



Department of Energy  
Field Office, Albuquerque  
Los Alamos Area Office  
Los Alamos, New Mexico 87544

*Noleigh*

JUN 08 1993

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Hazardous Waste Management Division  
U.S. Environmental Protection Agency, Region 6  
1445 Ross Avenue  
Dallas, Texas 75202-2733

Dear Ms. Reiter:

Enclosed are two copies of the Environmental Restoration Quarterly Report for January-March 1993 for the Los Alamos National Laboratory. An electronic copy of this document can be provided at your request.

If you have questions, please call me at (505) 665-5027, or ask your staff to call Ted Taylor of my staff at (505) 665-7203.

Sincerely,

Joseph C. Vozella, Acting Chief  
Environment, Safety and Health Branch

Enclosure

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*Report*

CERTIFICATION

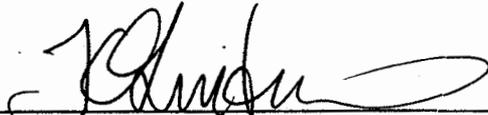
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Document Titles:

LANL Quarterly Report, January--March, Fiscal Year 1993

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\_\_\_\_\_

Date

6/2/93

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Date:

6/7/93

Joseph Vozella, Acting Chief  
Environment, Safety, and Health Branch  
Los Alamos Area Office - DOE

LA-UR-93-2043

Los Alamos National Laboratory  
**Environmental Restoration**

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A Department of Energy environmental cleanup program

**QUARTERLY REPORT**  
**JANUARY–MARCH**  
**FISCAL YEAR 1993**

June 3, 1993

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## LIST OF ACRONYMS AND ABBREVIATIONS

ADS	Activity data sheet
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	US Department of Energy
EM	Environmental Management (Division)
EM-8	Environmental Protection Group
EM-9	Health and Environmental Chemistry Group
EPA	US Environmental Protection Agency
ER	Environmental restoration
FIMAD	Facility for Information Management, Analysis, and Display
FY	Fiscal year
HS	Health and Safety (Division)
HS-5	Industrial Hygiene and Safety Group
HSWA	Hazardous and Solid Waste Amendments
INC	Isotope and Nuclear Chemistry (Division)
INC-12	Separations and Radiochemistry Group
LANL	Los Alamos National Laboratory
MWDF	Mixed Waste Disposal Facility
NEPA	National Environmental Policy Act
NMED	New Mexico Environment Department
OS	Operational Security and Safeguards (Division)
OS-6	Classification Office
OU	Operable unit
OUPL	Operable unit project leader (ER Program)
pCi/g	Picocuries per gram
PRS	Potential release site
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
SOP	Standard operating procedure
SWMU	Solid waste management unit
TA	Technical area

**QUARTERLY REPORT  
JANUARY-MARCH  
FISCAL YEAR 1993  
LOS ALAMOS NATIONAL LABORATORY  
ENVIRONMENTAL RESTORATION PROGRAM**

**ALBUQUERQUE OPERATIONS OFFICE**

**CONTRACTOR: University of California**

**DIVISION LEADER: Thomas Gunderson**

**PROGRAM MANAGER: Robert Vocke**

**NUMBER OF POTENTIAL RELEASE SITES (sampling sites): Approximately 2,250**

**SUSPECT WASTE: Radionuclides, High Explosives, Metals, Solvents, Organics**

## **1.0 INTRODUCTION**

This quarterly report describes the technical status of activities in the Los Alamos National Laboratory (the Laboratory) Environmental Restoration (ER) Program. Each activity is identified by an activity data sheet (ADS) number, a brief title describing the activity or the technical area (TA) where the activity is located, and the name of the project leader. The Hazardous and Solid Waste Amendments (HSWA) portion of the facility operating permit (Section P, Task III, c) requires the submission of a technical progress report on a quarterly basis. This report, submitted to fulfill the permit's requirement, summarizes the work performed and the results of sampling and analysis in the ER Program.

## **2.0 ACTIVITY DATA SHEETS**

### **2.1 ADS 1049—Canyons (Project Leader: Everett Springer)**

The objective of this activity is to conduct a Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) and any needed corrective measures studies of the Canyons operable unit (OU) at Los Alamos. Tasks include managing the ADS, preparing an RFI work plan, conducting the RFI, preparing any needed corrective measures study plans, and conducting any needed studies. Work plans for OUs 1157, 1140, and 1111 were reviewed for coordination with the Canyons OU; comments were returned to the respective operable unit project leaders (OUPLs). The Five-Year Plan was updated to reflect potential changes in future budgets. Other activities included presentations on the flow and transport data for the Bandelier Tuff, which were given at the Los Alamos Environmental Restoration Workshop and at the Joint Sandia/Los Alamos Technology Interchange meeting in Santa Fe.

### **2.2 ADS 1066—NEPA (Project Leader: David Kraig)**

Progress continues on completing the necessary National Environmental Policy Act (NEPA) documentation for the Mixed Waste Disposal Facility (MWDF). The Environmental Protection Group (EM-8) continues work on the environmental assessment for the MWDF. In other activities, a statement of work was submitted; project meetings were attended; meetings were held with ERM/Golder and Laboratory staff to evaluate alternatives, design, safety, emissions, monitoring systems, and other MWDF issues; and a US Department of Energy (DOE) environmental checklist was prepared and submitted to the DOE for the proposed seismic trenching at Pajarito Mesa. Personnel completed data analysis for the biological resource surveys and began report writing. A contract has been put in place for the goshawk survey.

### **2.3 ADS 1067—RCRA Mixed Waste Disposal Facility (Project Leader: Bob Gillis)**

Work has begun with the Leeds Hill architect/engineering firm of Albuquerque, New Mexico, on Title I design for the MWDF. A new, detailed schedule for this activity will soon be completed. Seismic trenching of Pajarito Mesa must be done before the application can be submitted to the state of New Mexico for the operating permit.

### **2.4 ADS 1071—TAs-0, -19, -26, -73, -74 (Project Leader: Jim Aldrich)**

The objective of ADS 1071 is to conduct an RFI in OU 1071, which includes TAs-0, -19, -26, and -73. TA 74 is also part of the OU but is being investigated under ADS 1049, the Canyons OU, because it does not contain any potential release sites (PRSs). RFI activities for this quarter consisted of planning, scheduling, and preparation for field activities. A revised schedule and cost estimate was prepared for FY93 for submittal to the DOE as part of a baseline change proposal. Field preparation was initiated for this summer's field work at PRS Aggregate 0-D (Ordnance Impact Areas) and PRS 0-030(g) (a septic tank at the old Catholic church). A geophysical survey was completed at PRS 0-031(a), soil contamination beneath former service station, to locate underground storage tanks. Magnetic and ground-penetrating radar surveys of the area indicate that the tanks were removed.

### **2.5 ADS 1078—TA-1 (Project Leader: Carl Newton)**

RFI activities conducted during the second quarter of FY93 consisted of administrative activities and field work involving a geotechnical investigation of the proposed locations of two new office buildings along the western portion of the Los Alamos Inn property; the collection and analyses of surface and subsurface soil samples from PRS subareas located on the Los Alamos Inn property; and the collection and laboratory screening of surface soil samples from the yards of private residences in the Timber Ridge townhouse complex.

The draft sampling and analysis plan for the Phase I mesa-top investigation required by the US Environmental Protection Agency (EPA) Region 6 in the notice of deficiency issued on the RFI work plan for OU 1078 (LANL 1992, 0782) was submitted to the EPA Region 6 and the New Mexico Environment Department (NMED) on March 15, 1993. Additional SWMUs were proposed for no further action in this plan. The sampling and analysis plan submitted to the EPA incorporated cost-saving sampling and assessment designs that have not been approved by the EPA Region 6. Compositing was proposed to reduce the number of analytical samples required, and mean concentration estimates were to be used for the health-based risk assessment. The compositing approach was designed to provide more extensive coverage than a discrete sample approach for the same cost limit and would not be blind to significant variabilities in constituent levels. The plan was for subsurface sampling to depths that are not likely to contribute to an increased health risk for current residents but with a subsequent risk analysis based on the data collected. Determining the extent of pockets of low-level concentrations at depth for this area, which has been twice remediated, would provide greater detail of constituent mapping than should be required for decisions concerning no further action or corrective measures studies.

Phase I mesa-top field work began the week of March 8, 1993, in the vicinity of the proposed office building construction locations at the Los Alamos Inn. Analytical laboratory results for samples from the Phase I hillside sampling efforts continued to be delivered during the second quarter. Data validation and assessment activities for the hillside samples will be completed during the third quarter of FY93, if the laboratory data are completed in 60 days. Table 2-1 summarizes the percentage of data packages returned for the samples submitted.

Reporting of field activities, analytical results, and data interpretation for Phase I hillside and mesa-top investigations (as available) will continue to be provided in future OU 1078 quarterly reports.

