

U.S. NUCLEAR REGULATORY COMMISSION
DOCKET NO. 40-6563
FINDING OF NO SIGNIFICANT IMPACT RELATED TO
APPROVAL OF THE MALLINCKRODT C-T PROJECT DECOMMISSIONING PLAN, PART 1
MALLINCKRODT CHEMICAL, INC.
ST. LOUIS, MISSOURI, LICENSE NO. STB-401

The U.S. Nuclear Regulatory Commission (NRC) is considering approval of the Mallinckrodt C-T Project Decommissioning Plan (DP), Part 1, originally submitted to NRC on November 20, 1997, and revised on January 18, 2001, February 13, 2002, and March 8, 2002. In the DP, Mallinckrodt Chemical Inc., (Mallinckrodt), is proposing to remediate the above-grade portion of buildings, and equipment. Mallinckrodt is proposing (1) to release columbium-tantalum (C-T) project process equipment in accordance with NRC's "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," (2) to release building surfaces in accordance with 10 CFR 20, Subpart E and, (3) to release building waste material which meets the requirements of NRC Policy and Guidance Directive FC 83-23, "Termination of Byproduct, Source, and Special Nuclear Material Licenses," November 1983, in accordance with license condition 16, or future NRC regulations on clearance of materials, or under the provisions of 10 CFR 20.2002. To demonstrate compliance with these documents, Mallinckrodt has derived beta release criteria based solely on measured beta emission.

Below is a summary of the Environmental Assessment (EA) prepared by the staff to support approval of the Mallinckrodt Phase 1 DP. The complete EA is available through NRC's Public Document Room.

ENVIRONMENTAL ASSESSMENT

Introduction:

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. From 1961 to 1985, Mallinckrodt extracted C-T from natural ores and tin slags.

Enclosure 3

Radiological contamination at the site resulted from MED-AEC and C-T processing activities. MED-AEC contamination is being removed by the U.S. Army Corps of Engineers (USACE) under the Formerly Utilized Sites Remedial Action Program (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.

Purpose and Need for the Proposed Action

Mallinckrodt has requested that NRC terminate License No. STB-401. Before the license can be terminated, NRC must be assured that the areas of the Mallinckrodt facility associated with the C-T project meet NRC's release criteria.

Mallinckrodt is planning to conduct the C-T decommissioning project in two phases. In Phase 1, Mallinckrodt will decommission buildings and equipment used during C-T production. C-T project buildings and equipment remaining on-site will be cleaned and released for unrestricted use. In Phase 2, Mallinckrodt will remediate building slabs and foundations, paved surfaces, and all subsurface materials. This EA addresses only Phase 1 of decommissioning.

Mallinckrodt has proposed a two-phase decommissioning approach. The two-phase approach is needed because:

- The facility is an operating facility with limited areas for staging decommissioning activities. Removal of buildings and equipment in Phase 1 will provide staging areas necessary for Phase 2 decommissioning.
- On-site workers have access to buildings containing residual contamination. Removal of buildings and equipment in Phase 1 reduces the potential that workers will be exposed to residual radioactive material. Further, some of the C-T process buildings have not been used for several years, and the buildings are starting to physically deteriorate.

Proposed Action

The ultimate goal of the C-T project decommissioning is to remediate those areas of the site associated with C-T production, to the extent necessary, to terminate License STB-401. Mallinckrodt is proposing to decommission the C-T Project areas, on the site, in two phases. In

Phase I, Mallinckrodt will decommission the buildings and equipment, to the extent necessary, to meet NRC's unrestricted release criteria as presented in 10 CFR part 20, Subpart E.

Phase 1 remediation is expected to take approximately two years. Phase II will include the remediation, of the building slabs and foundations, paved surfaces, and all subsurface materials. Mallinckrodt will submit the DP for Phase II to the NRC for review and approval in 2003.

Mallinckrodt is proposing (1) to release C-T process equipment in accordance with NRC's "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," (2) to release buildings in accordance with 10 CFR 20, Subpart E, and (3) to release building waste material which meets the requirements of NRC Policy and Guidance Directive FC 83-23, "Termination of Byproduct, Source, and Special Nuclear Material Licenses," November 1983, in accordance with license condition 16, or future NRC regulations on clearance of materials, or under the provisions of 10 CFR 20.2002. To demonstrate compliance with these documents, Mallinckrodt has derived beta release criteria based solely on measured beta emission. Section 2.2, of the DP, provides the release criteria for equipment and materials.

Mallinckrodt's rationale for developing release criteria based on beta emission is: (1) direct measurement of alpha particles can be unreliable if the contaminated surface is painted, (2) direct measurement of gamma concentration on equipment and building surfaces will not be representative due to significant gamma contributions from subsurface areas, and (3) the minimum detectable activity for beta will be lower than for combined beta-gamma, since background is about one-third of the combined beta-gamma background.

