May 30, 2000

Mr. Thomas Cardwell
Chair E-36 Ad Hoc TENORM Committee
Bureau of Radiation Control
1100 West 49th Street
Austin, TX 78756-3189

Dear Mr. Cardwell:

I am responding to your memorandum received February 2, 2000, requesting peer review of the Conference of Radiation Control Program Directors, Inc. (CRCPD) Part N Implementation Guidance for Regulation and Licensing of Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM). The CRCPD guidance interprets and implements the Suggested State Regulation contained in Part N, "Regulation and Licensing of Technologically Enhanced Naturally Occurring Radioactive Material," which was issued on April 1, 1999. NRC staff provided comments on a draft of the Part N final regulations on March 15, 1999. In our March 15th letter, we noted that our comments could be incorporated into a future revision of Part N. As a general comment, we suggest you consider those comments, where appropriate, for incorporation into the implementing guidance. The final revision of Part N, issued on April 1, 1999, does not appear to have incorporated our March 15th comments.

We believe the guidance contains much useful information for regulators and the regulated community in addressing and mitigating risks associated with TENORM. It provides clear and easily understood explanations of such topics as modeling, radiation measurements, and financial assurance.

Although it is not possible for NRC to provide concurrence, since TENORM is outside of NRC's regulatory jurisdiction, NRC supports the guidance and has identified a number of specific comments (enclosed). Please note that our comments are for your use in either considering possible revision to the current text of the guidance or for subsequent revisions of the guidance. After you have had the opportunity to review our comments, if you believe it would be helpful, NRC staff is prepared to discuss and review the comments with CRCPD staff. We also note that there is currently an effort underway (as identified in the Commission's March 9, 1999, Staff Requirements Memorandum) to "rationally address the risk from NORM, TENORM, low-level source material, and materials containing less than 0.05% uranium and/or thorium."

If you have any questions, or would like to arrange for discussion with NRC staff, please contact me or James Kennedy, Office of Nuclear Material Safety and Safeguards, at (301) 415-6668 or INTERNET: JEK1@NRC.GOV.

Sincerely,

/RA by Frederick C. Combs Acting for/
Paul H. Lohaus, Director
Office of State and Tribal Programs

Enclosure:
As stated

cc: Bruce Hirschler

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NRC Staff Comments on Conference of Radiation Control Program Directors' "Part N Implementation Guidance for Regulation and Licensing of Technologically Enhanced Naturally Occurring Radioactive Material"

1. The Committee should review our March 15, 1999, comments on Part N, and determine which, if any, can be addressed in this guidance document without causing a conflict with the final Part N.

2. P.1 - The document states that "Although the USNRC limits [of 100 mrem/yr and 25 mrem/yr] were adopted for *byproduct* [emphasis added] radioactive material. . ." We suggest that the word "byproduct" be changed to "Atomic Energy Act." Byproduct material is just one of the kinds of materials covered by the dose limits.

3. P.3 - For clarification purposes, we suggest that the first two sentences of the first paragraph of section 2.1 be replaced with "Part N applies to naturally occurring radioactive materials, other than source material, whose concentration has been technologically enhanced."

4. PP. 5-8 - These pages discuss the licensing of a facility managing TENORM and suggest that a general license is adequate for most facilities managing TENORM. However, the guidance appears to expect that the generally licensed TENORM facility will conduct many activities associated with the control of radiation that are typically required of specific licenses. For example, the guidance states that the general licensee must control contamination, worker and public exposures and ensure that activities associated with higher potential doses (such as facility decommissioning) are performed by a specifically licensed entity. In addition, the guidance indicates that the TENORM facility must ensure that equipment released with TENORM contamination in excess of the "unrestricted use" limit is used in a prescribed manner. It is unclear from the guidance how the regulatory authority will ensure that a general licensee will maintain the suggested radiation protection program or ensure that the equipment is used in the prescribed manner. We suggest that additional guidance on how this will be accomplished be included in the guidance.

5. P. 16 - In paragraph four of section 5.5.2, the guidance indicates that the Environmental Protection Agency's Toxicity Characteristic Leaching Procedure (TCLP) may be used to develop information to calculate distribution coefficients for radionuclides in soil. As the TCLP was designed to simulate the movement of hazardous waste in a conventional landfill, it is not clear if this procedure is appropriate for developing the distribution coefficients for radionuclides in the environment. We suggest that the use of the TCLP, as an appropriate method to develop distribution coefficients, be better validated before including this in the guidance as a reference.

6. P. 20 - Section 6.2 indicates that the Part N alpha contamination limit is 5000 disintegrations per minute per 100 square centimeters (5000 dpm/100cm^2), which is the limit for most uranium isotopes and their decay products. In addition to the above alpha contamination limit, NRC's Regulatory Guide 1.86 states that the acceptable levels of average contamination for nuclides, such as Ra-226 and Ra-228, is 100 dpm/100cm^2. Given that Ra-226 and Ra-228 can be present in TENORM, we suggest that section 6.2

should reflect that more restrictive contamination limits (i.e., for average, maximum, and removable contamination) may be imposed for certain nuclides such as Ra-226 and Ra-228. We suggest that Section 6.2 be revised to ensure that it is consistent with contamination levels in Regulatory Guide 1.86.

7. P. 21 - Statements on this page appear to advocate the use of exposure levels as screening levels for determining the fixed and removable contamination levels on equipment. As this method of evaluating contamination levels on equipment can be impacted by numerous factors, which may not be obvious to a general licensee, we suggest that the use of this method be de-emphasized in the guidance.

8. P.28 - The information regarding the computer codes in Table 1 “Selected Models for Assessing the Radiation Exposure from Residual Radioactivity” does not appear to contain current information. We suggest that the table be updated to reflect more current information on these codes.