



**University of California**  
 Environmental Restoration Project, MS M992  
 Los Alamos, New Mexico 87545  
 505-667-0808/FAX 505-665-4747



**U. S. Department of Energy**  
 Los Alamos Area Office, MS A316  
 Environmental Restoration Program  
 Los Alamos, New Mexico 87544  
 505-667-7203/FAX 505-665-4504

Date: November 14, 1997  
 Refer to: EM/ER:97-482



1/1106/21

Dr. Stu Dinwiddie  
 NMED-HRMB  
 P.O. Box 26110  
 Santa Fe, NM 87502

**SUBJECT: RESPONSE TO REQUEST FOR SUPPLEMENTAL  
 INFORMATION FOR PHASE II SAPS FOR PRSs 21-024(c, i)  
 and 21-027(a) (FORMER OU 1106)**

Dear Dr. Dinwiddie:

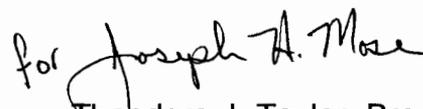
Enclosed is the Los Alamos National Laboratory's Response to the New Mexico Environment Department Hazardous and Radioactive Bureau's Request for Supplemental Information for Phase II Sampling and Analysis Plans for Potential Release Sites 21-024(c, i) and 21-027(a) in Technical Area 21. We regret that not all the information requested could be compiled in time to be incorporated in this Response. The additional information requested will be provided within 30 days of this submittal.

If you have any questions, please contact Gary McMath at (505) 665-4969 or Bonnie Koch at (505) 665-7202.

Sincerely,

  
 Julie A. Canepa, Program Manager  
 LANL/ER Project

Sincerely,

for   
 Theodore J. Taylor, Program Manager  
 DOE/LAO

JC/TT/ss

Enclosures (1) Response to Request for Supplemental Information for Phase II SAPS for PRSs 21-024(c, i) and 21-027(a) in TA-21 (former OU 1106)



*Handwritten mark*

Cy (w/enc.):

D. Griswold, AL-ERD, MS A906  
J. Harry, EES-5, MS M992  
B. Koch, LAAO, MS A316  
G. McMath, EM/ER, MS E525  
D. Neleigh, EPA, R.6, 6PD-N  
C. Rodriguez, CIO/ER, MS M769  
T. Taylor, LAAO, MS A316  
J. White, ESH-19, MS K490  
S. Dinwiddie, NMED-HRMB  
M. Leavitt, NMED-GWQB  
J. Parker, NMED-HRMB  
G. Saums, NMED-SWQB  
S. Yanicak, NMED-AIP, MS J993  
EM/ER File (CT# C334), MS M992  
RPF, MS M707

Information Only (w/o enc.):

T. Baca, EM, MS J591  
T. Glatzmaier, DDEES/ER, MS M992  
T. Longo, DOE-HQ, EM-453  
D. McInroy, EM/ER, MS M992  
J. Plum, LAAO, MS A316  
S. Rae, ESH-18, MS K497  
G. Rael, AL-ERD, MS A906  
J. Vozella, LAAO, MS A316  
EM/ER File, MS M992

**RESPONSE TO  
REQUEST FOR SUPPLEMENTAL INFORMATION  
PHASE II SAMPLING AND ANALYSIS PLAN  
21-024(c,i) AND 21-027(a)**



**INTRODUCTION**

To facilitate review of this response, New Mexico Environmental Department's (NMED) comments are included verbatim. The comments are divided into general and specific categories as presented in the letter. Los Alamos National Laboratory's (LANL) responses follow each NMED comment.

