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

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ENVIRONMENT
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OFFICE OF THE SECRETARY

William K. Honker, Chief
RCRA Permits Branch
U. S. Environmental Protection
Agency, Region 6
1445 Ross Ave., Suite 1200
Dallas, TX 75202-2733

Dear Mr. Honker:

Enclosed is the response to your Notice of Deficiency for Operable Unit 1086.

If any questions arise, please call me at (505) 665-7203.

Sincerely,

Theodore J. Taylor
Program Manager
Environmental Restoration
Program

LAAMEP:2TT-013

Enclosure

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3900

CERTIFICATION

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Document Title:

Notice of Deficiency (NOD) Response for Operable Unit 1086 Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan

Name: _____ Date: 8/26/94

Dennis Erickson
Division Director
Los Alamos National Laboratory

Name: _____ Date: 8/30/94

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

List of Deficiencies
Los Alamos National Laboratory
Operable Unit 1086

General Comments:

1. **EPA agrees that the following units do not need to be added to the HSWA portion of the RCRA permit:**

   15-005(a), Container Storage Area
   15-005(d), Lead Bricks
   15-008(e), Pile of Dirt at TA-15-194
   15-009(d), Building Drain
   15-013(a), Underground Propane Tank
   15-013(b), Underground Storage Tank
   15-014(c), Sink Drain
   AOC C-15-003, Pile of Black Granular Material
   AOC C-15-002, Pile of Excavated Dirt
   AOC C-15-009, Underground Fuel Tank

   Response: LANL will not add these to the HSWA portion of the RCRA permit.

LANL may apply for a Class 3 permit modification to remove the following units from the HSWA portion of the RCRA permit:

   15-004(e), Firing Point
   15-004(i), The Gulch.

   Response: LANL will prepare a permit modification request to remove these units from HSWA portion of the RCRA permit.

   AOC C-15-008 in Section 3.1.5 (proposed for NFA) was not covered in any of the specific NOD comments, and yet EPA did not specifically agree that the unit did not need to be added to the HSWA portion of the RCRA permit. What does EPA suggest as the disposition of this AOC?

2. **Descriptions of units and figures were lacking the detail necessary for anyone reading this work plan to properly evaluate if the sampling proposed in many instances was adequate. Even though there are numerous firing sites, septic tanks etc. at LANL they are all not alike in size, use etc. and a detailed description should be provided for each unit.**

   Response: See responses to individual comments. New figures have been attached.

Specific Comments:

1. **1.4 Description of the TA-15 Operable Unit and Solid Waste Management Units, p. 1-10 - What portion of the test shots (detonations) were conducted below ground, and where are they located? A figure indicating the location of subsurface shots would be helpful.**

   Response: Language has been clarified. Tests are shown in Appendix A of the work plan and also Figure 6.3-1 on Page 6-6.

Page 1-10, third paragraph, line 7, ~~In most cases,~~ All but two of the tests (15-007(c) and (d) on map of Appendix A of this work plan) were carried out aboveground...

2. **2.3 Environmental Monitoring at TA-15, p. 2-4 - What are the numbers for the two supply wells which were tested?**

   Response: Page 2-4, fourth paragraph of Section 2.3.

   Groundwater from two supply wells, PM-2 and PM-4, located ....

3. **Conceptual Hydrogeologic Model, p. 3-21 -**

a. The conceptual model as presented is confusing. The discussion of the discharge sink in the third paragraph indicates that contamination potentially from OU 1086 has been found in this sink which is located in OU 1130.

LANL needs to expand on this discussion and provide additional information concerning the interaction between the surface infiltration and the subsurface.

How does this sink interact with the alluvial or perched aquifers?

Response: We do not know at this time what is the interaction between surface infiltration and the subsurface. However, it was not appropriate that the sink discharge in Potrillo Canyon be included in the OU 1086 Work Plan. The canyons work plan (OU 1049) will address this in 1995. Therefore, the conceptual hydrogeologic model has been rearranged and is part of Chapter 4.

Page 3-20, Section 3.6 paragraph deleted.
Page 3-21, Section 3.6.1 paragraph 1 moved to page 4-4 as second paragraph.
Page 3-21, Section 3.6.1 paragraphs 2,3,4 deleted.
Page 3-22, Figure 3.6-1 deleted.
Page 3-23, Section 3.6.1 continued, paragraph 1 deleted.
Page 3-23, Section 3.6.1 paragraph 2 moved to page 4-4 as third paragraph.
Page 3-23, Section 3.6.2 deleted.

b. Figure 3.6-1 indicates three wells in or around the discharge sink; however, the figures in OU 1130 do not indicate these wells. Are these actual or proposed wells? If actual wells then sampling information related to the well logs, water level data and analytical data should be provided.

Response: b) See response of 3a above.

4. **Potential Release Sties Recommended for No Further Action, p. 5-3 -**

a. SWMU 15-014(g), Outfall from Cooling Water - There is insufficient information for EPA to make a determination on this SWMU. LANL shall provide information as to whether any hazardous constituents were ever released from this outfall.

Response: a) SWMU 15-014(g). Although no potentially hazardous materials were known to have been introduced in the once-through cooling water discharged at this outfall, a surface and 3 ft depth sample will be taken of the outfall. This SWMU has therefore been moved from Chapter 5 to Chapter 10.

Page 5-2, Table 5.2-1, ~~SWMU 15-014(g) Cooling Water Outfall~~.
Page 5.3, Section 5.3.1.2, Line 5. ~~Since~~ Although no potentially hazardous materials were introduced into this water, this SWMU ~~is recommended for NFA~~. will be sampled at the surface and at 3 ft depth.
Page 5-4, Section 5.3.1.2, move to Page 10-4, Section 10.1.2 as the third paragraph.
Page 10-1, Table 10.0-1, Section 10.1 add SWMU 15-014(g) Outfall.
Page 10-6, Figure 10.1-3. SWMU 15-0014(g) added.
Page 10-9, Table 10.1-1, add SWMU 15-C14(g) to first group of SWMUs and add 1 to surface and 1 subsurface samples respectively.

All changed figures are included at the end of this NOD.

b. SWMU 15-009(a); Septic Tank - What is period of time that this septic tank was used? What are the activities in Building TA-15-50? Why was the septic tank sampled for high explosives? All sampling data used for decisions should be provided in the work plan. LANL shall provide the sampling data discussed. Unless LANL can provide convincing evidence that no hazardous constituents were sent to this septic tank then it and the associated seepage pit need to be sampled. Is the outfall located in Canon de Valle or Water Canyon?

Response: b) SWMU 15-009(a); Septic Tank was constructed in 1949 and is still in use. There is no known discharge of hazardous materials into this septic tank. However, two samples of the sludge of the septic tank will be taken. The outfall of the septic tank ends in a 50 ft deep sump. Three samples from a borehole beside this sump will be taken and sent for analysis. The text has been moved from Chapter 5 to Chapter 10. There is no outfall from the sump at the present time. The original of the data reported in the 1990 DOE SWMU report has not been located.

Page 5-3, Section 5.3.1.4 move to Section 10.1.5.2 as fourth paragraph on Page 10-8.

This septic tank was sampled in 1981 for high explosives (HEs) as is standard practice on technical areas where firing sites are located; and none were detected. Two samples of the sludge will be taken, screened for HE and metals and sent for chemical analysis. The septic tank outflow goes to a 50 ft deep sump. A borehole to 55 ft will be drilled beside this sump. Three samples below the input to the sump will be taken, screened for HE, radioactivity and metals and sent for chemical analysis.

Page 5.2, Tables 5.2-1, ~~SWMU 15-009(a) Septic Tank~~
Page 10-1, Table 10.0-1, Section 10.1 add SWMU 15-009(a) Septic Tank and Sump.
Page 10-6, Figure 10.1-3. SWMU 15-009(a) and sump are added.

TA-15-50 is one of the older TA-15 buildings and is in the Hollow. It has been used for many different purposes associated with the assembly of experiments carried out on the various firing sites. Among the hazardous wastes handled in this building were acid waste (see Section 10.1).

The outfall was located in Cañon de Valle.

Page 5-3 & 4, Section 5.3.1.4, Line 9, ... edge of ~~Water Canyon~~ Cañon de Valle ....

5. Potential Release Sites at R-40, SWMU 15-010(a), p. 5-6 - LANL shall clarify whether or not this unit received hazardous constituents?

Response: SWMU 15-010(a) is not documented to have received hazardous materials. However, this SWMU will be moved from Chapter 5 to Chapter 10 and the location sampled.

Section 5.3.3.2, Page 5-6 moved to Chapter 10.3.3, Page 10-25.

~~This SWMU is recommended for NFA because no HEs or radioactivity was found on the tank when it was disposed of.~~ A borehole at the location of the removed tank will be drilled to a depth of 7 ft. Samples will be taken at 2 ft and at 7 ft, field screened for HEs, radioactivity, and metals. The samples will be submitted for chemical analysis.

Page 10-23, Figure 10.3-1, SWMU 15-010(a) added.

6. Potential Release Sites at PHERMEX -

a. SWMU 15-014(l), p. 5-8 - Did the cooling towers receive heavy metals? Also, did cooling tower TA-15-202 receive any heavy metals?

Response: a) SWMU 15-014(l). For anti-corrosion purposes sodium molybdate is added to the cooling water. It's total concentration is kept below 200 ppm. The cooling tower Ta-15-202 is the sole cooling tower.

b. SWMU 15-014(e), p. 5-8 - LANL shall confirm whether anything is added to the cooling water, and what parameters are analyzed at the permitted outfall.

Response: No additives are added to once-through cooling water. To the end of July 1994, the permit required only pH be measured. The new permit beginning August 1994 requires pH, chlorine, and arsenic routinely, and metals and radiation emitters on a yearly basis.

c. AOC C-15-013, p. 5-9 - LANL shall clarify whether this tank is storing ethylene glycol or ethylene glycol monoethyl ether?

Response: c) AOC C-15-013, Page 5-9. As stated in the text, this tank contained ethylene glycol. Also see Figure D-11 of Appendix D where this tank is called out on the engineering drawings as containing ethylene glycol.

7. Potential Release Sites at R-45 -

a. SWMUs 15-007(c) and 15-007(d), Shafts, p. 5-9 - Were the shafts backfilled before the explosions or after? Are there any hazardous constituents at the site besides high explosives (HE). Also, were there soil samples taken after the test to see if contaminants were absorbed during the explosive shot? Were any lithologic logs recorded during the drilling of these two shafts? LANL shall respond to these questions.

Response: a) The shafts were backfilled before the explosion in order to contain the explosion at the bottom of the shaft. As stated in the text on Page 5-9, Section 5.3.5.1, Paragraphs 3 & 4, beryllium and tritium are part of one of the explosions. There were no soil samples taken after the explosions because the containment practices were based on the experience of work done at The Nevada Test Site. Lithologic logs were not taken because the top 150 ft of Bandelier Tuff is well known.

b. Figure 5.3-4, p. 5-11 - LANL shall explain why lead shot is found at the surface of 15-007(c).

Response: b) Lead shot is not used as part of the backfill. However, bags of lead shot are often used to shield instruments during an explosive test. Apparently a bag was broken and the lead shot accidentally spread around. This lead shot will be gathered and disposed of properly.

c. SWMU 15-014(f), p. 5-12 - Are there any additives to the cooling water?

Response: c) There is no documented or oral evidence that additives were added to this once - through cooling water.

8. Potential Release Site at Ector, SWMU 15-014(m), p. 5-13 - LANL shall confirm whether anything is added to the cooling water.

Response: No additives are added to this non-contact cooling water.

9. Unlocated, p. 5-13 -

a. SWMU 15-004(i) - What attempts were made by LANL to locate this unit? Does LANL know the size of the two tests which were performed?

Response: a) The locations of these two tests were not located on any map, nor did any of the interviews reveal any additional information. The single description is from one memo that states they were carried out about 1 mile below R Site (TA-15). The tests consisted of up to 300 lbs of HE and 500 lbs of ammonium picrate, each being detonated about 10 ft from a canyon wall to observe the damage to the canyon wall.

b. SWMU 15-012(a) - What is the volume of oil LANL believes was used in this unit? LANL should provide the original archival information on this unit. Was this reported in the 1990 DOE report?

Response: We have no documentation on the volume of oil that is in this unit. SWMU 15-012(a) is listed in the 1990 DOE report as not having a CEARP identification and that the location is unknown. The earliest archival information available at LANL is Record 1589 from the Site Database, Task 24, TA-15. This information was used as the basis in the 1990 DOE SWMU report. A location has never been identified. Record 1589 is attached to this document.

10. 6.1 Introduction, p. 6-1 -

a. 2nd paragraph - EPA questions how LANL can make the statement that beryllium is the only potential hazard to workers at TA-15, when LANL has not sampled for other heavy metals such as lead and mercury. Please clarify.

Response: a) Language on Page 6-1 has been changed to show that beryllium is the main potential hazard based on the risk assessment of Appendix F and known quantities of metals used at PHERMEX. Other metals used at PHERMEX are bismuth, copper, cobalt, nickel, tin, and thorium; but at much lower quantities than uranium, beryllium, lead, and mercury. Concentrations of other metals have been recently reported in the references of 10d.

Page 6-1, Section 6.1, second paragraph, line 7, ... beryllium is the main potential hazard ....

b. p. 6-2, 3rd paragraph - Is there any aerosolization of hazardous constituents occurring at these sites?

Response: b) Some aerosolization does occur during the tests themselves. The studies carried out by Dahl & Johnson 1977, 0877 showed that approximately 10% did aerosolize. During a test personnel are not present in the detonation area affected by the aerosolization.

c. What type of surveillance measurements are made to determined the concentrations of beryllium, and what is the frequency of these measurements?

Response: See combined response after (e).

d. Comment on Active Firing Sites at TA-15: LANL should provide in the NOD Response all previous sampling results taken at each active firing site. This includes sampling done within the firing site and at the boundary of the firing site. EPA needs to review the sampling results to see whether deferring the RFI for the firing sites is acceptable.

Also, any proposed sampling to determine whether contaminants are moving past the boundary of each firing site should be approved by EPA, otherwise LANL is taking risk that EPA may determine at a later date that the sampling conducted was inadequate.

Response: See combined response after (e).

e. Page 6-2, Study #1 - LANL should analyze samples for total metals rather than TCLP as was done in the study. Also, the work plan states that the results from this study are to be completed in June of 1993.

Is this date correct? If it is, LANL shall submit the results of this study in the NOD Response.

Response: c),d),e) The PHERMEX area has been extensively sampled twice for uranium, beryllium, and other metals; Buhl 1987 and Fresquez 1993-1994. In addition, testing for beryllium in the air has been implemented in 1994 immediately following each explosion at TA-15 (results are not available at this time).

The unpublished results of T. Buhl from 1987 in which only uranium and beryllium were studied are attached. Also, attached are the most recent environment surveillance results of 1993-1994, memo P. Fresquez. This data is not meant to be used for corrective action and is carried out by the Environmental, Safety, and Health Division; not the Environmental Restoration Program. LANL agrees that samples taken for possible corrective measures will include other metals than those in the TCLP test. Also included are the 1994 results of

C. F. V. Mason, et al. of an alpha radiological survey carried out on many of the firing sites on TA-15.

Data on Firing Site R-44 is provided in the response to comment 35.

Samples in the drainages from Firing Site E-F are described in the sampling plan of Chapter 7.

11. Phermex Facility, p. 6-5 - What is the schedule for decommissioning of this SWMU?

Response: There is no proposed schedule for decommissioning of the PHERMEX Facility. Because of the moratorium on the testing of nuclear weapons, the PHERMEX Facility will have increased and prolonged usage in order to maintain the safety and security of America's nuclear stock pile designs.

12. 6.3.1 SWMUs 15-009(b), p. 6-5 - How was the septic tank connected to the building? Have hazardous wastes been introduced into the septic system since 1980?

Response: SWMU 15-009(b), Language has been clarified on Page 6-5 to show that this septic tank is connected to the restroom facilities of Building R-45. No hazardous materials have been known to have been introduced into this septic system. Building R-45 is not used for the handling of any hazardous materials. The explosives were handled on the firing site.

Page 6-5, Section 6.3.1, Line 5. ... site. It was last used in the fall of 1992 for special small experiments using less than 1 lb of explosive charge. The sandbags ...

Page 6-5, Section 6.3.1, Line 8. ~~It was last used in the fall of 1992 for special small experiments using less than 1 lb of explosive charge.~~ This septic tank is connected to the restroom facilities of Building R-45. No hazardous materials have been known to have been introduced into this septic tank.

13. 6.4.1 Site Description, p. 6-8 - What type of wastes were handled in the septic system at SWMU 15-009(c)?

Response: SWMU 15-009(c); septic tank is connected to the restroom facilities in the control room at R-44. No hazardous materials are introduced into the tank.

Page 6-8, Section 6.4.1, Paragraph 1, Line 8. ...R-44. This septic tank is connected to the restroom facilities in the control room at R-44. No hazardous materials are introduced into the tank.

14. 6.4.2 Potential Source Terms, p. 6-9 - What is the schedule for decommissioning firing site R-44?

Response: Firing sites R-44 and R-45 have recently been deactivated and will be submitted to DOE for funding for decontamination and decommissioning. This action occurred after the OU 1086 Work Plan had been submitted to EPA in July 1993 for approval. Because of this change in status, a sampling plan will be developed for firing sites R-44 and R-45 and submitted to EPA for approval as an addendum to the OU 1086 Work Plan as decommissioning proceeds.

