April 30, 2008

MEMORANDUM TO: Michael T. Lesar, Chief
Rules and Directives Branch
Division of Administrative Services
Office of Administration

FROM: Keith I. McConnell, Deputy Director **/RA by R.Tadesse /**
Decommissioning and Uranium
Recovery Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

SUBJECT: FEDERAL REGISTER NOTICE OF ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT RELATED ISSUANCE OF LICENSE AMENDMENT FOR REMOVAL OF UNREACTED ORE FROM PLANT 6W, MALLINCKRODT INC., ST. LOUIS, MISSOURI (LICENSE: STB-401, DOCKET: 04006563)

Enclosed please find one signed original, four copies, and an electronic version on a 3.5 diskette of the subject *Federal Register* Notice for transmittal to the Office of the Federal Register for publication.

ADM/DAS/RDB has been given owner's rights to the Notice in the U.S. Nuclear Regulatory Commission (NRC) Agencywide Documents Access Management System (ADAMS), ML081000085. Publicly-available U.S. Nuclear Regulatory Commission documents referenced in the Notice have been finalized in ADAMS and profiled for public release. ADAMS accession numbers for all such documents are provided in the text under Further Information.

Docket No.: 040-06563
License No.: STB-401

Enclosures:
1. One original and four copies
2. One 3.5-inch diskette (electronic version)

CONTACT: John T. Buckley, DWMEP
(301) 415-6607

MEMORANDUM TO: Michael T. Lesar, Chief
Rules and Directives Branch
Division of Administrative Services
Office of Administration

FROM: Keith I. McConnell, Deputy Director**/ RA by R.Tadesse** /
Decommissioning and Uranium
Recovery Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

SUBJECT: FEDERAL REGISTER NOTICE OF ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT RELATED ISSUANCE OF LICENSE AMENDMENT FOR REMOVAL OF UNREACTED ORE FROM PLANT 6W, MALLINCKRODT INC., ST. LOUIS, MISSOURI (LICENSE: STB-401, DOCKET: 04006563)

Enclosed please find one signed original, four copies, and an electronic version on a 3.5 diskette of the subject *Federal Register* Notice for transmittal to the Office of the Federal Register for publication.

ADM/DAS/RDB has been given owner's rights to the Notice in the U.S. Nuclear Regulatory Commission (NRC) Agencywide Documents Access Management System (ADAMS), ML081000085. Publicly-available U.S. Nuclear Regulatory Commission documents referenced in the Notice have been finalized in ADAMS and profiled for public release. ADAMS accession numbers for all such documents are provided in the text under Further Information.

Docket No.: 040-06563
License No.: STB-401

Enclosures:
1. One original and four copies
2. One 3.5-inch diskette (electronic version)

CONTACT: John T. Buckley, DWMEP
(301) 415-6607

DISTRIBUTION:
Docket File 040-6563 RidsAcrsAcnwMailCenter RidsOgcMailCenter

ML081000085

OFFICE	DWMEP: PM	DWMEP: LA	DWMEP: BC	OGC	DWMEP: DD
NAME	J. Buckley	S. Michonski	L. Chang	J. Hull	R.Tadesse for K. McConnell
DATE	04/29/08	04 /29/ 08	04 / 29/ 08	04/29/08	04/30/08

OFFICIAL RECORD COPY

[7590-01-P]

U.S. NUCLEAR REGULATORY COMMISSION

[Docket No. 40-6563]

Environmental Assessment and Finding of No Significant Impact

Related to Issuance of License Amendment for the Removal of Unreacted Ore from Plant 6W, Mallinckrodt Inc., St. Louis, Missouri

License No. STB-401

AGENCY: U.S Nuclear Regulatory Commission

ACTION: Environmental Assessment and Finding of No Significant Impact

FOR FURTHER INFORMATION CONTACT: John Buckley, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission, Mail Stop: T8F5, Washington, DC 20555-0001. Telephone: (301) 415-6607; e-mail: john.buckley@nrc.gov.