**TABLE 2-1****PERCENTAGE OF HILLSIDE SURFACE SAMPLE RESULTS RETURNED FROM THE ANALYTICAL LABORATORY**

<b>Analysis Requested</b>	<b>Number of Samples Submitted</b>	<b>Number of Sample Results Received</b>	<b>Percentage of Data Received</b>
Plutonium	209	61	29%
Total Uranium	78	23	30%
Gamma Spectroscopy	153	29	19%
Isotope Uranium	79	13	17%
TAL <sup>a</sup> Metals	208	79	38%
Semi-VOAs <sup>b</sup>	218	168	77%
VOAs	13	13	100%
Americium-241	2	0	0%
Tritium	2	0	0%
Gross Alpha/Beta	4	0	0%
Gross Gamma	2	2	100%

a. TAL = target analyte list.

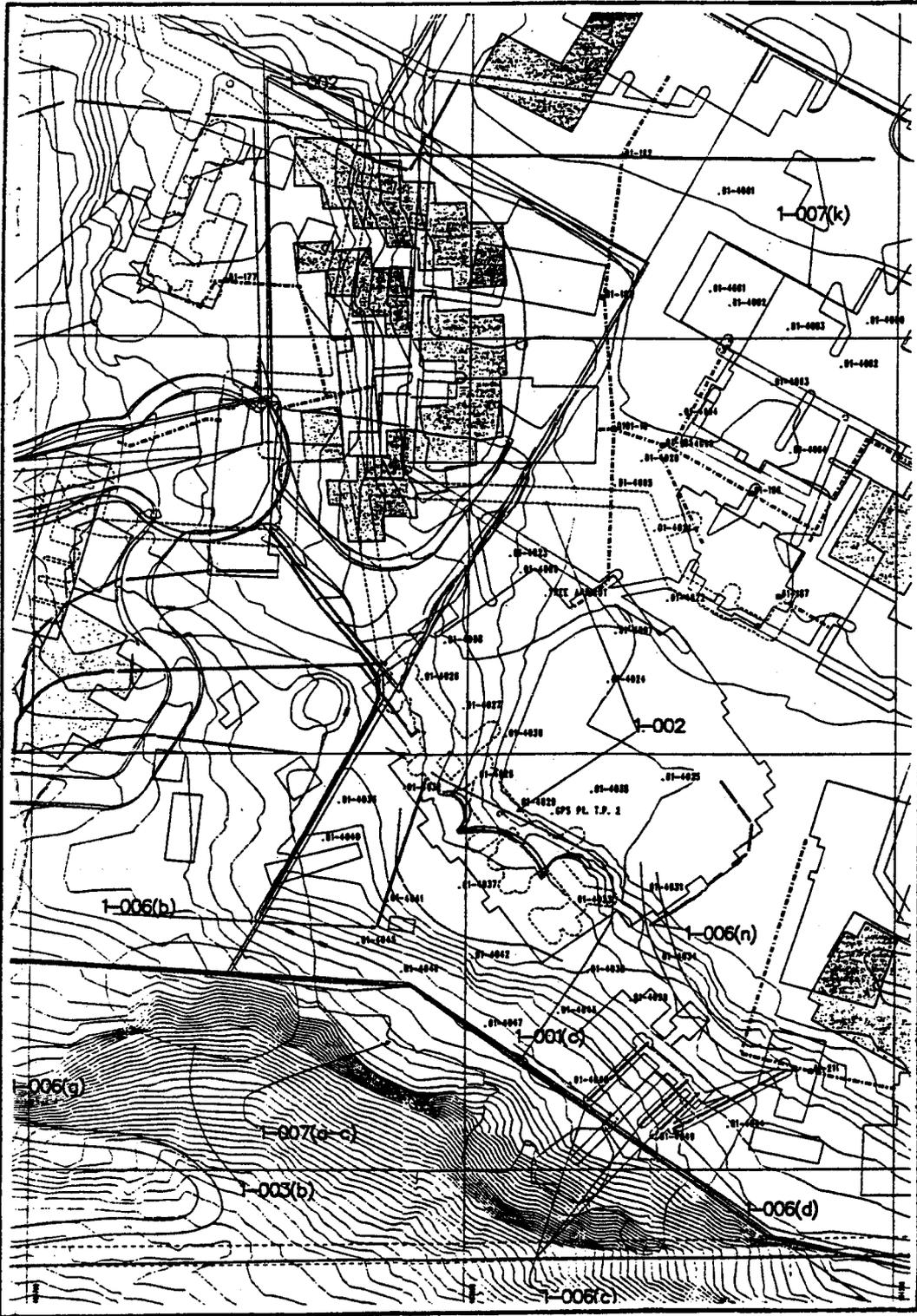
b. VOA = volatile organic analysis.

**2.5.1 Administrative Activities**

Administrative activities completed during the second quarter of FY93 included the preparation of the Phase I mesa-top sampling and analysis plan for FY93; conveyance of all Phase I mesa-top sampling locations identified to date to the Facility for Information Management, Analysis, and Display (FIMAD); generation of FIMAD maps with Phase I mesa-top sample locations identified; continued identification of and coordination with property owners for access to PRSs prior to initiation of field work; continued compilation of Phase I hillside analytical results; procurement of a drilling subcontractor and scheduling of required Laboratory and ER Program training for the subcontractor; preparation of materials for the ER Program Readiness Review for the geotechnical investigation and the Phase I mesa-top field work conducted at the Los Alamos Inn; planning, scheduling, budgeting, and mobilization preparations for the Phase I mesa-top field work; coordination of RFI field and laboratory work for the preliminary Phase I mesa-top field work; and ongoing management of OU 1078.

**2.5.2 Field Work****2.5.2.1 Geotechnical Investigation at the Los Alamos Inn**

The construction of two office buildings on the western portion of the Los Alamos Inn property is planned to begin in early April 1993. Borehole augering with a split barrel sampler was performed to collect subsurface sample materials for the measurement and determination of the soil/tuff geotechnical properties needed to facilitate the preparation of a recommended foundation design. The proposed location of the North Building will intersect PRS 1-007(k); the proposed location of the South Building will intersect an area of suspected subsurface soil contamination consisting of all or part of nine PRSs, including 1-001(c), 1-002 (partial), 1-006(b,c,d,n), and 1-007(a,b,c). The geotechnical investigation was performed during the week of January 18, 1993, and involved the collection of six subsurface soil samples (maximum of 75 ft deep) from the proposed office building locations and two subsurface soil samples (5 ft deep) from the associated proposed parking areas. Each sample location was assigned a FIMAD number, the land was surveyed, and the coordinates were conveyed to the FIMAD. Figure 2-1 shows the



- ### LEGEND
- Boundary, LANL
  - Boundary, OU
  - Boundary, TA
  - Contour, 100 foot
  - Contour, 2 foot
  - Cooling Line
  - Electrical >13.2 kVA
  - Electrical <13.2 kV
  - Fence, Industrial
  - Fence, Security
  - Gas Line
  - Gate
  - Industrial Waste Line
  - LabNET Fiber Optic Cable
  - Material Disposal Area
  - PRS, Absent
  - PRS, Possible
  - PRS, Probable
  - PRS, Present
  - Radioactive Liquid Waste Line
  - Retaining Wall
  - Road, Dirt
  - Road, Paved
  - Road/Trail
  - Sewer Line
  - Steam Line
  - Steam Tunnel
  - Storm Drain/Culvert
  - Surface Hydrologic Feature
  - Telephone Line
  - Underground electrical, gas, abandoned pipe, or unknown feature
  - Water Lines
  - Former Structure
  - Permanent Structure
  - Temporary Structure
  - Underground Structure
  - Steam Tunnel Shafts

State Plane Coordinate System, New Mexico Central Zone.

Grid provides New Mexico State Plane coordinates, in feet. Grid interval, in feet: 200. Feet per inch on map = 25.

UTM Zone: 14N

Scale: 1 inch = 200 feet

North Arrow

Graphic Scale: 0 to 200 feet

Graphic Scale: 0 to 100 meters

Notes: This map is not to be used for navigation. It is intended for use in the laboratory only. It is not to be used for any other purpose. The map is not to be used for any other purpose. The map is not to be used for any other purpose.

University of California  
Los Alamos National Laboratory  
Earth & Environmental Sciences Division  
**EMAD** Office for Environmental Measurements, Analysis and Safety  
EMAD is the national laboratory for the Environmental Measurements Program at Los Alamos National Laboratory.

Prepared by: Martin Jones  
Date: April 14, 1993  
File Number: EMAD 0140004

Figure 2-1. Map of D-Building subarea with sample points.

locations of the PRSs and of the sample points (01-4001 through 01-4008). Copies of the complete, full-sized map of the D-Building Area are available through FIMAD.

Split spoon samplers were utilized for the collection of subsurface samples at nominal depths of 0.5 to 2.5 ft, 2.5 to 4.5 ft, 5.0 to 7.0 ft, and then at 5.0-ft intervals to the total depth in each of the eight boreholes. The observed subsurface characteristics were significantly different between the boreholes drilled for the North Building (01-4001 through 01-4004) and those drilled for the South Building (01-4005 through 01-4008). The subsurface characteristics of the North Building site are described as having a surficial fill cover ranging in thickness from less than 2 ft to 8 ft. A welded tuff layer was encountered at depths ranging from 2 ft (01-4001) to 8 ft (01-4002) below land surface. The greater depth of the welded tuff (01-4002) may be attributable to a previous fill for foundation placement associated with the former Z Building at 01-4002. The bottom of the welded tuff unit was encountered at a depth of 27 ft, and a weathered, nonwelded tuff layer was observed in the sample collected from 29.5 to 31.5 ft below land surface.

