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UNITED STATES GOVERNMENT

DEPARTMENT OF ENERGY

memorandum

National Nuclear Security Administration
Los Alamos Site Office
Los Alamos, New Mexico 87544

DATE: **JUL 02 2010**
REPLY TO:
ATTN OF: COR-SO-6.30.2010-264748
SUBJECT: Response to Final Categorization for Material Disposal Area C

TO: Robert L. McQuinn, Associate Director, Nuclear and High Hazard Operations, Los Alamos National Security, LLC, MS-K778

References:

- 1) Letter AD-NHHO:10-021, from Robert L. McQuinn, ADNHHO, LANS, to Joseph C. Vozella, SO, LASO, Subject: "Final Hazard Categorization for Material Disposal Area C", dated February 9, 2010
- 2) Letter AD-NHHO:10-102, from Robert L. McQuinn, ADNHHO, LANS, to Joseph C. Vozella, SO, LASO, Subject: "Re-submittal of Final Hazard Categorization for Material Disposal Area C", dated April 19, 2010
- 3) Memorandum COR-SO-5.13.2010-254916, from Joseph C. Vozella, COR, LASO, and Donald L. Winchell, Jr., Manager, LASO, to Robert L. McQuinn, ADNHHO, LANS, Subject: "Response to Final Hazard Categorization for Material Disposal Area C", dated May 17, 2010
- 4) Letter AD-NHHO:10-145, from Robert L. McQuinn, ADNHHO, LANS, to Joseph C. Vozella, SO, LASO, Subject: "Second Re-submittal of Final Hazard Categorization for Material Disposal Area C", dated June 10, 2010
- 5) Contract Number DE-AC52-06NA25396, Los Alamos National Security, LLC and the Department of Energy, National Nuclear Security Administration (NNSA), Section I, "Contract Clauses", Clause H-2, "Performance Direction"

In Reference (1) the Los Alamos National Security, LLC (LANS) submitted to Los Alamos Site Office (LASO) a request for the Final Hazard Categorization (FHC) of Material Disposal Area C (MDA-C) from a Hazard Category 2, HC-2, nuclear facility to a radiological facility. The submittal was later withdrawn by LANS. In Reference (2), LANS resubmitted the request. In the re-submittal, LANS' request of FHC limits to the following two activities associated with MDA-C: site maintenance and drilling/sampling or characterization. Site maintenance includes activities such as vegetation removal to ground level, but not removal by digging, pulling, or pushing. Drilling will be used to collect subsurface samples of the soil surrounding the waste pits and shafts for characterization purposes. Intentionally drilling into the radioactive waste inventory at MDA-C will be prohibited. In Reference (3), LASO disapproved LANS' request in Reference (2) based on the failure to fully analyze the consequences of an underground fire. In Reference (4), LANS resubmitted the requested analysis for Final Categorization of MDA-C.

Los Alamos Site Office recognizes that assumptions have been made to estimate the radiological inventory associated only with limited activities as described with no intrusive sampling. LASO accepts the assumptions given and considers the base information to be adequate. The Hazard Analysis assumes waste pits and shafts will be covered by the overburden of 3 to 12 feet of crush tuff as described in the approved "Documented Safety Analysis (DSA) for the Nuclear Environmental Sites (NES) at Los Alamos National Laboratory" (NES-ABD-0101, R.2, September 2009).

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35512



Los Alamos Site Office hereby approves the LANS request to downgrade the Final Hazard Categorization of the MDA-C to below HC-3, a radiological facility, with the following Conditional of Approval.

CONDITION OF APPROVAL

If the MDA-C is scheduled for remediation or intrusive characterization into the radioactive waste inventory, the Hazard Analysis would need to be expanded to include hazards of waste pits and shafts and its contents for consideration of consequences to the public, worker and the environment. Any activity that will challenge the assumptions of the hazard analysis would constitute a Potential Inadequate Safety Analysis. If such an event were to occur, the final hazard categorization is required to be re-analyzed and to be approved by LASO.

