ABANDONED URANIUM MINES WORKING GROUP (AUMWG)

ANNUAL STAKEHOLDER REPORT

January 1 - December 31

2022

PREFACE

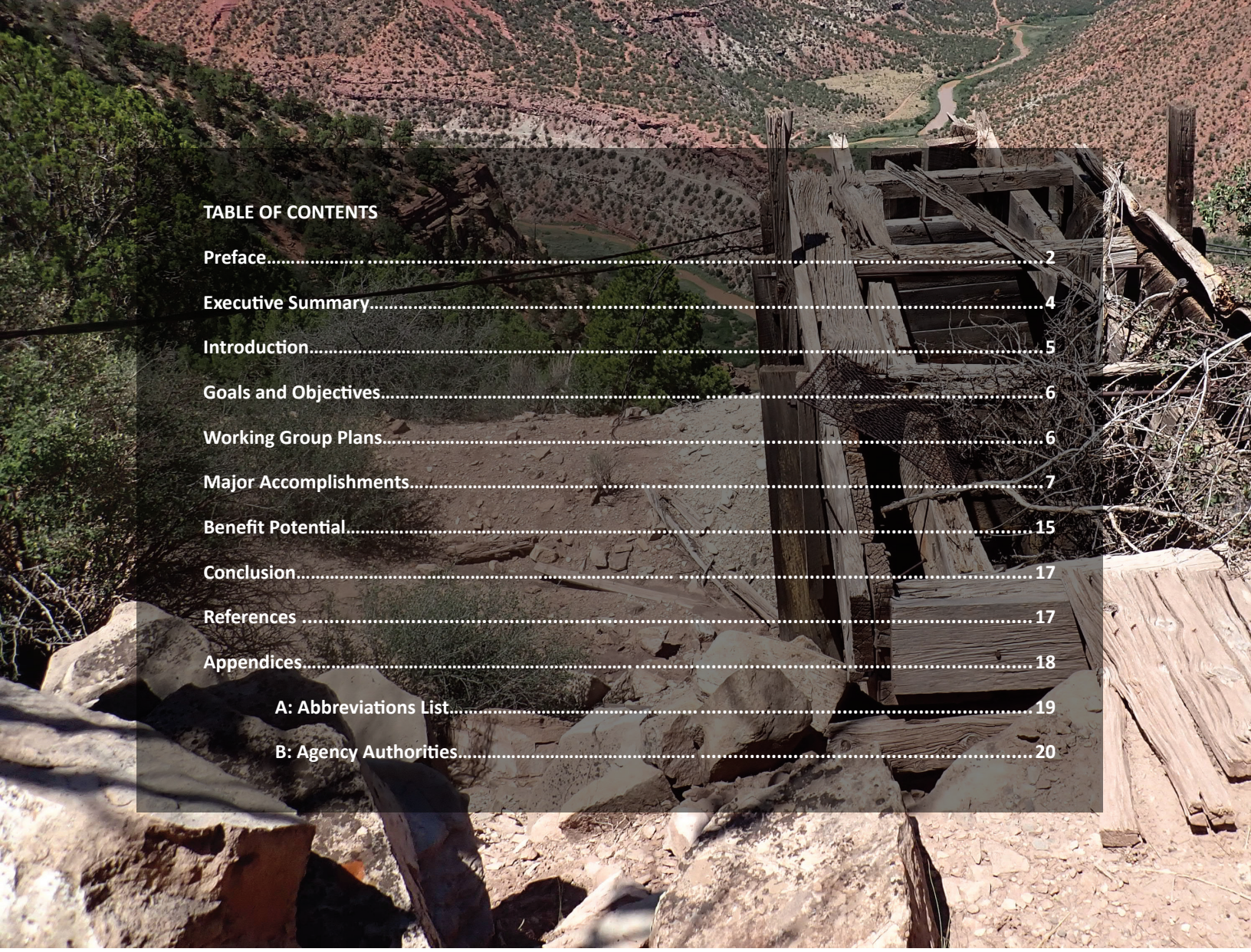
In 2013, Congress directed the U.S. Department of Energy (DOE), in consultation with the secretary of the U.S. Department of the Interior (DOI), the secretary of the U.S. Department of Agriculture (USDA), and the administrator of the U.S. Environmental Protection Agency (EPA), to conduct a review and prepare a report on approximately 4225 abandoned uranium mines (AUMs) across the nation that provided ore to the U.S. Atomic Energy Commission (AEC) for defense-related activities. DOE assigned the Office of Legacy Management (LM) to take the lead. In August 2014, LM submitted the *Defense-Related Uranium Mines Report to Congress* (DOE 2014) (Report to Congress).

The Report to Congress has four associated topic reports: (1) mine location and status, (2) priority ranking for reclamation and remediation, (3) potential cost and feasibility for reclaiming or remediating the mines, and (4) risks posed by mines to human health and the environment. Each of these topic reports noted and documented numerous data gaps, primarily related to three major issues: (1) the status of reclamation and remediation could only be confirmed at 15% of the mines, (2) location data were not always accurate (including information in AEC records), and (3) information about whether the mines pose risks to public health and safety and the environment was insufficient. This drove the need for a multiagency effort to fill existing data gaps and to verify and validate existing information.

The Abandoned Uranium Mines Working Group (AUMWG)—consisting of senior management and staff from DOE, DOI, USDA, and EPA—was formed to maintain ongoing dialogue among the agencies and continue collaborative efforts to exchange technical and administrative information. This heightened focus on inventorying and assessing potential impacts on public health and safety and the environmental condition of these mines contributed to the initiation of DOE's Defense-Related Uranium Mines (DRUM) Program.

The DRUM Program aims to fill the data gaps identified by the Report to Congress and provide accurate information to help decision makers prioritize mines for additional action, if warranted. The geographic distribution and land ownership of DRUM sites requires that multiple agencies be involved. As a result, DOE developed a phased-implementation strategy. This was also the impetus for establishing partnerships between DOE; federal land-management agencies (FLMAs), including DOI and USDA; EPA; and state and tribal abandoned mine lands (AML) programs. These relationships, both formal and voluntary, are beneficial and allow partners to leverage resources on an as needed basis.

The purpose of this Annual Stakeholder Report is to communicate AUMWG's collaborative efforts and accomplishments over the past year toward assessing, safeguarding, reclaiming, and remediating AUMs.



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EXECUTIVE SUMMARY

In 2022, the AUMWG partners reconfirmed the viability of their programmatic documents and communication strategies. The partners recognized that marshalling and leveraging the resources of multiple federal agencies increases the probability of success. Moreover, the coordinated efforts of a one-team approach are cost effective and strengthen public support. The partners worked with states and tribes to identify and address high-priority mines in an effective and coordinated manner.

This interaction and collaboration between DOE; FLMAs, including the U.S. Bureau of Land Management (BLM), the National Park Service (NPS), and the U.S. Forest Service (USFS); EPA; and state and tribal AML programs contributed to AUMWG's formation and the ongoing implementation of the DRUM Program.

AUMWG provides a forum to exchange operational experiences, advice, and lessons learned from each partner agency's challenges and successes. Through AUMWG, the partners recognized shared objectives, coordinated schedules, and exchanged constructive information for their respective administrative and technical needs. This one-team approach is intended to expedite the protection of human health and the environment from any hazards resulting from AUMs.

The 2022 AUMWG highlights include the following:

- The partners continued to fulfill their responsibilities to protect human health and the environment, focusing on assessments and response actions, enforcement of responsible party agreements and settlements, and community outreach.
- The partners continued to engage one another on both project and programmatic levels and assisted one another, where possible, in leveraging resources, experience, and methods.
- The DRUM Program continued to verify and validate the condition of approximately 2500 mines on public land. To date, the DRUM team has evaluated about 2100 sites on public land, and preliminary analysis suggests the following:
    - Unprotected open mine entries, subsidence features, dangerous highwalls, and unstable structures—all associated with historic mining operations—are the primary risks.
    - Seven hundred eighty-two mines, or 37% of mines, were ranked "low" by DOE for risk of physical, chemical, or radiological hazards that could result from the recreational use of the neighboring land.

- DOE's relative risk screening rankings ("high," "medium," and "low") indicate that many of the mines may not need additional action. However, it should be noted that therelative rankings do not constitute detailed human health risk assessments, and it is up to the FLMAs to evaluate the actual risks at these sites and determine which, if any, of the mines require risk mitigation actions in the future.

- The federal government could realize more than $380 million in cost avoidance, compared to the original estimates in the Report to Congress (DOE 2014). This cost avoidance is based on the number of mines that DOE risk-screening indicates may require safeguarding or remediation, as required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Title 42 *United States Code* Section 9601 et seq. [42 USC 9601 et seq]).

❖ The partners safeguarded physical hazards at mine sites in several locations across Colorado, New Mexico, and Utah. The DRUM team has planned additional safeguarding efforts in Utah and Colorado in 2023.

INTRODUCTION

The purpose of this Annual Stakeholder Report is to communicate AUMWG's collaborative efforts and accomplishments over the past year.

Formed in the aftermath of the Report to Congress, AUMWG is a consortium of federal agencies working together to address the human health, safety, and environmental challenges posed by the nation's AUMs. By marshalling and leveraging the resources of multiple federal agencies, AUMWG works with states and tribes to identify and address high-priority mines in an effective and coordinated manner. The working group is led by LM and comprises directors, managers, and senior technical AML personnel from DOE, EPA, DOI, USDA, BLM, USFS, NPS, and the U.S. Bureau of Indian Affairs (BIA).

The DRUM team continued to navigate the challenges presented by the ongoing coronavirus disease 2019 (COVID-19) pandemic. With the safety and wellbeing of employees, contractors, volunteers, and the public in mind, many AUMWG member agencies deferred or delayed activities to mitigate exposure and transmission risk. To the best of their abilities, AUMWG agencies followed the guidance provided by the U.S. Centers for Disease Control and Prevention while continuing to deliver essential services.

Members worked with state and local health authorities to minimize the risk of COVID-19 transmission and consider the unique circumstances of each operating location. AUMWG reviewed individual state and tribal orders for exemptions and permissible essential activities. In addition, AUMWG reviewed site-specific regulatory requirements to determine what could be completed within the constraints created by the orders. Each partner agency established and implemented its own posture in response to the pandemic.

The *Abandoned Uranium Mines Working Group Addressing Health and Safety Risks of Abandoned Uranium Mines Multiagency Strategic Plan* (AUMWG 2020) (AUMWG Strategic Plan) guides the activities of the working group. The group normally holds quarterly calls and an annual face-to-face meeting to discuss its progress in addressing the problems posed by AUMs and share technical approaches to assessing, safeguarding, reclaiming, and remediating these mines. Due to the ongoing COVID-19 pandemic, AUMWG canceled its annual face-to-face meeting. However, the quarterly calls occurred and were engaging, collaborative, and informative.

GOALS AND OBJECTIVES

AUMWG's goals are to (1) identify areas of common ground between the partner agencies with regard to AUM responsibilities and (2) improve resource allocation strategies to identify and address unacceptable risks to human health, safety, and the environment. To accomplish these goals, the working group leverages the collective experience and expertise of member agencies. This one-team approach benefits the government and overall program implementation by leveraging resources and reducing risks to human health, physical safety, and the environment.

In support of these goals, AUMWG's objectives are to:

1. Share existing information and collect site-specific data at each mine to identify potential safety hazards or human health and environmental risks.
2. Perform high-level or relative risk scoring and ranking of mine hazards.
3. Improve the data quality and content of the DRUM Program and agency databases.
4. Exchange information with federal, tribal, and state governments.
5. Work together to leverage resources to address mines with priority safety hazards, as well as human health and environmental risks.

A primary DRUM Program goal is to provide sufficient information to partner agencies to help them make informed decisions about what, if any, actions to take to address physical hazards or human health and environmental risks from AUMs. Accomplishment of this goal facilitates AUMWG achieving its goals and objectives.

