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January 20, 2012

Sharon R. Cotner  
FUSRAP Program Manager  
Department of the Army  
St. Louis District, Corps of Engineers  
8945 Latty Avenue  
Berkeley, Missouri 63134

Re: Mallinckrodt Comments on Remedial Investigation and Baseline Risk Assessment Report  
for the Inaccessible Soil Operable Unit at the St. Louis Downtown Site, St. Louis,  
Missouri, Revision B, Dated November 10, 2011

Dear Sharon:

Mallinckrodt has discussed submission of our comments with Susan Adams and received an extension of time to provide our response. Mallinckrodt appreciates the opportunity to comment on the above referenced document.

Mallinckrodt has the following specific comments including some clarifications and corrections where the USACE information appears inaccurate.

1. Executive Summary, Page ES-7 and Section 4.5

Broadway Street west of Plant 10 should be included in the scope of the Inaccessible Soil Operable Unit at the St. Louis Downtown Site investigation. A December 20, 1995 letter from ORISE to the U.S. Department of Energy documenting the Verification Survey of Plant 10 Area at the St. Louis Downtown Site stated "the excavation wall along the west boundary of the site (Broadway St) has residual contamination in excess of 50 pCi/g U-238, but could not be remediated without affecting the structural integrity of the road bed"

In a letter from David Adler to Robert Boland dated April 2, 1996 Mr. Adler stated that there is an area on the western boundary of Plant 10 along Broadway Street that was not remediated due to the concern of compromising the structural integrity of the roadway. Mr. Adler stated that "A future hazard assessment will address the impact of leaving this contamination in place". The "*Residual Dose and Risk Assessment for Plant 10 of the St. Louis Downtown Site*" mentions the verification survey of Plant 10 conducted by ORISE and that it supported the conclusion by the DOE's contractor that the Plant 10 area satisfied DOE requirements for release without radiological restrictions. However, it fails to evaluate the impact of the exception to the release as identified by ORISE along the western boundary of Plant 10.

Future development of Plant 10 by Mallinckrodt as well as St. Louis City roadway and utility maintenance in Broadway Street could be impacted by MED/AEC-related contaminants present in the subsurface along Broadway St. This report does not provide any further evaluation of Broadway St. to determine if MED/AEC-related contaminants are present at concentrations sufficiently low enough to be fully protective of human health and the environment. At a minimum this area should be highlighted in Section 4.8.1.5 as an Inaccessible Soil Area Associated with Roadways.

## 2. Section 1.1.2, page 5

The following statement in the 10<sup>th</sup> bullet is inaccurate and misleads the reader.

*"Plant 7W was used previously by MED/AEC and by Mallinckrodt for processing radioactive feed materials."*

There was no processing of radioactive feed materials performed in Plant 7W. Plant 7W areas were used to store containerized tin slag feed materials and in 1971 the concrete lined neutralization ponds were constructed and started receiving Mallinckrodt commercial processing waste waters. Mallinckrodt activities in Plant 7 would more accurately be described as support activities for Columbiuim-Tantalum (C-T) processing including raw material storage. Attached is suggested marked up test revised as noted above.

*Plant 7W was previously used by MED/AEC for processing radioactive feed materials and by Mallinckrodt to store containerized tin slag feed material and the operation of the concrete lined waste water neutralization ponds. In 1955, Building 700 was constructed by MED/AEC and was used to machine reactor cores. In the same year Building 701 was constructed by MED/AEC and used to recover uranium from reject magnesium fluoride slag liner using a mill and flotation process. The Mallinckrodt waste water neutralization ponds were constructed in 1971.*

### 3. Section 4.7, Figure H-1

Mallinckrodt maintains the position that MED/AEC impacted discharges flowed through the Diversion sewer. The construction drawings were approved for construction by MSD's Executive Director on 2-8-61. These drawings document that the construction of the diversion channel occurred in 1961.

As documented in November 1961 Destrehan Street Plant Decontamination report, decontamination methods used to remove gross contamination within the Destrehan Street Plant included:

- Broom sweeping
- Water rinsing using fire hydrants at maximum pressure
- Dry sandblasting to clean concrete and steel surfaces, followed by a water rinse
- Pneumatic hammer chipping where contamination penetrated deep into concrete
- Spot cleaning of certain surfaces with an acid-detergent solvent.

All residues from the decontamination activities reportedly were flushed to the sewers. Residues from these decontamination activities would have drained through the 42 inch diversion sewer that had been constructed as noted above making that sewer potentially impacted by MED/AEC materials. Furthermore, even after the Destrehan Street Plant Decontamination, radiological residues from processing MED/AEC remained at the SLDS site. There has been residual MED/AEC contamination in soils and on building structures to the present day. MED/AEC contamination existed in Plant 6 and 7 in soils, on structures and roofs specifically Buildings 704, 705 and 706 and old sewer lines long after the 42 inch diversion sewer was put into service thereby creating the potential for MED/AEC contamination to be discharged to the combined storm sewer system at the plant discharging to the diversion sewer. Over the years storm water runoff and waters due to flooding would have carried residual MED/AEC contamination to the plant sewers that discharge to the 42" diversion sewer.

To further support our position, Mallinckrodt would like to point out the impact from MED/AEC activities at the vicinity properties which again support the position that residual radiological contamination from MED/AEC activities remained at SLDS and surrounding sites after the initial decommissioning of the Destrehan Street Plant was completed.

As stated in the June 1990 Federal Facilities Agreement (FFA) governing USACE activities at the site, areas and/or structures which could have radiological waste resulting from or associated with uranium manufacturing or processing activities and other comingled contamination are the responsibility of USACE. Therefore, the 42 inch diversion sewer should be considered co-mingled and therefore be classified as a sewer that serviced both commercial and MED/AEC operations.

