

STATEMENT OF  
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DEPARTMENT OF ENERGY  
BEFORE THE  
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM  
UNITED STATES HOUSE OF REPRESENTATIVES

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Good morning Mr. Chairman, and distinguished Members of the Committee. My name is David Geiser and I am the Deputy Director of the Office of Legacy Management (LM) at the Department of Energy (DOE). LM is responsible for ensuring that DOE's post-closure responsibilities are met by providing long-term surveillance and maintenance, records management, workforce restructuring and benefits continuity, property management, and land use planning. By managing post-closure responsibilities, LM has better positioned DOE to continue focusing programs and personnel on achieving its diverse missions, including enabling the Environmental Management program (EM) to concentrate its efforts on the remaining cleanup and risk reduction.

### **DOE Legacy Management**

The activities of DOE and its predecessor agencies, particularly during the Cold War, left a legacy of environmental impacts at over 100 sites nationwide. Addressing this environmental and human legacy has been, and will continue to be, a major DOE undertaking.

LM's primary goals are to protect human health and the environment through effective and efficient long-term surveillance and maintenance; ensure the preservation, protection, and accessibility of legacy records and information; support an effective and efficient work force structured to accomplish DOE missions and assure contract worker pension and medical benefits; manage legacy land and assets, emphasizing protective real and personal property reuse and disposition; and improve program effectiveness through sound management.

In Fiscal Year (FY) 2007, LM conducted long-term surveillance and maintenance at more than 70 sites. These sites included private sector or Formerly Utilized Sites Remedial Action Program (FUSRAP) sites, former uranium milling sites, nuclear reactors and former nuclear weapons test sites, and DOE sites where closure and cleanups have been completed.

At the uranium milling sites, tailings or waste were produced by the extraction or concentration of uranium or thorium from ore. Under the Uranium Mill Tailings Radiation Control Act of 1978, as amended (referred to as "the Act" or "UMTRCA"), Public Law 95-604, DOE is responsible for cleaning up inactive uranium milling sites that were abandoned at the time the legislation was enacted subject to the oversight of the State in which the tailings were located and the U.S. Nuclear Regulatory Commission (NRC). Sites that were operating in 1978, or thereafter, are cleaned up by the operator under state or NRC oversight. LM provides long-term surveillance and maintenance for sites that are transferred to the federal government for custodial care. For the UMTRCA sites, this includes both surveillance and maintenance of the disposal cells and cleanup of contaminated groundwater.

## **Uranium Mill Tailings Radiation Control Act of 1978 authorizes DOE Remedial Action Program**

Title I of the UMTRCA originally required the cleanup of 22 inactive uranium milling sites and associated properties in the vicinity of the milling sites. The Act was amended a number of times: to extend the UMTRCA's expiration date; to add the Edgemont, South Dakota vicinity properties (but not the milling site); and most recently to add the Moab, Utah milling site.

Under the Act DOE's authority for surface (tailings) cleanup at the original 22 milling sites and vicinity properties (including Edgemont) expired in 1998. DOE's authority for groundwater remediation does not have an expiration date.

DOE remediated sites in accordance with standards promulgated by the U.S. Environmental Protection Agency (EPA) in 40 C.F.R. Part 192. The regulations provided standards for the cleanup of soil outside structures (radium-226 concentration in soils) and the cleanup of structural interiors (gamma radiation and radon-222). In addition, the regulations established the design standard for the longevity of disposal cells. The regulations also covered the cleanup of contaminated groundwater.

Over the years, DOE has developed alternatives for remedial action and then remedial action plans for each milling site and associated vicinity properties. These plans and alternatives provide for the cleanup of contaminated soils, groundwater, and structures, and the construction of disposal cells. In each case, NRC concurred on the remedial action plan and quality control procedures. For any given site, after surface remediation was performed (groundwater remediation is ongoing at many sites), a completion report documenting the cleanup and construction of the disposal cell was submitted to NRC for its concurrence.

After NRC concurs on a given completion report, the site falls under the NRC general license for Title I sites as established in 10 C.F.R. § 40.27. The Long Term Surveillance Plan written for each individual site becomes a condition of the general license and establishes the long-term surveillance and maintenance requirements. The long-term care responsibility is transferred to DOE's LM Program.

By 1998, DOE had remediated 22 milling sites and a total of 5,335 properties (4,266 in Grand Junction, Colorado; 1,038 in 18 other communities, including Edgemont; and 31 at the 4 Navajo sites). DOE also constructed 18 disposal cells. Program costs for all 22 milling sites and the vicinity properties totaled \$1.476 billion for the cleanup of the milling sites and vicinity properties.