A substantial portion of the South Building site was involved in a past soil excavation/removal during the mid-1970s (Ahlquist et al. 1977, 0016). As a result, a greater thickness of fill material was observed at depths ranging from 8 ft (01-4008) to more than 14.5 ft (01-4006). A nonwelded tuff, underlying the fill, was observed in all South Building boreholes. An anomalous section was located at 01-4005 because that was the site of the former industrial waste line, and the tuff was encountered at 23 ft.

All subsurface samples were screened in the field (after collection) for alpha, beta, and gamma activity and for volatile organic compounds. Additionally, each sample was screened in the EM-8 count laboratory for gross alpha/beta activity using a Berthold LB 770 detector and for gross gamma activity using a sodium iodide deep-well gamma counter. None of the 16 samples screened in either the field or the count laboratory exhibited elevated levels of radioactivity or volatile organic compounds; therefore, no samples were submitted for a full suite of analyses. The screening results and sample locations and/or depths are provided in Table 2-2. All field operations were performed in accordance with applicable Laboratory, ER Program, and ERM/Golder Team standard operating procedures (SOPs). An additional investigation of both proposed building areas, including the remaining areas associated with the former locations of the D, W and Z Buildings, was conducted in accordance with the draft Phase I mesa-top sampling and analysis plan submitted to the EPA Region 6 and the NMED on March 15, 1993, and is described in Section 2.5.2.2.

#### **2.5.2.2 Phase I Sampling of PRS Subareas at the Los Alamos Inn**

On March 8, 1993, the OU 1078 sampling team initiated field work in accordance with the draft Phase I mesa-top sampling and analysis plan. Between March 8 and March 18, 1993, 17 boreholes were advanced at sample locations identified in the immediate vicinity of the 2 proposed office building locations described in Section 2.5.2.1 and shown in Figure 2-1. Core samples were collected in 6-in. segments from each borehole, and each segment was screened in the field for beta and gamma activity using an ESP-1 beta/gamma pancake meter. Field screening results (the averages of two 1-minute counting periods) are presented in Table 2-3. From the 17 boreholes, 17 vertical composite samples were collected in accordance with procedures described in the draft sampling and analysis plan. Additionally, one surface composite and two bottom composite samples were prepared. All 20 samples were subsequently screened in the EM-8 count laboratory using a Berthold gas proportional counter for gross alpha and beta activity and using a deep-well counter for gamma activity in accordance with EM-8 SOPs. Results from the count laboratory screening indicated no elevated levels of radioactivity (above 20 picocuries per gram [pCi/g] gross alpha). These screening results and sample locations are provided in Table 2-4. All 20 samples were submitted for a full suite of analyses, which includes isotopic plutonium and uranium, total metals (As, Ag, Ba, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, and Th only), and gamma spectroscopy. Results from the analytical laboratory and subsequent field work will be presented in future OU 1078 quarterly reports.

**TABLE 2-2****LABORATORY RADIOACTIVE GROSS ACTIVITY RESULTS FOR GEOTECHNICAL INVESTIGATION AT THE LOS ALAMOS INN**

<b>Sample Number<sup>a</sup></b>	<b>Depth (ft)</b>	<b>Gross Alpha (pCi/g)</b>	<b>Gross Beta (pCi/g)</b>	<b>Gross Gamma (pCi/g)</b>
4001	0.5-2.5	1.2	10.1	0.9
4001	2.5-3.5	1.4	7.1	1.0
4001	4.5-6.5	1.7	8.6	1.0
4001	9.5-11.5	1.8	5.4	0.8
4001	14.5-15.0	2.6	9.9	1.0
4001	19.5-20.5	1.3	8.9	1.2
4001	24.5-26.0	2.8	8.7	0.9
4002	0.0-0.5	1.7	4.4	0.8
4002	0.5-2.5	1.5	7.0	0.8
4002	4.5-6.5	1.5	2.4	0.9
4002	9.5-11.5	2.9	8.8	1.0
4002	14.5-15.0	2.4	9.4	1.1
4002	19.5-20.0	2.0	13.0	1.2
4002	24.5-24.8	3.1	10.7	1.2
4002	29.5-31.5	1.4	6.5	1.1
4003	0.5-2.5	2.2	8.9	0.9
4003	2.5-4.5	0.9	5.3	0.9
4003	4.5-6.5	1.3	7.6	1.0
4004	0.0-1.5	2.5	6.8	0.6
4004	2.5-3.1	2.7	9.5	0.7
4004	4.5-5.3	3.0	9.9	0.7
4005	0.0-2.0	1.5	3.2	0.5
4005	2.5-4.0	3.1	7.9	0.4
4005	4.5-6.5	1.8	5.6	0.7
4005	9.5-11.5	3.6	9.0	0.8
4005	14.5-16.5	0.4	6.9	0.8
4005	19.5-21.5	0.9	6.5	0.9
4005	24.5-26.5	1.8	8.7	1.0
4005	29.5-31.5	2.9	9.7	0.9
4005	34.5-36.5	1.7	7.5	0.9
4005	39.5-41.5	1.1	10.9	0.8
4005	44.5-46.5	3.3	7.2	0.7
4005	49.5-51.5	3.6	9.1	0.8
4005	54.5-56.5	4.9	6.8	1.0
4005	59.5-61.5	3.8	8.8	0.9
4005	64.5-66.5	0.4	4.6	0.8
4005	69.5-71.5	2.4	9.7	1.3
4005	74.5-76.5	2.7	9.7	1.3
4006	0.5-2.5	2.7	3.9	0.7
4006	2.5-4.0	3.3	5.5	0.8
4006	4.5-6.5	1.9	6.8	0.9
4006	9.5-11.5	1.9	8.7	0.9
4006	14.5-16.5	3.5	8.2	0.9
4006	19.5-21.5	4.0	9.7	1.0

**TABLE 2-2 (continued)**

<b>Sample Number</b>	<b>Depth (ft)</b>	<b>Gross Alpha (pCi/g)</b>	<b>Gross Beta (pCi/g)</b>	<b>Gross Gamma (pCi/g)</b>
4007	0.5-2.5	NA <sup>b</sup>	NA	0.9
4007	2.5-4.5	4.2	6.1	0.8
4007	4.5-6.5	2.0	4.5	0.7
4008	0.5-2.5	2.7	7.0	0.6
4008	2.5-4.5	3.5	6.1	0.6
4008	4.5-6.5	3.3	7.1	0.8
4008	9.5-11.5	3.6	11.0	0.8
4008	14.5-16.0	3.6	9.0	0.8
4008	19.5-21.0	3.6	10.0	0.9
4008	24.5-26.5	3.3	9.0	0.8
4008	29.5-30.0	2.6	8.7	0.8

a. FIMAD numbers were used because ER numbers were not assigned.

b. NA = not analyzed.

**TABLE 2-3**

**FIELD RADIOLOGICAL SCREENING RESULTS FOR PHASE I MESA-TOP INVESTIGATION  
AT THE LOS ALAMOS INN**

Borehole 01-4020		Borehole 01-4021		Borehole 01-4022		Borehole 01-4023		Borehole 01-4024		Borehole 01-4025	
Depth (ft)	B/ $\gamma$ (cpm) <sup>a</sup>	Depth (ft)	B/ $\gamma$ (cpm)								
1	Empty Empty	1	Empty Empty	1	225 224	1	Empty Empty	1	182 Empty	1	208 Empty
2	202 214	2	Empty Empty	2	224 227	2	Empty Empty	2	Empty Empty	2	Empty Empty
3	222 206	3	194 231	3	250 237	3	Empty Empty	3	Empty Empty	3	Empty 182
4	235 207	4	181 210	4	199 230	4	184 185	4	206 175	4	236 211
5	217 247	5	225 220	5	223 207	5	221 244	5	214 250	5	230 203
6	215 220	6	201 207	6	Empty Empty	6	Empty Empty	6	Empty Empty	6	Empty Empty
7	190 171 <sup>b</sup>	7	212 229	7	Empty Empty	7	Empty Empty	7	Empty Empty	7	Empty Empty
8	209 220	8	240 190	8	226 199	8	Empty 228	8	Empty Empty	8	Empty 203
9	194 190	9	253 202	9	240 226	9	202 247	9	214 208	9	233 246
10	243 <sup>c</sup> 226	10	222 216	10	219 230	10	238 233	10	256 205	10	181 208
11	Empty Empty	11	Empty 230	11	Empty 215	11	201 208	11	Empty 244	11	170 197
12	211 227	12	223 208	12	201 192	12	189 239	12	199 231	12	188 215
13	228 251	13	218 271	13	235 186	13	227 241	13	191 230	13	194 242