WORKING GROUP PLANS

The AUMWG Strategic Plan and the *Abandoned Uranium Mines Working Group Communications Strategy* (AUMWG 2019) (Communications Strategy) are critical to providing the group with strategic direction and useful for guiding executive-level decisions, allocating resources, evaluating progress, and collaborating with stakeholders.

AUMWG Strategic Plan

The AUMWG Strategic Plan is a collaborative effort among the partner agencies to develop a comprehensive multiagency strategy to address the potential human health, safety, and environmental risks posed by AUMs. It summarizes the scope of the problem; provides existing information on the cleanup costs; describes the authorities and roles involved in addressing the hazards associated with these mines; and proposes a coordinated strategy by the agencies, along with state and tribal partners, to address these mines.

Communications Strategy

Through the Communications Strategy, AUMWG representatives will deploy an assortment of partnership-building activities and engagement opportunities to increase collaboration with communities; local, state, and tribal governments; and stakeholders. AUMWG recognizes that, to successfully implement its strategy, strong strategic partnerships and meaningful engagements with stakeholders are required.

MAJOR ACCOMPLISHMENTS

The AUMWG members continued to network, partner, and collaborate on the DRUM Program and other AML activities as one team. Member agencies reconfirmed the AUMWG Strategic Plan and Communications Strategy and prepared an annual report to its stakeholders. In 2022, the AUMWG member agencies accomplished the following:

EPA

EPA continued its efforts to execute enforceable agreements with potentially responsible parties for mine and groundwater cleanup, implement the Tronox Inc. settlement, oversee trust settlements, and conduct fund-lead response actions, such as replacement of contaminated homes, as well as assessments of high-priority mines near homes. Groundwater and surface contamination from uranium mining remain the primary concerns of communities and stakeholders near AUMs.

Issues related to the COVID-19 pandemic hampered some EPA progress in 2022. The pandemic impacted the availability of contractors, access to sites, the ability to conduct public meetings, and the ability of facility and laboratory personnel to carry out certain activities required by federal environmental permits, regulations, and statutes. However, EPA made incremental progress, including the following:

- EPA continued to implement the Region 6 Grants (New Mexico) Mining District Five-Year Plan to address legacy mining and milling impacts in New Mexico. This plan is a partnership with federal agencies; state environmental, mining, and health agencies; and tribal governments. Region 6 also continued the development of the Grants Mining District Five-Year Plan through discussions with federal, state, and tribal partners.

Region 6 expects to publish the plan in 2023.

- EPA Region 6 continued oversight of Atlantic Richfield Company's implementation of the Remedial Investigation/Feasibility Study at the Jackpile-Paguate uranium mine on Laguna Pueblo land. The site was one of the world's largest open-pit uranium mines.

- EPA Region 6 continued the oversight of three former mine operators who are conducting the groundwater Remedial Investigation/Feasibility Study of the lower portion of San Mateo Creek. This work will identify the nature and extent of the contamination, assess the risk to human health and the environment, and analyze cleanup options.

- EPA Region 6 provided oversight to Homestake Mining Company's removal site evaluations (RSEs) for eight mines in the Ambrosia Lake region of New Mexico. The RSEs will define the nature and extent of the site contamination. Homestake Mining Company expects to complete the RSEs in 2023.

- EPA Region 8 began defining the scope of work in the Cottonwood Wash Area in Utah and worked closely with the Ute Mountain Ute Tribe for the watershed analysis of the area.

- EPA Region 8 coordinated with BLM's Utah State Office on Lisbon Valley work, which will be funded through the Tronox settlement. The goal is to assess and conduct cleanup projects at priority sites.

- EPA committed to establishing field offices in Flagstaff and Window Rock, Arizona, to support the cleanup of Navajo Nation AUMs, as well as to recruiting remedial project managers for the Flagstaff Field Office in 2022.

- EPA Region 9 and the Navajo Nation Environmental Protection Agency (NNEPA) created a Waste Disposal Options Work Group. The purpose of this workgroup, which also includes representatives from the Navajo Abandoned Mine Lands Reclamation Department (NAMLRD), is to discuss community policy and technical challenges associated with evaluating and identifying cleanup options in forthcoming Navajo AUM engineering evaluation/cost analyses (EE/CAs).

- EPA continued collaborating with the DRUM Program by sharing methods for conducting mine assessments, collecting technical data, addressing potential risks to human health posed by AUMs, coordinating assessment and cleanup activities, and supporting the development of DOE plans for work on tribal lands.

- The EPA Office of Mountains, Deserts and Plains worked with Regions 6 and 9 and BLM to explore and identify possible offsite disposal locations on federal land near Navajo Nation land.

- The Infrastructure Investment and Jobs Act (Public Law 117–58 [PL 117–58]) (IIJA) provided $3.5 billion to the Superfund program. It reinstated the excise tax on the sale of certain chemicals, which is being discussed with the U.S. Office of Management and Budget. There

is no state cost share for construction projects. The funding will be placed into three categories: clearing backlog, accelerating cleanup construction projects already underway, and beginning new cleanup projects in the next 2–5 years. EPA is working with regional offices and FLMAs to identify projects.

- ❖ EPA Region 8 made an unacceptability notice on CERCLA's Off-Site Rule for the White Mesa Mill site in Utah. This notice informs the facility that CERCLA wastes may not be sent to White Mesa Mill until they come into compliance. This will impact the Navajo Nation AUM waste disposal option at this facility. Region 8 informed the Utah Congressional delegation of the notice.

- ❖ The Executive Order (EO) 14017, *America's Supply Chains*, one-year critical minerals reports from seven different agencies on U.S. supply chains were announced on February 22, 2022. EPA created a cross-agency group to support EO 14017, which relates to critical minerals: the Critical Minerals Recovery Mining Dialogue. DOI is leading the interagency workgroup effort on domestic mining of critical minerals to streamline the National Environmental Policy Act (NEPA) process and reform the General Mining Law.