15. 6.5.2 Potential Source Terms, p. 6-9 -

a. When sampling to determine concentration levels in the soil, LANL should sample and analyze for total metals, not TCLP, as was done at PF-MH-15A.

Response: a) The PF-MH-15 data was used in the work plan as historical data. LANL will certainly analyze for total metals on samples used in the current environmental restoration program.

b. p. 6-10 - What type of wastes were handled in the septic system at SWMU 15-009(h)?

Response: b) Septic tank 15-009(h), which is connected to a leach field, is connected to the restroom facilities of Ector control building. No hazardous wastes are handled within the Ector control building and consequently none are introduced into the tank.

Page 6-10, Section 6.5.2, Paragraph 1, ~~Since the~~ The septic system at SWMU 15-009(h) is still active, is connected to the restroom facilities, and no hazardous materials are handled in the control room of Ector.

16. 7.2 Data Needs and Objectives and Investigation Rationale, p. 7-1 - LANL shall list the other contaminants known or suspected to exist at the E-F site. Also, please include a narrative describing the spot tests used for high explosives.

Response: Other metal contaminants have been listed in the text on Page 7-1, as well as a brief narrative on the spot tests.

Page 7-1, Section 7.2, Paragraph 2, Line 3. other contaminants, bismuth, copper, cobalt, nickel, tin, and thorium, are known .....

Page 7-1, Section 7.2, Paragraph 2, Line 6. ... performed. These tests indicate the presence of various different high explosives used at Los Alamos if present in the soil in concentrations greater than 100 ppm. The reagents of the test form a particular color with the HE that is unique to that particular HE.

17. 7.3.5 Quantities and Locations of Potentially Hazardous Materials, p. 7-9 - LANL shall include the sampling results of the Cokal and Rodgers Study in the NOD response.

Response: Two Cokal and Rogers memos are attached to this response to the NOD.

18. Chapter 7, pp. 7-17 through 7-20 -

a. EPA disagrees with the sampling strategy/locations devised for this SWMU. EPA believes a more judgmental sampling plan is appropriate for this particular circumstance. More samples should be taken in areas of high uranium concentrations, in areas nearest the firing points, and in the drainage paths close to the firing site boundary.

Fewer samples should be taken farther away from the firing points and at the lower uranium concentration areas.

Therefore, LANL shall submit all the subsurface samples indicated within the area of highest concentration of uranium for laboratory analysis of total metals. At least 30% of the samples located outside the contour map of uranium concentrations should be sent for laboratory analysis of total metals. All samples collected in the drainage shall also be analyzed for total metals. LANL shall revise the work plan accordingly.

Response: a) LANL agrees with the changes and will be sending all subsurface samples taken within the previously characterized area and the drainages for laboratory analysis. In addition, 30% rather than 20% of the samples taken outside the area will be sent for laboratory analysis. The work plan has been changed to show this. Although the analysis tables indicate only the main constituents - uranium , lead, mercury, and beryllium - total metals will be determined in the analysis.

Page 7-15, Table 7.3.2, First Vertical Column under Laboratory Analysis.
Number (~~20%~~) 30%; ~~14~~, 21, ~~6~~, 19

Page 7-19, Paragraph 3, Line 13. .... 14 at 24 in. All of the subsurface samples taken within the previously characterized area will be sent for chemical analysis. Only 30% of the subsurface samples taken outside this area will be sent for characterization.

Page 7-18, Section 7.3.9.6, Paragraph 5. ... Figure 7.3-12. All samples taken in drainages will be sent for full chemical analysis for metals.

b. LANL shall include the drainage points more clearly on this diagram (Figure 7.3-12). LANL may want to use a separate figure with topography indicated and surface drainage.

Response: b) The drainages and sample points have been labeled on Figure 7.3-12 for clarity. The topographic map of Appendix A more clearly shows the drainage of the entire TA-15, including firing site E-F.

c. LANL shall include a more detailed map showing the sampling locations at points D, E, and F. From looking at Figure 7.3-12, no sampling points are shown.

Response: The sampling points for locations D, E, and F are included on Figure 7.3-12 and 7.3-13 (attached).

Page 7-18, Section 7.3.9.5, Paragraph 4, Line 11, These samples are not shown in Figure 7.3-12.

Page 7-18, Section 7.3.9.5, Paragraph 5, Line 9, ... sample locations are shown in Figure 7.3-12 and are ~~will be~~ outside of the characterized are shown in this figure ~~Figure 7.3-12~~.

19. 7.3.9.4 Sampling for Residual HE, p. 7-17 - EPA believes that most field tests for HE should be taken nearest the firing points, at high uranium concentration areas or in the drainage paths close to the firing site boundary. Therefore, if LANL is field testing 50% of the sampling points, the 50% should be concentrated within the area of highest residual uranium. LANL shall include on this map, or a separate map the areas to be field tested for HE.

Response: All samples taken are being field tested for HE. This is a requirement of the

TA-15 operations group. No separate map is thought necessary.

Page 7-15, Table 7.3-2, vertical column "Number" under field screening; ~~35~~, 70.

Page 7-15, Table 7.3-2, vertical column "% used"; ~~50~~, 100.

20. 7.3.9.7 Vertical Extent of..., p. 7-19 - EPA does not agree that the quality of the soil in the mounds is fairly uniform (p. 7-18, 2nd paragraph). EPA believes that sampling of the mounds should be at the surface, mid point of the mound, and at the soil-tuff interface. All samples should be sent for laboratory analysis of total metals. The borings in between the mounds should be sampled in the same manner as indicated above, and should extend to at least 5 feet. LANL shall take 2 borings in each mound. LANL shall provide a figure which indicates the samples to be collected in the mounds.

Response: Language on pages 7-18, 19 & 20 have been changed to agree with the EPA's comments. A figure of the sample locations is attached as Figure 7.3-13.

Page 7-18, Paragraph 2. ~~There will b e only sub-surface sampling at the mounds near Firing Point E because the grading and moving of the soil has been so extensive means the quality of the soil will be fairly uniform.~~

Page 7-18, Paragraph 3, Line 11. These samples are ~~not~~ shown in Figure 7.3-13.

Page 7-19, Section 7.3.9.7, Paragraph 2. ~~The sampling strategy consists of placement of two borings possibly using "driven casing" systems, at the perimeter (the soil at the perimeter of the mounds is expected to contain the same substances) of each mound and the collection of one soil sample from each mound. The soil sample from each mound will be collected at a depth of 1 to 2 ft within each mound. The soil borings will extend to the tuff underlying the site. Samples will be collected 6 in. below the surface and at the soil/tuff interface.~~ The sampling strategy consists of placement of two borings within each mound from the top to the tuff/soil interface, two borings to 5 ft depth or the soil/tuff interface between the mounds, and two borings to the tuff/soil interface on the exterior perimeter of the mounds. These locations are shown in Figure 7.3-13. Samples from the borings in the mounds will be taken at the surface, mid-point, and at the tuff/soil interface. Two samples, surface and bottom, will be taken from each of the other borings.

Page 7-20, Section 7.3.9.7, Paragraph 3, Line 1. ~~six~~, twenty; ~~two~~, twelve; and ~~four~~, eight

Page 7-20, Section 7.3.9.7, Paragraph 3, Line 3. These ~~will all be~~ samples ~~at 6 in. and 12 in.~~ locations ~~and~~ are ~~not~~ shown on Figure 7.3-13.

Page 7-20, Section 7.3.9.7, Paragraph 4. All samples from in and around the mounds will be sent for laboratory analysis. ~~Samples will be processed and analyzed in the same manner as that of other cores; some of these samples will be analyzed further.~~

21. 7.3.9.8 Sampling for Mercury, p. 7-20 - Is mercury a potential contaminant at this site? Was mercury used in any of the experiments? What is LANL's criteria for determining what fifty percent of the field samples are being screened? EPA recommends that most of the field screened samples should be taken in the highly concentrated uranium areas. LANL shall provide a figure indicating the location of sites to be field screened for mercury.

Response: As mentioned on Page 7-8, mercury was used in some explosions at E-F, but in smaller quantities than lead. However, the sampling plan has been changed (Pages 7-15 and 7-20) so that 100% of all samples will be screened for mercury.

Page 7-15, Table 7.3-2, vertical column "Number" under field screening; ~~53~~, 65

Page 7-15, Table 7.3-2, vertical column "% used"; ~~50~~, 100

Page 7-20, Section 7.3.9.8, Paragraph 1, Line 1. ~~Fifty~~, One hundred percent ....

Page 7-20, Section 7.3.9.8, Paragraph 2, last line. ~~and lead~~, and other metals.

No figure is necessary because 100% of samples will be screened for mercury.

22. SWMU 15-008(a); Surface Disposal, p. 7-20 - LANL needs to provide a better description of these piles. Based on the information presented, LANL shall take three samples within each debris pile and at least one of these samples should be taken at depth within the piles. All samples should be analyzed for total metals. LANL shall provide a figure of this site with sampling locations indicated.

Response: Language has been clarified.

Page 7-20, Section 7.4.1, Paragraph 1, Line 1. ... debris supposedly from...

Page 7-20, Section 7.4.1, Paragraph 1, Line 3...Appendix A). The debris is in the form of a small pile approximately 8 ft diameter and 2 ft thick at most, that must have been dumped from a truck at the edge of the canyon. The location of these two piles are shown on Figure 7.3-12.

Page 7-20, Section 7.4.2, Line 8. ... firings). Because of the small size of these SWMUs and because biased sample locations will be determined in the field, these sample locations are not exactly shown on the SWMU location on Figure 7.3-12.

23. 7.5 AOC C-15-004; Transformer Station, p. 7-21 - LANL shall include a detailed map showing the sampling locations. LANL shall also include: the soil sampling method; the depth of the samples taken; and, what the samples will be field screened for?

Response: Language has been clarified, per telephone conference with Barbara Driscoll, EPA (22 Aug. 94), rather than add an additional figure.

Page 7-21, Section 7.5, Paragraph 1, Line 3. ...located on a 5 ft long wooden platform held some 10 ft in the air by two telephone poles. The support structure is still present and is located approximately 15 feet to the southwest from the parking lot at R-27.

Page 7-21, Section 7.5, Paragraph 1, Line 6. These sample locations are not distinguishable on the SWMU location in Figure 7.3-12 because of the scale of the figure. Drainage in and around the SWMU can be seen on the topographic map in Appendix A.

Page 7-21, Section 7.5, Paragraph 2, Line 2. However, two surface soil samples (at 0 to 6 in. depth) directly beneath the platform and 3 ft apart will be taken, field screened for radioactivity, and for uranium, beryllium, lead and mercury and laboratory .....

24. 7.6 SWMU 15-009(e) Active Septic System, p. 7-21 - Do these systems have drain fields or release points? LANL needs to provide a better description of the unit. Also, LANL shall include a cross section of the unit showing depth of the unit, etc. and its relationship to the other TA-15 SWMUs. In addition, has this unit handled hazardous constituents in the past?

Response: Language has been changed to better describe the septic tank and its use.

Page 7-21, Section 7.6. This septic tank is a 1200 gal. (3 ft x 4 ft x 5 ft deep) reinforced concrete tank built in 1947. It serviced the restroom facilities of the control room (Building R-27) for the E-F firing site. The tank is approximately 5 ft down gradient from the R-27 control room floor and the cover to the tank is at ground level. The tank has a single release point (outfall) at the canyons edge.

Page 7-21, Section 7.6, Paragraph 1, Line 3. The location of the tank is ~~These are not~~ shown in Figure 7.3-12 and the topographic map of Appendix A.

25. 8.3.1 Site Description, History and Potential Source Terms, p. 8-5 - Sampling results using TCLP methods are not very beneficial for corrective action determinations. When sampling to determine concentration levels in the soil, LANL should sample for total metals, not TCLP.

Response: The results of the TCLP tests were supplied as historical data and are not to be used for corrective action determination. LANL will sample for total metals, but with emphasis on the main constituents uranium, beryllium, and lead.

26. 8.3.2 Firing Sites A and B Sampling Plan, p. 8-9 -

a. first paragraph - How deep did the regrading process disturb the soil/rock vertically?

Response: The regrading of firing sites A & B was simply to level and smooth the berm that protected the control room. No more than a foot in depth of soil was disturbed.

b. Was mercury used at these firing sites? If so, then field screening should be conducted for mercury independent of the results at the E-F site.

Response: No documentation was located on the use of mercury at this site. However, all samples are field screened for mercury. Language in text has been changed.

Page 8-9, Section 8.3.2, last paragraph, Line 10. ..., and mercury, and field spot-checked for HEs. ~~No Phase I field survey for mercury will be performed at firing sites other than E-F site where large amounts of testing were performed. If mercury proves to be of concern at E-R site, it will be evaluated at other sites during Phase II investigations.~~

[Changes as a result of telephone conversation with Barbara Driscoll (EPA), August 22, 1994.]

Page 8-9, Line 18. In addition to the nine randomly selected grid points of firing site A & B, the nine points nearest the actual location of the firing point will be field-screened for HEs, metals, and radionuclides. Any of this screened samples found to be contaminated above background will be sent for fixed laboratory analysis.

Page 8-11, Table 8.3-1, Field Screening Columns, Surface Sampling line. ~~9~~, 15. Totals: ~~18~~, 24.

26. 8.4 Firing Site C, p. 8-12 - See comment # 25.

Response: The results of the TCLP tests were supplied as historical data and are not to be used for corrective action determination.

27. Firing Site C Sampling Plan, p. 8-12 - What is the basis for the 100 foot grid being used? Of a possible 50 sampling locations, 18 samples are being collected and 8 are being submitted for laboratory analysis. This is not adequate to characterize a site of this size. LANL shall take two more soil borings within the Firing Point C circle, and in these borings samples shall be taken at the surface and at two feet. All of these additional samples should be submitted for laboratory analysis. All grid points should be field screened. LANL shall revise their work plan accordingly.

Response: The basis for the sampling grid is the same as that used for firing site A-B on page 8-9 and using the statistical approach described in Chapter 4. Using this approach we are 95% confident that contamination will not be overlooked within the firing site.

[Changes as a result of telephone conversation with Barbara Driscoll (EPA), August 22, 1994.]

Page 8-15, Paragraph 4, last line. In addition to the nine randomly selected grid points of firing site C, the nine points nearest the actual location of the firing point will be field-screened for HEs, metals, and radionuclides. Any of this screened samples found to be contaminated above background will be sent for fixed laboratory analysis.

Page 8-16, Table 8.4-1, Field Screening Columns, Surface Sampling line. ~~9~~, 13. Totals: ~~18~~, 22.

28. 8.5.2 Sampling Plan for Firing Site G and Nearby Surface Disposal, p. 8-20 - LANL has not provided enough information about these units for EPA to adequately evaluate the sampling plans proposed. LANL should provide detailed descriptions of units, proposed sampling and figures with all sampling plans.

a. Field screening for beryllium should be included in the first paragraph.

Response: a) Field screening for beryllium has been added.

Page 8-20, Section 8.5.2, Paragraph 1, Line 3. beryllium, lead, mercury, and HEs.

b. If confidence is low that the contaminated area exceeds 30% then a 20% area should be used and a minimum of 14 samples should be collected, and 8 samples should be sent for laboratory analysis. Sampling locations should be judgmentally picked closer to the firing point.

Response: b) Language has been clarified on confidence. LANL believes this supports the use of the present sampling grid. Firing Site G is as large, if not larger, than Firing Site A-B; therefore the confidence is high, not low. This is a mistake that was overlooked during internal review.

Page 8-20, Section 8.5.2, Paragraph 2, Line 3. Confidence is ~~low~~ high that the contaminated area exceeds 30% of the total area included.

[Changes as a result of telephone conversation with Barbara Driscoll (EPA), August 22, 1994.]

Page 8-20, Section 8.5.2, Paragraph 2, last line. In addition to the nine randomly selected grid points of firing site G, the nine points nearest the actual location of the firing point will be field-screened for HEs, metals, and radionuclides. Any of this screened samples found to be contaminated above background will be sent for fixed laboratory analysis.

Page 8-22, Table 8.5-1, Field Screening Columns, Surface Sampling line. ~~9~~, 14. Totals: ~~27~~, 32.

Page 8-26, Section 8.6.2, Paragraph 1, line 9. In addition to the nine randomly selected grid points of firing site H, the nine points nearest the actual location of the firing point will be field-screened for HEs, metals, and radionuclides. Any of this screened samples found to be contaminated above background will be sent for fixed laboratory analysis.

Page 8-27, Table 8.6-1, Field Screening Columns, Surface Sampling line for SWMU 15-004(h). ~~12~~, 17. Totals: ~~29~~, 31.

c. LANL shall provide a more detailed map showing the smaller SWMUs.

Response: Figure 8.5-1 has been enlarged to better show the location of the smaller SWMUs and the biased sample locations within these SWMUs.

LANL believes that this change along with the photographs, Figures 8.5-2 and 8.5-3 illustrate the smaller SWMUs and their biased sample locations..

d. LANL shall provide a more descriptive narrative on the septic tank. The one provided is short. Does the septic tank have any associated piping, drain fields or other release points? Please clarify. Also, include a cross section of the unit showing depth of the unit. What sampling method is being used to obtain the sludge from the septic tank?