If the Contractor believes the Performance Direction violates Contract No. DE-AC52-06NA25396, Clause H-2, entitled: "*Performance Direction*", the Contractor shall suspend implementation of the Performance Direction and promptly notify the LASO Contracting Officer of its reasons for believing that the Performance Direction violates this clause. Oral notification to the Contracting Officer shall be confirmed in writing within ten calendar days of the oral notification. To contact the LASO Contracts Office, call (505) 665-9175.

If you have any questions regarding this Memorandum, you may contact Sam Cheng at (505) 667-1613.



Joseph C. Vozella
Contracting Officer Representative
Safety Operations



Donald L. Winchell, Jr.
Manager

Attachment

cc w/attachment:

D.F. Nichols, NA-1, HQ/FORS
J.J. McConnell, NA-171, HQ/FORS
R.E. Snyder, OOM, LASO
LASO AMs
LASO, SO
LASO, FO
R.M. Poole, CAS, LASO
B.P. Broderick, DNFSB, LASO
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R.M. Rafferty, PCM-DO, LANS
LANS, SBD
Records Center, LASO
Official Contract File, LASO
COR File, SO, LASO

ATTACHMENT 1

BACKGROUND

Los Alamos National Security, LLC (LANS) submitted a request for the Final Hazard Categorization (FHC) to downgrade the Material Disposal Area C (MDA-C) from a Hazard Category 2 (HC-2) nuclear facility to a radiological facility. Based on a qualitative hazard analysis, LANS demonstrates that MDA-C, with its Material-at-Risk (MAR) from the worst-case accident that is available for dispersion, is less than the Threshold Quantities (TQ) for Category 3 listed in Table A.1 of DOE-STD-1027-92, Chg 3, and thus can be categorized as a radiological facility. LANS follows DOE-STD-1120-2005, Vol. 2 to form the justification of this categorization.

EVALUATION

The Material Disposal Area C is a 12-acre site located near the west end of Mesita del Buey, north of Pajarito Road and south of Building Technical Area (TA) -50-1. It was established in May 1948 and served as the main Laboratory disposal facility for approximately 20 years and has not been used as a waste site since that time. Routine waste disposed of at MDA-C consisted of radioactively contaminated trash in cardboard boxes and plastic bags, material generated in the chemistry laboratories and barrels of sludge from the waste treatment plants at Building 35, DP West, and TA-45. Non-routine contaminated waste included debris from the demolition of Bayo Site and TA-01, classified materials, and tube alloy chips from shops. The wastes are distributed among 7 pits with depths ranging from 12 feet to 25 feet below the original ground surface, and 108 shafts with depths ranging from 10 to 25 feet below the original ground surface (before a crushed tuff cover was placed over the site in 1984). No waste containing Pu metal and fines is expected at MDA-C. The entire area has approximately 3 to 12 feet of crushed tuff cover and has been re-seeded.

The radionuclide inventories used for initial categorization formed the basis for the DSA inventory. As provided in the DSA, MDA-C has a total inventory of 181 Plutonium Equivalent Curies (PE-Ci) exceeding the TQ for HC-2 of 56 PE-Ci. In order for MDA-C to be categorized as a Radiological facility, a hazard analysis must be performed to demonstrate that, for any credible event involving radiological release, the amount of the release must be less than 0.52 PE-Ci, which represents a level of material with less than 10rem doses at 30 meters based on 24-hour exposure.

Three physical characteristics of MDA-C are important for evaluation as part of the hazard analysis. They are additional inputs to the DSA analyses, but are not credited in the unmitigated analysis for this classification:

1. Shielding – The overburden varies in thickness from 3 to 12 ft of crushed tuff and provides the main protection for the buried waste.
2. Containment/Intrusion Barrier – The overburden also provides the intrusion barrier to protect the buried waste from external energy sources. This overburden proves confinement to filter any gas or particulates resulting from disperse events.
3. Waste form – The waste form in MDA-C are solids and sludge, which are less likely to disperse than liquid forms.

