November 28, 1994

MEMORANDUM TO: Joseph J. Holonich, Chief
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Recovery Projects Branch
Division of Waste Management/NMSS

FROM: Michael J. Bell, Chief
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SUBJECT: TECHNICAL EVALUATION OF THE RESPONSE TO SITE CLEANUP ISSUES ON THE TUBA CITY DRAFT COMPLETION REPORT

We have reviewed the Department of Energy's response (dated February 3, 1993,) to NRC's comments on the draft Completion Report for Tuba City, Arizona. Our evaluation of the site cleanup issues is attached. In addition, if a statement in Appendix H is not a typographical error, there is a new issue on the radon barrier thickness. If you have any questions, please contact Elaine Brummett at 415-6606.

Attachment: As stated

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TECHNICAL EVALUATION OF THE RESPONSE TO SITE CLEANUP
ISSUES ON THE TUBA CITY DRAFT COMPLETION REPORT

Verification Procedures (Appendix J)

ISSUE: Radium (Ra-226) data were not completed for two verification grids. Data were interpolated from surrounding grids, but not according to any known approved method.

RESPONSE: The Department of Energy (DOE) indicated that the two uncompleted verification grids were discovered after construction of the drainage system over that area, and that subsequent soil sampling would have been expensive. DOE determined that deriving a Ra-226 value by averaging the values of surrounding grids was similar to the grid averaging allowed at the Riverton Site for Th-230 in the saturated zone.

DISCUSSION: NRC staff cannot approve the averaging of surrounding grid values as an alternative to Ra-226 analysis to verify that the soil cleanup standard has been met. Also, this situation is not similar to the saturated zone at the Riverton Site because a difficult sampling situation did not exist at the time of verification. However, considering that the two grids will remain covered by the disposal cell drainage system that has been designed to the 1,000-year standard, the averaging procedure is acceptable in this case as there is no risk to human health due to any possible remaining contamination.

Considering this verification oversight and the 10 grids in Area Q (now beneath drainage ditches next to the pile) that were not verified, DOE should consider review of the Uranium Mill Tailings Remedial Action Project's verification quality control procedures.

ACTION NEEDED: None

ISSUE: A soil background Ra-226 value of 1.5 pCi/g was used for establishing the cleanup standard, rather than the 0.9 pCi/g value stated in the final Remedial Action Plan.

RESPONSE: The background value of 1.5 pCi/g was measured immediately prior to remedial action using the soil counting system that produced the verification results of the majority of the site.

DISCUSSION: The Completion Report indicates that the average Ra-226 value of the backfill soil was less than 1 pCi/g (Figure J.6). The data to support the background value used for soil cleanup and verification is not in Appendix J.

ACTION NEEDED: DOE should provide the background Ra-226 data used to calculate the 1.5 pCi/g value. DOE should also indicate why the backfill soil has a lower average Ra-226 concentration than the DOE background value.

Attachment

Test Results (Appendix J)

ISSUE: Radium (Ra-226) analyses indicated cleanup standards were exceeded at four surface and five subsurface locations (verification grids).

RESPONSE: DOE proposes to add a paragraph to Appendix J stating that radon flux estimates calculated for each of the nine verification grids indicate that the potential radon progeny level in a house built on any of the grids would not exceed the standard. DOE also points out that 9,010 soil samples were analyzed (one composite sample per grid), and 7,559 grids were verified by the RTRAK gamma survey system.

DISCUSSION: NRC staff note that the radon flux approach can be used to support that the current health risk from these deposits is low, but this conclusion is not apparent in the proposed paragraph. A possible conclusion from the proposed statement is that calculating an estimated radon flux to derive an estimated radon progeny level is an alternative method to Ra-226 analysis for verifying soil cleanup. Such a conclusion would not be correct. In addition, any modeling for long-term radon flux estimates must consider that the soil covering subsurface deposits might not remain.

Of the four surface grids, the highest Ra-226 value is 8.9 pCi/g. This is 37 percent higher than the surface cleanup standard of 6.5 pCi/g (5 pCi/g plus background), and the lack of further excavation should be justified.

The five subsurface grids (verified by the RTRAK gamma survey) are now covered by 3 feet of fill and are part of the site drainage system, according to Appendix J, so long-term control of this radioactivity is ensured.

ACTION NEEDED: Additional language should be added to the Completion Report Appendix J, to qualify the use of the radon flux estimate, and to justify not excavating the four girds that exceed the surface cleanup standard. In addition, DOE should indicate if these four grids will be identified in the land annotation records, and DOE should provide the quality control Ra-226 data for the fifteen RTRAK verified grids that exceeded the surface cleanup standard.

ISSUE: Six thorium (Th-230) analyses exceeded the cleanup standard and were not addressed.

RESPONSE: DOE indicated that all the values in the "Corrected F.A.S.T. (pCi/g)" column meet the cleanup standard.

DISCUSSION: The Th-230 data using the F.A.S.T. method was "corrected" based on a linear regression analysis with vendor laboratory values from duplicate samples. Since DOE no longer uses the F.A.S.T. method of analysis, DOE should demonstrate that reliable Th-230 verification data were obtained at this site.

ACTION NEEDED: DOE should indicate why the F.A.S.T. method of Th-230 analysis is no longer used in the Uranium Mill Tailings Remedial Action Project, and why the Th-230 verification data at this site is reliable.

POTENTIAL NEW ISSUE

Appendix H (Volume 3) states that 3 feet of radon barrier was placed. However, the Remedial Action Plan and the As-Built Drawing (TUB-PS-10-0825) indicate that 3.5 feet of radon barrier were to be placed.

ACTION NEEDED: DOE should indicate if there was a change to the radon barrier design after the RAP was approved. If so, a corrected As-Built Drawing is needed. If the barrier thickness was not changed, then DOE should provide a corrected page for Appendix H.