

**WRITTEN TESTIMONY
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MANAGEMENT PROGRAMS
UNITED STATES NUCLEAR REGULATORY COMMISSION
TO THE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE
HARDROCK MINING: ISSUES RELATED TO ABANDONED MINE LANDS AND
URANIUM MINING**

March 12, 2008

INTRODUCTION

Mr. Chairman and Members of the Committee, I am honored to appear before you today to discuss the U.S. Nuclear Regulatory Commission's (NRC) regulatory role for uranium recovery facilities. I hope that my testimony and clarification of NRC's jurisdiction will be helpful to you in your work on mining legislation.

URANIUM RECOVERY

The NRC does not have the statutory authority to regulate traditional mining. Therefore, the NRC does not regulate the digging or removal of uranium ore from the earth. Likewise, the NRC is not responsible for abandoned uranium mine sites. These operations are the responsibility of other Federal and State regulators.

The NRC does regulate the processing of uranium ore. Under its Atomic Energy Act authority, the NRC regulates uranium recovery facilities, which use chemical and/or mechanical processes to convert raw uranium into a compound commonly referred to as "yellowcake." Yellowcake is then shipped to a uranium conversion facility for further processing as it moves along the uranium fuel cycle process.

There are two primary uranium recovery processes over which NRC has jurisdiction: conventional mills and in situ leach (ISL). A conventional mill processes uranium ore which has been removed from the earth by either open pit or underground mining. The ore is then crushed and sent through a mill, where extraction processes concentrate the uranium. Waste from this process is primarily mill tailings, a sandy ore residue that poses a potential hazard to public health and safety due to its radium and chemical content. Conventional milling produces a substantial amount of mill tailings. NRC regulates the recovery process and the safe storage and disposal of these tailings.

In the ISL uranium extraction process, wells are drilled into rock formations containing uranium ore. Water, usually fortified with oxygen and sodium bicarbonate, is injected down the wells to mobilize the uranium in the rock so that it dissolves in the groundwater. The location of the uranium-bearing solution is controlled by pumping more water out of the formation than is pumped into it. Containment and water quality are assessed through a network of monitor wells. The uranium-bearing solution is pumped to a central processing plant, which uses ion exchange to separate the uranium and concentrate it. Although these ISL facilities are sometimes referred to as "mines", the entire uranium extraction process, below and above ground, is considered to be

processing and is therefore subject to NRC jurisdiction under the Atomic Energy Act. Waste from this process is specific in nature (e.g., filters, piping), relatively small in volume, and can be disposed in a tailings pile at a conventional mill site or at a licensed disposal facility. Tailings are not generated at ISL facilities. However, ISL facilities may have settling ponds where sediment containing uranium can accumulate and which must be remediated as part of decommissioning.

An additional extraction process is heap leaching. Heap leaching is used most often when the content in the ore is too low for the ore to be economically processed in a uranium mill.

NRC'S ROLE UNDER UMTRCA

With the enactment of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), mill tailings became subject to NRC regulation. UMTRCA was established by Congress to provide for the disposal, long-term stabilization and control of uranium mill tailings in a safe and environmentally sound manner. UMTRCA established two programs to protect the public and environment from the potential hazards of uranium mill tailings and other milling waste. Title I of UMTRCA generally addresses mill tailings sites that were abandoned by 1978. Title II focuses on uranium recovery facilities and mill tailing sites that possessed an active license in 1978 or were licensed after 1978 by NRC or an Agreement State¹.

Title I – Reclamation Work at Inactive Uranium Tailings Sites

Title I of UMTRCA covers 22 inactive uranium mill tailings sites. Title I established a U.S. Department of Energy (DOE) program to remediate uranium mill sites that were abandoned prior to the enactment of UMTRCA in 1978. Congress directed the U.S. Environmental Protection Agency (EPA) to promulgate the standards for remediation. These standards primarily address stabilization of the tailings pile and the cleanup of on and offsite contamination, including contaminated groundwater. Under Title I, the DOE is responsible for remediation of these abandoned sites. The NRC is required to evaluate the DOE's design and implementation of its remedial action, and, after remediation and NRC evaluation, concur that the sites meet the standards set by the EPA (40 CFR Part 192). DOE conducted its remediation activities in two distinct stages: surface remediation and groundwater restoration. Surface restoration activities at all but two Title 1 sites have been completed. DOE continues to perform groundwater restoration activities at sites with groundwater concerns.

