

SAFETY EVALUATION REPORT
APPROVAL OF DEPARTMENT OF THE ARMY, U. S. ARMY RESEARCH, DEVELOPMENT
AND ENGINEERING COMMAND, ARMY RESEARCH LABORATORY
"R-14 RANGE DECOMMISSIONING PLAN"
DOCKET NO. 040-06394

1.0 Executive Summary

The Department of the Army, U. S. Army Research, Development, and Engineering Command, Army Research Laboratory (the Licensee) is in the process of closing the R-14 Range at the Aberdeen Proving Ground, Maryland. License No. SMB-141 was issued on April 12, 1961 pursuant to 10 CFR Part 40, and has been amended periodically since that time. The license authorizes the Licensee to possess uranium and thorium as metals, metal oxides, and contaminants for research and development activities, fabrication, analysis, and munitions testing. The Licensee has ceased testing at the R-14 Range and is decommissioning that facility. The Licensee submitted a decommissioning plan which included site-specific derived concentration guideline levels (DCGLs) to allow unrestricted release of the R-14 Range.

2.0 Facility Operating History

NRC staff has reviewed the information in the "Facility Operating History" section of the Decommissioning Plan for the R-14 Range, License Number SMB-141, Docket Number 040-06394 located at Aberdeen Proving Ground, Maryland according to the Consolidated Decommissioning Guidance, Volume 1, Section 16.2 (Facility Operating History). Based on this review, NRC staff has determined that the Licensee has provided sufficient information to aid NRC staff in evaluating the Licensee's determination of the radiological status of the facility and the Licensee's planned decommissioning activities, to ensure that the decommissioning can be conducted in accordance with NRC requirements.

3.0 Facility Description

The R-14 Range is located at the Aberdeen Proving Ground, Maryland, on the southern end of Spesutie Island. It includes the following buildings: the Blast Chamber, the Hot Line, the Firing Tube with access shed, the Muffler (an air handling system), and the Water Treatment Shed. The R-14 Range includes five acres of surrounding grounds. There are no permanent residences on Spesutie Island. The town of Aberdeen, Maryland is located 6 miles northwest of the gate to Spesutie Island and has a population of 13,842; the town of Havre de Grace is 7 miles north of the gate to Spesutie Island and has a population of 11,331. Aberdeen Proving Ground has a population of 3,116 and the nearest occupied dwellings are located one mile northwest of the access gate to Spesutie Island.

The R-14 Range is one of several field test experimental facilities at Aberdeen Proving Ground. It will continue to be used for research and development activities in the future, but without use of licensed materials.

4.0 Radiological Status of Facility

NRC staff has reviewed the information in the “Radiological Status of the Facility” section of the Decommissioning Plan for the R-14 Range according to the Consolidated Decommissioning Guidance, Volume 1, Section 16.4 (Radiological Status of Facility). Based on this review, NRC staff has determined that the Licensee has described the types and activity of radioactive material contamination at its facility sufficiently to allow the NRC staff to evaluate the potential safety issues associated with remediating the facility, whether the remediation activities and radiation control measures proposed by the Licensee are appropriate for the type of radioactive material present at the facility, whether the Licensee’s waste management practices are appropriate, and whether the Licensee’s cost estimates are plausible, given the amount of contaminated material that will need to be removed or remediated.

5.0 Dose Analysis

NRC staff has reviewed the dose modeling analyses for the site-specific derived concentration guideline levels as part of the review of the Licensee’s decommissioning plan, using the Consolidated Decommissioning Guidance, Volume 2, Section 5.2 (Unrestricted Release Using Site-Specific Information). The staff concluded that the dose modeling is reasonable and is appropriate for the exposure scenario under consideration. In addition, the dose estimate provides reasonable assurance that the dose to the average member of the critical group is not likely to exceed the 0.25 millisieverts (25 millirem) annual dose criterion in 10 CFR 20.1402. This conclusion is based on the modeling effort performed by the Licensee and the independent analysis performed by the staff. In determining the dose, the Licensee has a combination of the conceptual model, exposure scenario, mathematical model and input parameters to calculate a reasonable estimate of dose. The Licensee has adequately considered the uncertainties inherent in the modeling analysis.

The Licensee intends to use NRC screening criteria for the release of structures, but intends to use a site-specific DCGL of 230 picocuries per gram (pCi/g) for the release of surface soils. This DCGL was originally developed for use in decommissioning the Transonic Range at APG, an area also contaminated with depleted uranium. The Licensee performed a dose analysis using RESRAD Version 6.3 to demonstrate that the use of the DCGL value for the Transonic Range is appropriate for the R-14 Range. In this analysis, the resident farmer scenario was used, and the same pathways were included as in the analysis for the Transonic Range, with the exception of the inhalation of radon-222 pathway, which was suppressed. Site specific parameter values were used in the analysis for the R-14 Range when this data was available. When this information was not available, the parameter values used were selected from NRC and EPA guidance documents when possible. RESRAD default values were used in cases where there was no site specific data and where information was not available in the NRC and EPA guidance documents. NRC staff found that the scenario, pathways, and parameter values selected are acceptable. The DCGL value calculated for the R-14 Range in this dose analysis was 253 pCi/g. Because the DCGL value for the Transonic Range is lower than the one calculated for the R-14 Range, the use of the Transonic Range DCGL value for the R-14 Range is conservative.