The site further limits activities for hazard analysis to site maintenance and drilling/sampling or characterization. Site maintenance includes activities such as vegetation removal to ground level, but not be removed by digging, pulling, or pushing. Drilling will be used to collect subsurface samples of the soil surrounding the waste pits and shafts for characterization purposes. Drilling methods typically involve using a hollow-stem auger drill rig or an air-rotary rig. Both methods will generate

closed barrels/tubes (usually 3 to 4 inch in diameter and 5 to 10 feet in length). Direct Push Technology (DPT) may also be used, which employs a push-tube technique rather than a rotating bit to extract samples. Drilling into the radioactive waste inventory at MDA-C is precluded from the hazard analysis of this FHC, as intentionally drilling into the radioactive waste inventory at MDA-C will be prohibited. After drilling, boreholes may be used for environmental monitoring purposes. Boreholes not needed for monitoring are either backfilled/stabilized or capped at the surface to prevent inadvertent intrusion by water, etc.

As future remediation of MDA-C is still possible, the site is not determined to be an inactive waste site. DOE-STD-1120-2005, Vol. 2, Appendix D is used to guide this hazard analysis. This standard is also identified in 10 CFR 830, Appendix A, Table 2 as an acceptable methodology for preparing a DSA for a DOE environmental restoration activity. The hazard analysis in this submittal considers releases that could occur during site maintenance and drilling/sampling or characterization at MDA-C. There are no other operational or process-related initiators of concern that would breach the protective overburden and expose hazardous/radioactive materials. Potential initiators to radiological exposure or releases are limited to a small set of internal initiators and external man-made and natural phenomena events as follows:

1. Criticality due to water intrusion or contamination movement,
2. Pressurization due to explosions,
3. Over pressurization of storage tanks,
4. Fire,
5. Loss of confinement,
6. Vehicle impact,
7. Aircraft crash,
8. Inadvertent penetration of the waste,
9. High wind/tornado, and
10. Seismic.

These events are also referenced in Table 1 of DOE-STD-1120-2005, Vol. 2, Appendix D, Attachment 3. The hazard analysis determines that:

- Pressurization is not a credible event since there are no explosives buried at the site.
- Over pressurization is not credible since there are no tanks associated with MDA-C.
- High wind/tornado and seismic are not credible as those natural phenomena would not cause either exposure or ejection of hazardous/radioactive material.

The hazard analysis determines that vehicle impact can be bounded by the aircraft crash. Only criticality, fire, loss of confinement, aircraft crash and inadvertent penetration of the waste are considered in this hazard analysis.

Los Alamos Site Office (LASO) recognizes that methodology for the FHC is based on an acceptable methodology described in DOE-STD-1120-2005, Vol. 2, Appendix D, Attachment 3, and, assumptions used to estimate the radiological inventory associated was limited to drilling. LASO accepts the methodology for the FHC and assumptions given and considers the base information to be adequate and conservative. The Hazard Analysis assumes waste pits and shafts will be covered by the overburden of 3 to 12 feet of crush tuff as described in the approved Documented Safety

Analysis for the Nuclear Environmental Sites at Los Alamos National Laboratory (NES-ABD-0101, R.2, September 2009).

CONCLUSION

Los Alamos Site Office hereby approves the LANS request to downgrade the Final Hazard Categorization of the MDA-C to below HC-3, a radiological facility with the following Conditional of approval.

CONDITION OF APPROVAL

If the MDA-C is scheduled for remediation or intrusive characterization into the radioactive waste inventory, the Hazard Analysis would need to be expanded to include hazards of waste pits and shafts and its contents for consideration of consequences to the public, worker and the environment. Any activities that will challenge the assumptions of the hazard analysis would constitute a Potential Inadequate Safety Analysis. If such an event were to occur, the final hazard categorization would be required to be re-analyzed and LASO approved.