**TABLE 2-3 (continued)**

Borehole 01-4026		Borehole 01-4027		Borehole 01-4029		Borehole 01-4030		Borehole 01-4035		Borehole 01-4060	
Depth (ft)	B/g (cpm)	Depth (ft)	B/g (cpm)								
1	211 Empty	1	192 Empty	1	198 Empty	1	220 Empty	1	223 Empty	1	206 220
2	Empty Empty	2	231 241								
3	Empty Empty	3	Empty Empty	3	Empty Empty	3	Empty 193	3	Empty 203	3	243 217
4	184 187	4	187 199	4	179 204	4	201 199	4	205 187	4	248 240
5	207 198	5	235 190	5	176 193	5	190 182	5	218 223	5	246 241
6	Empty Empty	6	Empty Empty	6	Empty Empty	6	Empty 206	6	Empty Empty	6	218 232
7	Empty Empty	7	Empty Empty	7	Empty Empty	7	189 185	7	Empty Empty	7	221 242
8	201 214	8	Empty Empty	8	Empty 212	8	227 214	8	Empty Empty	8	238 240
9	184 214	9	198 228	9	166 214	9	229 172	9	206 219	9	243 235
10	233 201	10	248 236	10	197 240	10	197 200	10	188 226	10	225 255
11	219 172	11	221 207	11	211 173	11	236 224	11	196 217	11	Empty 235
12	231 184	12	222 223	12	204 224	12	222 207	12	232 223	12	214 255
13	209 181	13	275 224	13	193 263	13	225 215	13	222 200	13	237 196

**TABLE 2-3 (continued)**

Borehole 01-4061		Borehole 01-4062		Borehole 01-4063		Borehole 01-4064		Borehole 01-4065	
Depth (ft)	B/g (cpm)	Depth (ft)	B/g (cpm)	Depth (ft)	B/g (cpm)	Depth (ft)	B/g (cpm)	Depth (ft)	B/g (cpm)
1	216 209	1	237 Empty	1	199 223	1	223 242	1	Empty Empty
2	212 268	2	Empty Empty	2	212 236	2	214 250	2	Empty Empty
3	217 210	3	Empty Empty	3	253 221	3	222 194	3	Empty Empty
4	221 208	4	204 179	4	181 256	4	236 231	4	215 215
5	197 230	5	247 211	5	234 199	5	241 198	5	219 209
6	202 217	6	Empty 212	6	251 249	6	Empty Empty	6	Empty Empty
7	216 243	7	199 240	7	251 214	7	Empty 218	7	Empty Empty
8	217 212	8	229 234	8	212 227	8	228 232	8	Empty Empty
9	198 260	9	224 244	9	192 223	9	227 224	9	248 224
10	218 234	10	223 270	10	288 184	10	250 250	10	208 227
11	197 241	11	242 222	11	226 192	11	245 200	11	213 198
12	201 224	12	220 193	12	223 201	12	247 237	12	205 243
13	204 265	13	218 228	13	232 230	13	253 272	13	248 235

a. cpm = counts per minute.

b. Bold numbers are the highest B/g readings in the borehole.

c. Italicized numbers are the lowest B/g readings in the borehole.

\*First sleeve containing tuff.

**TABLE 2-4****LABORATORY RADIOACTIVE GROSS ACTIVITY RESULTS FOR PHASE I MESA-TOP INVESTIGATION AT THE LOS ALAMOS INN**

Hole Number	Sample Number	Gross Alpha (pCi/g)	Gross Beta (pCi/g)	Gross Gamma (pCi/g)
01-4020	AAA1834	2.61	21.1	0.62
01-4021	AAA1836	8.16	14.6	0.71
01-4022	AAA1837	7.01	11.9	0.61
01-4023	AAA1835	9.09	19.4	0.54
01-4024	AAA1838	4.86	16.2	0.79
01-4025	AAA1839	5.33	12.9	0.53
01-4025R	AAA1840	0.889	12.6	0.71
01-4026	AAA1841	9.58	28.7	0.75
01-4027	AAA1842	3.72	27.8	0.79
01-4029	AAA1843	0.0	18.2	0.62
01-4030	AAA1844	2.19	18.1	0.80
01-4035	AAA1845	5.76	15.4	0.67
01-4060	AAA1688	2.48	28.3	0.78
01-4061	AAA1689	15.3	28.8	0.75
01-4062	AAA1690	5.7	25.4	0.69
01-4063	AAA1827	3.72	27.8	0.80
01-4064	AAA1828	4.86	21.6	0.68
01-4064R	AAA1829	13.5	18.5	0.72
01-4065	AAA1830	7.64	22.3	0.61
Surface Comp.*	AAA1831	6.29	30.5	0.66
Bottom Comp. 1	AAA1832	1.6	21.5	0.86
Bottom Comp. 2	AAA1833	12.8	18.5	0.84

\*Comp. = composite.

### 2.5.2.3 Surface Sample Collection at Timber Ridge Townhouses

The purpose of the sampling effort at the Timber Ridge townhouses was to provide radiological and selected metal screening information on exposed surface soils in townhouse yards in TA-1. The investigation was designed to determine whether a present day health risk exists due to residual contamination remaining on a property and being exposed as surficial soils.

On March 23, 1993, the OU 1078 sampling team collected a total of 22 surface soil samples (0 to 3 in. deep) from 22 townhouse yards where bare soil was evident, following SOP 06.09, "Spade and Scoop Method for Collection of Soil Samples," (LANL 1992, 0688). The samples were screened in the field for beta and gamma activity using an ESP-1 beta/gamma pancake meter. The samples were then screened in the EM-8 count laboratory using a Berthold gas proportional counter for gross alpha and beta activity, a deep-well counter for gamma activity, and an x-ray fluorescence unit for barium and lead. Results from these screening activities revealed neither field-measured beta/gamma activity above background nor elevated levels of radioactivity (above 20 pCi/g gross alpha); therefore, no samples were submitted for a full suite of analyses. Screening data are provided in Table 2-5. Additionally, screening data from the surface soil sampling conducted at Los Arboles condominiums in December 1992 are provided in Table 2-6.

**TABLE 2-5****FIELD LABORATORY SCREENING RESULTS FOR SAMPLES  
FROM TIMBER RIDGE TOWNHOUSES**

<b>Townhouse Number</b>	<b>Gross Alpha (pCi/g)</b>	<b>Gross Beta (pCi/g)</b>	<b>Gross Gamma (pCi/g)</b>	<b>Barium<sup>a</sup> (ppm)</b>	<b>Lead (ppm)</b>
21	4.61	19.7	0.75	127	ND <sup>b</sup>
22	4.38	13.2	0.80	317	ND
23	0.36	15.3	0.70	157	ND
24	1.56	21.7	0.99	176	ND
25	0	10.1	0.67	218	ND
26	1.6	17.7	0.79	203	ND
27	7.56	14.7	0.53	182	ND
28	0	14.2	0.88	191	ND
31	4.12	12.2	0.64	194	ND
32	0	3.69	0.36	326	ND
34	3.19	20.2	0.77	144	ND
35	3.72	14.6	0.95	125	ND
37	0	24.2	0.65	162	ND
38	4.07	0.05	1.05	178	ND
40	2.24	19.1	0.61	215	ND
41	0	11.3	0.77	173	ND
42	4.27	21.6	0.79	228	ND
43	2.62	20.1	0.64	201	ND
44	1.2	11.1	0.72	240	ND
45	4.49	9.85	0.65	209	ND
46	4.61	8.18	0.52	250	36J <sup>c</sup>
48	3.06	19.3	0.61	288	28J

- a. Barium and lead levels measured with a portable x-ray fluorescence unit. The screening action level for barium is 5,600 parts per million (ppm), and for lead it is 500 ppm.
- b. ND = not detected; results below minimum detection level.
- c. J = results above minimum detection level, but below minimum quantitation level.

**TABLE 2-6****FIELD LABORATORY SCREENING RESULTS FOR SAMPLES FROM  
LOS ARBOLES CONDOMINIUMS**

<b>Condominium Number</b>	<b>Gross Alpha (pCi/g)</b>	<b>Gross Beta (pCi/g)</b>	<b>Gross Gamma (pCi/g)</b>
6-1	1.05	8.05	0.46
7-1	2.45	8.85	0.81
7-2	2.25	8.8	0.81
8-1	2.8	10.4	0.96
9-1	1.7	8.65	0.84
10-1	0.5	3.2	0.62
11-1	1.1	7.65	0.5
12-1	0.3	6.3	0.59
12-2	1.6	9.3	0.69
15-1	2.05	10.6	0.89
17-1	1.65	10.55	0.76
19-1	2.25	10.35	1.17
21-1	1.85	5.55	0.62
23-1	0.2	3.7	0.86
25-1	2.05	12.2	0.83
27-1	0.75	0.0	0.01
29-1	0.5	0.4	0.15
31-1	1.6	11.45	0.93
33-1	2.5	9.45	1.06
33-2	2.15	8.5	0.91
35-1	1.75	13.2	1.02
37-1	1.95	7.85	0.85
39-1	1.4	7.7	0.79
41-1	1.75	9.85	0.97
42-1	1.55	10.3	0.65
44-1	2.1	10.65	0.64
46-1	2.1	5.8	0.71
71-1	1.45	9.1	0.85
73-1	1.8	8.4	0.73
75-1	0.95	10.55	0.79
77-1	1.75	8.0	0.95
79-1	1.45	9.0	0.83
81-1	1.9	12.2	0.90
PG-1*	0.0	0.0	0.34
PG-2	0.51	2.3	0.36

\*PG = playground.

