Excavates, hauls, and consolidates mining-impacted material in a proposed regional repository constructed within the LMMD Site designed to hold mining-impacted material from multiple LMMD mines. Constructs an ET cap to limit movement of and direct contact with the mining-impacted material.
5	Excavation and Placement into Underground Mine Workings	Excavates and stockpiles mining-impacted material, prepares a slurry of mining-impacted material with a stabilizing agent, and injects the slurry into underground mine workings.
6A	Excavation and Treatment Using Ablation ¹ and Backfill Treated Material on Mine Site	Excavates, stockpiles, and treats mining-impacted material using ablation and disposes of the treatment concentrates at an off-Navajo Nation licensed facility. If cleanup goals are met, uses treated coarse material as backfill.
6B	Excavation and Treatment Using Ablation ¹ and Cap Treated Material on Mine Site	Excavates, stockpiles, and treats mining-impacted material using ablation and disposes of the treatment concentrates at an off-Navajo Nation licensed facility. If cleanup goals are not met, then Alternatives 2B, 3, or 4 would be implemented to cap the treated coarse material.
7	Excavation, Hauling, and Disposal at Licensed Facility off Navajo Nation	Excavates and hauls the mining-impacted material for disposal at an off-Navajo Nation licensed facility.

Notes:

¹ Ablation treatment works by colliding mining-impacted material particles together in water to remove uranium minerals from the surface of mining-impacted material particles and separating uranium fines from the rest of the particles.

EE/CA Engineering evaluation/cost analysis ET Evapotranspiration

LMMD Lukachukai Mountains Mining District

PROPOSED REPOSITORY LOCATIONS AND DESIGN

USEPA assessed potential local and LMMD regional **repository** locations. The following potential repository locations are recommended for consideration:

- **Regional Repository.** The Mesa IV proposed location, shown in **Figure 1**, is already mining-impacted, located on a mesa top, and would not require hauling mine waste through the community.
- **Local Repository.** Proposed locations are already mining-impacted, located on a mesa top, and would not require hauling mine waste through the community. Proposed locations, shown in **Figure 1**, include Mesa I, Mesa II, Mesa V, and Cove Mesa.

The local and regional repositories under Alternatives 3 and 4, and the on-mine site repositories under Alternative 2, would be designed and constructed to blend in with the surrounding landscape and minimize erosion and water infiltration. They would be covered with an **evapotranspiration (ET) cap**. The design and the ET cap would minimize water infiltration and leaching of contaminants to groundwater and limit erosion, radon emissions, **gamma radiation**, and direct contact with mining-impacted material.

ET caps have been shown to be effective and durable at sites throughout the southwestern United States that are similar in nature to mines within the LMMD Site. ET caps include a layer of soil typically 2- to 3-feet thick for conditions at the LMMD Site. A thin top layer with gravel and small rocks mixed in is also typically included to provide better conditions for plant growth and better stability and erosion control. The repositories under Alternatives 2, 3, and 4 would require **institutional controls** to restrict activities that could damage the cap and the capped areas would require inspections and long-term maintenance to verify the caps remain effective.

Soil and rock to construct the cap would be used from areas near the mine site or repository location as much as possible. Additional soil and rock might need to be trucked in from other locations nearby.

