

Recommendations for State Action

New Mexico has approximately 1100 uranium mines and mine sites, many of which have had no remediation actions taken. These features pose environmental problems, but remediation offers economic opportunities. This report has documented the potential economic benefits of remediation of mines, based on estimates and invoices of uranium mine cleanup activities regionally (Section 3). We then discussed developing the skills and talent to tackle remediation activities in New Mexico and documented the qualifications needed to work specifically with radioactive and hazardous waste. We drew on our interviews with businesses that operate nationally, regionally, and locally to illustrate the nature of the environmental remediation industry and how to best match workers with opportunities (Section 4). Drawing on interviews with State and federal officials, representatives of Native government agencies, community members, industry professionals, legal groups, advocates and non-profit organizations, and educators and institutions involved in all levels of workforce training and research, we discussed challenges that the state faces in cleaning up the uranium sites. In particular, we considered the challenges New Mexico businesses and workers faced in sharing in the opportunities that cleanup efforts represent.

In all, the findings of this report are based on more than 75 in-depth interviews, cost-estimate and invoice data from government agencies conducting uranium mine cleanups, geographic, geologic, and historical information about the nature and scope of uranium mining in New Mexico.

The following are recommendations to New Mexico State agencies to systematically address the challenges laid out in the previous section. Addressing these challenges will require the involvement of *all* stakeholders: federal, State and local governments, Native nations, private landowners, private sector firms, educational institutions, and community organizations; however, the recommendations here are designed for State action, as the State of New Mexico sponsored this research project. Recommendations are presented not necessarily in order of priority but as a logically structured program to promote the cleanup of uranium sites.

The twelve recommendations are in four categories, each directly tied to the constraints described in the previous chapter:

- Overall Planning
- Challenges faced by state businesses
- Challenges faced by the state's workforce,
- Development of future opportunities

6.1. Overall Planning

6.1.1. Create a Central Repository for Information

The state needs to create a clearinghouse for all documentation related to uranium mining, employment, remediation, ownership, and land status. BBER pulled information from documents housed in federal, state, native government, academic, nonprofit, and business sources. Each of these institutions holds different pieces of a larger puzzle. However, without a better view of the larger picture, it is not easy to see what needs to be done collaboratively and comprehensively to address the more significant problem of working toward uranium mine remediation.

The New Mexico State Library could be a resource for housing this information; however, someone would need to continually catalog and update information as identifying and cleaning up these sites is an evolving event. The EPA is continually doing site evaluations and working on remediation litigation to address these long-contaminated sites. BBER would be happy to share the documentation we have cataloged during this research process; however, more needs to be done.

6.1.2. Identify and Engage Key Stakeholders

Unremediated uranium sites are found on state lands, private lands, federal lands, and Native lands across New Mexico. All of these different stakeholders have addressed remediation in some ways, but not all have been brought to the table to discuss how to work together.

Bringing the stakeholders together is essential to addressing remediation as environmental pollution does not respect political boundaries. Many uranium sites may be between two jurisdictions or may involve the waste from two different corporations; collaboration is required to facilitate cleanup efforts. Further, remediation in one jurisdiction will likely impact others at minimum due to transportation and an influx of workers and activity. To best ensure all impacted groups are being considered, a critical step is identifying who will be affected by remediation work.

Identifying key stakeholders is not a simple task. As more information about the mines is uncovered, more stakeholders may need to be brought to the table. Thus, this action needs to be ongoing and flexible, and the unified plan discussed in the next recommendation needs to adapt accordingly.

