

# Los Alamos

Los Alamos National Laboratory  
Los Alamos, New Mexico 87545

DATE: June 20, 1994  
IN REPLY REFER TO: EM/ER:94-A217  
MAIL STOP: M992  
TELEPHONE: (505) 665-2613

Ms. Barbara Driscoll  
RCRA Permits Branch  
Environmental Protection Agency  
Region 6  
1445 Ross Avenue, Suite 1200  
Dallas, TX 75202-2733

Dear Ms. Driscoll:

**SUBJECT: SAMPLING SUMMARY FOR OPERABLE UNIT 1098, INTERMEDIATE BOREHOLE, SOILS/SEDIMENTS, AND SURFACE WATER**

The following two field projects (surface sampling and intermediate borehole) will be conducted during the summer of 1994. The surface sampling will commence on July 1, 1994, and continue to the end of the month. The intermediate borehole operation will commence on August 9, 1994, and continue through the end of September.

Surface sampling consists of 22 soil samples, 15 sediment samples (3 samples from each of 5 stream transects), and 10 surface water samples (1 filtered and 1 non-filtered samples from each of 5 stream transects). The analytes are described on the attached lists.

Intermediate borehole samples will consist of 20 to 30 samples taken for the listed analytes, 20 to 30 geotechnical samples (see attached), and 2 groundwater monitoring samples (filtered and non-filtered).

Please feel free to call me with any questions regarding this sampling program.

Sincerely,

Tracy Glatzmaier  
Programmatic Project Leader

TG/sg

Attachment a/s

Cy: Ted Taylor DOE/LAAO, MS A316  
J. Jansen, EM/ER, MS M992  
D. McInroy, EM/ER, MS M992  
B. Swanton, NMED/AIP, MS J993  
P. Longmire, CST-10, MS C346  
CIC-10, MS A150 (w/o att.)  
RPF, MS M707



3117

0418  
TA-02

ANALYTICAL SUITE FOR SUBSURFACE SOIL/SEDIMENT SAMPLING  
AT OU 1098 IN LOS ALAMOS CANYON

Analyte	Analytical Method
Gross alpha/beta	Gas flow proportional counter
Gross gamma	Gamma spectrometry
Cesium-137	Gamma spectrometry
Strontium-90	Gas flow proportional counter
Technetium-99	Gamma spectrometry
Uranium (total)	ICP (EPA method 6010)
Plutonium (isotopic)	Radiochemical separation and alpha spectrometry
Cobalt-60	Gamma spectrometry
Americium-241	Gamma spectrometry
Tritium	Distillation and liquid scintillation
Mercury	EPA Method 7470, Cold Vapor
Inorganics* (lead, chromium, and beryllium)	EPA Method 6010, ICP
Hexavalent Chromium	SM 312b (1985)**
Semivolatile organic compounds*	EPA Method 8270
Volatile organic compounds*	EPA Method 8240
Organochlorine pesticides*	EPA Method 8080
Polychlorinated biphenyls*	EPA Method 8080

\* 20 percent of subsurface soil/sediment samples will be analyzed for Appendix IX inorganics, semivolatile organic compounds, volatile organic compounds, organochlorine pesticides, and polychlorinated biphenyls.

\*\* *Standard Methods for the Examination of Waste and Wastewater, 16th ed.; 1985.*

SUMMARY OF GEOTECHNICAL SAMPLING OF SUBSURFACE  
SOILS/SEDIMENTS  
AT OU 1098 IN LOS ALAMOS CANYON

Geotechnical Analysis	Method
ASTM soil classification	ASTM Method
Mineralogical composition	X-Ray Diffraction
Bulk density	ASTM Density Method
Porosity (total and effective)	ASTM Method
Total organic carbon	ASTM Method
Permeability or hydraulic conductivity	ASTM Method
$K_d$ (distribution coefficient)	Batch Method

ANALYTICAL SUITE FOR ROUTINE WATER SAMPLING  
AT OU 1098 IN LOS ALAMOS CANYON

<u>Major Anions</u>	<u>Minor and Trace Constituents</u>
Chloride	Aluminum <sup>1</sup>
Sulfate	Antimony <sup>1,2</sup>
Fluoride	Arsenic <sup>1,2</sup>
Nitrate	Barium <sup>1</sup>
Nitrite	Beryllium <sup>1</sup>
Phosphate <sup>1</sup>	Boron
	Bromide
	Cadmium <sup>1,2</sup>
<u>Major Cations</u>	Chlorate <sup>2</sup>
Ammonium	Chromium <sup>1</sup>
Calcium <sup>1</sup>	Cobalt
Magnesium <sup>1</sup>	Copper
Potassium <sup>1</sup>	Cyanide
Sodium <sup>1</sup>	Iron
	Lead <sup>1</sup>
<u>Radionuclides</u>	Lithium <sup>1</sup>
Gross alpha	Manganese <sup>1</sup>
Gross beta	Mercury
Radium-226 <sup>2</sup>	Molybdenum <sup>1</sup>
Thorium-230 <sup>2</sup>	Nickel <sup>1</sup>
Cesium-137	Selenium <sup>1</sup>
Strontium-90	Silver <sup>1,2</sup>
Isotopic uranium <sup>2</sup>	Strontium <sup>1</sup>
Isotopic plutonium <sup>2</sup>	Thallium <sup>1,2</sup>
Americium-241	Uranium
	Vanadium <sup>1,2</sup>
<u>Other Parameters</u>	Zinc <sup>1</sup>
Volatile organic compounds (SW-8240)	
Semivolatile organic compounds (SW-8270)	<u>Environmental Isotopes</u>
Silica	Hydrogen/deuterium
Dissolved organic carbon <sup>2</sup>	Oxygen-16/oxygen-18
	Tritium
<u>Field Measured Parameters</u>	
Temperature	
pH	
Specific conductance	
Alkalinity	
Dissolved oxygen	

<sup>1</sup> These metals are listed in SW-846 Method 6010.

<sup>2</sup> These parameters are not routinely required for water chemistry evaluations. If these constituents are not found to be present as contaminants after several quarterly sample analyses, they will be dropped from the analytical suite.