Response: d) Language has been added to clarify.

Page 8-20, Section 8.5.2, Paragraph 4. SWMU 15-009(i) is a 7 ft x 4 ft x 5 ft deep concrete septic tank located southeast of Building R-233 (Figure 8.5-1) and connected to the restroom facilities of that building. The outflow from the septic tank is connected to a 50 ft deep sump. Two sludge samples will be taken by bailer or sludge sucker at ...

Page 8-20, Section 8.5.2, Paragraph 4, Line 3. ...contaminants. A borehole to 55 ft will be made next to the sump. Samples will be taken at three depths below the inlet to the sump.

e. SWMU 15-008(c) - LANL shall a better description of the surfaced disposal area including size and the depth of disposal. What previous sampling has been conducted at this site.

Response: e) SWMU 15-008(c) is a shallow depression to the side of the road. It is approximately 10 ft wide and 30 ft long. The depth of the infiltration is not known; nor is nature of the material that was disposed here. No record exists other than radioactivity has

been found on the surface. Only the sampling for the DOE 1989, 0271 report has been done.

Page 8-20, Section 8.5.2, Paragraph 3, Line 7, SWMU 15-008(c) is a shallow depression approximately 10 ft wide and 30 ft long extending southwest from the road to TA-15-233. The depth of infiltration is not know; nor is the nature of the material disposed here.

29. 8.6.3 SWMU 15-010(c) Septic Tank, p. 8-26 - Why is LANL sampling at the end of the drain line if the drain only carries rainwater?

Response: There is no documentation to suggest that this drain ever carried anything but rainwater, therefore this SWMU should be proposed for NFA. Move from Page 8-26, Section 8.6.3 to Page 5-13, Section 5.3.8.3.

Page 8-26, Section ~~8.6.3~~ 5.3.8.3

Page 8-26, Section 5.3.8.3, Paragraph 1, Line 8. This SWMU is recommended for No Further Action (NFA).

30. 8.7.2 Unnamed Burn Pit Sampling Plan, p. 8-28 - What are the actual dimensions of the pit?

Response: The unnamed burn pit is a round horseshoe shaped berm of approximately 35 ft diameter at its ridge and rising about 3 ft above the natural terrain. The opening in the berm is on the east side.

Page 8-28, Section 8.7.2, Line 4, ... levels. It is a round horseshoe shaped berm of approximately 35 ft diameter and rising about 3 ft above the natural terrain. After ....

31. 9.1.1 Landfill MDA N, SWMU 15-007(a) and Related Areas, p. 9-2 - Did photographic solutions during this time period contain volatile organics?

Response: Photographic solutions were water based and did not contain volatile organics.

32. 9.1.3 Data Needs, p. 9-4 - The boundaries need to include the vertical depth of the unit.

Response: Language changed.

Page 9-4, Section 9.1.3, Point 1. 1. What are the boundaries of the landfill, including depth?

33. 9.1.4 Sampling Plan, p. 9-4 - If the vertical depth of disposal is more than 2 feet, LANL will have to take deeper sampling intervals.

Response: Language and Table 9.1-1 changed.

Page 9-5, Table 9.1-1.

Subsurface Samples (soil/tuff interface) 777777777 44444444 added.

Totals ~~20~~, 27; ~~14~~, 21; ~~10~~, 17; ~~12~~, 16, ~~6~~, 10.

34. 9.2.2 Potential Pathways and Receptors, p. 9-7 - It may be more economic to survey the site for the mentioned contaminants, remove the material and then sample underneath the removed materials.

Response: SWMU 15-007(b); MDA-Z is indeed being recommended for removal of the material (VCA). Phase I sampling will show LANL what are the main contaminants, after which a VCA and associated sampling will be proposed.

35. 9.3.1 Disposal Area SWMU 15-008(b) at R-44, p. 9-22 - Please include a map in the revised work plan showing the sampling locations and the corresponding concentrations found in the INEL 1987 Environmental Study.

Response: Map and results of INEL study are attached to this report. In addition, figure 9.3-3 is added to the work plan.

Page 9-12, Section 9.3.1, Paragraph 5, Line. Four samples were taken at each of four radii .... 450 ft). The samples at each radii were mixed together to form one composite sample from each radii for analysis. None ....

Page 9-12, Section 9.3.1, Paragraph 5, Line 7, ... test area, to 31, to 6, to 12 .... from ~~16.3~~ 16, to 5, to 2, to 0.6 ....

Page 9-12, Section 9.3.1, Paragraph 5, Line 9, ~~725~~ 2100, to 800, to 375, to 20, ~~to 45~~ mg/kg).

36. 9.3.2 Sampling Plan, p. 9-15 - EPA believes that 5 borings should be taken from the debris pile since higher concentrations of contamination is likely here. Only 3 samples are needed over the canyon rim. In addition, all samples taken from the pile should be both surficial and at a determined depth, dependent on the depth of the pile. LANL shall revise the work plan accordingly.

Response: Language has been changed to show five samples in debris and three below.

Page 9-12, Section 9.3.2, Paragraph 2, Line 3. Thus, ~~two~~ five

Page 9-16, Table 9.3.1

line "Surface Samples"	~~2~~, 5 in all spaces
line "Subsurface Samples"	~~2~~, 5 in all spaces
line "Surface Sampling in Canyon"	~~6~~, 3 in all spaces
"Totals"	~~10~~, 13; ~~4~~, 10

Page 9-14, Figure 9.3-2 has been changed and is attached.

37. 10.1.2 History and Potential Source Terms, p. 10-2 - LANL shall indicate the location of Water Canyon on Figure 10.1-1. LANL shall also describe the characteristics of the drain (SWMU -011(b)).

Response: By mistake, Cañon de Valle was called Water Canyon in the Second paragraph of 10.1.2. Water Canyon is not on Figure 10.1.2. The corrected figure 10.1-1 is attached.

Page 10-2, Section 10.1.2, Paragraph 2, Line 5. ... edge of ~~Water Canyon~~ Cañon de Valle.

38. **10.1.5 Sampling Plans, p. 10-4 - It is not clear where the surface samples are being taken. However, a soil boring should be taken at the point where the outfall liquid hits the ground. One or two borings should also be taken next to the 50 foot deep seepage pit. Several intervals should be sampled in this boring. A soil boring should also be taken near the pipe that discharges into the main channel at 15-014(j). LANL shall revise the work plan as requested by EPA and provide a better description of the surface samples.**

Response: Language has been changed to clarify.

Page 10-4, Section 10.1.2, Paragraph 1, Line 2-3. ... for all ~~five~~ six PRSs ....15-014(g), (i), and (j), and .....

Page 10-4, Section 10.1.2, Paragraph 3, Line 4. .... Funneled to the sump and/or to SWMU 15-011(c).

Page 10-4, Section 10.1.4, Line 3. ... at the outfalls, septic tank, and sumps, and in ...

Page 10-8, Section 10.1.5.1, Paragraph 1. .... rear of the buildings. All of the outfalls, which are located at the north edge of the buildings, empty into a common ditch, which leads to the edge of the Cañon de Valle at SWMU 15-011(c). Surface (0 - 6 in.) and 3 ft depth samples will be taken at the outfall SWMU 15-014(g) at Building 203, at the three outfalls which constitute SWMU 15-014(j) at Building 50, and at the drainline 15-014(i) at Building 194. A boring near the sump, 15-011(b) will be made to a 55 ft depth. Samples will be taken at three depths below the intake to the sump. All samples ~~These~~ will be field screened for radioactivity, metals, including Pb and Cr and

Page 10-9, Table 10.1-1

Title line 2, add SWMU 15-014(g).

Surface Samples, ~~4,~~ 6 for all spaces

Subsurface Samples, ~~4,~~ 9 for all spaces

Totals ~~14,~~ 21; ~~4,~~ 6; ~~10,~~ 15; ~~14,~~ 21; ~~10,~~ 15; ~~14,~~ 21.

39. **Figure 10.1-3, p. 10-6 - Why is LANL taking a boring from the east fork drainage system?**

Response: These samples at the surface and at 2 ft depth are being taken as a background sample of anything entering the surface drainage system and outfall from the south side of the buildings in "The Hollow."

40. **10.1.5.2 PRSs East Side of the Hollow, p. 10-8 - LANL shall include a larger scale map of the SWMUs on the east side of "The Hollow". Also, LANL shall include the location of septic tank TA-15-51 on the map. In addition, include the sampling locations for 15-011(a), 15-014(k) and the trench drains.**

Response: For continuity, details requested have been added to Figure 10.1-3, which is attached.

41. 10.2.1.4 Sampling Plan, p. 10-14 -

a. 1st paragraph - List the constituents which are being sampled for in the EPA NPDES permit for 15-014(a). Do the outfalls exit next to the building or are they carried by underground pipe? Please clarify.

Response: a) Outfall 15-014(a) is routinely sampled for pH, Ag, and CN^-. Beginning in August 1994 the permit no longer requires analysis for CN^-.

Page 10-14, Section 10.2.2.1, Paragraph 1, Line 3. .... use. Outfall 15-014(a) is routinely sampled for pH, Ag, and CN^-. After Aug. 1, 19944 CN^- will no longer be tested. Before ....

The outfalls are located at the edge of the macadam parking lots. The drains are extended under the parking lot in pipes.

Page 10-14, Section 10.2.2.1, Paragraph 2, Line 2. .... which run under the parking lot and under the trailer ....

b. 2nd paragraph - Is LANL saying that rinse water runs east approximately 25 ft from the area of origination and ponds at that point?

Response: b) Yes, if the rate of input of the rinse water into the SWMU was faster than the infiltration into the soil, the rinse water could run east and pond.

c. Does the active Septic Tank system (SWMU 15-009(j)) contain any hazardous constituents and does it have a drain field, associated pipes, or outfall? Samples should be taken to a depth deeper than 2 feet. LANL shall provide the requested information and revise the sampling plan.

Response: c) This septic tank drains into a 50 ft deep sump. Two samples will be taken of the sludge. We could not find any mention of a 2 ft depth sample in the text. Please note the corrected location of SWMU 15-009(j) on Figure 10.2-3.

Page 10-14, Section 10.2.1.4, Paragraph 3, Line 0. SWMU 15-009(j) is an active 1500 gal. concrete septic tank constructed in 1981 and servicing building TA-15-285, which is used for the assembly of containment vessels. The outflow of the septic tank flows into a 50 ft deep sump. No hazardous materials have been known to have been introduced into this tank. However, ~~Because the active septic system SWMU 15-009(j) is in the area of sampling for 15-012(b),~~ we propose ...

42. Figure 10.2-5, p. 10-17 - What is the significance of the broken pipe? Also, samples should be taken in between the 130 foot interval, preferably in ponding landscapes. LANL shall revise the work plan accordingly.

Response: There is no significance to the broken pipe. It is simply trash. The wording has been removed from Figure 10.2-5 so that further confusion does not occur. A surface sample and a 3 ft deep subsurface sample will be taken at least every 50 ft or in ponded landscapes. Language has been changed as well as changes made to Figure 10.2-5.

Page 10-18, Section 10.2.2.4, Line 1. ... at the ~~six~~ ten locations.

Page 10-18, Section 10.2.4., Line 2. ... adding, ~~two~~ subsurface samples to depths of ~~2~~ 3 ft

Page 10-18, Section 10.2.2.4, Line 3. ... at ~~two~~ all locations.

Page 10-19, Table 10.2-3

Line "Surface Sampling"		~~6~~, 10 in all spaces
Line "Subsurface Sampling"		~~2~~, 10 in all spaces
Totals	Silver	~~12~~, 24 in both spaces

43. 10.2.2.4 Sampling Plan, p. 10-18 - EPA is requiring that subsurface samples be taken at all points and that each soil boring be located where the outfall hits the ground. Borings should go to at least 3 feet.

Response: Language changed. See response to #42.

44. 10.2.3.1 Active Septic Systems, p. 10-18 - Is LANL saying that these two tanks have never received hazardous constituents in their lifetime? Please clarify.

Response: No documented processes for the introduction of hazardous wastes to these septic tanks has been located. The sludge of the tanks, however, will be sampled and analyzed.

45. 10.2.3.2 last paragraph, p. 10-21 - LANL shall include the sampling intervals for each boring.

Response: Sampling intervals have been added.

Page 10-21, Paragraph 2. ... laboratory analysis. Samples will be taken at the surface (0 to 6 in.) and at a 2 ft depth.

46. 10.3.1.4 Sampling Plan, p. 10-22 - EPA is requiring a soil sample be taken at 3 feet for each boring.

Response: Subsurface samples at 3 ft depth have been added.

Page 10-22, Section 10.3.1.4, Line 1... four ~~6 in.~~ 3 ft depth subsurface samples

47. 10.3.2 SWMU 15-010(b), p. 10-25, second paragraph - EPA is requiring that a soil sample be taken at three feet for each boring.

Response: Three foot deep soil coring added.

Page 10-25, Section 10.3.2, Paragraph 2, Line 2. ... samples, one surface and also at 3 ft depth where the drainline empties at the outfall and one surface and also at 3 ft depth from the ...

CHANGED

FIGURES

FOR

OU 1086

WORK PLAN

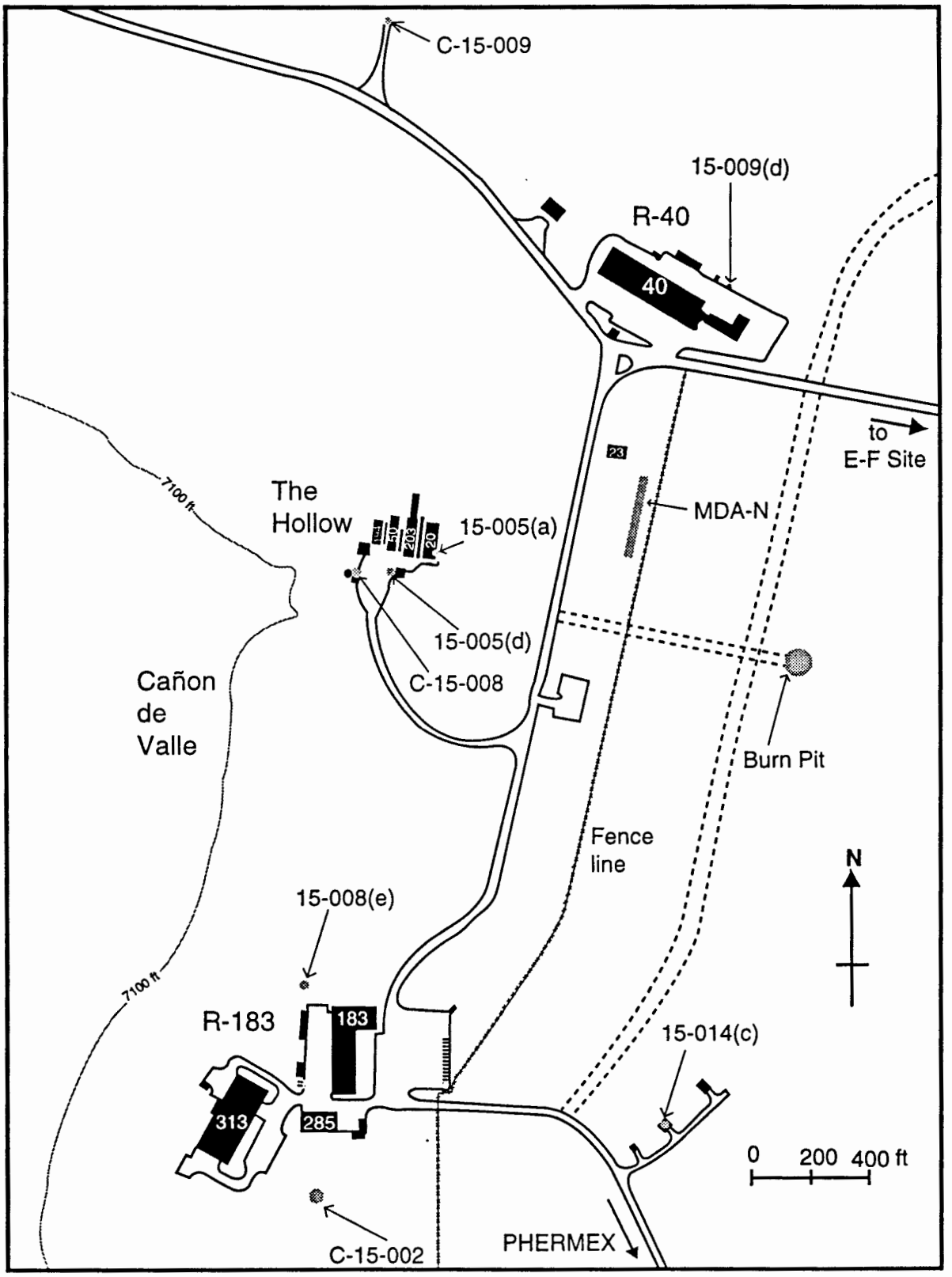


Figure 5.3-1 Site map showing The Hollow, R-183, and R-40 with PRSs recommended for NFA.

