

## TRIP REPORT

MEMORANDUM TO: License File  
Sigma-Aldrich Company  
St. Louis, MO  
License No. 24-16273-01  
Docket No. 030-10716

THRU: Christine Lipa, Chief *Christine Lipa 1-14-09*  
Materials Control, ISFSI, & Decommissioning Branch  
Division of Nuclear Materials Safety, Region III

FROM: George M. McCann, Senior Health Physicist  
Materials Control, ISFSI, & Decommissioning Branch  
Division of Nuclear Materials Safety, Region III *George M. McCann*

SUBJECT: December 10, 2008, DECOMMISSIONING PLAN LICENSE MEETING

### Meeting Participants:

#### NRC Region III

- George (Mike) McCann, Senior Health Physicist, MCID, DNMS
- Peter Lee, PhD, CHP, MCID, DNMS
- Lionel Rodriguez, Reactor Engineer, MCID, DNMS

#### Sigma-Aldrich

- Bob Ringering, Director of Manufacturing, 314-771-5765, x3165
- Thomas Spencer, Production Manager, RSO, 314-771-5765, x3186

#### Philotechnics

- Matt Norton, Vice President, 781-222-5047
- Gary S. Nadeau, Director of Health Physics Operations, 781-222-5048
- Ryan Fahey, Project Manager, 978-844-4560
- Tracie Clemons, Senior Health Physicist, 978-844-2008

Background: A meeting between representatives from the Sigma-Aldrich Company (Sigma), Philotechnics, Ltd. (decommissioning service contractor), and NRC Region III staff was held to discuss Sigma's Decommissioning Plan for its Ft. Mims byproduct materials production facility. The meeting was held at Sigma's production facility, which is located at 11542 Fort Mims Drive, Maryland Heights, Missouri.

Sigma's radioactive materials usage at the Ft. Mims site consisted of research and development activities as defined in 10 CFR 30.4, and storage, processing and use in the production of labeled compounds for distribution to authorized customers. The licensee used radioactive materials in specific areas of the building since 1975. The licensee ceased production activities at the facility on September 30, 2008. The radioactive materials of significance with regards to decommissioning used at the Fort Mims facility consisted of carbon-14 and hydrogen-3.

The Sigma-Aldrich property in Maryland Heights, Missouri consists of a two-story building of approximately 20,000 square feet. The building is constructed on a concrete slab. The building exterior walls are a combination of cinder block, sheet metal and wood. The building roof is sheet metal and foam. Interior floors are a combination of carpeted concrete, tile over concrete and painted concrete. Interior walls are primarily painted drywall with a few painted cinder block walls. The facility is located on approximately a one-acre parcel in a commercial/light industrial park.

Sigma submitted a decommissioning plan for its Fort Mims Facility on October 22, 2008 (ML083010187). On November 24, 2008, Region III issued a letter acknowledging receipt of the DP, and notified the licensee that the DP had been accepted for technical review. Sigma has contracted Philotechnics to perform the decommissioning activities including characterization, remediation, final status surveys and development of a final report. Philotechnics is performing onsite activities under a reciprocity agreement with the NRC using Philotechnics' Massachusetts Radioactive Materials License No. 56-0543. In October of 2008, the licensee projected that the decommissioning of the facility would take approximately 3 to 4 months. The end goal is to remediate the facility to below the NRC screening values, with a projected ALARA dose limit of 10 mrem annual dose.

Discussion: NRC staff informed the licensee that the DP plan had been accepted for full technical review (6-month period allowed). On November 26, 2008, Region III submitted a draft Federal Register Notice (FRN) to the NRC's Office of General Council (OGC). The notice was published in the Federal Register on December 29, 2008, Vol. 73, No. 249, pg. no. 79520-79522. The 60 day comment period ends on February 27, 2009.

