

November 6, 1996

Mr. Richard Sena, Acting Director  
Environmental Restoration Division  
Uranium Mill Tailings Remedial Action  
Project  
U.S. Department of Energy  
2155 Louisiana NE, Suite 4000  
Albuquerque, NM 87110

SUBJECT: REVIEW OF THE FINAL COMPLETION REPORT AND THE FINAL AUDIT REPORT FOR  
THE GUNNISON, COLORADO, URANIUM MILL TAILINGS REMEDIAL ACTION  
PROJECT SITE

Dear Mr. Sena:

By a letter of June 13, 1996, the U.S. Department of Energy (DOE) transmitted the Final Completion Report (CR) and the Final Audit Report (AR) for the Gunnison, Colorado, Uranium Mill Tailings Remedial Action Project site for review and comment by the U.S. Nuclear Regulatory Commission. The CR includes both the processing and disposal sites. This letter provides the results of the NRC staff's review of the completion documentation.

Based on its evaluation of the CR, the NRC staff has identified areas where additional information is needed (see Enclosure 1). Furthermore DOE, in order to expedite its transmittal of the Final Completion Report for staff review, has identified a number of in-progress documents that, when finalized, will form a part of the CR. The yet-to-be-submitted documents are identified in Enclosure 2. The NRC staff has no comments on the AR.

To fine tune the content of future "streamlined" CR's, some suggestions relative to the Gunnison CR format and content are included in Enclosure 3. If you have any questions regarding this subject, please contact the NRC Project Manager, Harold E. Lefevre, at (301) 415-6678.

Sincerely,

Original Signed By:  
Daniel M. Gillen, Assistant Chief  
Uranium Recovery Branch  
Division of Waste Management  
Office of Nuclear Material Safety  
and Safeguards

Enclosures: As stated

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S. Hamp, DOE Alb  
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REQUEST FOR INFORMATION CONCERNING THE  
"GUNNISON, COLORADO, PROCESSING AND DISPOSAL SITES  
FINAL COMPLETION REPORT"

1. DISCUSSION: Volume 1, Critical Review Issues Section, contains a table labeled "Summary of Geotechnical Test Results" which indicates that the radon barrier material averaged 4.8 percent bentonite. However, Volume 3, Appendix E, Radon Barrier Material, page 3, indicates that the average of the 105 bentonite verification tests performed was 5.3 percent with only one test (at 4.8 percent) falling below 5.0 percent. Page 3 further indicates that a sensor malfunction failed to indicate all the bentonite in the single sample measuring less than 5.0 percent. The U.S. Department of Energy (DOE) therefore considers (and the staff concurs) that all tests demonstrated that the 5.0 percent minimum value was achieved.

COMMENT: Revise the bentonite value in the table to reflect an average of 5.3 percent rather than the 4.8 percent currently indicated.

2. DISCUSSION: In Volume 1, Critical Review Issues Section, the page titled "Verification Measurements & Supplemental Standards Summary Charts" is followed, not by the two referenced summary charts, but by the Type D Riprap Comparisons chart. Page 2 of the Critical Review Summary Section references Volume 3, Appendices J and K, for the two summary charts. No charts entitled "summary" were noted in either appendix. It is not clear to the staff whether summary charts were omitted from the stated location in the Critical Review Issues Section, or whether the summary charts were just not identified as such in either Appendix J or Appendix K.

COMMENT: Provide the appropriate summary charts for each of the five chart categories identified in the Critical Review Summary Section of the Critical Review Issues Section (i.e. Verification Measurements and Supplemental Standards) or provide the proper reference to what DOE considers summary charts.

3. DISCUSSION: The U.S. Nuclear Regulatory Commission (NRC) and DOE agreement relative to streamlining the both the CR content and NRC's CR review documentation included the omission of many as-built drawings traditionally submitted as part of the CR, as well as the retention and continued submission of other as-built drawings. It is the staff's understanding that well abandonment drawings were to be included among those as-built drawings to be submitted with the CR.

COMMENT: Provide both the Processing Site and Disposal Site as-built well abandonment drawings identified in CR Volume 2, Appendix D, Drawing No. GUN-GE-10-0102.

