



**Department of Energy**

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Los Alamos, New Mexico 87544

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*LANL Area Office*

William K. Honker, Chief  
RCRA Permits Branch  
Hazardous Waste Management Division  
U.S. Environmental Protection Agency, Region 6  
1445 Ross Avenue  
Dallas, Texas 75202-2733

Dear Mr. Honker:

Enclosed are two copies of the Environmental Restoration Quarterly Report for October-December 1992 for the Los Alamos National Laboratory.

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

cc w/enclosure:



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LA-UR-92-1201

Los Alamos National Laboratory

**Environmental Restoration**

A Department of Energy environmental cleanup program

**QUARTERLY REPORT  
OCTOBER - DECEMBER  
FISCAL YEAR 1992**

**QUARTERLY REPORT**  
**OCTOBER - DECEMBER**  
**FISCAL YEAR 1992**  
**LOS ALAMOS NATIONAL LABORATORY**  
**ENVIRONMENTAL RESTORATION PROGRAM**

**ALBUQUERQUE FIELD OFFICE**

**CONTRACTOR: UNIVERSITY OF CALIFORNIA**

**DIVISION LEADER: THOMAS GUNDERSON**

**PROGRAM MANAGER: ROBERT VOCKE**

**NUMBER OF POTENTIAL RELEASE SITES: APPROXIMATELY 2,250**

**SUSPECT WASTE: RADIONUCLIDES, HIGH EXPLOSIVES, METALS, SOLVENTS,  
ORGANICS**

**INTRODUCTION**

The technical status of each ongoing activity in the program is discussed below. These activities are presented in parallel with the Five-Year Plan For Environmental Restoration (ER). Each activity is identified by an Activity Data Sheet (ADS) number and a title that describes the activity.

**ASSESSMENT**

**ADS 1049--CANYONS ASSESSMENT (Project Leader: Sandy Wagner)**

A preliminary meeting was held on evaluating the risk in the canyons system; limited activity will occur in FY92.

**ADS 1066--NEPA DOCUMENTATION (Project Leader: Paul Aamodt)**

There was still no clear guidance from the Department of Energy Headquarters (DOE-HQ) on how to proceed with National Environmental Policy Act (NEPA) compliance at Los Alamos National Laboratory (LANL). There was some suggestion that DOE-HQ would be recommending that installations like LANL prepare Environmental Assessments (EAs) rather than assume (as we have done) that an Environmental Impact Statement (EIS) would be needed. We continue to wait for clarification, but we will prepare background or baseline documentation that can be used in either case.

A potentially significant occurrence this quarter was the official transfer of NEPA authority (within DOE) from DOE-HQ to DOE Albuquerque Field Office (AFO). This occurred late in the quarter, and we hope it will help expedite important NEPA decisions.

The TA-40 Scrap Detonation Site Closure - DOE Environmental Checklist was sent to DOE September 10, 1991. A categorical exclusion determination is expected but has not yet been made by DOE/Environmental Management (EM) at HQ.

**ADS 1071--TAs-0, -19, -26, -73, AND -74 ASSESSMENT (Project Leader: Jim Aldrich)**

The first internal (Laboratory) review of the draft Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) Work Plan for Operable Unit (OU) 1071 was completed. The document was revised and resubmitted for a second internal review.

**ADS 1078--TA-1 ASSESSMENT (Project Leader: Ron Conrad)**

During the first quarter of FY92, a draft of the RFI Work Plan for TA-1 was completed for internal review. This draft is now undergoing informal review by DOE and more formal review by the ER office and Argonne National Laboratory. The RFI Work Plan for TA-1 is due at the Environmental Protection Agency (EPA) on May 18, 1992.

**ADS 1079--TAs-10, -31, -32, AND -45 ASSESSMENT (Project Leader: Sandy Wagner)**

The draft RFI Work Plan was completed and submitted for internal and value engineering review on December 23, 1991.

Several additional letters were sent to homeowners with solid waste management units (SWMUs) located on or near their property in mid-December. These locations were identified as a result of additional or more accurate field information received since the first notification was conducted in August/September.

Meetings are held regularly with Los Alamos County to discuss SWMU issues and concerns and to coordinate construction activities that may impact SWMU areas.

**ADS 1082--TA-11, -13, -16, -24, -25, -28, -37 ASSESSMENT (Project Leader: Brad Martin)**

During the first quarter of FY92, we began work on OU 1082. However, because of budgetary uncertainties, work was slowed in the initial several weeks of the FY. As of 12/31/91, we have made progress in setting up the overall Chemistry and Laser Sciences (CLS) Team for OUs 1082, 1114, and 1140, including the technical support members from the other required technical divisions. While applied effort will be paid for by the appropriate OU, we expect that overall CLS Division will experience economies of scale using this approach. Specifically, the OU 1082 team effort has been focused on planning the project, archival retrieval, and initial interactions with the Decision Analysis, Geology, and Statistics personnel.

**ADS 1086--TA-15 (Project Leader: Allen Ogard)**

Work on the RFI Work Plan was initiated this quarter with completion of the plan and delivery to the EPA scheduled for May 23, 1993. Team formation and records and archive searches were the principal activities this quarter.

**ADS 1098--TA-2 and -41 ASSESSMENT (Project Leader: Patrick Longmire)**

Reviewed available information on SWMUs at TA-2 TA-41 and conducted interviews and archival searches. Held meetings with group leaders for TA-2 and TA-41. Wrote introductory chapters (1-4) for Work Plan. We prepared a Fact Sheet and budget .

**ADS 1106--TA-21 ASSESSMENT (Project Leader: Micheline Devaurs)**

A meeting was held with US Environmental Protection Agency (EPA ) Region VI personnel on September 9, 1991. In this meeting EPA requested additional schedule information. Response to EPA was hindered by uncertainty in the funding available for FY92. Therefore, EPA issued an Notice of Deficiency (NOD) on November 5, 1991, that required schedule information for TA-21. The NOD also requested that LANL accelerate completion of work plans for town site operable units. An NOD response was submitted to EPA on December 5, 1991, containing a revised schedule for RFI field work that addresses more SWMUs earlier in the RFI. The Laboratory's ability to stick to this schedule is contingent upon availability of DOE funding.

**ADS 1111--TA-6, -7, -22, -40, -58, -62 ASSESSMENT (Project Leader: Cheryl Rofer)**

SWMUs were identified by inspection on OU 1111. Some of the SWMUs currently listed are questionable; other areas were identified as possible SWMUs, but these areas cannot be fully investigated until the ground is free of snow. A team for writing the OU 1111 work plan is being formed. The work plan has been outlined, and tentative assignments have been made to OU 1111 Project Team members. A preliminary records search on Material Disposal Area F [SWMUs 6007 (a) and 6007 (b)] was performed at the Records Processing Facility.

**ADS 1114--TA-3, 30, 59, 60, 61, 64 ASSESSMENT (Project Leader: Ed Griggs)**

Research into the SWMU Report for OU 1114 commenced October 1, 1992 and is continuing. The archivist arrived November 18 and has been actively researching the records of the Records Processing Facility. It was decided early into FY92 among the four CLS Project Leaders that a team organization would be established for the ER effort. In so doing, meetings with Statistics and Decision Analysis (A-1), Geology and Geochemistry (EES-1), Environmental Protection Group (EM-8), and others were held with all OU team members present so that only one meeting was required to apprise all personnel of the requirements of each of the technical support organizations. Such team meetings are continuing. Concentrated efforts were made in early December to provide several "rapid-turnaround" inputs on the FY92 budget and the schedule with the ER Program Office estimating and scheduling section.

**ADS 1122--TAs-33 AND -70 ASSESSMENT (Project Leader: Keith Dowler)**

Work continued on development and revision of field sampling plans. The work plan chapter that describes SWMUs and SWMU aggregates has been revised to be more concise by eliminating descriptions that are not relevant. The needs for illustrations and figures have been identified.

**ADS 1129--TAs-5, -35, -42, -48, -52, -55, -63, AND -66 ASSESSMENT (Project Leader: Al Pratt)**

Significant progress toward the accomplishment of RFI Work Plan tasks occurred during the quarter. A draft RFI Work Plan was completed and submitted to the Project Office on December 18, 1991. The draft was complete except for the development of some of the sample and analysis plans. The draft RFI is currently in the informal review process.

**ADS 1130--TA-36, -68, and -71 ASSESSMENT (Project Leader: Sharad Kelkar)**

The activities of significance during this quarter consisted of submitting the Statement of Work (SOW) to the program office, preparing costs and schedules for FY92, and locating and analyzing existing data for the RFI work plan. In addition, a working team has been organized for the RFI work plan. The project is off to a slow start as a result of budget uncertainties, but no delays are anticipated in the deliverables.

**ADS 1132--TA-39 ASSESSMENT (Project Leaders: Kenneth Bostick/Paul Aamodt)**

Work on the RFI Work Plan was initiated this quarter with completion of the plan and delivery to the EPA scheduled for May 23, 1993. Team formation and records and archive searches were the principal activities started this quarter.

**ADS 1140--TA-46 ASSESSMENT (Project Leader: Bob Anderson)**

Work has begun on the production of an RFI Work Plan for OU 1140 (TA-46). A technical team has been established and the scoping of the RFI Work Plan has been completed. A budget and schedule for this FY have been produced and submitted. Considerable progress has also been made in locating existing data for OU 1140.

**ADS 1144--TA-49 ASSESSMENT (Project Leader: Gary Eller)**

Draft sampling plans and main body of the TA-49 RFI Work Plan were essentially completed during this period. Some appendices and annexes are still being developed. We are on schedule for delivery of rough draft Work Plan on January 17 for LANL review and final Work Plan submittal on May 23 to EPA.

**ADS 1147--TA-50 ASSESSMENT (Project Leader: Tom Hakonson)**

The TA-50 RFI was nearly completed during the quarter ending December 31, 1991. Considerable time was spent in budget baselining activities for the remainder of the TA-50 RFI/CMS process. We also started the TA-39 Work Plan.

**ADS 1148--TAs-51 AND -54 ASSESSMENT (Project Leader: Bob Gilkeson, acting)**

Work Plan - A preliminary draft of the RCRA Facility Investigation (RFI) Work Plan was completed in December 1991 and editing/production was initiated to meet a submittal date in early January 1992 for internal review by the Laboratory. The draft RFI Work Plan that will be submitted for internal review will be complete except for the program management section. The draft Work Plan includes a voluntary corrective action plan to remediate the volatile organic contaminant (VOC) plume present in the subsurface beneath and surrounding MDA L at TA-54.

Baseline schedules were defined for the RFI investigation for the operable unit. The schedules were established for two budget scenarios:

1. Unconstrained funding in FY92, and
2. Constrained funding in FY92. The RFI Work Plan for the operable unit is completed in both scenarios. However, in the constrained budget, many activities in the voluntary corrective action plan are deferred for one fiscal year.

Voluntary Corrective Action - Quarterly pore gas samples were collected at the monitor wells in the volatile organic compounds (VOC) plume at MDA L. The analytical data are reported to the Geoanalysis Group (EES-5) for plume modeling. EES-5 delivered a report on numerical simulation of vapor extraction at MDA L. The numerical modeling presented in the report is useful to identify additional data needs and provides guidance for the strategy to remediate the VOC plume.

**ADS 1157--TA-8, 9, 23, 69 ASSESSMENT (Project Leader: Tracy Glatzmaier)**

Work on the RFI Work Plan was initiated this quarter with completion of the plan and delivery to the EPA scheduled for May 23, 1993. Team formation and records and archive searches were the principal activities undertaken this quarter.

**ADS 2107-- Assessment Management (Program Managers: Bob Vocke/Lars Sohlt)**

The DOE held a public hearing in Los Alamos on the Site-Specific Five Year Plan for ER/Waste Management (WM) of the Laboratory. Approximately 20 members of the public and media attended and no formal comments were received. The Laboratory provided a technical overview of the program and answered questions.

**REMEDATION**

**ADS 1067--RCRA MIXED WASTE STORAGE AND DISPOSAL FACILITY (Project Leader: Paul Aamodt)**

During this quarter, the first drafts of information being compiled for completion of the Parts A and B permits (or for modification of the existing permits under which LANL operates, if that is feasible) were submitted by the Merrick/Dames and Moore contractor team. A review of the available information suggests that we have in hand about half of all information needed. Most of the remaining information will be derived from ongoing facility design, site characterization, and waste inventory studies that are underway or planned for later in this fiscal year. If work goes forward as planned, we hope to submit these applications to the New Mexico Environmental Department (NMED) early next fiscal year. Work related to the permit application process is being delegated to LANL's permitting section in Group EM-8 beginning next quarter (January 1992).

**RCRA CLOSURES**

**ADS 1135--TA-40 SCRAP DETONATION SITE CLOSURE (Project Leader: John Krueger)**

Initial sampling activities for closure of the TA-40 Scrap Detonation Site were to have been completed by November 13, 1991 (as per NMED approved closure plan); however, sampling activities have not yet begun. The site is now covered with several inches of snow, which will hinder and possibly further delay site investigation and closure activities.

**Attachment 1**

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

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## **1.0 SUMMARY OF ACTIVITIES**

This Quarterly Technical Progress Report is the first to address the Operable Unit 1071 RCRA Facility Investigation conducted by Los Alamos National Laboratory, and summarizes RFI activities for the fourth quarter of fiscal year 1992. This investigation is conducted according to the OU 1071 RFI Work Plan (LANL, 1992a), and the Installation Work Plan for Environmental Restoration (LANL, 1991).

RFI activities conducted during the fourth quarter of fiscal year 1992 consisted of administrative activities and initial field work on Solid Waste Management Unit (SWMU) Aggregate 0-D, Mortar Impact Areas.

Field work at SWMU Aggregate 0-G, PCB Transformers, was completed in the spring of 1992. Completion of a phase report documenting field activities, analytical results, data interpretation and recommendations for any further action was delayed about two and a half months, to December 1992, as a result of a delay in the receipt of funding to support this effort.

## **2.0 ADMINISTRATIVE ACTIVITIES**

### **2.1 Fourth Quarter Administrative Activities**

Administrative activities completed during the fourth quarter of FY 1992 included: planning of field work for fiscal year 1993, coordination with property owners for access to SWMUs prior to field work, mobilization for field work, and ongoing management of OU 1071.

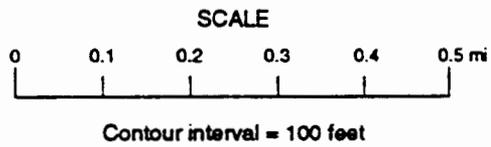
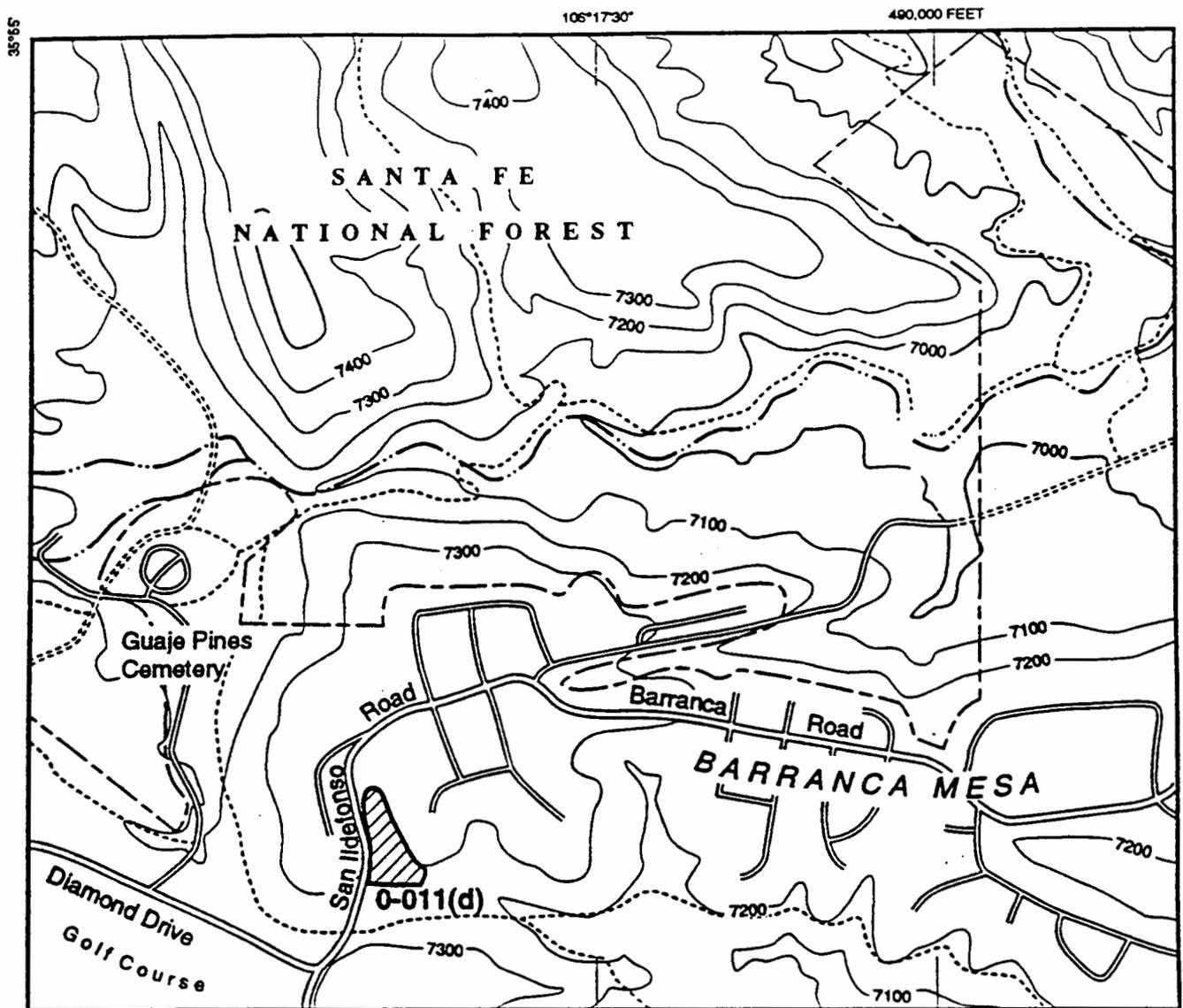
### **2.2 Administrative Activities Planned for First Quarter FY 1993.**

Administrative activities that will be conducted during the first quarter of FY 1993 include: planning, scheduling, and mobilization preparations and coordination of RFI field work scheduled for the spring and summer of 1993. A phase report on RFI activities at SWMU Aggregate 0-G, PCB Transformers will also be prepared.

## **3.0 FIELD WORK**

Field Work for the fourth quarter of FY 1992 consisted of RFI activities at SWMU 0-011(d), Barranca Mesa Mortar Impact Area (Figure 1). Barranca Mesa Mortar Impact Area is part of SWMU Aggregate 0-D and is described in section 5.3 of the LANL OU 1071 RFI Work Plan. Barranca Mesa Mortar Impact Area was used as a bazooka range in the mid 1940's by the military. It is located in a residential area of Los Alamos.

The OU 1071 RFI work plan calls for an ordnance sweep and removal, geomorphic mapping, and surface soil sampling at SWMU 0-011(d). As of the end of the fourth Quarter of FY 1992, the ordnance sweep and clearance and geomorphologic mapping tasks have been completed. The surface soil sampling task at SWMU 0-011(d) will be completed in the first Quarter of FY 1993. The RFI Phase I activities at the four other SWMUs that are part of SWMU Aggregate 0-D are scheduled to be completed in FY 1993. A phase report for these RFI activities, containing detailed information on field activities, data interpretation and recommendations for further action, will be completed and submitted soon after the completion of RFI activities at SWMU Aggregate 0-D.



- Paved road
- Dirt road
- Foot trail
- Forest boundary
- Intermittent stream
- SWMU 0-011(d)

Figure 1. Location Map, SWMU 0-011(d).

### **3.1 Ordnance Search and Removal at SWMU 0-011(d)**

An ordnance search and removal operation was conducted at SWMU 0-011(d) from 14 September to 30 September 1992. This task is described in section 5.3.6.2 of the OU 1071 RFI work plan. A detailed surface and subsurface clearance of ordnance, ordnance waste and metallic debris was completed by two teams experienced in subsurface ordnance detection. The initial sweep and clearance was completed by an explosive ordnance disposal (EOD) team trained in clearance of military ordnance areas. The subsequent sweep was completed by a team composed of geophysicists experienced in the location of buried metallic objects (including ordnance). All material handling and subsurface investigations were performed by EOD team members certified in safe procedures for the handling of ordnance. Both teams performed surveys designed to locate both surface and subsurface metallic objects. This dual survey approach resulted in a more thorough sweep and clearance than one team alone might have accomplished.