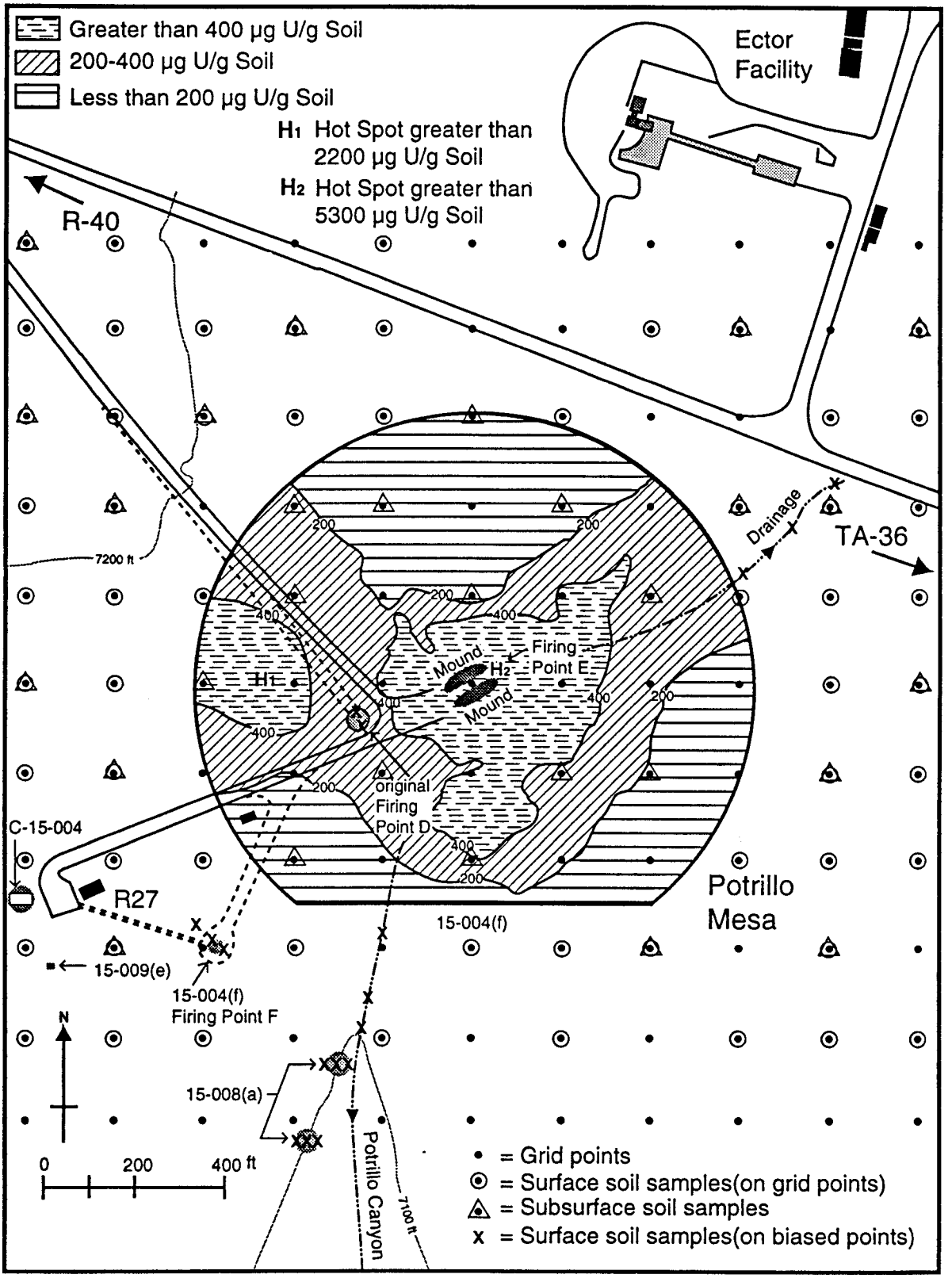


Figure 7.3-12 Site diagram for Firing Site E-F with sampling plan. The contour map of uranium concentrations is taken from Table I (White et al. 1980, 0771).

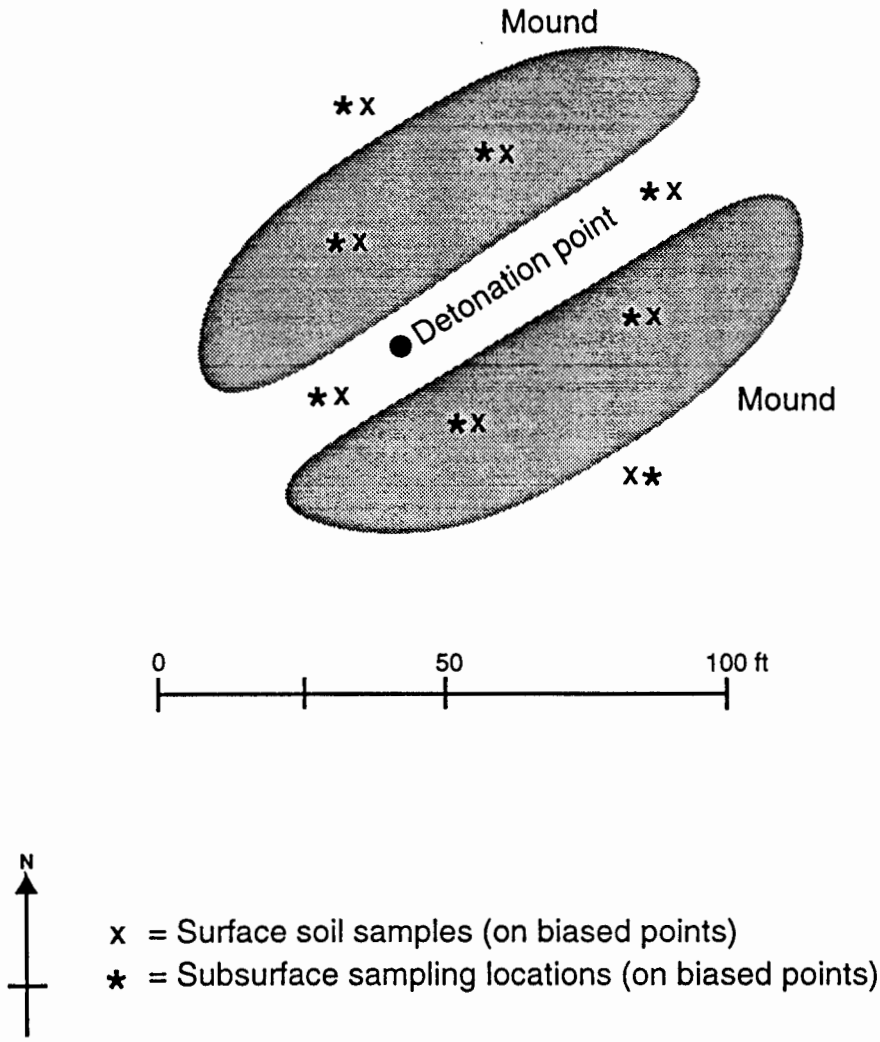


Figure 7.3-13 Sampling locations for borings at the Firing Site E-F mounds.

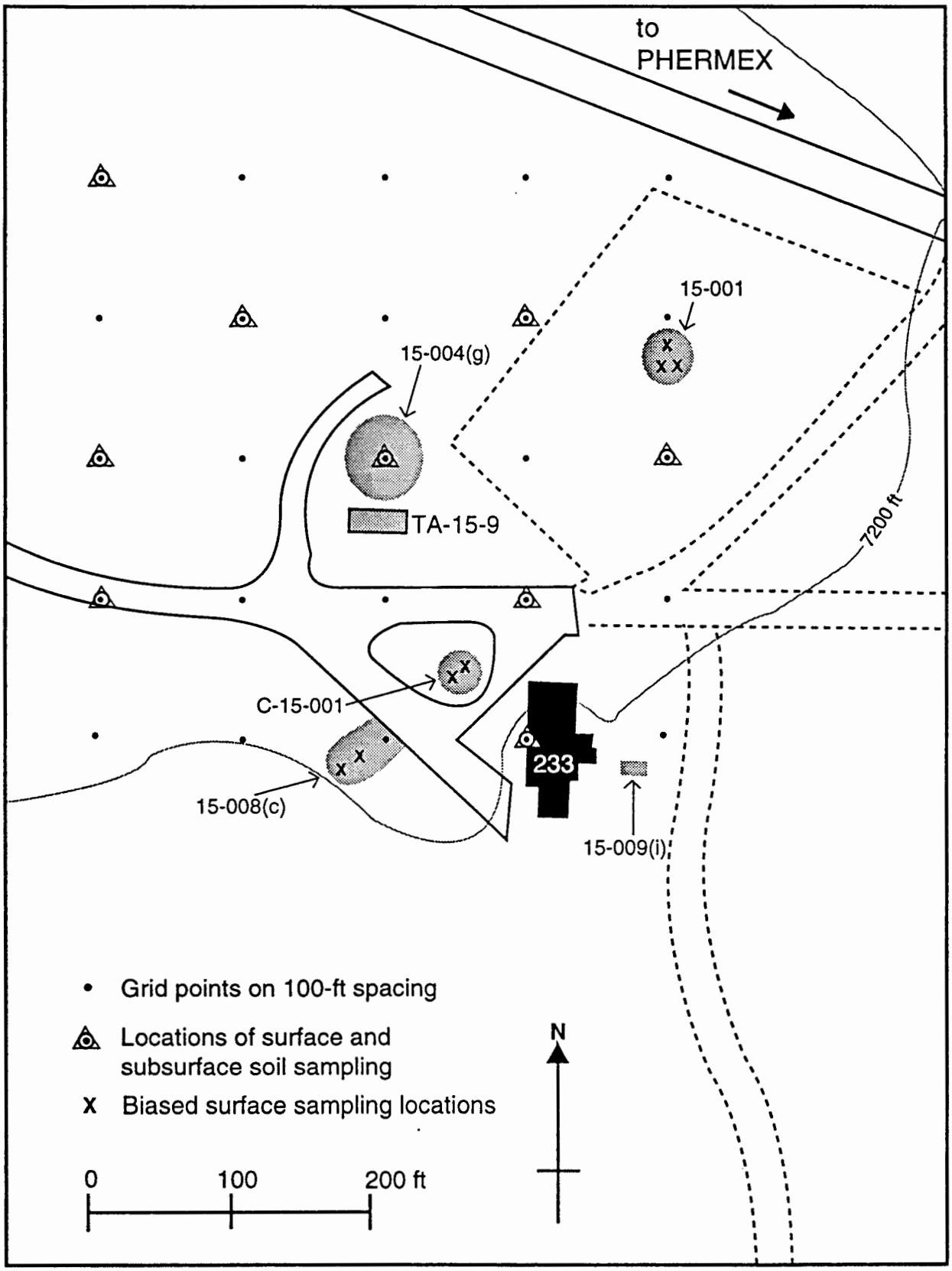


Figure 8.5-1 Site diagram and sampling grid for Firing Site G at TA-15.

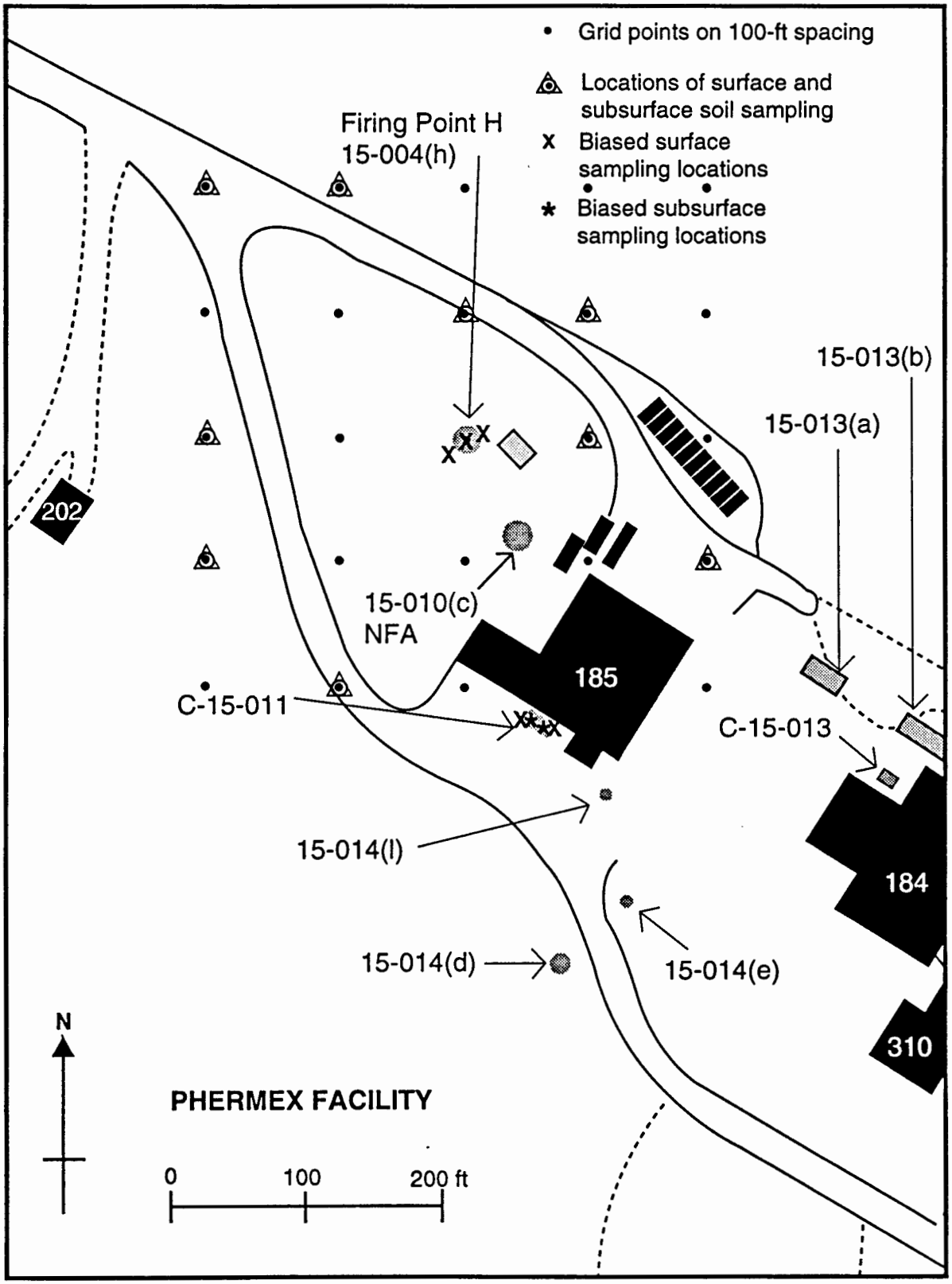


Figure 8.6-2 Site diagram and sampling plan for inactive Firing Site H, SWMU 15-004(h).