SUPPLEMENTAL INFORMATION:

1. INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) is considering approval of Mallinckrodt Inc.'s (Mallinckrodt's) license amendment request (ADAMS No. ML073390035) for removal of unreacted ore (URO) from Plant 6W, a portion of Mallinckrodt's site located in St. Louis, Missouri. As part of its review, the NRC staff has prepared this environmental assessment (EA). The EA evaluates Mallinckrodt's request, as supplemented by its responses dated January 28, 2008 (ML080350013), and March 17, 2008 (ML080800076), to the NRC's request for additional information (ML073550832).

2. BACKGROUND

Mallinckrodt has been operating at the St. Louis Plant since 1867 producing various products including metallic oxides and salts, ammonia, and organic chemicals. From 1942 to 1957, Mallinckrodt was under contract with the Manhattan Engineering District and the Atomic Energy Commission (MED-AEC) to process uranium ore to produce uranium for development of atomic weapons. Remediation of MED-AEC contamination at the St. Louis Plant site is being performed by the U.S. Army Corp of Engineers (USACE) under the Formerly Utilized Sites Remedial Action Program (FUSRAP). The Plant 6W area (described below) contains widespread contamination from MED-AEC operations.

In addition to its MED-AEC operations, Mallinckrodt extracted Columbium and Tantalum (C-T) from natural ores and tin slags from 1961 to 1985. These ores contained uranium and thorium isotopes, and were thus source material which required a 10 CFR Part 40 possession and use license. Mallinckrodt was issued License No. STB-401 in 1961. The C-T operations produced the URO at issue here. The URO is comprised of columbite ore and tin slag that did not dissolve by acid leaching, and portions that precipitated as insoluble fluoride compounds UF_4 and ThF_4. The URO is buried in a set of 10 trenches within the Plant 6W area, and is surrounded by MED-AEC contamination. 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 slag were processed. In July 1993, NRC amended Mallinckrodt's license to a possession only license for purposes of decommissioning the NRC-licensed site and eventually terminating the NRC license. Approximately 6 Ci of natural uranium and 19 Ci of natural thorium isotopes were contained in the ores and tin slags processed under License STB-401.

Mallinckrodt needs to remove the URO so that USACE can proceed with its FUSRAP action. Mallinckrodt and USACE worked cooperatively to reach an agreement in 2007 that defines a geographical boundary between buried URO in trenches numbered 1-9, and surrounding land within Plant 6W. Under the agreement Mallinckrodt is responsible for removal of all material within the geographical boundary, including the URO in the nine burial trenches, and USACE is responsible for remediation of the remainder of Plant 6W. Prior to removal of URO from Trench 10, Mallinckrodt and USACE will need to conclude a similar delineation agreement -- to be examined by NRC -- defining the geographical boundary of Trench 10. With the exception of the buried URO, the remediation of the Plant 6W area will be conducted by USACE pursuant to FUSRAP.

Mallinckrodt's St. Louis facility as a whole contains more than 50 buildings in an area covering approximately 43 acres. The facility has been traditionally subdivided into areas called "Plants" based on similar operations being performed within each plant. C-T processing and support occurred in 21 buildings, mainly within Plant 5, but also within Plants 1, 3, 6, 7 and 8. Select buildings and areas in Plants 6 and 7 were used to receive and store feed materials and drummed URO waste. In 1972-73 approximately 300 cubic yards (yd^3) of URO was buried in the set of 10 trenches located on the western portion of Plant 6 – now designated as Plant 6W. Plant 6W is an uncovered area of approximately 60,000 ft^2 (200 ft x 300 ft) of which the burials occupy an area of approximately 4500 ft^2. A portion of Trench 10 is located beneath a corner of Building 101, so that the URO within Trench 10 is not fully accessible. The initial amendment request for removal of URO from Plant 6W did not include removal of URO from Trench 10. Mallinckrodt requested that NRC approve the removal of URO from Trench 10 in its March 17, 2008, supplement. This request is discussed below under the "Connected Action" heading.