During the site-visit, requests for additional information (RAIs) were discussed and a copy was provided to the licensee. These RAIs were based on NRC staff review of the DP. The licensee was advised that once the RAIs are addressed and the NRC determines that the DP is acceptable, another FRN will be submitted which allows the Commission to issue the amendment approving the DP. A copy of the RAIs is attached. The licensee was also advised that the second FRN does not require a comment period. Furthermore, Sigma was notified that as of this time no public meeting is foreseen, since there does not appear to be any public interest. Also, the licensee was advised that since the project is a Group 3 decommissioning activity, the level of sensitivity is less. The licensee was advised that this position could change if new information should develop warranting a meeting. The NRC staff confirmed that contact information for the NRC Region III Public Affairs Officers and the licensee's public relations staff had been successfully exchanged. It was emphasized that any emergent public interest should be shared with the NRC.

Currently, the licensee estimates that the work Philotechnics could perform prior to DP approval (estimated for February of 2009) will be completed before the end of December, 2008; Reference the "October 1, 2008 Trip Report to Sigma Aldrich" (ML083050591) for more information on the allowable work that could be done by Philotechnics at the site. Once completed, the contractor will demobilize from the site until further work is approved by the NRC. The contractor had completed a significant amount of waste and equipment removal. Pictures of the site and current laboratory conditions are attached.

During the meeting the licensee asked if the NRC could approve the decommissioning contractor's soil sampling plan ahead of the DP plan approval. The licensee indicated that the ground freezes in February, which would make the sampling more difficult. The NRC staff indicated that they would attempt to review the plan during the month of December. Additional information specific to the soil sampling program will be submitted by the licensee to address NRC staff questions. A letter requesting approval of the soil sampling plan was received from the licensee on December 15, 2008, (ML083510259). The licensee was advised that this will be done either as an amendment to the Sigma license or a letter will be sent advising the licensee that the work can be done by Philotechnics under their Agreement State license.

The licensee also asked if they could perform the decommissioning using a phased approach. The licensee indicated that they want to decontaminate the building structure to unrestricted use limits, and then demolish the building leaving the concrete slab. The licensee believes that this will allow for easier and better characterization of subsurface soils. The NRC staff indicated that the approach seems reasonable, but that the licensee should submit a write-up indicating the approach so that it could be incorporated into the DP. The licensee submitted a letter dated December 15, 2008 (ML083510270), which discussed the phased approach.

For the inspection phase of the site visit, NRC staff focused on ensuring that the facility is in a safe and secure condition during this break in work. Site security was inspected by randomly checking access points, asking licensee about intrusion alarm system functionality, and verifying that the conditions for storage of residual contamination and remaining inventory would be adequately monitored during the shutdown. The NRC staff reviewed bioassay, air sampling, and radioactive waste shipment records. The inspectors also performed independent measurements in remediated areas of the building and observed the performance of surveys by contractor personnel. No violations were noted during the inspection.

CC  
D. Orlando, FSME

# Attachments

Sigma-Aldrich Chemical Company  
REQUEST FOR ADDITIONAL INFORMATION REGARDING  
STAFF REVIEW OF DECOMMISSIONING PLAN DATED  
OCTOBER 22, 2008

1. Clarify the end state of the building. Specifically, is the building to be free released and then demolished, or will portions of the building structure be disposed of as radiological waste. If portions of the building are to be demolished, then discuss the potential impacts and actions to prevent and or monitor the effluent releases during demolition.
2. Discuss in greater detail the activities to characterize and possibly remediate the buried septic tank and related soils, and any potential impacts on ground and surface waters as follows:
  - A. When is the characterization of the tank and septic field planned?
  - B. What is the anticipated condition of the building when the characterization is to be performed?
  - C. What has been done to localize the buried tank?
  - D. What has been done to identify the septic leach field, which drained the liquids from the tank?
  - E. How will characterization of soils under the building, adjoining the tank, and associated drain field be performed? Provide a written discussion and plan.
  - F. Discuss the actions to be taken in the event significant amounts of contamination are encountered, that is significantly higher than the screening values.
  - G. If subsurface contamination above the screening values are identified, then provide additional information, which indicates that the underlying site aquifers are not impacted. NUREG-1757, Volume 2, Appendix F "Ground and Surface Water Characterization," outlines the considerations and information necessary to demonstrate adequate characterization of groundwater and surface water impacts.
  - H. Discuss the potential for mixed wastes and chemical impacts in contaminated soils. The information should describe your monitoring actions and the data collected to verify that there are no chemical impacts in the subsurface soils which could be mobilized as a result of the remediation activities.
3. Provide a representative sampling of the final status survey packages for the different survey classes, which have been completed in anticipation of the upcoming FSS. We need to evaluate the documentation, calculation and assumptions. For projects, lasting years, a description of the plan may be acceptable and finalized near completion, but in the case of a 2 to 4 month project the survey packages with completed calculations, diagrams, assumptions, and other need to be provided.
4. Was the MARSSIM Compass program used in conjunction with the VSP program? The usual way to determine the number of samples is to use ORISE's COMPASS program, MARSSIM Implementation Software. This enables the user to transfer the COMPASS sample data and MDCs, etc to VSP. Provide the data used to derive the final report
5. Please describe in greater detail how your decommissioning contractor will monitor potential environmental releases during the remediation Activities. Please see Item 11, in Appendix D of NUREG-1757, Vol 1.