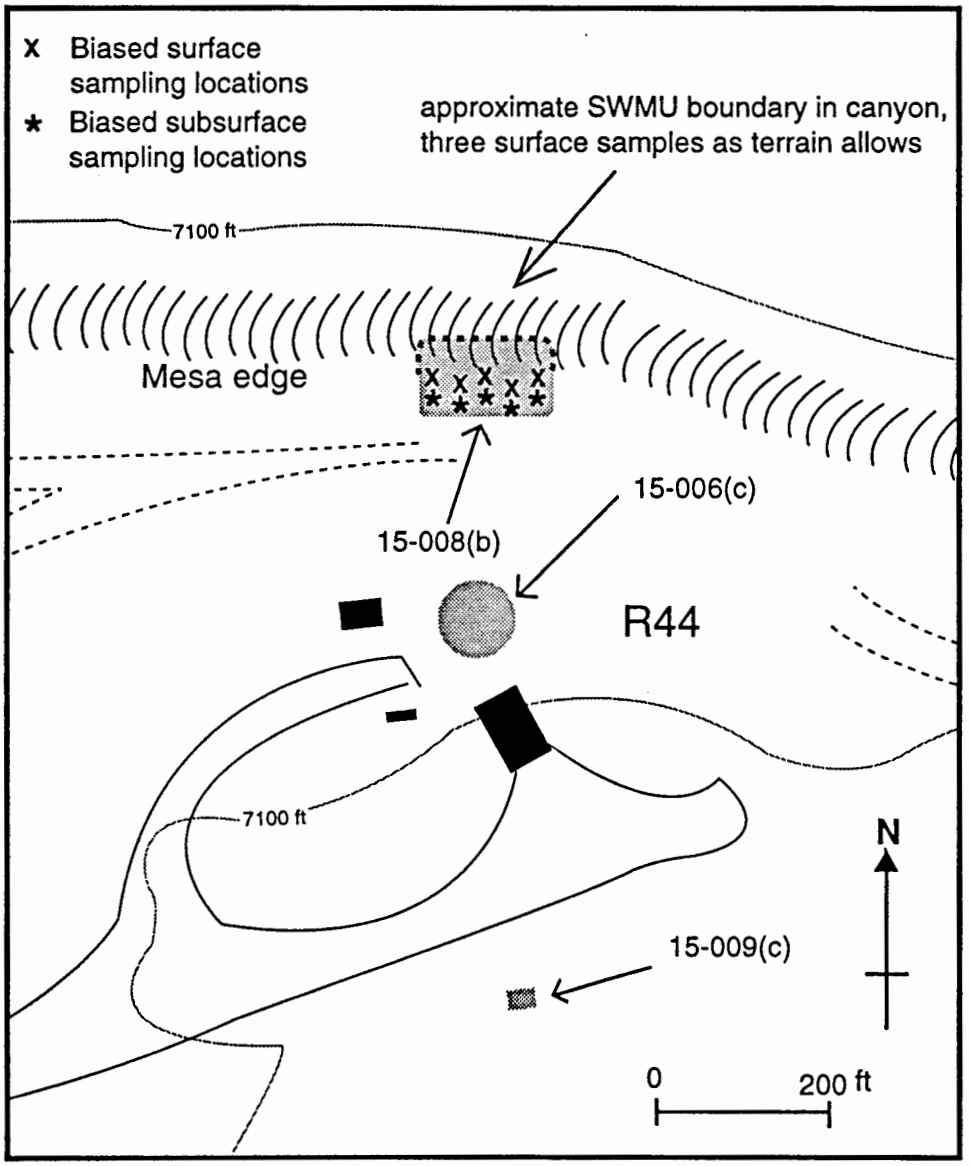
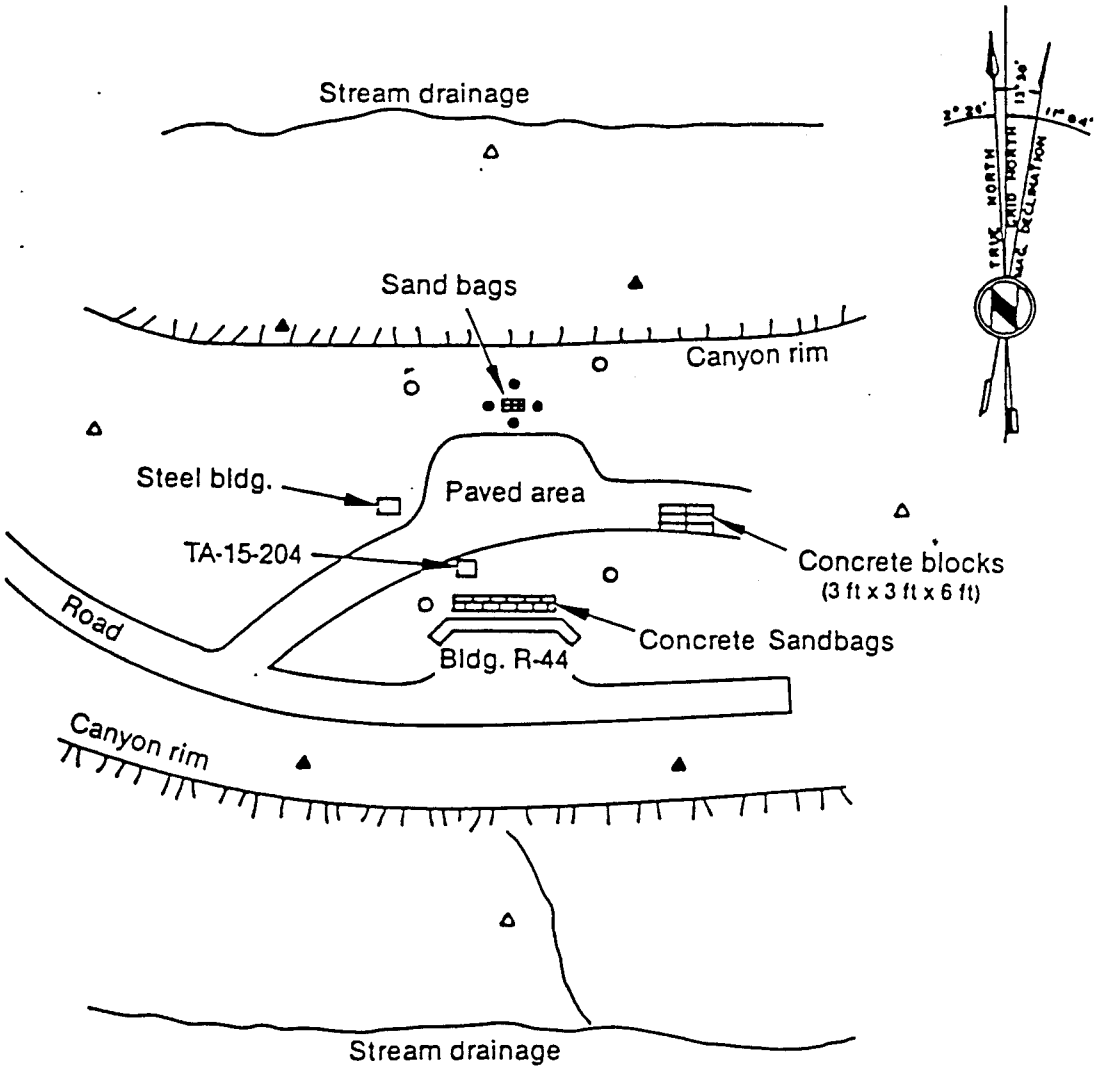


Figure 9.3-2 Site diagram for R-44 and sampling plan for SWMU 15-008(b).

Sampling Locations at the TA-15-44 Firing Site



Composite subsample locations

- ● – 01 (10 ft radius)
- ○ – 02 (100 ft radius)
- ▲ – 03 (250 ft radius)
- △ – 04 (450 ft radius)

NOT TO SCALE

FIGURE 9.3-3

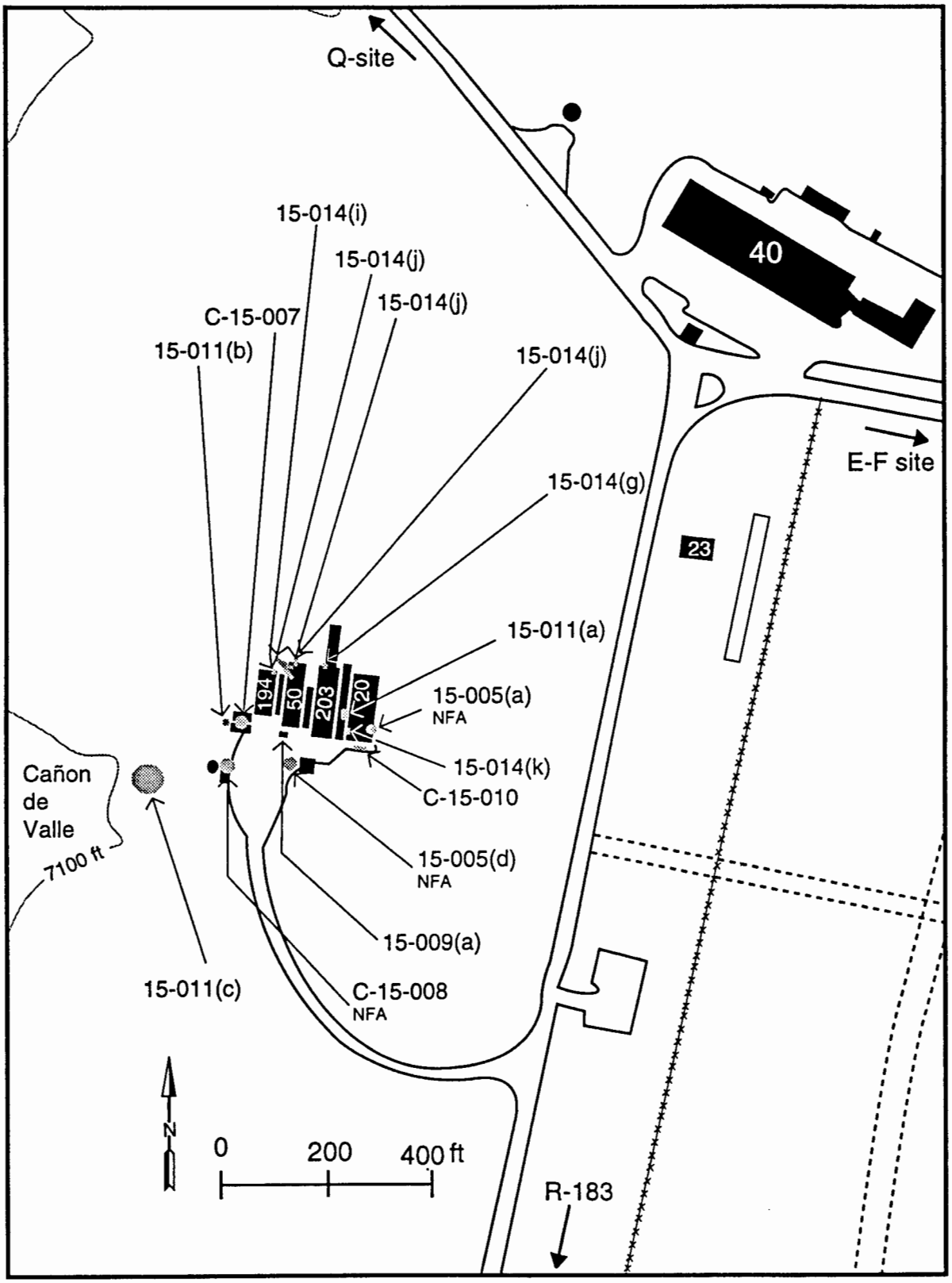


Figure 10.1-1 Buildings and PRSs in The Hollow.

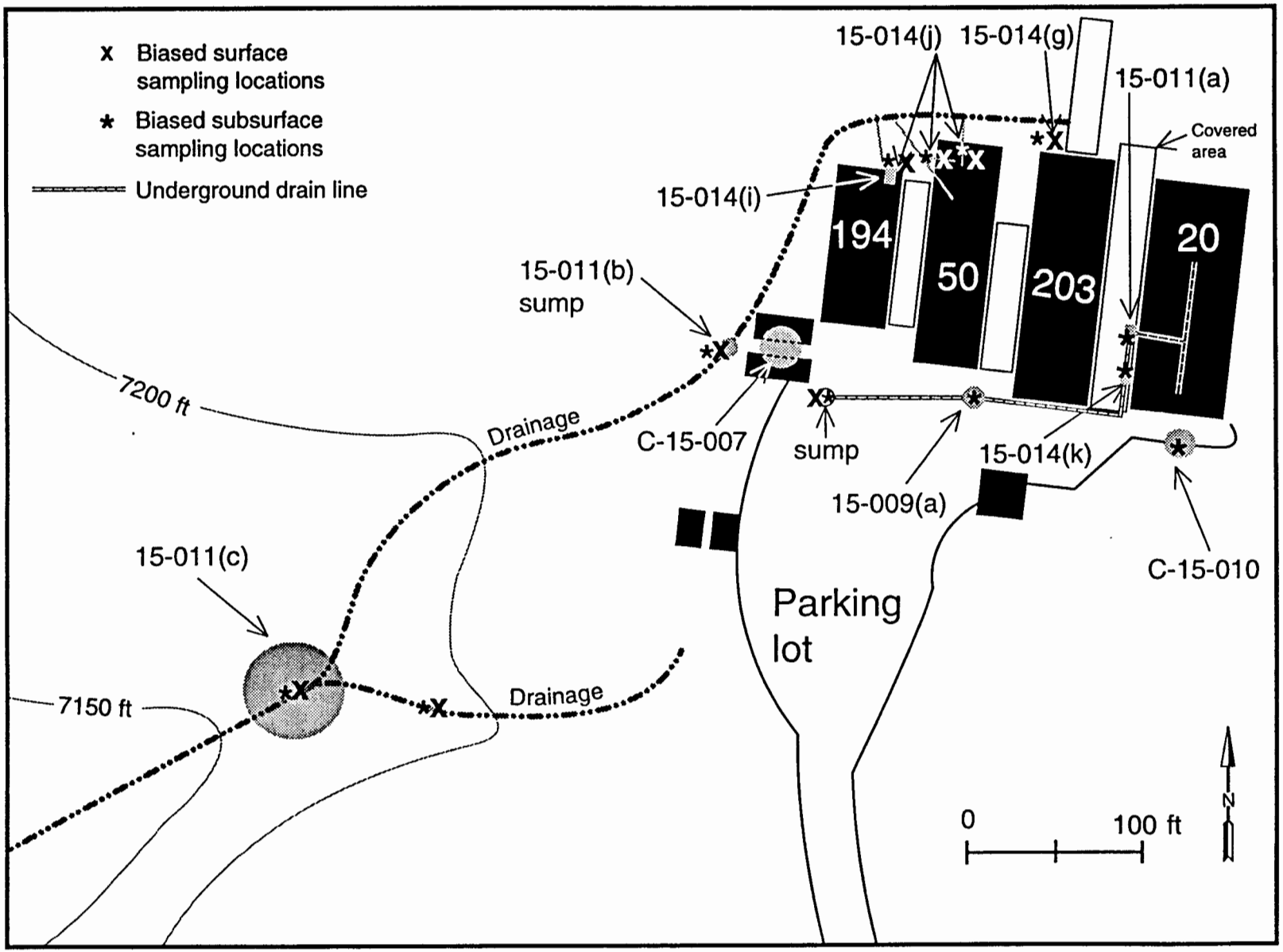


Figure 10.1-3 Site diagram and sampling plan for PRSs in The Hollow.

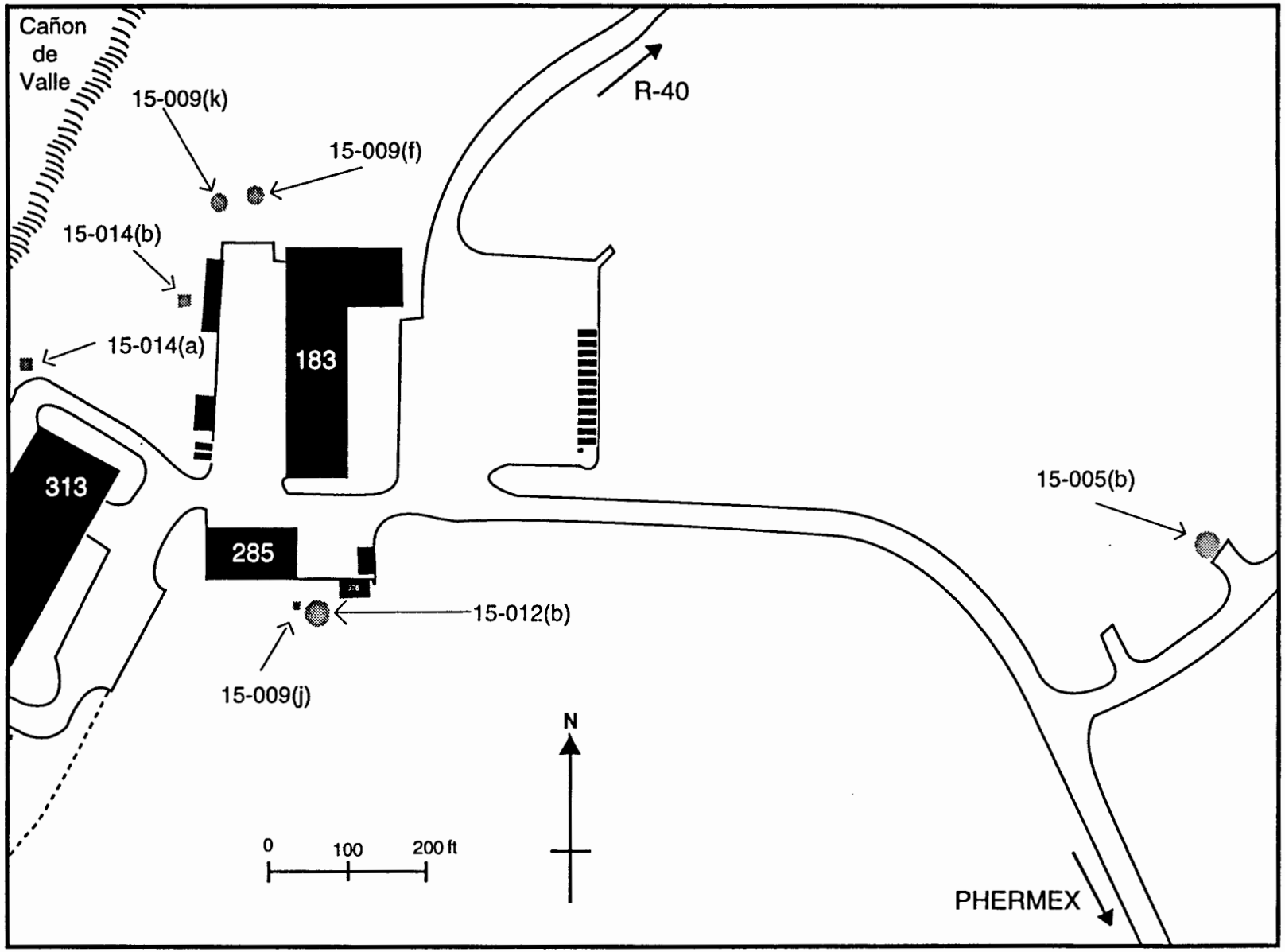


Figure 10.2-1 Diagram of R-183 showing location of PRSs with sampling plans in chapter 10.