Mallinckrodt is conducting its decommissioning activities of the C-T processing areas in two phases. The NRC approved the Phase 1 decommissioning plan (DP) in May 2002. In Phase 1, Mallinckrodt decommissioned the buildings and equipment to the extent necessary to meet NRC's guidelines for unrestricted release. Mallinckrodt completed Phase 1 decommissioning activities in February 2007. Phase 2 will include the remediation of the building slabs and foundations, paved surfaces, and all remaining subsurface materials. Mallinckrodt submitted its Phase 2 DP for NRC review and approval in 2003. The staff is still reviewing the Phase 2 DP.

Mallinckrodt originally planned to remove the URO from Plant 6W as part of its Phase 2 decommissioning activities. However, in order to coordinate schedules for remediation of Plant 6W with USACE, Mallinckrodt is proposing to remove the URO buried in Plant 6W under this separate licensing action prior to approval and implementation of the Phase 2 DP.

3. NEED FOR THE PROPOSED ACTION

The ultimate goal of the C-T project decommissioning being overseen by the NRC is to remediate those areas of the St. Louis site associated with past C-T production, to the extent necessary to permit the termination of License STB-401. As noted above, Plant 6W contains MED-AEC contamination and URO from C-T operations in ten burial pits, and Mallinckrodt is responsible for removing this URO. Removal of the URO prior to Phase 2 decommissioning activities will remove a significant source of radioactive material from the St. Louis Plant site, thereby reducing the risk of exposure to Mallinckrodt workers during these subsequent decommissioning activities.

4. PROPOSED ACTION

Mallinckrodt plans to remove URO and adjacent soil from the set of ten trenches in Plant 6W, and ship the material by rail to a regulated disposal facility. The specific disposal facility will

depend on whether the URO and soil contains more or less than the exempted quantity of source material – 0.05% by weight – as set forth in 10 CFR Part 40.13(a). Non-URO and soil materials with surface contamination meeting the standards in NRC Policy and Guidance Directive FC 83-23 can be released from the site in accordance with license condition 16.

4.1 Site description

The facility is located adjacent to the west bank of the Mississippi River. The area surrounding the site is completely developed, and includes a mixture of commercial, industrial and residential uses. The St. Louis plant is located within Census Tract 1267. The residential population within this tract was 2,867 in 1990, and the total residential population within one mile of the plant was approximately 10,000. Section 1 of the DP provides maps showing the site location, plant site, and C-T production and process areas.

The Mississippi, Missouri, and Meramec rivers are the main surface water bodies near the facility. Storm runoff from the St. Louis plant flows via the sewer system to the Metropolitan Sewer District. The City of St. Louis municipal water intakes are located up-stream from the St. Louis, Plant. The Mississippi River is subject to flooding. A levee constructed in 1964 on City of St. Louis property protects the plant from flood waters.

The St. Louis plant is underlain by two unconsolidated soil units and one bedrock unit. The upper soil unit consists of fill material and is between 12 and 30 feet thick. This unit contains a perched groundwater unit at depths of three to nine feet below the surface. The lower soil unit is composed of silt and clay above sandy alluvium, and ranges between 0 and 60 feet thick. Groundwater in the sandy alluvium is saline and very hard, and flows to the east towards the Mississippi River. The bedrock unit is limestone. Groundwater in the bedrock is saline and non-potable. Groundwater beneath the St. Louis Plant and surrounding area is not used for drinking water, and there are no drinking water wells located near the plant.

The climate in the St. Louis area is warm and moist in the summer and cold and dry in the winter. The annual average high and low temperatures are 88 degrees Fahrenheit and 23 degree Fahrenheit, respectively. The average annual precipitation is 36 inches.

4.2 Source Removal Criteria

As indicated above, the disposal criterion for the removed URO and soil depends on whether or not the 10 CFR Part 40.13(a) exemption limit is exceeded. Equipment with surface contamination meeting the requirements of NRC Policy and Guidance Directive FC 83-23 can be released in accordance with license condition 16, as indicated in the following chart.