**2.5.2.4 Deviations from the Work Plan**

Deviations from the RFI work plan for OU 1078 included the addition of the geotechnical investigation and of subsurface sampling activities at Los Alamos Inn and the collection of soil samples (0 to 3 in. deep) from the backyards in the Timber Ridge townhouses. The only schedule variance occurred with the draft Phase I mesa-top sampling and analysis plan. The plan was originally scheduled to be submitted in late

January 1993 but was not submitted until March 15, 1993, because the innovative composite sampling approach presented in the plan resulted in the necessity for several revisions.

**2.6 ADS 1079—TAs-10, -31, -32, -45 (Project Leader: Garry Allen)**

The objective of ADS 1079 is to conduct an RFI and any necessary corrective measures studies and corrective measures implementation for formerly utilized TAs-10, -31, -32, and -45. The primary focus for ADS 1079 during this past quarter has been to develop a new subsurface sampling plan for TA-10. The revised sampling plan, which uses the judgmental approach to identify sampling locations, was submitted to the EPA on March 15, 1993. A second activity involved identifying and correcting scheduling errors in the FY93 baseline schedule. The new schedule, along with the appropriate activity resource loading, better represents the activities in the RFI work plan for OU 1079 (LANL 1992, 0783). In addition, contracts were submitted for assistance with TA-45 sampling activities planned for the summer of 1993.

**2.7 ADS 1082—TAs-11, -13, -16, -24, -25, -28, -37 (Project Leader: Brad Martin)**

Most efforts for this quarter involved responding to comments from the formal internal, informal DOE, and value engineering reviews of the draft RFI work plan for OU 1082. The revised RFI work plan was submitted on March 26, 1993, for formal DOE, Classification Office (OS-6), and Legal Counsel reviews. Personnel continued the RFI process for the next approximately 150 PRSs in OU 1082. Planning activities began this quarter for the submission of a closure plan for Material Disposal Area P; this plan is due to the state of New Mexico at the end of August 1993. Efforts continued to complete the statements of work for each of the Laboratory organizations that will have personnel working on OU 1082 in FY93.

**2.8 ADS 1085—TAs-12, -14, -67 (Project Leader: Calvin Martell)**

The data quality objectives for TA-12 and TA-14 will be completed soon. Additional archival materials, aerial photographs, and interviews recorded as memoranda have been collected. Information from interviews, site visits, aerial photographs, and other archival materials has been entered into a worksheet data base for each SWMU in OU 1085.

**2.9 ADS 1086—TA-15 (Project Leader: Caroline Mason)**

Comments that were received from the formal internal review, the DOE informal review, and the value engineering review of the draft RFI work plan for OU 1086 were incorporated into the work plan. The revised draft RFI work plan was then submitted for formal DOE review on March 12, 1993.

**2.10 ADS 1093—TA-18 (Project Leader: Gene Gould)**

The draft RFI work plan for OU 1093 was delivered for formal DOE review on January 25, 1993, and the resulting comments were resolved and incorporated. Also, the comment responses from the November 9, 1992, version of the draft RFI work plan were completed and distributed. Team members obtained training and background information related to the field investigation, which is scheduled to begin in August 1993, and negotiated a contract with the US Geological Survey to conduct treatability studies.

**2.11 ADS 1098—TAs-2, -41 (Project Leader: Patrick Longmire)**

During this quarter, the draft RFI work plan for OU 1098 received formal internal, informal DOE, and value engineering reviews. The work plan was revised, based on these reviews, and was submitted for formal DOE review. The technical team continues to coordinate with the OUPL for OU 1049 to maintain a consistent approach to that OU. Technical activities in OU 1098 include monitoring alluvial groundwater within the Laboratory boundary that is contaminated by strontium-90, cesium-137, and tritium above drinking water standards. Table 2-7 shows the tritium levels within alluvial groundwater in Los Alamos Canyon; these analyses were performed by the Environmental Management Division. Additional characterization wells are proposed in the work plan to identify source terms and contaminant distributions in the subsurface. Efforts continue to integrate risk assessment activities with the field investigation for this OU.

**TABLE 2-7****SUMMARY OF TRITIUM ACTIVITIES WITHIN ALLUVIAL GROUNDWATER,  
LOS ALAMOS CANYON**

Date	Characterization Well				
	LAO-C	LAO-1	LAO-2	LAO-3	LAO-4
9/29/92	400 ± 300*	9,300 ± 900	1,200 ± 300	1,000 ± 300	1,600 ± 400
2/2/93	100 ± 300	25,000 ± 200		700 ± 300	
2/12/93	300 ± 300	28,000 ± 200	29,000 ± 200	700 ± 300	
2/19/93	100 ± 300	12,000 ± 100		400 ± 400	
2/25/93	400 ± 300	8,000 ± 100			
2/26/93		31,000 ± 200			
3/4/93		29,000 ± 200			
3/5/93		29,000 ± 200			
3/8/93	3,200 ± 500	26,000 ± 200		1,700 ± 400	
3/9/93		25,000 ± 200			
3/10/93		23,000 ± 200			
3/11/93		23,000 ± 200			
3/12/93		21,000 ± 200			

\*units in picocuries per liter (pCi/L).

**2.12 ADS 1100—TA-53 (Project Leader: Gene Gould)**

A closure plan for the TA-53 surface impoundments (referred to as "lagoons" in the SWMU report) was written and delivered to the NMED on February 16, 1993. Historical data are being gathered for Chapter 2 of the draft RFI work plan for OU 1100.

**2.13 ADS 1106—TA-21 (Project Leader: P. G. Eller)**

Activities conducted during the second quarter of FY93 included the following. Data management and data validation activities continued for the first and second rounds of surface grid sampling, outfall investigations, and filter building investigations. Efforts were continued to integrate the ER Program with the Decontamination and Decommissioning Program as directed by the DOE, and a work plan modification will be prepared to document the changes necessitated by the integration of the two programs. Also, stratigraphic and geomorphic studies of DP Mesa were completed.

Budget projections for FY93 were completed during the quarter, and revisions to the RFI schedule have begun and will be presented for approval as a work plan modification.

## **2.13.1 Administrative Activities**

### **2.13.1.1 Second Quarter Activities**

During the second quarter of FY93, administrative support continued for data management and data validation activities for analytical results from earlier field work and for cost estimation and scheduling of activities for FY93.

### **2.13.1.2 Delay of Scheduled Activities**

Because of the slow return of analytical results for samples collected in the summer and fall of 1992, the data will not be available in time to be validated, assessed, and reported in a phase report (Technical Memorandum 1) as planned for June 1993 (Figure 2-2). These data will be reported in an additional report, expected to be scheduled for December 1993.

As reported in the "ER Quarterly Report, October–December, Fiscal Year 1993," funding limitations continue to delay the schedule for the initial vadose zone investigations and for the investigations at the liquid waste disposal area, PRS 21-018; national emissions standards for hazardous air pollutants compliance issues have delayed subsurface investigations at outfall locations.

### **2.13.1.3 Progress Against Schedule**

Figure 2-2 illustrates current progress through March 31, 1993, against the schedule for the TA-21 OU RFI. These figures are based on those given in the addendum to the RFI work plan for TA-21 (LANL 1991, 0689) representing the RFI schedule approved by the EPA. Progress is indicated as incomplete for one field work task (Chapter 15 of the work plan) representing the noncompletion of the subsurface investigations at the outfalls. Sample analyses and data assessment tasks are behind schedule because analytical results are being obtained so slowly.