An EOD team composed of military certified master EOD technicians initially searched the area for any surface or subsurface ordnance. The team divided the area into ten-ft-wide lanes that were carefully searched for ordnance and explosive waste (OEW). Objects were located using hand-held magnetic and electromagnetic instruments in audio mode. The EOD team recovered more than 1,000 pieces of metallic debris (wire scrap, cans, fencing material, and other metallic debris) and approximately 35 pieces of non-explosive OEW. The OEW was predominantly composed of fragments from 2.36 inch US Army bazooka rounds. No potentially live ordnance or explosive material was found.

After the EOD team completed its survey of a given area, an additional sweep to detect objects was performed by a team of environmental geophysicists. The geophysics team conducted a magnetic gradiometer survey and an electromagnetic induction survey. Magnetic gradiometer readings were taken at five ft intervals across the site. The data were used to produce a computer generated map from which potential locations of buried metallic objects were defined and marked in the field. Additional readings were taken manually and interpreted in the field in the area where the EOD team had previously recovered ordnance fragments. Approximately 100 pieces of metallic debris and 15 pieces of OEW were detected by the geophysical team and then recovered by the EOD team. The combination of two surveys completed by two teams using different procedures provided an increased level of confidence that any buried OEW was recovered.

All waste material generated during the RFI field work was handled according to an approved waste management plan. The OEW was packaged and stored following approved procedures for handling potentially explosive waste. The OEW was then transported according to DOT regulations to a RCRA permitted facility at LANL for thermal treatment and disposal. The remaining metallic debris was placed in an on-site industrial dumpster for disposal at the Los Alamos County Landfill.

### **3.2 Geomorphic Mapping at SWMU 0-011(d)**

This activity is described in section 5.3.6.1.2 of the OU 1071 RFI work plan. SWMU 0-011(d) was mapped for surface deposition and drainage features according to LANL-ER-SOP-3.08, Geomorphic Characterization (draft) (LANL, 1992b). Seven soil sampling locations were selected based on the information gathered during this task.

### **3.3 Deviations from Work Plan**

There were no significant deviations from the OU 1071 RFI work plan, but there were schedule variances. Funding delays caused the field work at SWMU 0-011(d) to be postponed for more than two months. Submittal of the phase report for SWMU Aggregate 0-G, PCB Transformers, has also been postponed for approximately two and a half months due to a funding delay. Surface soil sampling at SWMU 0-011(d), as described in section 5.3.6.3 of the OU 1071 RFI work plan, will be completed in the first quarter of FY 1993.

#### **3.4 Field Work Planned for First Quarter FY 1993**

Five soil samples, two sediment samples, and the associated quality control samples will be taken at SWMU 0-011(d) in October 1992. The soil samples will be analyzed for Target Analyte List (TAL) metals and high explosive compounds as described in the LANL Generic QA Project Plan (Appendix T, Installation Work Plan, LANL 1991).

The four other SWMUs that make up SWMU Aggregate 0-D, Mortar Impact Areas, are scheduled for investigation during the third and fourth quarters of FY 1993. The phase report for SWMU aggregate 0-D, Mortar Impact Areas, is scheduled for submittal in December, 1993.

#### **4.0 REFERENCES**

LANL 1991. Installation Work Plan for Environmental Restoration, LA-UR-01-3310, Los Alamos National Laboratory, Los Alamos, NM 87545. November 1991

LANL 1992a. RFI Work Plan for Operable Unit 1071, LA-UR-92-810, Los Alamos National Laboratory, Los Alamos, NM 87545. May 1992

LANL 1992b. Environmental Restoration Standard Operating Procedures, Los Alamos National Laboratory, Los Alamos, NM 87545. June 1, 1992

**Attachment 2**

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

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## Introduction

The RFI Work Plan for Operable Unit (OU) 1078 was submitted to the U.S. Environmental Protection Agency (EPA) Region VI and the New Mexico Environment Department (NMED) in May 1992. The Phase I investigation described in the Work Plan was subsequently initiated in June 1992 and included radiological and land surveying; surface soil and sediment sampling on hillsides in Los Alamos Canyon; and water and sediment (Ashley Pond) sampling. Near-surface samples were also collected from shallow trenches in benches located on the hillsides. This initial investigation was implemented to document the present-day risk from radionuclides and RCRA hazardous constituents to the residents living in the area where TA-1 was located from 1943-1965, and to verify areas of hillside contamination not remediated during the previous cleanups. The field sampling deadline of October 1, 1992, established for the Phase I investigation of the RFI Work Plan for OU 1078, was met.

## Areas Sampled

The types of Solid Waste Management Units (SWMUs) addressed by the first phase of sampling include sanitary waste disposal systems (septic tanks); hillside surface disposal sites; building and storm drain lines and/or outfalls that discharged into Los Alamos Canyon; and receiving drainages along the hillsides and the bottom of the canyon. Approximately 675 samples were collected from the following SWMU Aggregates: Bailey Bridge, Aggregate B; Hillside 140, Aggregate C; J-2/TU Area, Aggregate D; Cooling Tower 80, Aggregate E; Hillside 138, Aggregate F; Hillside 137, Aggregate G; Surface Disposal Site Southeast of the Los Alamos Inn, Aggregate H; Can Dump Site, Aggregate I; and Drain Lines and Outfalls to Ashley Pond, Aggregate J. Detailed descriptions of the SWMUs in each aggregate are provided in the OU 1078 RFI Work Plan, and specific sample locations for the Phase I sampling are depicted on the appended map. Table 1 includes the unique sampling location identification numbers and their corresponding New Mexico State Plane coordinates.

## Sampling Approach

The Phase I sampling and analysis plans for OU 1078 were developed with the assumption that radioactive and hazardous constituents were co-disposed and are generally still co-located today. The analyses currently being conducted for the surface soil samples should verify whether this assumption is valid. Of the samples collected this summer, 217 are being analyzed for the full suite of analytes; gamma spectrometry (including Cs 137); total or isotopic uranium; isotopic plutonium; semivolatile organic compounds (SW 8270); and total metals including arsenic, silver, barium, cadmium, chromium, mercury, lead, selenium, thallium, nickel, antimony, and beryllium (SW 6010). Twenty replicate and 20 rinsate samples were also submitted for full suite analyses. EPA auditors split a total of 55 samples with the OU 1078 field team during the final month of sampling. The split samples included 5 for radiological activity; 19 for total metals; 24 for semivolatile organic compounds; and 7 for volatile organic compounds. Sample locations were based on random selection, double sampling selection by indication of radioactivity (gross alpha or beta in excess of 20 pCi/g), and judgmental sample locations identified using field radiological survey instruments. Every surface soil sample taken was counted for gross radiological activity. Table 1 lists the unique sample identification numbers and the corresponding gross radiological activity data that has been obtained to date.

Initial gross radiological screening results (as shown in Table 1) show elevated levels of radiological activity at sample locations in the Hillside 140 and Hillside 138 Aggregates. This elevated activity was previously documented by John Ahlquist during the decontamination and decommissioning activities carried out at TA-1 in the mid-1970s (as referenced in the OU 1078 RFI Work Plan). No decontamination efforts were performed on the hillsides below the Septic Tank 140 or Septic Tank 138 outfalls by Ahlquist because the areas were inaccessible to the heavy equipment needed for remediation. Preliminary in-situ measurements of metals, using x-ray fluorescence (XRF), performed at Phase I hillside sample locations where elevated levels of radiological activity were detected, indicate that metals above background levels are in fact co-located with radioactive constituents. Furthermore, XRF measurements taken in areas with background levels of radiological activity show metal concentrations at or below background. Additional

XRF measurements are being taken but analytical metals data will ultimately be used to verify the co-location thesis. It is important to note that no elevated levels of gross radiological activity were detected in the drainages at the bottom of the canyon below the hillside SWMUs, at the points where the drainages intersect the stream running at the bottom of Los Alamos Canyon.

### **Planned Activities**

Analytical results should begin arriving from the laboratory and subcontract analytical laboratories in November 1992. Upon receipt, the data will be verified and validated in accordance with LANL ER Program procedures. Quality data will then be used to: 1) perform preliminary health-based risk assessments, 2) determine whether additional investigation and/or characterization is required on the hillsides, 3) proceed to corrective measures study as needed, or 4) recommend a particular SWMU for no further action.

A second phase of investigation, scheduled to begin in the Spring of 1993, will focus on the subsurface and delineation of any areas found with elevated levels of contamination in Phase I. The SWMU locations DOE/UC proposes for initial subsurface investigation in Phase II include:

- the former location of the D Building, near what is now the western parking lot of the Los Alamos Inn;
- the Elmo C. DeBaca property (Tract 1) directly west of the Los Alamos Inn and east of the Loma Vista subdivision;
- the Los Alamos County park at the south end of Oppenheimer Drive;
- areas south of the Los Alamos Inn;
- the parking lot located directly south of the Records Processing Facility in Tri-Square Plaza;
- areas along Trinity Drive which are located off the paved portion of the road;
- the parking lots around the office buildings located at 555 and 557 Oppenheimer Drive;
- the paved area west of the Loma Vista townhouse development, (SWMU 1-002, the acid waste line);
- the area southeast of the Timberidge condominiums and the strip of land between the Timberidge condominiums and Trinity Village; and
- the grassy area south of Ashley Pond.

The objective of these subsurface investigations is to confirm whether the remediation effort managed by John Ahlquist in the mid-1970s on the mesa top at TA-1, was adequate, and to ensure that any remaining residual contamination poses no unacceptable risk to the public via direct exposure. Sampling plans for each of these areas and specified SWMUs to be investigated in this initial stage of Phase II will be submitted to EPA Region VI and NMED in January 1993. The first Phase Report will be submitted in February 1993.

Before the Spring 1993 sampling effort begins, DOE/UC will also take in-situ XRF and FIDLER (low energy x-ray and gamma) measurements in the immediate locations of town houses and common areas for two of the town house developments located at TA-1.

The principal questions that arise as a result of the Phase I sampling are:

1. How are the areas with elevated levels of contamination to be posted or otherwise managed to deter the public from accessing these areas?

2. What is the ultimate extent of contamination of these affected areas in terms of vertical depth and lateral spread, and what is the best method to define this?
3. What risk do these contaminant levels afford to the adjacent public, and if corrective measures are required to remediate these hillside areas, what are the alternatives, how will they be evaluated, and what are the costs of implementation?

### **Outstanding Issues**

One outstanding issue that may affect planning future TA-1 sampling is that isotopic Pu analyses may be delayed for up to 9 months. Lack of data from the initial sampling activities may hinder additional sampling activities.

### **Key Personnel Changes**

Carl Newton, EES-3, has taken over as project leader for OU 1078, effective October 1, 1992.

TABLE 1

## TA-1 PHASE 1 SOIL SAMPLES

SAMPLNUM	NORTHING	EASTING	ELEV.	MEASDATE	GROSS ALPHA pCi/g	GROSS BETA pCi/g
01-1015	1775733.85	482689.13	7260.31	09/03/92	3.59	21.78
01-1015	1775733.85	482689.13	7260.31	07/10/92	4.44	17.98
01-1016	1775715.43	482682.10	7257.95	09/03/92	3.76	26.56
01-1016	1775715.43	482682.10	7257.95	07/10/92	3.93	18.26
01-1017	1775696.64	482674.78	7258.02	09/03/92	5.65	28.50
01-1017	1775696.64	482674.78	7258.02	06/23/92	2.55	33.76
01-1018	1775677.18	482667.42	7256.88	09/03/92	3.38	23.94
01-1018	1775677.18	482667.42	7256.88	07/13/92	4.10	17.23
01-1040	1775684.01	482648.64	7253.98	07/07/92	2.38	15.20
01-1041	1775703.58	482652.47	7253.54	09/15/92	2.90	16.66
01-1042	1775739.70	482669.90	7257.48	09/15/92	3.93	15.98
01-1043	1775759.76	482674.26	7254.33	07/07/92	2.55	15.00
01-1043	1775759.76	482674.26	7254.33	09/15/92	2.38	16.07
01-1044	1775774.95	482686.49	7252.17	09/15/92	3.24	18.17
01-1045	1775783.14	482686.08	7249.18	06/23/92	1.52	30.52
01-1060	1775758.96	482642.78	7237.67	07/17/92	5.13	16.43
01-1060	1775758.96	482642.78	7237.67	09/15/92	3.41	18.66
01-1061	1775747.81	482633.54	7234.93	09/15/92	2.90	15.75
01-1062	1775727.41	482621.86	7227.97	09/15/92	2.38	13.29
01-1063	1775708.87	482613.77	7226.77	09/15/92	4.10	14.64
01-1063	1775708.87	482613.77	7226.77	07/09/92	3.93	15.41
01-1080	1775648.38	482642.53	7256.24	11/04/92	8.40	24.80
01-1081	1775638.34	482643.59	7255.85	07/07/92	5.13	15.59
01-1081	1775638.34	482643.59	7255.85	07/07/92	3.93	15.88
01-1082	1775628.54	482644.78	7256.41	07/07/92	3.07	19.10
01-1083	1775618.78	482646.83	7257.24	07/23/92	2.21	15.30
01-1084	1775608.87	482647.30	7258.61	07/07/92	3.07	14.33
01-1084	1775608.87	482647.30	7258.61	07/07/92	2.04	15.28
01-1085	1775599.78	482649.07	7260.14	07/07/92	2.38	16.10
01-1086	1775591.42	482650.35	7262.80	07/23/92	3.07	15.40
01-1086	1775591.42	482650.35	7262.80	07/07/92	3.07	14.13
01-1086	1775591.42	482650.35	7262.80	07/07/92	4.44	13.37
01-1087	1775648.43	482627.37	7244.40	11/04/92	6.51	26.10
01-1088	1775638.29	482628.95	7250.37	07/07/92	13.72	39.09
01-1088	1775638.29	482628.95	7250.37	07/07/92	16.30	40.12
01-1089	1775628.60	482629.69	7252.03	07/07/92	17.50	56.32

TABLE 1 (cont.)

**TA-1 PHASE 1 SOIL SAMPLES**

<b>SAMPLNUM</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>MEASDATE</b>	<b>GROSS ALPHA</b> pCi/g	<b>GROSS BETA</b> pCi/g
01-1089	1775628.60	482629.69	7252.03	07/07/92	14.06	57.95
01-1090	1775619.07	482629.81	7253.83	07/23/92	3.40	17.20
01-1091	1775608.69	482629.75	7255.17	07/07/92	2.90	16.50
01-1092	1775598.84	482630.58	7257.05	07/07/92	2.55	18.50
01-1092	1775598.84	482630.58	7257.05	07/07/92	2.73	17.52
01-1093	1775592.97	482630.97	7257.42	07/07/92	3.41	21.70
01-1094	1775629.50	482612.35	7242.91	07/23/92	15.50	670.20
01-1095	1775623.29	482615.23	7245.78	07/23/92	50.80	147.80
01-1096	1775613.56	482612.46	7247.55	07/23/92	3.80	14.50
01-1097	1775631.53	482594.79	7234.04	07/23/92	121.10	445.20
01-1098	1775632.19	482580.81	7216.24	09/03/92	8.57	36.26
01-1098	1775632.19	482580.81	7216.24	06/24/92	5.82	46.71
01-1099	1775623.36	482575.88	7219.90	07/09/92	5.30	16.84
01-1099	1775623.36	482575.88	7219.90	09/03/92	3.24	26.71
01-1100	1775613.93	482572.50	7218.98	07/09/92	4.61	18.32
01-1100	1775613.93	482572.50	7218.98	09/03/92	3.93	23.32
01-1101	1775604.69	482569.90	7217.32	09/03/92	3.07	20.67
01-1102	1775592.31	482566.16	7213.26	09/03/92	3.24	22.70
01-1102	1775592.31	482566.16	7213.26	07/09/92	2.73	14.12
01-1103	1775594.89	482528.82	7193.51	09/03/92	5.30	15.63
01-1104	1775604.74	482531.61	7194.29	09/03/92	3.24	14.67
01-1105	1775611.55	482534.22	7194.72	09/03/92	4.10	14.00
01-1106	1775630.25	482544.83	7200.44	09/03/92	5.65	15.58
01-1107	1775634.48	482551.60	7203.46	09/03/92	3.07	14.18
01-1108	1775639.59	482561.86	7205.03	07/09/92	5.82	20.79
01-1108	1775639.59	482561.86	7205.03	09/03/92	5.65	16.08
01-1109	1775643.94	482570.77	7207.61	06/24/92	54.43	394.95
01-1109	1775643.94	482570.77	7207.61	09/03/92	113.02	220.56
01-1110	1775647.39	482580.02	7209.17	06/24/92	60.11	487.20
01-1110	1775647.39	482580.02	7209.17	09/03/92	84.67	188.25
01-1111	1775652.81	482587.48	7210.12	09/03/92	26.61	69.12
01-1111	1775652.81	482587.48	7210.12	06/24/92	9.94	127.71
01-1112	1775659.40	482595.03	7212.97	09/03/92	17.16	52.33
01-1112	1775659.40	482595.03	7212.97	06/24/92	10.97	121.69
01-1113	1775668.43	482600.22	7212.62	07/09/92	7.02	29.11
01-1113	1775668.43	482600.22	7212.62	09/16/92	4.44	22.20

TABLE 1 (cont.)

## TA-1 PHASE 1 SOIL SAMPLES

SAMPLNUM	NORTHING	EASTING	ELEV.	MEASDATE	GROSS ALPHA pCi/g	GROSS BETA pCi/g
01-1114	1775677.56	482604.92	7214.54	07/09/92	3.59	18.08
01-1115	1775684.78	482610.20	7218.66	07/09/92	6.33	17.23
01-1116	1775690.30	482613.71	7220.58	09/03/92	3.59	13.30
01-1140	1775744.39	482612.75	7226.93	07/07/92	3.93	18.47
01-1140	1775744.39	482612.75	7226.93	09/03/92	3.93	16.78
01-1141	1775739.34	482589.72	7219.54	09/03/92	4.27	17.11
01-1141	1775739.34	482589.72	7219.54	07/10/92	4.96	19.68
01-1142	1775734.46	482576.92	7219.56	09/16/92	6.68	32.17
01-1142	1775734.46	482576.92	7219.56	07/07/92	3.24	18.17
01-1142	1775734.46	482576.92	7219.56	09/03/92	8.74	28.34
01-1143	1775725.71	482559.79	7216.11	07/09/92	8.57	29.56
01-1143	1775725.71	482559.79	7216.11	09/16/92	5.82	26.80
01-1143	1775725.71	482559.79	7216.11	09/03/92	9.08	28.06
01-1144	1775708.84	482546.64	7212.67	06/23/92	5.65	44.10
01-1145	1775702.44	482527.05	7212.78	09/03/92	2.73	14.23
01-1145	1775702.44	482527.05	7212.78	07/07/92	4.27	33.89
01-1146	1775703.80	482506.15	7209.29	07/09/92	2.55	15.19
01-1146	1775703.80	482506.15	7209.29	09/03/92	2.38	16.07
01-1147	1775699.83	482486.46	7205.93	06/23/92	2.73	37.53
01-1147	1775699.83	482486.46	7205.93	09/03/92	3.93	15.41
01-1148	1775697.07	482466.38	7200.76	07/10/92	4.44	18.13
01-1148	1775697.07	482466.38	7200.76	09/03/92	3.59	17.82
01-1149	1775639.43	482475.29	7174.52	07/07/92	3.24	16.79
01-1149	1775639.43	482475.29	7174.52	09/03/92	7.36	16.29
01-1150	1775653.33	482490.78	7178.43	09/03/92	3.24	19.50
01-1150	1775653.33	482490.78	7178.43	07/07/92	3.24	25.97
01-1151	1775669.83	482509.86	7191.17	09/03/92	4.44	29.11
01-1151	1775669.83	482509.86	7191.17	07/07/92	2.55	17.94
01-1152	1775669.92	482521.46	7192.38	07/07/92	9.94	26.50
01-1152	1775669.92	482521.46	7192.38	09/03/92	4.61	22.44
01-1153	1775686.23	482541.64	7199.49	07/07/92	3.41	24.10
01-1153	1775686.23	482541.64	7199.49	09/03/92	3.59	25.13
01-1153	1775686.23	482541.64	7199.49	07/07/92	2.21	18.36
01-1154	1775694.52	482557.92	7204.43	07/07/92	5.30	19.73
01-1154	1775694.52	482557.92	7204.43	07/07/92	3.41	22.80
01-1154	1775694.52	482557.92	7204.43	09/03/92	5.47	28.03

TABLE 1 (cont.)