EQUIPMENT SURFACE RELEASE LIMITS

Equipment Location	Average (dpmα/100 $cm^{2)}$	Maximum (dpmα/100 $cm^{2)}$	Removable (dpmα/100 $cm^{2)}$
Any	2400	7200	500

At the Plant 6W site, Mallinckrodt will remove all material within a geographical boundary agreed to between Mallinckrodt and USACE. Completion of the removal action will be verified by measurement of the excavation width and depth. Because this URO source removal action is based upon agreed geographical boundaries, a residual radioactivity concentration criterion – applicable in decommissioning actions -- will not be applicable here. Similarly, a final status survey will not be required. Mallinckrodt will demonstrate completion of the URO removal action by documenting the removal of the volume of material specified in the Mallinckrodt/USACE delineation agreements.

4.3 Site Characterization

URO was buried in Plant 6W in a set of ten excavated trenches. Mallinckrodt estimates that the URO contains about 1.8 wt% thorium and about 0.15 wt% uranium. Approximately 290 yd^3 of URO was packaged in 305 thirty-gallon steel drums. The drums were placed in the trenches in a two foot layer with approximately 3-4 feet of clean cover consisting of compact soil.

4.4 Areas to be Remediated

As stated above, Mallinckrodt and USACE have agreed upon a defined geographic boundary for nine of the trenches in Plant 6W. Mallinckrodt initially planned to remove URO buried in Trench 10 later, during Phase 2 decommissioning. However, if removal of URO from Trench 10 benefits Mallinckrodt/USACE remediation activities in Plant 6W, Mallinckrodt may elect to establish a delineation agreement with USACE for Trench 10 as well, and remove URO from Trench 10 under this proposed license amendment.

URO burials in Trenches 1- 9 occupy an area of about 418 square yards (yd^2). Allowing for sloping excavation side walls results in a total volume of excavated material of about 2605 yd^3. The URO from Trench 10 adds approximately 900 yd^3 which brings the total excavated volume to 3495 yd^3.

4.5 Approach to URO Removal

Mallinckrodt is proposing to treat removal of the URO as a volume of material within specified geographical bounds. Land outside the boundary is the responsibility of USACE under FUSRAP. Mallinckrodt is proposing to remove the URO using the following steps:

- utility lines, including water, electricity, gas, etc., will be located and marked prior to initiation of remediation activities and will be relocated as necessary to perform this work;
- macadam pavement atop URO burials one through nine will be removed;

- soil covering the buried URO will be removed by excavation;
- water misting or similarly effective dust control methods will be used as necessary to prevent the release of airborne dust during excavation and materials handling activities;
- extent of the removal is to be verified by visual inspection and, where necessary confirmed by appropriate radiation measurements;
- URO contents will be transported to the rail loading facility on site for loading and delivery to a carrier for transport;
- excavated soil and URO may be mixed in order to satisfy disposal site criteria; and
- backfill will be specified to ensure no subsidence or, by agreement with the USACE, excavation cavities may be left to facilitate FUSRAP remediation nearby.

4.6 Environmental Safety Program

Mallinckrodt has committed to perform URO removal activities in accordance with a Health and Safety Program, which includes: (1) an Industrial Safety Program; (2) a Radiation Protection Program; and (3) an Environmental Safety Program. Only the Environmental Safety Program is discussed here. Implementation of the overall Health and Safety Program will be evaluated during NRC site inspections.

Mallinckrodt has committed to implement an Environmental Protection Program to monitor air and water effluents discharged during the URO removal project. During soil handling activities, Mallinckrodt has committed to routinely collect samples or take measurements at on-site and site boundary or off-site locations to determine the extent of environmental discharges during remediation.