## **2.13.2 Field Work**

### **2.13.2.1 Mesa-Wide Surface Grid Sampling**

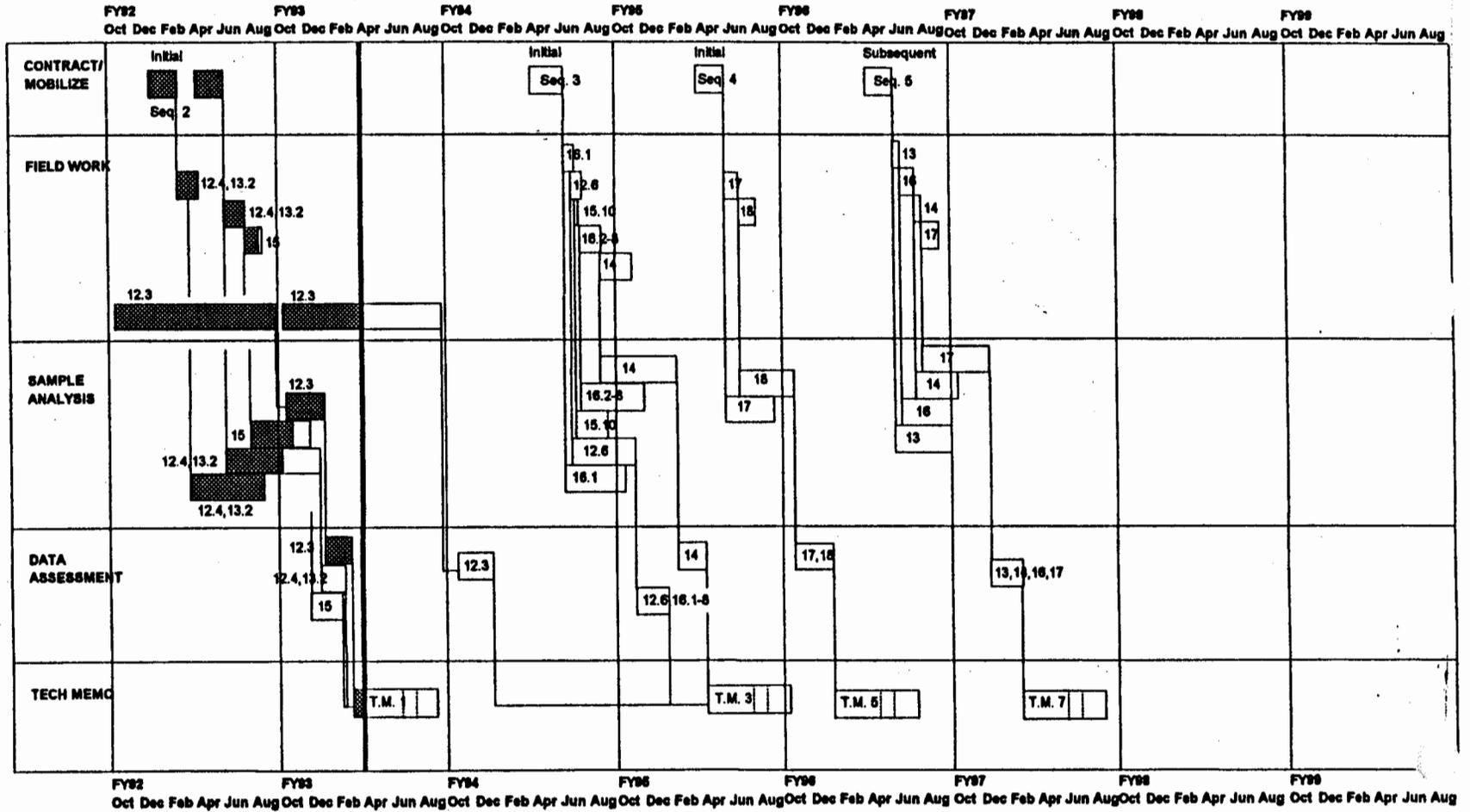
The investigations reported in this section are those described in the RFI work plan in Section 12.4, Surface Grid Sampling Plan, and in Chapter 13, Surface Soil Contamination from Airborne Emissions. Analytical laboratory results for samples from the March through April 1992 and the June through July 1992 sampling rounds continued to be delivered during the second quarter of FY93. Data validation activities for these results began during the first quarter of FY93. Table 2-8 summarizes the percentage of analysis results returned for the samples submitted. Data assessment and interpretation will be conducted for the entire mesa-wide grid sampling data set at one time. The Round 1 data set is essentially complete, but because the data set for the Round 2 investigation is not yet complete, the data assessment and interpretation activities have not been conducted.

### **2.13.2.2 Outfall Investigations**

The investigations reported in this section are those described in the RFI work plan in Chapter 15, Outfalls Description and Sampling Plan (Sections 15.2 through 15.9). As mentioned above, subsurface investigation activities were postponed.

Analytical laboratory results for samples from the outfall investigations continued to be received during the second quarter of FY93. Data validation activities for these results began in the first quarter of FY93. Table 2-9 summarizes the percentage of analysis results returned for the samples submitted. Data assessment and interpretation will be conducted for the outfall investigations when this data set is complete.

Figure 2-2. TA-21 OU RFI progress: near-surface investigations (3/31/93).



Completed

Notes: Field work task 15 was not completed due to postponement of drilling.

Sample analysis tasks 12.4, 13.2 and 15 are not on schedule due to postponement of drilling and slow return of laboratory results.

**TABLE 2-8**

**PERCENTAGE OF SURFACE GRID SAMPLE RESULTS RETURNED  
FROM ANALYTICAL LABORATORY**

Analysis Requested	Round 1 Samples				Round 2 Samples			
	Number of Samples Submitted	Number of Sample Results Received	Percentage of Data Received	Percentage of Data on FMAD	Number of Samples Submitted	Number of Sample Results Received	Percentage of Data Received	Percentage of Data on FMAD
Americium-241	136	136	100%	100%	145	110	76%	51%
Gamma Spectroscopy	244	244	100%	0%	269	269	100%	0%
Plutonium-238	244	244	100%	100%	269	156	58%	49%
Plutonium-239	244	244	100%	100%	269	156	58%	49%
Strontium-90	244	244	100%	100%	269	159	59%	49%
Thorium-228	27	27	100%	100%	20	14	70%	40%
Thorium-230	27	27	100%	100%	20	14	70%	40%
Thorium-232	27	27	100%	100%	20	13	65%	35%
Tritium	244	244	100%	100%	269	269	100%	100%
Uranium-234	27	27	100%	100%	20	13	65%	35%
Uranium-235	27	27	100%	100%	20	13	65%	35%
Uranium-238	27	27	100%	100%	20	13	65%	35%
Uranium (total)	244	244	100%	100%	269	269	100%	100%
Metals (SW-6010) Ag	256	255	100%	99.6%	282	281	99.6%	94%
Metals (SW-6010) As	256	256	100%	99.6%	282	281	99.6%	94%
Metals (SW-6010) Se	256	256	100%	99.6%	282	281	99.6%	94%
Metals (SW-6010) ICPES*	256	256	100%	100%	282	281	99.6%	94%
Semivolatiles (SW-8270)	100	100	100%	99.6%	80	80	100%	98%

\*ICPES = inductively coupled plasma emission spectroscopy.

**TABLE 2-9****PERCENTAGE OF OUTFALL SAMPLE RESULTS RETURNED  
FROM ANALYTICAL LABORATORY**

<b>Analysis Requested</b>	<b>Outfall Samples</b>			
	<b>Number of Samples Submitted</b>	<b>Number of Sample Results Received</b>	<b>Percentage of Data Received</b>	<b>Percentage of Data on FIMAD</b>
Americium-241	202	94	47%	46%
Gamma Spectroscopy	202	178	88%	0%
Plutonium-238	202	93	46%	47%
Plutonium-239	202	93	46%	47%
Strontium-90	202	93	46%	47%
Thorium-228	98	47	48%	48%
Thorium-230	98	47	48%	48%
Thorium-232	98	42	43%	44%
Tritium	202	202	100%	98%
Uranium (total)	202	201	99.5%	97%
Metals (SW-6010) Ag	213	197	92%	46%
Metals (SW-6010) As	213	197	92%	46%
Metals (SW-6010) Se	213	197	92%	46%
Metals (SW-6010) ICPES	213	197	92%	46%
Semivolatiles (SW-8270)	215	199	93%	97%
Volatiles (SW 8240)	224	217	97%	71%

**2.13.2.3 Filter Building Investigations**

The investigations reported in this section are those described in the RFI work plan in Chapter 13, Surface Contamination from Airborne Emissions Description and Sampling Plan, in the subsections on filter buildings.

Analytical laboratory results for samples from the filter building investigations that were conducted in 1992 continued to be received during the second quarter of FY93. Data validation activities for these results began in the first quarter of FY93. Table 2-10 summarizes the percentage of analysis results returned for the samples submitted. Data assessment and interpretation will be conducted for the filter building investigations when this data set is complete.

**2.13.2.4 Geomorphologic Studies**

As part of the TA-21 mesa-top characterization, geologic studies were scheduled throughout FY92 and FY93. The studies are described in Section 12.3, Geomorphologic Sampling Plan, of the TA-21 OU RFI work plan.

**TABLE 2-10**

**PERCENTAGE OF FILTER BUILDING SAMPLE RESULTS RETURNED  
FROM ANALYTICAL LABORATORY**

Analysis Requested	Filter Building Samples--Near-Surface				Filter Building Samples--Subsurface			
	Number of Samples Submitted	Number of Sample Results Received	Percentage of Data Received	Percentage of Data on FIMAD	Number of Samples Submitted	Number of Sample Results Received	Percentage of Data Received	Percentage of Data on FIMAD
Americium-241	18	18	100%	70%	7	0	0%	0%
Gamma Spectroscopy	35	35	100%	0%	11	0	0%	0%
Plutonium-238	35	26	74%	56%	11	0	0%	0%
Plutonium-239	35	26	74%	56%	11	0	0%	0%
Strontium-90	35	25	71%	56%	11	0	0%	0%
Thorium-228	1	1	100%	100%				
Thorium-230	1	1	100%	100%				
Thorium-232	1	0	0%	0%				
Tritium	35	35	100%	76%	11	0	0%	0%
Uranium-234	1	0	0%	0%				
Uranium-235	1	0	0%	0%				
Uranium-238	1	0	0%	0%				
Uranium (total)	35	33	94%	79%	11	2	18%	0%
Metals (SW-6010) Ag	42	37	88%	25%	12	12	100%	0%
Metals (SW-6010) As	42	37	88%	25%	12	4	33%	0%
Metals (SW-6010) Se	42	37	88%	25%	12	4	33%	0%
Metals (SW-6010) ICPEs	42	37	88%	25%	12	12	100%	0%
Semivolatiles (SW-8270)	42	34	81%	93%	12	9	75%	0%
Volatiles (SW-8240)	47	37	79%	62%	13	13	100%	0%

**2.13.2.4.1 Stratigraphy/Lithology**

The mineralogy of samples collected from stratigraphic sections OU 1106-STRAT-1 and OU 1106-STRAT-3 was determined by x-ray diffraction. The locations of the stratigraphic sections were identified in Figure 4.1-1 of the "ER Quarterly Report, July-September, Fiscal Year 1992." These data, together with mineralogy analyses for OU 1106-STRAT-2 (see Table 2-9 and Figure 2-4 in the "ER Quarterly Report, October-December, Fiscal Year 1993") will be used to determine vertical and lateral variations in the bulk-rock mineralogy of the Bandelier Tuff at TA-21.