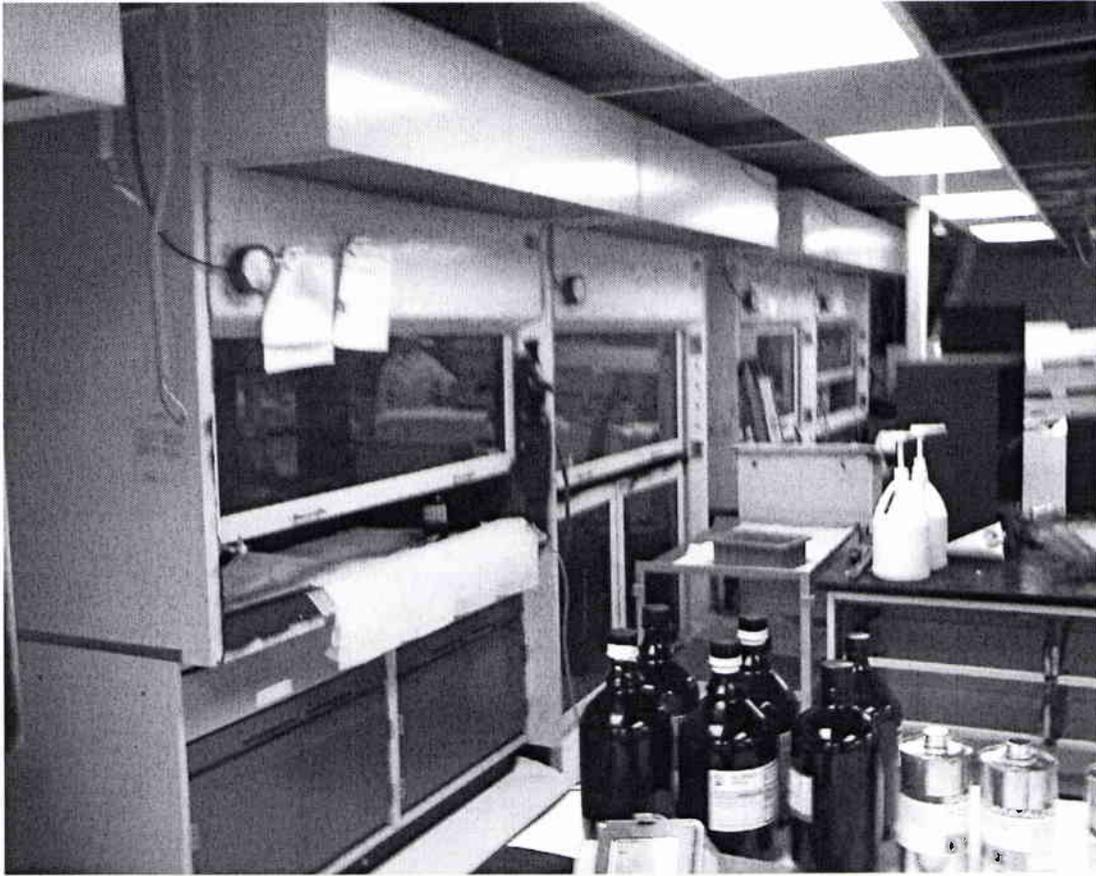
Clarify the statement in Section 8 Effluent Control Program. It is indicated in the DP that the air exhaust system for the facility is monitored. However, comments provided to the NRC during the last inspection indicated that the facility exhaust is not monitored. If the facility exhaust is not monitored, then discuss what monitoring will be implemented.