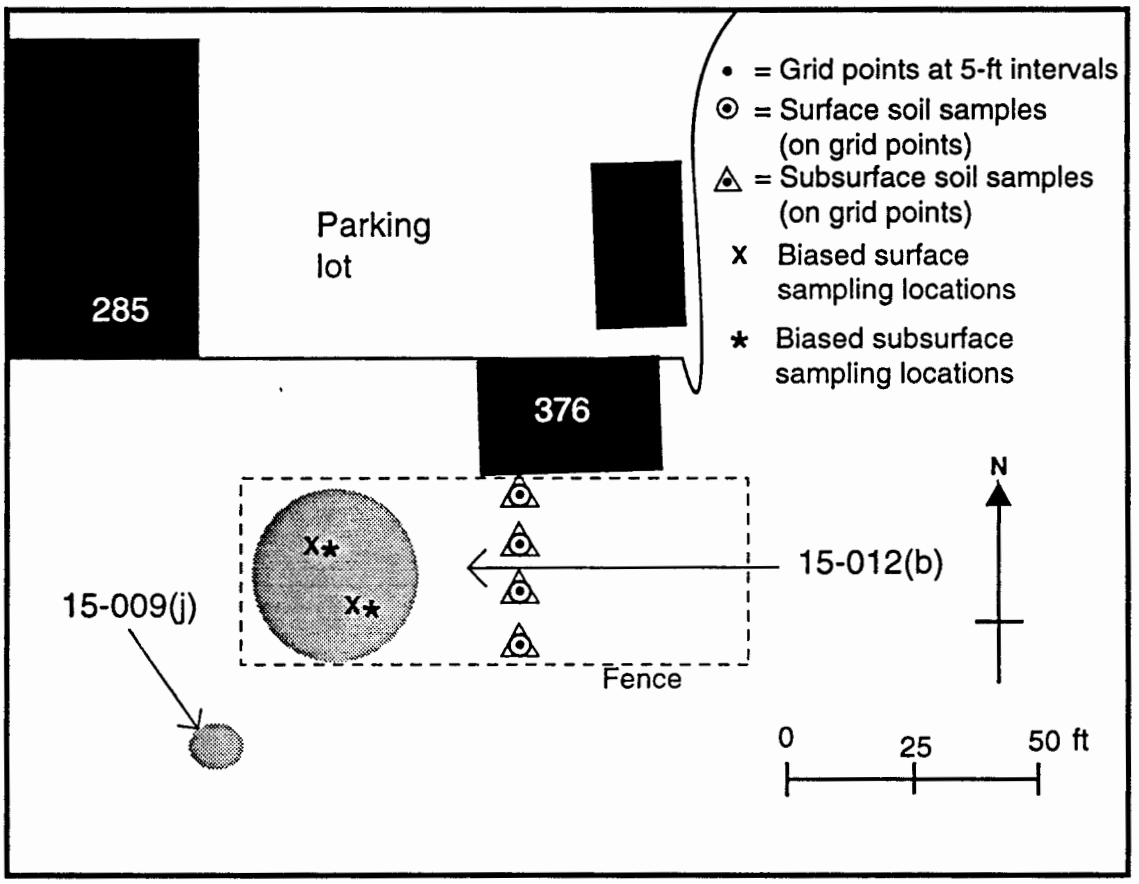


Figure 10.2-3 Site diagram for R-183 showing sampling plan for SWMU 15-012(b) .

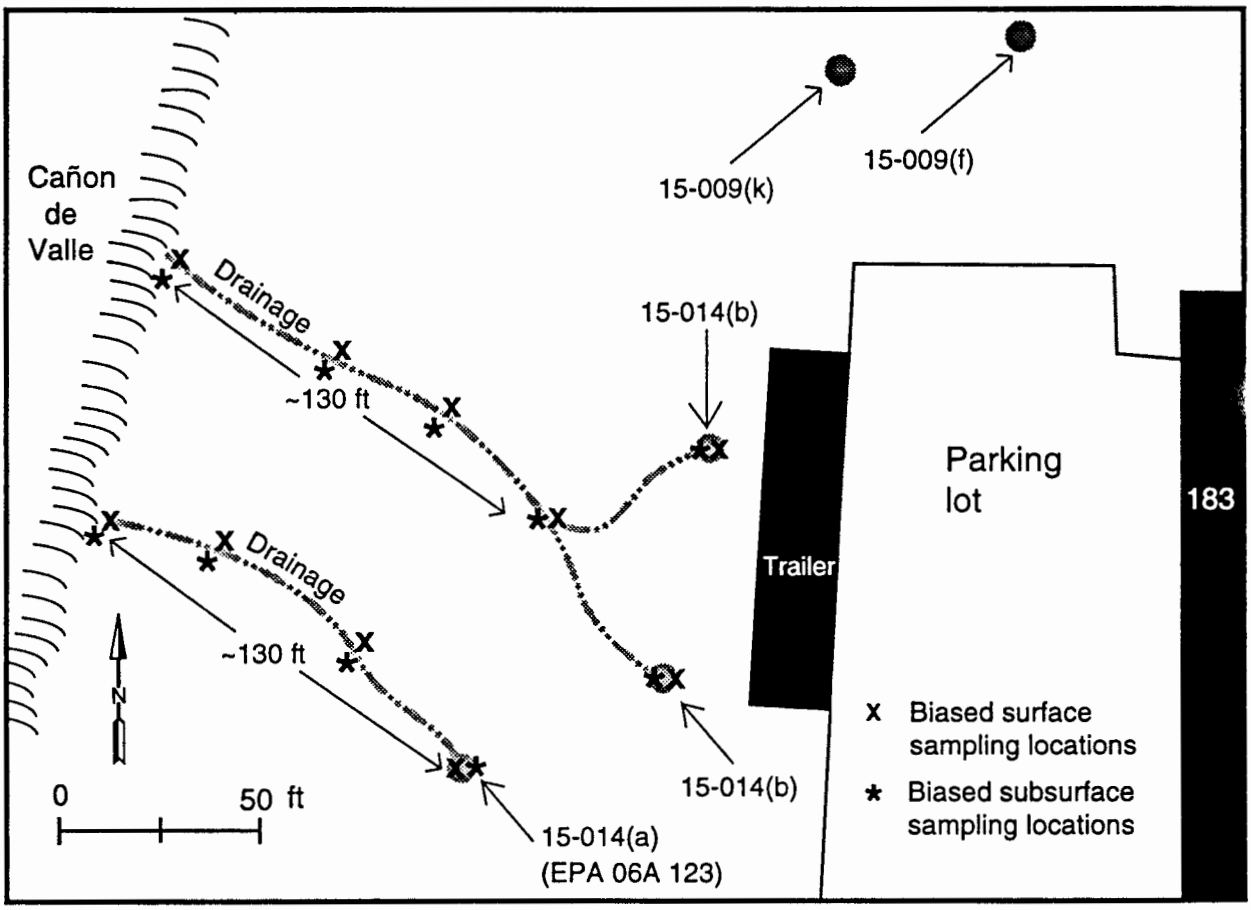


Figure 10.2-5 Diagram for location and sampling plan for SWMUs 15-014(a) and 15-014(b).

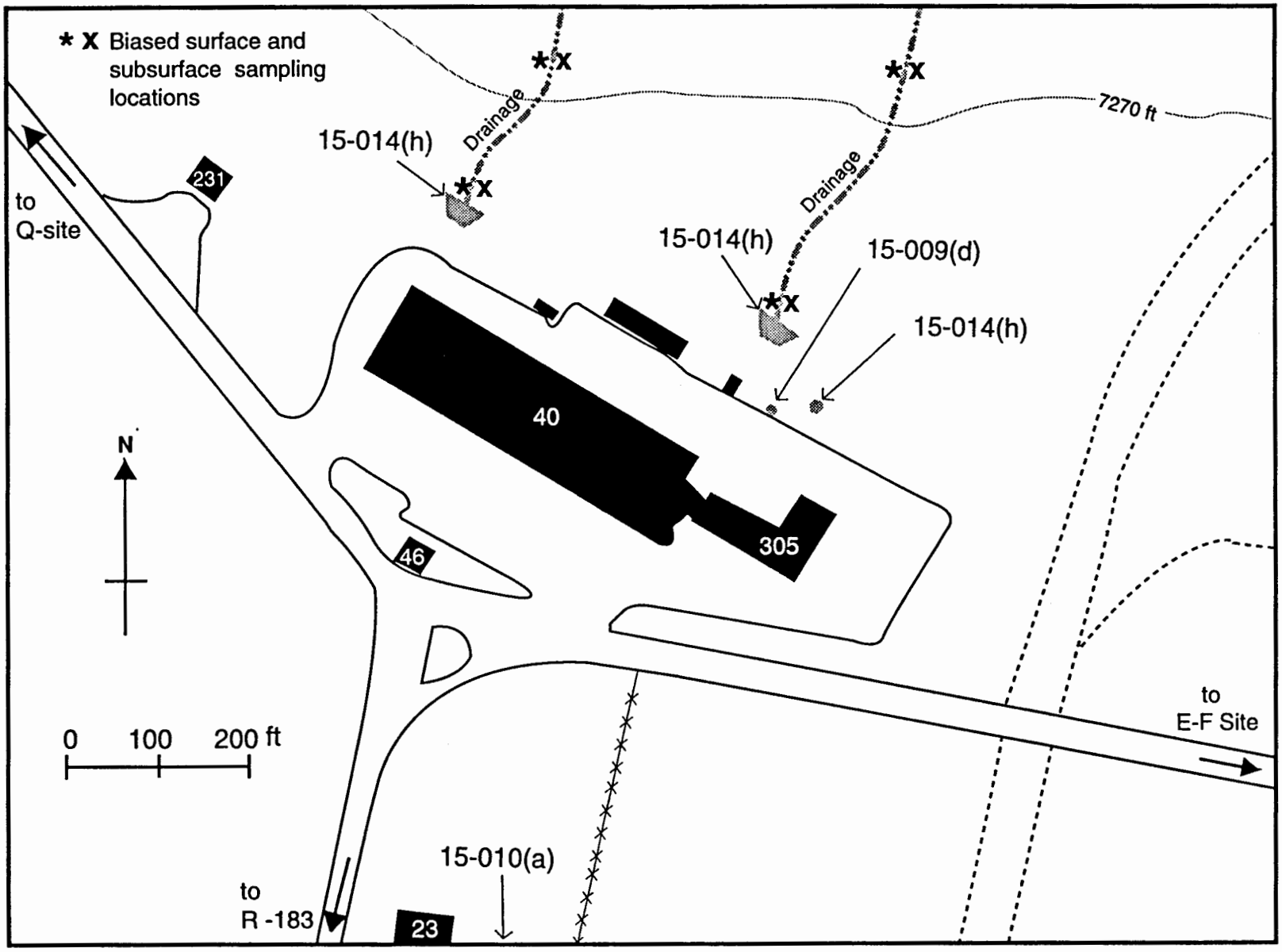


Figure 10.3-1 SWMUs at R-40.

REQUESTED

REFERENCE MATERIAL

Comment 9b) Site Database Task 24

Comment 10d) Previous Sampling Results
T. Buhl, Phil Fresques,
C.F.V. Mason et. al, LAUR-94-400

Comment 17) Cokal and Rodgers Memos

Comment 35) DOE 1988, 0271 Report by INEL

Environmental
Restoration
Program

Lc Alamos Environmental Restoration Records Processing Facility

ER Record I.D.# 0011963

Site Database
Task 24
TA-15

Los Alamos National Laboratory
Los Alamos, New Mexico

Working Draft

Prepared by
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for
U.S. Department of Energy
Albuquerque Operations Office

Environmental Restoration Program
Technical Support Office
Los Alamos National Laboratory

September 1989

1. Project Name : ER PROGRAM

2. Installation : LOS ALAMOS NATIONAL LABORATORY

3. Site Name : Surface soil contamination

4. Task Number : AL-LA-024

5. Phase 1 Heading : TA-15-5-CA/OL-I-HW/RW (Disposal areas)

6. Release Site Descriptor : TA-15-06-007-0000

7. Installation Identifier : TA-15-5d15

8. Alternative Identifier : SWMU# 15-008a,RFA# 15.008

9. Site Description :
Vacuum pump oil disposal area suspected of containing pump oil, mercury, tritium, hazardous, and radioactive waste (R02r). The location for this area is not given in the RFA report. It was not located during the ER Program site recon visit (R01s).

10. Site Location:
Coordinate system and units : To be determined
The site has not been surveyed
Coordinates : Not identified
Elevation : Not identified

11. Program Phase : RI Scoping

12. Program Phase Rationale :
The site was identified in the SWMU report and is considered worthy of further investigation under a RI scoping.

13. Current Operational Status : Not Operational
Current Owner/Operating Group : M-4

14. Site Type : Surface soil contamination

15. Potential Pathways : Not identified

16. Generic Waste Type : Not identified

17. EPA Waste Characteristics : Not identified

18. EPA Waste Types : Not identified

19. Contaminants of Concern:

Name of contaminant	Data Quality	Index Type	Index Number	Reference
TRITIUM	U	ERP	H-3	R02r
TOTAL PETROLEUM PRODUCTS	U	ERP	TPP	R02r
MERCURY, TOTAL	U	CAS	7439-97-6	R02r
RADIONUCLIDES	U	ERP	RAD	R02r
UNKNOWN	U	ERP	TIC9	R02r

21. Chronological Events:

Description	Date	Reference
•ER Program site recon visit.	09/12/88-09/14/88	R01s

22. Comments:

The RFA report states, "...contaminated areas include an inactive vacuum pump oil disposal area suspected of containing pump oil, mercury, tritium, hazardous, and radioactive waste...."

This disposal area was not located during the ER Program site recon visit (R01s).

23. Information Resources

Reports

• Reference R01r
Title : SWMU Report
Author : LANL
Date : 1988
Location: ER Program document control system, Roy F. Weston, Albuquerque, NM

- Reference R02r
  Title : RCRA Facility Assessment... PR/VSI Report of... LANL
  Author : EPA
  Date : 08/87
  Location: ER Program document control system, Roy F. Weston, Albuquerque, NM

Site Visits

- Reference R01s
  Title : ER Program site recon visit
  Author : Roy F. Weston
  Date : 09/12/88-09/14/88
  Location: Field notebook #72, ER Program document control system, Roy F. Weston, Albuquerque, NM

PNERMEX 1987

Grid map

TA-15 U & Be Data from TB

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	

0 uranium concentration averaged over entire area: 201.6 pCi/g

X\Y (ft)	0	20	40	60	80	100	120	140	160	180	200	220	240	260	
240	0.0	0.0	0.0	0.0	17.4	96.1	311.1	306.1	56.0	184.43	86.36	6.67	34.00	69.01	168
220	0.0	0.0	0.0	0.0	801.3	346.3	249.8	356.3	499.5	115.74	47.58	186.55	64.60	1174.06	154
200	0.0	0.0	0.0	0.0	0.0	493.3	499.2	248.8	256.4	183.84	341.41	309.62	566.34	113.66	140
180	0.0	0.0	0.0	0.0	0.0	763.8	873.6	251.4	538.0	146.61	86.58	397.96	173.61	41.90	126
160	0.0	0.0	0.0	0.0	0.0	397.2	751.2	815.9	549.8	409.72	40.82	1243.29	232.09	212.76	1[illegible]
140	0.0	0.0	0.0	0.0	0.0	543.1	739.5	456.3	41.7	242.90	107.93	72.85	84.66	41.73	[illegible]
120	0.0	0.0	0.0	0.0	93.2	757.4	570.6	747.2	1313.0	97.86	228.27	131.41	22.04	48.11	84
100	0.0	0.0	0.0	0.0	15.6	345.3	614.0	207.1	75.9	75.54	107.07	47.86	52.94	16.32	70
80	4.8	5.6	6.7	17.6	12.9	114.8	581.8	116.0	34.0	9.61	27.24	754.33	48.13	30.07	56
60	5.1	5.3	7.8	33.2	27.1	22.8	153.4	115.0	6.7	41.80	9.18	8.98	88.71	1649.52	42
40	6.0	3.7	7.5	14.9	602.6	24.0	9.5	489.9	91.4	16.72	55.61	21.19	15.48	9.06	28
20	4.8	4.7	4.6	8.6	10.1	11.2	11.3	17.0	14.9	25.67	0.77	5.59	9.35	6.21	14
0	7.7	11.3	8.8	9.8	9.9	19.9	19.5	13.5	14.9	16.42	4.60	0.65	1.50	7.59	0