    - The Critical Minerals Recovery Subcommittee was formed under the Federal Mining Dialogue. U.S. Geological Survey (USGS) is leading this effort, and Tania Gallegos is the chair. USGS is compiling a database to assess mine sites for critical minerals.

- ❖ The U.S. Department of Justice and the Navajo Nation entered into the Phase 2 Expanded Trust Agreement (Trust Agreement). The scope of work under this Trust Agreement includes RSEs at 30 AUMs, two water studies, and 15 EE/CA and removal actions.

- ❖ EPA senior leadership met with White House tribal contacts on June 2, 2022. The agency requested an all-government task force to develop offsite disposal options for AUM wastes on federal lands surrounding the Navajo Nation and nearby communities. This task force would include the U.S. Department of Defense (DOD), DOE, EPA, the U.S. Nuclear Regulatory Commission (NRC), USDA, and DOI. The request includes a report to be submitted within 1 year to identify potential offsite waste disposal options for AUMs on the Navajo Nation and other AUMs on federal lands. The task force would develop a long-term waste management strategy for Navajo Nation AUM waste and AUM wastes from other surrounding areas.

    - EPA hosted a workshop on October 21, 2022, with federal partners, including DOI, USDA, DOE, NRC, and DOD as well as the Navajo Nation, Pueblo of Laguna, and Ute Mountain Ute tribes to discuss potential federal land AUM waste disposal options.

    - EPA Region 9 has continued to work closely with the NAMLRD and NNEPA to identify and develop cleanup options at AUMs. This has included evaluating the effectiveness of an evapotranspiration cap implemented by NAMLRD and

conducting treatability studies of technologies that could be used to reduce the volume of AUM waste.

- EPA Region 9 performed field investigations in the Cove Region aimed at filling data gaps to support forthcoming EE/CAs and created a proposal to add a large group of mine sites in the Cove Region to the National Priorities List (NPL) in fiscal year (FY) 2023. In spring 2023, EPA Region 9 will propose adding a group of mines in the Cove Region to the NPL. This area is referred to as the Lukachukai Mountains Mining District, and it comprises 88 sites and the associated watershed.

- EPA Region 9 conducted treatability studies at three Navajo Nation AUMs using ablation technology. This high-pressure water treatment is used to remove uranium and vanadium from mine waste and thereby reduce the volume of waste requiring disposal. The results of these treatability studies will be shared in a report in March 2023.

- EPA Region 9 hosted community meetings to present cleanup options for several Navajo Nation AUMs. These included the Quivira mine site and the Mariano Lake site in the Eastern Agency and the Charles Huskon 12 site in the Western Agency. The purpose of these meetings was to preview the cleanup options that were being considered and to solicit community feedback before EPA shares recommended cleanup options and conducts formal public meetings in 2023. The Navajo Nation requested this informal comment period so that they could provide feedback before EPA recommended cleanup options in the final EE/CA.

- Congressman Tom O'Halleran met with NNEPA Executive Director Valinda Shirley the week of August 22, 2022 and requested that the Navajo Nation develop a white paper to describe the challenges they have faced with waste disposal.

DOE

The DRUM Program's field season began March 14, 2022. Due to the pandemic, the field teams followed additional health and safety protocols to ensure continuation of work. To date, the DRUM team has conducted verification and validation (V&V) work at approximately 2100 mines on public land. Specifically, DOE accomplished the following:

- LM's director for site operations briefed the House Energy & Water Development Subcommittee majority on the DRUM Program. The subcommittee wanted to know more about the program and whether the funding for reclamation of abandoned mines in the IIJA was applicable to the program. In short, Section 40701(b) of the IIJA indicates funding is granted directly to states and tribes to address reclamation of AUMs. The funding is not available to the DRUM Program.

- LM's director for site operations addressed the Navajo Nation Council's Resources and Development Committee. The testimony focused on information related to LM's efforts to inventory and safeguard DRUM sites on the Navajo Nation. The testimony also included information on four Uranium Mill Tailings Radiation Control Act sites on the Navajo Nation: (1) the Shiprock, New Mexico, Disposal Site; (2) the Monument Valley, Arizona, Processing Site; (3) the Mexican Hat, Utah, Disposal Site; and (4) the Tuba City, Arizona, Disposal Site. It also included a progress update about the efforts to reach the targets and goals assigned to LM in the *Ten-Year Plan: Federal Actions to Address Impacts of Uranium Contamination on the Navajo Nation 2020–2029* (EPA 2021).

- The DRUM Program sent a request for continued assistance and participation to Chairman Norris of the Tohono O'odham Nation to inventory and sample an abandoned DRUM site on their land this coming field season. This formalized the ongoing collaboration and coordination with his Natural Resources Department, specifically his mineral resources administrator. There is one DRUM site on their land, the Linda Lee 2 mine, which was a small mine, producing only 8 tons of ore before it was abandoned in 1955.

- DRUM field teams began V&V work on NPS land after collaborating with NPS program managers and individual national parks on planning requirements for NEPA documentation, cultural resources management, and access. The field teams will continue work in the parks in 2023.

- DOE met with EPA Region 6 to discuss the Grants Mining District Five-Year Plan. Federal, state, and tribal agencies are partners to the plan, which addresses contamination caused by legacy uranium mining and milling operations in the mining district. The DRUM Program will contribute the resources to inventory and safeguard DRUM sites in that mining district.

- DOE established a new cooperative agreement with the NAMLRD to support V&V activity and safeguarding.

- DOE initiated discussions with several EPA regional offices regarding the next campaign to verify and validate AUMs on tribal lands. DOE developed specific campaign methodologies with tribal AML programs and EPA.The DRUM sites are primarily on Navajo Nation land (96%) and are unique when compared to mines on public land since tribal members may live on or near DRUM sites.

- DRUM field teams completed V&V activities of the three mines not currently funded under CERCLA on Pueblo of Laguna lands in August.

- DRUM field teams started work on Navajo Nation Land in the Northern AUM Region in October. DRUM field teams completed V&V activities on 13 AUMs on Navajo Nation land in the 2022 field season.