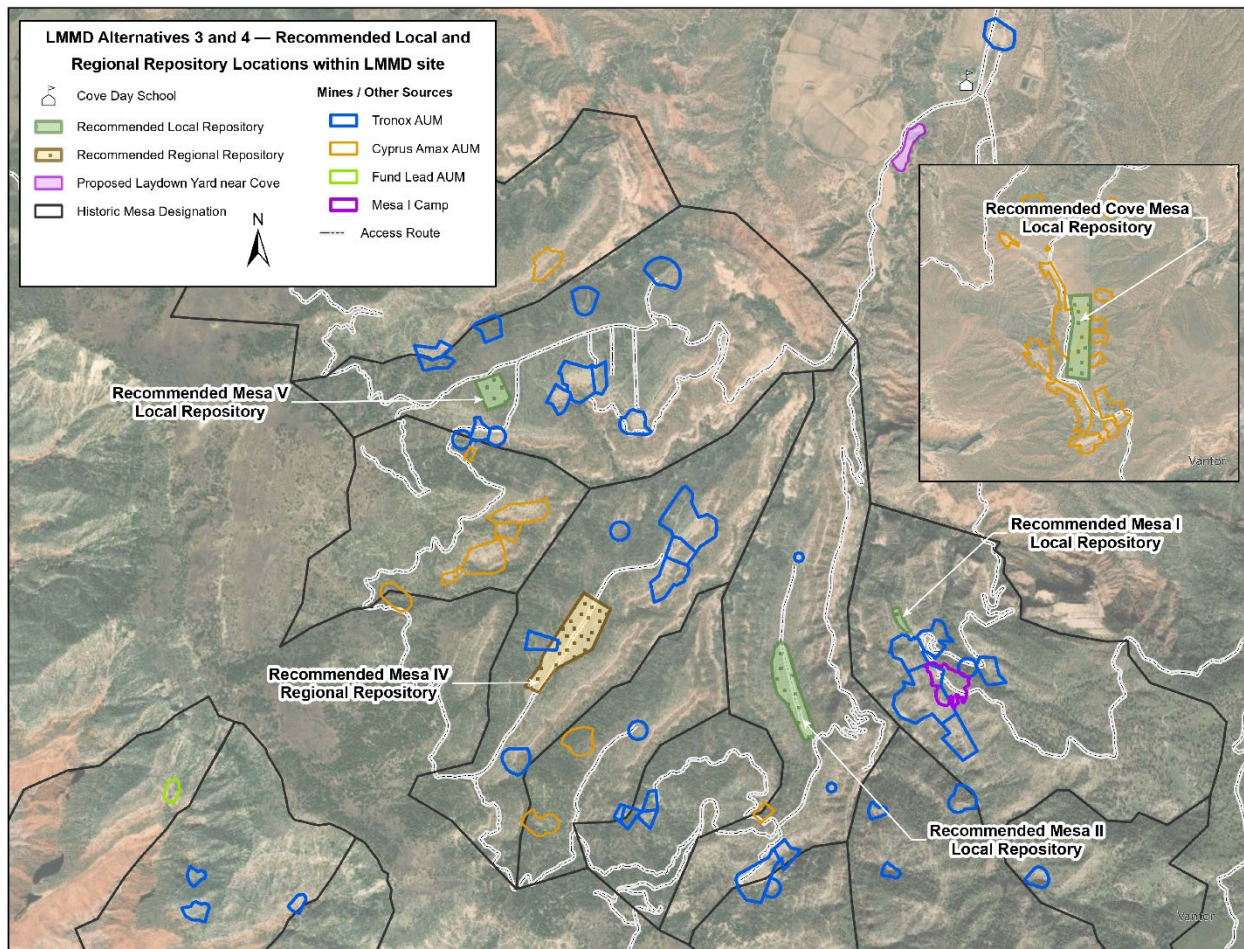


Figure 1. Recommended Local and Regional Repository Locations within the LMMD Site

STABILIZATION OF MINING-IMPACTED MATERIAL REMAINING IN PLACE

Some mining-impacted material is not accessible or is in a location where accessing and removing the material would pose risks to workers, destabilize slopes, and destroy mature vegetation leading to more erosion. Accessing and removing the material would also destroy natural channels and riparian vegetation or cause more harm to the environment than the risk posed by the contaminants. These areas will be stabilized using methods that limit erosion and promote vegetation growth to reduce the movement of and limit exposure to mining-impacted material. In these areas, berms and ditches would be installed to help move water around waste piles, waste areas, and mining-impacted material; rock walls would be constructed to stabilize slopes; and native vegetation would be planted to help stabilize slopes. Accessible waste piles, waste areas, and mining-impacted material that can be removed would be addressed by one or more of the potential cleanup alternatives described below.

