



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUL 8 1983

Central Docket Section (LE-130)
Environmental Protection Agency
ATTN: Docket No. A-82-26
Washington, D. C. 20460

Gentlemen:

The Nuclear Regulatory Commission (NRC) staff is responding to the request by the Environmental Protection Agency (EPA) for comments on the proposed environmental standards for management of uranium and thorium mill tailings at licensed commercial processing sites (48 FR 19584). These comments address separately the two major parts of the proposed standards. The first part includes standards that govern tailings management during milling operations and would require additional protection of groundwater. The second part specifies the goals that are to be achieved by final disposal and governs the design of disposal systems for closure and long-term stability. These two parts of the standard are applicable to separate and distinct functional phases of mill life, i.e., during processing operations and after closure. The standards also address two separate and distinct problems: protection of groundwater during operations, and design of tailings disposal measures to achieve long-term control of the radiological hazards from tailings.

We note that EPA proposes to apply to mill tailings management certain groundwater protection elements of its regulations in 40 CFR Part 264, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities." These regulations implement the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, which amended the Solid Waste Disposal Act (SWDA), and would be applied to uranium recovery operations without modification. The elements of the RCRA regulations that would be applied encompass groundwater protection standards, corrective action programs, impoundment design and operating requirements, and closure performance standards.

NRC's licensing practice has been to assure that water quality be maintained within the existing potential use category, regardless of current uses, and employ cost-benefit considerations in determining appropriate control or remedial action requirements. The RCRA standards are essentially nondegradation standards and apply to all groundwater regardless of quality or use potential. A primary part of the RCRA groundwater strategy is to require the use of liners for this purpose. We have supported the use of cost-effective clay liners as being essential to adequate site-specific programs of groundwater protection. However, we are not aware of any liner technology capable of meeting 40 CFR Part 264 liner design requirements for zero leakage, or alternatively, zero migration of hazardous constituents to adjacent soil or groundwater at any time.

Under the proposed rules, there is also a requirement for EPA concurrence in all hazardous constituent exemptions or alternate concentration limits proposed by NRC on a site-specific basis. Preliminary analysis of currently active mill tailings sites indicates that none can comply with the RCRA nondegradation standard. As a consequence of the impracticability of implementation of the nondegradation standard, NRC will be required to consider exemptions in practically every case, not just occasionally. This, in turn, under proposed 40 CFR 192.32(a)(2)(iv), will draw EPA into the site-specific licensing process because of the proposed requirement for EPA concurrence in all exemptions and the required use of EPA exemption procedures. However, this involvement of EPA in individual licensing cases appears to be in conflict with the proviso in Section 275 b.(2) of the Atomic Energy Act, as amended, that no EPA permit is required. It is the NRC staff's belief that the division of functions between EPA and NRC provided for in the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA) was intended to give NRC the sole direct licensing function. See Section 275 d. of the Atomic Energy Act, as amended. This comment also applies to the provisions dealing with thorium byproduct material under proposed 40 CFR Part 192, Subpart E.

While the staff has no objection to consultation with EPA with regard to specific exemptions, a concurrence role for EPA on each site-specific license appears contrary to the intent of Congress, since, for all practical purposes, a concurrence role in these circumstances is equivalent to the issuance of an EPA permit. In sum, we agree with the observations in the preamble to the proposed rule that EPA's legal role is limited to setting standards and is unlike EPA's SWDA function in that it does not include an implementing responsibility (48 FR 19592). We find the reservation of concurrence authority based entirely upon SWDA procedures (see 48 FR 19594) inconsistent with the limitation on EPA authority.

We also note that only a relatively few isolated chemical sites have been brought into conformance by EPA's application of RCRA to sites under their immediate jurisdiction. Thus, the rule which NRC would be required to implement would be the first instance where RCRA would be applied to a broad industry category. This leads us to conclude that the feasibility of technical alternatives needs further study before the specific RCRA standards are directly applied to uranium mill tailings.

With respect to groundwater protection, we believe that the requirement in Section 275 b.(2) for nonradiological hazard standards, "...consistent with the standards required under Subtitle C of the Solid Waste Disposal Act...", can be met with modified standards that take into account the limited number and type of the hazardous constituents in mill tailings. Under Section 84 a.(3) of the Atomic Energy Act of 1954, as amended, standards of the

Commission for the same wastes need only to be comparable, to the maximum extent practicable, to RCRA standards. We suggest that a consistent reading of Sections 84 a.(3) and 275 b.(2) allows EPA some latitude in formulating a groundwater protection standard that is less rigid and more realistic for uranium mill tailings impoundments than the referenced sections of 10 CFR Part 264. In addition, we do not believe it is appropriate to implement as RCRA standards the maximum contamination limits of the Safe Drinking Water Act. These limits are applicable at the point of public supply and should not be applied to underground aquifers which are unlikely to be used as public water supplies by virtue of their falling within a degraded use category.

