June 22, 2009

Ms. Elizabeth Southerland, Director
Division of Assessment and Remediation
Office of Superfund Remediation
and Technology Innovation
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Mail Code: 5204P
Washington, DC 20460

SUBJECT: MEMORANDUM OF UNDERSTANDING CONSULTATION ON THE DECOMMISSIONING OF THE MALLINCKRODT INC., SITE, ST. LOUIS, MISSOURI

Dear Ms. Southerland:

This letter is intended to inform you of the decommissioning oversight actions that the U.S. Nuclear Regulatory Commission (NRC) has taken, and intends to take, for the Mallinckrodt Inc., (Mallinckrodt) site, located in St. Louis, Missouri.

On October 9, 2002, the NRC and the U.S. Environmental Protection Agency (EPA) entered into a Memorandum of Understanding (MOU) on "Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites." Under the MOU, EPA agreed to continue its Comprehensive Environmental Response, Compensation, and Liability Act deferral policy of not listing sites on the National Priorities List that are subject to NRC's licensing authority. The MOU provides that, unless an NRC-licensed site exceeds any of three trigger criteria contained in the MOU, EPA agrees to a policy of deferral to NRC decision-making on decommissioning without the need for consultation.

For sites that trigger the criteria in the MOU, NRC will consult with EPA at two points in the decommissioning process: (1) prior to NRC approval of the license termination plan or decommissioning plan (DP), which NRC terms Level 1 consultation; and (2) following completion of the final status survey (FSS), which NRC terms Level 2 consultation.

We are sending this letter as our Level 1 consultation for the Mallinckrodt site. The NRC has reviewed the Phase 2 DP for this site dated October 14, 2008 (ML083150652), and the staff plans to approve the DP for implementation. The DP includes derived concentration guideline levels (DCGLs) for certain radionuclides that exceed soil concentration values in Table 1 of the MOU. This triggers a Level 1 consultation with EPA.

The Mallinckrodt Site

Mallinckrodt has been operating at the St. Louis Plant since 1867, producing various products, including metallic oxides and salts, ammonia, organic chemicals, and various uranium compounds. The St. Louis Plant, comprised of over 50 buildings on approximately 43 acres, is subdivided into smaller areas, called plants, based on the similarity of operations being performed.

Between 1942 and 1958, uranium processing and waste management activities were conducted by Mallinckrodt in support of early Federal government programs to develop atomic weapons under the Manhattan Engineer District and later the Atomic Energy Commission (MED/AEC). These activities resulted in radiological contamination on Mallinckrodt property and properties adjacent to the site. The contamination at these locations consists of natural uranium and natural thorium and their associated progeny, including thorium-230 and radium. MED/AEC contamination is present in groundwater, soils, and structures. Under the authority of the Formerly Utilized Sites Remedial Action Program, the U.S. Army Corps of Engineers (USACE) is remediating contamination at the site resulting from past MED/AEC activities. In accordance with the USACE Record of Decision, no remedial action is required for groundwater beneath the site. USACE will conduct perimeter monitoring of the groundwater in the Mississippi River alluvial aquifer, and will evaluate the need for groundwater remediation as part of the periodic reviews performed for the site.

In 1961, Mallinckrodt was issued License No. STB-401 to extract columbium and tantalum (C-T) from natural ores and tin slags. From 1961 to 1985, Mallinckrodt purchased and processed materials for C-T production. These ores and processed byproduct materials contained uranium and thorium isotopes. C-T processing was shut down from 1985 through early 1987, when Mallinckrodt began a two month pilot production run. During the pilot production run, approximately 20,000 pounds of tin slags were processed. In July 1993, NRC amended Mallinckrodt's license to a possession only license for decommissioning and license termination.

Mallinckrodt elected to decommission the C-T project areas of the site in two phases. In Phase 1, Mallinckrodt decommissioned the buildings and equipment to the extent necessary to meet the NRC's guidelines for unrestricted release. Phase 1 of the decommissioning project was completed in February 2007.

Mallinckrodt's objective during Phase 2 is to decommission grade-level and below-grade building slabs, paved surfaces, and subsurface materials affected by former C-T operations, such that these areas meet NRC's criteria for unrestricted release and Mallinckrodt's license can be terminated by license amendment.