- LM travelled to Spokane, Washington, to assess two DRUM sites on the Spokane Indian Reservation not under CERCLA funding. The objective of the trip was to

assess resource needs for future DRUM field V&V activity. A letter of recommendation for No Further Action by the DRUM Program was sent to the Spokane Tribe of Indians chairwoman.

- DOE hosted members of the International Atomic Energy Agency (IAEA) Coordination Group for Uranium Legacy Sites (CGULS) in Grand Junction, Colorado, for the technical workshop on long-term management of remediated areas. The workshop included presentations given by IAEA; the Central Asian member states of Kyrgyzstan, Tajikistan, and Uzbekistan; the European Bank for Reconstruction and Development; and various LM programs. Field visits were held at the LM long-term surveillance and maintenance sites in Rifle and Grand Junction, Colorado, and Monticello, Utah. Uranium Leasing Program lease tracts and DRUM sites in Slick Rock, Colorado, were also visited. CGULS currently focuses on uranium legacy sites in the former Soviet Central Asian Republics of Tajikistan, Kyrgyzstan, and Uzbekistan to help those countries better understand what activities may be necessary at abandoned mine sites.
- In August, the DRUM Program reached the milestone of completing V&V work at its 2000th mine. The Bee Hive mine near Beaver, Utah, was the 2000th mine at which V&V work was completed.
- DOE sponsored and participated in the 2022 National Association of Abandoned Mine Land Programs conference in Grand Junction, Colorado, and presented on the status of the DRUM Program, project achievements, and planned future work.

DOE continued to form and revise necessary partnership agreements among the various federal and state entities to accomplish the V&V work and to safeguard physical safety hazards, such as hazardous mine openings, at AUMs. Most notably, DOE continued its cooperative agreement with Bat Conservation International, providing long-term access to the spectrum of contracting services needed to safeguard mines on public land, such as project development, environmental review (including NEPA documentation), and design and construction.

The DRUM Program is proceeding well. Table 1 shows the program's progress to date by state. Notably, the DRUM Program has preliminarily investigated over 4200 acres of public land containing AUMs.

Table 1. Progress of the DRUM Program by State

State	Estimated Number of DRUM Sites[a]	Current DRUM Site Estimate	Field V&V Operations Completed (12/31/2022)	Field V&V Operations Remaining
Alaska	1	1	0	0
Arizona	413	363	13	197
California	26	24	0	22
Colorado	1539	1251	966	235
Florida	1	1	0	0
Idaho	7	6	0	6
Missouri	0	1	0	0
Montana	19	21	11	9
Nevada	24	22	0	22
New Jersey	1	1	0	1
New Mexico	247	227	62	120
New York	0	2	0	0
North Dakota	14	12	2	10
Oklahoma	2	2	0	2
Oregon	4	3	0	1
Pennsylvania	1	1	0	1
South Dakota	155	138	96	32
Texas	29	29	0	27
Utah	1380	1089	929	75
Washington	17	15	0	14
Wyoming	319	261	43	202
Unknown	26	2	0	0
Totals	4225	3472	2122	976

[a] This represents the estimated number of DRUM mines per state presented in the 2014 Report to Congress.

The DRUM Program assisted FLMAs in safeguarding the immediate hazards posed by physical mine features. This was accomplished while honoring historical, cultural, and ecological values at individual mine sites. These hazards are primarily unprotected open mine entries and subsidence features. Table 2 describes the safeguarding projects

performed this past year and their associated closure costs.

Table 2. 2022 Safeguarding Projects

State	Project Area	Features Safeguarded	Cooperating Land Management Agency	Total Cost ($)	Cost Per Feature ($)
Colorado	Colorado DRMS				
	Carpenter Ridge/Flats	27	BLM Uncompahgre Field Office	$136,890	$5,070
	Jamestown	2	Private	$10,000	$5,000
	Sullivan's Travels	3	USFS Arapaho and Roosevelt National Forests	$15,400	$5,134
Utah	Utah AMRP				
	Kane Creek	80	BLM Moab Field Office	$540,839	$5,898
	Yellow Cat Maintenance	24	BLM Moab Field Office	$38,700	$1,300
Montana	BLM Montana/Dakotas				
	Pryor Mountains	4	BLM Billings Field Office	$3,000	$750
Total		**140**		**$744,829**	

Abbreviations:
AMRP = Abandoned Mine Reclamation Program
DRMS = Division of Reclamation, Mining, and Safety

FLMAs

BIA

As a trustee for tribal mine sites, BIA continued to participate in community outreach efforts, ensuring that tribes are informed and consulted, both formally and informally. BIA monitored the ongoing work at tribal sites and provided long-term monitoring of institutional controls and completed remedies.

BIA also prepared the supporting NEPA documentation for the safeguarding of the Haystack 2 mine on Navajo Nation land. This safeguarding project has since been postponed by Navajo Nation EPA

BLM

BLM continued its inventory, assessment, and cleanup of AUMs on BLM-managed lands. BLM made progress, despite the constraints caused by available funding and the ongoing pandemic. BLM leveraged program funding for contracts and existing agreements with state agencies to continue its response actions at AUMs under its purview. BLM is partnering with DOE so both agencies can leverage resources to collectively perform DRUM Program inventory work and safety closures on BLM-

managed land.

- BLM collaborated with DOE to facilitate numerous V&V operations in Colorado and Utah.

- BLM began working with DOE to review and comment on numerous draft Field Operations Plans (FOPs) for V&V efforts scheduled to start in 2023, including V&V work at the remaining DRUM sites in Arizona, California, Nevada, New Mexico, and Wyoming.

- BLM coordinated with DOE; the Colorado Division of Reclamation, Mining, and Safety; and Utah's Abandoned Mine Reclamation Program on AUM safeguarding projects in Colorado and Utah (see Table 2).

- BLM's Colorado State Office continued inventorying non-DOE, non-Freeport-McMoRan Inc. AUMs and, to date, inventoried over 1400 sites on BLM-managed land throughout western Colorado. Mine features deemed to be of extremely high physical safety risk were signed, fenced, or both.

