

NUCLEAR REGULATORY COMMISSION
Docket Nos. 070-00784 and 040-07044
Notice of Determination that No Further Action is Required
under the U.S. Nuclear Regulatory Commission's Authority
at the Union Carbide Corporation Facility in Lawrenceburg, TN

AGENCY: U.S. Nuclear Regulatory Commission (NRC)

ACTION: Notice of Determination that no further remedial action is required.

FOR FURTHER INFORMATION CONTACT: Kenneth Kalman, Materials Decommissioning Section, Division of Waste Management and Environmental Protection, NRC, Washington, D.C., 20555; telephone: (301) 415-6664; fax: (301) 415-5398; or email at: klk@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Introduction

The NRC is providing notice that it has determined that no further remedial action under the NRC's authority is required at the Union Carbide Corporation (UCAR) site located at Highway 43 South, in Lawrenceburg, Tennessee (the Site).

UCAR was issued Special Nuclear Materials License No. SNM-724 (SNM-724), on August 26, 1963, for testing equipment and nuclear fuels development. UCAR also held License No. SMB-720 (SMB-720), which authorized the possession of source material at the Site. SNM-724 was terminated on June 4, 1974, and the U.S. Atomic Energy Commission (AEC) released the site for unrestricted use. SMB-720 was superceded by the State of Tennessee License No. S-5002-H8 and was terminated on August 28, 1975.

SNM-724 authorized possession of up to 500 grams (g) of fully-enriched (<94 percent) uranium for testing of equipment and processes in the Lawrenceburg Fuel Development Facility located at the Site. On May 22, 1964, the license was amended to authorize possession of 150 kilograms (kg) of U-235 to make graphite-coated uranium-thorium carbide particles and graphite-matrix fuel elements. The possession limit was increased to 475 kg on June 12, 1964.

By letter dated February 4, 1974, UCAR submitted "closeout" survey information and requested that SNM-724 be terminated and the facility be released for unrestricted use. On April 5, 1974, AEC staff performed a closeout inspection which was documented in Inspection Report 70-784/74-1. The staff recommended that the license be terminated, and the facility be released for unrestricted use. By AEC letter dated June 4, 1974, SNM-724 was terminated and the UCAR facility released for unrestricted use.

In 1991, the Oak Ridge National Laboratory was contracted by NRC to review and evaluate all nuclear materials licenses terminated by NRC or its predecessor agencies, since inception of materials regulation in the late 1940s. One of the objectives of this review was to identify sites with the potential for residual contamination, based on information in the license documentation. NRC evaluated the available survey data to determine if the information was sufficient to conclude that the site meets the existing guidelines for unrestricted use.

Radiological assessments performed at the UCAR facility and its immediate vicinity identified the presence of enriched and depleted uranium on building surfaces and in soil in excess of applicable radiological release criteria. Sampling identified contamination in three buildings on the UCAR site: Building 10, Building 5 Annex, and the Metallurgy Laboratory. Surface contamination in Building 10, Building 5 Annex, and in the Metallurgy Laboratory was primarily present as fixed contamination. Contamination in soils/sediments in small areas was also present.

Surface contamination above the release guidelines was identified in 11 rooms in Building 10 (Rooms 106-2, 120, 121, 122, 124, 126, 128-1, 129, 132, 133, and 134) ranging from background to 106,469 disintegrations per minute/100 square centimeter (dpm/100 cm²) direct beta/gamma. Volumetric contamination in other areas of the site was found to be above the release criteria: (1) soil surrounding the incinerator pad; (2) sediment in the manholes and cooling water tanks; (3) laundry sump tank; and, (4) the surface layer of concrete flooring. A core sample was taken near the incinerator pad. The range for total uranium concentration was 1.33 to 3,655 picocuries per gram (pCi/g). The estimated average depth of the soil contamination was one foot resulting in a contaminated soil volume estimate of 500 cubic feet.

Uranium was also the primary contaminant in Building 5 Annex. Surface contamination was found in four rooms in Building 5 (Rooms 106, 107, 108, 110), ranging from background to 428,698 dpm/100 cm² direct beta/gamma. Volumetric contamination above the release criteria was found in three areas in and around Building 5: (1) sink trap; (2) concrete flooring; and (3) asphalt outside exit.