6.1.3. Develop a Unified Plan with Stakeholders

The state's first priority should be communication and collaboration among the various entities and stakeholders in this work. The Navajo Nation has its own remediation plans and has acted to address many of its abandoned uranium mines. The affected Pueblos have addressed and continue to address some of their remediation concerns. State and federal agencies are also working to attend to contamination concerns. Each of these stakeholders has taken steps to generate funding for remediation through lawsuits and other types of accountability endeavors. All of this could be done more efficiently with enhanced communication and collaboration, drawing upon cultural and historical values that underpin stakeholders' relationships to the land and how remediation can be best addressed moving forward. Some steps toward generating a unified plan are explicitly addressed in subsequent recommendations; however, much needs to be done to ensure that all affected voices have a seat at the table during its development.

Although more attention is now being given to the many issues related to uranium mines in New Mexico, there is still no single State plan to address these issues. Community organizations have repeatedly called for a Legislative effort to address the problems, akin to agencies and actions created within the Navajo Nation and at the federal level. Given the scale and complexity of the issue – overlapping Federal, Native, State, and local jurisdictions; the geographical patchwork of the mines, millings, transportation routes, and the flow of groundwater – establishment of a venue for relevant stakeholders to forge a unified strategy is a necessary first step to coordinated State action.

When the State develops a unified plan with all relevant stakeholders, it should include funding and strategies to acquire future funding. This plan then needs to be widely publicized and continually managed to maximize the opportunities we describe in the following sections.

6.2. Challenges Faced by State Businesses

6.2.1. Establish a Specialized Small Business Assistance Center

Identifying opportunities and successful application for subcontracts are barriers for local companies hoping to work in environmental remediation. Small businesses lack the necessary administrative scale and specialization to compete with larger, often out-of-state businesses. To support local businesses, the State of New Mexico should establish a small business assistance center specializing in the unique challenges of environmental remediation and particularly uranium

mine remediation. The center should be located in the northwestern quadrant of the state, close to impacted communities.

The business assistance center should be staffed by personnel trained in business licensing, environmental regulation, and subcontracting paperwork, especially under federal agencies. The center would maintain an up-to-date listing of contracting opportunities in environmental remediation and assist in navigating the paperwork and certification processes both before and in managing federal contracts. Our interviews illustrated the need for both upfront support in securing a contract and continued assistance in managing the documentation needed to maintain the contract. These services could be free of charge until a business successfully secures a subcontract; after that time, a business could pay fees for project management documentation to help the center become self-supporting over time. The center may also host workshops conducted by federal agencies and contractors.

This type of work could be done within the Economic Development Department, the Energy, Minerals, and Natural Resources Department, or the Environment Department, but should be consistent and available to New Mexico businesses seeking to apply for environmental remediation subcontracts. Wherever the position is stationed, the person or persons must be trained in the specific types of work and certifications required for uranium mine remediation efforts.

6.2.2. Create Shared Workspace for Businesses

As discussed in the report's constraints section, networking and coordination become critical skills for small businesses to develop. To facilitate relationships between smaller New Mexico businesses and larger businesses looking to subcontract remediation work and between the smaller businesses themselves, the state should consider creating co-work spaces in northwestern New Mexico for businesses to utilize when doing environmental remediation work. These spaces could be used not only to host networking events in which businesses may set up tables and discuss their specializations, but also a place for companies to better meet one another and do business. This work could be done in conjunction with the establishment of a small business assistance center or separately.

Workspaces would be set up in key locations throughout the state with inadequate access to internet services, phone services, and meeting space. This could look like a "one-stop-shop" for local and national businesses to rent cubicles, meeting rooms, and access information about remediation work. These spaces would need dedicated phone, internet, and workspace access in addition to a staff member who manages the space.

These spaces could also serve as a repository for contact information, both for businesses able to do remediation work in New Mexico and individuals with certifications and skill sets appropriate for the industry. They would provide centralized locations for notification of upcoming RFPs and potential subcontracting opportunities.

It may be beneficial for the state to investigate commercial properties in a few target areas in northwestern New Mexico to see what the availability of adequate space may look like. Should sufficient space be unavailable, commercial services deliver rentable, portable workspaces for various terms and costs.