DETAILS AND CONSIDERATIONS FOR EACH ALTERNATIVE

Alternative 1: No Action

- No treatment, containment, or removal would occur.
- All contamination would remain in place.
- No maintenance of current reclamation features would occur.
- No action would not be protective and is thus not discussed in the following sections.



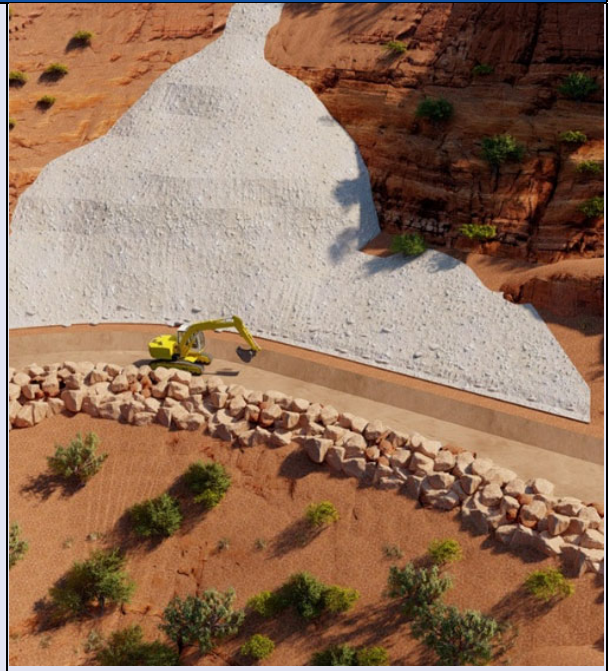
Alternative 2A: Manage on Site – Capping in Place

- Constructs an ET cap over mining-impacted material in place or improves existing covers to limit movement of and direct contact with mining-impacted material.
- Requires that location at the mine site has appropriate long-term stability.
- Requires institutional controls for the capped areas to restrict activities that could damage the cap and inspections and long-term maintenance to verify that the caps remain effective.
- No transferring or hauling of mining-impacted material through the community; all activities would occur on the mesa.
- Degradation of roads would be limited.



Alternative 2B: Manage on Site – Excavation, Consolidation, and Capping on Mine Site

- Excavates mining-impacted material from various areas and consolidates and caps in one location on the mine site.
- Constructs an ET cap to limit movement of and direct contact with the mining-impacted material.
- Requires a location at the mine site large enough to manage the mining-impacted material and that has appropriate long-term stability.
- Requires institutional controls for the capped areas to restrict activities that could damage the cap and inspections and long-term maintenance to verify that the caps remain effective.
- No transferring or hauling of mining-impacted material through the community; all activities would occur on the mesa.
- Degradation of roads would be limited.



Alternative 3: Excavation and Disposal at Local Repository

- Excavates, hauls, and consolidates mining-impacted material in a proposed local repository that would hold mining-impacted material from several mines on the same mesa.
- Constructs an ET cap to limit movement of and direct contact with the mining-impacted material.
- Requires institutional controls for the capped areas to restrict activities that could damage the cap and inspections and long-term maintenance to verify that the caps remain effective.
- The four recommended local repository locations are on mine sites or within a mine lease boundary where pristine land would not be disturbed. These local repository locations are large enough to manage mining-impacted material from several mines and would provide long-term stability.
- No transferring or hauling of mining-impacted material through the community; all activities would occur on the mesa.
- Degradation of roads would be limited.



