

# Los Alamos

NATIONAL LABORATORY

Los Alamos National Laboratory  
Los Alamos, New Mexico 87545

Date: April 3, 2000

In Reply Refer To: ESH-18/WQ&H:00-0126

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Mr. Samuel Coleman, P. E., Director  
Compliance Assurance and Enforcement Division (6-EN)  
U. S. Environmental Protection Agency  
1445 Ross Avenue  
Dallas, Texas 75202-2733

**SUBJECT: NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051,  
NPDES PERMIT NO. NM0028355**

Dear Mr. Coleman:

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for Los Alamos National Laboratory requires the permittee to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged. In accordance with Part III.D.1.a. of the NPDES Permit issued to the Laboratory on August 1, 1994, I am providing this notification regarding a change in the waste streams contributing to the effluent discharged from NPDES Outfall 051 at the Technical Area 50, Radioactive Liquid Wastewater Treatment Facility (RLWTF).

In order to meet the Department of Energy's (DOE) Derived Concentration Guidelines (DCGs) concerning radioactive constituents established by DOE Order 5400.5 and to meet ground water discharge requirements for nitrate and other parameters established by the New Mexico Water Quality Control Commission (NMWQCC) Regulations, the RLWTF upgraded its treatment processes in a two-phased project. Phase I, installation of the Tubular Ultrafiltration and Reverse Osmosis treatment units, was completed in November, 1999. Phase II, installation of the Electrodialysis Reversal (EDR) treatment unit and the interim mechanical evaporator, was completed in January, 2000. The upgrades have significantly improved effluent quality at the RLWTF. However, during the start-up of the interim mechanical evaporator, the Laboratory collected approximately 700 gallons of evaporator cleaning solutions, rinsewater, and solids from the cleaning of the mechanical evaporator's heat exchanger. This wastewater may contain residual waste from the treatment units prior user, the Barnwell Nuclear Fuel Plant, in Barnwell, South Carolina. The wastewater and solids were collected and stored in three 300-gallon tuff tanks (Tanks 1, 2, and 3). The following is a chronology of the accumulation of this wastewater and solids in the tuff tanks.

Tank 1 was filled on January 27, 2000, with approximately 175 gallons of acid wash and rinsewater. The wastewater in the tank originated from the evaporator's heat exchanger before radioactive wastewater from the RLWTF was fed into the evaporator. Hydrochloric acid was used for cleaning. Analysis of the wastewater documented elevated levels of gross alpha, beta, and gamma radioactivity. On January 28-29, 2000, industrial cold water was fed to the evaporator and

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the bottoms product from this operation was analyzed. Concentrations of Uranium-234, -235, and -238, as well as Plutonium-238, -239, and Americium-241 were found in the concentrate solution from the evaporator. Radioactive wastewater from the RLWTF was fed to the evaporator on January 31, 2000.

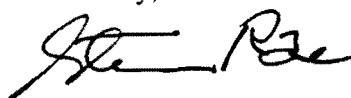
The evaporator's heat exchanger was cleaned again using hydrochloric acid on February 8, 2000. These cleaning and rinse waters were collected in Tank 2. Elevated gross alpha and gross beta concentrations were detected. It is assumed that a portion of the gross alpha is due to the Uranium radionuclides which are not characteristic of the waters processed at RLWTF. There is approximately 165 gallons of cleaning solutions and rinsewater in Tank 2.

The evaporator heat exchanger and the rest of the evaporator system were cleaned on February 11, 2000, with a hydrochloric acid solution. This wastewater (300 gallons) was stored in Tank 3. This wastewater had concentrations of cadmium and chromium above RCRA regulatory limits before neutralization with sodium hydroxide. After neutralization, the chromium concentration dropped below the RCRA level, but cadmium remains at a concentration (5.8 mg/L) above the RCRA hazardous waste concentration. Additionally, radioactivity concentrations in the cleaning solution decreased. Analytical data for the wastewater in the tuff tanks are enclosed.

The Laboratory is providing this notice because the liquid waste stream portion in Tank 1, Tank 2, and Tank 3 (total volume approximately 640 gallons) will be decanted and discharged into the RLWTF head-works. These waste streams were not included in the Laboratory's Permit Re-Application dated May 4, 1998. The liquid waste streams should not significantly change the effluent quantity or quality from the RLWTF. Effluent quality will be sampled prior to discharge to ensure that the discharge will meet all NPDES Permit limits for NPDES Outfall 051.

Please contact Mike Saladen of the Laboratory's Water Quality and Hydrology Group at (505) 665-6085 additional information would be helpful.