6. Provide the Philotechnics project-specific Quality Assurance Project Plan (QAPP) provided to Sigma Aldrich as indicated in Section 15.0 Quality Assurance Program of the DP.
7. Confirm that the procedures cited in the index submitted with Sigma's DP will not be changed. If a change to a procedure is necessary, discuss how the licensee and NRC will be made aware of the change prior to the implementation of any procedural change.
8. Philotechnics Procedures
  - A. Procedure Review and Approval - Section 4.4 Procedure Manuals  
Section 4.4.1 = current copy of license application = provide
  - B. Radiation Work Permits HP-AC-03

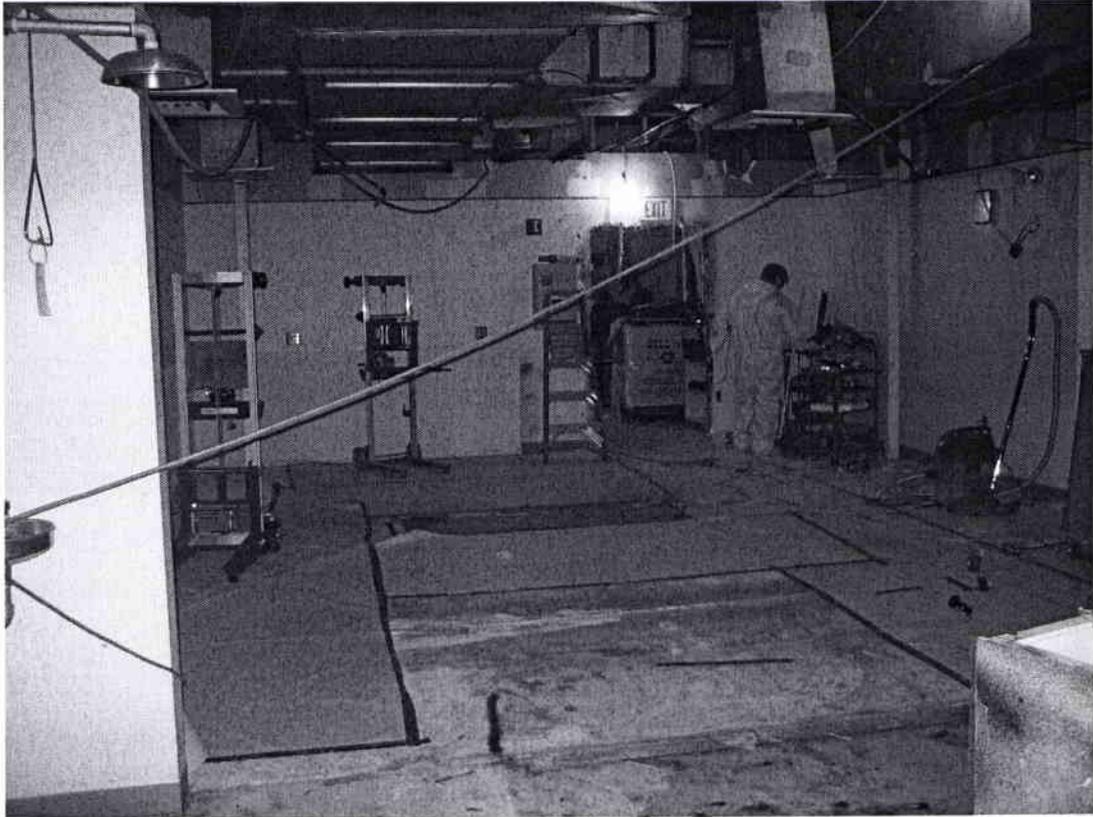
Page 3 - Applicability, clarify, this statement regarding license issued from the State of Tennessee. The license that is being worked under is from the State of Massachusetts