The amendment request states that Mallinckrodt will be responsible for overall project direction and ensuring that NRC requirements are met. The remediation contractors will be responsible for implementation of the radiological, occupational, environmental safety and

quality assurance programs. The contractor will also be responsible for providing trained personnel to conduct decommissioning activities. The amendment request describes an acceptable organizational structure and presents minimum qualifications for safety related personnel.

4.7 ALARA Plan

Mallinckrodt has committed to keeping radiation exposures to workers and the environment ALARA, by implementing health safety practices specified in the Radiation Protection Program. The remediation contractor is responsible for implementing the Radiation Protection Program. Under the Radiation Protection Program, the contractor is required to consider how exposures will be kept ALARA in the preparation of safety work permits. In addition, all individuals will be trained in the concepts of ALARA before being allowed to work in controlled areas.

The Radiation Protection Program requires that workers be adequately trained. All unescorted individuals involved in C-T Project decommissioning activities will be required to receive Industrial Safety Training and Radiation Safety Training. All individuals will receive Radiation Safety Training before entering a controlled area to perform work.

Mallinckrodt will also implement an Environmental Safety Program to monitor air and water effluents discharged during URO source removal. Mallinckrodt will routinely collect samples or take measurements at locations on-site, site boundaries, and off-site, to determine the extent of environmental discharges.

Environmental sampling stations will collect continuous samples during URO source removal activities to verify that there are no significant adverse impacts to workers or the environment. Mallinckrodt has also committed to monitor direct radiation using thermoluminescent dosimeters (TLDs). TLDs will be placed at various locations around the

perimeter of the controlled area to ensure that direct radiation in unrestricted areas does not exceed the public dose limits specified in 10 CFR 20.1301.

The Radiation Control and Environmental Safety Programs described in the license amendment request are acceptable programs which should keep radiation exposures to workers, and the environment ALARA.

5. ALTERNATIVES TO THE PROPOSED ACTION

Removal of the URO from Plant 6W contributes to the systematic remediation of the C-T process areas at the St. Louis Plant. Removal of the URO from Plant 6W was initially supposed to occur as part of Phase 2 decommissioning activities. Removal of the URO as a separate licensing action, before the Phase 2 DP has been approved, provides Mallinckrodt the opportunity to coordinate remediation activities of Plant 6 with USACE and remove a significant source of radioactive material from the St. Louis Plant site. There are two possible alternatives to the proposed action: (1) no action alternative; and (2) removal of URO during Phase 2 decommissioning activities.

The “no action” alternative is not an acceptable alternative because the URO burial pits contain residual contamination exceeding NRC’s release criteria. Although the second alternative would be an acceptable decommissioning approach, this alternative delays USACE remediation activities in Plant 6W. Delaying USACE remediation activities in Plant 6 increases the potential dose to Mallinckrodt workers since a significant source of radioactive material remains on site.

6. AFFECTED ENVIRONMENT

As stated in the Background section above, MED-AEC contamination at Mallinckrodt facility is being removed by USACE under FUSRAP. USACE developed a preferred cleanup approach for the MED-AEC contamination, based on the data and findings presented in four

documents: (1) Remedial Investigation Report; (2) Baseline Risk Assessment; (3) Initial Screening of Alternatives; and (4) Feasibility Study.

Section 2.2 of the Feasibility Study provides an evaluation of the affected environment surrounding the Mallinckrodt facility. The findings in Section 2.2 of the Feasibility Study also apply to remediation of the C-T process areas. The NRC staff incorporates by reference the Feasibility Study's Section 2.2 discussion of the following topics: (1) Land use and recreational and esthetic resources; (2) Climatology, meteorology, and air quality; (3) Geology and soils; (4) Water resources; (5) Biological resources; (6) Threatened and endangered species; (7) Wetlands and floodplains; (8) Population and socioeconomics; and (9) Historical, archeological, and cultural resources.

7. ENVIRONMENTAL IMPACTS

7.1 Radiological Impacts

Removal of the URO from Plant 6W creates a potential for radiological environmental impacts. Radiological environmental impacts that could result from remediation activities include exposure, inhalation, and ingestion hazards to workers and the public. These hazards could occur during the excavation and handling of the URO and surrounding soil.