6.0 Planned Decommissioning Activities

NRC staff has reviewed the decommissioning activities described in the Decommissioning Plan for the R-14 Range according to the Consolidated Decommissioning Guidance, Volume 1, Section 17.1 (Planned Decommissioning Activities). Based on this review, the NRC staff has

determined that the Licensee has provided sufficient information to allow the NRC staff to evaluate the Licensee's planned decommissioning activities to ensure that the decommissioning can be conducted in accordance with NRC requirements.

7.0 Project Management and Organization

NRC staff has reviewed the description of the decommissioning project management organization, position descriptions, management and safety position qualification requirements, and the manner in which the Licensee will use contractors during the decommissioning of the R-14 Range according to the Consolidated Decommissioning Guidance, Volume 1, Section 17.2 (Project Management and Organization). Based on this review, the NRC staff has determined that the Licensee has provided sufficient information to allow the NRC staff to evaluate the Licensee's decommissioning project management organization and structure to determine if the decommissioning can be conducted safely and in accordance with NRC requirements.

8.0 Radiation Safety and Health Program

NRC staff has reviewed the information in the Decommissioning Plan for the R-14 Range according to the Consolidated Decommissioning Guidance, Volume 1, Section 17.3. (Radiation Safety and Health Program during Decommissioning). Based on this review, the NRC staff has determined that the Licensee has provided sufficient information about the radiation safety and health program to allow the NRC staff to conclude that the Licensee's program will comply with 10 CFR Parts 19 and 20.

9.0 Environmental Monitoring and Control Program

NRC staff has reviewed the information in the Decommissioning Plan for the R-14 Range according to the Consolidated NMSS Decommissioning Guidance, Volume 1, Section 17.4 (Environmental Monitoring and Control Program). Based on this review, the NRC staff has determined that the Licensee has provided sufficient information on the staff to conclude that the Licensee's program will comply with 10 CFR Part 20.

10.0 Radioactive Waste Management Program

NRC staff has reviewed the Licensee's descriptions of the radioactive waste management program for the R-14 Range according to the Consolidated NMSS Decommissioning Guidance, Volume 1, Section 17.5 (Radioactive Waste Management Program). Based on this review, the NRC staff has determined that the Licensee's programs for the management of radioactive waste generated during decommissioning operations ensure that the waste will be managed in accordance with NRC requirements and in a manner that is protective of the public health and safety.

11.0 Quality Assurance Program

The NRC staff has reviewed the Quality Assurance Program for the R-14 Range according to the Consolidated NMSS Decommissioning Guidance, Volume 1, Section 17.6 (Quality

Assurance Program). Based on this review, the NRC staff has determined that the Licensee's QA program is sufficient to ensure that information submitted to support the decommissioning of its facility should be of sufficient quality to allow the staff to determine if the Licensee's planned decommissioning activities can be conducted in accordance with NRC requirements.

12.0 Facility Radiation Surveys

The NRC staff has reviewed the information in the Decommissioning Plan for the R-14 Range according to the Consolidated NMSS Decommissioning Guidance, Volume 2, Section 4. (Facility Radiation Surveys). Based on this review, the NRC staff have determined that (1) the Licensee has summarized the DCGL(s) and area factors used for survey design and for demonstrating compliance with the radiological criteria for license termination; (2) the radiological characterization of the site, area, or building is adequate to permit planning for a remediation that will be effective and will not endanger the remediation workers, to demonstrate that it is unlikely that significant quantities of residual radioactivity has not gone undetected, and to provide information that will be used to design the final status survey; and (3) the final status survey design is adequate to demonstrate compliance with radiological criteria for license termination.

13.0 Financial Assurance

The NRC staff has reviewed the cost estimate for the Licensee's License Number SMB-141, Docket Number 040-06394 according to the Consolidated NMSS Decommissioning Guidance, Volume 3, Section 4.1 (Cost Estimate (as Contained in a Decommissioning Funding Plan or Decommissioning Plan)). Based on this review, the NRC staff has determined that the cost estimate submitted by the Licensee adequately reflects the costs to carry out all required decommissioning activities prior to license termination and, if the license is being terminated under restricted conditions, to enable an independent third party to assume and carry out responsibilities for any necessary control and maintenance of the site.

The NRC staff has reviewed the financial assurance mechanism for the Licensee's License Number SMB-141, Docket Number 040-06394 according to the Consolidated NMSS Decommissioning Guidance, Volume 3, Section 4.3 (Financial Assurance Mechanisms). Based on this review, the NRC staff has determined that the financial assurance mechanism submitted by the Licensee is adequate to ensure that sufficient funds will be available to carry out all required decommissioning activities prior to license termination and, if the license is being terminated under restricted conditions, to enable an independent third party to assume and carry out responsibilities for any necessary control and maintenance of the site.