## **Health Risks Associated with UMTRCA Sites**

Prior to surface remediation, the primary health risk from uranium mill tailings was radon exposure to people living in structures built over contaminated soil. Risks from gamma exposure and other radioactive materials at inactive milling disposal sites, such as the Tuba City disposal site, are low.

The risk to public health due to contaminated groundwater from the inactive uranium milling disposal sites is also low because groundwater use is prevented by institutional controls. Furthermore, the geologic conditions at most sites prevent seepage (precluding animal use) and make it difficult for humans to pump the water out. In addition, DOE built public water supplies to provide alternate water sources to communities in lieu of using contaminated groundwater (i.e., Mexican Hat, Utah; Riverton, Wyoming; Rifle and Gunnison, Colorado).

### **DOE's actions have significantly improved the protection of human health and the environment.**

DOE prepared a remedial action plan for each milling site that explained the basis and approach for the remedial action. These plans included the design drawings and specifications for the remediation and the construction of the associated disposal cell. All designs followed applicable NRC and DOE guidance, including DOE's Technical Approach Document, which was written specifically for the design of the disposal cells. At the four sites on Navajo Nation lands, the NRC and the Navajo Nation concurred on the remedial action plans.

Disposal cells were designed for a 1000-year lifespan to the extent reasonably achievable, and, if 1,000 years was not achievable, the cells were designed to last for a minimum of 200 years. EPA standards required radon gas to not exceed 20 picocuries per square meter per second from the tailings placed in the cell. The disposal cell covers contain clay barriers to prevent the release of radon and minimize the infiltration of water and future maintenance. These clay barriers are in turn covered with soil and then rock for erosion protection.

As part of annual inspections, DOE maintains disposal cell integrity by monitoring erosion around the cell, plant encroachment, and other potential impacts. DOE performs repairs as necessary.

By stabilizing the radioactive tailings in disposal cells and remediating the groundwater that exceeds EPA pollution standards, DOE has been protective of human health and the environment.

## **DOE Activities on Navajo Nation Lands**

Four of the original milling sites were located within the Navajo Nation. UMTRCA required DOE to remediate Navajo sites at no cost to the Navajo Nation (while participating states paid 10% on sites within that state). The Act required a cooperative agreement between the DOE and the Navajo Nation with the following major conditions: 1) the Navajo Nation and property owners agreed to release the U.S. from any liability associated with the cleanup; 2) all remedial action would be performed in accordance with the Act; 3) DOE would have a permanent right of entry to the milling sites; and 4) DOE would take title to the remediated tailings.

The four inactive uranium milling sites located on the Navajo Nation that have been remediated under the Act are: Mexican Hat, Utah; Monument Valley, Arizona (tailings moved to Mexican Hat); Shiprock, New Mexico; and Tuba City, Arizona. The remediation of these sites includes surface reclamation and ground water remediation. The surface reclamation program was completed in 1998, and the authority of DOE to effect further surface cleanups expired at that time. The cost of the surface cleanup at the four Navajo Nation sites was \$137 million. The groundwater program is ongoing at a cost of \$3.26 million per year. The groundwater program has no statutory expiration date.

The four Navajo Nation milling sites are being cleaned up through a cooperative agreement with the Navajo Nation that provides the opportunity for a participative decision-making process as required by UMTRCA. In addition, ongoing communication includes regular meetings and consultations on draft reports. This assures that DOE addresses the concerns of the Nation and that the Nation has full knowledge of current and planned activities related to the cleanup. Work at Tuba City is staffed by Navajo operators under contract with the LM technical assistance contractor. DOE also periodically employs students under an internship program, and gives technical presentations about the site at local colleges. Further, DOE conducts tours of the site giving local students the opportunity to enhance their educational experience.

## **DOE Working with Navajo Nation**

DOE has worked closely with the Navajo Nation over the last 20 years and the two currently enjoy a positive working relationship. DOE provides funding (over \$300,000 per year) to the Navajo nation so that Navajo UMTRA program staff can participate in decision-making. The Navajo Nation staff assist with site inspection, monitoring, and maintenance and review plans and information updates. DOE holds quarterly meetings with the Navajo Nation to update the progress of site cleanup, address any of the Nation's concerns, and plan for technology transfer and educational opportunities. The goals for FY 08 include increasing utilization of Navajo staff in site inspections, sampling, well-field repairs and construction, and periodic site cleanup.

## **DOE Groundwater Cleanup Program on Navajo Nation Sites**

DOE is currently remediating groundwater at the Tuba City, Monument Valley, and Shiprock sites. The Mexican Hat site does not require cleanup. The groundwater plumes are a result of the past uranium milling site ponds that contained large volumes of process water.

