

TA-55



**Solid Waste Regulatory Compliance**  
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Date: March 25, 2003  
Refer To: SWRC:03-013

Mr. Carl Will  
RCRA Permits Management Program  
Hazardous Waste Bureau  
New Mexico Environment Department  
2044-A Galisteo Street  
P.O. Box 26110  
Santa Fe, New Mexico 87502-6110



Dear Mr. Will:

**SUBJECT: TREATABILITY STUDY NOTIFICATION**

The purpose of this letter is to provide notification of intent to conduct one mixed waste treatability study at Los Alamos National Laboratory (LANL), pursuant to Title 20 of the New Mexico Administrative Code, Chapter 4, Part 1 (20.4.1 NMAC), which incorporated 40 CFR 261.4(f). The study will be conducted by the Weapon Component Technology Group (NMT-5) of the Nuclear Materials Technology Division (NMT).

The waste sample to be studied will be Trichloroethylene (TCE) and bromobenzene used in the cleaning of parts and conducting density measurements respectively. When these solvents are spent, they are contaminated greater than 100 nanocuries per gram. Presently, they are a waste management challenge because there are few disposal options for transuranic organic waste liquids. This project, described in detail in the enclosure, will evaluate several filtering technologies that are designed to reduce the spent actinide concentration to below 50 nanocuries per gram.

If you have any questions, please contact me at (505) 665-3435.

Sincerely,

Luciana Vigil-Holterman  
Solid Waste Regulatory Compliance

LVH/vc



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Enc. 1.) Treatability Study Process Description, Filtering Organic Solutions to Reduce Actinide Concentration

Cy: w/o enc.  
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ENCLOSURE

TREATABILITY STUDY PROCESS DESCRIPTION

FILTERING ORGANIC SOLUTIONS TO REDUCE ACTINIDE  
CONCENTRATION

# Los Alamos

## NATIONAL LABORATORY

Solid Waste Regulatory Compliance Group

*Los Alamos National Laboratory*

*Los Alamos, New Mexico 87545*

**Facility Name:** Los Alamos National Laboratory (LANL)  
Nuclear Materials Technology Division  
Weapon Component Technology Group (NMT-5)

**Facility EPA ID Number:** NM0890010515

**Project Title:** Filtering Organic Solutions to Reduce Actinide Concentration

**Location of Project:** TA-55, Building PF-4

**Project Contact:** Debra Johnson  
NMT -5, Mail Stop E506  
(505) 665-7501

**Other Contacts:** Vivek Dave  
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Jeff Carmichael  
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(505) 665-2505

### **Project Description:**

Trichloroethylene (TCE) and bromobenzene are used in the cleaning of parts and conducting density measurements associated with Pit Manufacturing. When these solvents are spent, they are contaminated at transuranic levels (greater than 100 nanocuries per gram) and at present, a waste management challenge, because there are few disposal options for transuranic organic waste liquids. This project consists of a treatability study that will evaluate several filtering technologies that are designed to reduce the spent TCE actinide concentration to below 50 nanocuries per gram (hereafter referred to as low-level).

### **Project Goals and Objectives:**

The primary objective of this project is to evaluate several types of filtering technologies and equipment set-ups to determine the easiest and most effective way to filter these solvents to low level. At a low level actinide concentration these waste organics can be transported to an off-site facility for energy recovery.

## Projected Tasks:

Test several filtering technologies.  
Analysis the filtered organic liquids for actinide concentration.  
Determine the effectiveness of each filtering technology.  
Determine which filtering technology would be the easiest to implement in a glovebox environment.

## Project Discussion Treatability Study

Description of Waste to Be Treated: TCE and bromobenzene are used in the cleaning of parts and conducting density measurements respectively. These organics typically have an actinide concentration greater than 100 nCi/gram. The TCE and bromobenzene used in this treatability study have been collected in an on-site satellite accumulation area or is presently in storage in an interim status container storage unit (CSU).

### Sample Waste Amounts to be Treated:

Trichloroethylene	200 Kilograms
Bromobenzene	200 Kilograms

RCRA Waste Code(s): Ignitable F001, D001

Site Treatment Plan Information: The wastes samples to be evaluated have not been included in the Compliance Plan Volume of LANL's Federal Facility Compliance Order Site Treatment Plan. The TCE and bromobenzene in CSU storage has been in storage for less than one year.

Description Of The Waste Treatment Technology: Application of the filtration techniques includes a determination of the filter media. Candidates for evaluation are paper filters, ceramic, glass, or metal frit filters, or a solid membrane cartridge. The housing for each of the above filter media is also being evaluated as part of the considerations. A stainless steel housing may be employed, but other materials may be used such as ceramic buchner funnels or glass funnels. It is likely that a pumping mechanism will be needed if gravity filtration does not provide timely results. The solid filter media would be disposed of as radioactive mixed waste transuranic solid. The filtrate would be evaluated for radioactive contamination and disposed of as low-level mixed waste or retreated as a part of the study to determine efficiency. The testing will be performed in order of complexity. The simplest method will be evaluated first.

Surrogate Waste Treatment Results: A surrogate study of filtration was performed using an outside vendor. The study evaluated TCE contaminated with varying levels of organic contamination as well as cerium oxide contamination. The study indicated that filtration of the cerium yielded favorable results for the removal of suspended solids from the waste stream. The results indicated that the evaluated filter media did not remove the organic materials to the desired level.

Waste Management: All treated and untreated waste samples will be placed into one of TA-55's mixed waste interim status CSUs. If the filtered TCE and bromobenzene achieve NMT's goal of contamination <50 nCi/gram, these organic low-level hazardous liquids will eventually be sent off-site for disposal.

## Project Milestones:

- |    |  |                            |
|----|--|----------------------------|
| 1. | Begin testing several filtering technologies                     | 45 Days after notification |
| 2. | Analysis the filtered organic liquids for actinide concentration | On going                   |
| 3. | Determine the effectiveness of each filtering technology         | On going                   |
| 4. | Complete data evaluation   | April 20, 2004             |

**Qualifications:**

Experience: Debra Johnson, Chemical Engineer-BSc. Qualified waste handler.  
Jeff Carmichael, Biology and Geology -BSc. Experience in waste management regulations and activities since 1985.

**Equipment and Facilities:**

This project will be conducted within LANL's radiological controlled Plutonium Facility. Samples collected for actinide concentration evaluations will be submitted for radiochemical analysis and analyzed at the TA-55 Health Physics Analytical Laboratory.