**GENERAL COMMENTS**

**NMED Comment**

1. *LANL continues to refer to other workplans, reports, and voluntary corrective action plans for information pertinent to the document being reviewed. If information presented in a previous document is pertinent to the approach being taken in the document being reviewed then LANL needs to repeat and provide the necessary information rather than citing another document. All reports and sampling plans should be complete documents, and the reviewer should not be required to find numerous other documents to complete a review and make a decision on the information being presented. Note: The Voluntary Corrective Action Plan listed (LANL 1995, 01-018) has not been reviewed, and the approach from this document (PRS 21-024(c)) cited on page 5, last paragraph has not been approved.*

**LANL Response**

1. LANL's intent is to supply sufficient information regarding site history, past events, etc., to support any proposed actions or conclusions. The level of information provided should address a reviewer's questions without the reviewer searching for other documents. However, LANL does not intend to provide all verbiage from each previous document in which a PRS is discussed.

**NMED Comment**

2. *LANL needs to provide the detection limits for the field screening devices being used, in particular for the XRF.*

**LANL Response**

2. Radiation survey instruments are typically used to measure the relative difference between local background responses and those responses obtained in the PRS boundaries. Radiation instrument responses can be affected by many site-specific conditions, such as the geometry of instrument relative surrounding terrain fractures and geologic strata. The x-ray fluorescence (XRF) field screening method is explained in LANL standard operating procedure (SOP) 10.08. The estimated lower limits of detection based on the procedures described in this SOP can be found in Attachment A of 10.08 and are also attached to this response.

**NMED Comment**

3. *Data is being collected for the possible recreational risk assessment and not for an eco-risk assessment which may need to be addressed at a later date.*

**LANL Response**

3. Although the data is being collected for human risk assessment, this data is assumed to be applicable to a future ecological risk assessment. When the methodology of the ecological risk

assessment is approved in the ongoing negotiations between LANL and NMED, some resampling may be necessary.

**NMED Comment**

4. *When collecting the exterior samples, LANL should ensure that a sample is collected beneath where the piping enters and exits the septic tank.*

**LANL Response**

4. LANL acknowledges NMED comment. LANL will sample beneath inlet and outlet piping.

**NMED Comment**

5. *LANL shall provide a schedule for field activities and RFI Report submittals.*

**LANL Response**

5. The following dates are proposed dates and may be affected by changes in funding and or priority.

- PRS 21-024(i)—Begin VCA October 1, 1997 and submit report to administrative authority March 30, 1998.
- PRS 21-024(c)—Begin RFI October 3, 2005 and submit report to administrative authority October 1, 2006.
- PRS 21-027(a)—Begin RFI October 1, 1998 and submit report to administrative authority October 4, 1999.

**NMED Comment**

6. *Please clarify why LANL indicates proposed Phase II sampling locations on associated figures if sampling locations will be biased using field screening techniques.*

**LANL Response**

6. Indicated sampling locations were only illustrative of possible locations and were not the actual sampling locations.

**NMED Comment**

7. *LANL must not consider the soil-tuff interface as a contaminant boundary. In other words, LANL must sample below the soil-tuff interface if it occurs above the planned or recommended sampling intervals.*

**LANL Response**

7. Samples are being collected below the soil tuff interface by six inches. Sampling depths are listed as every six inches until soil tuff interface, then six inches into the tuff. Because of the large contrast in hydrological conductivities, the soil-tuff interface has been used in approved work plans as a indicator of an area where downward migration can be retarded. In most cases, a sample is taken beyond this interface by six to twelve inches. This provides a cost effective and consistent approach to sampling (particularly Phase I sampling) where the goals are often to confirm the existence or absence of contamination. However, this approach is evaluated at each site to provide assurances that a complete assessment is performed and DQOs are met.

## SPECIFIC COMMENTS

### 21-024(c) Septic Tank and Outfall

#### NMED Comment

1. *Figure 2, p. 3: The correlation between the 20-foot grid and the proposed Phase II sampling locations is unclear. Please clarify if this is related to the approach described in LANL 1995, 01-018.*

#### LANL Response

1. The proposed sampling locations are only indicative of the number of samples; they do not depict exact locations. The final sampling locations will be determined by field surveys. The approach of using a grid for preliminary field screening followed by biased sampling is the approach used at most outfall/septic systems at TA-21, including 21-024(e) (LANL 1995, 01-018).