Enclosure 1

4. DISCUSSION: Page 3 of Appendix J (Verification Measurements) indicates that the 1000-year bulk average Ra-226 is 10.6 pCi/g, with a maximum value of 17.5 pCi/g, excluding supplemental standard areas. However, the 1000-year Ra-226 value itself is a supplemental standard value for residual Th-230.

COMMENT: Clarify that these values exclude the supplemental standard areas for Th-230 in the water table.

5. DISCUSSION: Staff notes that about 38 verification grids will contain 17 to 17.5 pCi/g Ra-226 in 1000 years because of residual Th-230. This is at, or just below the bulk Th-230 limit for areas above the water table. This remediation does not appear to be ALARA.

COMMENT: DOE should justify that reasonable attempts were made to remediate Th-230 in these areas.

6. DISCUSSION: Based on the contamination limits indicated on Appendix J, Drawing No. GUN-SV-0001, data for a number of grid blocks has not been provided.

COMMENT: Submit additional grid data (Table J.4) for blocks A-30 to 32, A-37 to 40, A-45 to 46, B-22, B-25 to B-28, B-30, B-31, B-36 and B-44.

7. DISCUSSION: Some grids in blocks E-12 to 16 and E-20 to 24 do not have data indicated in either Appendix J or Appendix K.

COMMENT: Provide grid data as necessary, or justification for why there is no data.

8. DISCUSSION: Appendix J does not address the assessment of uranium contamination. The Remedial Action Plan (RAP) indicated that uranium concentrations would be assessed, and if remedial action was indicated, a supplemental standard would be proposed.

COMMENT: Summarize the Special Study that: (1) assessed the potential impacts of residual uranium soil contamination on ground water and (2) evaluated the need for a supplemental standard for uranium (see page 2 of DOE's Site-Specific Analysis, January 1994).

9. DISCUSSION: Appendix K, page 3, states that for Th-230 in the water table, at the site manager's discretion, one foot of select fill (high clay content soil) will be placed as low in the excavation as practicable where Th-230 in the finer portion of the sample is greater than 175 pCi/g (approximates 15 pCi/g bulk averaged Ra-226 in 1000 years) to control radon emission. However, page 5 states that 41 grids

in the subpile area had greater than 175 pCi/g Th-230, but select fill was not placed (Figure K.1). DOE's ALARA analysis of the future potential health risks, due to the 41 grids, consists of radon flux estimates for each grid (average values were used for other supplemental standard areas). DOE's flux model assumes that: (1) there is a low water table and the fill is saturated, (2) the Th-230 remains buried, and (3) the risk is to workers in a building on the modeled grid. DOE concludes that only one grid exceeds 650 mrem/yr, which is the dose expected at 0.02 WL (radon progeny concentration) for 50% resident occupancy. The estimated dose for that one grid was 1600 mrem/yr.

COMMENT:

- a. In order to substantiate the modeling assumptions and resulting risk assessments, DOE should indicate in the CR how the backfill on the site remains at the current thickness for at least 200 years. If backfill thickness cannot be maintained, the radon flux models should be revised and other exposure pathways should be considered in addition to radon inhalation.
- b. Indicate in the CR what commitments, if any, the State of Colorado has made in terms of land use restrictions or required efforts to mitigate future radiation exposure due to the large areas of elevated Th-230.
- c. Use a generally accepted public dose limit such as 100 mrem/yr, for comparison to the modeling results.

10. DISCUSSION: The second sentence on page 8 of Appendix K indicates that grid B-43-16 had the highest 1000-year Ra-226 of grids not receiving select fill that had Th-230 in the fines of less than, or equal to 175 pCi/g. However, Table K.1 indicates that the grid B-43-16 bulk Th-230 level was 114 pCi/g which would mean the Th-230 concentration in the fines portion was 457 pCi/g (fines represent about 25 percent of the bulk sample). Also, grids B-43-8 and D-17-19 did not receive select fill and have higher 1000-year Ra-226 values than did grid B-43-16.

COMMENT: Correct page 8 of Appendix K based on data presented in Table K.1.