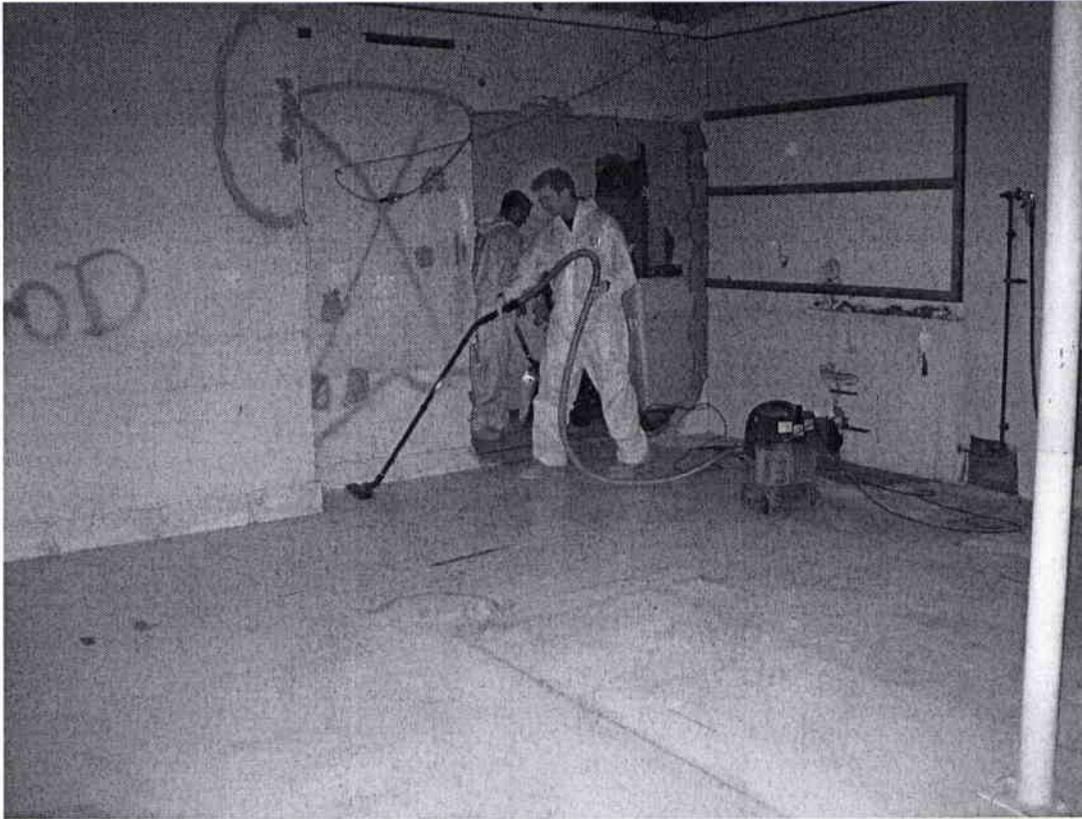
Figure 1 Front of Ft. Mims Facility



**Figure 2** Production Lab prior to cleanup



**Figure 3 Production Laboratory almost done**



**Figure 4 Rad Techs performing cleanup**



**SIGMA-ALDRICH**

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December 15, 2008

George M. McCann  
U.S. NRC Region III  
2443 Warrenville Rd  
Lisle, IL 60532-4352

RE: NRC License 24-16273-01; Soil Plan

Dear Mr. McCann

In order to improve the efficiency of our decommissioning project, I am requesting permission to proceed with the Open Land Soil Sampling and Analysis Plan (Soil Plan). This plan, submitted as part of the Decommissioning Plan dated October 22, 2008, was recently reviewed and discussed with your NRC team during the inspection visit of December 10, 2008.

Under contract with Sigma-Aldrich and with a reciprocity license from the state of Massachusetts, Philotechnics, Ltd. will perform the work detailed in the Soil Plan. The Soil Plan entails only characterization surveys - not remediation. Thus, release of radioactivity to the public is not a concern.

Thank you for considering this request. Please contact me if you have any questions in this matter.

Sincerely,

Thomas K Spencer  
Radiation Safety Officer  
Sigma-Aldrich Company  
Phone 314/286-7686  
Email [tspencer@sial.com](mailto:tspencer@sial.com)

CC:

Ryan P. Fahey, Project Manager, Philotechnics, Ltd.  
Bob Ringerling, Director of Manufacturing, Sigma-Aldrich  
Cheryl Stipsits, Director of Environmental, Health & Safety, Sigma-Aldrich