- BLM's Utah State Office worked with the BLM National Operations Center and its support contractor to review DRUM V&V reports and risk roll-up reports.

- BLM's Utah State Office worked with EPA Region 8 on time-critical removal actions in the Lisbon Valley region. These removals are part of the Tronox settlement. BLM accomplished all field reconnaissance work in May 2021. BLM is conducting document review and establishing a memorandum of understanding.

- BLM's Montana/Dakotas State Office posted warning signs at several Pryor Mountains DRUM sites. Polyurethane foam was used to close a subsidence feature identified by the DRUM Program.

USFS

USFS continued its assessment and cleanup of AUMs, commensurate with annual funding and relative project prioritization. Additional funding would permit USFS to conduct a complete AUM inventory and evaluate these sites for their potential environmental impacts. Despite funding constraints and the ongoing pandemic, USFS made incremental progress, including the following:

- USFS partnered with EPA regions, as well as states and DOE, to leverage agency resources and collectively address AUMs on National Forest System land.

- USFS has new AML program manager after the position was vacant for many years. The new program manager is rebuilding the AML group.

- USFS facilitated concurrence with the supervisor for the Manti-La Sal National Forest to execute safeguarding projects in the future.

- ❖ USFS began planning for DRUM safety closures in Arapaho-Roosevelt National Forests and Pike-San Isabel National Forests.

- ❖ USFS continued assessing and cleaning up other AUMs on National Forest System land. USFS awarded the contract and started construction for remediation and removal-in-place for the Bluff B mine near Riley Pass, South Dakota.

- ❖ The Riley Pass, South Dakota, work is in progress and on schedule. The on-scene coordinator collaborated with DOE to determine V&V needs for sites.

NPS

NPS continued to investigate the nature and extent of contamination at the Orphan mine site in Grand Canyon National Park using its CERCLA authority. NPS intends to identify a recommended cleanup action for the upper mine area in the near term and address the lower mine area in the future, as they are generally inaccessible to park visitors due to fencing and signage (in the upper mine area) and offtrail remoteness (in the lower mine area).

- ❖ NPS entered into an interagency agreement with DOE to facilitate inventory, environmental, and safeguarding activities at DRUM sites. The agreement reflects the natural resource stewardship approach of NPS based on the bureau's guiding statutes.

- ❖ NPS is working with all FOP-specified parks with mines on NPS land ground truthing DOE proposed access routes, revising environmental restrictions, updating points of contact for each park, confirming mine additions and location changes provided by DOE, and starting the site assessment and compliance process in preparation for DRUM field activities in 2023.

DOI Office of Environmental Policy and Compliance

- ❖ DOI established the Abandoned Hardrock Mine Reclamation (AHMR) program as required under Section 40704 of the IIJA. The IIJA authorized $3 billion to fund the AHMR program but did not appropriate the funding. DOI received $5 million in FY 2022 appropriations to initiate program activities, which will include a federal program (DOI and USFS) and a grant program for states and tribes.

- ❖ Through an interagency agreement, USGS began developing a comprehensive AML database using the USMIN Mineral Deposit Database as a starting point. This effort is being coordinated with DOE's DRUM Program, EPA, the Interstate Mining Compact Commission, the National Association of Abandoned Mine Land Programs, and others. DOI is working closely with states and tribes to structure a grant program similar to that developed for orphaned wells (see below).

- Under IIJA Section 40601, DOI received $4.677 billion to establish an Orphaned Well Site Plugging, Remediation, and Restoration Program to address orphaned wells on federal, state, and tribal lands. The program distributed $560 million in initial state grants and $33 million to federal agencies in DOI and USDA, in addition to releasing Tribal Grant Guidance following listening sessions and tribal consultation.

BENEFIT POTENTIAL

Several benefits can be achieved when AUMWG and its partner agencies collectively address the hazards posed by AUMs. With effective partnerships and collaboration, the cleanup and restoration of an AUM can provide significant economic, public health, and environmental benefits.

Background

Uranium mining has a long history in the United States. After the Atomic Energy Act of 1946 (42 USC 2011 et seq.), AEC facilitated a mining boom, offering incentives and guaranteed prices as the sole purchaser of uranium. Uranium mines initially opened in the states of Utah, Colorado, New Mexico, and Arizona and then rapidly spread to other states. When mining ventures were no longer economically viable, prospectors abandoned their mines without being subject to the closure and cleanup requirements of present-day regulation. Most abandoned mines have no responsible or solvent party to perform the safeguarding or reclamation, so the federal government, including the AUMWG agencies, has undertaken the extensive effort to assess and clean up the mines. There are still many abandoned mines that may pose significant safety hazards.

Nearly 11% of AUMs are on tribal lands, and the vast majority of these are on Navajo Nation land. Because the radiological risks are not visually evident, mine waste material was used in the construction of some homes, and some homes were built directly on top of mine waste.

Benefits

As part of its commitment to finding effective solutions to address the potential threats that abandoned mines pose to human health, safety, and the environment, AUMWG is focusing significant attention on the potential future uses of these lands and on the economic, environmental, and social impact of reuse on the neighboring communities.
AUMWG is critical to achieving these benefits, which include:

- Reclaiming and reusing thousands of acres of formerly contaminated land.
- Safeguarding historic mining areas for recreational visitation and tourism.
- Providing neighboring communities with new opportunities to grow and prosper.
- Creating, preserving, and restoring land for recreational and ecological purposes.
- Creating and enhancing wildlife habitats.
- Restoring the connection between local communities and the impacted area.
- Maintaining the protective use of the land.
- Sustaining the environment for future generations.

CONCLUSION

AUMWG successfully fostered dialogue among partner agencies, enabled community and stakeholder engagement, and collaborated to address the human health, safety, and environmental challenges posed by AUMs. By orchestrating the resources and efforts of multiple federal agencies, the working group helped states and tribes identify and address high-priority mines in an effective and coordinated manner. Acting as one team was essential to the group's overall success.