## TA-1 PHASE 1 SOIL SAMPLES

SAMPLNUM	NORTHING	EASTING	ELEV.	MEASDATE	GROSS ALPHA pCi/g	GROSS BETA pCi/g
01-1155	1775707.82	482567.61	7208.30	09/03/92	5.13	27.15
01-1155	1775707.82	482567.61	7208.30	07/07/92	13.20	42.51
01-1156	1775717.73	482585.71	7212.63	09/03/92	13.03	58.57
01-1156	1775717.73	482585.71	7212.63	09/16/92	1.01	12.80
01-1156	1775717.73	482585.71	7212.63	07/07/92	1.69	14.55
01-1157	1775732.00	482599.68	7219.68	09/16/92	8.22	24.97
01-1157	1775732.00	482599.68	7219.68	09/03/92	.39	38.92
01-1157	1775732.00	482599.68	7219.68	07/07/92	3.93	25.13
01-1157	1775732.00	482599.68	7219.68	07/07/92	4.61	27.52
01-1160	1775342.39	482715.81	7275.45	11/04/92	3.24	14.30
01-1161	1775339.95	482720.59	7275.39	11/04/92	2.55	12.80
01-1162	1775338.38	482724.71	7275.02	11/04/92	3.76	13.20
01-1163	1775334.99	482729.19	7274.58	11/04/92	3.24	13.10
01-1164	1775332.61	482734.39	7274.58	11/04/92	2.38	13.10
01-1165	1775342.09	482706.00	7274.64	11/04/92	3.41	16.10
01-1166	1775339.40	482709.69	7274.96	11/04/92	3.24	17.20
01-1167	1775337.19	482714.56	7274.67	11/04/92	4.96	16.00
01-1168	1775334.80	482718.95	7274.63	11/04/92	3.07	14.00
01-1169	1775332.37	482723.26	7274.28	11/04/92	2.73	13.70
01-1170	1775330.28	482727.71	7274.01	11/04/92	1.87	12.50
01-1171	1775327.93	482732.14	7272.51	11/04/92	2.21	13.00
01-1172	1775337.60	482702.59	7273.25	11/04/92	4.10	13.40
01-1173	1775335.82	482707.18	7273.90	11/04/92	2.55	13.00
01-1174	1775333.96	482711.68	7273.68	11/04/92	3.07	15.60
01-1175	1775331.84	482716.21	7273.68	11/04/92	2.55	14.20
01-1176	1775329.50	482720.63	7273.83	11/04/92	3.76	13.10
01-1200	1775731.64	482507.82	7248.72	07/13/92	5.30	17.15
01-1201	1775746.96	482522.20	7249.72	07/13/92	4.44	15.05
01-1202	1775761.47	482535.42	7249.72	06/23/92	3.07	21.25
01-1202	1775761.47	482535.42	7249.72	07/23/92	4.44	17.49
01-1203	1775777.37	482548.40	7252.62	07/10/92	2.73	16.74
01-1203	1775777.37	482548.40	7252.62	07/17/92	3.41	14.78
01-1204	1775792.57	482560.07	7253.29	07/13/92	5.65	17.90
01-1205	1775807.28	482574.66	7253.12	07/10/92	2.73	13.81
01-1206	1775816.55	482589.88	7252.90	07/13/92	3.07	16.05
01-1207	1775820.44	482609.81	7253.26	07/17/92	2.04	14.75

TABLE 1 (cont.)

## TA-1 PHASE 1 SOIL SAMPLES

SAMPLNUM	NORTHING	EASTING	ELEV.	MEASDATE	GROSS ALPHA pCi/g	GROSS BETA pCi/g
01-1208	1775822.81	482628.90	7251.61	07/13/92	2.21	14.17
01-1209	1775825.32	482650.28	7252.07	07/13/92	2.73	15.68
01-1210	1775824.50	482669.95	7252.38	07/17/92	1.52	10.47
01-1211	1775794.96	482681.13	7244.77	07/13/92	2.55	20.17
01-1211	1775794.96	482681.13	7244.77	09/03/92	4.61	26.64
01-1212	1775778.21	482690.46	7250.54	07/13/92	3.41	15.20
01-1212	1775778.21	482690.46	7250.54	09/03/92	2.21	20.41
01-1213	1775770.98	482694.49	7252.96	09/03/92	4.79	24.35
01-1213	1775770.98	482694.49	7252.96	07/13/92	5.47	14.75
01-1214	1775752.99	482696.33	7258.47	09/03/92	4.79	21.00
01-1214	1775752.99	482696.33	7258.47	07/10/92	1.87	14.72
01-1248	1775341.13	482232.09	7061.04	07/28/92	5.65	20.15
01-1249	1775317.08	482215.39	7056.97	07/28/92	3.24	15.01
01-1250	1775262.00	482172.09	7043.78	07/30/92	3.76	16.80
01-1251	1775261.60	482181.69	7041.96	09/16/92	7.54	32.83
01-1252	1775260.65	482191.82	7040.89	07/30/92	5.30	21.00
01-1253	1775260.89	482201.18	7042.77	07/28/92	3.24	13.80
01-1253R	1775260.89	482201.18	7042.77	07/28/92	2.38	14.20
01-1254	1775259.60	482210.97	7045.52	07/30/92	1.87	15.90
01-1255	1775240.76	482171.93	7041.42	07/30/92	2.04	15.20
01-1256	1775240.59	482181.80	7041.23	09/16/92	4.10	25.86
01-1257	1775240.27	482191.65	7040.15	07/30/92	4.10	19.20
01-1258	1775239.78	482201.46	7041.91	07/30/92	1.69	13.70
01-1259	1775239.40	482211.34	7042.05	07/30/92	2.90	14.80
01-1260	1775238.72	482220.95	7043.41	07/28/92	3.93	16.02
01-1300	1775371.46	482250.82	7101.48	08/26/92	4.10	20.27
01-1301	1775443.75	482287.71	7124.53	08/26/92	12.86	61.83
01-1302	1775453.81	482292.09	7124.31	08/26/92	2.38	13.21
01-1303	1775478.71	482309.23	7131.89	08/26/92	5.82	23.68
01-1304	1775530.53	482346.21	7147.19	08/26/92	12.00	40.40
01-1305	1775538.65	482350.09	7147.69	08/26/92	9.26	34.37
01-1306	1775542.23	482345.02	7147.50	08/26/92	12.69	44.11
01-1307	1775588.35	482400.74	7158.09	08/26/92	5.13	22.79
01-1308	1775624.83	482459.91	7168.95	08/26/92	10.63	47.72
01-1309	1775631.76	482501.50	7181.72	08/26/92	7.19	22.15
01-1310	1775644.25	482508.98	7185.26	08/26/92	17.85	78.00

TABLE 1 (cont.)

**TA-1 PHASE 1 SOIL SAMPLES**

<b>SAMPLNUM</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>MEASDATE</b>	<b>GROSS ALPHA pCi/g</b>	<b>GROSS BETA pCi/g</b>
01-1311	1775644.47	482528.11	7188.53	08/26/92	9.94	40.05
01-1312	1775657.35	482562.41	7198.25	08/26/92	63.37	248.99
01-1313	1775651.48	482575.11	7205.27	08/26/92	62.00	148.58
01-1314	1775668.18	482576.14	7200.25	08/26/92	25.06	101.42
01-2000	1775246.28	482980.17	7276.15	08/12/92	2.73	11.30
01-2001	1775260.77	482978.75	7278.56	08/12/92	2.38	13.30
01-2002	1775262.43	482988.90	7280.81	08/12/92	1.18	14.10
01-2003	1775266.44	482999.76	7282.44	08/12/92	1.52	13.40
01-2004	1775265.00	483008.37	7282.45	08/12/92	2.90	11.10
01-2005	1775265.73	483018.40	7282.47	08/12/92	0.84	10.50
01-2006	1775267.13	483028.45	7282.57	08/10/92	3.07	14.00
01-2007	1775248.20	482989.21	7277.37	08/10/92	2.38	13.40
01-2008	1775249.23	482998.29	7277.79	08/12/92	3.76	16.60
01-2009	1775250.48	483009.62	7275.78	08/10/92	1.87	16.70
01-2010	1775250.52	483018.64	7277.55	08/12/92	2.90	14.40
01-2011	1775249.72	483028.96	7277.78	08/12/92	1.52	16.70
01-2012	1775267.54	483038.01	7282.66	08/05/92	3.24	14.50
01-2013	1775268.10	483048.13	7282.77	08/03/92	3.76	11.60
01-2013	1775268.10	483048.13	7282.77	08/05/92	1.69	14.40
01-2014	1775268.37	483058.22	7282.52	08/05/92	2.73	13.80
01-2015	1775268.78	483068.18	7282.21	08/05/92	2.73	9.97
01-2016	1775269.83	483078.15	7281.93	08/05/92	2.73	11.30
01-2017	1775270.48	483087.99	7281.57	08/05/92	0.84	12.00
01-2018	1775271.04	483098.01	7280.77	08/05/92	1.52	14.50
01-2019	1775271.68	483108.10	7279.97	08/05/92	1.69	13.50
01-2020	1775276.83	483116.46	7282.66	08/05/92	2.90	15.20
01-2021	1775280.55	483125.37	7282.82	08/05/92	3.07	14.40
01-2022	1775285.23	483133.99	7281.85	08/03/92	3.07	12.90
01-2022R	1775285.23	483133.99	7281.85	08/03/92	2.38	14.10
01-2023	1775290.20	483142.61	7282.02	08/03/92	3.24	14.60
01-2024	1775295.23	483151.57	7283.17	08/03/92	4.61	13.60
01-2025	1775300.03	483160.12	7282.56	08/05/92	1.18	14.50
01-2026	1775304.85	483168.95	7281.80	08/05/92	3.07	12.70
01-2027	1775312.92	483178.11	7280.21	08/05/92	2.21	13.30
01-2028	1775316.18	483185.04	7279.63	08/05/92	1.35	12.20

TABLE 1 (cont.)

**TA-1 PHASE 1 SOIL SAMPLES**

<b>SAMPLNUM</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>MEASDATE</b>	<b>GROSS ALPHA pCi/g</b>	<b>GROSS BETA pCi/g</b>
01-2029	1775321.10	483193.84	7279.61	08/05/92	2.55	13.60
01-2030	1775324.84	483202.83	7279.69	08/05/92	2.55	13.60
01-2031	1775329.70	483211.55	7279.47	08/05/92	2.55	15.10
01-2032	1775334.62	483220.22	7279.18	08/05/92	2.21	12.20
01-2033	1775339.01	483228.96	7279.76	08/05/92	2.21	9.76
01-2157	1775343.47	483237.84	7278.80	10/26/92	1.35	8.80
01-2034	1775349.10	483245.94	7278.53	08/03/92	2.90	14.60
01-2035	1775356.00	483253.39	7278.49	08/03/92	3.07	15.80
01-2036	1775362.99	483260.31	7278.52	08/03/92	3.41	12.20
01-2037	1775370.01	483267.33	7277.92	08/05/92	2.55	15.50
01-2038	1775377.17	483274.15	7277.55	08/03/92	2.04	7.33
01-2039	1775382.79	483279.68	7277.85	08/05/92	3.07	14.10
01-2040	1775390.78	483288.67	7279.16	08/05/92	3.24	14.60
01-2041	1775397.94	483295.65	7279.35	08/05/92	2.73	17.80
01-2042	1775404.73	483302.94	7279.34	08/05/92	1.87	14.70
01-2043	1775411.68	483310.43	7279.62	08/03/92	2.90	15.60
01-2044	1775417.74	483318.53	7279.22	08/05/92	2.90	15.90
01-2045	1775425.63	483324.62	7279.62	08/03/92	1.69	13.58
01-2046	1775432.71	483331.40	7279.69	08/05/92	3.07	16.20
01-2047	1775439.99	483338.50	7279.29	08/06/92	3.41	13.10
01-2048	1775446.84	483345.59	7279.43	08/06/92	5.30	13.20
01-2049	1775453.87	483352.69	7278.25	08/06/92	4.10	14.00
01-2050	1775459.83	483360.34	7277.64	08/03/92	3.59	13.67
01-2051	1775452.74	483366.08	7271.87	08/06/92	2.73	13.80
01-2052	1775444.82	483373.02	7269.86	08/06/92	1.69	13.70
01-2053	1775437.07	483379.11	7271.09	08/06/92	4.61	14.20
01-2054	1775429.48	483385.98	7271.03	08/06/92	2.90	11.70
01-2055	1775422.23	483392.76	7271.46	08/06/92	3.59	14.10
01-2056	1775415.04	483399.55	7271.10	08/06/92	2.55	14.90
01-2057	1775407.70	483406.23	7270.62	08/06/92	2.73	14.00
01-2058	1775400.18	483412.65	7269.49	08/03/92	3.41	15.50
01-2059	1775393.24	483420.10	7269.74	08/06/92	2.21	16.10
01-2060	1775385.09	483425.75	7269.86	08/06/92	2.55	14.40
01-2061	1775378.37	483433.16	7270.59	08/06/92	1.18	14.30
01-2062	1775370.80	483439.60	7270.25	08/06/92	1.87	12.20
01-2063	1775363.08	483445.46	7270.67	08/06/92	1.69	14.20

TABLE 1 (cont.)

## TA-1 PHASE 1 SOIL SAMPLES

SAMPLNUM	NORTHING	EASTING	ELEV.	MEASDATE	GROSS ALPHA pCi/g	GROSS BETA pCi/g
01-2064	1775355.89	483452.15	7269.67	08/03/92	3.24	17.60
01-2065	1775349.47	483456.73	7266.48	08/06/92	1.52	14.80
01-2066	1775339.44	483464.28	7269.93	08/06/92	1.52	14.40
01-2067	1775329.90	483467.89	7270.87	08/06/92	1.69	13.20
01-2070	1775376.64	483429.59	7267.78	10/26/92	3.59	9.94
01-2071	1775365.54	483434.05	7268.30	10/26/92	2.73	6.92
01-2072	1775356.49	483437.11	7266.27	10/26/92	2.55	12.30
01-2073	1775349.89	483440.14	7264.74	08/03/92	3.24	13.57
01-2073R	1775349.89	483440.14	7264.74	08/03/92	1.52	16.13
01-2074	1775338.37	483443.08	7264.45	08/06/92	3.24	15.30
01-2075	1775327.61	483446.67	7260.96	08/03/92	6.85	18.24
01-2076	1775318.78	483449.57	7262.75	08/06/92	13.70	23.00
01-2076	1775318.78	483449.57	7262.75	09/16/92	6.33	13.42
01-2077	1775308.96	483450.68	7263.43	08/06/92	1.87	12.20
01-2078	1775298.80	483450.51	7264.14	08/06/92	3.07	16.20
01-2079	1775289.01	483454.15	7263.14	08/06/92	5.65	18.30
01-2080	1775279.42	483456.14	7265.76	08/03/92	4.61	14.01
01-2090	1775369.33	483419.60	7260.05	08/06/92	2.38	14.90
01-2091	1775359.29	483423.51	7259.12	08/06/92	2.04	12.90
01-2092	1775350.74	483425.68	7258.41	08/06/92	2.73	15.30
01-2093	1775340.73	483428.23	7259.76	08/06/92	3.76	17.40
01-2094	1775331.26	483432.30	7260.94	08/06/92	1.87	13.80
01-2095	1775322.67	483433.64	7260.39	08/03/92	3.41	14.21
01-2096	1775311.89	483436.51	7260.20	08/03/92	3.24	19.73
01-2097	1775302.17	483435.89	7260.82	08/06/92	4.79	15.40
01-2098	1775290.78	483437.67	7258.61	08/06/92	3.24	16.80
01-2099	1775282.28	483439.40	7260.45	08/06/92	3.07	17.50
01-2100	1775272.26	483441.16	7262.73	08/06/92	3.07	16.70
01-2110	1775347.95	483370.51	7227.70	08/12/92	1.87	9.39
01-2111	1775340.59	483377.05	7226.56	08/12/92	1.35	10.70
01-2112	1775332.59	483383.24	7225.27	08/12/92	0.32	10.80
01-2113	1775324.01	483388.82	7224.86	08/12/92	2.04	9.01
01-2114	1775315.79	483392.35	7230.26	08/10/92	3.76	16.00
01-2115	1775306.93	483401.06	7233.10	08/12/92	1.35	12.90
01-2120	1775321.21	483353.22	7220.45	08/12/92	2.73	15.90
01-2121	1775313.98	483360.10	7218.80	08/12/92	3.07	14.30

TABLE 1 (cont.)

## TA-1 PHASE 1 SOIL SAMPLES

SAMPLNUM	NORTHING	EASTING	ELEV.	MEASDATE	GROSS ALPHA pCi/g	GROSS BETA pCi/g
01-2122	1775306.98	483367.49	7219.15	08/10/92	3.76	11.10
01-2123	1775299.65	483374.06	7222.49	08/12/92	3.07	12.50
01-2130	1775289.46	483326.43	7209.53	08/12/92	2.04	12.80
01-2131	1775285.96	483335.66	7208.40	08/12/92	1.69	13.90
01-2132	1775281.60	483345.04	7209.91	08/12/92	2.21	12.20
01-2133	1775277.62	483354.81	7214.80	08/10/92	2.73	15.60
01-2134	1775273.18	483363.54	7214.82	08/12/92	2.21	12.60
01-2140	1774839.04	483133.76	7025.98	07/30/92	3.24	16.50
01-2141	1774836.66	483143.45	7015.96	07/30/92	3.07	13.00
01-2142	1774836.42	483153.36	7013.31	07/29/92	1.35	14.16
01-2143	1774836.79	483163.47	7016.32	07/30/92	2.90	15.80
01-2144	1774833.06	483172.53	7012.02	07/30/92	3.41	12.90
01-2145	1774834.62	483182.84	7015.03	07/30/92	3.24	13.40
01-2146	1774832.93	483191.98	7014.93	07/30/92	2.21	14.80
01-2147	1774830.70	483202.01	7016.83	07/29/92	2.38	14.28
01-2147R	1774830.70	483202.01	7016.83	07/29/92	4.44	16.00
01-2148	1774826.35	483210.91	7016.71	07/30/92	4.10	15.80
01-2149	1774821.00	483219.37	7018.70	07/30/92	3.76	16.30
01-2150	1774807.94	483143.27	7011.01	07/29/92	3.24	15.73
01-2151	1774805.21	483152.92	7009.73	07/30/92	3.93	15.60
01-2152	1774802.41	483162.38	7009.26	07/30/92	4.27	18.40
01-2153	1774799.73	483171.91	7008.95	07/30/92	2.55	15.65
01-2154	1774796.80	483181.31	7007.89	07/30/92	3.24	12.81
01-2155	1774794.05	483190.99	7005.66	07/30/92	1.52	11.68
01-2156	1774791.34	483200.60	7008.60	07/30/92	3.59	15.42
01-2160	1775359.10	483388.58	7240.35	10/19/92	4.61	10.30
01-2161	1775314.77	483374.01	7223.16	10/19/92	1.87	10.50
01-2162	1775294.19	483345.01	7213.78	10/19/92	4.61	11.90
01-2163	1775275.82	483324.69	7208.35	10/19/92	4.27	14.10
01-2164	1775257.04	483341.81	7206.90	10/19/92	2.73	15.50
01-2165	1775241.64	483310.99	7197.21	10/19/92	3.41	12.40
01-2166	1775189.86	483300.27	7182.24	10/19/92	5.99	18.10
01-2167	1775159.66	483294.64	7175.38	10/19/92	2.04	13.00
01-2168	1775128.99	483269.70	7167.56	10/19/92	3.59	13.10
01-2169	1775090.68	483233.41	7158.73	10/19/92	4.27	15.60
01-2170	1775038.85	483216.16	7139.05	10/19/92	3.59	12.40

TABLE 1 (cont.)