### Mexican Hat Site

The milling waste from Monument Valley was co-located at the Mexican Hat site for disposal. There is little groundwater at this site, and following several years of monitoring four wells and several seeps near the cell, further monitoring has been discontinued in consultation with the Navajo Nation. DOE conducts periodic inspections of the area, and if seep flow returns, sampling will resume. The four groundwater monitoring wells were recently decommissioned because it is not anticipated that the collection of additional samples will be necessary. Further, closing the wells to surface flow reduces environmental risk.

### Monument Valley Site

The primary contaminant of concern at the Monument Valley site is nitrate, although selenium and sulfate are also present. Nitrate is a result of the natural oxidation of ammonia compounds used in processing the ores and is not a radioactive substance. Consequently, a technique called phytoremediation, which utilizes native plants, is being used to clean up the nitrate. There is a pilot study underway utilizing native plants to facilitate the reduction of the nitrate in ground water at the site. The pilot study was approved under an Environmental Assessment in cooperation with the Navajo Nation. Native plants that are naturally water-seeking are planted and contaminated water is pumped from the aquifer to irrigate them. The pilot project has been so successful to date that the well has gone dry and a deeper well was recently drilled to continue to provide contaminated water for irrigation. Once established, these deep rooting plants use the nitrate and water, reducing both the volume of contaminated water as well as the concentration of the nitrate. It is anticipated that there will not be a need to expand the program beyond the pilot stage in order to fully address the nitrate plume, which is about equal in areal extent to the original milling site. DOE employs local labor and students to help operate the system. In addition, a water line was built by DOE for the few residents who might be impacted by the groundwater plume so that they have an alternate supply of clean water.

### Shiprock Site

The major contaminant of concern at the Shiprock site is uranium. There are in general two areas of groundwater contamination at the Shiprock site, the terrace and the floodplain. Because of this, Shiprock site groundwater is pumped from a series of wells to a large evaporation pond. The mill was located on the terrace area, as is most of the

town, while the floodplain is at the river level. The biggest technical challenge is capturing the small volume of contaminated water on the terrace. Due to the nature of the soil in the terrace area, one well may produce significant contaminated water during extraction while another very close by will not. In an attempt to circumvent this problem, a large excavation pit was recently dug and observations indicate that the water is seeping into the pit in small, discrete areas rather than throughout. It is anticipated that this effort will greatly enhance the extraction of contaminated water on the terrace and accelerate the site towards ground water compliance.

It is also difficult to consistently extract contaminated groundwater from the floodplain. However, an effort a year ago to emplace two 200 foot long drains has proven very successful in increasing the production in this area, nearly doubling the total amount of contaminated water being pumped to the evaporation pond. Some elevated concentrations of uranium still enter the San Juan River, but they quickly dissipate to non detectable levels in the river water.

### Tuba City Site

The Tuba City site has a state-of-the-art treatment system to collect and treat contaminated groundwater. Because the system is so effective in removing molybdenum, nitrate, selenium, and uranium contaminants, the treated groundwater can be reinjected back into the ground. This was done at the request of the Navajo Nation so that there would be minimal impact to area groundwater. The extraction well network associated with the treatment plant has mitigated movement of the plume away from the former milling site location, and the contaminated groundwater does not discharge to a seep or surface water (e.g., a stream). Separated wastes are placed in a lined pond where dust is minimized by keeping the sediments in the lined structure wet. A study conducted by DOE on the pond water showed that there is no ecological risk based on observed species and pond chemistry. The contaminants in the pond will be disposed of at a future date. Navajo operators have been hired to operate the groundwater treatment plant.

### **Vicinity Property Program**

In addition to conducting remedial action on the milling sites, DOE also remediated contaminated soils surrounding the sites and properties in the vicinity of the sites, as part of the Vicinity Property Program (“the Program”). DOE conducted investigations for contaminated properties through aerial surveys, mobile scans, and advertising. Participation in the Program was voluntary, and DOE conducted a radiological survey at a property upon request.

DOE investigated 10 properties near the Tuba city milling sites for possible inclusion in the Program. Out of the ten, one site was included in the Program and was cleaned up, while the other nine properties did not exceed standards and therefore no action was taken. Mill worker housing near the Tuba City milling site was the one property remediated. Although the windblown tailings contamination around the milling site was

cleaned up, the area was not deemed as a vicinity property as it would have been in other communities, since it did not fall on separate parcels of land.

Groundwater issues generally do not occur on vicinity properties because large volumes of water were not historically used and they do not have enough contamination to impact ground water quality.

Since the DOE currently lacks the regulatory authority to clean up the Tuba City property located north of the Tuba City disposal cell, reauthorization of the Act's surface remediation authority would be required to perform additional remediation of vicinity properties. If remediation is required, the material could possibly be accepted at the Grand Junction disposal cell, or sent to a commercial low-level waste disposal facility.

I would be happy to answer any questions you may have on our activities.