The proposed standards for final disposal have two key sections, one dealing with effective cover life, 10 CFR 192.32(b)(1)(i), and one dealing with radon releases, 10 CFR 192.32(b)(1)(ii). The NRC staff considers the section of the standard requiring pile stabilization to be designed to "be effective for one thousand years, to the extent reasonably achievable, and in any case, for at least 200 years," to be a practical approach and consistent with the primary stabilization objective of limiting dispersion by erosion and misuse of tailings solid materials. Reasonable measures which prevent the misuse of tailings in construction will avoid the primary health hazard of radon associated with tailings, that is, the potential increase of levels of radon decay products in occupied structures. Such misuse is the major health problem that has been identified in the remedial action program now being conducted in Grand Junction, Colorado.

An ongoing NRC study of design considerations for long-term stability of mill tailings impoundments indicates that the specific type and amount of cover required to achieve long-term stability for a particular site is likely to be site dependent and that optimum cover designs will be based upon a number of parameters including types of materials available, local meteorological conditions, and the siting of existing and future tailings piles. We believe, therefore, that the kind of performance standards proposed by EPA for effective cover life will allow the flexibility needed to permit licensees to design and NRC to analyze site-specific cover designs for compliance with the standards. The study referred to above will be published soon. We will provide you with a copy of the report when it is available.

We believe that a generally applicable environmental standard based on health risks to individuals would be consistent with the flexibility that Congress provided in the recently enacted NRC Authorization Act, P.L. 97-415, which amended Sections 84 and 274 of the Atomic Energy Act of 1954, as amended, and would be preferable to the more prescriptive standard in the proposed rule controlling radon releases from the tailings pile.

Such flexibility is permitted by amended Section 274 of the Atomic Energy Act which provides that Agreement States may adopt alternatives to requirements of the Commission that will achieve appropriate levels of stabilization and containment and of protection of the public health, safety and the environment and that are generally equivalent to Commission requirements.

Likewise, under amended Section 84 of the Act, licensees may propose similar alternatives that take into account local or regional conditions, including geology, topography, hydrology, and meteorology, as well as local demography, both present and as projected in the future.

The EPA proposed standard of $20 \text{ pCi/m}^2/\text{sec}$ inhibits flexibility in that such a standard would be applied without consideration of site-specific factors affecting health risk. The proposed radon release standard would define the thickness and characteristics of the cover, regardless of what variation may exist in site features, such as the size of the tailings pile, population patterns, climate, and accessibility. There may be instances where a radon release rate greater or less than the EPA proposed standard might be justifiable on the basis of health, safety, and environmental needs, and economic costs, depending on the level of risk protection to be achieved.

The NRC staff suggests that EPA consider promulgating a radon standard that addresses the need for additional protection for those persons at greatest risk on the assumption that adequate stabilization will be provided by application of the 1000-year longevity standard to protect against dispersion and misuse without need to refer to an additional radon release rate design standard. Accordingly, as an alternative to the $20 \text{ pCi/m}^2/\text{sec}$ cover design standard, we suggest that EPA consider an environmental standard for radon of 0.3 pCi/l , based on risk that could be applied to the highest exposed individual or, alternatively, at the site boundary. The health protection provided by the NRC staff recommended standard would result in an annual risk of less than 10^{-5} to the maximum exposed individual (using assumptions that overestimate the true risk such as 100 percent occupancy of a residence at the point of exposure). The actual risk to both local individuals and the populations as well as distant populations will be further reduced by the NRC's application of ALARA considerations in the licensing process and in its implementing regulations.

In implementing this standard, NRC would apply ALARA using, among other things, the 1960 Federal Radiation Council Guidance. This standard would also be consistent with EPA's standard of 0.5 pCi/l for inactive mill tailings sites.