#### 4. Section 4.7.3.1 Description of Plant 2 Sewers

Mallinckrodt believes that there was the potential for wastewater and sediment from the Plant 2 MED/AEC operations to have flowed in the 15 inch MSD sewer south of Destrehan. Although the 1980 Warren and Van Praag sewer drawing indicates a plug in the line just south of MH-37 it

does not provide a date as to when the sewer line was plugged. Several Mallinckrodt sewer drawings dated between 1945 and 1958 do not indicate a plug in the 15 inch sewer. Drawing number 2027 "Main Sewers in and Around Plants 1, 2 & 3" originally dated 1945 and updated in 1946 and 1957 does not indicate a plug in the line south of MH-37. In addition, drawing number 3121-3 "Map of Plant Sewers West of Hall Street" dated August 12, 1958 does not note a plug in the 15 inch line south of MH-37.

The Warren and Van Praag sewer drawing for this 15 inch sewer indicates that the flow direction for the sewer line varied between manholes. In general, the slope of the sewer line in the Plant 2 is considered to be relatively flat thereby allowing flows to migrate in either the north or south direction. In addition, the 1943 flood waters could have potentially caused significant variations in the sewer system flow direction. Potential MED/AEC impacts of the 15 inch sewer line should be addressed south of Destrehan Street.

The 15 inch MSD sewer main running north and south from Plant 5 up to Plant 1 was never used by Mallinckrodt commercial processing. The Plant 5 property was purchased in 1944 and in 1947 the sewer system as it exists today in Plant 5 was constructed along with the first Mallinckrodt manufacturing building. A historical MSD drawing indicates that the 15 inch sewer main extends into Plant 5 approximately 303 feet.

#### 5. Section 4.7.4.1 Description of Plant 6 Sewers

First paragraph:

*" Both MED/AEC wastes and wastes originated from Mallinckrodt commercial work (C-T operations) were transported in sewer lines at Plant 6".*

This statement is incorrect. These statements throughout the document need to be modified to accurately reflect the facts. As you know, there was no C-T processing performed in Plant 6 that would have discharged radioactive effluent. Buildings in Plant 6 were used to store containerized C-T feed materials and drummed URO waste. Feed materials were received at the plant in burlap bags which were then transferred into drums and/or boxes for storage. This feed material was so valuable that after emptying the burlap bags in the processing area they were incinerated for the purpose of recovering residuals on the bags. The ashes from the incinerator were collected and used in the C-T process.

It should be noted that because the Plant 6 sewers were not used for C-T manufacturing operations, the overwhelming majority of contamination that might be present in these sewers

would be from MED/AEC operations. Furthermore, burial of the C-T materials would have had no impact in sewer lines based on the located and timing of the burials.

Suggest text revision as noted above.

*MED/AEC wastes generated in the Plant 6 Buildings were transported in sewer lines at Plant 6. After MED/AEC manufacturing activities had ceased Mallinckrodt used these buildings to store containerize C-T feed material and URO.*

#### 6. Section 4.7.5.1 Description of Plant 7N and DT-12 Sewers

As stated in Comment 1, text should be modified to accurately reflect the facts. The document as written inaccurately describes operations. There was no C-T processing performed in Plant 7 that would have discharged radioactive effluent. Buildings in Plant 7 were used to store containerized C-T feed materials and drummed URO waste. Because the Plant 7 sewers were not used for C-T manufacturing operations, the overwhelming majority of contamination that might be present in these sewers would be from MED/AEC operations.

The text describing the historical timeline for the commercial sewer line should be corrected because as written it is inaccurate. The Plant 5 sewer layout designed drawings dated July 1947 were prepared by Horner & Shifrin. The sewer layout was routed under the Hall Street railroad tracks to the northwest corner of Plant 7W where it discharged into what is now known as the Plant 5 lift station. The sewer continued due east for approximately 440 ft where it was tied into the existing 30" Destrehan St. sewer. The sewer was constructed by mid-1948. The 30" Destrehan St. sewer discharged to the Mississippi River until approximately 1962 when the Diversion sewer was installed.

During the operational period of the Destrehan St. Plant the Mississippi River exceeded flood stage in 19 events. The St. Louis Downtown Site was impacted by these flood events because the levee along the Mississippi River was not built until the 1960's. The peak flood events occurred during the MED-AEC operations in 1943, 1944, 1947 and 1951. The water level of the river during these events was eight to ten feet above flood stage. The 1943 event reportedly interrupted the MED-AEC uranium processing in Plant 2. It was also reported that sewers were plugged and a large metal gate on rollers was placed between two buildings on Destrehan Street to hold back the gushing water. The greatest flood event in the 1940-1964 time frame occurred in 1947. As a result of the flood waters, potential dispersion of MED-AEC contamination occurred not only in subsurface soils outside of Plant 6 but also within the plant sewer system upstream of the Destrehan St. plant.

Mallinckrodt disagrees with the text "URO discharged to the sewers at Plant 5 flowed eastward into the 30-in sewer at the northern edge of Plant 7". The text should state "C-T process

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wastewaters were discharged to the sewers at Plant 5...". Management of URO solids changed with time. URO solids were typically drummed for offsite disposal, however, in 1972 and 1973 approximately 300 cubic yards of URO were buried on-site in conformance with 10 CFR 20.304.

Mallinckrodt appreciates the consideration given by the Corps on the comments submitted.

If you have any questions regarding this matter, please contact me as 314-654-5838.

Sincerely,

A handwritten signature in cursive script, appearing to read "Karen Burke".

Karen M. Burke  
Director Environmental Remediation

cc: Ms. Patricia Duft, Mallinckrodt  
file

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