Alternative 4: Excavation, Hauling, and Disposal at Regional Repository within LMMD Site

- Excavates, hauls, and consolidates mining-impacted material in a proposed regional repository constructed on Mesa IV designed to hold mining-impacted material from many mines within the LMMD Site.
- Constructs an ET cap to limit movement of and direct contact with the mining-impacted material.
- Requires institutional controls for the capped area to restrict activities that could damage the cap and inspections and long-term maintenance to verify that the cap remains effective.
- The recommended regional repository location is within a mine lease boundary where pristine land would not be disturbed. The regional repository location is large enough to manage mining-impacted material from most mines within the LMMD and would provide long-term stability.
- Limited transferring and hauling of mining-impacted material through the community; most activities would occur on the mesa.
- Degradation of roads would be limited.



Alternative 5: Excavation and Placement into Underground Mine Workings

- Excavates, stockpiles, screens, and crushes mining-impacted material; prepares a slurry of mining-impacted material with a stabilizing agent; and injects the slurry into accessible underground mine workings.
- Isolates mining-impacted material underground.
- Requires mine-specific treatability studies to identify the correct water and chemical stabilizing agent mixture to create a stable matrix and minimize leachability and migration to seeps.
- Requires locating underground mine workings, which would be difficult even using geophysical and drilling methods.
- Open spaces in the underground mine workings would likely not be large enough to accept all the mining-impacted material. The remaining volume, after the mine workings are filled, needs to be addressed by another alternative.
- No institutional controls would be required for mining-impacted material placed back into underground mine workings.
- No transferring or hauling of mining-impacted material through the community; all activities would occur on the mesa.
- Degradation of roads would be limited.



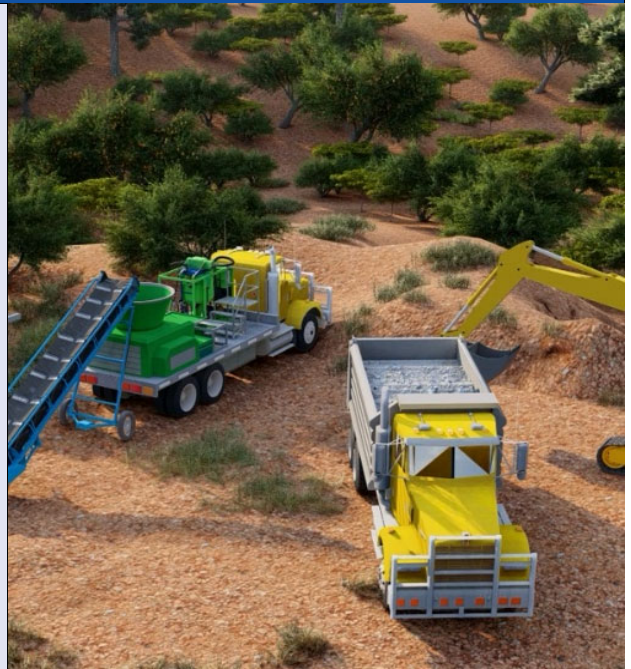
Alternative 6A: Excavation and Treatment Using Ablation and Backfill Treated Material on Mine Site

- Excavates, stockpiles, and treats mining-impacted material from the LMMD Site using high-pressure slurry ablation.
- Ablation rubs the uranium minerals off of sand grains (coarse material) and separates contaminants, silts, and clay (treatment fines) from solution for disposal off the Navajo Nation.
- Typically, 75 percent of initial volume is treated coarse material and 25 percent is treatment fines containing higher concentrations of uranium, radium-226, and metals.
- Hauls treatment fines off of the mesa and requires transfer from off-road haul trucks to on-highway haul trucks, which would haul waste through the community.
- Constructs and operates a covered transfer station west of Cove. Transfer operations would create dust and noise.
- Disposes of the treatment fines at a licensed facility off the Navajo Nation. Identifying an appropriate licensed facility could be difficult based on acceptance criteria and volume limits.
- Uses treated coarse material as backfill if it meets cleanup goals.
- Institutional controls would not be necessary where excavations have achieved cleanup levels that allow for unlimited use.
- Ablation of mining-impacted material has not been demonstrated at full scale.
- Pilot study results indicate ablation treatment might have difficulty attaining cleanup goals for LMMD Site mines.



