UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON NUCLEAR WASTE
WASHINGTON, D.C. 20555

April 28, 1995

The Honorable Ivan Selin
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Selin:

SUBJECT: THE U.S. EPA PREPROPOSAL DRAFT OF 40 CFR PART 193 AND THE NRC'S PROPOSED RADIOLOGICAL CRITERIA FOR DECOMMISSIONING

At its 71st meeting, February 21-22, 1995, the Advisory Committee on Nuclear Waste had presentations from and held discussions with representatives from the U.S. EPA, the NRC staff, and the Nuclear Energy Institute on EPA's Preproposal Draft (hereinafter referred to as Draft) of 40 CFR Part 193, "Environmental Radiation Protection Standards for the Management, Storage and Disposal of Low-Level Radioactive Waste." We initiated this review at the request of a Commissioner and because of its relevance to the Committee charter and program plan. As an adjunct to the discussions of factors impacting the generation and disposal of LLW, the Committee heard at its 72nd meeting, March 15-16, 1995, a presentation by and discussed with the NRC staff issues on the residual contamination levels associated with the decontamination of facilities and sites used for activities regulated under the Atomic Energy Act. These discussions addressed the bases for and the impact of levels of residual contamination allowed under the proposed decommissioning rule.

The Draft is divided into three subparts. Subparts A and B concern the management, storage and disposal of LLW and Subpart C concerns groundwater protection. Subparts A and B cite an upper limit to the annual committed effective dose (CED) of 0.15 mSv (15 millirem). Subpart C requires that the level of radioactivity from the disposal system in any underground source of drinking water be less than the maximum contaminant level (MCL) which, for radionuclides, is equivalent to an annual CED of 0.04 mSv (4 millirem).

The Committee could not evaluate the technical bases for the Draft or for many of the topics presented in the text accompanying the Draft since the background information documents, the regulatory impact analysis, and the environmental impact analysis in which such information is expected to be detailed are not yet available. Therefore, we focused our discussions and review on the apparent bases for the action recommended by the EPA and also estimated the potential impacts that were evident from the text that accompanied the Draft. The absence of detailed scientific analyses that lead to the standards in the Draft makes our conclusions less firmly

based than desirable. We plan to examine the technical issues as soon as the supporting documents become available.

We believe the Draft can be divided into two parts that can be considered separately. The first part deals with the protection of the health and safety of the public and is represented by Subparts A and B. The second concerns the application of the drinking water standards and is found in Subpart C. On that basis, we offer the following conclusions:

1. The standards in Subparts A and B dealing with the management, storage and disposal of LLW and its relation to public health and safety may effectively provide the same extent of protection as is obtained from provisions in 10 CFR Part 61 and 10 CFR Part 20 when these regulations are combined with application of the ALARA principle. Although there may be some differences in applicability of each of the NRC regulations, we conclude that the Draft provides protection that appears to be redundant with that provided by the NRC regulations. This conclusion is based on the NRC staff calculation that the 25/75/25 millirem regulation found in Section 61.41 is equivalent to the 0.15 mSv (15 millirem) in the Draft. In addition, in the absence of a clear intent in the Draft, we recommend that the limiting individual (or member of the public) subject to exposure from the LLW be clarified to mean "the average member of the critical group."

2. The selection of the 0.15 mSv (15 millirem) annual CED represents an unnecessarily conservative fraction of the 1 mSv (100 millirem) annual CED limitation recommended by the International Commission on Radiological Protection (ICRP) and the National Council on Radiation Protection and Measurements (NCRP) for the population. The need to partition the annual recommended limit among several sources from which a person is likely to be exposed appears justifiable. We have not found explicit guidance from the various national or international bodies, e.g., ICRP, on this subject.

   Nevertheless, we believe that one-third (Reference 4) or one-fourth of the 1 mSv limitation is more easily justified, based on the likelihood that no more than three or four separate, regulated sources will affect the exposed person at any instance. The selection of one-seventh of the annual limit, i.e., the assumption that a person will encounter a simultaneous dose from seven different, regulated sources, appears to be unjustified, particularly since the application of the ALARA principle accompanies all such NRC regulatory actions. In addition, the nature of the partitioning of the annual effective dose limit is highlighted by the NCRP comment (Reference 3) that ". . . whenever the potential exists for exposure of an individual member of the public to exceed 25

percent of the annual effective dose limit as a result of irradiation attributable to a single site, the site operator should ensure that the annual exposure of the maximally exposed individual, from all man-made exposures (excepting that individual's medical exposure), does not exceed 1 mSv on a continuous basis. Alternatively, if such an assessment is not conducted, no single source or set of sources under one control should result in an individual being exposed to more than 0.25 mSv annually."

We also have reservations about the applicability of this level to residual contamination following the decontamination of a site or facility. This is especially pertinent when it is noted that the permissible residual activity limit is further reduced by the dose attributable to drinking water. Thus, the net allowed exposure of a person in the most exposed group could actually be as low as 11 mrem annually, a level that, especially when in concert with the ALARA principle, becomes unnecessarily restrictive and without justification. The impact of such regulations on the volume of LLW generated by decommissioning and the risk associated with the generation, transport, and disposal of this LLW require a reevaluation of these regulations.