11. DISCUSSION: As indicated by Comments 9 and 10, the Generic Protocol for Th-230 Cleanup/Verification says one foot of select fill (high clay content soil) will be considered for placement in the excavation where Th-230 in the finer portion of the sample is greater than 175 pCi/g, but Table K.1 demonstrates that implementation was for 175 pCi/g bulk Th-230. Since the fines portion averages 25 percent of the bulk sample, DOE used a guideline value four times higher than expected.

COMMENT: Revise Appendix K to address the above matter, and to point out that grid C-48-23 has a 1000-year Ra-226 value of 187 pCi/g and a bulk Th-230 concentration of 524 pCi/g.

12. DISCUSSION: Appendix E (Material Testing) of the CR includes some data on the placed contaminated material and on the Fill Type B used for the frost protection layer.

COMMENT: Provide the average placement moisture for the above materials for comparison to the long-term values used in the radon flux model.

13. DISCUSSION: Design calculations have not been included in the CR. The Table of Contents (Volumes 2 and 4/4A) indicates that an interested party either: (1) refer to the RAP or (2) contact the DOE. Since the NRC staff has not been privy to radon barrier design calculations subsequent to its September 1993 Final Technical Evaluation Report (FTER) for the RAP these post-FTER calculations should have been included within the CR. This is especially true since the NRC staff made a specific FTER request that the radon barrier design calculations be incorporated within the CR. Additionally, based on a September 4, 1996, conversation, the DOE's Site Manager indicated that this calculation had not yet been made but would be made in the near future and shortly thereafter provided to the NRC staff for its review.

COMMENT: Provide this calculation as soon as possible, so that NRC staff can complete this particular element of its CR review.

IDENTIFICATION OF ITEMS NOT INCLUDED IN THE  
COMPLETION REPORT BUT REQUIRED  
PRIOR TO NRC'S CONCURRENCE THAT THE GUNNISON PROJECT  
MEETS THE APPLICABLE 40 CFR PART 192 STANDARDS

Item No.

Topic

AS-BUILT DRAWINGS

- 1 VERTICAL AND OBLIQUE AIR PHOTO AREA (DRAWING NO. GUN-GE-10-0315)\*
- 2 AS-BUILT TOPOGRAPHIC MAP (DRAWING NO. GUN-GE-10-0316)\*

OTHER ITEMS

- 3 EROSION PROTECTION MATERIALS (TYPES C AND D RIPRAP) - AVERAGE, MAXIMUM, AND MINIMUM THICKNESSES ARE PENDING\*\*
- 4 VOLUME (CUBIC YARDS) OF RIPRAP AND BEDDING MATERIALS (CR VOL. 3, APPENDIX H, PAGE 2)\*\*\*

\* Identified in DOE's June 13, 1996 CR/AR/LTSP cover letter as in progress.

\*\* CR Volume 1, Appendix E, Disposal Cell Layer Thickness As-Built Chart

\*\*\* CR Volume 3, Appendix H, page 3.



SUGGESTIONS FOR DOE'S IMPROVEMENT OF  
FUTURE COMPLETION REPORTS

1. Design Criteria and Design Calculations: Although NRC had indicated that such information was not required to be submitted by DOE as part of the Completion Report, this agreement was meant to apply to design criteria and calculations previously reviewed and concurred in by the NRC staff. Criteria and calculations that have not been reviewed by the NRC post RAP, especially those having been identified specifically by the staff in the FTER for inclusion in the CR, should be either included with the CR or submitted to the staff for review prior to finalization of the CR.
2. Ensure that the CR Has Been Properly Assembled: Ensure that summary charts and other descriptive material have been collated properly and that the referenced charts and other materials have been appropriately and correctly identified (see NRC CR Comment 2 for a specific example).
3. Provide Tables of Contents

A number of CR appendices are quite lengthy. Because of the volume of material included within such appendices simply locating (or even identifying) materials contained within the appendices consumes considerable NRC staff review time. DOE should consider compiling and submitting tables of content for appendices comprised of multiple tables, figures, and separate reports in order to facilitate staff review for these appendices. Additionally, consideration should be given to the numbering of pages within the appendices.