Alternative 6B: Excavation and Treatment Using Ablation and Cap Treated Material on Mine Site

- Excavates, stockpiles, and treats mining-impacted material from the LMMD Site using high-pressure slurry ablation.
- Ablation rubs the uranium minerals off of sand grains (coarse material) and separates contaminants, silts, and clay (treatment fines) from solution for disposal off the Navajo Nation.
- Typically, 75 percent of initial volume is treated coarse material and 25 percent is treatment fines containing higher concentrations of uranium, radium-226, and metals.
- Hauls treatment fines off of the mesa and requires transfer from off-road haul trucks to on-highway haul trucks, which would haul waste through the community.
- Constructs and operates a covered transfer station west of Cove. Transfer operations would create dust and noise.
- Disposes of the treatment fines at a licensed facility off the Navajo Nation. Identifying an appropriate licensed facility could be difficult based on acceptance criteria and volume limits.
- Caps treated coarse material (see Alternatives 2, 3, or 4) if it does not meet cleanup goals.
- Requires institutional controls to limit land uses where material is stabilized in place or capped on the Navajo Nation.
- Ablation of mining-impacted material has not been demonstrated at full scale.
- Pilot study results indicate ablation treatment might have difficulty attaining cleanup goals for LMMD Site mines.



Alternative 7: Excavation, Hauling, and Disposal at Licensed Facility off Navajo Nation

- Excavates and hauls mining-impacted material from the LMMD Site to a licensed facility off the Navajo Nation.
- Removes all excavatable mining-impacted material from the Navajo Nation and community.
- Requires transfer of mining-impacted material from off-road haul trucks to on-highway haul trucks.
- Hauls all excavatable waste through the community, estimated to be thousands of truck loads.
- Constructs and operates a covered transfer station west of Cove. Transfer operations would create dust and noise.
- Facilities that can accept the waste are located between 150 and 650 miles away.
- Degrades haul roads.
- A limited local trucking fleet size might extend cleanup time.
- Institutional controls would not be necessary where excavations have achieved cleanup levels that allow for unlimited use.
- Requires long-term maintenance of the stabilized and restored excavation areas.



All alternatives would require long-term inspections and maintenance, as well as institutional controls, in the difficult-access or sensitive areas that were stabilized rather than addressed by excavation or capping. Short-term maintenance would occur at all areas for all alternatives during a restoration and revegetation period. All excavation, construction, and stabilization-in-place areas would be backfilled with local soil as needed, stabilized, and revegetated with native plants. USEPA will monitor air quality before, during, and after construction to make sure the dust controls are working and the community is safe. USEPA will work with local chapters to minimize transportation hazards to traffic, pedestrians, and communities.

EVALUATION OF POTENTIAL CLEANUP ALTERNATIVES

After identification and development, each alternative is evaluated for how well it meets the three criteria outlined in [Table 2](#).

Table 2. Engineering Evaluation/Cost Analysis Evaluation Criteria

Effectiveness	Implementability	Cost
<p>Effectiveness is how well the cleanup alternative works. It must:</p> <ul style="list-style-type: none"> • Protect human health and the environment • Meet federal and state laws • Protect workers and the community during construction (low short-term risk) • Be reliable once completed (low long-term risk) 	<p>Implementability includes how easy it would be to complete the cleanup alternative. For this, U.S. Environmental Protection Agency looks at:</p> <ul style="list-style-type: none"> • Technical feasibility: <ul style="list-style-type: none"> ○ If it can be done ○ Available material (such as soil and clay to build a cap) ○ Available workforce • Administrative feasibility <ul style="list-style-type: none"> ○ Regulatory requirements ○ Scheduling limits 	<p>Cost is an estimate of the total financial and other resources the cleanup alternative will require, including:</p> <ul style="list-style-type: none"> • Planning and designing the cleanup alternative • Conducting the cleanup alternative • Maintaining the cleanup alternative

The following summarizes the alternative analysis conducted in the LMMD regional EE/CA based on the cleanup of typical small and large mines within the LMMD. [Table 3](#) provides an at-a-glance overview of findings.