Tuffs in all three measured sections consist primarily of feldspar + quartz +/- cristobalite +/- tridymite +/- glass. Minor constituents include smectite, hornblende, mica, hematite, calcite, and kaolinite. Volcanic glass is a dominant constituent in the Otowi Member, in the tuffs of the Cerro Toledo interval, and in the Tshirege Member below the vapor-phase notch. The mineralogy of the upper part of the Tshirege member is similar in the three stratigraphic sections, consisting of feldspar, tridymite, quartz and cristobalite. Tridymite is pervasive throughout the Tshirege Member above the vapor-phase notch and is most concentrated in the moderately welded tuffs of Unit 2. Smectite and hematite are disseminated in small amounts (<2%) throughout the stratigraphic sequence at OU 1106.

#### **2.13.2.4.2 Geomorphology**

Field work on geomorphic characterization of TA-21 was completed during the quarter. Results of these investigations are being prepared for inclusion in the first phase report, planned for June 1993. The report will identify potential depositional sites for contaminants transported by surface run-off, areas of potential landsliding and mass wasting in the vicinity of the material disposal areas, and a description of the surficial deposits at the site. The map of surficial deposits has been combined with the bedrock geologic map information and entered into FIMAD.

#### **2.14 ADS 1111—TAs-6, -7, -22, -40, -58, -62 (Project Leader: Cheryl K. Rofer)**

The draft RFI work plan for OU 1111 was submitted for formal internal review, informal DOE review, and value engineering review. The comments from these reviews have been received. Discussions were held with personnel from the Idaho National Engineering Laboratory on the use of their rapid data acquisition system for magnetometry surveys as a way to help characterize Material Disposal Area F, and the Value Engineering Review Team from Argonne National Laboratory toured OU 1111. In other activities, the test plot for pilot studies on landfill covers was completely instrumented, and data were collected during the spring snow melt. Early results reveal larger amounts of water movement through the soil than were anticipated. Also, personnel are examining samples of altered tuff from PRS 22-015(c), the plating bath outflow, to identify their mineralogical composition to help determine the degree of contamination and the possible remediation schemes. The initial data suggest that the alteration rims around some minerals are enriched in Cr, Mn, Cu, and Fe.

#### **2.15 ADS 1114—TAs-3, -30, -59, -60, -61, -64 (Project Leader: Ed Griggs)**

This quarter most efforts were aimed at responding to the comments received from the informal DOE, formal Laboratory, and value engineering reviews of the draft RFI work plan for OU 1114. The comments were incorporated, and the RFI work plan was submitted on March 15, 1993, for the formal DOE, Classification Office (OS-6), and Legal Counsel reviews. The OU 1114 team is reviewing the work plan in anticipation of comments to be received. In other activities, OU 1114 personnel are preparing for the data analysis and delineation of the approximately 180 remaining potential release sites in OU 1114. Data worksheets were revised, and suggestions were received from team members on ways to improve the efficiency of the potential release site review system. Funding requirements for the balance of FY93 and for FY94 are being reviewed. Sample monitoring of PRS 3-010(a), the mercury spill at TA-3-30, is continuing in preparation for voluntary corrective action. Statements of work for OU 1114 were delivered to the Program Office in January 1993. Efforts continue for the completion of the statements of work and for the allocation of funds.

#### **2.16 ADS 1122—TAs-33, -70 (Project Leader: Keith E. Dowler)**

Assessment activities continue at the main site and Area 6 Site at TA-33. OU 1122 personnel have identified the training requirements for all field personnel and have begun training. A site-specific health and safety plan and a waste management plan are in the preparation stages. SOPs that are needed for field work were identified and are being developed. A memorandum addressing the national emissions standards for hazardous air pollutants was reviewed, and additional information is being prepared to address critical issues. Subsurface structures and outfalls have been identified in the field in preparation for land surveying. Sampling schedules have been prepared and coordinated with the Sample Coordination Facility.

#### **2.17 ADS 1127—TA-35, TSL-125 (Project Leader: Dave McInroy)**

During this quarter, OU 1127 personnel received the analytical results from the December 1992 sampling of Ten-Site Canyon; the results revealed no contaminants of concern. The final closure report is being written.

**2.18 ADS 1129—TAs-4, -5, -35, -42, -48, -52, -55, -63, -66 (Project Leader: Allyn Pratt)**

OU 1129 personnel continue to collect data from the sampling activities of June and September 1992 in response to the Nuclear Safeguards Technology Laboratory construction requirements. Data received to date represent more than 90 percent of the characterization results and are presented here for informational purposes (Tables 2-11 and 2-12). The Separations and Radiochemistry Group (INC-12) data for lead and for plutonium were non-EPA quality but were accepted by DOE management for construction validation purposes. OU 1129 personnel will report the Health and Environmental Chemistry Group (EM-9) results to the EPA as standard RFI characterization data.

In response to an NMED request, OU 1129 personnel, in coordination with EM-8, have written a sample and analysis plan for compliance with the NMED underground storage tank regulations and have arranged for sampling of the former sites of tanks TA-35-TSL-188-1 and TA-35-TSL-188-2 to be conducted the week of May 10, 1993. The bulk of OU 1129 activities this quarter has involved developing the necessary infrastructure to begin RFI Phase I field work for TA-48. OU 1129 personnel have made significant progress in developing the FIMAD interface; the recent orthophotos for OU 1129 have been scanned into ARC/INFO and overlaid onto existing coverages. Data management and data analysis activities have progressed, and OU 1129 personnel have coordinated field operation preparations with building managers and affected programs. The OU-specific health and safety plan from the Industrial Hygiene Group (HS-5) is nearly complete. Also, as part of the RFI preparations, OU 1129 personnel have met with EM-9 to resolve analytical requirement problems and to explore the efficient use of the mobile chemistry and radiochemistry laboratories.

**2.19 ADS 1130—TAs-36, -68, -71 (Project Leader: Gene Gould)**

The draft RFI work plan for OU 1130 was delivered for formal DOE review on February 22, 1993, and the resulting comments have been resolved. Comment responses from the review of the previous draft also have been resolved.

**2.20 ADS 1132—TA-39 (Project Leader: Gene Gould)**

The draft RFI work plan for OU 1132 was delivered for formal DOE review on February 25, 1993, and the resulting comments are being resolved and incorporated into the final draft. Comment responses from the review of the previous draft of the RFI work plan were distributed.

**2.21 ADS 1135—TA-40 (Project Leader: Dave McInroy)**

To address the unexpected contamination that was identified at several locations throughout TA-40, an amendment to the closure plan has been written. The amendment addresses the strategy for delineation and possible clean-up of these areas. A draft of the amended closure plan has been delivered to the state of New Mexico. A risk assessment is being proposed to address those contaminants (lead, antimony, beryllium, and thallium) that were identified to be above action levels.

**2.22 ADS 1136—TA-43 (Project Leader: Calvin Martell)**

The data quality objectives for OU 1136 have almost been completed. In other activities, OU 1136 personnel have entered information from archives, interviews, site visits, and drawings into a worksheet data base for each PRS in the OU.