## TA-1 PHASE 1 SOIL SAMPLES

SAMPLNUM	NORTHING	EASTING	ELEV.	MEASDATE	GROSS ALPHA pCi/g	GROSS BETA pCi/g
01-2171	1775006.13	483221.43	7116.68	10/19/92	3.41	7.63
01-2171R	1775006.13	483221.43	7116.68	10/19/92	2.90	15.40
01-2172	1774970.01	483213.43	7094.38	10/19/92	3.41	15.00
01-2173	1774960.55	483196.80	7083.74	10/19/92	5.30	11.90
01-2174	1774946.68	483187.09	7075.52	10/19/92	2.90	11.40
01-2175	1774921.52	483182.92	7060.16	10/19/92	3.07	10.10
01-2176	1774897.08	483166.16	7046.36	10/19/92	3.24	13.70
01-3000	1775040.18	484002.23	7300.23	08/31/92	1.18	13.71
01-3001	1775034.36	484011.09	7300.40	08/20/92	2.73	19.07
01-3001	1775034.36	484011.09	7300.40	08/31/92	3.41	12.80
01-3002	1775028.72	484019.26	7300.72	08/31/92	4.61	12.12
01-3003	1775022.98	484027.41	7301.09	08/20/92	2.04	21.02
01-3004	1775017.19	484035.50	7301.21	08/31/92	1.87	20.73
01-3005	1775012.16	484043.24	7301.79	08/31/92	3.24	13.42
01-3006	1775009.47	484047.55	7302.63	08/31/92	2.55	12.60
01-3007	1775026.04	483990.72	7292.55	08/20/92	3.07	24.14
01-3008	1775019.99	483998.95	7292.43	08/31/92	2.73	12.82
01-3009	1775014.64	484007.85	7296.28	08/31/92	1.69	14.57
01-3010	1775007.53	484015.87	7294.24	08/31/92	2.38	14.66
01-3011	1775003.33	484023.64	7294.37	08/31/92	1.87	13.92
01-3012	1774998.56	484033.86	7294.47	08/31/92	1.69	15.48
01-3013	1774995.16	484042.70	7293.77	08/31/92	3.07	15.06
01-3014	1774992.27	484052.62	7294.21	08/31/92	4.61	14.89
01-3015	1774998.07	483993.38	7285.73	08/20/92	5.30	24.75
01-3016	1774993.00	484002.48	7283.53	08/31/92	2.04	13.30
01-3017	1774987.67	484011.17	7283.58	08/31/92	8.22	13.86
01-3018	1774983.43	484020.00	7285.54	08/31/92	13.20	15.78
01-3019	1774978.42	484028.45	7283.89	08/31/92	87.08	16.60
01-3019	1774978.42	484028.45	7283.89	09/17/92	57.90	12.30
01-3020	1774972.81	484036.67	7279.95	08/31/92	5.82	14.01
01-3021	1774970.87	484045.92	7281.12	08/31/92	4.61	16.60
01-3022	1774968.34	484055.97	7281.76	08/31/92	3.24	16.23
01-3023	1774968.87	483987.77	7248.84	08/20/92	9.94	24.02
01-3024	1774964.40	483996.32	7251.43	08/31/92	2.73	22.54
01-3025	1774962.76	484003.97	7253.72	08/31/92	8.40	22.91

TABLE 1 (cont.)

**TA-1 PHASE 1 SOIL SAMPLES**

<b>SAMPLNUM</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>MEASDATE</b>	<b>GROSS ALPHA pCi/g</b>	<b>GROSS BETA pCi/g</b>
01-3026	1774957.53	484014.59	7254.19	08/31/92	20.25	24.44
01-3027	1774955.17	484024.07	7256.39	08/31/92	16.47	19.85
01-3028	1774953.93	484033.65	7260.02	08/31/92	3.76	24.41
01-3029	1774953.92	484042.57	7263.88	08/31/92	3.59	27.35
01-3030	1774953.70	484051.67	7268.09	08/31/92	3.07	24.32
01-3031	1774927.98	483985.79	7235.16	08/20/92	6.68	26.77
01-3031	1774927.98	483985.79	7235.16	08/31/92	3.59	22.98
01-3032	1774924.48	483995.04	7236.84	08/31/92	7.36	21.46
01-3033	1774921.13	484004.12	7238.46	08/20/92	9.43	26.75
01-3034	1774918.32	484013.45	7239.98	08/31/92	3.24	27.01
01-3035	1774915.92	484022.64	7241.85	08/31/92	1.18	15.60
01-3036	1774912.08	484032.03	7242.41	08/31/92	3.24	14.30
01-3037	1774907.76	484041.01	7242.69	08/31/92	2.04	15.80
01-3038	1774914.40	483907.87	7214.38	08/31/92	5.47	15.60
01-3039	1774910.66	483917.05	7215.00	08/31/92	5.99	17.80
01-3040	1774905.96	483925.90	7214.62	08/31/92	3.93	16.50
01-3041	1774901.67	483934.83	7215.30	08/31/92	3.93	18.90
01-3042	1774897.32	483943.30	7215.34	08/31/92	2.90	18.50
01-3043	1774891.99	483951.82	7214.64	08/31/92	3.76	16.90
01-3044	1774886.61	483960.43	7214.58	08/31/92	4.44	16.30
01-3045	1774881.54	483968.90	7214.20	08/20/92	5.65	29.58
01-3046	1774876.63	483977.53	7214.69	08/31/92	3.41	16.30
01-3047	1774871.58	483986.15	7215.67	08/31/92	2.90	14.76
01-3048	1774867.26	483995.58	7215.08	08/31/92	3.07	14.67
01-3049	1774863.02	484005.62	7214.96	08/31/92	3.24	16.91
01-3050	1774859.68	484014.86	7214.28	08/31/92	2.55	16.29
01-3051	1774855.76	484023.95	7213.92	08/20/92	4.10	29.18
01-3052	1775102.02	483862.66	7289.06	08/20/92	1.69	11.37
01-3052	1775102.02	483862.66	7289.06	08/31/92	1.87	11.48
01-3053	1775100.22	483868.60	7290.62	08/20/92	5.65	22.15
01-3054	1775096.73	483883.85	7289.53	08/31/92	3.41	8.89
01-3055	1775094.01	483891.44	7289.71	08/31/92	2.04	13.53
01-3056	1775092.09	483900.99	7294.43	08/31/92	2.55	9.71
01-3057	1775071.43	483829.06	7253.65	08/20/92	11.83	14.01
01-3057	1775071.43	483829.06	7253.65	08/31/92	34.51	11.12
01-3057	1775071.43	483829.06	7253.65	09/17/92	37.40	10.90

TABLE 1 (cont.)

**TA-1 PHASE 1 SOIL SAMPLES**

<b>SAMPLNUM</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>MEASDATE</b>	<b>GROSS ALPHA pCi/g</b>	<b>GROSS BETA pCi/g</b>
01-3058	1775067.39	483838.26	7253.15	09/01/92	50.80	12.80
01-3058	1775067.39	483838.26	7253.15	09/17/92	120.60	12.80
01-3059	1775061.66	483848.11	7252.97	08/20/92	7.19	26.44
01-3060	1775058.52	483857.07	7253.80	09/01/92	3.41	11.50
01-3061	1775053.91	483865.26	7254.41	09/01/92	4.79	14.30
01-3062	1775049.22	483873.85	7256.66	09/01/92	6.68	17.30
01-3063	1774996.02	483781.98	7218.85	09/01/92	5.30	17.80
01-3064	1774993.62	483791.50	7216.26	09/01/92	3.93	16.60
01-3065	1774990.92	483801.23	7216.46	08/20/92	3.07	28.04
01-3066	1774987.79	483810.67	7217.83	09/01/92	6.85	16.20
01-3067	1774984.66	483820.78	7216.86	09/01/92	5.47	13.60
01-3068	1774981.72	483830.00	7218.21	09/01/92	5.30	15.90
01-3069	1774978.57	483839.50	7218.64	08/20/92	4.44	15.81
01-3070	1774975.75	483848.97	7219.36	09/01/92	2.90	13.30
01-3071	1774972.35	483858.17	7220.06	09/01/92	3.07	22.76
01-3072	1774973.29	483772.89	7213.18	08/20/92	2.73	16.97
01-3072	1774973.29	483772.89	7213.18	09/01/92	4.44	22.87
01-3073	1774971.19	483782.62	7212.65	09/01/92	3.76	25.49
01-3074	1774969.22	483792.30	7212.98	08/20/92	1.87	17.68
01-3075	1774967.57	483801.34	7213.34	09/01/92	3.41	22.93
01-3076	1774963.22	483807.96	7212.93	09/01/92	9.60	21.64
01-3077	1774963.86	483821.50	7213.33	09/01/92	15.95	24.67
01-3078	1774944.39	483782.29	7209.54	08/20/92	8.91	25.16
01-3078	1774944.39	483782.29	7209.54	09/01/92	18.53	23.09
01-3079	1774944.30	483793.08	7210.02	09/01/92	12.69	23.82
01-3080	1774944.98	483803.36	7211.87	09/01/92	8.91	23.36
01-3081	1774945.91	483813.00	7212.75	08/20/92	7.71	16.24
01-3082	1775015.03	483744.39	7225.02	08/20/92	4.96	23.29
01-3082	1775015.03	483744.39	7225.02	09/01/92	4.44	25.09
01-3082	1775015.03	483744.39	7225.02	09/17/92	4.61	14.05
01-3083	1775019.55	483695.57	7232.03	08/20/92	2.73	16.71
01-3084	1775037.73	483650.45	7244.07	09/01/92	3.07	13.50
01-3085	1775064.39	483608.42	7255.86	09/01/92	2.73	15.72
01-3086	1775046.93	483878.70	7256.39	09/01/92	5.82	17.63
01-3087	1775113.31	483590.74	7273.62	08/20/92	7.36	25.12
01-3087	1775113.31	483590.74	7273.62	09/01/92	4.96	14.27

TABLE 1 (cont.)

**TA-1 PHASE 1 SOIL SAMPLES**

<b>SAMPLNUM</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>MEASDATE</b>	<b>GROSS ALPHA</b> pCi/g	<b>GROSS BETA</b> pCi/g
01-3088	1775113.44	483600.45	7273.54	08/20/92	7.19	16.06
01-3089	1775112.85	483610.37	7272.88	09/01/92	4.10	13.80
01-3090	1775113.88	483620.69	7273.24	09/01/92	2.38	15.00
01-3091	1775096.89	483590.06	7270.72	08/20/92	4.61	21.12
01-3091	1775096.89	483590.06	7270.72	09/01/92	7.36	14.80
01-3092	1775097.20	483599.11	7270.67	09/01/92	2.90	11.94
01-3093	1775098.63	483610.30	7270.83	08/20/92	4.10	13.84
01-3094	1775099.06	483619.59	7270.33	11/04/92	6.16	13.60
01-3100	1775083.97	483899.34	7293.53	09/03/92	4.96	13.78
01-3101	1775077.02	483909.30	7290.36	09/03/92	1.52	11.27
01-3102	1775071.71	483916.13	7295.57	09/03/92	2.90	14.79
01-3103	1775069.30	483925.58	7295.53	09/02/92	4.44	14.71
01-3103R	1775069.30	483925.58	7295.53	09/02/92	5.13	11.41
01-3104	1775066.29	483934.38	7294.43	09/03/92	4.79	15.49
01-3105	1775062.16	483944.30	7293.88	09/03/92	3.07	15.40
01-3106	1775058.41	483953.79	7293.72	09/02/92	4.44	13.53
01-3108	1775049.11	483971.25	7289.69	09/03/92	12.35	16.57
01-3109	1775043.48	483979.37	7291.69	09/03/92	6.16	11.88
01-3110	1775039.29	483987.35	7292.96	09/02/92	2.04	14.79
01-3111	1775037.02	483995.93	7297.03	09/03/92	3.24	12.20
01-3112	1775070.71	483892.46	7290.28	09/03/92	2.73	11.99
01-3113	1775064.56	483901.19	7291.18	09/02/92	3.41	15.01
01-3114	1775061.98	483912.09	7292.19	09/02/92	6.16	18.19
01-3115	1775057.15	483920.25	7291.95	11/04/92	3.41	14.00
01-3116	1775056.44	483929.14	7290.34	09/03/92	8.57	14.34
01-3117	1775050.38	483935.81	7288.49	09/02/92	5.82	13.21
01-3117R	1775050.38	483935.81	7288.49	09/02/92	4.61	14.32
01-3118	1775044.83	483943.14	7286.74	09/03/92	4.61	13.50
01-3119	1775040.42	483953.04	7284.45	09/03/92	8.05	14.50
01-3120	1775038.68	483961.93	7282.30	09/03/92	18.20	16.80
01-3121	1775035.49	483970.41	7281.97	09/03/92	11.10	14.40
01-3122	1775032.12	483979.86	7286.85	09/03/92	6.16	14.00
01-3123	1775028.14	483986.13	7290.68	09/03/92	5.47	14.90
01-3124	1775032.48	483961.30	7279.99	09/02/92	3.59	14.39
01-3125	1775025.14	483968.75	7280.62	09/02/92	3.24	17.68
01-3126	1775029.17	483957.91	7278.49	09/02/92	3.07	23.06

TABLE 1 (cont.)

## TA-1 PHASE 1 SOIL SAMPLES

SAMPLNUM	NORTHING	EASTING	ELEV.	MEASDATE	GROSS ALPHA pCi/g	GROSS BETA pCi/g
01-3127	1775019.73	483964.25	7279.45	09/02/92	5.30	31.94
01-3128	1775036.96	483957.27	7281.85	09/02/92	4.10	25.47
01-3130	1774673.43	483611.71	7010.44	07/30/92	13.90	17.40
01-3131	1774672.25	483631.71	7011.36	07/30/92	2.55	15.10
01-3132	1774672.76	483641.31	7013.70	07/28/92	9.43	19.37
01-3133	1774672.64	483650.65	7010.62	07/30/92	6.68	17.10
01-3134	1774671.13	483660.86	7013.29	07/30/92	10.50	13.10
01-3135	1774670.21	483671.01	7011.26	07/30/92	2.55	15.90
01-3136	1774669.52	483681.41	7010.72	07/30/92	11.10	16.60
01-3137	1774669.22	483691.53	7011.76	07/30/92	6.51	17.90
01-3138	1774668.03	483700.66	7011.31	07/30/92	9.94	19.30
01-3139	1774650.29	483607.82	7003.33	07/28/92	7.71	17.53
01-3139R	1774650.29	483607.82	7003.33	07/28/92	6.33	18.34
01-3140	1774649.27	483617.75	6998.85	07/30/92	3.41	15.50
01-3141	1774649.59	483629.63	6992.38	07/30/92	4.27	16.00
01-3142	1774645.42	483636.51	6996.93	07/30/92	4.44	16.90
01-3143	1774643.69	483645.90	6994.67	07/30/92	6.16	18.30
01-3144	1774641.61	483656.49	6996.87	07/28/92	8.57	14.19
01-3145	1774639.24	483666.33	6998.73	07/30/92	3.59	16.70
01-3146	1774636.81	483675.60	6994.12	07/30/92	3.59	15.90
01-3147	1774635.03	483685.78	6993.45	07/30/92	2.04	14.70
01-3148	1774632.59	483695.36	6995.11	07/30/92	2.38	15.00
01-3149	1774665.77	483621.84	7004.95	07/30/92	3.24	14.80
01-3150	1774930.81	483745.67	7209.51	09/23/92	10.10	14.70
01-3151	1774932.99	483725.58	7208.95	09/23/92	7.54	15.90
01-3152	1774900.14	483748.32	7202.25	09/23/92	12.50	16.30
01-3153	1774905.27	483733.26	7201.80	09/23/92	24.70	17.30
01-3154	1774906.30	483697.50	7200.41	09/23/92	28.80	15.50
01-3155	1774797.52	483653.64	7081.80	09/23/92	9.43	16.90
01-3156	1774781.52	483679.06	7077.54	09/23/92	13.50	14.90
01-3157	1774740.80	483692.86	7054.06	09/23/92	12.50	14.00
01-3158	1774711.74	483671.58	7032.10	09/23/92	10.50	13.70
01-3159	1774713.53	483649.10	7032.47	09/23/92	4.10	20.20
01-3160	1774797.74	483695.93	7089.60	09/23/92	8.74	16.90
01-3161	1774820.26	483695.31	7102.29	09/23/92	4.61	19.50
01-3162	1774821.68	483734.22	7112.61	09/23/92	4.96	15.50

TABLE 1 (cont.)

**TA-1 PHASE 1 SOIL SAMPLES**

<b>SAMPLNUM</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>MEASDATE</b>	<b>GROSS ALPHA pCi/g</b>	<b>GROSS BETA pCi/g</b>
01-3170-T	1774893.22	483824.29	7213.08	10/08/92	5.82	17.80
01-3171-3	1774895.70	483829.16	7213.29	10/08/92	2.90	13.50
01-3171-T	1774895.70	483829.16	7213.29	10/09/92	5.65	13.07
01-3172-3	1774898.35	483833.67	7213.62	10/08/92	3.93	13.60
01-3172-T	1774898.35	483833.67	7213.62	10/09/92	4.61	13.94
01-3173-3	1774900.86	483837.96	7213.62	10/08/92	3.41	16.90
01-3173-T	1774900.86	483837.96	7213.62	10/08/92	5.65	15.80
01-3174-3	1774903.68	483842.11	7213.89	10/08/92	6.68	16.20
01-3174-T	1774903.68	483842.11	7213.89	10/09/92	4.96	14.24
01-3178-3	1774914.43	483858.79	7214.20	10/08/92	7.71	17.00
01-3178-T	1774914.43	483858.79	7214.20	10/09/92	7.02	16.90
01-3179-3	1774916.84	483863.03	7214.95	10/08/92	5.47	14.50
01-3179-T	1774916.84	483863.03	7214.95	10/08/92	4.96	14.10
01-3180-3	1774919.04	483867.25	7216.38	10/08/92	6.51	16.20
01-3180-T	1774919.04	483867.25	7216.38	10/09/92	7.02	17.56
01-3181-3	1774921.27	483871.80	7217.99	10/08/92	4.79	16.10
01-3181-T	1774921.27	483871.80	7217.99	10/09/92	4.61	16.72
01-3182-3	1774923.84	483875.64	7218.17	10/08/92	7.02	18.40
01-3182-3	1774923.84	483875.64	7218.17	10/08/92	5.82	14.00
01-3182-T	1774923.84	483875.64	7218.17	10/09/92	8.74	16.12
01-3183-3	1774925.89	483879.61	7218.19	10/08/92	5.82	15.50
01-3183-T	1774925.89	483879.61	7218.19	10/09/92	7.71	14.94
01-3184-3	1774930.06	483883.79	7218.45	10/08/92	4.10	17.70
01-3184-T	1774930.06	483883.79	7218.45	10/09/92	3.41	16.57
01-3184-TR	1774930.06	483883.79	7218.45	10/09/92	5.13	17.00
01-5000	1774961.22	484340.81	7305.68	08/19/92	3.76	11.60
01-5001	1774964.24	484345.06	7305.10	08/19/92	2.38	11.10
01-5002	1774965.61	484349.18	7303.60	08/19/92	2.55	9.56
01-5003	1774967.86	484353.44	7302.34	08/19/92	3.07	12.70
01-5004	1774970.25	484357.30	7300.59	08/18/92	3.24	10.60
01-5005	1774932.32	484330.97	7294.60	08/19/92	2.55	11.00
01-5006	1774935.25	484335.20	7293.21	08/19/92	1.52	15.20
01-5007	1774937.71	484339.83	7293.77	08/19/92	3.07	15.50
01-5008	1774940.43	484343.64	7294.04	08/19/92	3.24	10.60
01-5009	1774943.07	484347.69	7293.98	08/19/92	1.87	12.40

TABLE 1 (cont.)

**TA-1 PHASE 1 SOIL SAMPLES**

<b>SAMPLNUM</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>MEASDATE</b>	<b>GROSS ALPHA pCi/g</b>	<b>GROSS BETA pCi/g</b>
01-5010	1774945.61	484352.14	7293.36	08/19/92	5.30	17.20
01-5011	1774948.94	484355.87	7293.67	08/18/92	1.18	10.20
01-5012	1774951.28	484360.33	7292.83	08/19/92	2.38	20.10
01-5013	1774955.62	484363.29	7291.30	08/19/92	2.21	13.75
01-5014	1774957.54	484367.46	7289.82	08/19/92	2.21	15.85
01-5015	1774918.91	484343.93	7284.73	08/19/92	29.35	18.37
01-5016	1774921.49	484349.11	7285.60	08/19/92	28.66	16.98
01-5016	1774921.49	484349.11	7285.60	09/17/92	21.45	10.87
01-5017	1774924.18	484353.16	7286.08	08/19/92	44.48	17.45
01-5018	1774926.28	484356.34	7285.76	08/18/92	265.60	19.20
01-5019	1774929.85	484360.58	7285.20	08/19/92	17.16	17.17
01-5020	1774933.13	484364.87	7284.85	08/19/92	10.11	16.91
01-5021	1774938.12	484368.01	7285.17	08/19/92	5.82	19.99
01-5022	1774941.11	484371.29	7285.33	11/04/92	9.26	23.07
01-5023	1774944.45	484374.65	7284.20	11/04/92	5.82	13.10
01-5024	1774948.58	484377.65	7284.24	08/19/92	5.82	15.90
01-5025	1774952.03	484381.24	7285.55	08/19/92	3.76	15.00
01-5025	1774952.03	484381.24	7285.55	09/17/92	3.76	13.97
01-5026	1774903.11	484349.85	7278.65	08/19/92	144.46	34.60
01-5027	1774908.21	484359.37	7275.74	08/19/92	41.56	19.03
01-5028	1774916.72	484364.46	7275.94	08/18/92	312.70	27.00
01-5029	1774923.11	484372.44	7277.28	08/19/92	10.80	17.31
01-5030	1774929.33	484379.82	7278.17	08/19/92	4.61	15.42
01-5031	1774935.68	484389.05	7278.22	08/19/92	4.27	19.69
01-5032	1774944.64	484396.30	7276.73	08/19/92	3.76	15.65
01-5033	1774978.53	484363.61	7299.03	08/12/92	2.38	11.50
01-5034	1774997.65	484397.44	7295.42	08/12/92	1.87	11.20
01-5035	1775017.06	484433.25	7300.76	08/12/92	3.93	17.40
01-5036	1775035.45	484467.91	7302.40	08/12/92	2.38	14.90
01-5037	1775044.71	484505.96	7299.84	08/12/92	2.55	13.70
01-5038	1775047.85	484544.78	7298.68	08/12/92	1.69	8.64
01-5039	1775046.11	484586.24	7301.26	08/12/92	1.87	9.36
01-5040	1775030.62	484624.99	7298.25	08/12/92	1.18	8.12
01-5041	1774994.44	484620.60	7277.87	08/10/92	0.84	12.00
01-5042	1774970.54	484444.85	7267.17	08/12/92	2.90	14.07
01-5043	1774985.47	484465.41	7267.04	08/12/92	0.84	11.79

TABLE 1 (cont.)