Effectiveness

Alternatives 2A, 2B, 3, and 4 (for mines close to the regional repository) would offer the best combination of short- and long-term effectiveness. For short-term effectiveness, these alternatives would have the lowest chance of traffic-related accidents, deaths, and air emissions and the least impacts to the community. For mines far away from the regional repository under Alternative 4, short-term effectiveness would be similar to Alternative 7 for worker protectiveness because of the extended project duration from short-range hauling. While Alternative 7 would potentially be slightly better over the long term, it would be significantly worse in the short term. Alternative 5 would be as effective long term as Alternatives 2A, 2B, 3, 4, and 7 but only for the small portion of the mining-impacted material that could be placed back in the underground mine workings and would cause more short-term impacts than Alternatives 2, 3, and 4. Alternative 6A would not be effective because it would not attain cleanup goals, and Alternative 6B would be less effective in the long and short terms than Alternatives 2A, 2B, 3, and 4.

Implementability

Alternatives 2B through 7 would require a large amount of earthmoving, which would be difficult in the remote and rugged terrain of the LMMD Site. However, earthmoving would be implementable with a combination of construction equipment and does not affect the comparisons between alternatives. Alternatives 2A, 2B, 3, and 4 would all be the easiest alternatives to implement. Alternative 7 would be slightly more difficult overall to implement for quantities less than 50,000 tons (33,000 cubic yards) per year (the acceptance limit at the White Mesa Mill) and moderately more difficult with larger quantities because of logistics and scheduling hundreds of trucks to haul mining-impacted material long distances to licensed disposal facilities in Utah, Colorado, or Texas. Alternatives 5 and 6 would be significantly more difficult overall to implement because they would involve operating specialized equipment in remote areas.

Cost

Overall, the costs for Alternatives 2A, 2B, and 3 would be similar and the lowest of all alternatives. Alternative 4 (for mines close to the regional repository) would be slightly higher, Alternative 4 (for mines far from the regional repository) would be moderately higher, Alternatives 5, 6A, and 6B would be significantly higher at approximately one and a half times the cost of Alternative 2A, and Alternative 7 would be even higher at up to twice the cost of Alternative 2A.

Table 3. Summary of Comparative Analysis of Alternatives

Alternative	Name	Effectiveness			Implementability		Cost (MM)
		Protective?	Short-Term Risk	Long-Term Risk	Technical Feasibility	Administrative Feasibility	
1	No Action	No	None	Not Viable	None	None	\$0
2A	Manage on Site – Capping in Place	Yes	Best	Better	Easy	Easy	\$18.1
2B	Manage on Site – Excavation, Consolidation, and Capping on Mine Site	Yes	Best	Better	Easy	Easy	\$18.6
3	Excavation and Disposal at Local Repository	Yes	Best	Better	Easy	Easy	\$18.7
4	Excavation, Hauling, and Disposal at Regional Repository within LMMD Site ¹	Yes	Better (near) Good (far)	Best	Easy	Moderate	\$24.7 (near) \$30.6 (far)
5	Excavation and Placement into Underground Mine Workings	Yes	Good	Better	Difficult	Moderate	\$31.3
6A	Excavation and Treatment Using Ablation and Backfill Treated Material on Mine Site	No ²	Good	Good	Difficult	Moderate	\$32.1
6B	Excavation and Treatment Using Ablation and Cap Treated Material on Mine Site	Yes	Good	Good	Difficult	Moderate	\$32.8
7	Excavation, Hauling, and Disposal at Licensed Facility off Navajo Nation	Yes	Poor	Best	Moderate	Easy	\$38.3

Notes:

Alternative 1 is required as a baseline.