Title I also requires DOE to remediate vicinity properties. Vicinity properties are land in the surrounding area of a mill site that DOE determined were contaminated with residual radioactive materials from the mill site. Here again, NRC's role is limited to evaluation and concurrence on DOE's remediation design and implementation. However because of the large number of vicinity properties, DOE prepared a document ("Vicinity Properties Management and Implementation Manual" or VPMIM) containing generic procedures for

¹ Section 274 of the Atomic Energy Act of 1954, as amended, provides for State assumption of NRC's regulatory authority to license and regulate byproduct materials (radioisotopes); source materials (uranium and thorium); and certain quantities of special nuclear materials. NRC periodically reviews these programs for adequacy and compatibility with NRC regulations. There are currently 34 agreement states.

identifying and remediating vicinity properties. NRC concurred on the VPMIM and only separately evaluates and potentially concurs in vicinity property remediations that do not conform to this generic document.

10 CFR §40.27 – General License for DOE Established by Regulation

To implement Title I, the NRC promulgated regulations (10 CFR §40.27) to establish, in the regulation itself, a general license authorizing DOE's custody and long-term care of residual radioactive material disposal sites with conditions imposed by the regulation. These conditions include requirements for the monitoring, maintenance, and emergency measures necessary to protect public health and safety and other actions necessary to comply with the standards promulgated by the EPA (40 CFR Part 192). Although the DOE is not an NRC licensee during site cleanup, NRC must evaluate and potentially concur with DOE's proposed remedial action. The NRC general license authorizing the custody and long-term care of a specific site becomes effective after NRC concurs with DOE that its site-specific remedial action has been completed and when the Commission accepts DOE's Long-Term Surveillance Plan (LTSP) for the site that meets NRC requirements as specified in our regulations. After these actions, the DOE is the perpetual custodian of a site under NRC's General License established in this regulation.

An LTSP must include an executed waiver under which any person – including an Indian Tribe – holding any interest in the Title I disposal site, releases the United States from any liability or claim arising from the DOE's remedial action. A two-step process with respect to NRC concurrence was used at sites where groundwater contamination exists. At such sites, the NRC concurred on surface remediation; however, NRC concurrence in groundwater remediation was addressed separately and, in some cases, has not yet occurred. Once the NRC accepted the LTSP for surface remediation, each site was then included in the general license in 10 CFR §40.27. Ongoing groundwater monitoring is addressed in the LTSP to assess performance of the tailings disposal units. When the NRC concurs that groundwater restoration has been completed, the LTSP may be modified as necessary to reflect completion.

Once an LTSP has been approved, the DOE has the primary responsibility to ensure public health and safety at the site. However, the NRC continues to have an oversight role. The NRC receives annual updates on the results of the DOE's Title I inspection program and under 10 CFR §40.27, the NRC maintains permanent right-of-entry to Title I Sites. NRC staff periodically accompany the DOE during Title I site inspections. If, for any reason, (e.g., DOE report, NRC inspection, allegation), the NRC determines the site is not safe, it can require DOE to correct the condition.

Title II – Licensed Uranium Recovery Facilities and Mill Tailings Sites

Title II of UMTRCA established the framework for NRC and Agreement States to regulate mill tailings and other wastes at uranium and thorium mills licensed by the NRC at the time of UMTRCA's passage in 1978 or after. The statute created a second category of byproduct material, referred to as 11e.(2) byproduct material, defined as the tailings or wastes produced under any license by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. Under Title II of UMTRCA, NRC regulates this byproduct material during mill operation and requires that the site be properly closed prior to terminating the license. The NRC standards for site closure, contained in Appendix A of 10 CFR Part 40, conform to

standards promulgated by EPA (40 CFR Part 192) and are similar to EPA standards for the remediation of Title I sites. After license termination, the site is governed by another general license, established in NRC regulations (10 CFR §40.28) which imposes conditions for custody and long-term care of uranium or thorium byproduct materials disposal sites. A State can become the perpetual custodian. However if a State chooses not to do so, DOE must assume custody. To date, no State has become a perpetual custodian.