Contamination in the Metallurgy Laboratory consisted of localized surface contamination on the tops of cabinets. There was no indication of radioactive material above the release criteria beyond the former restricted area boundary in the ground water, settling basins, or former sanitary sewer system.

UCAR voluntarily conducted remediation activities without a license, as its license was terminated in 1974. Although UCAR was not a licensee, NRC staff conducted periodic inspections to ensure that remediation was performed in accordance with current regulations and release limits.

As part of its remediation activities, UCAR amassed fifteen (15) 24-yard³ intermodal containers of solid low-level radiological waste. UCAR reported concentrations in the intermodal containers averaging approximately 25 pCi/g of U-235 and 1,082 pCi/g of total uranium.

On February 15 and 16, 2006, NRC staff conducted an inspection of the UCAR site that included Building 10, Building 5 Annex, the Metallurgy Lab, the incinerator pad and other areas, as well as the intermodal containers (Inspection Report 07000784/2005001). This inspection found that residual uranium contamination on surfaces and soil met the criteria in the remediation plan for unrestricted use. The remediation activities in Building 10 and the incinerator pad resulted in complete removal of the structures and the concrete floor pads so that no surfaces were available for surface contamination measurements. Gamma scans of areas where an incinerator pad, drain lines, and a buried water cooling tank had been located, as well as scans of various non-remediated areas found no areas of elevated gamma exposure rates. Direct alpha measurement of the Building 5 Annex and the Metallurgy Lab were all less

than 2000 dpm/100cm². The inspector found no areas of elevated gamma exposure rates in the scanned areas.

Soil samples were taken from Site areas based on operational history and remediation activities and were analyzed by the Oak Ridge Institute for Science and Education for isotopic concentrations of U-234, U-235, and U-238. All samples were surface soil, collected within the top four inches of the soil surface. One sample from the Building 5 Annex showed elevated concentrations of U-234, but when averaged over the survey unit was found to be within the derived concentration guidelines for soils at the site.

The NRC inspector examined the intermodal containers while they were stored at the site. The amount of U-235 in the intermodals ranged from 75 to 206 grams per intermodal. One of the intermodals contained a sump from Building 10 and had a contact exposure rate of 65 microrentgens/hour. Measurements of the other containers were not significantly above background. On August 14, 2006, UCAR provided copies of the shipping manifests demonstrating that the 15 intermodal containers had been accepted for disposal by EnergySolutions in Utah.

UCAR provided a final radiological status survey and the NRC staff performed an independent dose assessment to demonstrate the site meets the license termination criteria in Subpart E of 10 CFR Part 20. Based on its reviews of UCAR submittals and its own analyses and assessments, the NRC staff has determined that the site meets the unrestricted release dose criteria in 10 CFR Part 20.1402 and that no further remedial action under the NRC's authority is required at the UCAR site. The staff prepared a Safety Evaluation Report (SER) (ML062580415) to support its determination.

II. Further Information

In accordance with 10 CFR Part 2.790 of the NRC's "Rules of Practice," details with respect to this action, including the SER, are available electronically at the NRC's Electronic Reading Room at <http://www.nrc.gov/reading-rm/adams.html>. From this site, you can access the NRC's Agency wide Document Access and Management System (ADAMS), which provides text and image files of NRC's public documents. The ADAMS accession number for the termination letter and SER, "Safety Evaluation Report to Support the Determination that No Further Action is Required under the Authority of the U.S. Nuclear Regulatory Commission at the Union Carbide Corporation Facility in Lawrenceburg, TN" (Docket Nos. 070-00784 and 040-07044) is ADAMS No. ML062620512. If you do not have access to ADAMS or if there are problems in accessing a document located in ADAMS, contact the NRC Public Document Room Reference staff at 1-800-397-4209, 301-415-4737, or by email to: pdr@nrc.gov.

This document may also be viewed electronically on the public computers located at the NRC's PDR, O-1-F21, One White Flint North, 11555 Rockville Pike, Rockville, MD 20852. The PDR reproduction contractor will copy documents for a fee.

Dated at NRC, Rockville, MD, this 22nd day of September, 2006

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Keith I. McConnell, Deputy Director
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards