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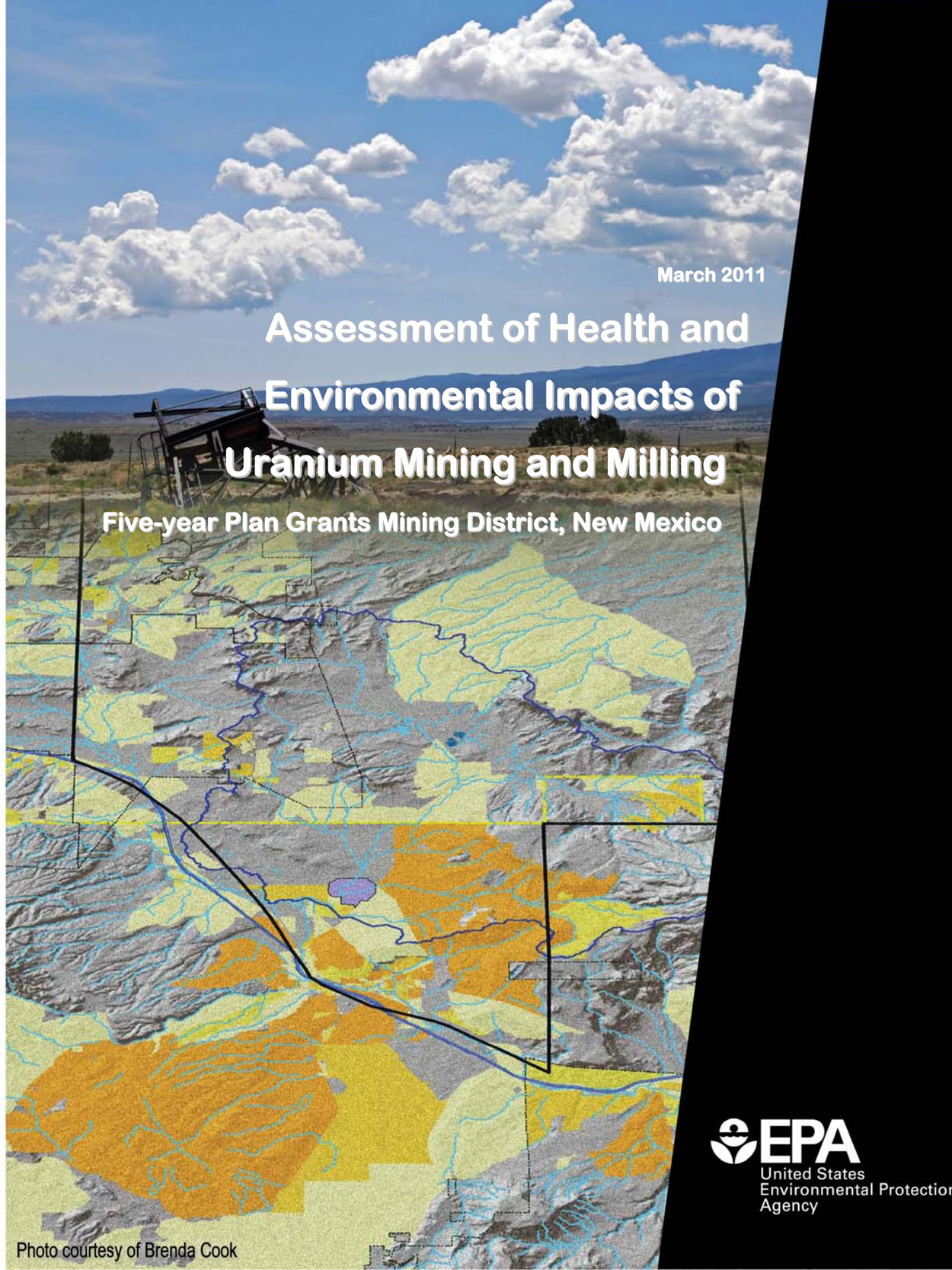
Assessment of Health and Environmental Impacts of Uranium Mining and Milling

Five-year Plan Grants Mining District, New Mexico



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Assessment of Water Supply for Contamination

Background
Residents within the Ambrosia Lake and Laguna sub-districts primarily rely on private wells for residential-domestic, stock-watering, and agricultural uses. Legacy uranium mining and milling operations generated liquid wastes that included water produced from mine dewatering operations and process waters from milling operations. The New Mexico Environment Department and the Environmental Protection Agency continue to assess impacts to regional ground water.

Accomplishments
- Developed an Uranium Legacy Environmental Portal, which allows state and federal agencies to manage and share data.
- Since 2005, NMED sampled 128 existing wells and found that 81 exceeded federal/state primary drinking water standards and/or state ground water standards.
- Convened workgroup with representatives from state and federal agencies in October 2010 to develop work plans for investigations in the area between the Bluewater Mill and Homestake Mining Company site to ensure protection of public water supplies.

Next Steps Planned
- Develop a ground water investigation plan within the context of a comprehensive Grants Mining District investigation.

Assessment and Cleanup of Legacy Uranium Mines

Background
The Grants Mining District comprises an area of 100 miles by 25 miles where primary uranium extraction and production activities occurred in New Mexico from the 1950s until late into the 20th century. There are 97 legacy uranium mines in the district with the potential for physical hazards such as open adits and shafts, and for potential releases to soil, surface water, and ground water.