3. The application of the drinking water standard to the disposal of LLW (Subpart C of the EPA Draft) presents, for at least the several reasons cited below, an entirely different approach to the promulgation of generally applicable environmental standards. The material in the Draft and discussions during our meeting indicated that both the application of the drinking water standard and the level of that application is not now based on evident rationale, in part because the background information documents are not available.

   a. There is no evident technical basis for the application of the drinking water standard (applied at the tap) to an underground aquifer at the boundary of the LLW disposal facility. In fact, the text accompanying the Draft indicates clearly that this application is a policy issue and not a technically driven standard. We believe that the EPA should provide the cost-benefit support for such a decision and, in the absence of documents supporting the Draft, we have seen no such support.

   b. The application of the drinking water standard as in the Draft has the effect of moving the point of compliance from the water tap, as it is for the existing drinking water standard, to the fence of the disposal facility. An important factor included in this shift is the definition of drinking water adopted by the EPA which includes waters containing concentrations of solids at

levels significantly above those that can be used for human purposes without treatment. We believe that this change may severely limit, without providing an appropriate benefit, the use of any humid site, otherwise qualified, to serve as a LLW disposal facility.

c. The introduction of a new standard, particularly the coupling of the exposure standards with the drinking water standard, may introduce confusion and delays in the siting of LLW disposal facilities. In the absence of substantial and necessary improvements in the protection of the health and safety of the public, the application of the Draft standard is likely to be detrimental to progress in siting LLW disposal facilities. A significant refocusing of the application of the Draft standard on the health and safety of the public may therefore be warranted.

d. We see little technical justification based on the protection of the health and safety of the public for a 0.04 mSv (4 millirem) annual CED for drinking water. In addition, the identification of nuclides that are to be compared to the standard and the relationship of the contributing nuclides to those that are naturally present point to the need to define requirements that modify the application of the standard to selected aquifers owing to the existing levels of certain nuclides. Hence, a level of radioactive contamination that is equivalent to the 0.04 mSv annual dose is not always acceptable as an expression of an environmental standard, and EPA is seeking alternatives to the application. The potential for shifting the drinking water standard depending on the nature of the background indicates clearly that the standard is not in concert with real situations. If the EPA is to protect resources, then other means, e.g., legislative provisions, must be devised to accomplish this goal.

4. We agree with one aspect of the motivation of the EPA to provide the Draft at this time. The standards and regulations pertaining to the management and disposal of LLW by the DOE and by commercial activities are scattered throughout the Federal regulations and are not consistently defined. A single source of standards, coupled to a set of uniform NRC regulations on the management of LLW, would represent a desirable alternative.

5. We are aware of the communication from the EPA (Reference 5) offering to waive the application of the Draft standard to the NRC if the EPA drinking water protection standard were to be included in the NRC regulations.

Since the general protection afforded by existing NRC regulations already appears to be equivalent to those proposed in the Draft, and since the applicability of the groundwater standard to the LLW disposal site is apparently not technically justified, we recommend that the proposed waiver be studied further to ensure that there are benefits to the protection of the public that could only be obtained by its acceptance. We do not see such benefits at this time.

The Committee plans to continue the study of the Draft once the background information documents and other documents become available. We believe that at present there appears to be too little information for a complete technical evaluation of the Draft, and we recommend that the Commission defer its final decision. It is likely, however, that the impact of the Draft may be detrimental to the progress in implementing LLW disposal among the State compacts and, therefore, the EPA should be urged to complete the standards development process including issuance of the background information documents as soon as possible. Finally, in light of the similarities in the recommendations of the EPA regarding LLW and the NRC staff regarding residual contamination levels following decommissioning, the Commission is urged to foster a government-wide consistent and practical approach to the regulation of very low levels of contamination.

Sincerely,

Martin J. Steindler
Chairman

References:

1. Preproposal Draft, "Environmental Radiation Protection Standards for the Management, Storage and Disposal of Low-Level Radioactive Waste (40 CFR 193)," November 30, 1994
2. Radiological Criteria for Decommissioning, Federal Register, Vol. 59, No. 161, pp. 43200-43232, August 22, 1994
3. National Council on Radiation Protection and Measurements, NCRP Report 116, "Limitation of Exposure to Ionizing Radiation," p.47, March 1993
4. Clarke, Roger H., "The ICRP Principles of Radiological Protection and their Application in Setting Limits and Constraints for the Public from Radiation Sources" (Presentation to the Nuclear Regulatory Commission, January 12, 1995)
5. Letter dated October 21, 1994, from Margo T. Oge, EPA, to Robert M. Bernero, Office of Nuclear Material Safety and Safeguards, NRC, regarding EPA's preferred option for dealing with groundwater protection at commercial LLW disposal sites