PNERMEX

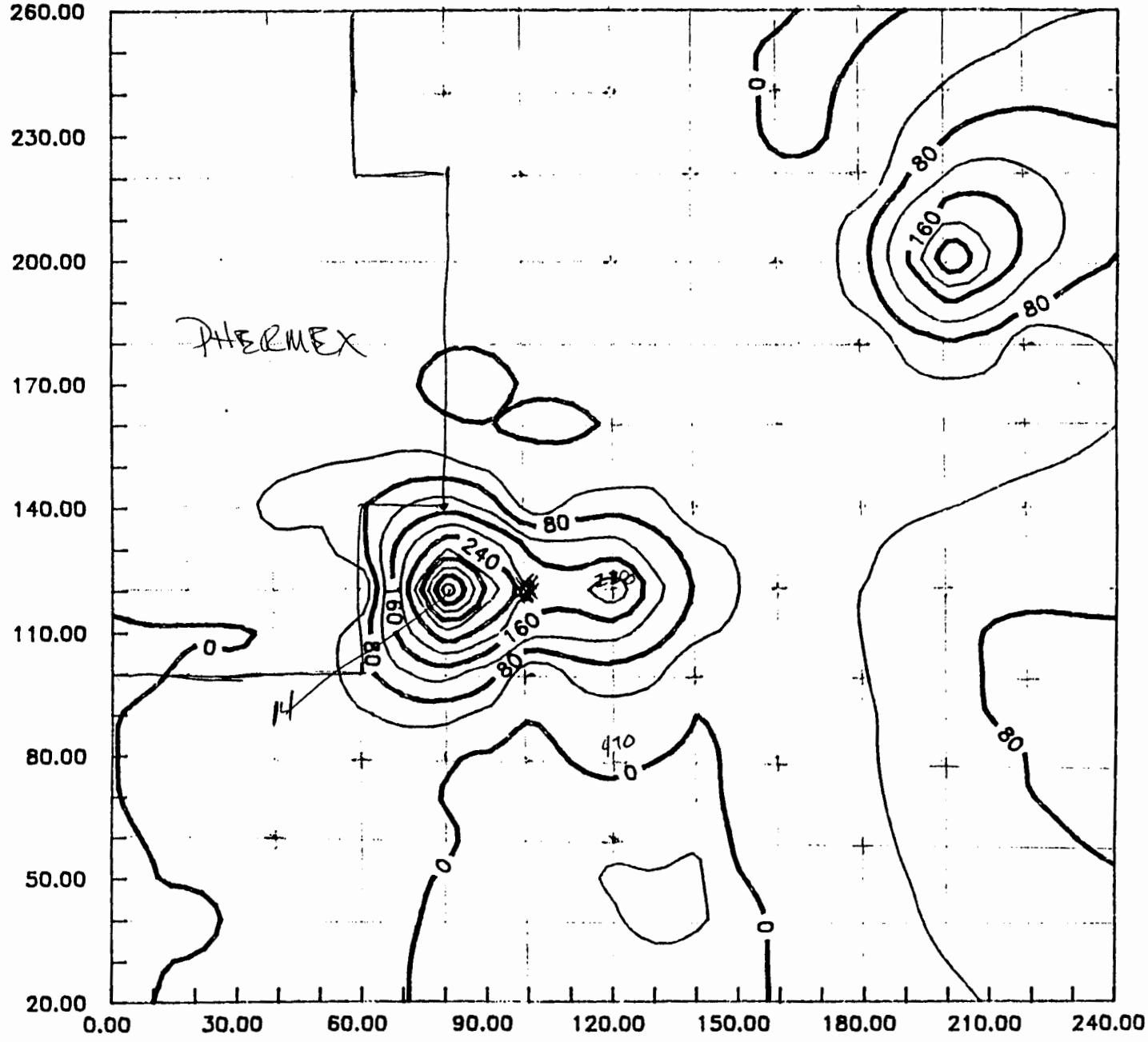
(Here is 0,0) SW corner

1 beryllium concentration averaged over entire area: 31.7 µg/g

X\Y (ft)	0	20	40	60	80	100	120	140	160	180	200	220	240	260	
240					3.6		260.0		4.8		4.8		3.4		16[illegible]
220						90.0		54.0		9.0		5.8			15[illegible]
200							74.0		18.2		280.0			4.4	140
180										6.4		10.8	7.4		126
160							27.0		13.6		2.6	3.0			112
140						6.0		9.8		21.6		3.2		3.0	98
120					13.6		228.0		3.8		5.4		3.2		84
100						1.4		17.0		5.8		2.8			70
80				2.4	2.2		470.0		1.6		1.3			2.2	56
60			1.6				5.6			1.8			2.4		42

DRAFT

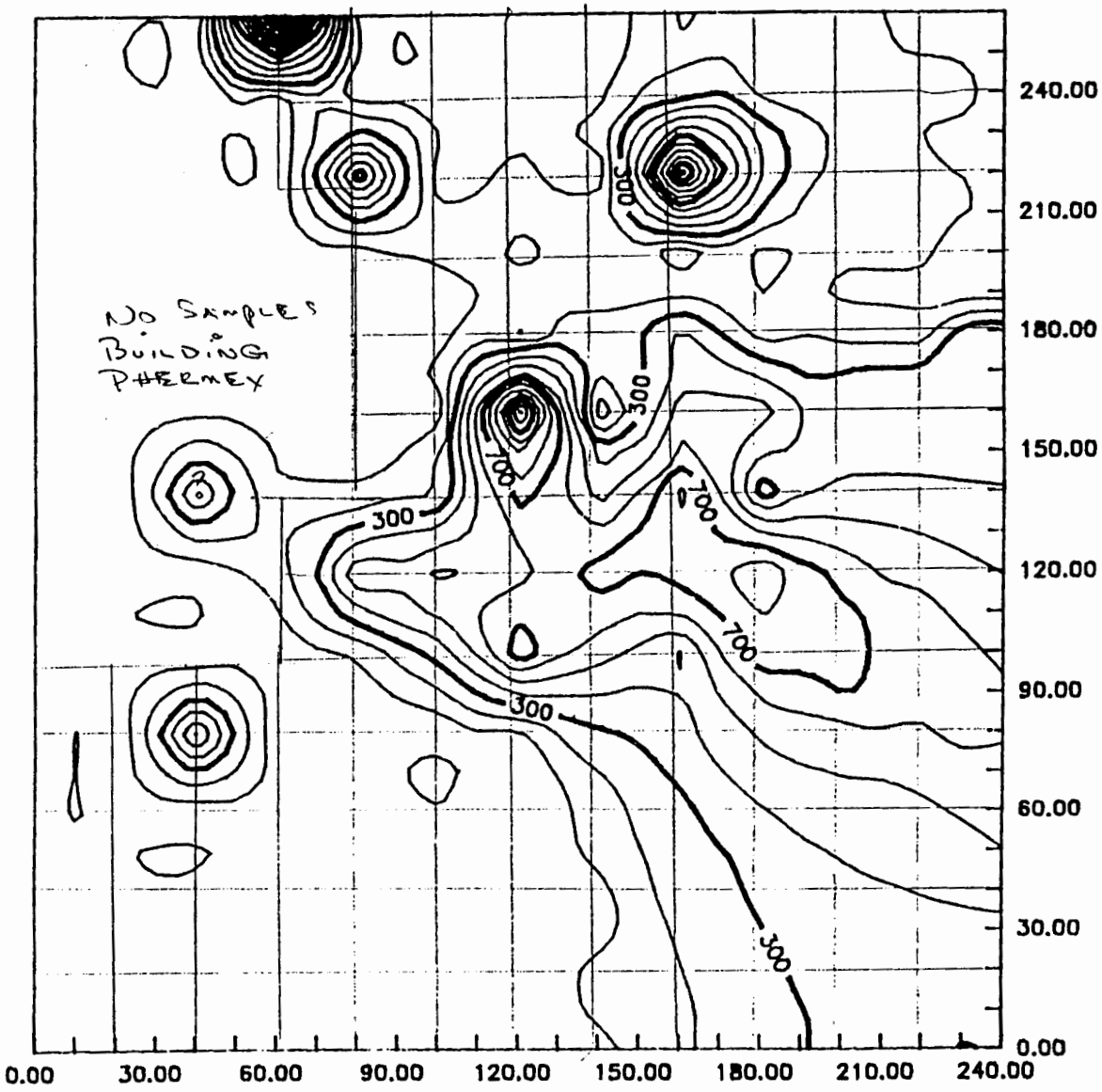
Phermex soil Beryllium ppm



Be samples at pink nodes

DRAFT

Phermex soil Uranium pCi/g



SAMPLED AT EACH GRID POINTS FOR URANIUM

TABLE 4.1.3 LOS ALAMOS NATIONAL LABORATORY - INORGANIC DATA - ENVIRONMENTAL PROBLEM I (continued)

AREA	TA-36	TA-36	TA-15-44	TA-15-44	TA-15-44	TA-15-44
LOCATION	ACTIVE F.S.	ACTIVE F.S.	ACTIVE F.S.	ACTIVE F.S.	ACTIVE F.S.	ACTIVE F.S.
TYPE OF LOCATION	L.SLOBBOVIA	L.SLOBBOVIA	FIRE SITE	FIRE SITE	FIRE SITE	FIRE SITE
SAMPLE NUMBER	LA20204XW	LA20205XW	LA20501XW	LA20502XW	LA20503XW	LA20504XW
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SDG NUMBER	LA20204XW	LA20204XW	LA20501XW	LA20501XW	LA20501XW	LA20501XW
FIELD MEASUREMENTS						
Depth (ft)	0-0.25	0-0.25	0-0.25	0-0.25	0-0.25	0-0.25
ANALYTES						
Antimony	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---
Barium	133	82.2	225	82.9	58.5	55.4
Beryllium	---	---	16.3	4.7	2.4	0.56 B
Cadmium	---	---	---	---	---	---
Chromium	6.9	4.9	13.5	5.4	5.7	5.2
Copper	---	---	747	779	46.0	4.1 B
Lead[c]	14.4	12.2	513	31.3	5.6	12.1
Mercury[b]	---	---	---	---	---	---
Nickel	---	---	12.6	---	5.7 B	---
Selenium	---	---	---	---	---	---
Silver	---	---	---	---	---	---
Thallium[d]	---	---	---	---	---	---
Zinc	37.9	39.1	194	39.1	33.0	21.0
% Solids	91.8	98.3	94.3	95.0	88.8	89.6
Total (Allowed) Hold Time[a]	154(182)d	154(182)d	14(182)d	14(182)d	14(182)d	14(182)d
Total (Allowed) Hold Time[b]	125(28)d*	125(28)d*	14(28)d	14(28)d	14(28)d	14(28)d
Total (Allowed) Hold Time[c]	132(182)d	132(182)d	7(182)d	7(182)d	7(182)d	7(182)d
Total (Allowed) Hold Time[d]			4(182)d	4(182)d	4(182)d	4(182)d

a. ICP.
b. CVAAS.
c. GFAAS-Pb.
d. GFAAS-Tl.

TABLE 4.1.5 LOS ALAMOS NATIONAL LABORATORY - RADIOLOGICAL DATA - ENVIRONMENTAL PROBLEM 1 (Continued)

AREA	TA-36	TA-36	TA-36	TA-15-44	TA-15-44
LOCATION	ACTIVE F.S.	ACTIVE F.S.	ACTIVE F.S.	ACTIVE F.S.	ACTIVE F.S.
TYPE OF LOCATION	L.SLOBBOVIA	L.SLOBBOVIA	L.SLOBBOVIA	FIRE SITE	FIRE SITE
SAMPLE NUMBER	LA20204W	LA20205D	LA20205W	LA20501D	LA20501W
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	pCi/kgW	pCi/kgD	pCi/kgW	pCi/kgD	pCi/kgW
Alpha Emitters					
Thorium - 230	na	1700 ±500	na	1100 ±300	na
Thorium - 232[a]	<15500 ±1200	na	<14060 ±990	na	<7020 ±640
Uranium - 234	----	na	----	na	89000 ±126000
Uranium - 235	198 ±73.0	na	100 ±74.0	na	3300 ±240
Uranium - 238[a]	<16600 ±1300	na	<14500 ±1100	na	<7570 ±990
Uranium - 238[b]	----	na	----	na	362000 ±34000
Uranium (all isotopes)[c]	na	4000 ±400	na	726000 ±73000	na
Gamma Emitters					
Potassium - 40	24800 ±3000	na	22700 ±3700	na	16800 ±2100
Cobalt - 56	----	na	----	na	----
Cesium - 137	722 ±82.0	na	534 ±94.0	na	55.0 ±38.0

a. Total unbroken chain activi[illegible] in equilibrium.
b. Activity in excess of U23[illegible] al chain.
c. Units are ug (/L, /kgW, or /kgD) instead of pCi (/L, /kgW, or /kgD).
d. This column contains the results of the radiological screening run.

TABLE 4.1.5 LOS ALAMOS NATIONAL LABORATORY - RADIOLOGICAL DATA - ENVIRONMENTAL PROBLEM 1 (Continued)

AREA	TA-15-44	TA-15-44	TA-15-44	TA-15-44	TA-15-44
LOCATION	ACTIVE F.S.	ACTIVE F.S.	ACTIVE F.S.	ACTIVE F.S.	ACTIVE F.S.
TYPE OF LOCATION	FIRE SITE	FIRE SITE	FIRE SITE	FIRE SITE	FIRE SITE
SAMPLE NUMBER	LA20502D	LA20502W	LA20503D	LA20503W	LA20504D
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	pCi/kgD	pCi/kgW	pCi/kgD	pCi/kgW	pCi/kgD
Alpha Emitters					
Thorium - 230	900 ±300	na	1500 ±500	na	800 ±400
Thorium - 232[a]	na	<8150 ±660	na	<11200 ±840	na
Uranium - 234	na	----	na	----	na
Uranium - 235	na	1380 ±110	na	600 ±63.0	na
Uranium - 238[a]	na	<7960 ±740	na	<12030 ±900	na
Uranium - 238[b]	na	128000 ±10000	na	48400 ±5600	na
Uranium (all isotopes)[c]	260000 ±26000	na	124000 ±12400	na	7000 ±700
Gamma Emitters					
Potassium - 40	na	20200 ±1700	na	21200 ±1900	na
Cobalt - 56	na	----	na	29.0 ±20.0	na
Cesium - 137	na	121 ±25.0	na	244 ±48.0	na

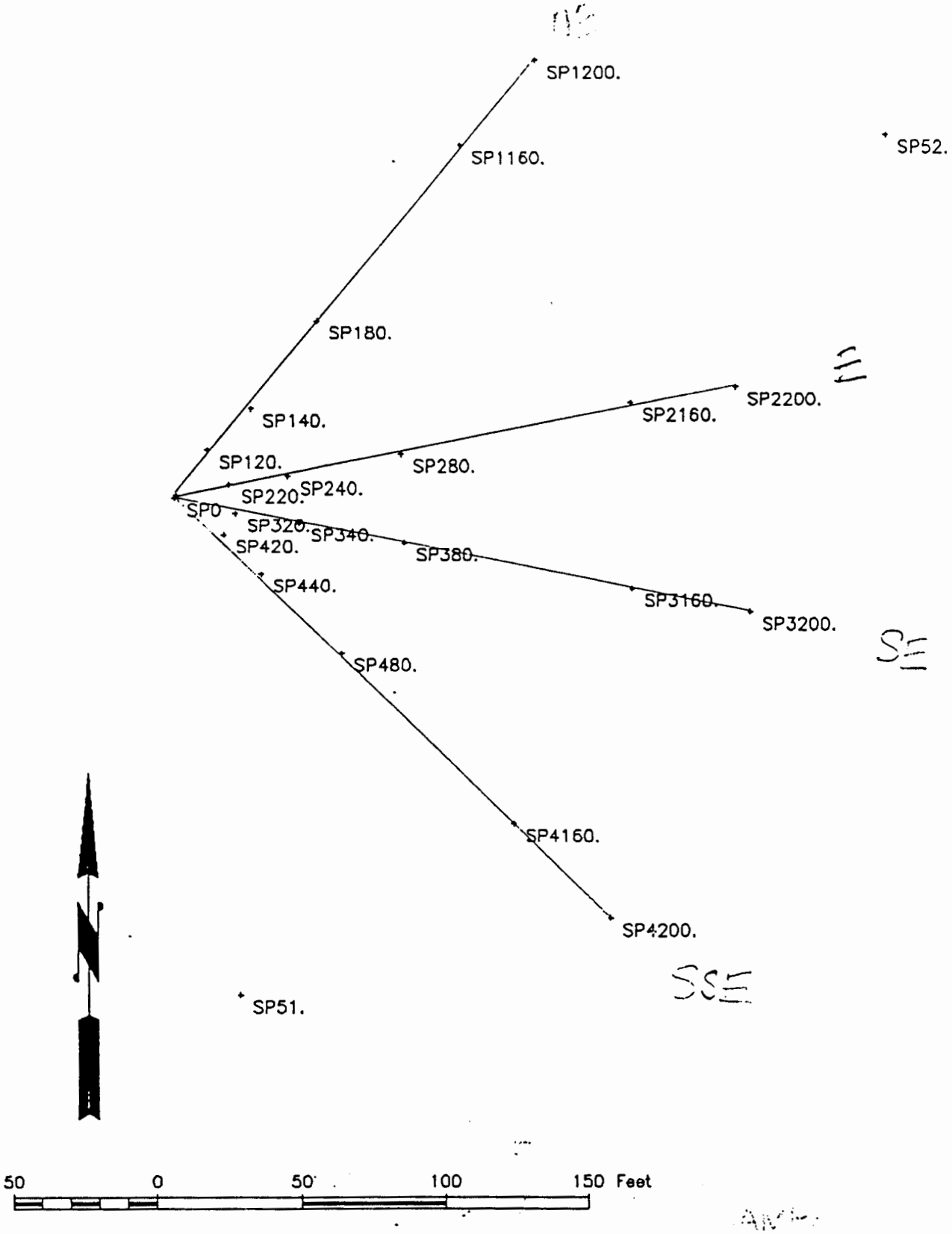
a. Total unbroken chain activity in equilibrium.
b. Activity in excess of U238 natural chain.
c. Units are ug (/L, /kgW, or /kgD) instead of pCi (/L, /kgW, or /kgD).
d. This column contains the results of the radiological screening run.