If such a standard were adopted, the NRC staff would suggest a three-tiered approach to design of tailings closure and cover requirements. Each tier would constitute a separate and independent basis for imposing tailings closure and cover requirements. The first tier would be the design for the 1000-year stability standard in terms of erosion control and prevention of intrusion and misuse. This would require a minimum cover thickness and would include design features governing such elements as cover materials and contours that are necessary to prevent dispersion and misuse. These requirements could be specified in NRC implementing rules or in the licensing process. Such cover would also result in some attenuation of the radon flux rate. The second tier would be the inclusion of design features to control radon release as required to meet the risk-based standard. The third tier would be the application of ALARA principles to further reduce the doses to individuals at highest risk, local populations and distant populations. ALARA, which includes collective dose assessment, would be applied in the Commission's implementing regulations or in the licensing process to take into account site-specific considerations.

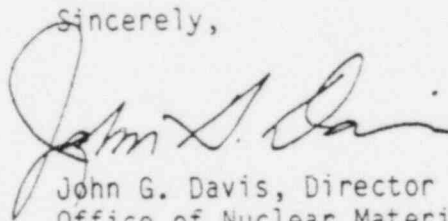
In October 1982, prior to the enactment of P.L. 97-415, the NRC staff was directed by the Chairman to take a fresh look at our uranium mill tailings licensing requirements. One product of that reevaluation is a radiological analysis of mill tailings control requirements that explored the considerations necessary for establishing a risk-based performance standard for radon release. Our comments on the proposed standards are supported by this recent analysis and, for this reason, are not entirely consistent with our current requirements in Appendix A of 10 CFR Part 40.

Enclosed are the responses of NRC staff to EPA's request for comments on four specific questions concerning the proposed standards.

The NRC staff will be pleased to assist EPA with any clarification on these comments or in the preparation of the final standards.

This response has been reviewed and approved by a majority of the Commission. Commissioner Ahearne provided separate comments to you on June 29, 1983. Commissioner Gilinsky indicated that he is in general agreement with the EPA standards.

Sincerely,



John G. Davis, Director
Office of Nuclear Material
Safety and Safeguards

Enclosure: NRC Staff Comments on
Specific Questions Concerning the
Proposed Standards

NRC Staff Comments on Four Specific Questions
Concerning the Proposed Standards

1. Should the radon control standards require a specific level of control of radon from tailings prior to disposal, and, if so, how?

The proposed standard requires control of radon releases during operations to a level that is as low as reasonably achievable (ALARA), which is consistent with existing general Commission requirements in 10 CFR Part 20. While there are certain ways to control operational radon releases, their applicability and cost-effectiveness is site-specific, making a uniformly applicable numerical limit inadvisable. Under the proposed ALARA standard, consideration would have to be given to effective control techniques on a case-by-case basis. Where appropriate, individual decisions would be made to require control measures or other techniques which would reduce radon releases from active tailings piles.

2. Should the health and environmental goals for standards for remote sites be different from those in more populated areas, and, if so, how?

The NRC staff has recommended that EPA adopt a risk-based standard that could be applied to the highest exposed individual or at the site boundary. Such a standard would provide flexibility for dealing with mill tailing disposal on a site-specific basis. Since the goal of a risk-based standard would be to limit the risk to individual members of the public to an acceptable level, the standard would apply equally well at both remote sites and those in more populated areas.

3. Should the provisions of these proposed standards for a liner under tailings (new or existing) be modified for this specific category of wastes, and, if so, how?

The proposed standards should be modified to prohibit degradation of off-site groundwater below its existing potential use category, during the operational period, and to require restoration of any affected on-site groundwater to its pre-operational potential use category, to the maximum extent practicable. Such a standard should recognize the current state-of-the-art of liner technology and groundwater protection as applied to uranium mill tailings management, thus allowing the use of clay liners even though they do not represent a zero-leakage design. Since groundwater would still be protected within its pre-operational potential use category, there should be no significant effect on health, safety or the environment.

4. Should implementation of the disposal standards be permitted to depend primarily or in part on maintenance of institutional control of access (e.g., by fences)?

The NRC staff believes that any consideration of institutional controls should recognize the unique state or federal custody in perpetuity vested in UMTRCA. The minimal institutional controls implied by governmental custody should be effective in preventing long-term occupation of a tailings disposal area, and significantly reduce the probability of intrusion, misuse, and dispersion by people.

Commissioners Asselstine and Roberts believe that implementation of the disposal standards should not be permitted to depend on the active maintenance of access control measures such as fences, guards or barriers. However, they also believe that some consideration should be given to the requirement for state or federal custody in perpetuity under UMTRCA. For example, it may be permissible to consider the contribution of minimal institutional controls implied by governmental custody (i.e., infrequent but periodic checking of the site) in preventing long-term occupation of a tailings disposal area, and in reducing the probability of intrusion, misuse, and dispersion by people.