Based on site-wide groundwater samples taken to date, there is no indication that groundwater directly beneath the C-T areas of the site is contaminated. However, one groundwater well in the MED/AEC area shows contamination. No wells downgradient of the C-T areas show contamination in the aquifer.

The DCGLs contained in the DP which the staff plans to approve are contained in the enclosure. As can be seen from the enclosure, the DCGLs for uranium-238, thorium-232,

radium-226 and total uranium exceed the MOU soil concentration levels for the industrial land use scenario. The staff's determination of the industrial land use scenario is based on the historical land use of the site, Mallinckrodt's plans to continue industrial use of the site, and current City of St. Louis zoning restrictions. Before the NRC license is terminated the doses to the average member of the critical group at the Mallinckrodt site will be in compliance with NRC's criteria in 10 CFR Part 20, Subpart E that provides an all-pathways dose criteria of no more than 0.25 millisieverts per year (25 millirem per year) and that are as low as reasonably achievable (ALARA), to an average member of the critical group. The dose criteria in Part 20, Subpart E are fully protective of the public health and safety, and were the result of a comprehensive rulemaking, including an accompanying generic environmental impact statement. Furthermore, individuals at a decommissioned site are expected to receive doses substantially below the constraint level because of ALARA, conservative dose modeling assumptions, and the nature of the cleanup process itself, which often reduces residual contamination levels significantly below site DCGLs. The DCGLs in the DP represent the maximum levels for each radionuclide without considering the existence of other radionuclides. Thus, in applying the sum of fractions requirement, the actual cleanup values will be reduced such that the potential dose from all residual radioactivity at the site from all media is less than 25 millirem per year.

However, in view of the extent to which the proposed cleanup values exceed the MOU trigger levels, and based on NRC's decommissioning experience, a Level 2 consultation may be necessary because the levels of residual radioactivity remaining after remediation may still exceed the MOU trigger levels. If this is the case, NRC will consult with the EPA in accordance with the MOU.

As part of the DP review and approval process, the NRC staff will prepare an environmental assessment (EA) to document how the remediation at the Mallinckrodt site would ensure protection of the public health and safety and the environment. The EA will be published in the *Federal Register.*

Next Steps

In accordance with the MOU, NRC is requesting EPA's views on the DP within 90 days of the date of this letter. Following remediation activities at the site, Mallinckrodt is required to submit a FSS report. NRC will review the FSS Report and will compare the remaining levels of residual radioactivity to the MOU trigger levels. If the FSS measurements trigger the MOU, a consultation between the agencies will occur under the MOU to identify and resolve any remaining issues. In the meantime, if you have any questions regarding this letter or the

decommissioning activities at the Mallinckrodt site, please contact Mr. Keith I. McConnell, Deputy Director, Decommissioning and Uranium Recovery Licensing Directorate, at (301) 415-7295.

Sincerely,

/RA/

Larry W. Camper, Director
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Enclosure:
Mallinckrodt Cleanup Values

cc: Mallinckrodt Service List

Docket No.: 40-6563
License No.: STB-401

decommissioning activities at the Mallinckrodt site, please contact Mr. Keith I. McConnell, Deputy Director, Decommissioning and Uranium Recovery Licensing Directorate, at (301) 415-7295.

Sincerely,

/RA/

Larry W. Camper, Director
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Enclosure:
Mallinckrodt Cleanup Values

cc: Mallinckrodt Service List

Docket No.: 40-6563
License No.: STB-401

DISTRIBUTION:
DWMEP r/f RidsRgn3MailCenter

ML091460665

Office	DWMEP	DWMEP	DWMEP	DWMEP
Name	RChang	TMixon	JBuckley	LChang
Date	5/25/09	5/22/09	5/28/09	6/ 4 /09

Office	DWMEP	DWMEP
Name	KMcConnell	LWCamper
Date	6/ 11 /09	6/22/09

OFFICIAL RECORD COPY

Mallinckrodt Cleanup Values

Radionuclide	Cleanup Value	EPA MOU (Industrial)
U-238+D*	721 pCi/g	179 pCi/g
Total uranium	2480 mg/kg	1230 mg/kg
Th-232+D**	23.9 pCi/g	5 pCi/g
Ra-226***	29.4 pCi/g	5 pCi/g

* DCGL of natural uranium is referenced to U-238

** DCGL of thorium series is referenced to Th-232

*** DCGL of Th-230, Ra-226 and Pb-210 is referenced to Ra-226

Enclosure