6.2.3. Create a Facility to Provide Support or Guarantee for Bonding

Some of the biggest barriers for small companies involved and bidding on uranium mine cleanup are bonding and capital requirements.

There are several types of Surety Bonds for contractors: Bid Bonds, Performance Bonds, Payment Bonds, License Bonds and Supply Bonds are a few. In general, surety bonds assure a project owner that they can rely on contractor performance, ability to make payments to certain other parties (sub-contractors, e.g.), good faith bid submissions, and so on. The issuer

of sureties, usually an insurance company subsidiary, investigates a contractor's abilities and, in the event of a valid claim, will make reimbursement for non-performance according to the terms of the surety.

New Mexico could support meeting those requirements by establishing a funding mechanism to be the bond agent for small companies. The SBA has a model that could be adopted by the state. While the SBA Surety Bond program for small companies has some limitations, such as no environmental work, multi-year contracts, and excessive warranty and liquidated damages provisions, the basic concepts warrant consideration by the state to establish a program specifically for small businesses seeking to enter the uranium mine cleanup domain.

Three SBA programs could be considered for emulation regarding uranium mine cleanup:

- Prior Approval Program
- Preferred Surety Bond Program
- Quick Bond Program

The Prior Approval and Preferred Surety Bond Programs offer an 80% guarantee on contracts up to \$6.5 million and up to \$10 million on federal projects (with a federal contracting officer's certification). The Quick Bond Program is designed for smaller contracts, up to \$400,000, and offers an 80-90% guarantee rate, depending on the size of the contract. A benefit of the SBA bond guaranty program is the minimum working capital requirement. The SBA will go to 20 times working capital of the total (bonded and unbonded) costs to complete work on hand. This is aggressive; the standard industry caps at 10 times. Additionally, the SBA will also count unused credit lines toward working capital.

This sort of program coupled with support services for small companies to help with all the ancillary but crucial mechanisms to be effective in bidding on uranium mine remediation projects, e.g., accounting services, contract review services, marketing support services, etc. could go a long way toward helping small local firms enter the market and could potentially attract large cleanup firms to consider partnering with smaller New Mexico businesses that are seeking entry in this arena.

One potential mechanism is for the state to create a fund – created by state law and funded initially under state law but then established with state funding and administrative support for assisting smaller New Mexico companies entering the uranium mine cleanup arena. The state has established such an entity for assisting companies and workers regarding Workers Compensation issues – NM Mutual – which helps companies, workers, and agents.

6.3. Challenges Faced by the State's Workforce

6.3.1. Advance Consistent Safety Certification Training Programs

We recommend that the State consider coordinating remediation-related Occupational Safety and Health Administration (OSHA) training programs so that New Mexico workers and students entering uranium mine remediation work would be more easily able to access this coursework that is necessary to work in this field. At the time of this writing, few OSHA programs related to uranium mine cleanup are being held across the state. In our conversations with different educational institutions, we found that it was cost-prohibitive for those institutions to shoulder the burden of the OSHA trainings along with the subsequent testing. Additionally, training students by institution results in small, expensive classes with a lack of adequate records as to which professionals hold the training credentials state-wide, thereby further distancing those professionals from opportunities that may arise outside of the institutional network.

To streamline the training process, we recommend the State look to agencies well-positioned to provide the OSHA courses, such as the Bureau of Mine Safety, which already provides Mine Safety and Health Administration (MSHA)

trainings across New Mexico. In conversations with the Bureau of Mine Safety, they felt that providing OSHA trainings was analogous to providing MSHA trainings and would not require massive repositioning of their agency. In this way, an OSHA training model that looks like the MSHA training would not require creating a new institution, but instead a reorientation and expansion of existing resources. Additionally, the State is better positioned than individual institutions to offer OSHA trainings at critical junctures as the timeline for remediation activities is unclear. State-led actions cannot fully overcome the timeline constraint, but the State can be more directly involved with federal and corporate cleanup initiatives, thereby structuring training opportunities to benefit the most workers simultaneously.

Finally, some of the institutions in New Mexico currently offering limited OSHA trainings argued that a state-led initiative would benefit their programs immensely, and they could better focus on workforce development. BBER suggests that the State consider how to potentially fund these programs through existing channels to minimize costs and maximize benefits to students and workers across New Mexico.

6.3.2. Facilitate Collaboration among Higher Education Institutions

Although many of our higher education institutions are training engineers, health physicists, geologists, and other professionals that are essential for addressing uranium mine cleanup efforts, there is little evidence that these programs are coordinating with one another, nor is there evidence they are coordinating with state agencies on a large scale. This can be remedied, in part, with intervention by state initiatives to incentivize or encourage collaboration among relevant institutions and departments. This could be as simple as holding annual conferences on the topic of uranium mine remediation and developing sessions designed to bring New Mexico's professionals together in a common setting to discuss research and development of ideas.

Collaboration would help ensure the research being done at the educational institutions across the state is being shared and that institutional overlap is minimized. Additionally, research and innovation need to be shared with state agencies working on cleanup efforts and other educational institutions. With state-led collaborative sessions or conferences, students and professors would be able to discuss their research with state professionals. Then, our educational institutions could begin to partner on educational strategies, promote one another's work, build skills and innovation into the professional degrees most needed for uranium mine remediation, and share new ideas with the State. We discuss specific ideas related to this proposed collaboration in sections 6.4.2. and 6.4.3., with our recommendations on facilitating innovation and continuing research into topics related to uranium mine remediation.

6.3.3. Create Opportunities for Worker Placement Locally

Whether talking about skilled professionals or those with an advanced degree, more networking opportunities need to be made to connect those workers with employment opportunities. Most of the businesses we interviewed, from small, local businesses to major corporations, talked about the need for matching workers to opportunities. Worker placement should also be prioritized in the state agencies concerned with cleanup efforts. There is no current skills/certifications directory to help companies find workers, as we discussed in 6.2.3., nor are there job fairs that focus specifically on environmental remediation. Many of the professors we spoke with at different educational institutions described a lack of communication about opportunities unless that specific professor had ties directly to state agencies or corporations. As a result, many trained students left the state in search of appropriate work elsewhere.

One example of a growing worker placement initiative is STEM Boomerang⁷¹. We spoke with representatives of this organization, which does not, at this time, focus on engineering or environmental remediation. However, their work should be seen as a model for an effective worker placement program. STEM Boomerang's mission is to "establish connections between Science, Technology, Engineering, and Math (STEM) professionals and the companies and colleges

⁷¹ <https://stemboomerang.org/>

that want to hire them.” They are funded through community partnerships with organizations across New Mexico. In addition to hosting job fair events, they also maintain a database of employment opportunities for job seekers and a database of resumes for employers to search. The state could build on this model when considering how to match local professionals with local businesses and reduce the “brain drain” we see as students leave New Mexico for other opportunities.

6.4. Development of Future Opportunities

6.4.1. Prioritize Environmental Remediation as a Target Industry

This report has focused on the remediation of uranium mines; however, there is a consensus that environmental remediation, in general, is an emerging growth industry for the 21st century. New Mexico’s prioritization of this industry can be leveraged to create success in other remediation opportunities.

From a New Mexico economic development perspective, given the significant levels of expertise in this state concerning nuclear materials, mining, engineering, health, and legal and legislative matters, developing a model for how to bring all these resources together to address the various issues surrounding uranium mine cleanup could represent not only immediate benefit to residents and businesses in New Mexico but could also parlay this model into a significant new business sector. As we continue to see fluctuations in the extractive energy economy’s stability, it is essential to diversify our economic development priorities. In those regions, such as northwestern New Mexico, most dependent on energy resource development, planning for environmental remediation work repositions our already experienced workforce to be ready for economic shifts.

Beyond New Mexico, a sector focused specifically on environmental remediation with specialized expertise in radioactive cleanup could export its industry nationally and internationally. Uranium mine sites exist all around the world. Further, there are still active uranium mines that someday will close out either because the demand and economics don’t justify the continuation of the mines or because the deposits are sufficiently depleted as to render them uneconomic to continue when there are other sites with greater reserves. With the inclusion of environmental remediation as a priority industry, New Mexico could develop a skills list for businesses and individuals trained to do uranium mine cleanup work and help grow our educational programs alongside our companies. This focus could also make New Mexico a place for international education, attracting students from other countries to learn from our professionals at our state institutions.

6.4.2. Generate Pathways for Greater Innovation

In the current setting, there have been insufficient resources to investigate the evidence to alter the current approaches to uranium mine cleanup both from the private and the public sectors. Utilizing the resources in New Mexico for innovation would benefit not only the state but potentially the remediation industry on the whole. The state’s jurisdiction over some of the lands with uranium mines and waste could provide the opportunity for specific research and projects in collaboration with our higher education institutions and local innovators.

One model discussed in our interviews with stakeholders was a collaborative session in which experts from various institutions were brought together by Harvard in 1998 to tackle complex problems in the health field.⁷² When a project was completed, these experts went back to their “home” institutions. Out of this revolving collection of experts, many new patents were obtained for new products, services, and medicines.

In principle, there is no reason why New Mexico could not become the national/global market leader in addressing the remediation and cleanup of nuclear waste materials. We have countless experts in our state who could be called upon to innovate new solutions to address this massive problem. Educational institutions such as Diné College, Navajo Technical

⁷² <https://cimit.org/about>

University, New Mexico State University, New Mexico Tech, and the University of New Mexico have all been examining various aspects of uranium mine remediation. The state could facilitate information exchanges and brainstorming sessions with these experts, alongside experts from Los Alamos National Laboratories and Sandia Labs. These sessions would have the potential to improve the economic and social well-being of impacted communities and yield new products and services that are marketable well beyond New Mexico.

6.4.3. Continue Research on the Effects of Unremediated Uranium Mines

Finally, there seems to be some level of agreement that collaborative research needs to be done to identify and address additional pathways wherein uranium waste products are harmful to local citizenry beyond the known routes of groundwater contamination and living on or proximate to former mining and milling sites that often contain high levels of radioactive materials. Experts from different fields seem to agree that airborne exposure, for example, needs to be investigated in such a manner that USEPA can recognize there is sufficient and unequivocal evidence to support defined remedies and/or the need to marshal such research to find such remedies. It is evident within uranium mine cleanup sites that residual materials are fundamentally “hot” and represent potential vectors for wind-borne toxic materials in the form of dust.

Another area of research currently being investigated within the state is the validity of the metrics used to determine exposure. For example, some research examines culturally appropriate metrics for measuring impacts – many exposed communities generally don’t eat much beef, but they do eat mutton. Yet, the current EPA metrics with regard to meat consumption are based on the grazing patterns of cattle, which are unlikely to be the same grazing patterns as for sheep. These metrics determine the level of cleanup required and/or accepted and may well be grossly inappropriate in areas primarily inhabited by Native populations, where many mines are situated. Incorporating localized research and expertise on Traditional Ecological Knowledge will be critical to gaining full insight into the magnitude of the impacts of unremediated uranium mines in New Mexico.

The State could help facilitate bringing together the myriad technical specialties that have a keen interest in addressing exposure problems and finding ways around the existing hurdles to more rapid development and technology. There is a clear need to assess the negative consequences such as disease, diminished life expectancy, disturbed or destroyed community life, and ties that have been mentioned in public meetings, research reports, various media campaigns, and testimony before Congress. Once these are more fully understood, the real economic and social costs can be more readily calculated. Thus, the deeper benefits to remediation and cleanup efforts could be sufficiently demonstrated and resources more appropriately allocated.