## TA-1 PHASE 1 SOIL SAMPLES

SAMPLNUM	NORTHING	EASTING	ELEV.	MEASDATE	GROSS ALPHA pCi/g	GROSS BETA pCi/g
01-5044	1774985.28	484503.55	7253.06	08/12/92	1.35	10.62
01-5045	1774987.33	484542.96	7253.37	08/12/92	1.18	9.41
01-5046	1774977.34	484582.15	7250.16	08/10/92	1.69	13.20
01-5047	1774866.38	484355.78	7232.44	08/19/92	13.03	16.78
01-5048	1774870.24	484364.29	7231.07	08/19/92	1202.39	116.78
01-5048	1774870.24	484364.29	7231.07	09/17/92	464.04	38.39
01-5049	1774875.33	484374.45	7230.64	08/18/92	157.50	30.60
01-5049R	1774875.33	484374.45	7230.64	08/18/92	116.30	24.00
01-5050	1774879.47	484383.49	7229.04	08/19/92	36.06	25.11
01-5051	1774885.09	484391.96	7229.30	08/19/92	5.30	15.90
01-5052	1774891.88	484400.29	7229.02	08/19/92	4.61	16.30
01-5053	1774901.16	484404.43	7229.27	08/19/92	17.33	17.55
01-5054	1774907.18	484411.32	7230.31	08/19/92	8.91	20.00
01-5055	1774912.74	484421.29	7231.43	08/19/92	4.44	21.29
01-5056	1774852.33	484361.84	7224.82	08/19/92	80.20	31.24
01-5056	1774852.33	484361.84	7224.82	09/17/92	111.64	14.23
01-5057	1774856.07	484371.52	7225.17	08/19/92	769.01	190.41
01-5057	1774856.07	484371.52	7225.17	09/17/92	724.59	112.21
01-5058	1774859.02	484380.43	7222.65	09/17/92	450.86	41.23
01-5058	1774859.02	484380.43	7222.65	08/19/92	329.00	52.70
01-5059	1774866.34	484386.66	7223.86	08/19/92	5.13	18.80
01-5060	1774873.90	484398.99	7225.13	08/19/92	16.00	19.30
01-5061	1774879.16	484407.41	7223.33	08/18/92	4.79	14.40
01-5062	1774875.64	484418.57	7217.19	08/19/92	1.69	15.48
01-5063	1774877.07	484427.93	7214.44	08/19/92	2.73	17.50
01-5064	1774881.22	484438.90	7213.92	08/19/92	3.07	18.90
01-5065	1774832.24	484366.93	7212.80	08/18/92	4.61	15.50
01-5066	1774833.87	484376.80	7211.91	08/19/92	5.13	17.00
01-5067	1774834.14	484385.80	7209.95	08/19/92	11.50	19.60
01-5068	1774832.93	484395.54	7208.11	08/19/92	14.60	20.00
01-5069	1774837.40	484403.74	7207.53	08/19/92	4.10	27.60
01-5070	1774843.27	484412.45	7206.22	08/19/92	4.10	15.10
01-5071	1774846.48	484421.11	7204.85	08/19/92	5.82	18.73
01-5072	1774851.27	484429.99	7203.64	08/19/92	2.38	17.56
01-5073	1774855.91	484438.18	7202.49	08/19/92	2.73	20.77
01-5074	1774860.17	484448.10	7202.78	08/19/92	3.41	19.54

TABLE 1 (cont.)

**TA-1 PHASE 1 SOIL SAMPLES**

<b>SAMPLNUM</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>MEASDATE</b>	<b>GROSS ALPHA pCi/g</b>	<b>GROSS BETA pCi/g</b>
01-5075	1774478.74	484500.31	6968.78	07/27/92	1.01	12.40
01-5076	1774472.91	484508.28	6968.64	07/27/92	2.73	14.10
01-5077	1774467.63	484516.27	6967.57	07/27/92	3.24	13.60
01-5078	1774461.38	484524.93	6968.21	07/27/92	1.69	13.00
01-5079	1774455.85	484533.31	6967.68	07/27/92	2.04	12.30
01-5080	1774868.99	484365.68	7230.02	08/27/92	626.80	79.70
01-5081	1774863.44	484366.44	7228.05	08/27/92	644.30	43.30
01-5082	1774855.09	484377.82	7221.71	08/27/92	872.80	88.50
01-5083	1774882.18	484354.94	7240.16	08/27/92	258.40	29.50
01-5084	1774887.00	484356.06	7242.08	08/27/92	180.00	3.40
01-5085	1774882.70	484360.79	7238.45	08/27/92	724.00	75.50
01-5086	1774874.83	484370.37	7231.34	08/27/92	352.30	39.90
01-5087	1774848.60	484381.48	7217.11	08/27/92	242.20	36.50
01-5088	1774450.82	484503.99	6965.70	07/27/92	2.38	12.22
01-5089	1774444.40	484511.99	6965.87	07/27/92	2.38	14.66
01-5090	1774438.45	484520.17	6965.49	07/27/92	2.04	9.58
01-5091	1774432.24	484528.76	6965.22	07/27/92	1.87	15.20
01-5092	1774449.96	484541.58	6967.47	07/27/92	1.35	12.70
01-5093	1774469.02	484495.10	6968.12	07/27/92	2.38	13.30
01-5094	1774463.54	484502.51	6967.70	07/27/92	2.21	12.30
01-5095	1774458.29	484511.00	6966.48	07/27/92	1.87	14.30
01-5096	1774452.73	484519.66	6967.34	07/27/92	2.38	13.50
01-5097	1774446.99	484527.87	6967.09	07/27/92	1.01	11.93
01-5098	1774441.58	484535.78	6966.71	07/27/92	3.24	12.90
01-5099	1774456.59	484497.45	6966.04	07/27/92	1.52	11.91
01-5100	1774847.34	484501.11	7196.04	09/23/92	3.59	11.58
01-5101	1774833.33	484513.99	7190.07	09/23/92	1.18	11.70
01-5102	1774820.42	484545.07	7185.63	09/23/92	1.52	9.36
01-5103	1774775.44	484545.54	7169.09	09/23/92	2.90	13.60
01-5104	1774770.14	484518.05	7162.70	09/23/92	1.52	12.33
01-5105	1774737.46	484521.78	7107.70	09/23/92	2.04	13.95
01-5106	1774737.55	484556.25	7112.10	09/23/92	3.59	13.10
01-5107	1774698.24	484517.63	7082.71	09/23/92	5.82	14.36
01-5108	1774711.49	484563.95	7094.19	09/23/92	2.73	15.41
01-5109	1774682.38	484549.18	7072.43	09/23/92	2.90	16.58
01-5110	1774661.50	484529.04	7058.18	09/23/92	10.11	12.35

TABLE 1 (cont.)

**TA-1 PHASE 1 SOIL SAMPLES**

<b>SAMPLNUM</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>MEASDATE</b>	<b>GROSS ALPHA pCi/g</b>	<b>GROSS BETA pCi/g</b>
01-5111	1774631.08	484535.95	7041.95	09/23/92	4.96	14.92
01-5112	1774587.30	484536.59	7018.54	09/23/92	2.90	16.13
01-5113	1774578.46	484552.47	7011.40	09/23/92	1.69	12.71
01-5114	1774542.13	484550.30	6993.59	09/23/92	3.59	14.74
01-5115	1774511.90	484540.79	6976.07	09/23/92	2.90	13.16
01-5120-6	1774857.56	484461.59	7201.28	09/24/92	3.59	17.66
01-5120-T	1774857.56	484461.59	7201.28	09/28/92	6.33	17.19
01-5121-6	1774852.22	484460.83	7200.51	09/28/92	5.13	13.62
01-5121-T	1774852.22	484460.83	7200.51	09/28/92	5.30	14.83
01-5122-6	1774847.33	484459.67	7200.59	09/28/92	4.79	13.56
01-5122-T	1774847.33	484459.67	7200.59	09/24/92	2.55	17.36
01-5123-6	1774842.67	484457.74	7200.68	09/24/92	9.77	15.71
01-5123-T	1774842.67	484457.74	7200.68	09/28/92	9.26	17.06
01-5124-6	1774838.29	484455.81	7200.76	09/28/92	6.68	11.40
01-5124-T	1774838.29	484455.81	7200.76	09/28/92	8.05	18.62
01-5125-6	1774833.63	484453.53	7200.96	09/28/92	6.51	14.45
01-5125-T	1774833.63	484453.53	7200.96	09/28/92	5.47	15.21
01-5126-6	1774829.03	484451.75	7200.91	09/28/92	6.33	14.00
01-5126-T	1774829.03	484451.75	7200.91	09/28/92	5.65	12.54
01-5127-6	1774825.81	484449.75	7200.43	09/28/92	8.57	14.31
01-5127-T	1774825.81	484449.75	7200.43	09/24/92	4.79	15.84
01-5127-TR	1774825.81	484449.75	7200.43	09/24/92	5.47	16.46
01-5128-6	1774825.60	484444.99	7201.25	09/24/92	5.47	16.99
01-5128-T	1774825.60	484444.99	7201.25	09/24/92	2.38	17.48
01-5129-6	1774825.16	484440.06	7201.62	09/28/92	7.02	14.28
01-5129-T	1774825.16	484440.06	7201.62	09/28/92	5.13	15.48
01-5129-TR	1774825.16	484440.06	7201.62	09/28/92	7.54	15.14
01-5130-6	1774824.89	484433.50	7202.39	09/28/92	6.68	17.37
01-5130-6	1774824.89	484433.50	7202.39	09/28/92	5.47	18.10
01-5130-T	1774824.89	484433.50	7202.39	09/28/92	7.02	17.63
01-5130-TR	1774824.89	484433.50	7202.39	09/28/92	7.54	15.98
01-6001	1774764.40	484728.87	7204.29	09/15/92	3.07	14.06
01-6002	1774760.28	484748.62	7201.94	09/15/92	2.90	15.71
01-6003	1774759.60	484768.62	7203.67	09/15/92	3.07	14.83
01-6004	1774757.25	484788.23	7206.42	09/15/92	5.13	15.67

TABLE 1 (cont.)

**TA-1 PHASE 1 SOIL SAMPLES**

<b>SAMPLNUM</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>MEASDATE</b>	<b>GROSS ALPHA pCi/g</b>	<b>GROSS BETA pCi/g</b>
01-6005	1774755.20	484808.14	7204.40	07/20/92	4.96	17.40
01-6006	1774752.42	484828.17	7206.17	09/15/92	2.55	12.75
01-6007	1774748.26	484847.56	7206.48	09/15/92	2.55	14.54
01-6008	1774744.69	484867.29	7204.88	09/15/92	1.87	13.23
01-6009	1774741.24	484887.31	7202.14	09/15/92	4.96	18.72
01-6010	1774737.34	484905.54	7203.32	09/15/92	5.13	14.50
01-6011	1774736.99	484926.80	7205.46	09/15/92	5.30	18.14
01-6012	1774781.82	484807.11	7217.56	09/15/92	4.96	16.06
01-6013	1774778.85	484828.37	7215.52	09/15/92	2.38	16.34
01-6014	1774776.43	484847.57	7218.03	07/20/92	3.93	12.40
01-6015	1774774.86	484867.40	7215.79	09/15/92	1.87	12.32
01-6016	1774774.58	484887.54	7217.06	09/15/92	3.59	16.71
01-6017	1774771.03	484907.33	7220.78	09/15/92	4.44	13.75
01-6018	1774801.65	484804.86	7229.00	09/15/92	3.24	16.80
01-6019	1774799.28	484824.76	7227.67	09/15/92	4.10	19.17
01-6020	1774795.03	484843.54	7227.32	09/15/92	2.21	12.23
01-6021	1774793.13	484863.76	7227.14	09/15/92	3.24	13.11
01-6022	1774790.31	484883.44	7227.98	09/15/92	3.24	14.56
01-6023	1774787.55	484903.07	7230.06	07/20/92	3.24	15.80
01-6050	1775814.73	482579.62	7253.95	07/10/92	1.87	16.73
01-6050	1775814.73	482579.62	7253.95	09/09/92	4.10	15.90
01-6051	1775819.36	482672.11	7249.68	07/10/92	3.76	13.78
01-6051	1775819.36	482672.11	7249.68	09/09/92	4.44	15.50
01-6052	1775726.99	482686.99	7259.61	07/10/92	4.27	20.04
01-6052	1775726.99	482686.99	7259.61	09/09/92	3.93	18.30
01-6053	1775633.71	482661.39	7260.09	09/09/92	2.90	13.60
01-6054	1775537.10	482664.73	7271.44	09/09/92	3.41	16.03
01-6055	1775438.54	482654.55	7272.34	09/09/92	3.07	10.61
01-6056	1775366.38	482693.44	7274.16	09/09/92	2.90	11.53
01-6057	1775302.90	482797.84	7279.25	09/09/92	3.59	12.19
01-6058	1775282.98	482892.39	7279.36	09/09/92	2.73	12.78
01-6059	1775267.24	482989.72	7282.27	09/09/92	3.41	15.16
01-6060	1775273.06	483088.83	7282.86	09/09/92	5.13	10.65
01-6061	1775312.49	483178.04	7280.40	09/09/92	4.10	14.72
01-6062	1775364.50	483262.09	7278.47	09/09/92	4.10	14.34
01-6063	1775436.81	483332.68	7279.67	09/09/92	2.90	15.75

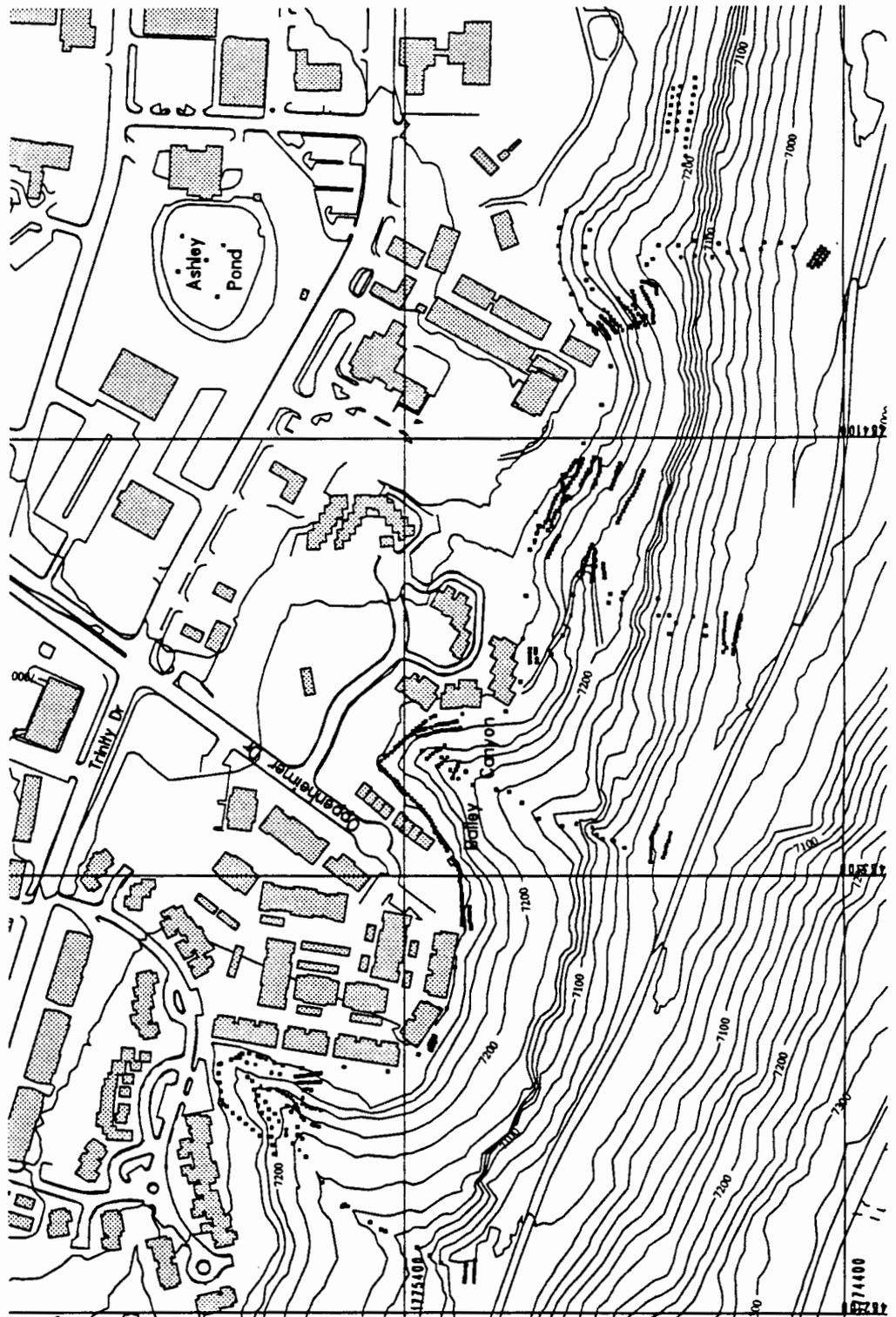
TABLE 1

**TA-1 PHASE 1 SOIL SAMPLES**

<b>SAMPLNUM</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>MEASDATE</b>	<b>GROSS ALPHA</b> pCi/g	<b>GROSS BETA</b> pCi/g
01-6064	1775421.75	483396.85	7271.56	09/09/92	4.44	14.74
01-6065	1775356.86	483452.19	7270.22	09/09/92	3.93	15.11
01-6066	1775266.09	483473.40	7270.41	09/09/92	3.59	14.78
01-6067	1775167.66	483478.35	7269.16	09/09/92	2.55	14.00
01-6068	1775133.81	483546.74	7273.88	09/09/92	3.07	13.80
01-6069	1775128.37	483643.45	7279.06	09/09/92	3.59	15.50
01-6070	1775121.77	483741.25	7286.48	09/09/92	3.59	14.40
01-6071	1775113.85	483846.22	7292.81	09/09/92	2.21	14.10
01-6072	1775098.69	483933.77	7299.87	09/09/92	5.47	14.60
01-6073	1775038.94	484016.47	7301.04	09/09/92	3.07	11.79
01-6074	1774990.59	484088.69	7307.38	09/09/92	3.24	13.49
01-6074R	1774990.59	484088.69	7307.38	09/09/92	4.27	11.37
01-6075	1774950.35	484175.79	7307.20	09/09/92	3.07	13.60
01-6076	1774930.21	484265.15	7305.54	09/09/92	2.90	10.30
01-6077	1774968.39	484347.25	7305.83	09/09/92	2.73	9.89
01-6100	1775917.32	484488.33	7311.95	*		
01-6101	1775814.58	484547.48	7311.11	*		
01-6101R	1775814.58	484547.48	7311.11	*		
01-6102	1775907.61	484569.18	7312.17	*		
01-6103	1775828.00	484429.43	7311.76	*		
01-6104	1775853.04	484514.07	7311.80	*		

(WATER AND SLUDGE SAMPLES  
FROM ASHLEY POND NOT  
MEASURED)

# TA-1 Sampling Grid



**Attachment 3**

**ADS 1106 — TA-21 (Project Leader: Gary Eller)**

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## **1. Summary of Activities**

This Quarterly Technical Progress Report is the fourth addressing the Technical Area 21 (TA-21) Operable Unit (OU) RCRA Facility Investigation (RFI) conducted by the Los Alamos National Laboratory (the Laboratory). The TA-21 OU RFI is conducted according to the plans presented in the TA-21 Operable Unit Work Plan for Environmental Restoration (LANL 1991a) as amended by the Addendum to TA-21 Operable Unit RFI Work Plan for Environmental Restoration (LANL 1991b) and approved by the US Environmental Protection Agency (EPA 1992).

