

public that does not exceed 25 millirems (0.25 mSv) per year, including that from groundwater sources of drinking water, and that the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA).

Current NRC guidance (Section 2.5 of NUREG-1757, Volume 2, "Consolidated NMSS Decommissioning Guidance") recommends that licensees demonstrate compliance with the dose criteria by using dose modeling or derived concentration guideline levels (DCGLs) and final status survey results. The licensee's request to release the site for unrestricted use is based, in part, on dose modeling calculations conducted using the NRC-approved DandD and RESRAD computer codes. The licensee used the DandD code (Version 2.1.0) to model the annual dose to members of the public inside of the building. The licensee also used the RESRAD computer code (Version 6.21) to model the annual dose to members of the public outside of the building. The code inputs included information obtained during the licensee's performance of the final radiological status survey, *i.e.*, measured radioactivity at the site. The code outputs were then compared to the 25-millirem dose criteria.

Using the DandD building occupancy scenario, the licensee conducted two analyses, one for all alpha-emitting radionuclides and the second for all beta-emitting radionuclides. The licensee used DandD's default parameters for both analyses. The licensee prorated the radionuclides based on the total activity in inventory at the time of facility closure. The licensee used 29 alpha-emitting radionuclides in the first analysis and 50 beta-gamma emitting radionuclides (including yttrium-90) in the second analysis. The calculated total dose from all pathways was 9.88 millirems for alpha-emitting radionuclides and 12.4 millirems for beta-gamma emitting radionuclides. The combined total of the two analyses was 22.28 millirems per year, a dose that is below the 25-millirem limit.

The licensee also conducted an analysis using RESRAD for radionuclides that may be in the soil in the vicinity of the building. The licensee sampled the soil and determined that the soil contained measurable amounts of uranium, thorium, and radium. The inputs into RESRAD included radium-228 and thorium-232 because the licensee could not determine a background concentration for these radionuclides. The licensee did not include uranium and radium-226 in the RESRAD program because sample

analyses indicated that these two radionuclides were at or below background levels. The licensee used the default RESRAD program parameters. The calculated maximum dose was 15.08 millirems per year, a dose rate below the 25-millirem per year limit. [Since DandD and RESRAD have different occupancy factors, it is not appropriate to add the building occupancy results and outdoor exposure results together. The DandD and RESRAD results are individually compared to the 25-millirem limit.]

During a portion of laboratory decommissioning, the licensee monitored worker exposures to radioactive materials. Occupational exposure records were reviewed during the June 2003 inspection (NRC Inspection Report 030-19913/2003-001). As noted in the Inspection Report, records for 2002 (the time frame when decommissioning was conducted) were not always available. The NRC staff believes, based on exposure and environmental records for 1998-2001, that worker exposure to radioactive materials was most likely well below the NRC's annual total effective dose equivalent limit during decommissioning activities.

In summary, the licensee's final status survey results indicate that annual doses to occupants of the building and annual doses to members of the public located outdoors will be less than the NRC's radiological criteria for unrestricted use of the facility. Since the licensee used the default values for both computer codes, then the calculated results are considered conservative. No cumulative impacts or impacts of a non-radiological nature were identified in connection with the proposed action.

2. Environmental Resource Impacts

Proposed Action. The licensee conducted studies to demonstrate that the area around and under the former laboratory had not been contaminated with radioactive material. The licensee collected soil samples from around the building for analysis. The sample results revealed detectable amounts of radioactive lead, radium, thorium, and uranium at or near background levels. These sample results could be representative of naturally occurring radionuclides in the soil. No man-made gamma emitting radionuclides were identified, including cobalt-60 and cesium-137. In summary, the soil sample results suggest that all radionuclides were undetectable or were at naturally occurring background levels.

The licensee conducted a study to determine if there had been any

contamination of soil or groundwater as a result of a leaking sump that was repaired during 1996. The study was conducted prior to start of decommissioning but was included in the DP submittal. The sample results identified radioactivity at background levels. The study concluded that the sump had not leaked detectable quantities of licensed radioactive material into the environs of the site.

The property owner (not the same entity as the licensee) conducted sampling of the former sump during September 2001. During drilling operations, groundwater was encountered at approximately 10.5 feet below the surface. The data presented in the owner's TriHydro Corporation report dated November 29, 2001, indicated that soils in the area of the sump did not display elevated concentrations of any constituent, except non-radioactive mercury which is not regulated by the NRC. The report documents that mercury was identified in the 0-4 foot sample at 95.6 mg/kg. The State of Wyoming's residential soil cleanup level is 23 mg/kg for mercury. The NRC does not have the regulatory authority to address the report of mercury contamination. As such, notification to the State of Wyoming was made by letter dated November 4, 2003. If the proposed action is implemented, any existing mercury in site soils would be part of the property that is released from NRC's license conditions.

Current regulations allow licensees to dispose of radioactive material through the sanitary sewer system as long as the concentration limits provided in 10 CFR Part 20, Appendix B, Table 3, "Release to Sewers," are not exceeded. The NRC conducted routine inspections of the facility, and waste disposal records were reviewed during these inspections. The NRC inspectors did not identify any violations of this regulation, suggesting that the licensee's waste disposal practices were in accordance with license and regulatory requirements.

During the confirmatory survey of the laboratory, the NRC inspector surveyed the exterior of the building for ambient gamma exposure rates and sampled for total (fixed and removable) contamination at selected exterior surfaces. The only area that exhibited an elevated gamma exposure rate was a ventilation duct that exited the building from the former soil preparation room. This room was subsequently remediated a second time by the licensee. No other area, including adjacent land areas, exhibited elevated gamma exposure rates. In addition, no exterior surface contamination sample exhibited an