12.0 RADIOACTIVE WASTE MANAGEMENT PROGRAM

NUREG-1727 specifies that the licensee or responsible party have a program to manage radioactive waste generated as part of decommissioning. Under the "no action" alternative, the decommissioning activities yet to be performed at the site involve only sampling and survey activities, the removal of non-radioactive structures and systems, and the removal of a container of sample-derived waste previously generated at the site. These activities are not expected to result in the generation of wastes containing licensable or measurable quantities of radioactive materials. As a result, there is no potential for decommissioning activities to generate radioactive wastes.

However, as part of the decommissioning process leading to license termination, the MDNR plans to cut, cap, and remove piping and above-ground equipment associated with the LCTS. In addition, one small concrete building (the LCTS building) and a concrete slab will be removed. The LCTS building currently stores one drum of sample-derived waste that may contain radioactive material. The drum, the piping and equipment, the building, and the slab will be disposed. Although most, if not all, of these wastes are not expected to contain radioactive material (excepting the drum) and are, therefore, not expected to be classified as radioactive wastes, the following DP sections discuss characterization and disposal of the wastes, as appropriate.

12.1 SOLID RADIOACTIVE WASTE

12.1.1 Types of Potential Solid Radioactive Waste

The LCTS building stores one drum of sample-derived waste from past sampling activities. The waste consists of small quantities of soil, PPE, and other miscellaneous debris from the sampling activities, such as empty containers. The contents are identified as "potentially radioactive." The exterior surfaces of the container are routinely surveyed, and these surveys confirm the integrity of the containment by the absence of measurable concentrations of removable radioactivity.

The aboveground LCTS piping is made of high density polyethylene (HDPE). There are other small items of equipment associated with the LCTS that are made of various forms of metal and plastic. The LCTS building is slab-on-grade construction and is made entirely of concrete. The site also has a separate concrete slab that will be removed and disposed. None of these items are expected to have measurable concentrations of radioactivity on their surfaces. MDNR will perform radiological surveys in the interest of appropriately documenting the radiological condition of the LCTS piping, LCTS building, and concrete pad prior to disposal as unimpacted, non-radioactive debris. In the unlikely event that surveys indicate the presence of surface activity in excess of the approved decontamination limits, the MDNR will implement the appropriate radiological controls to ensure the materials are appropriately managed and disposed.

12.1.2 Volumes of Potential Solid Radioactive Waste

While it is not expected that the solid wastes generated during the decommissioning will be radioactive, the potential solid waste volume (radioactive or not) for all planned decommissioning tasks is estimated as follows:

- Approximately 8 cubic feet of sample-derived waste (one 55-gallon drum)
- Approximately 24 cubic feet of piping and equipment from the LCTS (approximately three 55-gallon drums)
- Approximately 108 cubic feet of concrete from the structure
- Approximately 54 cubic feet of concrete from the separate slab

12.1.3 Types and Activities of Radionuclides

The radionuclides potentially present in solid wastes generated at the site derive from the radionuclide profile described in Section 4.4.3. These include the parent Th-230 and Th-232 nuclides and their progeny.

Having considered the analytical evidence for establishing the radionuclide composition of residual radioactivity at the site, the following source term isotopic composition is defined:

- Pb-210 0.5%
- Ra-226 1.1%
- Ra-228 16.1%
- Th-228 16.1%
- Th-230 50.0%
- Th-232 16.1%

Any of the solid waste streams itemized above would be classified as low-level, if they were radioactive at all. There are no volumetrically contaminated materials (except perhaps portions of the sample-derived wastes that are already containerized), and there are no activated radioactive materials at the site. None of the potential radioactive waste could be greater than Classes A, B, or C.

12.1.4 Waste Management

The contents of the drum have not been characterized for waste disposal purposes, but the outside of the drum has been subjected to routine radiological surveys to ensure no radioactive contamination has escaped. The drum contents will be characterized using existing knowledge and data, and based on that characterization, the drum will be assessed to ensure it meets the transportation requirements of the U.S. Department of Transportation (DOT). If the drum does not meet the applicable DOT requirements, it will be overpacked or the contents will be repackaged, as appropriate.

The LCTS building was constructed on radiologically clean cap materials. Routine surveys of the posted radioactive materials area (RMA) within the building's interior show that any radioactivity in the drum has not contaminated the inside of the building. Prior to demolition, building surfaces and components will be surveyed to ensure that residual radioactivity in excess of the applicable decontamination limits is identified. The building debris will be characterized using existing knowledge and radiological survey data collected prior to demolition. Based upon the radiological survey and characterization, the building debris will be packaged, labeled, and managed on site in accordance with the radiological requirements of the NRC until transported to an approved offsite disposal facility in accordance with the transportation requirements of the DOT.

The concrete slab was constructed on clean cap materials. Past radiological surveys (at the completion of the subsurface characterization program) concluded that the surface of the concrete slab was free of residual radioactive surface contamination. Before the concrete slab is broken up for disposal, the top surface will be radiologically surveyed again to verify and document the radiological condition of the slab. The slab will be broken into pieces that can be inverted, at which point the underside of the slab will be radiologically surveyed as well. The concrete slab debris will be characterized using existing knowledge and radiological survey data collected prior to and during demolition. Based upon the radiological survey and characterization, the concrete debris will be packaged, labeled, and managed on site in accordance with the radiological requirements of the NRC until transported to an approved offsite disposal facility in accordance with the transportation requirements of the DOT.

Cutting and capping of LCTS piping will occur within the clean materials of the cap such that access to and contact with residual radioactivity deposits in the subsurface soil source term will be precluded. Radiological surveys designed to verify and document the radiological condition of the LCTS piping system will be performed as the LCTS piping is cut and capped. The system was never made operational, and has never contained radioactive materials. It is not expected that measurable concentrations of radioactivity will be encountered. In the unlikely event that some item(s) is found to have surface radioactivity in excess of the applicable decontamination limits, it will be sized and stored in containers that meet the transportation specifications of the DOT. The LCTS pipe and equipment debris will be characterized using existing knowledge and radiological survey data collected during the cutting and capping operation. Based upon the radiological survey and characterization, the piping system debris will be packaged, labeled, and managed on site in accordance with the radiological requirements of the NRC until transported to an approved offsite disposal facility in accordance with the transportation requirements of the DOT.

Items and debris confirmed to meet the applicable decontamination limits for radiological contamination will be disposed of as sanitary waste in a nearby landfill. Items and debris determined to be radiologically contaminated, or which cannot be positively identified as meeting the applicable decontamination limits for radiological contamination, will be packaged in DOT-compliant containers and will be stored on pallets, under tarps, and

within the fenced area until disposal can be arranged. Such materials will be disposed of at a licensed, low-level radioactive waste disposal facility. Transportation and disposal of any radiological waste will be accomplished through a waste broker, using the broker's existing disposal contract (likely with Envirocare of Utah).

12.2 LIQUID RADIOACTIVE WASTE

No liquid radioactive waste is present at the site, and no liquid waste will be generated while above-grade structures and items are removed. Therefore, liquid radioactive waste is not required to be addressed further in this DP.

12.3 MIXED WASTE

No mixed radioactive waste is present at the site, and no mixed waste will be generated while above-grade structures and items are removed. Therefore, mixed radioactive waste is not addressed this DP.