Notably, the work on the DRUM Program is 89% complete for AUMs on public land. Based on the preliminary analysis of data collected from ongoing mine evaluations, concerns regarding physical hazards continue, since they are an immediate threat to humans and wildlife. These hazards mostly consist of unprotected open mine entries, subsidence features, dangerous highwalls, and large unstable structures associated with historic mining operations.

To date, the DRUM Program has found most mines to be potential candidates for no additional action by FLMAs. Since many sites on public land may not need additional action, the federal government could realize over $380 million in cost avoidance as compared to the estimates made in the Report to Congress. However, this trend may not continue for the remaining mines because of factors, such as geological formations, mining methods, and land-use risk scenarios.

The AUMWG partners continued to fulfill their imperative responsibility to protect human health and the environment. Their efforts focused on assessments and response actions, enforcement of responsible party agreements and settlements, and community outreach. The team made great progress, but more is needed.

Finally, as part of its commitment to finding effective solutions to address the potential threats that AUMs pose to human health, safety, and the environment, AUMWG paid significant attention to the potential future uses of these lands and to the economic, environmental, and social impact of reuse on the neighboring communities. This attention is important for sustaining the environment for future generations.

REFERENCES

4 Stat. 564. "Appointment of a Commissioner of Indian Affairs," *Statutes at Large*, July 9, 1832.

25 USC 1. "Commissioner of Indian Affairs and Agreement Between the Secretary and the Tribal Government," *United States Code*.

30 USC 1201 et seq. "Surface Mining Control and Reclamation Act," *United States Code*.

42 USC 9601 et seq. "Comprehensive Environmental Response, Compensation, and Liability Act," *United States Code*.

AUMWG (Abandoned Uranium Mines Working Group), 2019. *Abandoned Uranium Mines Working Group Communications Strategy*, December 6.

AUMWG (Abandoned Uranium Mines Working Group), 2020. *Abandoned Uranium Mines Working Group Addressing Health and Safety Risks of Abandoned Uranium Mines Multiagency Strategic Plan*, December 3.

DOE (U.S. Department of Energy), 2014. *Defense-Related Uranium Mines Report to* Congress, U.S. Department of Energy, August.

EO (Executive Order) 14017. *America's Supply Chains*, February 24, 2021.

EPA (U.S. Environmental Protection Agency), 2021. *Ten-Year Plan: Federal Actions to Address Impacts of Uranium Contamination on the Navajo Nation 2020–2029*.

PL 64–235. "National Park Service Organic Act," Public Law.

PL 84–167. "Surface Resources Act," Public Law.

PL 94–579. "Federal Land Policy and Management Act," Public Law.

PL 94–588. "National Forest Management Act," Public Law.

PL 99–499. "Superfund Amendments and Reauthorization Act," Public Law.

PL 117–58. "Infrastructure Investment and Jobs Act," Public Law.

APPENDIXES

APPENDIX A
Abbreviations List

AEC	U.S. Atomic Energy Commission
AHMR	Abandoned Hardrock Mine Reclamation
AML	abandoned mine lands
AUM	abandoned uranium mine
AUMWG	Abandoned Uranium Mines Working Group
BIA	U.S. Bureau of Indian Affairs
BLM	U.S. Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CGULS	Coordination Group for Uranium Legacy Sites
COVID-19	coronavirus disease 2019
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DRUM	Defense-Related Uranium Mines
EE/CA	engineering evaluation/cost analysis
EPA	U.S. Environmental Protection Agency
FLMA	federal land management agency
FLPMA	Federal Land Policy and Management Act
FOP	Field Operations Plan
FY	fiscal year
IAEA	International Atomic Energy Agency
IIJA	Infrastructure Investment and Jobs Act
LM	Office of Legacy Management
NAMLRD	Navajo Abandoned Mine Lands Reclamation Department
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NNEPA	Navajo Nation Environmental Protection Agency
NPL	National Priorities List
NPS	National Park Service
NRC	U.S. Nuclear Regulatory Commission
PL	Public Law
RSE	removal site evaluation
SARA	Superfund Amendments and Reauthorization Act

SMCRA	Surface Mining Control and Reclamation Act
Stat.	*Statutes at Large*
USC	*United States Code*
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
V&V	verification and validation

APPENDIX B

Agency Authorities

This appendix documents the statutes that provide authority to the Abandoned Uranium Mines Working Group partner agencies. It defines the extent of powers and responsibilities held by the agencies that must be consistent with constitutional constraints and legislative intent.

Atomic Energy Act

Title 42 *United States Code* Section 2011 et seq. (42 USC 2011 et seq.) (1954)

This federal law covers the development, regulation, and disposal of nuclear materials and facilities in the United States. It was an amendment to the Atomic Energy Act of 1946 and substantially refined certain aspects of the law; these changes included increasing support for the possibility of a civilian nuclear industry. Notably, it made it possible for the government to allow private companies to gain technical information (Restricted Data) about nuclear energy production and the production of fissile materials, allowing for a greater exchange of information with foreign nations as part of President Dwight D. Eisenhower's Atoms for Peace program. It reversed certain provisions in the 1946 law, which had made it impossible to patent processes for generating nuclear energy or fissile materials.

U.S. Bureau of Indian Affairs (BIA)

25 USC 1 et seq. (1969)

Congress gave BIA statutory authority by the act of July 9, 1832, Volume 4 *Statutes at Large* page 564 (4 Stat. 564). In 1849, BIA was transferred to the newly created U.S. Department of the Interior (DOI). DOI adopted the agency's name on Sept. 17, 1947. BIA carries out its core mission to serve 574 federally recognized tribes through four offices. The Office of Indian Services operates BIA's general assistance, disaster relief, child welfare, tribal government, Indian Self-Determination, and Indian Reservation Roads programs. The Office of Justice Services directly operates or funds law enforcement, tribal courts, and detention facilities on federal tribal lands. The Office of Trust Services works with tribes and individual American Indians and Alaska Natives in the management of their trust lands, assets, and resources. Finally, the Office of Field Operations oversees 12 regional offices and 83 agencies, which carry out the mission of the bureau at the tribal level.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

42 USC 9601 et seq. (1980)

The act provides a federal "Superfund" to clean up uncontrolled or abandoned hazardous waste sites as well as accidents, spills, and the release or threatened release of pollutants and contaminants into the environment. Through CERCLA, the U.S. Environmental Protections Agency (EPA) was also given authority to require parties responsible for

contamination to either perform cleanups or reimburse the government for EPA-led cleanup work.