Alternatives 2A through 4 are recommended for evaluation in the mine-specific recommended removal alternative reports.

Alternatives 5 through 7 are not recommended for evaluation in the mine-specific recommended removal alternative reports.

¹ Alternative 4 included evaluation of mines located near and far from the regional repository. When evaluation results differed for near and far mines, the table indicates both evaluation results.

² Ablation has not been demonstrated at a large scale and might have difficulty attaining cleanup goals for LMMD mine sites.

LMMD Lukachukai Mountains Mining District

MM Million

LMMD REGIONAL EE/CA RECOMMENDED ALTERNATIVES

Table 4 lists the recommended alternatives from the LMMD regional EE/CA that will be evaluated in the mine-specific recommended removal alternative reports.

Table 4. Recommended Cleanup Alternatives for Use in Recommended Removal Alternative Reports

Alternative	Alternative Name
2A	Manage on Site – Capping in Place
2B	Manage on Site – Excavation, Consolidation, and Capping on Mine Site
3	Excavation and Disposal at Local Repository
4	Excavation, Hauling, and Disposal at Regional Repository within the Lukachukai Mountains Mining District Site

MINE-SPECIFIC RECOMMENDED REMOVAL ALTERNATIVE REPORT PROCESS

The mine-specific recommended removal alternative report identifies which LMMD Site cleanup alternative to recommend for each area at a mine. Mine-specific recommended removal alternative reports reference the LMMD regional EE/CA for general information and the development and screening of alternatives. Each mine-specific recommended removal alternative report documents the following steps in selecting the recommended alternative(s):

- Confirms that specific mine characteristics are consistent with the LMMD regional EE/CA
- Identifies areas of the mine site that are inaccessible or where accessing and removing mining-impacted material would pose risks to workers, destabilize slopes and destroy mature vegetation leading to more erosion, destroy natural channels and riparian vegetation, or cause more harm to the environment than the risk posed by the contaminants; these areas would be stabilized using methods that limit erosion and promote vegetation
- Uses alternative evaluation flowcharts to help identify which alternative(s) to carry forward from the LMMD regional EE/CA that best addresses site conditions, mining-impacted material, and mine features
- Compares mine-specific alternatives using the EE/CA evaluation criteria listed in **Table 2**
- Selects the recommended alternative for each area at a mine site
- Describes how the recommended alternative(s) will be implemented at the mine site

COMMUNITY INVOLVEMENT

The alternatives presented in the LMMD regional EE/CA reflect public feedback received to date. USEPA worked closely with the surrounding communities to gather input on the range of cleanup alternatives for abandoned uranium mines within the LMMD Site, including:

- Fall 2021 to present: Monthly meetings with the Cove community
- Spring 2023 to present: Regular meetings with the Navajo Nation Environmental Protection Agency
- August 12, 2018: Presentations to the Cove community on the site investigations
- March 19, 2019: Presentations to the Cove community on the **removal site evaluation** results
- March 8, 2024: Presentations to the Cove community on the EE/CA alternatives
- August 21 and 22, 2024: Presentations to the Cove, Round Rock, and Lukachukai communities on the LMMD community involvement plan
- March 5 and 6, 2026: Presentations to the Cove, Round Rock, and Lukachukai communities on the regional EE/CA approach and alternatives

USEPA will continue to engage with the community throughout all steps of the LMMD regional EE/CA and the mine-specific cleanup decision-making and cleanup process, including the mine-specific design and construction processes.

