

UNITED STATES NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

October 18, 1999

Mr. George Rael, Director U.S. Department of Energy Albuquerque Operations Office ERD/UMTRA P.O. Box 5400 Albuquerque, NM 87185-5400

SUBJECT: ACCEPTANCE OF COMPLETION REPORT FOR GUNNISON, COLORADO, VICINITY PROPERTY GU-013/014S

Dear Mr. Rael:

By letter dated September 28, 1999, the U.S. Department of Energy (DOE) provided the Gunnison, Colorado, Vicinity Property GU-013/014S Completion Report (VP CR) to the U.S. Nuclear Regulatory Commission (NRC) for review and concurrence. NRC staff's review of the VP CR is enclosed (Enclosure 1).

Concurrence by NRC on this VP CR is required because special circumstances resulted in supplemental radiological cleanup standards being invoked during remedial action. The NRC staff concludes that the information provided by DOE in the VP CR provides reasonable assurance that supplemental standards for soil cleanup have been properly applied. Therefore, the NRC staff concurs that the use of supplemental standards and the remedial action of the vicinity property were completed in accordance with the Environmental Protection Agency standards. The signed *NRC Review Form for Supplemental Certification of Vicinity Properties*, showing NRC concurrence, is also enclosed (Enclosure 2).

G. Rael

If you have any questions concerning this letter or the enclosures, please contact the NRC Project Manager, Richard Weller, at (301) 415-7287.

Sincerely,

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John J. Surmeier, Chief Uranium Recovery and Low-Level Waste Branch Division of Waste Management Office of Nuclear Material Safety and Safeguards

WM-61

Enclosures: 1. U.S. NRC Staff Review of the Completion Report for Gunnison Vicinity Property GU-013/014S

2. NRC Review Form for Supplemental Certification of Vicinity Properties

cc: L. Woodworth, DOE Alb F. Bosiljevac, DOE Alb J. Hylko, TAC Alb J. Artiglia, TAC Alb

K. Johnson, TAC Alb

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ENCLOSURE 1

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U. S. NUCLEAR REGULATORY COMMISSION STAFF REVIEW OF THE COMPLETION REPORT FOR GUNNISON VICINITY PROPERTY GU-013/014S

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the April 1, 1998 version of the Vicinity Property Completion Report (VP CR) for the Gunnison Vicinity Property GU-013/014S, which was transmitted by U.S. Department of Energy (DOE) letter dated September 28, 1999.

The VP CR describes the remedial actions (radiological cleanup) and verification activities performed at the VP GU-013/014S. This Property lies within Gunnison County, Colorado, and includes the Gunnison County Airport.

Remedial action was completed on Vicinity Property GU-013/014S. A total of 48,205 cubic yards of soil was removed from the property. Radiological surveys conducted following the removal of contaminated material, but before property restoration, demonstrate that, with the application of supplemental standards, the property has been cleaned up to EPA standards.

Because the reason for the NRC's review of this VP CR is that the supplemental standards were used at the VP, the NRC staff review has been limited to areas related to the use of the supplemental standards for the VP.

Large areas of deeply buried Th-230 contaminated soil material remain at the former Gunnison processing site. The Th-230 contamination is primarily associated with the finer fraction of the cobbly soils. Portions of the area are covered with a one foot thick layer of clay material to inhibit the future release of radon followed by additional cobbly material and a layer of clayey top soil material.

The Gunnison Site CR, including the supplemental standards recommendation, has been approved by DOE and concurred with by the NRC. In consideration of the Site CR supplemental standards with regard to health risk, it can be concluded that the dose to a member of the public working in a building erected over any of the area in 1000 years would be less than a dose received by a member of the public living in a house with an indoor radon progeny concentration of 0.02 Working Levels (i.e.,4pCi/l an EPA habitable structure standard). And, since this area lies on airport property in close proximity to the emergency runway, it is very unlikely that a building will be erected, thus reducing the potential hazard to the public from radon emissions to negligible levels. Additionally, thorough evaluation of the saturated zone, with the application of the clay barriers, and ALARA analysis indicate that the cost relative to the long term benefits for the removal of Th-230 in these areas are excessive. Therefore, the application of supplemental standards for these VPs are appropriate.

The radiological conditions within the supplemental standards areas are summarized as follows:

Radon flux estimates were calculated based on the 1000-year estimated Ra-226 concentrations and current low water table information to assess the impact of future radon emissions. It was conservatively assumed in the radon flux analysis that groundwater could drop to lower levels and remain at those levels during the drought years. Solubility of Th-230 was assessed to determine if there were impacts to groundwater quality or if there was a potential for flushing the remaining Th-230 out of

the area. The risk from airborne Th-230 contamination resulting from excavation to place underground utility lines was performed. Future gamma radiation exposures were also assessed for the supplemental standards areas. The future health risk assessments can be divided into two categories, risk to residents living in the vicinity of the processing site, and risks to individuals working onsite or at a building erected on the former processing site.