Activities conducted during the fourth quarter of Fiscal Year 1992 (FY92), July through September 1992, are reported herein. The major activities were:

- The last of the surface grid sampling was completed early in the quarter (see Chapter 3).
- Surface and near-surface investigations at outfall locations were completed during the quarter (see Chapter 4). Subsurface investigations were postponed because of NESHAP compliance issues (see Chapter 2).
- Surface and near-surface investigations at two filter building locations were completed during the quarter (see Chapter 5). Subsurface investigations were modified because of NESHAP compliance issues and rescheduled for October 1992 (see Chapter 2).
- Stratigraphic and geomorphic studies of DP Mesa continued throughout the fourth quarter and are nearly complete (see Chapter 6).

Budget projections for FY93 were developed during the quarter and revisions to the RFI schedule are planned to be made early in first quarter FY93 and presented for approval as a work plan modification.

## **2. Administrative and Planning Activities**

### **2.1. Fourth Quarter Activities**

During the fourth quarter of FY92 (July - September 1992), administrative support continued for:

- RFI field work continuing from third quarter, specifically the completion of the outfall investigations and the filter buildings investigations.
- Mobilization for first quarter FY93 field work. No field work was originally planned; however, delays in conducting subsurface sampling at the filter buildings has pushed that effort into October 1992.
- Compilation of field-collected data and data management activities for analytical results from earlier field work.
- Cost estimation and scheduling of activities for FY93.

### **2.2. Delay of Scheduled Activities**

It was noted in the last quarterly report (LANL 1992a) that funding limitations were expected to preclude initiation of some activities scheduled for the fourth quarter. Those activities were not conducted. They are:

- The initial vadose zone investigations described in the work plan at Section 12.5, Subsurface Sampling Plan, and

- Initial investigations at a liquid waste disposal area as described in the work plan at Section 16.7, SWMU 21-018, Material Disposal Area V (MDA V).

In addition, the NESHAP radioactive air emissions compliance issue discussed in the last quarterly report (LANL 1992a) resulted in the delay and postponement of some subsurface investigations scheduled for the fourth quarter. The postponed work was the subsurface investigation at the outfall locations, including shallow hollow-stem auger coring (20 ft nominal depth) and shallow backhoe excavations (10 ft maximum depth) to identify the locations of several septic tanks. At present it is expected that the drilling and excavations will be incorporated in the next near-surface field program (Sequence 3, summer 1994, see Figure 2.1 below).

The delayed work was the subsurface investigation at the locations of two former filter buildings. The planned hollow-stem auger coring was very shallow at the filter buildings (7.5 ft) and can be accomplished manually with soil augers. These shallow investigations are planned to be conducted manually during October 1992.

### **2.3. Activities Planned for First Quarter FY93**

During the first quarter of FY93, budget and schedule revisions will address the future schedule for the TA-21 RFI as part of the DOE five-year budget request process. A revised RFI schedule for FY93 will be matched against the fixed budgets specified for the next two budget years (FY93 and FY94) and against the budget-growth guidelines for the out-years. As soon as this process is complete a TA-21 OU RFI Work Plan modification detailing a revised RFI schedule will be prepared and submitted to EPA.

Technical activities planned for the first quarter include data validation for analytical results from the summer's investigations. Evaluation and interpretation of the data may start late in the first quarter depending on the number of data packages that have been returned.

### **2.4. Progress Against Schedule**

Figures 2.1 and 2.2 illustrate current progress through September 30, 1992 against the schedule for the TA-21 OU RFI. These figures are based on those given in the work plan addendum (LANL 1991b), representing the RFI schedule which EPA approved (EPA 1992).

In Figure 2.1 progress is indicated as incomplete for two field work tasks (Sections 12.4 and 13.2, and Chapter 15), representing the non-completion of the subsurface investigations at the filter buildings and the outfalls. Also shown as incomplete are sample analyses for the same two tasks. The sample analyses are not on schedule in part because of the samples that have not been collected, and also because some of the analyses are not being completed by the laboratories as quickly as planned.

In Figure 2.2 no tasks are shown as complete since the vadose zone investigations were not started in FY92, as discussed above.

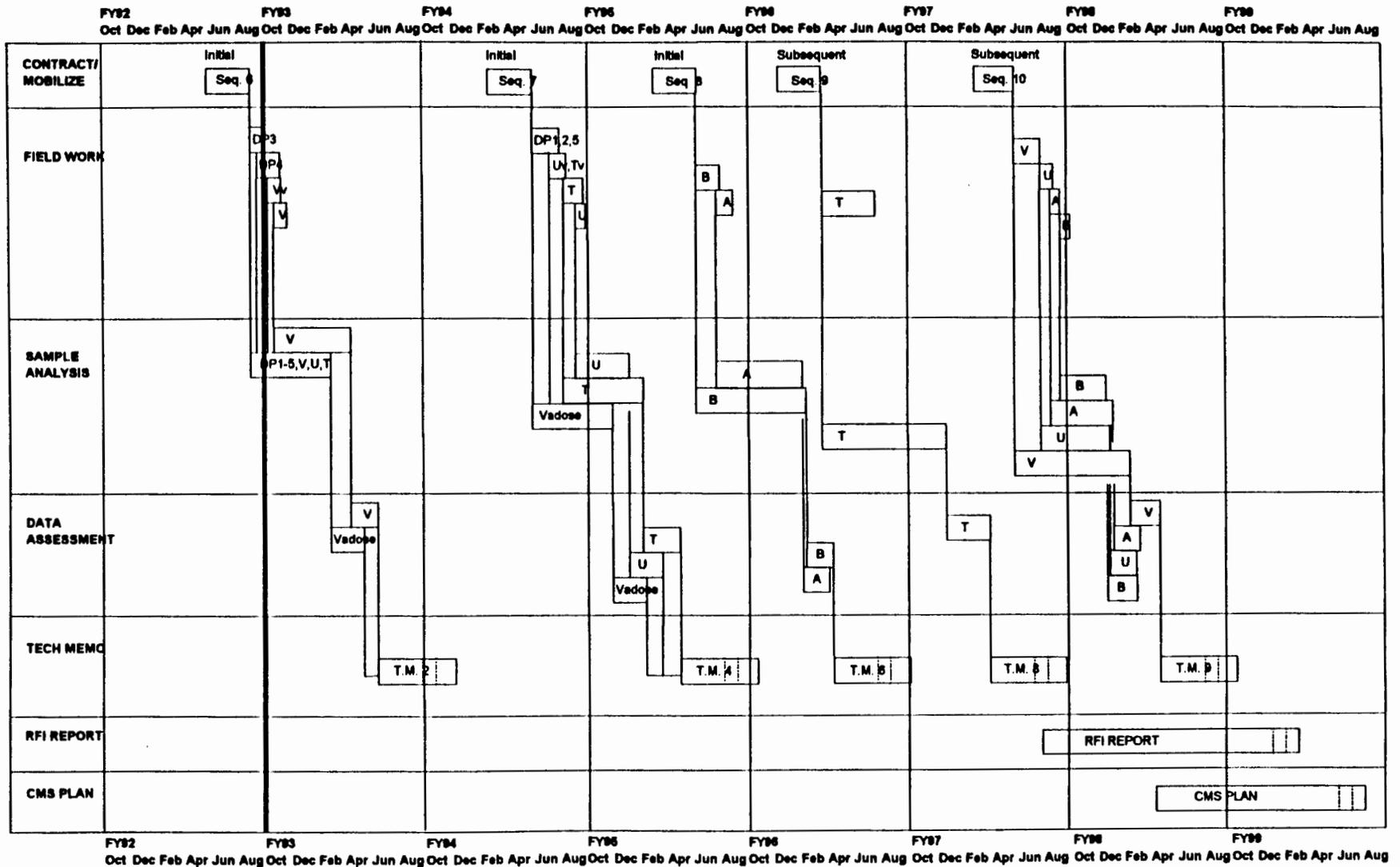
### **2.5. Issues for Discussion with Regulatory Authority**

Several issues have been identified which need to be addressed as part of the proposed work plan modification. A dialog with EPA and NMED about these issues prior to writing the modification would facilitate its preparation. The issues are identified briefly below.

**Analytical Detection Limits:** Based on early results from the surface soils sampled this summer, it appears that considerable cost and time savings can be realized on certain radiological analyses from raising the detection limits which were originally set in the TA-21 Quality Assurance Project Plan (Appendix A of the work plan (LANL 1991a)). The savings can be realized while achieving all of the original objectives of the investigation.



**FIGURE 2.2. TA-21 OU RFI PROGRESS: SUBSURFACE INVESTIGATIONS (9/30/92)**



■ Completed

Note: No progress against any task is indicated since none of the scheduled work was started in FY92.

For certain investigations the original detection limits are still appropriate, but for many investigations higher limits will be technically acceptable. In the work plan modification this will be addressed as an investigation by investigation identification of the detection limits to be used.

**Sampling of DP Spring:** The work plan calls for sampling of DP Spring on a monthly basis for the first year of sampling and quarterly thereafter. The samples are to be analyzed for a full suite of analytes. Recent reviews of this plan have suggested changes to the analyte list and to the frequency of sampling or sample analysis for some analytes. The changes would reduce the annual cost and would provide technical information fully adequate for the originally intended purposes of the investigation.

**D&D Integration:** DOE and the Laboratory are integrating, to the extent possible, activities under the Environmental Restoration (ER) Program (under which this RFI falls) and the Decontamination and Decommissioning (D&D) Program. The result will be cost and time savings to both programs when characterization or remedial efforts can be piggy-backed on the other program's work. To tie into the D&D Program's schedule, some flexibility is needed in modifying the existing schedule for the TA-21 RFI. With limited funding available in a year, any changes made to cooperate with the D&D schedule will take money from other planned RFI activities.

**Report Detail:** To avoid setting unnecessary precedent, and to keep the cost and time for routine reporting reasonable, it is prudent to define the degree of detail required in TA-21 quarterly reports and phase reports for their regulatory purpose. Thus, guidance on the proper level of detail is desired.

**Phase Reports:** The TA-21 OU RFI is scheduled to be reported in topical phase reports/work plan modifications which are scheduled based on the completion of particular units of work. The contents and schedule for the several phase reports (called technical memoranda in the work plan) are given in the work plan addendum (LANL 1991b) (the schedule can be seen in Figures 2.1 and 2.2, above). As originally scheduled in the TA-21 work plan, there are no phase reports in some years and more than one in other years.

If delays are encountered in acquiring the data to be reported in one of the topical reports, it is assumed the report should be delayed until sufficient data are available to allow preparation of a report which can address the intended issues. Alternatively a report can be issued on schedule which will include the data available at the time. In some cases those data may not be sufficient to address the issues the report was intended to address.

**Priorities:** Funding limited the number of investigations which could be pursued in FY92. The series of investigations identified as Sequence 6 in Figure 2.2 was chosen to be delayed. This choice was based on our interpretation of EPA's priorities for the RFI as expressed in the Notice of Deficiency (EPA 1991) and the work plan addendum at Section 2.1, Revised Investigation Priorities (LANL 1991b). If future delays are necessary, it is assumed that these priorities provide guidance for selecting activities to delay.

**Work Plan Modification:** In the writing of the TA-21 work plan it was assumed that work plan modifications would be submitted with each phase report, to adjust RFI plans for the knowledge gained. In practice, it has been found that the need for EPA/NMED concurrence in changes to the work plan will occur more frequently than the phase report/work plan modification schedule will accommodate. A more frequent and streamlined means for presenting proposed work plan modifications to EPA/NMED would be desirable. One mechanism could be separate work plan modification documents prepared case-by-case as needed. This could generate a number of small documents on an unscheduled basis. Another mechanism could be an annual work plan modification document, but this is infrequent enough to be as constraining as the current phase report/work plan modification system.

### 3. Mesa-Wide Surface Grid Sampling

The investigations reported in this chapter are those described in the work plan (LANL 1991a) at Section 12.4, Surface Grid Sampling Plan, and in Chapter 13, Surface Soil Contamination from Airborne Emissions. The work plan sampling grid was found to have been based on erroneous information, as described in the Quarterly Technical Progress Report for the Second Quarter FY92 (LANL 1992b). A replacement sampling plan was presented in that report, and has been implemented.

The first round of surface soil grid sampling was started in March 1992 and completed in April 1992. The second round was started in June 1992 and completed in July 1992. Field-collected data from both sampling rounds were reported in the Quarterly Technical Progress Report for the Third Quarter FY92 (LANL 1992a). Analytical laboratory results for samples from both sampling rounds continued to be delivered during the fourth quarter. Data validation activities for these results will begin during the first quarter of FY93. Table 3.1 summarizes the percentage of data packages returned for the samples submitted.

**Table 3.1. Percentage of Surface Grid Sample Results Returned from Laboratory.**

Analysis Requested	Round 1 Samples			Round 2 Samples		
	Number of Samples Submitted	Number of Sample Results Received	Percentage of Data Received	Number of Samples Submitted	Number of Sample Results Received	Percentage of Data Received
Americium-241	136	20	15%	237	4	2%
Gamma Spectroscopy	244	239	98%	269	56	21%
Plutonium-238	244	41	17%	269	5	2%
Plutonium-239	244	41	17%	269	5	2%
Strontium-90	244	40	16%	269	8	3%
Thorium-228	27	2	7%	20	0	0%
Thorium-230	27	2	7%	20	0	0%
Thorium-232	27	2	7%	20	0	0%
Tritium	244	244	100%	269	255	95%
Uranium-234	27	2	7%	20	0	0%
Uranium-235	27	2	7%	20	0	0%
Uranium-238	27	2	7%	20	0	0%
Uranium (total)	244	244	100%	269	261	97%
Metals (SW-6010) Ag	256	255	100%	282	0	0%
Metals (SW-6010) As	256	254	99%	282	0	0%
Metals (SW-6010) Se	256	154	60%	282	0	0%
Metals (SW-6010) ICPES	256	256	100%	282	191	68%
Semivolatiles (SW-8270)	100	100	100%	80	46	58%

### 4. Outfall Investigations

#### 4.1. Summary of Investigations

The investigations reported in this chapter are those described in the work plan (LANL 1991a) in Chapter 15, Outfalls Description and Sampling Plan (Sections 15.2 through 15.9). This work was conducted in July 1992, approximately as scheduled in the work plan addendum (LANL 1991b) (see schedule in Figure 2.1, above). Table 4.1 summarizes the number of samples planned and the number actually collected, by work plan section and SWMU.

**Table 4.1. Summary of Planned and Actual Numbers of Samples.**

Work Plan Chapter/Section	SWMU No.	Surface and Near- Surface Soil Samples		Borehole Core Samples		QA Samples	
		Planned	Collected	Planned	Collected	Planned	Collected*
15.2 Undetermined Locations	21-023(c)	6	6	4	0		
	21-024(a)	18	18	4	0		
	21-024(g)	12	14	4	0		
	21-024(l)	6	6				
	21-027(c)	6	6				
	21-027(d)	6	6				
	All 15.2					15	
15.3 Outfalls w/ Septic Tanks	21-024(b)	9	9	4	0		
	21-024(c)	4	4	4	0		
	21-024(d)	4	4	4	0		
	21-024(e)	4	4	4	0		
	21-024(i)	6	6	4	0		
	All 15.3						11
15.4 Direct Discharge Outfalls	21-011(k)	5	5				
	21-022(h)	9	8				
	21-024(n)	9	9				
	21-024(o)	6	6				
	21-026(d)	6	6				
	All 15.4						7
15.5 Drainage South of TA-21-3	21-027(a)	14	14	8	0		
	All 15.5						4
15.6 Septic Tanks	21-024(j)			4	0		
	21-024(k)			12	0		
	All 15.6						5
15.7 Drainage South of TA-21-155	21-024(m)	3	3				
	21-027(b)	3	3				
	All 15.7						4
15.8 Drainage North of TA-21-155	21-004(d)	21	18				
	21-024(h)	9	8	4	0		
	All 15.8						7
15.9 Special Cases	21-006(b)	6	6				
	21-024(f)	9	9	8	0		
	All 15.9						7
Totals		181	178	68	0	53	45
Grand Total	Planned:	302					
	Collected:	223					

\* QA samples were not collected on a Chapter/Section basis; only the total number of QA samples is shown in this column.

It should be noted that Section 15.10, NPDES Discharge Systems, was not originally scheduled for the summer of 1992 (see Figure 2.1, above), and thus has not been investigated.

As described in Chapter 2 above, planned drilling and backhoe excavation activities were postponed as a result of NESHAP compliance issues. All other sampling investigations at outfall locations were completed in July 1992; land surveys to document sampling locations continued into August.

#### 4.2. Status of Analytical Sample Results

Analytical laboratory results for samples from the outfall investigations began to be received during the fourth quarter. Data validation activities for these results will begin late in the first quarter of FY93 when a sufficient number of data packages have been received. Table 4.2 summarizes the percentage of data packages returned for the samples submitted.

**Table 4.2 Percentage of Outfall Sample Results Returned from Laboratory**

Analysis Requested	Outfall Samples		
	Number of Samples Submitted	Number of Sample Results Received	Percentage of Data Received
Americium-241	202	0	0%
Gamma Spectroscopy	202	178	88%
Plutonium-238	202	2	1%
Plutonium-239	202	2	1%
Strontium-90	202	2	1%
Thorium-228	98	0	0%
Thorium-230	98	0	0%
Thorium-232	98	0	0%
Tritium	202	176	87%
Uranium (total)	202	183	91%
Metals (SW-6010) Ag	213	0	0%
Metals (SW-6010) As	213	0	0%
Metals (SW-6010) Se	213	0	0%
Metals (SW-6010) ICPES	213	17	8%
Semivolatiles (SW-8270)	215	117	54%
Volatiles (SW 8240)	211	96	45%

**4.3. Field-Collected Data**

Certain field-collected data were specified in the analytical tables for the outfall investigations. In the work plan (LANL 1991a) the analytical specifications are given in Tables 15.2-II, 15.3-II, 15.4-III, 15.5-III, 15.6-I, 15.7-I, 15.8-II and 15.9-II.

Work plan specified field-collected data are summarized below:

- Field surveys: gross gamma radioactivity and low-energy gamma radioactivity. (Field surveys are measurements made at sampling locations. In areas where contaminants are present, field surveys can contribute to site knowledge in lieu of sample collection and analysis.)
- Field screening: gross gamma radioactivity, gross alpha radioactivity, and volatile organic compounds. (Field screening measurements are made on samples at the point of sample collection to identify gross contamination of significance to worker health or safety.)
- Field laboratory measurements: none specified. (Field laboratory measurements are made under controlled conditions in a field laboratory to provide near real-time guidance to the conduct of field operations, or to aid in the selection of samples to be submitted for laboratory analysis.)

In implementing these sampling plans several changes were made to the specified field-collected data. These are summarized below:

- Field surveys: to address the capabilities of other radiation survey techniques, some additional measurements were made.
- Field laboratory measurements: None were specified for technical purposes for these investigations. However, Laboratory procedures for the transportation of potentially radioactive samples require certain radioactivity measurements to ensure compliance with DOT transportation regulations. Thus, three field laboratory measurements were made on all samples: gross alpha, gross beta, and gross gamma.

#### 4.4. Presentation of Field-Collected data

The presentation of data given here is based on a rapid review and compilation of the field data logs. This information is presented to document progress to date. These data and their assessment are subject to revision after later review. The summary below should be considered a "raw data" report.

##### 4.4.1. Field Survey Data

For comparison to the values in the tables, background measurements on natural soils were made with each of the instruments. The mean and standard deviation of the background measurements are given in Table 4.3.

Field survey data for environmental radioactivity measurements are summarized in Table 4.4 under the heading "Field Surveys."

##### 4.4.2. Field Screening Data

Field screening of samples in this investigation identified several samples as contaminated: AAA0770 at location 21-1395, AAA0774 at location 21-1397 (both at SWMU 21-024(i), see other data under 15.3, Outfalls w/ Septic Tanks, in Table 4.3), AAA0833 at location 21-1416, and AAA0906 at location 21-1417 (both at SWMU 21-011(k), see other data under 15.4, Direct Discharge Outfalls, in Table 4.4). Since these data are primarily qualitative, no specific data presentation is given.

##### 4.4.3. Field Laboratory Data

Although most of the data reported by the field laboratory are less than detection limits, these data are quantitative and are reported as documentation of the low levels encountered. These results are given in Table 4.4 under the heading "Field Laboratory."