GLOSSARY

Terminology	Definition
Ablation	The ablation process mixes water with mining-impacted material into a slurry and uses a high-pressure system to knock contaminants off of the mine waste.
Action Memorandum	A concise written record of the selection and approval of a removal action. Describes the site's history, current activities, and human health and environmental threats, and outlines the action, cleanup levels, and costs.
Administrative Record	A document, or collection of documents, that forms the basis for USEPA's decision; in this case, the selection of a response action at a Superfund site.
Engineering evaluation/ cost analysis (EE/CA)	A report that describes the mine site characteristics and evaluates and compares cleanup alternatives that are capable of addressing the contamination at the mine site. The alternative evaluation criteria include effectiveness/protectiveness, implementability, and cost.
Evapotranspiration (ET) cap	ET caps consist of clean soil placed over mining-impacted material to keep water from reaching the material. ET caps store water from rainfall and snowmelt until drier or warmer weather evaporates the water, or until the water is taken in by plant roots and released to the air as water vapor through the leaves and stems (this process is called "transpiration").
Gamma radiation	A stream of high-energy radiation given off by an atomic nucleus undergoing radioactive decay.
Institutional controls	Institutional controls are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and protect the integrity of a remedy by limiting land or resource use.
Lukachukai Mountains Mining District (LMMD) Site	The LMMD Site is a Superfund site located primarily in the Cove, Round Rock, and Lukachukai Chapters of the Navajo Nation in northeast Arizona. Past uranium and vanadium mining in the Lukachukai Mountains created more than 100 piles of mine waste rock.
LMMD regional EE/CA	A report that generally describes the characteristics of mines within the LMMD Site; identifies technologies; develops, analyzes, and compares multiple removal action alternatives; and identifies a list of removal alternatives for evaluation in each mine-specific recommended removal alternative(s) report.
Mining-impacted material	Mining-impacted material includes soil, rock, and sediment containing chemicals of concern for human or ecological (plants and animals) health that were released or disturbed by mining activities.
Proposed plan	A report that presents the suggested method of cleanup to be considered and accepted.
Recommended removal alternative	A report that describes mine-specific conditions, uses a standardized decision process from the LMMD regional EE/CA to streamline evaluation of the list of removal action alternatives, and recommends removal alternative(s) suitable for each mine.
Repository	A repository is a secure, permanent, engineered consolidation area for mining-impacted material.
Removal action	The cleanup or removal of released hazardous substances, pollutants, or contaminants that might present an imminent and substantial danger.
Removal site evaluation	A report that presents the investigation results for a mine or group of mines, including past investigations, sampling results, risk assessment, and proposed removal action extent.
Rimstrip	A mining technique that cuts into an ore body exposed on the side of a cliff or slope.

ADDITIONAL PUBLIC INFORMATION

The intent of this proposed plan fact sheet is to provide a summary of the alternatives evaluated and the recommended alternatives to be considered further in mine-specific recommended removal alternative reports. The public is encouraged to consult the **Administrative Record**, which contains all pertinent materials, including the LMMD regional EE/CA, fact sheets, and other reports, that form the basis for alternative evaluation and recommendation.

The Administrative Record for this regional EE/CA will be available during the public comment period at the following locations:

Cove Chapter House

Indian Route 33
Red Valley, Arizona 86544
Phone: (928) 653-5806

Kinyaa'áanii Charlie Benally Library

Diné College, Main Campus
One Circle Drive and Indian Route 12
Tsaile, Arizona 86556
Phone: (928) 724-6757

Senator John Pinto Library

Diné College, Shiprock South Campus
US Highway 64 and Indian Route 570 Shiprock,
New Mexico 87420
Phone: (505) 368-3646

Additional information can be found at:

<https://www.epa.gov/navajo-nation-uranium-cleanup/administrative-records>

For digital copies online:

<https://www.epa.gov/navajo-nation-uranium-cleanup/lukachukai>

HOW CAN YOU LEARN MORE?

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Ways to provide input:

- At the May 30, 2026 public meeting
- Email: brown.krista@epa.gov
- Post mail:
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2255 N. Gemini Drive
Flagstaff, Arizona 86001-1637
- Toll-Free voicemail:
(833) 484-4384

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