Mallinckrodt has committed to perform work activities in accordance with a Health and Safety Program as described in the amendment request. The Health and Safety Program will consist of: (1) an Industrial Safety Program; (2) a Radiation Protection Program; and (3) an Environmental Safety Program. The Radiation Protection Program will contain controls to monitor exposures to workers. Action levels have been established based on 10 CFR 20, Appendix B. If action levels are exceeded, Mallinckrodt will take corrective action, as necessary. The Radiation Protection Program will keep exposures due to ingestion and inhalation ALARA

by controlling and monitoring airborne releases in work areas, and by utilizing respiratory protection, as necessary.

Mallinckrodt will implement the NRC approved Environmental Safety Program developed for Phase 1 decommissioning activities to monitor air and water effluents discharged during the URO source removal action. If necessary, Mallinckrodt will revise elements of the Phase 1 Environmental Safety Program to effectively control URO removal activities. Mallinckrodt will collect air and water samples on-site and off-site routinely to determine the extent of environmental discharges. Mallinckrodt does not anticipate the need for effluent air monitoring since there will likely be no point sources of effluent air. However, if such a need arises, Mallinckrodt will use a exhaust ventilation system, and the effluent air will be sampled and analyzed. Mallinckrodt will provide environmental monitoring stations to verify that there are no significant adverse impacts to the workers or the environment.

Mallinckrodt has committed to minimize the production of contaminated liquids. There are four potential sources of contaminated liquids: water collection in an excavation pit; sink and shower water; fluids produced by decontamination of equipment; and water used for dust suppression. Sink and shower water is expected to contain insignificant amounts of radioactivity and will be discharged into the sewer in accordance with 10 CFR Part 20.2003. If rain water or surface water is collected, it will ordinarily be used for dust suppression of URO and adjacent soils destined for NRC-approved disposal. Aqueous waste from decontamination fluids and dust suppression containing potentially significant concentrations of radionuclides will be filtered to remove the solids, sampled and analyzed to estimate the concentration in the sewerage. The concentration will be compared with 10 CFR Part 20 concentration limits and the total inventory discharged will be calculated.

Mallinckrodt has also committed to monitor direct radiation using TLDs. TLDs will be placed at various locations around the perimeter of the controlled area for the source removal action, to ensure that direct radiation from the URO does not exceed the limits specified in 10 CFR 20.1301 for unrestricted areas.

Mallinckrodt has established action levels to aid in compliance with environmental safety regulations in 10 CFR Part 20. The action levels for environmental air, effluent water and sewage are 0.75, 0.6, and 0.6 of the limits, respectively. If action levels are exceeded, Mallinckrodt will take corrective actions.

Mallinckrodt has performed dose assessments to determine an occupational exposure estimate, and the dose associated with credible accident scenarios. The occupational exposure estimate for a representative worker during URO removal is 83 mrem/yr.

7.2 Non-radiological Impacts

The St. Louis Plant is located in an area which is completely developed with no pre-settlement vegetation existing. Land use within a one mile radius from the site is a mixture of commercial, industrial, and residential. Commercial or industrial properties in the area include McKinley Iron Company, Thomas and Proetz Lumber Company, and several railroad properties. The USACE Feasibility Study states that there was no sign of federal or state designated endangered or threatened species present at the Mallinckrodt facility. The Feasibility Study also states that the Mallinckrodt facility does not contain any historic buildings. Further, available data indicate that there are no archeological sites in the area.

The residential population within one mile of the site is approximately 10,000 persons, with most of the residences located on the opposite side of Interstate 70. The URO removal action is a small scale activity requiring relatively few workers. Due to the small number of

workers and the short duration of the project, this effort should have minimal socioeconomic impact on the local community.