**Table 4.3. Field Survey Radiation Background Measurements on Natural Soils.**

	Gross Alpha	Low-Energy Gamma		Gross Gamma		Beta-Gamma
	Alpha Scintillometer dpm	FIDLER (Pu-238) dpm	FIDLER (Am-241) dpm	Micro R Meter μR/hr	2x2 NaI Detector cpm	Pancake GM dpm
Mean	26.0	729,000	90,000	14.5	16,100	380
Standard Deviations	11.0	68,000	6,000	1.0	1,300	60
Mean + 3 Standard Deviations	59.0	933,000	108,000	17.5	20,000	560

**Table 4.4. Field-Collected Data from Outfall Investigations**

Work Plan Chapter/Section	SWMU Number	Location Identification	Sample Number	Sample Depth	Field Laboratory			Field Surveys						
					Gross Alpha pCi/g	Gross Beta pCi/g	Gross Gamma pCi/g	Gross Alpha		Low-Energy Gamma		Gross Gamma		Beta-Gamma
								Alpha Scintillometer dpm	FIDLER (Pu-238) dpm	FIDLER (Am-241) dpm	Micro R $\mu$ R/hr	2x2 NaI Surface cpm	Pancake GM dpm	
15 2 Undetermined Locations														
21-023(c)	21-1302	Radiological survey of area					Typ.*	26	Min. †	680,000			Min:	15,000
								Max. ‡	880,000				Max:	20,500
		21-1335	AAA0622	4"	137	<MDA**	<MDA							
		21-1336	AAA0623	6"	104	<MDA	<MDA							
		21-1337	AAA0624	6"	<MDA	<MDA	<MDA							
		21-1338	AAA0625	6"	408	<MDA	<MDA							
		21-1339	AAA0628	3"	<MDA	<MDA	<MDA							
	21-1340	AAA0629	6"	<MDA	<MDA	<MDA								
21-024(a)	21-1315	Radiological survey of area					Typ:	14	Min:	720,000			Min:	16,000
								Max:	800,000				Max:	21,000
			AAA0932	6"	<MDA	<MDA	<MDA							
			AAA0936	12-18"	<MDA	<MDA	<MDA							
			AAA0939	6-12"	<MDA	<MDA	<MDA							
			AAA0933	12-18"	<MDA	<MDA	<MDA							
			AAA0937	6"	<MDA	<MDA	<MDA							
			AAA0938	6-12"	<MDA	<MDA	<MDA							
			AAA0940	6"	<MDA	<MDA	<MDA							
			AAA0941	6-12"	<MDA	<MDA	<MDA							
			AAA0942	12-18"	<MDA	<MDA	<MDA							
			AAA0943	6"	<MDA	<MDA	<MDA							
			AAA0944	6-12"	<MDA	<MDA	<MDA							
			AAA0945	12-18"	<MDA	<MDA	<MDA							
			AAA0946	6"	<MDA	<MDA	<MDA							
	AAA0947	6-12"	<MDA	<MDA	<MDA									
	AAA0948	12-18"	<MDA	<MDA	<MDA									
	AAA0925	6"	<MDA	<MDA	<MDA									
	AAA0929	12-18"	<MDA	<MDA	<MDA									

**Table 4.4. Field-Collected Data from Outfall Investigations (continued)**

Work Plan Chapter/Section	SWMU Number	Location Identification	Sample Number	Sample Depth	Field Laboratory			Field Surveys							
					Gross Alpha pCi/g	Gross Beta pCi/g	Gross Gamma pCi/g	Gross Alpha		Low-Energy Gamma		Gross Gamma		Beta-Gamma	
								Alpha Scintillometer dpm		FIDLER (Pu-238) dpm	FIDLER (Am-241) dpm	Micro R $\mu$ R/hr	2x2 NaI Surface cpm	Pancake GM dpm	
			AAA0949 AAA0950	6" 6" dup	<MDA <MDA	<MDA <MDA	<MDA <MDA								
21-024(g)	21-1325	Radiological survey of area						Typ: 6	Min: 667,000 Max: 704,000			Min: 16,000 Max: 18,000			
			21-1425	AAA0893 AAA0894	6" 6-12"	<MDA <MDA	<MDA <MDA	<MDA 5							
	21-1426	AAA0796 AAA0895	6-12"	<MDA	<MDA	<MDA									
			6"	<MDA	<MDA	<MDA									
	21-1427	AAA0797 AAA0798	6"	<MDA	<MDA	<MDA									
			6-12"	<MDA	<MDA	<MDA									
	21-1428	AAA0349 AAA0350 AAA0799 AAA0800	0-6"	<MDA	<MDA	<MDA									
			6-12"	<MDA	<MDA	<MDA									
			6"	<MDA	<MDA	<MDA									
			6-12"	<MDA	<MDA	<MDA									
	21-1429	AAA0801 AAA1091	6"	<MDA	<MDA	<MDA									
			6-12"	<MDA	<MDA	<MDA									
	21-1430	AAA1092 AAA1093 AAA1094	6"	<MDA	<MDA	<MDA									
			6" dup	<MDA	<MDA	<MDA									
			6-12"	<MDA	<MDA	<MDA									
21-024(l)	21-1328														
	21-1419	AAA0912	6"	<MDA	<MDA	<MDA									
	21-1420	AAA0913	6"	<MDA	<MDA	<MDA									
	21-1421	AAA0889	6"	<MDA	<MDA	<MDA									
	21-1422	AAA0890	6"	<MDA	<MDA	<MDA									
	21-1423	AAA0891	6"	<MDA	<MDA	<MDA									
	21-1424	AAA0892	6"	<MDA	<MDA	<MDA									

**Table 4.4. Field-Collected Data from Outfall Investigations (continued)**

Work Plan Chapter/Section	SWMU Number	Location Identification	Sample Number	Sample Depth	Field Laboratory			Field Surveys						
					Gross Alpha pCi/g	Gross Beta pCi/g	Gross Gamma pCi/g	Gross Alpha		Low-Energy Gamma		Gross Gamma		Beta-Gamma
								Alpha Scintillometer cpm	Typ:	FIDLER (Pu-238) cpm	FIDLER (Am-241) cpm	Micro R µR/hr	2x2 NaI Surface cpm	Pancake GM cpm
21-027(c)	21-1308	Radiological survey of area					Typ: 5	Min: 720,000 Max: 800,000			Min: 16,000 Max: 18,000			
	21-1349	AAA0856	6"	<MDA	<MDA	<MDA								
	21-1350	AAA0857	6"	<MDA	<MDA	<MDA								
	21-1351	AAA0861	6" dup	<MDA	<MDA	<MDA								
		AAA0858	6"	<MDA	<MDA	<MDA								
	21-1352	AAA0862	6"	<MDA	<MDA	<MDA								
	21-1353	AAA0863	6"	<MDA	<MDA	<MDA								
	21-1354	AAA0864	6"	<MDA	<MDA	<MDA								
21-027(d)	21-1303	Radiological survey of area						Min: Max:	213,000 313,000					
	21-1329	AAA0615	6"	<MDA	<MDA	<MDA								
	21-1330	AAA0616	6"	<MDA	<MDA	<MDA								
		AAA0616		<MDA	<MDA	<MDA								
	21-1331	AAA0617	6"	<MDA	<MDA	<MDA								
		AAA0618	6" dup	<MDA	<MDA	<MDA								
	21-1332	AAA0619	6"	<MDA	<MDA	<MDA								
	21-1333	AAA0620	1"	<MDA	<MDA	<MDA								
21-1334	AAA0621	6"	<MDA	<MDA	<MDA									
15 3 Outfalls w/ Septic Tanks														
21-024(b)	21-1311	Radiological survey of area					Typ: 36	Min: 720,000 Max: 920,000			Min: 18,000 Max: 23,000			
	21-1377	AAA0896	6"	<MDA	<MDA	<MDA								
		AAA0897	6-12"	<MDA	<MDA	<MDA								
		AAA0898	12-18"	<MDA	<MDA	<MDA								
	21-1378	AAA0899	6"	<MDA	<MDA	<MDA								

Table 4.4. Field-Collected Data from Outfall Investigations (continued)

Work Plan Chapter/Section	SWMU Number	Location Identification	Sample Number	Sample Depth	Field Laboratory			Field Surveys							
					Gross Alpha pCi/g	Gross Beta pCi/g	Gross Gamma pCi/g	Gross Alpha		Low-Energy Gamma		Gross Gamma		Beta-Gamma	
								Alpha Scintillometer dpm	FIDLER (Pu-238) dpm	FIDLER (Am-241) dpm	Micro R µR/hr	2x2 NaI Surface cpm	Pancake GM dpm		
			AAA0900	6-12"	<MDA	<MDA	<MDA								
			AAA0901	12-18"	<MDA	<MDA	<MDA								
			AAA0902	6-12" dup	<MDA	<MDA	<MDA								
	21-1379		AAA0903	6"	<MDA	<MDA	<MDA								
			AAA0904	6-12"	120	<MDA	<MDA								
			AAA0905	12-18"	<MDA	<MDA	<MDA								
21-024(c)	21-1316	Radiological survey of area						Typ: 3	Min: 720,000 Max: 920,000			Min: 16,000 Max: 21,000			
	21-1391	AAA0753	6"	<MDA	<MDA	<MDA									
		AAA0756	6-12"	<MDA	<MDA	<MDA									
	21-1392	AAA0757	6"	<MDA	<MDA	<MDA									
		AAA0758	6" dup	<MDA	<MDA	<MDA									
		AAA0759	6-12"	<MDA	<MDA	<MDA									
21-024(d)	21-1307	Radiological survey of area						Typ: 26 Typ: 50	Min: 720,000 Max: 889,000			Min: 16,900 Max: 21,500			
	21-1347	AAA0852	6"	<MDA	<MDA	<MDA									
	21-1348	AAA0853	6"	<MDA	<MDA	<MDA									
		AAA0854	6-12"	<MDA	<MDA	<MDA									
		AAA0855	12-18"	<MDA	<MDA	<MDA									
21-024(e)	21-1304	Radiological survey of area							Typ: 800,000			Min: 17,900 Max: 21,000			
	21-1341	AAA0630	6"	<MDA	<MDA	<MDA									
		AAA0631	6" dup	<MDA	<MDA	<MDA									
		AAA0632	6-11"	<MDA	<MDA	<MDA									
	21-1342	AAA0633	4"	<MDA	<MDA	<MDA									
21-024(i)	21-1319	Radiological survey of area						HS1 § 745	2,400,000	312,500	35	28,000	1,100		
							HS3 538	1,112,000	181,250		26,000	600			
							HS5 823	2,000,000	312,500		39,000	700			

**Table 4.4. Field-Collected Data from Outfall Investigations (continued)**

Work Plan Chapter/Section	SWMU Number	Location Identification	Sample Number	Sample Depth	Field Laboratory			Field Surveys						
					Gross Alpha	Gross Beta	Gross Gamma	Gross Alpha		Low-Energy Gamma		Gross Gamma		Beta-Gamma
					pCi/g	pCi/g	pCi/g	Alpha Scintillometer dpm	FIDLER (Pu-238) dpm	FIDLER (Am-241) dpm	Micro R µR/hr	2x2 NaI Surface cpm	Pancake GM dpm	
		21-1395	AAA0770 AAA0771	6" 6-12"	332 73	68 <MDA	5 <MDA	HS2 3,155	4,000,000	656,250		68,000	4,200	
		21-1396	AAA0772 AAA0773	6" 6-12"	79 96	<MDA <MDA	<MDA <MDA	HS4 2,494	2,800,000	375,000		58,000	1,900	
		21-1397	AAA0774 AAA0775	6" 6-12"	214 180	44 <MDA	<MDA <MDA	HS8 1,828	3,200,000	500,000		58,000	900	
15 4 Direct Discharge Outfalls														
	21-011(k)	21-1324	Radiological survey of area					N S HS1 37 HS3 44	> 18,519,000 3,704,000 > 18,519,000	>3125000 >3125000 >3125000	400 800 80 260	> 999,000 103,000 750,000	900 8,300	
		21-1416	AAA0833	5"	2,304	2,808	1,314	HS2 1,130	> 18,519,000		210	650,000	19,200	
		21-1417	AAA0906 AAA0907	6" 6-12"	465 149	2,397 797	1,461 415	HS4 67	> 18,519,000		360	930,000	145,700	
		21-1418	AAA0908 AAA0909	6" 6-12"	<MDA <MDA	409 604	369 205	HS5 28	> 18,519,000		340	> 999,000	4,200	
	21-022(h)	21-1313	Radiological survey of area					Typ: 22 Typ: 24	Min: 760,000 Max: 880,000			Min: 17,000 Max: 23,000		
		21-1380	AAA0915 AAA0916 AAA0917 AAA0918	6" 6" dup 6-12" 12-18"	<MDA <MDA <MDA <MDA	<MDA <MDA <MDA <MDA	<MDA <MDA <MDA <MDA							
		21-1381	AAA0919 AAA0920 AAA0921	6" 6-12" 12-18"	<MDA <MDA <MDA	<MDA <MDA <MDA	<MDA <MDA <MDA							
		21-1382	AAA0922	6"	<MDA	<MDA	<MDA							

**Table 4.4. Field-Collected Data from Outfall Investigations (continued)**

Work Plan Chapter/Section	SWMU Number	Location Identification	Sample Number	Sample Depth	Field Laboratory			Field Surveys								
					Gross Alpha pCi/g	Gross Beta pCi/g	Gross Gamma pCi/g	Gross Alpha		Low-Energy Gamma		Gross Gamma		Beta-Gamma		
								Alpha Scintillometer dpm	Typ:	FIDLER (Pu-238) dpm	FIDLER (Am-241) dpm	Micro R µR/hr	2x2 NaI Surface cpm	Pancake GM dpm		
			AAA0923	6-12"	<MDA	<MDA	<MDA									
21-024(n)	21-1321	Radiological survey of area						Typ: 20	Min: 520,000			Min: 12,800				
									Max: 680,000			Max: 18,000				
	21-1402	AAA0785	6"	<MDA	<MDA	<MDA										
				AAA0788	6-12"	<MDA	<MDA	<MDA								
				AAA0789	12-18"	<MDA	<MDA	<MDA								
	21-1403	AAA0790	6"	<MDA	<MDA	<MDA										
				AAA0791	6-12"	<MDA	<MDA	<MDA								
				AAA0792	12-18"	<MDA	<MDA	<MDA								
	21-1404	AAA0793	6"	<MDA	<MDA	<MDA										
				AAA0794	6-12"	<MDA	<MDA	<MDA								
				AAA0795	12-18"	<MDA	<MDA	<MDA								
21-024(o)	21-1305	Radiological survey of area						Typ: 17	Min: 680,000			Min: 15,900				
								Typ: 64	Max: 720,000			Max: 17,000				
	21-1343	AAA0837	6"	<MDA	<MDA	<MDA										
				AAA0838	6" dup	<MDA	<MDA	<MDA								
				AAA0839	6-12"	<MDA	<MDA	<MDA								
				AAA0840	12-18"	<MDA	<MDA	<MDA								
	21-1344	AAA0841	6"	<MDA	<MDA	<MDA										
				AAA0842	6-12"	<MDA	<MDA	<MDA								
				AAA0843	12-18"	<MDA	<MDA	<MDA								
	21-026(d)	21-1320	Radiological survey of area						Typ: 31	Min: 640,000			Min: 15,000			
									Max: 880,000			Max: 21,000				
21-1398		AAA0776	6"	<MDA	<MDA	<MDA										
21-1399		AAA0779	6"	<MDA	<MDA	<MDA										
21-1400		AAA0780	6"	<MDA	<MDA	<MDA										
21-1401		AAA0781	6"	<MDA	<MDA	<MDA										
	AAA0782			6-12"	<MDA	<MDA	<MDA									

**Table 4.4. Field-Collected Data from Outfall Investigations (continued)**

Work Plan Chapter/Section	SWMU Number	Location Identification	Sample Number	Sample Depth	Field Laboratory			Field Surveys					
					Gross Alpha	Gross Beta	Gross Gamma	Gross Alpha	Low-Energy Gamma		Gross Gamma		Beta-Gamma
					pCi/g	pCi/g	pCi/g	Alpha Scintillometer dpm	FIDLER (Pu-238) dpm	FIDLER (Am-241) dpm	Micro R µR/hr	2x2 NaI Surface cpm	Pancake GM dpm
			AAA0783	12-18"	<MDA	<MDA	<MDA						
15.5 Drainage South of TA-21-3													
	21-027(e)												
		21-1361	AAA0872	6"	<MDA	<MDA	<MDA						
		21-1362	AAA0873	6"	<MDA	<MDA	<MDA						
		21-1363	AAA0874	6"	<MDA	<MDA	<MDA						
		21-1364	AAA0875	6"	<MDA	<MDA	<MDA						
		21-1365	AAA0876	6"	87	<MDA	<MDA						
		21-1366	AAA0877	6"	<MDA	<MDA	<MDA						
		21-1367	AAA0878	6"	<MDA	<MDA	<MDA						
		21-1368	AAA0879	6"	<MDA	<MDA	<MDA						
		21-1369	AAA0880	6"	<MDA	<MDA	<MDA						
		21-1370	AAA0881	6"	122	<MDA	<MDA						
		21-1371	AAA0882	6"	<MDA	<MDA	<MDA						
		21-1372	AAA0883	6"	<MDA	<MDA	<MDA						
		21-1373	AAA0884	6"	<MDA	<MDA	<MDA						
		21-1374	AAA0885	6"	<MDA	<MDA	<MDA						
15.7 Drainage South of TA-21-155													
	21-024(m) and	21-1317	Radiological survey of area					Typ: 9	Min: 760,000			Min: 18,000	
									Max: 920,000			Max: 26,000	
	21-027(b)	21-1318	Radiological survey of area					Typ: 39	Min: 720,000			Min: 16,000	
									Max: 800,000			Max: 18,000	
		21-1393	AAA0760	6"	<MDA	<MDA	<MDA						
			AAA0761	6-12"	<MDA	<MDA	<MDA						
			AAA0762	12-18"	<MDA	<MDA	<MDA						

**Table 4.4. Field-Collected Data from Outfall Investigations (continued)**

Work Plan Chapter/Section	SWMU Number	Location Identification	Sample Number	Sample Depth	Field Laboratory			Field Surveys						
					Gross Alpha	Gross Beta	Gross Gamma	Gross Alpha	Low-Energy Gamma		Gross Gamma		Beta-Gamma	
					pCi/g	pCi/g	pCi/g	Alpha Scintillometer dpm	FIDLER (Pu-238) dpm	FIDLER (Am-241) dpm	Micro R µR/hr	2x2 NaI Surface cpm	Pancake GM dpm	
		21-1394	AAA0763 AAA0764 AAA0765 AAA0766	6" 6" dup 6-12" 12-18"	<MDA <MDA <MDA <MDA	<MDA <MDA <MDA <MDA	<MDA <MDA <MDA <MDA							
15 8 Drainage North of TA-21-155														
	21-004(d)	21-1322	Radiological survey of area					Typ: 11	Min: 520,000 Max: 680,000			Min: 14,500 Max: 18,500		
		21-1407	AAA0802 AAA0803 AAA0804	6" 6-12" 12-18"	<MDA <MDA <MDA	<MDA <MDA <MDA	<MDA <MDA <MDA							
		21-1408	AAA0805 AAA0806 AAA0807 AAA0808	6" 6" dup 6-12" 12-18"	<MDA <MDA <MDA <MDA	<MDA <MDA <MDA <MDA	<MDA <MDA <MDA <MDA							
		21-1409	AAA0809 AAA0810 AAA0811	6" 6-12" 12-18"	<MDA <MDA <MDA	<MDA <MDA <MDA	<MDA <MDA <MDA							
		21-1410	AAA0812 AAA0813 AAA0814	6" 6-12" 12-18"	<MDA <MDA <MDA	<MDA <MDA <MDA	<MDA <MDA <MDA							
		21-1411	AAA0815 AAA0816 AAA0817	6" 6-12" 12-18"	<MDA <MDA <MDA	<MDA <MDA <MDA	<MDA <MDA <MDA							
		21-1412	AAA0818 AAA0819 AAA0820	6" 6-12" 12-18"	<MDA <MDA <MDA	<MDA <MDA <MDA	<MDA <MDA <MDA							

**Table 4.4. Field-Collected Data from Outfall Investigations (continued)**

Work Plan Chapter/Section	SWMU Number	Location Identification	Sample Number	Sample Depth	Field Laboratory			Field Surveys						
					Gross Alpha pCi/g	Gross Beta pCi/g	Gross Gamma pCi/g	Gross Alpha		Low-Energy Gamma		Gross Gamma		Beta-Gamma
								Alpha Scintillometer dpm	FIDLER (Pu-238) dpm	FIDLER (Am-241) dpm	Micro R $\mu$ R/hr	2x2 NaI Surface cpm	Pancake GM dpm	
21-024(h)	21-1323	Radiological survey of area					Typ: 5	Min: 680,000			Min: 16,000			
								Max: 760,000			Max: 19,000			
		21-1413	AAA0823	6"	<MDA	<MDA	<MDA							
			AAA0824	6-12"	<MDA	<MDA	<MDA							
			AAA0825	12-18"	<MDA	<MDA	<MDA							
		21-1414	AAA0826	6"	<MDA	<MDA	<MDA							
			AAA0827	6" dup	<MDA	<MDA	<MDA							
			AAA0828	6-12"	<MDA	<MDA	<MDA							
		21-1415	AAA0830	6"	<MDA	<MDA	<MDA							
			AAA0831	6-12"	<MDA	<MDA	<MDA							
			AAA0832	12-18"	<MDA	<MDA	<MDA							
		15.9 Special Cases												
		21-006(b)	21-1309	Radiological survey of area					Typ: 22	Min: 741,000			Min: 21,000	
								Max: 852,000			Max: 23,000			
21-1355	AAA0866			6"	<MDA	<MDA	<MDA							
21-1356	AAA0867			6"	<MDA	<MDA	<MDA							
21-1357	AAA0868			6"	<MDA	<MDA	<MDA							
21-1358	AAA0869			4"	<MDA	<MDA	<MDA							
21-1359	AAA0870			6"	<MDA	<MDA	<MDA							
21-1360	AAA0871	6"	<MDA	<MDA	<MDA									
21-024(f)	21-1326	Radiological survey of area					Typ: 6	Min: 704,000			Min: 17,000			
								Max: 741,000			Max: 19,400			
		21-1431	AAA1095	6"	<MDA	<MDA	<MDA							
			AAA1096	6-12"	<MDA	<MDA	<MDA							
			AAA1097	12-18"	<MDA	<MDA	<MDA							
21-1432	AAA1098	6"	<MDA	<MDA	<MDA									
	AAA1099	6" dup	<MDA	<MDA	<MDA									

**Table 4.4. Field-Collected Data from Outfall Investigations (continued)**

Work Plan Chapter/Section					Field Laboratory			Field Surveys									
					SWMU Number	Location Identification	Sample Number	Sample Depth	Gross Alpha	Gross Beta	Gross Gamma	Gross Alpha	Low-Energy Gamma		Gross Gamma		Beta-Gamma
									pCi/g	pCi/g	pCi/g	Alpha Scintillometer dpm	FIDLER (Pu-238) dpm	FIDLER (Am-241) dpm	Micro R μR/hr	2x2 NaI Surface cpm	Pancake GM dpm
		AAA1100	6-12"	<MDA	<MDA	<MDA											
		AAA1101	12-18"	<MDA	<MDA	<MDA											
	21-1433	AAA1102	6"	<MDA	<MDA	<MDA											
		AAA1103	6-12"	<MDA	<MDA	<MDA											
		AAA1104	12-18"	<MDA	<MDA	<MDA											

\* Typ: Measurement was made at a typical point within the area surveyed.

