

## EPA'S LOW-LEVEL RADIOACTIVE WASTE STANDARDS PROGRAM: DEVELOPMENT OVERVIEW - 1987

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### ABSTRACT

The EPA program to develop generally applicable environmental standards for land disposal of low-level radioactive waste has completed its risk assessment and cost-effectiveness analyses. The staff has developed a proposed form of the standards for review by both inter- and intra-Agency groups. The elements of the proposed standards will include: (a) exposure limits for pre-disposal operations, (b) criteria for wastes that are Below Regulatory Concern, (c) post-disposal exposure limits, and (d) groundwater contamination limits. In addition to covering those radioactive wastes as defined by the Atomic Energy Act, the Agency is including high concentration, relatively low volume Natural and Accelerator-produced Radioactive Material (NARM) wastes in the same standards' promulgation.

### INTRODUCTION

On August 31, 1983, EPA published an Advanced Notice of Proposed Rulemaking (ANPRM) (1), stating the Agency's intention to develop generally applicable environmental standards for the land disposal of low-level radioactive waste (LLW).

These standards will be developed under the authority of the Atomic Energy Act of 1954, as amended (2), and Reorganization Plan No. 3 of 1970 (3). They must be met by facilities that dispose of LLW, whether the facilities are licensed and regulated by the Nuclear Regulatory Commission (NRC) or their Agreement States, or are owned and operated by the Department of Energy (DOE).

In our very initial Standards development plans, we only indicated the intent to cover Atomic Energy Act wastes. Comments in response to our ANPRM and at public outreach meetings, especially from State representatives, strongly recommended that the Standard should also cover certain wastes from Natural and Accelerator-produced Radioactive Materials (NARM). It was determined to be sufficiently worthwhile, and our plan was subsequently so modified.

We are using the Toxic Substances Control Act (4) for the necessary authority to regulate NARM. Section 6 of this Act provides that if the Administrator determines that an unreasonable risk exists, he may promulgate regulations on the disposal to mitigate such risks.

The EPA LLW Standard is intended to cover disposal of all Atomic Energy Act materials not covered by other EPA standards. This standard will have several important and closely related areas of focus:

- (a) Low-level waste pre-disposal operations and management. This would include limits on radiation exposure to individuals during processing, management, and storage of low-level waste.
- (b) Definition of radiation exposures related to radioactive waste disposal that are sufficiently small that they either do not need to be

regulated regarding their radiation hazard or the wastes can be disposed of with minimal controls (i.e., a level "below regulatory concern")

- (c) Radiation exposure to individuals after the disposal site is closed, i.e., after it stops receiving waste.
- (d) Groundwater protection for both pre- and post-disposal phases.
- (e) High concentration, relatively low volume NARM wastes in the same standards promulgation. However, we will have to do this in a separate segment of the Code of Federal Regulations because we will be using a different authority.
- (f) Other areas will include guidance on implementation and qualitative assurance requirements.

### STANDARDS RATIONALE

#### Individual Radiation Exposure Limits During Operations and Management

This area would limit annual individual exposures from all environmental pathways to members of the public from all non-uranium fuel cycle facilities which process, manage, or store low-level radioactive wastes.

With the advent of NRC's 10 CFR Part 61 rulemaking (5) on licensing requirements for land disposal of LLW, all higher activity commercial wastes (NRC's Class B, C, and greater-than C) must be solidified and packaged with the intent to add retention and structural strength to the waste package. Waste generators are also now opting for volume reduction, waste processing, and packaging, not only to meet NRC requirements, but as methods to reduce disposal costs and to stay within reduced out-of-State volume limits imposed by host States for existing LLW disposal facilities under the Low-Level Radioactive Waste Policy Amendments of 1985 (6).

This greatly increased need for processing and packaging LLW is being met in a number of ways: (a) Large generators building their own processing facilities; (b) small generators being serviced on site by mobile processing units (i.e., compactors, solidifiers); and (c) commercial companies applying to establish facilities solely for processing LLW.

We are, therefore, confronted with growing trends to create a large number of diverse facilities for treating and processing LLW, plus the potential for facilities that would be dedicated to the storage of LLW for periods beyond our previous perception. These circumstances then create a possible gap in the coverage of EPA's waste related standards. Processing and storage done at a power reactor site would be covered by the Uranium Fuel Cycle Standards, 40 CFR Part 190 (7). Exposure from atmospheric releases at all other LLW processing and storage facilities would be covered by the Clean Air Act radionuclide emission regulations (40 CFR Part 61) (8). However, exposure through other pathways from processing operations and long-term storage at non-UFC, at DOE, and other Government facilities would not be covered.

Most of the exposures from these facilities would be expected to result from airborne releases, but there is also the potential for exposures from direct gamma radiation, water pathways and from releases caused by spillage and similar incidents. Our analyses indicate that control of these exposures should require no more increment of effort than maintaining processing and storage vessels away from public access and the good housekeeping practices necessary to eliminate or cleanup spillage.

The Agency, therefore, deems it prudent to include limits on these potential exposures in our Standard. This would also make the EPA LLW Standard more parallel and consistent in structure with those (25 mrem per year) the Agency promulgated for High-Level Radioactive Waste, 40 CFR Part 191 (9).

#### "Below Regulatory Concern" Criteria

We intend to establish criteria for identifying wastes with sufficiently low levels of radioactivity to qualify as "Below Regulatory Concern" (BRC). Any waste meeting these criteria could be disposed of as a non-radioactive waste. If it had Resource Conservation and Recovery Act (RCRA) hazardous characteristics, it would have to be disposed of in compliance with RCRA regulations. The EPA would not be involved in identifying or selecting specific LLW types which qualify as BRC wastes; the NRC, States and DOE would implement the use of our criteria.