REGULATORY IMPROVEMENTS IMPLEMENTED BY NRC

With the promulgation of Appendix A and the associated development of more than a dozen Regulatory Guides related to uranium recovery site location, design, operation, inspection, and licensing, the NRC has a well-established regulatory framework for ensuring that uranium recovery facilities are appropriately licensed, operated, decommissioned and monitored to protect public health and safety. Improvements to the program include below grade disposal of mill tailings, liners for tailings impoundments and groundwater monitoring to prevent groundwater contamination, siting and design features of tailings impoundments which minimize disturbance by natural forces, design features of impoundments to minimize release of radon, inspection and oversight of both active and inactive mill sites, stringent financial surety requirements to ensure adequate funds are available for decommissioning, comprehensive reclamation and decommissioning requirements to ensure adequate cleanup of formerly operating mills, and long-term monitoring and oversight of decommissioned facilities.

NEW URANIUM RECOVERY LICENSING

Consistent with the intent of UMTRCA, the NRC believes that the Agency's comprehensive regulatory framework is sufficient to ensure the continued safe operation of active facilities and those in decommissioning, as well as any new facilities that operate in the future. New applicants are required to address in their application the handling and cleanup of solid and liquid wastes generated as a result of proposed operations. Prior to the commencement of operations, applicants must also provide financial surety arrangements to carry out the decontamination and decommissioning of the mill and site and for the reclamation of any tailings or waste disposal areas.

To date, the NRC has received three new applications for ISL facilities in Wyoming. The Agency is anticipating fifteen more applications for new uranium recovery facilities, as well as a number of restarts and expansions of existing facilities in the next few years due to a resurgence in the industry. Existing facilities and new potential sites are located in the States of Wyoming, New Mexico, Nebraska, South Dakota, and Arizona, and in the Agreement States of Texas, Colorado, and Utah. The NRC plans to work closely with the stakeholders, including Indian Tribes, to ensure that any concerns associated with licensing of future proposed uranium recovery facilities are appropriately addressed. The formal license application review process should be completed within a period of 24 months, depending on resources. This process includes the NRC conducting a comprehensive safety and environmental review on any new application for a uranium recovery site. Uranium recovery facility license application review schedules are generally driven by the environmental review, which involves the preparation of an environmental impact statement (EIS), as specified in 10 CFR Part 51.20(b)(8), or a complex Environmental Assessment (EA) for *in-situ* recovery facilities that may expand upon a Generic EIS that NRC staff is currently developing. If an application is accepted

for full review, a notice of opportunity for an adjudicatory hearing would be published in the ***Federal Register***. Adjudicatory proceedings may begin at any point in the license review process and are subject to decisions of the Atomic Safety and Licensing Board. Hearings may also occur concurrently or after the technical and environmental review. If the NRC issues a license for a new uranium recovery facility, NRC's continued oversight of these facilities is implemented through licensing reviews and inspections.

URANIUM RECOVERY FACILITIES ON FEDERAL LANDS

Many of the uranium recovery facilities are partly on Federal lands administered by the Bureau of Land Management (BLM). The NRC is responsible for oversight of uranium recovery facilities, both conventional mills and ISL, on Federal land in the same manner as described above for facilities located on private land. The NRC's focus is on the safety and potential environmental impacts of these facilities. The NRC staff works with the BLM in its review of new license applications and the BLM is often a cooperating agency in the development of an EIS or complex EA in complying with NEPA requirements. However, the NRC is not involved in any pre-application exploration, mining claim, and mining royalty issues. Applicants work outside of the NRC licensing process to obtain any other permits from the BLM or other agencies such as the National Park Service or Forest Service for mineral exploration. In addition to the NRC license, an applicant must also comply with other Federal and local permitting requirements prior to construction and operation of a uranium recovery facility. Analysis of potential environmental impacts from exploration and mining claim issues are outside the scope of the regulatory authority held by the NRC and NRC Agreement States.

CONCLUSION

Mr. Chairman and Members of the Committee, I hope my testimony provides you with an understanding of NRC's regulatory role with regard to uranium recovery. I would be pleased to respond to your questions.