\*\* <MDA: Analysis result was less than the instrument minimum detectable activity.

† Min: Minimum measurement observed within the area surveyed.

‡ Max: Maximum measurement within the area surveyed.

§ HS1, N, etc: Various identifiers assigned to particular measurement points within area surveyed.

## 5. Filter Building Investigations

### 5.1. Summary of Investigations

The investigations reported in this chapter are those described in the work plan (LANL 1991a) in Chapter 13, Surface Contamination from Airborne Emissions Description and Sampling Plan, in the subsections on filter buildings. This work was conducted in July 1992, about a month late based on the schedule in the work plan addendum (LANL 1991b) (see schedule in Figure 2.1, above). There were two filter buildings: building TA-21-12 served DP-West and was removed in 1973, building TA-21-153 served DP-East and was removed in 1978. The investigations address the areas where the buildings once stood. Table 5.1 summarizes the planned and conducted investigations.

**Table 5.1 Summary of Planned and Actual Numbers of Samples**

Filter Building and SWMU No.	Samples for	Near-Surface Soil Samples		Borehole Core Samples		QA Samples	
		Planned	Collected	Planned	Collected	Planned	Collected
TA-21-12, 21-020(a)	Field Analysis	48	48	10	0		
	Laboratory Analysis	14	15	5	0		
						16	
TA-21-153, 21-020(b)	Field Analysis	40	40				
	Laboratory Analysis	12	10				
						11	
<b>Totals</b>		114	113	15	0	27	22
<b>Grand Total</b>	<b>Planned:</b>	156					
	<b>Collected:</b>		135				

As described in Chapter 2 above, planned drilling activities could not be accomplished as scheduled as a result of NESHAP compliance issues. The shallow drilling planned can be replaced by manual soil augering, and is planned to be completed in October 1992.

### 5.2. Status of Analytical Sample Results

Analytical laboratory results for samples from the filter building investigations began to be received during the fourth quarter. Data validation activities for these results will begin late in the first quarter of FY93 when a sufficient number of data packages have been received. Table 5.2 summarizes the percentage of data packages returned for the samples submitted.

**Table 5.2 Percentage of Filter Building Sample Results Returned from Laboratory**

Analysis Requested	Filter Building Samples		
	Number of Samples Submitted	Number of Sample Results Received	Percentage of Data Received
Americium-241	17	0	0%
Gamma Spectroscopy	35	35	100%
Plutonium-238	35	0	0%
Plutonium-239	35	0	0%
Strontium-90	35	0	0%
Thorium-228	1	0	0%
Thorium-230	1	0	0%
Thorium-232	1	0	0%
Tritium	35	27	77%
Uranium-234	1	0	0%
Uranium-235	1	0	0%
Uranium-238	1	0	0%
Uranium (total)	35	33	94%
Metals (SW-6010) Ag	42	0	0%
Metals (SW-6010) As	42	0	0%
Metals (SW-6010) Se	42	0	0%
Metals (SW-6010) ICPEs	42	0	0%
Semivolatiles (SW-8270)	42	26	62%
Volatiles (SW 8240)	47	14	30%

### 5.3. Field-Collected Data

Certain field-collected data were specified in the analytical tables for the filter building investigations. In the work plan (LANL 1991a) the analytical specifications are given in Table 13.2-VII, Screening and Analysis for Initial Investigations at SWMU 21-020(a) and (b), Filter Buildings.

Work plan specified field-collected data are summarized below:

- Field surveys: none specified. (Field surveys are measurements made at sampling locations. In areas where contaminants are present, field surveys can contribute to site knowledge in lieu of sample collection and analysis.)
- Field screening: gross gamma radioactivity, gross alpha radioactivity, and volatile organic compounds. (Field screening measurements are made on samples at the point of sample collection to identify gross contamination of significance to worker health or safety.)
- Field laboratory measurements: gross alpha radioactivity, gamma spectroscopy, tritium, volatile organic compounds. (Field laboratory measurements are made under controlled conditions in a field laboratory to provide real-time guidance to the conduct of field operations, or to aid in the selection of samples to be submitted for laboratory analysis.)

In implementing these sampling plans a change was made to the specified field-collected data:

- Field laboratory measurements: Laboratory procedures for the transportation of potentially radioactive samples require certain radioactivity measurements to ensure compliance with DOT transportation regulations. Thus, two additional field laboratory measurements were made on all samples: gross beta and gross gamma.

#### **5.4. Presentation of Field-Collected data**

The presentation of data given here is based on a rapid review and compilation of the field data logs. This information is presented to document progress to date. These data and their assessment are subject to revision after later review. The summary below should be considered a "raw data" report.

##### **5.4.1. Field Screening Data**

Field screening of samples in this investigation identified no samples as grossly contaminated. Since these data are primarily qualitative, and all results were non-detects or background, no specific data presentation is given.

##### **5.4.2. Field Laboratory Data**

Although most of the data reported by the field laboratory are less than detection limits, these data are quantitative and are reported as documentation of the low levels encountered. These results are given in Tables 5.3 and 5.4.

**Table 5.3 Field-Collected Data For Building TA-21-12, SWMU 21-020(a)**

Location Identification	Sample Number	Sample Depth	Field Laboratory						
			Gross Alpha pCi/g	Gross Beta pCi/g	Gross Gamma pCi/g	Gamma Spec. pCi/g	Volatile Organics microg/g	Tritium in Soil Moisture pCi/ml	Soil Moisture weight %
21-1436	AAA1305	12-18"	<MDA	<MDA	<MDA	<MDA	ND		
	AAA1306	18-24"	<MDA	<MDA	<MDA	<MDA	ND		
	AAA1307	24-30"	<MDA	<MDA	<MDA	<MDA	ND		
21-1437	AAA1308	12-18"	<MDA	<MDA	<MDA	<MDA	ND		
	AAA1309	18-24"	<MDA	<MDA	<MDA	<MDA	ND		
	AAA1312	24-30"	<MDA	<MDA	<MDA	<MDA	ND		
21-1438	AAA1313	12-18"	<MDA	<MDA	5.1	<MDA	ND		
	AAA1314	18-24"	<MDA	<MDA	<MDA	<MDA	ND		
	AAA1315	24-30"	<MDA	<MDA	<MDA	<MDA	ND		
21-1439	AAA1317	12-18"	<MDA	<MDA	<MDA	<MDA	ND	0	16.2
	AAA1318	18-24"	<MDA	<MDA	<MDA	<MDA	ND	17	16.1
	AAA1319	24-30"	<MDA	<MDA	<MDA	<MDA	ND	0	16.8
21-1440	AAA1320	12-18"	<MDA	<MDA	<MDA	<MDA	ND	0	10.6
	AAA1321	18-24"	<MDA	<MDA	<MDA	<MDA	ND	0	12.9
	AAA1322	24-30"	<MDA	<MDA	<MDA	<MDA	ND	2	16.2
21-1441	AAA1323	12-18"	<MDA	<MDA	<MDA	<MDA	ND	0	15.0
	AAA1324	18-24"	<MDA	<MDA	<MDA	<MDA	ND		14.0
	AAA1327	24-30"	<MDA	<MDA	<MDA	<MDA	ND		14.5
21-1442	AAA1329	12-18"	<MDA	<MDA	<MDA	<MDA	ND		13.9
	AAA1330	18-24"	<MDA	<MDA	<MDA	<MDA	ND		19.5
	AAA1331	24-30"	<MDA	<MDA	<MDA	<MDA	ND		14.1
21-1443	AAA1332	12-18"	<MDA	<MDA	<MDA	<MDA	ND	0	15.4
	AAA1333	18-24"	<MDA	<MDA	<MDA	<MDA	ND	0	15.7
	AAA1334	24-30"	<MDA	<MDA	<MDA	<MDA	ND	0	16.4
21-1444	AAA1335	12-18"	<MDA	<MDA	<MDA	<MDA	ND	0	8.7
	AAA1336	18-24"	<MDA	<MDA	<MDA	<MDA	ND	18	14.5
	AAA1337	24-30"	<MDA	<MDA	<MDA	<MDA	ND	0	15.6
21-1445	AAA1339	12-18"	<MDA	<MDA	<MDA	<MDA	ND	1	15.4
	AAA1340	18-24"	<MDA	<MDA	<MDA	<MDA	ND	2	14.8
	AAA1343	24-30"	<MDA	<MDA	<MDA	<MDA	ND	12	14.8
21-1446	AAA1344	12-18"	<MDA	<MDA	<MDA	<MDA	ND	1	15.8
	AAA1345	18-24"	<MDA	<MDA	<MDA	<MDA	ND	4	13.4
	AAA1346	24-30"	<MDA	<MDA	<MDA	<MDA	ND	2	13.3
21-1447	AAA1347	12-18"	<MDA	<MDA	<MDA	<MDA	ND	0	12.3
	AAA1348	18-24"	<MDA	<MDA	<MDA	<MDA	ND	18	12.6
	AAA1349	dup 12-18"	<MDA	<MDA	<MDA	<MDA	ND	2	13.3
	AAA1350	24-30"	<MDA	<MDA	<MDA	<MDA	ND	8	14.6
21-1448	AAA1352	12-18"	<MDA	<MDA	<MDA	<MDA	ND	0	15.7
	AAA1353	18-24"	<MDA	<MDA	<MDA	<MDA	ND	105	13.5
	AAA1354	24-30"	<MDA	<MDA	<MDA	<MDA	ND	0	13.7
21-1449	AAA1355	12-18"	<MDA	<MDA	<MDA	<MDA	ND	0	11.3
	AAA1356	18-24"	<MDA	<MDA	<MDA	<MDA	ND	0	12.2
	AAA1359	24-30"	<MDA	<MDA	<MDA	<MDA	ND	0	15.2
21-1450	AAA1360	12-18"	<MDA	<MDA	<MDA	<MDA	ND	0	13.9
	AAA1361	18-24"	<MDA	<MDA	<MDA	<MDA	ND	29	14.6
	AAA1362	24-30"	<MDA	<MDA	<MDA	<MDA	ND	638	13.2
21-1451	AAA1364	12-18"	<MDA	<MDA	<MDA	<MDA	ND	6	14.5
	AAA1365	18-24"	<MDA	<MDA	<MDA	<MDA	ND	0	12.2
	AAA1366	24-30"	<MDA	<MDA	<MDA	<MDA	ND	0	13.0

Table 5.4 Field-Collected Data For Building TA-21-153, SWMU 21-020(b)

Location Identification	Sample Number	Sample Depth	Field Laboratory						
			Gross Alpha pCi/g	Gross Beta pCi/g	Gross Gamma pCi/g	Gamma Spec. pCi/g	Volatile Organics microg/g	Tritium in Soil Moisture pCi/ml	Soil Moisture weight %
21-1457	AAA1380	6-12"	<MDA	<MDA	<MDA	<MDA	ND	12	14.0
	AAA1381	12-18"	<MDA	<MDA	<MDA	<MDA	ND	18	23.3
	AAA1382	18-24"	<MDA	<MDA	<MDA	<MDA	ND	8	17.2
	AAA1383	24-30"	<MDA	<MDA	<MDA	<MDA	ND	109	17.6
21-1458	AAA1384	6-12"	<MDA	<MDA	<MDA	<MDA	ND	7	10.6
	AAA1385	12-18"	<MDA	<MDA	<MDA	<MDA	ND	10	11.2
	AAA1386	18-24"	<MDA	<MDA	<MDA	<MDA	ND	368	10.2
	AAA1387	24-30"	<MDA	<MDA	<MDA	<MDA	ND	14	10.8
21-1459	AAA1388	6-12"	<MDA	<MDA	<MDA	<MDA	ND	0	10.7
	AAA1389	12-18"	<MDA	<MDA	<MDA	<MDA	ND	9	9.9
	AAA1390	18-24"	<MDA	<MDA	<MDA	<MDA	ND	13	9.6
	AAA1393	24-30"	<MDA	<MDA	<MDA	<MDA	ND	18	9.2
21-1460	AAA1395	6-12"	<MDA	<MDA	<MDA	<MDA	ND	62	12.4
	AAA1396	12-18"	<MDA	<MDA	<MDA	<MDA	ND	4	15.7
	AAA1397	18-24"	<MDA	<MDA	<MDA	<MDA	ND	0	18.7
	AAA1398	24-30"	<MDA	<MDA	<MDA	<MDA	ND	0	19.1
21-1461	AAA1399	6-12"	<MDA	<MDA	<MDA	<MDA	ND	5	16.5
	AAA1400	12-18"	<MDA	<MDA	<MDA	<MDA	ND	0	10.4
	AAA1401	18-24"	<MDA	<MDA	<MDA	<MDA	ND	16	8.7
	AAA1402	18-24"	<MDA	<MDA	<MDA	<MDA	ND	15	8.0
21-1462	AAA1403	6-12"	<MDA	<MDA	<MDA	<MDA	ND	68	13.4
	AAA1404	12-18"	<MDA	<MDA	<MDA	<MDA	ND	12	9.7
	AAA1405	18-24"	<MDA	<MDA	<MDA	<MDA	ND	599	2.4
	AAA1406	24-30"	<MDA	<MDA	<MDA	<MDA	ND	14	9.4
21-1463	AAA1408	6-12"	<MDA	<MDA	<MDA	<MDA	ND	25	6.8
	AAA1409	12-18"	<MDA	<MDA	<MDA	<MDA	ND	40	6.4
	AAA1410	18-24"	<MDA	<MDA	<MDA	<MDA	ND	40	6.4
	AAA1413	24-30"	<MDA	<MDA	<MDA	<MDA	ND	1739	6.4
21-1464	AAA1414	6-12"	<MDA	<MDA	<MDA	<MDA	ND	23	12.2
	AAA1415	12-18"	<MDA	<MDA	<MDA	<MDA	ND	28	14.0
	AAA1416	18-24"	<MDA	<MDA	<MDA	<MDA	ND	23	14.0
	AAA1417	24-30"	<MDA	<MDA	<MDA	<MDA	ND	20	22.9
21-1465	AAA1418	6-12"	<MDA	<MDA	<MDA	<MDA	ND	44	28.5
	AAA1419	12-18"	<MDA	<MDA	<MDA	<MDA	ND	74	17.7
	AAA1420	18-24"	<MDA	<MDA	<MDA	<MDA	ND	80	15.3
	AAA1421	24-30"	<MDA	<MDA	<MDA	<MDA	ND	38	19.5
21-1466	AAA1423	6-12"	<MDA	<MDA	<MDA	<MDA	ND	109	16.5
	AAA1424	12-18"	<MDA	<MDA	<MDA	<MDA	ND	246	18.7
	AAA1425	18-24"	<MDA	<MDA	<MDA	<MDA	ND	243	9.8
	AAA1426	24-30"	<MDA	<MDA	<MDA	<MDA	ND	304	5.5
	AAA1427	dup 24-30"	<MDA	<MDA	<MDA	<MDA			

## **6. 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 (LANL 1991a).

### **6.1. Stratigraphy/Lithology**

Measurements on three stratigraphic sections on the north wall of Los Alamos Canyon were completed. Samples collected from the sections were submitted for analysis by X-ray diffraction to identify mineralogy. These samples will address vertical and lateral variations in the bulk rock mineralogy of the Bandelier tuff at TA-21. Analysis of the samples is expected to be completed during the first quarter of FY93. Field data for lithologic characteristics of the Bandelier tuff were compiled, evaluation will continue into FY93.

### **6.2. Geomorphology**

Work on the geomorphic characterization of TA-21 in the fourth quarter included completion of an approximately 1:5000 scale map of geomorphic features in the operable unit. Detailed mapping of drainages in the vicinity of the MDAs was initiated. The mapping effort identifies drainages, sediment storage areas, areas of active erosion, and landslides.

### **6.3. Faults/Fractures**

Field studies of fractures at TA-21 were completed during the quarter. Over 4000 linear feet of fractures were mapped and described along a lateral traverse at the base of a cliff forming unit in the upper Bandelier tuff on the north wall of Los Alamos Canyon. Compilation was initiated for the collected data for strike, dip, aperture, and descriptions of fracture filling materials. Compilation and evaluation will continue into FY93.

### **6.4. Geologic Mapping**

A bedrock geologic map for TA-21 was completed during the quarter. An office copy has been compiled and will be digitized for entry into the ER Program's Facility for Information Management and Display (FIMAD) during first quarter FY93.

## **7. References**

EPA 1991 Letter from William K. Honker, Chief, RCRA Permits Branch, Region VI, U.S. Environmental Protection Agency, Dallas TX to Mr. Jerry Bellows, Area Manager, Los Alamos Area Office, U.S. Department of Energy, Los Alamos NM. October 30, 1991.

EPA 1992 Letter from Allyn M. Davis, Director, Hazardous Waste Management Division, Region VI, U.S. Environmental Protection Agency, Dallas TX to Mr. Jerry Bellows, Area Manager, Los Alamos Area Office, U.S. Department of Energy, Los Alamos NM. January 9, 1992.

LANL 1991a TA-21 Operable Unit RFI Work Plan for Environmental Restoration, LAUR-91-962, Los Alamos National Laboratory, Los Alamos, NM 87545. May 1991.

LANL 1991b Addendum to TA-21 Operable Unit RFI Work Plan for Environmental Restoration, Los Alamos National Laboratory, Los Alamos NM 87545. December 1991.

LANL 1992a Quarterly Technical Progress Report, TA-21 Operable Unit, RCRA Facility Investigation, Third Quarter FY92, Environmental Restoration Group, Los Alamos National Laboratory, Los Alamos NM 87545. August 15, 1992.

LANL 1992b Quarterly Technical Progress Report, TA-21 Operable Unit, RCRA Facility Investigation, Second Quarter FY92. Environmental Restoration Group, Los Alamos National Laboratory, Los Alamos NM 87545. May 15, 1992.