NRC staff performed an environmental justice review of the Mallinckrodt site for approval of the Phase 1 DP. The review concluded that since Phase 1 decommissioning activities result in an insignificant risk to the public health and safety, and the human environment, that there are no environmental justice issues with this site. As was the case during Phase 1 decommissioning activities, URO burial removal activities result in an insignificant risk to the public health and safety, and the human environment. Therefore, the conclusion that there is no environmental justice issue associated with this site remains valid.

Air quality and noise impacts may result from excavation and handling of URO and surrounding soil, and transport of waste. Mallinckrodt will use appropriate dust control measures during URO and soil handling. These activities will be short in duration; and, therefore, will have minimal impact on the surrounding community and environment.

The St. Louis Plant can be serviced by road, rail, and river barge. Interstate 70 (east and west) can be accessed within one mile from the St. Louis Plant. Rail lines from the Chicago, Burlington, and Quincy Railroad, the Norfolk and Western Railroad, and the St. Louis Terminal Railroad Association, transect the St. Louis Plant from north to south. URO and adjacent soils will be shipped from the site by rail. The total volume of such materials to be shipped from the site is estimated to be approximately 3495 yd^3. Approximately 50 gondola-type rail cars will be required to transport the URO and adjacent soil to a disposal facility. This small number of rail cars will have an insignificant impact on the local rail traffic. The staff incorporates by reference, the USACE Feasibility Study, Appendix C, ALARA Analysis, which calculates the risk to a worker or member of the public during waste transport.

7.3 Connected Action

Mallinckrodt has determined that it may be beneficial to demolish Building 101. As stated above, such action would make Trench 10 fully accessible, and allow all URO from Plant 6W to be moved offsite. Building 101 was not used for C-T processing activities. Mallinckrodt performed a final status survey on the exterior of Building 101 as part of Phase 1 decommissioning activities. A final status survey report was submitted to NRC in March 2004 (ML042600286). NRC released Building 101 for unrestricted use in February 2007 (ML070530675) and it is currently used by Mallinckrodt for business operations not regulated by the NRC. Ordinarily, since Mallinckrodt could demolish Building 101 at any time without NRC approval, such action would not be a federal action requiring the NRC staff's environmental review.

However, it appears that but for the need to make the URO in Trench 10 accessible, in furtherance of the removal action being evaluated in this EA, Building 101 would not be slated for demolition at this time. This nexus between the potential demolition and the licensed action brings Building 101 within the scope of this EA.

Building 101 is a 243 ft by 23 ft cinder block building constructed in 1973. As noted above, although Building 101 was not used for C-T processing activities, Mallinckrodt surveyed the exterior of the building for radioactivity. The NRC performed a confirmatory survey of the building exterior during a February 2007 inspection (ML070530262) and released the building for unrestricted use the same month. Since radioactivity is not a concern, demolition of building 101 will involve the use of standard demolition equipment. The volume of building rubble to be disposed should be less than 2,500 yd^3. Since radioactive material is not a concern and the building has no historic significance, the environmental impacts associated with the demolition of this building will be equal to the demolition of any cinder block building in an industrial area.

The volume of rubble to be transported from the site as the result of Building 101's demolition would have an insignificant impact on the local transportation system.

The URO in Trench 10 has the same radiological characteristics as the URO in the other nine trenches, and the same removal techniques would be used for it. Mallinckrodt must conclude a delineation agreement with USACE prior to removal of URO from Trench 10.

Accordingly, the NRC staff has determined that Mallinckrodt may remove URO from Trench 10 under this proposed license amendment. This conditional approval is reflected in License Condition 19.

7.4 Cumulative Impacts

The URO removal action will have a small, insignificant cumulative impact on conditions at the Mallinckrodt site. The Plant 6W area is a small part of Mallinckrodt's larger operating industrial facility at the St. Louis site. The volume of material to be removed from the trenches is relatively small compared to volume of material to be removed by USACE from Plant 6 under FUSRAP. The URO removal activities are expected to be completed within 12 months.