#### NMED Comment

2. *3.4.1 Outfall Area, p. 7: LANL must obtain additional samples at depth at the outfall location, 21-1391, since surficial contamination has already been identified. Two additional samples must be taken at the 2-foot and 4-foot depth.*

#### LANL Response

2. LANL will collect additional samples at the 2- and 4-ft depths at location 21-1391.

#### NMED Comment

3. *Since contamination was found at the outfall, LANL must also investigate the piping associated with the septic tank for leakage.*

#### LANL Response

3. LANL will sample associated piping at four locations to determine if leakage has occurred.

#### NMED Comment

4. *LANL must include analyses for mercury and polychlorinated biphenols in the Phase II sampling since it was "inadvertently omitted" from the Phase I investigation.*

#### LANL Response

4. As stated in Table 1, pg. 11, metals (including mercury) and polychlorinated biphenols are included in the fixed laboratory analysis.

#### NMED Comment

5. *LANL must submit samples for laboratory analysis obtained from hot spots identified using XRF and radiological field screening techniques in order to determine if radiological constituents and inorganic compounds are potentially co-located.*

#### LANL Response

5. At all potential sample locations identified by field screening, whether by radiological or XRF, the samples are analyzed for all constituents specified in Table 1, pg. 11. The results from these analyses will determine if and where any contaminants are co-located.

**NMED Comment**

6. *LANL shall also conduct field screening for volatile organic compounds.*

**LANL Response**

6. LANL acknowledges the comment and concurs that all samples will be screened for VOCs.

**NMED Comment**

7. *LANL must ensure the integrity of volatile organic compound samples from both the interior and exterior of the septic tank.*

**LANL Response**

7. LANL acknowledges the comment and proposes to develop a standard operating procedure that addresses NMED's concern.

**NMED Comment**

8. *Of the four borings LANL intends to take on the exterior of the septic tank, two shall be located beneath the entrance and exit pipes.*

**LANL Response**

8. Borings will be located beneath the entrance and exit pipes as requested.

**21-024(i) Septic Tank and Outfall**

**NMED Comments**

1. *LANL must obtain additional deeper samples at the three sampling locations (21-1395, 21-1396 and 21-1397) where arsenic was identified above SALs. Two additional samples must be taken at the 2-foot and 4-foot depth.*
2. *LANL must submit samples for laboratory analysis obtained from hot spots identified using XRF and radiological field screening techniques in order to determine if radiological constituents and inorganic compounds are potentially co-located.*
3. *LANL shall also conduct field screening for volatile organic compounds.*
4. *LANL must ensure the integrity of volatile organic compound samples from both the interior and exterior of the septic tank.*
5. *Of the four borings LANL intends to take on the exterior of the septic tank, two shall be located beneath the entrance and exit pipes.*
6. *Depending on the outcome of the Phase II sampling at the outfall and septic tank areas, additional investigation of the associated piping may also need to be investigated.*

**LANL Response**

The following response addresses NMED's Comments 1 through 6:

The sampling analysis plan (SAP) for 21-024(i) has been implemented at risk. LANL proposes that NMED's comments will be addressed in the proposed VCA plan and subsequent VCA Report to be submitted to NMED at a later date.

## **21-027(a) Surface Drainage System**

### **NMED Comment**

1. **3.3 Field Screening, p. 8:** *LANL shall describe the chromium field screening technique.*

### **LANL Response**

1. When the SAP is implemented, the availability and detection limits of available test kits and mobile laboratories will be evaluated. The technique that best meets DQOs will be implemented; therefore, further descriptions of the method to be used cannot be provided in the SAP. Typically, chromium testing is performed by Inductively Coupled Plasma (ICP) in mobile laboratories and colorimetric techniques by test kits.