Sincerely,



Steven Rae  
Group Leader  
Water Quality and Hydrology Group

SR:MS/tml

Enclosures: a/s

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WQ&H File, w/enc., MS K497  
CIC-10, w/enc., MS A150

|   | <b>Tuff Tank #1</b>          |                                 |  | <b>Tuff Tank #2</b>             | <b>Tuff Tank #3</b>                                  |                     |
|---|------------------------------|---------------------------------|--|---------------------------------|--|---------------------|
|   | Th 1/27/00                   |                                 | Fr 1/28-Sa 1/29/00                         | Tu 2/8/00                       | Fr 2/11/00   |                     |
|   | cleaned heat exchanger only  |                                 | processed industrial cold water            | cleaned heat exchanger only     | cleaned heat exchanger and rest of system            |                     |
|   | (15-20 gallons of acid wash) | (175 gals of acid wash + rinse) | liquid was sent to evaporator bottoms tank | (165 gals of acid wash + rinse) | before pH adjustment (300 gals of acid wash + rinse) | after pH adjustment |
| (analyses in mg/L unless otherwise noted) |                              |                                 |  |                                 |  |                     |
| Solids volume                             |                              | 40 gals                         |  | 25 gals                         |  | 75 gals             |
| Ag  |                              | 0.007                           |  | 0.23                            | 2.1  | 0.66                |
| As  |                              | -0.035                          |  | -0.027                          | 0.72   | -0.034              |
| Ba  |                              | 0.11                            |  | 0.4                             | 0.83   | 0.16                |
| Cd  |                              | 0.89                            |  | 0.82                            | 20   | 5.8                 |
| Cr  |                              | 0.01                            |  | 0.15                            | 8.5  | 0.11                |
| Hg  |                              | NA                              |  | 0.52 ppb                        | 3.82 ppb   | NA                  |
| Pb  |                              | -0.02                           |  | -0.044                          | 0.78   | 0.07                |
| Se  |                              | -0.029                          |  | -0.006                          | -0.67  | <0.05               |
| Al  |                              | 0.18                            |  | 0.48                            | 14   |                     |
| Ca  |                              | 1110                            |  | 2500                            | 3500   |                     |
| Cu  |                              | 0.14                            |  | 0.22                            | 3.1  |                     |
| Fe  |                              | 0.17                            |  | 1.4                             | 69   |                     |
| K   |                              | 110                             |  | 62                              | 130  |                     |
| Li  |                              | 0.59                            |  | 0.19                            | 0.82   |                     |
| Mg  |                              | 8                               |  | 31                              | 110  |                     |
| Mn  |                              | 0.06                            |  | 0.25                            | 6.1  |                     |
| Mo  |                              | 9.4                             |  | 5                               | 4.6  |                     |
| Na  |                              | 3500                            |  | 3500                            | 3400   |                     |
| Ni  |                              | 0.34                            |  | 0.93                            | 23   |                     |
| Si  |                              | 11                              |  | 17                              | 86   |                     |
| Sr  |                              | 13                              |  | 3.4                             | 11   |                     |
| Ti  |                              | -0.035                          |  | 0.002                           | 4  |                     |
| Zn  |                              | 1                               |  | 1.2                             | 60   |                     |
| Chloride                                  |                              |                                 |  |                                 | 15415  |                     |
| Sulfate                                   |                              |                                 |  |                                 | 2894   |                     |
| pH  |                              | 9.2                             |  | 8.8                             | 1.5  | 8.9                 |
| <b>Rad Info (nCi/L)</b>                   |                              |                                 |  |                                 |  |                     |
| Gross alpha                               | 1300                         | 150                             |  | 7800                            | 6.8  | 0.45                |
| Gross beta                                | 4800                         | 5                               |  | 1400                            | 21   | 2.3                 |
| Gross gamma                               | 180                          |                                 |  |                                 |  |                     |
| Am-241 gamma                              |                              | 42                              |  |                                 |  |                     |
| Am-241 alpha                              |                              |                                 | 0.14                                       |                                 |  |                     |
| U-238 alpha                               |                              |                                 | 8.9  |                                 |  |                     |
| U-235 alpha                               |                              |                                 | 0.39                                       |                                 |  |                     |
| U-234                                     |                              |                                 | 9.2  |                                 |  |                     |
| Pu-239                                    |                              |                                 | 0.13                                       |                                 |  |                     |
| Pu-238                                    |                              |                                 | 0.46                                       |                                 |  |                     |