While other federal agencies have authority to clean up federal land, EPA is the lead agency for cleanups on private and mixed-ownership sites.

EPA cleans up orphan sites when potentially responsible parties cannot be identified or located or when they fail to act. Through various enforcement tools, EPA obtains private party cleanup through orders, consent decrees, and other settlements. EPA also recovers costs from financially viable individuals and companies upon response action completion.

EPA is authorized to implement the act in all 50 states and U.S. territories. EPA may undertake Superfund site identification, monitoring, and response activities in coordination with state and tribal environmental protection or waste management agencies.

The Superfund Amendments and Reauthorization Act (SARA) of 1986 (Public Law 99–499 [PL 99–499]) reauthorized CERCLA to continue cleanup activities around the country. Lawmakers added several site-specific amendments, definition clarifications, and technical requirements to the legislation, including additional enforcement authorities. Also, Title III of SARA authorized the Emergency Planning and Community Right-to-Know Act.

Under CERCLA, the secretary of the interior has the authority to address the release or threatened release of hazardous substances, pollutants, and contaminants on or from land under DOI's jurisdiction, custody, or control. The secretary has delegated this authority to the bureau directors. In addition, under CERCLA, DOI is designated as a trustee for natural resources and must act as such on behalf of the public.

Federal Land Policy and Management Act (FLPMA)

PL 94–579 (1976)

This federal law governs the way in which the public land is administered by the U.S. Forest Service (USFS), the U.S. Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (USFWS), and the National Park Service (NPS). The act phased out homesteading in the United States by repealing the preexisting homestead acts. Congress recognized the value of the public land, declaring that these lands would remain in public ownership. USFS, USFWS, NPS, and, BLM are commissioned in FLPMA to allow a variety of uses on their land while simultaneously trying to preserve the natural resources within it. This concept is best summarized by the term "multiple use."

The term "multiple use" is defined in the act as "management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people."

The act addresses topics like land-use planning, land acquisition, fees and payments, administration of federal land, range management, and rights-of-way on federal land. The law specifies objectives and time frames in which to accomplish them, which contributes

to its authority and eliminates the uncertainty surrounding BLM's role in wilderness designation and management.

National Forest Management Act (NFMA)

PL 94–588 (1976)

This federal law is the primary statute governing the administration of national forests and was an amendment to the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on National Forest System land.

The main objectives of the NFMA are to require USFS to develop plans for national forests, set standards for timber sales, and create policies to regulate timber harvesting. The purpose of these objectives is to protect national forests from permanent damage from excessive logging and clear cutting. Congress requires USFS, in conjunction with other appropriate agencies, to thoroughly assess, research, and plan for the nation's renewable resource use, including the current demand, anticipated demands, and environmental and economic impacts.

USFS's Abandoned Mine Lands program uses this act to restore the land disturbed by historic mining activities. There are approximately 40,000 abandoned mine sites on National Forest System lands. Of those, 34% were mines with records of mineral production.

National Park Service Organic Act

PL 64–235 (1916)

This federal law established NPS, an agency of DOI. NPS, as established by the act, promotes and regulates the use of the federal areas known as national parks, monuments, and reservations in order to conserve the scenery, the natural and historic objects, and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

Surface Mining Control and Reclamation Act (SMCRA)

30 USC 1201 et seq. (1977)

This act provides for cooperation between the secretary of the interior and the states with respect to the regulation of surface coal-mining operations, the acquisition and reclamation of abandoned mines, and other purposes.

SMCRA created two programs: one for regulating active coal mines and a second for reclaiming abandoned mine lands. SMCRA also created the Office of Surface Mining Reclamation and Enforcement, an agency within DOI, to promulgate regulations, fund state regulatory and reclamation efforts, and ensure consistency among state regulatory programs.

The regulation of active mines under SMCRA has five major components:

- **Standards of performance.** SMCRA and its implementing regulations set environmental standards that mines must follow while operating and that must be achieved when reclaiming mined land.
- **Permitting.** SMCRA requires that companies obtain permits before conducting surface mining. Permit applications must describe what the premining environmental conditions and land use are, what the proposed mining and reclamation will be, how the mine will meet the SMCRA performance standards, and how the land will be used after reclamation is complete. This information is intended to help the government determine whether to allow the mining and set requirements in the permit that will protect the environment.
- **Bonding.** SMCRA requires that mining companies post a bond sufficient to cover the cost of reclaiming the site. This is meant to ensure that the mining site will be reclaimed even if the company goes out of business or fails to clean up the land for some other reason. The bond is not released until the mining site has been fully reclaimed and the government has found that the reclamation was successful.
- **Inspection and enforcement.** SMCRA gives government regulators the authority to inspect mining operations and to punish companies that violate SMCRA or an equivalent state statute. Inspectors can issue notices of violation, which require operators to correct problems within a certain amount of time, levy fines, or order that mining cease.
- **Land restrictions.** SMCRA prohibits surface mining altogether on certain lands, such as national parks and wilderness areas. It also allows citizens to challenge proposed surface mining operations on the grounds that they will cause too much environmental harm.

Surface Resources Act

PL 84–167 (1955), 30 USC 611 et seq.

This act allows BLM to address abandoned mine openings on active mining claims staked after 1955 as long as the proposed closure work does not endanger or materially interfere with actual, established prospecting, mining, or processing operations or reasonably incidental uses. Therefore, BLM is authorized to take the necessary steps to protect public safety and prevent further unnecessary and undue degradation caused by abandoned mines.