If the BRC criteria is implemented as we envision, most wastes identified as BRC wastes, and not having RCRA hazardous characteristics, would be disposed of as trash in a municipal sanitary disposal facility or be incinerated and subsequently so disposed. Our risk analyses show that with careful selection and segregation of waste, the population, individual and on-site worker risks can be quite low.

Our economic analyses show that the use of a BRC criteria to eliminate certain low-activity radioactive wastes from full LLW regulation and disposal processes is very cost effective. Approximately 35% by volume of all commercial LLW could be reclassified as BRC with a resulting maximum annual dose to an individual of less than 1 mrem per year and potential savings of more than 350 to 650 million dollars over 20 years.

Removing these BRC wastes from LLW disposal facilities would have two additional benefits. It would (a) conserve much needed disposal space and (b) remove a general class of trash-type wastes which has unstable engineering properties and could undermine the integrity of the disposal facilities.

#### Individual Radiation Exposure Limits for Post-Disposal

Our standard will establish limits on exposure through all pathways to members of the public from the land disposal of LLW. It would apply to a LLW disposal facility using any land disposal method any place in the United States.

Such a provision would have the same purpose as the individual exposure performance objective contained in the NRC's 10 CFR Part 61.41 (5). When we commented on the NRC's rulemaking for 10 CFR Part 61, we stated and still agree with the view that "the 25 millirem per year is in the correct range of values." Furthermore, we feel we would need to have some persuasive reason to significantly depart from the 25 millirem per year chosen by the NRC. The staff's technical analysis has not revealed any such reason so far.

#### Groundwater Protection

The protection of the Nation's groundwaters is of major importance in EPA and such a consideration is particularly appropriate in waste disposal standards. The Agency's Groundwater Protection Strategy (10) calls for the protection of groundwater commensurate with its value and use, along with the development of a groundwater classification system. Our approach to groundwater protection is developed in this context.

Class I groundwaters require the highest levels of protection and represents those that serve as irreplaceable sources of drinking water for large populations, i.e., 2,500 people or more. It is appropriate to give these groundwaters the highest level of protection and even non-degradation criteria are being considered.

The draft EPA groundwater classification system generally defines a Class II groundwater as any that is not Class I and is potable, i.e., contains less than 10,000 parts per million dissolved solids. This may be too broad a category for our regulatory purposes. As a second level for regulation, we are considering a subset of Class II groundwaters which represents the more productive aquifers that are presently, or could in the future, serve as community water supplies. One thought is to assure that no community has to remove radionuclides from their drinking water because of releases from a low-level radioactive waste facility. In such an instance the EPA Drinking Water Standards 11 could be the recommended limit.

Any actual consumption or use of other groundwaters would, of course, have to be considered in determining compliance with the individual radiation exposure limits.

#### NARM Coverage

The considerations for the regulation of NARM are to:

- (a) Assure the same disposal of discrete high

activity NARM wastes as for similar Atomic Energy Act wastes;

- (b) Provide for a manifest system that will track the NARM waste from generator to disposal; and
- (c) Provide criteria for State assumption of Federal NARM authority in a way that is consistent with the NRC State Agreement Program.

An important point on the NARM coverage of an EPA standard is specifically which NARM wastes are to be covered. We have used the nomenclature of discrete, non-diffuse, low volume, high activity NARM waste to describe our intention. We presently are excluding those high volume diffuse wastes such as mine over-burden and beneficiation residuals. That is not to say that these latter wastes are not deserving of some type of regulation but rather that they are not appropriate for coverage under these LLW Standards.

To define which NARM wastes should be subject to the Low-Level Waste Standard, we have examined the world of NARM wastes and have determined that a specific activity of 1 to 2 nanocuries per gram may be a good lower limit for applicability of the Standard's requirements.

#### Qualitative Requirements

Another area of coverage in the Standard that is being considered is the matter of qualitative requirements. Such requirements would be intended to make clear the context and assumptions within which we expect the Standard to be implemented.

#### 1987 ACTIVITIES

We are now on track, to what we see as the final approach to proposing the LLW standard sometime this year. We are presently preparing a series of documents which will be available when the proposed standard is published in the Federal Register. They will include: (a) a Background Information Document (BID)--providing a technical treatise on the risk assessment including sources of radiation exposures, routes of exposures, methodology of assessments, individual and population risk, and uncertainties; (b) an Economic Impact Assessment (EIA) -- providing a complete presentation of the costs of the controls and cost-effectiveness of the regulatory options; (c) the proposed standard listing the requirements discussed earlier; and (d) a preamble to the rule which discusses how the Agency went about its decision process and why it made the decisions it did. For the final rulemaking (probably about a year after the proposed rule is issued) an additional volume of the BID will be added which summarizes the Agency's response to public comments.

Our program for the next several months includes finalizing these documents, obtaining both inter- and intra-Agency approval and the Office of Management and Budget approval.

#### CONCLUSION

The EPA Low-Level Radioactive Waste Management program staff believe that Standards covering the above described areas would provide adequate

protection of members of the general public with a reasonable balance of risks and costs. However, we recognize that we are somewhat isolated from the front line of waste disposal activity. The public process that we will be going through, which includes a formal notice of proposed rulemaking, public comment, and public hearings will, we hope, provide a mechanism for receiving a perspective from the "front line." However, it is never too early to get your viewpoint heard. We hope that this presentation will encourage some early response and comments on the areas of coverage we are considering for the EPA Low-Level Radioactive Waste Standard.

#### REFERENCES

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