The Mallinckrodt facility is an operating industrial facility located in a highly industrial area. Further, USACE is conducting remedial activities at the site. As such, the increased noise from URO removal activities will be insignificant.

As described earlier, the URO removal action will generate a relatively small volume of material that will be transported from the site to a disposal facility. While local rail traffic will thus be increased, the small number of rail cars required will have an insignificant cumulative impact on the transportation system in the St. Louis metropolitan area.

The small short term negative impacts associated with the URO removal action are outweighed by the significant positive impact resulting from the removal of URO from the Mallinckrodt facility. Removing the URO from Plant 6W now will reduce the potential radiological

dose to Mallinckrodt workers later, when such workers will be conducting Phase 2 decommissioning activities.

8. AGENCIES AND PERSONS CONSULTED AND SOURCES USED

Much of the information contained in this EA was taken directly from the Mallinckrodt license amendment request and the USACE Feasibility Study. In preparation of the Feasibility Study, USACE consulted with the U.S. Fish and Wildlife Service and the State Historic Preservation Office. Since Plant 6W URO removal activities will be occurring at the same site as USACE decommissioning activities, with a much more limited scope, NRC has utilized the input of the U.S. Fish and Wildlife Service and the State Historic Preservation Office by reference of the Feasibility Study. NRC staff provided a draft of this EA to the State of Missouri for review, and the State's concerns were addressed in the final EA.

9. CONCLUSION

Radiological exposures to workers and the public will be in accordance with 10 CFR Part 20 limits. NRC believes the amendment request contains sufficient controls to keep potential doses to workers and the public from direct exposure, airborne material, and released effluents, ALARA. The staff also believes that the remediation alternative proposed by Mallinckrodt minimizes the potential dose to workers and members of the public, and other environmental impacts.

10. LIST OF PREPARERS

This EA was prepared by John Buckley, Senior Project Manager, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs. No other sources were used beyond those referenced.

11. FINDING OF NO SIGNIFICANT IMPACT

Pursuant to 10 CFR Part 51, NRC has prepared this EA related to the approval of Mallinckrodt's license amendment request for removal of URO from Plant 6W. On the basis of this EA, NRC has concluded that this Federal action would not have any significant affect on the quality of the human environment and does not warrant the preparation of an Environmental Impact Statement. Accordingly, it has been determined that a Finding of No Significant Impact is appropriate.

Since the conclusion of this EA is that the remediation of the Plant 6W URO burial trenches of Mallinckrodt's St. Louis Plant represents no significant risk to the public health and safety and the human environment, NRC concludes that there are no environmental justice issues related to the URO removal action.

The affore mentioned documents related to this proposed action are available for public inspection and copying at NRC's Public Document Room at One White Flint North, 11555 Rockville Pike, Rockville, MD 20852-2738.

12. LIST OF REFERENCES

12.1 Mallinckrodt Chemical, Inc., Request for NRC License Amendment to Remove URO From Plant 6W, November 20, 2007.

12.2 Mallinckrodt Chemical, Inc., Mallinckrodt C-T Project Decommissioning Plan (DP), Part 1, January 18, 2001.

12.3 U.S. Army Corps of Engineers, Proposed Plan for the St. Louis Downtown Site, April 1998.

12.4 U.S. Army Corps of Engineers, Feasibility Study for the St. Louis Downtown Site, April 1998.

12.5 NRC, Policy and Guidance Directive FC 83-23, “Termination of Byproduct, Source, and Special Nuclear Material Licenses,” November 1983.

12.6 NRC, 10CFR Part 20, “Radiological Criteria for License Termination: Final Rule,“ July 1997.

FOR FURTHER INFORMATION CONTACT

John Buckley, Decommissioning and Uranium Recovery Licensing Directorate, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Protection Programs. Telephone: 301-415-6607, email: john.buckley@nrc.gov

Dated at Rockville, Maryland, this 30th day of April 2008.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/ by R.Tadesse

Rebecca Tadesse, Acting Deputy Director
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Protection Programs