### **NMED Comment**

2. *Depending on the outcome of the Phase II sampling at the outfall and septic tank areas, additional investigation of the associated piping may also need to be investigated.*

### **LANL Response**

2. The 21-027(a) surface drainage system is not a septic system and therefore has no tanks associated with it. As described in the TA-21 Work Plan and the SAP, 21-027(a) is a system of drains, ditches, and culverts that directed surface water run-off from the south side of TA-21 near buildings TA-21-2 and TA-21-3 to a mesa edge above Los Alamos Canyon. LANL proposes to sample associated culverts at four locations to determine if leakage has occurred.

### **NMED Comment**

3. *LANL must obtain deeper samples (at a depth of 2 feet) at the following locations: 21-1365, 21-1366, 21-1368, 21-1370, 21-1371, and 21-1369. Additional samples must be obtained at the 2-foot and 4-foot interval for sample location 21-1365.*

### **LANL Response**

3. LANL acknowledges the comment and proposes to develop a standard operating procedure that addresses NMED's concern.

**Los Alamos National Laboratory Environmental Restoration Project  
 ELEMENTS EXCITED BY RADIOACTIVE SOURCES  
 AND LOWER LIMITS OF DETECTION FOR THESE ELEMENTS**

For Soil Samples application using a source measuring times of 60 sec. and 200 sec., the following are typical element minimum detection levels (MDL):

Source	Element	60 sec.	200 sec.
		MDL (mg/kg)	MDL (mg/kg)
<sup>55</sup> Fe	Potassium (K)	325	140
	Calcium (Ca)	150	75
	Titanium (Ti)	110	65
	Chromium (CrLo)	180	117
<sup>109</sup> Cd	Chromium (CrHi)	525	345
	Manganese (Mn)	410	320
	Iron (Fe)	225	155
	Cobalt (Co)	205	138
	Nickel (Ni)	125	95
	Copper (Cu)	90	55
	Zinc (Zn)	70	50
	Mercury (Hg)	60	50
	Arsenic (As)	50	35
	Selenium (Se)	35	25
	Lead (Pb)	30	20
	Rubidium (Rb)	10	10
	Strontium (Sr)	10	5
	Zirconium (Zr)	10	3
	Molybdenum (Mo)	10	4
	<sup>241</sup> Am	Cadmium (Cd)	180
Tin (Sn)		100	50
Antimony (Sb)		65	35
Barium (Ba)		20	10
Uranium (U)		100	60
Thorium (Th)		100	60
Silver (Ag)		100	60

**Los Alamos National Laboratory Environmental Restoration Project  
 ELEMENTS EXCITED BY RADIOACTIVE SOURCES  
 AND LOWER LIMITS OF DETECTION FOR THESE ELEMENTS  
 (Continued)**

For Thin Samples application using a source measuring time of 200 sec. for the <sup>55</sup>Fe and <sup>109</sup>Cd sources, and 800 sec. for the <sup>241</sup>Am source, the following are typical element MDLs:

Source	Element	MDL ((g/cm <sup>2</sup> ))
<sup>55</sup> Fe	Potassium (K)	0.40
	Calcium (Ca)	0.20
	Titanium (Ti)	0.15
	Chromium (CrLo)	0.40
<sup>109</sup> Cd	Chromium (CrHi)	0.90
	Manganese (Mn)	0.65
	Iron (Fe)	0.65
	Cobalt (Co)	0.50
	Nickel (Ni)	0.30
	Copper (Cu)	0.65
	Zinc (Zn)	0.40
	Mercury (Hg)	0.45
	Arsenic (As)	0.40
	Selenium (Se)	0.15
	Lead (Pb)	0.50
	Rubidium (Rb)	0.10
	Strontium (Sr)	0.10
	Zirconium (Zr)	0.15
Molybdenum (Mo)	0.10	
<sup>241</sup> Am	Cadmium (Cd)	2.5
	Tin (Sn)	2.5
	Antimony (Sb)	1.5
	Barium (Ba)	0.70