**2.23 ADS 1140—TA-46 (Project Leader: Roy Michelotti)**

The draft RFI work plan for OU 1140 received the formal internal, informal DOE, and value engineering reviews. Formal responses to the comments are being made, and the comments are being incorporated into the draft work plan. The OUPL and team members developed statements of work for OU 1140. They also met with Facilities Engineering personnel to discuss projects at TA-46 for this fiscal year;

**TABLE 2-11**

**EM-9 ANALYTICAL RESULTS FOR TA-42**

ER BARCODE	<sup>238</sup> Pu	<sup>238</sup> Pu unc	<sup>239</sup> Pu	<sup>239</sup> Pu unc	Pb	Pb unc	<sup>228</sup> Th	<sup>228</sup> Th unc	<sup>230</sup> Th	<sup>230</sup> Th unc	<sup>232</sup> Th	<sup>232</sup> Th unc	<sup>234</sup> U	<sup>234</sup> U unc	<sup>235</sup> U	<sup>235</sup> U unc	<sup>238</sup> U	<sup>238</sup> U unc	<sup>241</sup> Am	<sup>241</sup> Am unc
AAA0951	0.0739	0.0244	0.0523	0.0208	14.4	2.88													0.4910	0.0352
AAA0952					14.5	2.9														
AAA0953	0.2	0.062	0.0839	0.0395	4.3	0.86													0.0657	0.0568
AAA0954					12	2.4														
AAA0955					6.6	1.32														
AAA0956					11.7	2.34														
AAA0957	1.75	0.24	2.24	0.31	28.1	5.62													0.3320	0.1070
AAA0958					4.2	0.42														
AAA0959					3.7	0.37														
AAA0960	0.438	0.149	0.125	0.08															0.121	0.055
AAA0961	0.289	0.107	0.231	0.096															0.082	0.0477
AAA0962	0.36	0.146	0.216	0.112															0.096	0.0558
AAA0963	0.139	0.075	0.511	0.155			1.9	0.49	1.55	0.41	1.53	0.41	0.819	0.28	0.0999	0.0901	0.779	0.226	0.138	0.061
AAA0964	0.377	0.171	0.298	0.151															0.103	0.046
AAA0964	0.0873	0.0783	0.401	0.152															0.209	0.069
AAA0965																			0.157	0.075
AAA0966																			0.057	0.114
AAA0967	0.389	0.165	0.135	0.102			1.27	0.29	1.1	0.26	1.39	0.3	1	0.43	0	0.105	0.815	0.365	0.107	0.055
AAA0968	0.214	0.108	0.485	0.187															0.227	0.071
AAA0969	0.154	0.091	0.0441	0.0543															0.08	0.0455
AAA0970																			0.38	0.12
AAA0971	1.8	1.18	0.969	0.846															0.264	0.325
AAA0972	5.63	1.66	2.68	1.1															1.09	0.56
AAA0973																			0.061	0.211
AAA0974																			0.025	0.0499
AAA0975																			0.086	0.0529
AAA0976																			0.138	0.062
AAA0977																			0.071	0.0584
AAA0978																			0.039	0.0778
AAA0979																			0.041	0.034
AAA0980																			0.152	0.074
AAA0981																			0.292	0.107
AAA0982	0.0836	0.0727	0.0119	0.024															0.327	0.098
AAA0983	0.269	0.105	0.0179	0.0254															0.358	0.112
AAA0984	0.0492	0.0738	0.312	0.0159															0.463	0.116

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unc = Uncertainty

NR = Not Reported

\* = Quality Control Sample

(Units are in pCi/g except for the "Pb" and "Pb unc" data columns, which are in mg/kg.)

**TABLE 2-11 (continued)**

ER BARCODE	<sup>238</sup> Pu	<sup>238</sup> Pu unc	<sup>239</sup> Pu	<sup>239</sup> Pu unc	Pb	Pb unc	<sup>228</sup> Th	<sup>228</sup> Th unc	<sup>230</sup> Th	<sup>230</sup> Th unc	<sup>232</sup> Th	<sup>232</sup> Th unc	<sup>234</sup> U	<sup>234</sup> U unc	<sup>235</sup> U	<sup>235</sup> U unc	<sup>238</sup> U	<sup>238</sup> U unc	<sup>241</sup> Am	<sup>241</sup> Am unc
AAA0984	0.132	0.07	0.29	0.111															0.749	0.171
AAA0985	0.0238	0.0424	0.0189	0.0378															0.529	0.127
AAA0986	0.332	0.144	0.0553	0.0559															0.342	0.102
AAA0987	0.465	0.471	0	0.0181															0.199	0.298
AAA0988	0.852	0.815	0.142	0.492															0.135	0.27
AAA0989	0.156	0.102	0.296	0.144															0.105	0.052
AAA0990	0.138	0.09	0.0964	0.0743															0.135	0.057
AAA0991	0.147	0.09	0.0793	0.061															0.332	0.097
AAA0992	0.0827	0.0719	0.0591	0.0535			2.50	0.81	1.52	0.55	0.91	0.395							0.933	0.194
AAA0993	0.0771	0.07	0.0	0.0024			1.83	0.69	1.1	0.44	1.46	0.53							0.309	0.09
AAA1691					10.4	NR														
AAA1692					12.5	NR														
AAA1693					15.3	NR														
AAA1694					17.1	NR														
AAA1695					12.4	NR														
AAA1696					5.3	NR														
*OO26087					<1															

unc = Uncertainty

NR = Not Reported

\* = Quality Control Sample

(Units are in pCi/g except for the "Pb" and "Pb unc" data columns, which are in mg/kg.)

**TABLE 2-12****INC-12 ANALYTICAL DATA, TA-42**

ER Bar Code	Pu238 (pCi/g)	Pu239 (pCi/g)	Pb (ppm)
AAA0951	0.036+/- 8%	1.28+/- 6.5%	17
AAA0952			
AAA0953			
AAA0954	<0.02+/- 12%	0.094+/- 15%	<5
AAA0955	<0.004+/- 1%	0.044+/- 11%	<5
AAA0956			
AAA0957	0.016+/- 25%	1.05+/- 4.8%	<5
AAA0958			
AAA0959			
AAA0960	0.0067+/-24%	0.110+/- 20%	
AAA0961	<0.002+/- 2%	0.144+/- 0.9%	
AAA0962			
AAA0963	<0.004+/- 9%	0.165/- 13%	
AAA0964	0.022+/- 19%	0.639+/- 14%	
AAA0964			
AAA0965			
AAA0966	0.009+/- 44%	<0.006+/-24%	
AAA0967	0.012+/- 30%	0.149+/- 2.9%	
AAA0968			
AAA0969	<0.003+/- 5%	0.043+/- 11%	
AAA0970	0.029+/- 18%	0.877+/- 3.0%	
AAA0971			
AAA0972			
AAA0973			
AAA0974			
AAA0975	<0.06+/- 17%	<0.406+/- 18%	
AAA0976			
AAA0977			
AAA0978	<0.01+/- 6%	<0.006+/- 45%	
AAA0979			
AAA0980			
AAA0981			
AAA0982	0.067+/- 7%	<0.002+/- 28%	
AAA0983			
AAA0984	0.010+/- 20%	0.176+/- 12%	
AAA0984			
AAA0985	<0.01+/- 3%	<0.003+/- 28%	
AAA0986			
AAA0987			
AAA0988			
AAA0989			

**TABLE 2-12 (continued)**

ER Bar Code	Pu238 (pCi/g)	Pu239 (pCi/g)	Pb (ppm)
AAA0990			
AAA0991	<0.03+/- 9%	<0.17+/- 13%	
AAA0992	<0.01+/- 2%	<0/002+/- 23%	
AAA0993			
AAA1691			
AAA1692			
AAA1693			
AAA1694			
AAA1695			
AAA1696			
OO26067			

several drain systems are proposed to be rerouted and brought into compliance. In other activities, visitors from Argonne National Laboratory were briefed on the RFI work plan and were given a tour of TA-46. The Management Information System is developing a baseline change proposal to reflect the addition of 17 new PRSs to OU 1140. Additional funds are needed to accommodate the expanded scope.

**2.24 ADS 1144—TA-49 (Project Leader: Ines Triay)**

OU 1144 personnel presented a description and update on planned activities at TA-49 at the quarterly public meetings held in January 1993. A notice of deficiency on the RFI work plan for OU 1144 (LANL 1992, 0786) was received from the EPA, and a response was submitted. Personnel completed all statements of work and baseline change proposals for FY93 and submitted them to the ER Program Office. Other activities included personnel being trained on the DOE's RESRAD software system and giving a presentation of the ER activities at TA-49 to Ed Helminski, publisher of the *Weapons Complex Monitor*. Plans were made for a new transducer to be placed in corehole CH-2 and for this corehole to become part of the EM-8 surveillance network. The Area 2 corehole CH-2 was sampled by the EM-8 environmental survey team; however, the results from these samples have not been received.

**2.25 ADS 1147—TA-50 (Project Leader: Cheryl K. Rofer)**

An official response to the EPA's notice of deficiency was sent to the ER Program Office on March 3, 1993, for transmission to the EPA. A letter describing minor alterations in the plans for soil sampling of Material Disposal Area C and Aggregates 5 and 6 was also sent to the EPA during this quarter, but no comments have been received.

**2.26 ADS 1148—TAs-51, -54 (Project Leader: Don Neeper)**

The objective of ADS 1148 is to conduct an RFI of TAs-51 and -54, with concurrent voluntary corrective actions where appropriate. Activity this quarter concentrated on preparations for field work. Personnel conducted a literature review to identify any additional tests on the properties of tuff that may be needed for the voluntary extraction of the vapor plume at Area L. In preparation for the investigative drilling and the subsequent extraction tests, OU 1148 personnel began the development of an improved method for pore gas sampling. Considerable effort was made in reviewing drilling technology and in preparing the procurement for drilling services. Geologic mapping of subsurface features in an open pit at Area G continued. When completed, this mapping will provide information relevant to the effects of fractures on the various subsurface vapor plumes at TA-54.