Accomplishments
- Completed 58 site screenings of legacy uranium mines in the Grants Mining District.
- Completed an Engineering Evaluation and Cost Analysis for the San Mateo Mine located on United States Forest Service land.
- Created a technical workgroup with representatives from state and federal agencies to develop a characterization protocol for legacy uranium mine sites and cleanup criteria.

Next Steps Planned
- Complete site screenings for the remaining 39 legacy uranium mines by September 2011.
- Complete more detailed assessment on at least 4 previously screened mines collecting soil and/or ground water samples to determine impact from mining activities.
- Assess radiation levels at 2 mine sites located on Bureau of Land Management property.
- Conduct emergency action at mine sites when warranted due to releases to the environment or physical hazards.
- Prioritize all remaining sites and determine appropriate action.
- Finalize characterization protocol and cleanup criteria including solicitation of comments from stakeholders.

Contaminant Assessment, Cleanup, and Long-Term Management of Former Uranium Milling Sites

Background
There are 5 legacy uranium mill sites within the Grants Mining District. Four are located in Ambrosia Lake sub-district and one in the Laguna sub-district. The Homestake Mining Company site and the Ambrosia Lake-Rio Algom Mill sites are currently under the jurisdiction of the Nuclear Regulatory Commission until reclamation is complete. The Department of Energy is responsible for the long-term surveillance, maintenance and ground water monitoring at the Ambrosia Lake-Phillips Mill site, the Anaconda Bluewater Mill site, and the L-Bar Mill site since reclamation activities have been completed.

Accomplishments
- DOE developed a plan for ground water investigations at the Ambrosia Lake-Phillips Mill and the Bluewater Mill sites, in coordination with NMED.
- EPA initiated a human health risk assessment (HHRA) at the Homestake Mining Company site that identifies way to improve remediation efficiencies.
- EPA completed a Remedy System Evaluation (RSE) for the Homestake Mining Company site that identifies ways to improve remediation efficiencies.

Next Steps Planned
- Complete ground water investigations at the Ambrosia Lake-Phillips Mill and the Bluewater Mill sites, including installation and sampling of additional monitoring wells.
- Complete the HHRA at the Homestake Mining Company site.

Assessment and Cleanup of Contaminated Structures

Background

The Grants Mining District has been inhabited since the 12th century, therefore, structures can date back to those early days. More recent dwellings may be constructed of materials unearthed during mining activities or built on or near high uranium content lands. Based on the results of the Airborne Spectrophotometric Environmental Collection Technology (ASPECT) Gamma Emergency Mapper and residential radiological survey, the Environmental Protection Agency has been surveying structures and properties potentially affected.

Accomplishments

- Completed an ASPECT survey over villages on Pueblo of Laguna, in the Cebolleta Land Grant, and San Mateo.
- Screened 458 structures/properties on the exterior for potential gamma and elemental uranium contamination.
- Based on the exterior screening, identified 209 structures for further evaluation to determine if unacceptable levels of alpha, gamma radiation or radon exist.

Next Steps Planned

- Complete testing on all structure.
- Implement radon abatement at residences, as warranted.
- Cleanup contaminated soil at residences, as needed.
- Cleanup contaminated structures, as needed.

Jackpile Mine on Laguna Pueblo

Background

The Jackpile Mine, once the world's largest open pit uranium mine, is located on the Pueblo of Laguna near the village of Paguate and operated from 1953 to 1982. A Record of Decision was adopted by the Bureau of Indian Affairs and the Bureau of Land Management in 1986 with the objective of reclaiming and stabilizing the mine site. The Environmental Protection Agency is conducting investigations to determine the extent of residual risk from legacy activities.

Accomplishments

- Finalized CERCLA Preliminary Assessment Report that documents impacts to ground water and soil.
- A draft CERCLA Site Inspection report was developed and is currently under review by the Pueblo of Laguna.

Next Steps Planned

- Finalize the CERCLA Site Inspection report.
- An Expanded Site Inspection will be conducted Spring 2011 to investigate the ground water to surface water pathway at Jackpile Mine site.

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Public Health Surveillance

Background

Historical releases from legacy uranium sites throughout the Grants Mining District are documented. Area residents requested health screenings and studies to evaluate health impacts from uranium mining and milling in the area.

Accomplishments

- In June 2010 the Agency for Toxic Substances and Disease Registry and the New Mexico Department of Health hosted a presentation on the physical and chemical science of uranium with discussion of indoor radon for New Mexico health care providers in Gallup for the Navajo Nation, in Grants, and in Albuquerque, New Mexico.
- The New Mexico Department of Health conducted an assessment to gauge the current public exposure to environmental uranium in the Grants area.
  - Exposure assessment surveys were completed
  - Urine samples were tested for uranium
  - Water samples were tested for uranium
- On November 23, 2010, the New Mexico Department of Health gave a presentation to the Pueblo of Laguna Council. The presentation summarized results of uranium in urine and water, as well as exposure assessment survey results for Pueblo of Laguna residents.
- The New Mexico Department of Health produced a report titled "Grants Mineral Belt Uranium Biomonitoring Project Summary." This report is available on the New Mexico Environmental Public Health Tracking website: *https://nmtracking.unm.edu/environ_exposure/exposure-assess/*

Next Steps Planned

- The New Mexico Department of Health will be presenting results from the Health Assessment to the public in Grants/Milan/San Mateo and the Pueblo of Laguna, providing recommendations for residents in areas with high uranium concentrations, which include raising community awareness about potential sources of exposure to uranium and how to reduce this exposure.