The primary potential health risk to residents living in the vicinity of the processing site and the VPs is from radon emissions. The average estimated 1000-year radon flux from the entire site was calculated using flux estimates from the non-select fill areas and select fill areas to determine the effect of the remaining contamination on the environment surrounding the processing site. Average 1000-year Ra-226 concentrations and average backfill thicknesses were used in the calculations. As discussed above, when the water table rises and saturates the select fill region at the select fill locations, the radon flux rates and radiation risk from radon will be reduced to negligible levels. However, for the analysis, the select fill areas were conservatively assumed to be unsaturated to illustrate a worst case scenario. The area-weighted estimated radon flux for the cobbly area of the site, excluding supplemental standard areas, was 1.38pCi/m²s. The area-weighted estimated radon flux for the site including the supplemental standards areas was 1.42 pCi/m²-s, which is considerably less than 3.90 pCi/m²-s, the estimated value required to produce 0.02 Working Levels (the EPA habitable structure standard). The small difference with the conservative area-weighted radon flux estimates indicates that there will be very little additional potential hazard associated with radon emissions from the supplemental standards areas for the general public living in the vicinity of the processing site and the VPs in 1000 years.

Available information indicates that Th-230 contamination in the saturated zone is likely to remain in its present location given the current groundwater and surface soil conditions. Therefore, the risk to the general public from Th-230 contamination (from the subpile areas and the vicinity properties) in the groundwater is considered negligible. Due to the depth of materials and the relative low levels of estimated 1000-year Ra-226 concentrations, estimated gamma radiation exposures to the general public from the site and supplemental standards areas were negligible.

The primary future potential health risk to individuals working in a building erected over the supplemental standards areas on the former processing site is also associated with radon emissions. Due to the saturation of the select fill area, radon emissions would be negligible for those areas that received select fill. However, radon flux modeling of the select fill areas was performed to assess the potential risk in the unlikely event that the select fill did not become saturated. The worst case estimated radon flux for the select fill areas was 3.7 pCi/m²-s which is less than 3.9 pCi/m²-s, the estimated value required to produce 0.02 Working Levels in a slab-on-grade structure erected on site. The worst case estimated radon flux of all the areas not receiving select fill and having Th-230 concentrations in the fines of less than 175 pCi/g was 3.5 pCi/m²-s. This value is less than 3.9 pCi/m²-s. Based on the assumptions given, it can be concluded that the radon risk from those areas not receiving select fill (and<175PpCi/g Th-230 in the fines) and areas receiving select fill is less than that associated with the risk to a person living in a residence cleaned up to EPA habitable standards (0.02 Working Levels).

In addition to the risk associated with future radon emissions a risk analysis was performed to estimate the potential risk associated with excavating Th-230 contaminated materials to place utility lines in the supplemental standards areas at the site or VPs. The conservative risk assessment indicates that a utility worker has the potential of receiving less than 30 mrem from exposure to airborne Th-230 contamination. Using the maximum 1000-year Ra-226 concentration of 187 pCi/g for the site, the maximum gamma exposure to a utility worker for an 80 hour time period for utility line placement would be approximately 15 mrem. Added together, these exposures are less than the 100 mrem annual limit outlined in NRC and DOE radiation protection standards for members of the public.

NRC Staff Conclusion

The staff thus concludes that the information provided by the DOE and its contractor in the VP CR and other documents provides reasonable assurance that remedial action of this VP and the use of supplemental standards were appropriate, in accordance with EPA standards.

REFERENCES

DOE (U.S. Department of Energy) Letter to John J. Surmeier, Chief, Uranium Recovery Branch, Division of Waste Management, Nuclear Materials Safety and Safeguards, U.S. Nuclear Regulatory Commission, dated September 28, 1999, with enclosed copies of the Gunnison, Colorado, Gunnison County Airport UMTRA project site VP GU-013/014S completion report. U.S. Department of Energy, Albuquerque Operations Office, Environmental Restoration Division, Uranium Mill Tailings Remedial Action Team, Albuquerque, New Mexico.

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ENCLOSURE 2

The Department of Energy (DOE) has determined that the remedial action at the following vicinity property (VP) has been completed and thereby complies with supplemental standards invoked by DOE under 40 CFR, Subpart C, specifically Subsections 192.21 and 192.22.

- [] NRC concurrence for the Radiological Engineering Assessment (REA) was requested on:
- [X] Supplemental standards were not in the REA, special circumstances required that supplemental standards be invoked during remedial action.

Frank D. Bosiljevac, DOF Certification Officer

Based on the information and certification provided by the DOE, the NRC:

Concurs that the remedial action at the subject VP has been competed under its authority provided by the Uranium Mill Tailings Radiation Control Act (UMTRCA), Section 104 (f)(1) and as described in the Memorandum of Understanding (MOU), Appendix A, Section 3.4.

- [] Concurs, as above, except for the following conditions:
 - 1. _____2.
 - 3.
 - [] See attached sheets for any additional provisions.
- [] Needs additional information to make a concurrence decision. This information consists of:

See attached sheets for any additional informational needs. []10/18/99 Date John Surmeier, Chief Uranium Recovery and Low Level Waste Branch Office of Nuclear Material Safety and Safeguards

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10/18/99 Date

John Surmeier, Chief Uranium Recovery and Low Level Waste Branch Office of Nuclear Material Safety and Safeguards

If you have any questions concerning this letter or the enclosures, please contact the NRC Project Manager, Richard Weller, at (301) 415-7287.

Sincerely,

Original signed by John J. Surmeier, Chief Uranium Recovery and Low-Level Waste Branch Division of Waste Management Office of Nuclear Material Safety and Safeguards

Enclosures: 1. U.S. NRC Staff Review of the Completion Report for Gunnison Vicinity Property GU-013/014S

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 - J. Hylko, TAC Alb
 - J. Artiglia, TAC Alb
 - K. Johnson, TAC Alb

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