Alternatives to the Proposed Action

The remediation approach proposed by Mallinckrodt provides for the systematic remediation, of the C-T process areas, at the St. Louis Plant. This approach provides Mallinckrodt the opportunity to remove C-T process building material and equipment from the site, and release usable buildings and equipment for unrestricted use. Removal of C-T process buildings from the site will provide Mallinckrodt necessary staging areas for Phase 2 remediation activities. There are two alternatives to the proposed action: (1) no action, and (2)

prepare a single DP and conduct all C-T process decommissioning activities in accordance with it.

The no action alternative is not acceptable because the C-T process buildings, equipment and surrounding areas contain residual contamination exceeding NRC's release criteria. Although, the second alternative would be an acceptable decommissioning approach, this alternative does not provide Mallinckrodt the advantages discussed above.

Affected Environment

As stated in the Introduction, 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 following issues are addressed: (1) Land use and recreational and Aesthetic 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 flood plains; (8) Population and socioeconomics, and (9) Historical, archeological, and cultural resources.

Environmental Impacts

Remediation of the C-T process buildings and equipment creates a potential for radiological environmental impacts. Radiological environmental impacts that could result from remediation activities include exposure, inhalation, and ingestion hazard to workers and the public. These hazards could occur during the decontamination and demolition of buildings.

Mallinckrodt has committed to perform work activities in accordance with a Health and Safety Program as described in Section 3 of the DP. 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 an Environmental Safety Program to monitor air and water effluents discharged during decommissioning. Mallinckrodt is proposing to 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 Mallinckrodt uses a decommissioning process exhaust ventilation system, 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 three potential sources of contaminated liquids: sink and shower water; decontamination fluids; 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. 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. All contaminated liquids will be disposed to the Metropolitan St. Louis Sewer District (MSD) following confirmation that MSD specifications for sampling, analysis, and pre-treatment have been met.

Mallinckrodt has also committed to monitor direct radiation using TLDs. TLDs will be placed at various locations around the perimeter of the restricted area to ensure that direct radiation in unrestricted areas does not exceed the limits specified in 10 CFR 20.1301.

Mallinckrodt has established action levels for air and water effluents based on the levels provided in 10 CFR 20, Appendix B, Tables 2 and 3. 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 Phase 1 decommissioning is 43.4 mrem. The dose estimate to a maximum exposed worker as a consequence, of the worst case hypothetical accident, is less than 0.1 percent, of the annual limit of uptake (ALI), of 10 CFR Part 20.

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, with most of the residences located on the opposite side of Interstate 70. Mallinckrodt estimates that approximately 14 workers will be required to Phase 1 decommissioning activities. Due to the small number of workers required for decommissioning, 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. 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.

Air quality and noise impacts will result from demolition of buildings and transport of waste. Mallinckrodt will use appropriate dust control measures during building demolition. Asbestos abatement work will be performed in accordance with EPA, OSHA, State, and City regulations. These activities will be sporadic in nature and short in duration, 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. Waste will be transported from the site by rail. Mallinckrodt estimates that the volume of waste to be transported will be approximately 126,000 ft³. This volume of waste will require less than 100 rail cars spread over a one year time period. Therefore, the impact of transporting waste from the site should be insignificant.

Agencies and Persons Consulted and Sources Used

Much of the information contained in this EA was taken directly from the Mallinckrodt DP 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 Phase 1 decommissioning 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 to the Feasibility Study. NRC staff provided a draft of this EA to the State of Missouri for review.

Conclusion

Radiological exposures to workers and the public will be in accordance with 10 CFR Part 20 limits. NRC believes the DP 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.

List of References:

1. Mallinckrodt Chemical, Inc., Mallinckrodt C-T Project Decommissioning Plan (DP), Part 1, January 18, 2001.
2. U.S. Army Corps of Engineers, Proposed Plan for the St. Louis Downtown Site, April 1998.
3. U.S. Army Corps of Engineers, Feasibility Study for the St. Louis Downtown Site, April 1998.
4. NRC, Policy and Guidance Directive FC 83-23, "Termination of Byproduct, Source, and Special Nuclear Material Licenses," November 1983.
5. NRC, 10CFR Part 20, "Radiological Criteria for License Termination: Final Rule," July 1997
6. NRC, NUREG/CR-5512, "Residual Radioactive Contamination From Decommissioning," October 1992.

FINDING OF NO SIGNIFICANT IMPACT

Pursuant to 10 CFR Part 51, NRC has prepared this EA related to the approval of Mallinckrodt's DP. 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 C-T project areas 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 remediation.

The aforementioned 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.

FOR FURTHER INFORMATION CONTACT

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Dated at Rockville, Maryland, this _____ day of April 2002.

FOR THE NUCLEAR REGULATORY COMMISSION

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