

June 20, 2006

Ms. Elizabeth Cotsworth, Director
Office of Radiation and Indoor Air
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Ms. Cynthia C. Dougherty, Director
Office of Groundwater and Drinking Water
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460

SUBJECT: NUCLEAR REGULATORY COMMISSION RULEMAKING FOR
GROUNDWATER PROTECTION REQUIREMENTS AT *IN SITU* LEACH
URANIUM RECOVERY FACILITIES

Dear Ms. Cotsworth and Ms. Dougherty:

The U.S. Nuclear Regulatory Commission (NRC) is initiating a rulemaking to more specifically address, in its regulations, groundwater protection programs at *in situ* leach (ISL) uranium recovery facilities. Under the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), as amended, the U.S. Environmental Protection Agency (EPA) has the primary responsibility to promulgate standards for the protection of the public health, safety, and the environment, for activities related to byproduct material, as defined in section 11e.(2) (11e.(2) byproduct material) of the Atomic Energy Act of 1954, as amended. NRC must ensure that the management of 11e.(2) byproduct material conforms to EPA standards. Based on the discussion accompanying EPA's publication of standards for uranium mill tailings (48 FR 45926), NRC has determined that the appropriate standards for protection of groundwater at ISL facilities are provided by EPA's Underground Injection Control (UIC) program. Accordingly, NRC intends to conform its regulations to the standards in 40 CFR 144 through 148, with the goal of eliminating dual NRC/EPA regulation of groundwater protection activities at ISL facilities. We are requesting early interaction, with EPA, in our rulemaking effort, and EPA's confirmation that UIC rules are the appropriate standards to which to conform NRC regulations in this area.

NRC plans to publish a proposed rule by early next year. To support this schedule, a timely EPA response to this letter is requested. Further details regarding the NRC's rulemaking effort are set forth in the enclosure.

NRC hopes to work with EPA to ensure that it acceptably conforms its regulations to EPA standards, as required by UMTRCA. In support of that effort, we request that you identify a point of contact to interact with my staff. The NRC contact is Myron Fliegel, who can be reached at 301-415-6629 or, by e-mail, at mhf1@nrc.gov.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,

/RA/

Jack R. Strosnider, Director
Office of Nuclear Material Safety
and Safeguards

Enclosure: Background

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Jack R. Strosnider, Director
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Enclosure: Background

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Background of ISL Groundwater Regulations

The Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), as amended, required the U.S. Environmental Protection Agency (EPA) to promulgate regulations, for nonradiological hazards associated with 11e.(2) byproduct material, to be consistent with Solid Waste Disposal Act regulations, to the maximum extent practicable. EPA promulgated the standards, which appear in 40 CFR Part 192. The U.S. Nuclear Regulatory Commission (NRC) adopted regulations conforming to the EPA standards in Appendix A to 10 CFR Part 40. At the time the standards were codified, uranium milling was performed primarily at conventional mills, i.e., facilities that received ore, in the form of rock containing uranium, ground the ore, processed it to remove and concentrate the uranium, and put the residual crushed ore in tailings piles. Although *in situ* leach (ISL) uranium recovery facilities existed at that time, the primary concerns leading to the enactment of UMTRCA were the large tailings piles at conventional mill sites which contained radium and were releasing radon gas to the air, the potential for misuse of those tailings, and the potential for contamination of the underlying groundwater.

The standards codified by the EPA in 40 CFR Part 192 address the groundwater protection aspects of 11e.(2) byproduct material, which is a significant concern at conventional uranium mills, primarily by referencing applicable sections of EPA's Resource Conservation and Recovery Act regulations. NRC's groundwater protection standards for 11e.(2) byproduct material appear primarily in criterion 5 of Appendix A to 10 CFR Part 40 and, like the EPA standards to which they conform are focused on groundwater protection at conventional mills. The standards focus on preventing contaminants from entering the groundwater, primarily by lining tailings impoundments, monitoring groundwater to detect leaks early, and cleaning up contamination that reaches groundwater.

In recent years, ISL facilities have become the predominant means of producing uranium in the United States. ISL facilities eliminate the steps of removing ore from the ground, transporting it to a mill, and grinding it before the uranium is leached from the ore through chemical means, such as using sulfuric acid to dissolve the uranium. Instead, at ISL facilities, the chemical leaching occurs underground in the ore body itself. Usually water with added oxygen and/or bicarbonate is pumped to the ore body through injection wells. The change induced in water chemistry in the ore zone is designed to free the uranium, which becomes dissolved in the groundwater and is pumped to the surface from production wells. On the surface, an ion-exchange process is used to remove the dissolved uranium from the water. In order for an ISL facility to perform properly, the ore zone must be in an aquifer that is confined vertically.

At ISL uranium facilities, NRC staff regulates the surface production facilities under its source material authority and regulates wastes produced in the process (e.g., ponds used to evaporate excess water from the process and soil contaminated from spills) under its 11e.(2) byproduct material authority. NRC has also asserted authority over groundwater protection aspects of the solution-mining process, under its authority to regulate 11e.(2) byproduct material. Although the ore body itself is not 11e.(2) byproduct material, NRC considers the constituents dissolved in the groundwater to be byproduct material. In this regard, NRC regulates the construction of wells, the design of the well field to ensure that contaminated water does not migrate outside the mining zone, the restoration of the groundwater after uranium extraction is complete, and the groundwater monitoring necessary to verify it all.

Enclosure

In recent years, NRC has found that the regulation of groundwater at ISLs, using the existing 10 CFR Part 40 requirements, has become increasingly problematic, as the requirements were written to address concerns at conventional mills with tailings impoundments. NRC has increasingly been relying on license conditions to regulate ISL facilities. NRC has been able to fulfill its statutory mandate to protect public health and safety and the environment by using the existing combination of 10 CFR Part 40 requirements, other applicable NRC regulatory requirements, and relevant regulatory and policy guidance and directives, to make licensing decisions.

To address these difficulties, NRC has decided to undertake a rulemaking effort to codify requirements applicable to protection of groundwater at ISL facilities. NRC intends to conform its regulations to those promulgated by EPA for the Underground Injection Control program, as the applicable standards for groundwater protection at ISL facilities. In its *Federal Register* notice (48 FR 45926), announcing the final standards for 11e.(2) byproduct material in 40 CFR 192, EPA stated, "Rules for protection of ground water from the underground operations of *in situ* mining are provided by the Underground Injection Control program...."