TABLE 4.1.5 LOS ALAMOS NATIONAL LABORATORY - RADIOLOGICAL DATA - ENVIRONMENTAL PROBLEM 1 (Continued)

AREA	TA-15-44
LOCATION	ACTIVE F.S.
TYPE OF LOCATION	FIRE SITE
SAMPLE NUMBER	LA20504W
MEDIA	SOIL
UNITS	pCi/kgW
Alpha Emitters	
Thorium - 230	na
Thorium - 232[a]	<11240 ±820
Uranium - 234	----
Uranium - 235	101 ±33.0
Uranium - 238[a]	<11940 ±890
Uranium - 238[b]	----
Uranium (all isotopes)[c]	na
Gamma Emitters	
Potassium - 40	21200 ±1600
Cobalt - 56	<30.0
Cesium - 137	157 ±28.0

a. Total unbroken chain activity in equilibrium.
b. Activity in excess of U238 natural chain.
c. Units are ug (/L, /kgW, or /kgD) instead of pCi (/L, /kgW, or /kgD).
d. This column contains the results of the radiological screening run.

FIGURE 1.



EM-8 WASTE SITE STUDIES	PHERMEX SAMPLE POINTS LOCATION TA-15
DR. BY: EDDIE TAFOYA DATE: 12/20/93	DRAWING NO. SHEET 1 OF 1

NUMBER	DESCRIPTION	NORTHING	EASTING	ELEVATION
100	SP0	1758281.5386	486617.0200	7149.4048
101	SP120.	1758298.0291	486628.2022	7149.8967
102	SP140.	1758312.3913	486643.4281	7149.6235
103	SP180.	1758343.0195	486666.2299	7148.8339
104	SP220.	1758286.1510	486635.8085	7149.5152
105	SP240.	1758288.8373	486656.1720	7148.9780
106	SP280.	1758296.4781	486695.3365	7148.5185
107	SP2160.	1758314.5071	486775.8775	7145.5443
108	SP2200.	1758320.1075	486812.3787	7144.0415
109	SP320.	1758276.0943	486637.9150	7149.3359
110	SP340.	1758272.6251	486659.9493	7148.8446
111	SP380.	1758265.6304	486696.4245	7148.4757
112	SP3160.	1758249.6728	486776.4377	7146.4587
113	SP3200.	1758241.5735	486817.4364	7145.0794
114	SP420.	1758268.6526	486633.8661	7149.3976
115	SP440.	1758254.7456	486646.9071	7149.4176
116	SP480.	1758226.7772	486674.7047	7149.1328
117	SP4160.	1758167.3480	486734.5860	7148.5166
118	SP4200.	1758134.5452	486768.4173	7148.3642
119	SP1160.	1758404.1306	486716.0328	7146.3034
120	SP1200.	1758433.7751	486742.5140	7144.6667
121	SP51.	1758107.5233	486639.3895	7136.9635
122	SP52.	1758408.4767	486864.6348	7130.6504

Total U

********** EM-9 ANALYTICAL REPORT **********

Prepared by: AKS on 12-Apr-1994

ANALYSIS: U REQUEST NUMBER: 14436 MATRIX: SS ANALYST: RICHARD PETERS PROGRAM CODE: M106

OWNER: Philip R. Fresquez GROUP: ESH-8 MAIL-STOP: K490 PHONE: 7-0815

ANALYTICAL TECHNIQUE: KPA ANALYTICAL PROCEDURE: NOTEBOOK: PAGE:

CUSTOMER SAMPLES:

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
TA-15-0-0	93.05337	160.5	16.1	UG/G	3/22/94	
TA-15-NE-20	93.05338	1307.7	130.8	UG/G	3/28/94	
TA-15-NE-40	93.05339	29.2	2.9	UG/G	3/22/94	
TA-15-NE-80	93.05340	786.2	78.6	UG/G	3/22/94	450.6 ± 575.4
TA-15-NE-160	93.05341	97.8	9.8	UG/G	3/22/94	
TA-15-NE-200	93.05342	32.1	3.2	UG/G	3/28/94	
TA-15-E-20	93.05343	2117.4	211.7	UG/G	3/28/94	
TA-15-E-40	93.05344	1057.5	105.8	UG/G	3/28/94	
TA-15-E-80	93.05345	350.8	35.1	UG/G	3/28/94	824.6 ± 823.3 $\bar{X}$ = 1,210.1 ug/g
TA-15-E-160	93.05346	54.2	5.4	UG/G	3/22/94	
TA-15-E-200	93.05347	48.7	4.9	UG/G	3/22/94	
TA-15-E-20R	93.05348	1318.8	131.9	UG/G	3/28/94	
TA-15-SE-20	93.05349	707.6	70.8	UG/G	3/22/94	
TA-15-SE-40	93.05350	674.9	67.5	UG/G	3/22/94	
TA-15-SE-80	93.05351	35.	3.5	UG/G	3/22/40	402.9 ± 396.8
TA-15-SE-160	93.05352	81.7	8.2	UG/G	3/22/94	
TA-15-SE-200	93.05353	25.6	2.6	UG/G	3/22/94	
TA-15-SE-20R	93.05354	892.4	89.2	UG/G	3/28/94	
TA15-SSE-20	93.05355	4137.5	413.8	UG/G	3/30/94	
TA15-SSE-40	93.05356	13397.5	1339.8	UG/G	4/08/94	3,610.9 ± 5,736.1
TA15-SSE-80	93.05357	89.5	9.	UG/G	4/08/94	
TA15-SSE-160	93.05358	429.	42.9	UG/G	3/30/94	
TA15-SSE-200	93.05359	0.8	0.1	UG/G	4/08/94	
TA-15-W1	93.05360	105.	10.5	UG/G	4/08/94	
TA-15-S1	93.05361	11.3	1.1	UG/G	3/28/94	

REPORT NUMBER: 19236

Total Hg

********** EM-9 ANALYTICAL REPORT **********

Prepared by: DJG on 7-Jul-1993

REQUEST NUMBER: 14434 MATRIX: SS ANALYST: HARRY PATTERSON PROGRAM CODE: M106

OWNER: Philip R. Fresquez GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0815

ANALYTICAL TECHNIQUE: CVAA ANALYTICAL PROCEDURE: 245.5 NOTEBOOK: PAGE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS (ppb)	COMPLETION DATE	COMMENT
TA-15-NE-20	93.05365	HG	< 20.		NG/G	6/22/93	
TA-15-NE-40	93.05366	HG	< 20.		NG/G	6/22/93	
TA-15-NE-80	93.05367	HG	< 10.		NG/G	6/22/93	
TA-15-NE-160	93.05368	HG	< 10.		NG/G	6/22/93	
TA-15-NE-200	93.05369	HG	< 20.		NG/G	6/22/93	
TA-15-E-20	93.05370	HG	< 20.		NG/G	6/22/93	
TA-15-E-40	93.05371	HG	< 10.		NG/G	6/22/93	
TA-15-E-80	93.05372	HG	< 20.		NG/G	6/22/93	
TA-15-E-160	93.05373	HG	< 20.		NG/G	6/22/93	
TA-15-E-200	93.05374	HG	< 20.		NG/G	6/22/93	
TA-15-E-20R	93.05375	HG	< 20.		NG/G	6/22/93	
TA-15-SE-20	93.05376	HG	< 20.		NG/G	6/22/93	
TA-15-SE-40	93.05377	HG	20.		NG/G	6/22/93	
TA-15-SE-80	93.05378	HG	< 20.		NG/G	6/22/93	
TA-15-SE-160	93.05379	HG	< 20.		NG/G	6/22/93	
TA-15-SE-200	93.05380	HG	< 20.		NG/G	6/22/93	
TA-15-SE-20R	93.05381	HG	< 20.		NG/G	6/22/93	
TA15-SSE-20	93.05382	HG	< 20.		NG/G	6/22/93	
TA15-SSE-40	93.05383	HG	< 20.		NG/G	6/25/93	
TA15-SSE-80	93.05384	HG	< 100.		NG/G	6/25/93	
TA15-SSE-160	93.05385	HG	< 20.		NG/G	6/25/93	
TA15-SSE-200	93.05386	HG	< 20.		NG/G	6/25/93	
~~TA-15-W1~~	~~93.05387~~	~~HG~~	< 20.		NG/G	6/25/93	
~~TA-15-S1~~	~~93.05388~~	~~HG~~	< 50.		NG/G	6/25/93	
TA15-RINSATE	93.05389	HG	< 0.2		UG/L	6/22/93	

< 20 ppm
ag/8

CUSTOMER SAMPLE DUPLICATES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
TA-15-0-0	93.05364	HG	< 20.		NG/G	6/22/93	
TA-15-0-0	93.05364	HG	< 20.		NG/G	6/22/93	
TA-15-S1	93.05388	HG	< 100.		NG/G	6/25/93	
TA15-RINSATE	93.05389	HG	0.3	0.2	UG/L	6/23/93	

********** EM-9 QUALITY ASSURANCE REPORT *********

Prepared by: DJG on 7-Jul-1993

REQUEST NUMBER: 14434 MATRIX: SS ANALYST: HARRY PATTERSON PROGRAM CODE: M106

OWNER: Philip R. Fresquez GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0815

NOTEBOOK: PAGE:

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
00.23653	HG	4.	0.4	UG/L	4.	0.2	6/22/93	UNDER CONTROL
00.23653	HG	4.2	0.4	UG/L	4.	0.2	6/25/93	UNDER CONTROL
00.23653	HG	4.2	0.4	UG/L	4.	0.2	6/25/93	UNDER CONTROL

SUMMARY OF CONTROL STATUS OF BLIND QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
93.05449	HG	< 10.		NG/G	5.	0.5	6/25/93	UNDER CONTROL
93.05450	HG	10.	10.	NG/G	5.1	0.5	6/22/93	UNDER CONTROL

REPORT NUMBER: 19236

Analyst	Reviewer	Section Leader	QA Officer
7/7/93	7/7/93	7/8/93	7/9/93
Date	Date	Date	Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

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MATRIX SPIKES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT
TA-15-0-0	93.05364	HG	1.	1.	NG/G	6/22/93	
TA-15-S1	93.05388	HG	2.	1.9	NG/G	6/25/93	

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REPORT NUMBER: 19235

total Be, Ga, Pb Th.

********** EM-9 ANALYTICAL REPORT **********

Prepared by: DJG on 7-Jul-1993

REQUEST NUMBER: 14434 MATRIX: SS ANALYST: CYNTHIA MAHAN PROGRAM CODE: M106

OWNER: Philip R. Fresquez GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0815

ANALYTICAL TECHNIQUE: ICPMS ANALYTICAL PROCEDURE: EPA6020 NOTEBOOK: Y04106 PAGE: 71

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
TA-15-0-0	93.05364	BE	0.6	0.3	UG/G	6/21/93	
TA-15-0-0	93.05364	GA	1.2	0.2	UG/G	6/21/93	
TA-15-0-0	93.05364	PB	230.	16.	UG/G	6/21/93	
TA-15-0-0	93.05364	TH	2.5	0.4	UG/G	6/21/93	
TA-15-NE-20	93.05365	BE	18.3	3.6	UG/G	6/21/93	
TA-15-NE-20	93.05365	GA	1.7	0.3	UG/G	6/21/93	
TA-15-NE-20	93.05365	PB	172.	4.	UG/G	6/21/93	
TA-15-NE-20	93.05365	TH	1.8	0.2	UG/G	6/21/93	
TA-15-NE-40	93.05366	BE	0.8	0.4	UG/G	6/21/93	
TA-15-NE-40	93.05366	GA	0.8	0.1	UG/G	6/21/93	
TA-15-NE-40	93.05366	PB	29.7	1.3	UG/G	6/21/93	
TA-15-NE-40	93.05366	TH	1.2	0.1	UG/G	6/21/93	
TA-15-NE-80	93.05367	BE	8.8	1.5	UG/G	6/21/93	
TA-15-NE-80	93.05367	GA	1.3	0.3	UG/G	6/21/93	
TA-15-NE-80	93.05367	PB	28.8	0.8	UG/G	6/21/93	
TA-15-NE-80	93.05367	TH	1.9	0.1	UG/G	6/21/93	
TA-15-NE-160	93.05368	BE	1.1	0.6	UG/G	6/21/93	
TA-15-NE-160	93.05368	GA	4.	0.7	UG/G	6/21/93	
TA-15-NE-160	93.05368	PB	36.7	1.4	UG/G	6/21/93	
TA-15-NE-160	93.05368	TH	3.5	0.2	UG/G	6/21/93	
TA-15-NE-200	93.05369	BE	0.6	0.3	UG/G	6/21/93	
TA-15-NE-200	93.05369	GA	3.5	0.4	UG/G	6/21/93	
TA-15-NE-200	93.05369	PB	25.4	1.	UG/G	6/21/93	
TA-15-NE-200	93.05369	TH	4.3	0.5	UG/G	6/21/93	
TA-15-E-20	93.05370	BE	9.7	2.1	UG/G	6/21/93	
TA-15-E-20	93.05370	GA	1.4	0.3	UG/G	6/21/93	
TA-15-E-20	93.05370	PB	94.8	1.7	UG/G	6/21/93	
TA-15-E-20	93.05370	TH	2.1	0.2	UG/G	6/21/93	
TA-15-E-40	93.05371	BE	3.6	0.5	UG/G	6/21/93	
TA-15-E-40	93.05371	GA	1.8	0.3	UG/G	6/21/93	
TA-15-E-40	93.05371	PB	149.	9.5	UG/G	6/21/93	
TA-15-E-40	93.05371	TH	2.5	0.2	UG/G	6/21/93	
TA-15-E-80	93.05372	BE	1.8	0.5	UG/G	6/21/93	
TA-15-E-80	93.05372	GA	1.7	0.3	UG/G	6/21/93	
TA-15-E-80	93.05372	PB	28.8	0.6	UG/G	6/21/93	
TA-15-E-80	93.05372	TH	2.2	0.3	UG/G	6/21/93	
TA-15-E-160	93.05373	BE	< 1.		UG/G	6/21/93	

TA-15-E-160	93.05373	GA	4.9	0.8	UG/G	6/21/93
TA-15-E-160	93.05373	PB	14.9	0.5	UG/G	6/21/93
TA-15-E-160	93.05373	TH	5.5	0.5	UG/G	6/21/93
TA-15-E-200	93.05374	BE	0.2	0.2	UG/G	6/21/93
TA-15-E-200	93.05374	GA	1.1	0.1	UG/G	6/21/93
TA-15-E-200	93.05374	PB	4.2	1.3	UG/G	6/21/93
TA-15-E-200	93.05374	TH	1.2	0.2	UG/G	6/21/93
TA-15-E-20R	93.05375	BE	63.9	8.5	UG/G	6/21/93
TA-15-E-20R	93.05375	GA	2.	0.2	UG/G	6/21/93
TA-15-E-20R	93.05375	PB	76.4	3.9	UG/G	6/21/93
TA-15-E-20R	93.05375	TH	3.1	0.7	UG/G	6/21/93
TA-15-SE-20	93.05376	BE	3.1	0.7	UG/G	6/21/93
TA-15-SE-20	93.05376	GA	1.7	0.3	UG/G	6/21/93
TA-15-SE-20	93.05376	PB	97.	3.4	UG/G	6/21/93
TA-15-SE-20	93.05376	TH	2.4	0.5	UG/G	6/21/93
TA-15-SE-40	93.05377	BE	0.9	0.7	UG/G	6/21/93
TA-15-SE-40	93.05377	GA	2.4	0.3	UG/G	6/21/93
TA-15-SE-40	93.05377	PB	70.	3.1	UG/G	6/21/93
TA-15-SE-40	93.05377	TH	3.3	0.6	UG/G	6/21/93
TA-15-SE-80	93.05378	BE	0.3	0.3	UG/G	6/21/93
TA-15-SE-80	93.05378	GA	2.9	1.3	UG/G	6/21/93
TA-15-SE-80	93.05378	PB	7.6	0.2	UG/G	6/21/93
TA-15-SE-80	93.05378	TH	2.8	0.3	UG/G	6/21/93
TA-15-SE-160	93.05379	BE	0.9	0.1	UG/G	6/21/93
TA-15-SE-160	93.05379	GA	2.6	0.3	UG/G	6/21/93
TA-15-SE-160	93.05379	PB	18.1	0.6	UG/G	6/21/93
TA-15-SE-160	93.05379	TH	4.	0.7	UG/G	6/21/93
TA-15-SE-200	93.05380	BE	0.4	0.3	UG/G	6/21/93
TA-15-SE-200	93.05380	GA	4.7	0.6	UG/G	6/21/93
TA-15-SE-200	93.05380	PB	22.1	1.3	UG/G	6/21/93
TA-15-SE-200	93.05380	TH	4.7	1.	UG/G	6/21/93
TA-15-SE-20R	93.05381	BE	9.8	2.4	UG/G	6/21/93
TA-15-SE-20R	93.05381	GA	1.6	0.1	UG/G	6/21/93
TA-15-SE-20R	93.05381	PB	41.2	1.9	UG/G	6/21/93
TA-15-SE-20R	93.05381	TH	2.4	0.4	UG/G	6/21/93
TA15-SSE-20	93.05382	BE	6.2	1.	UG/G	6/21/93
TA15-SSE-20	93.05382	GA	2.1	0.2	UG/G	6/21/93
TA15-SSE-20	93.05382	PB	81.7	4.6	UG/G	6/21/93
TA15-SSE-20	93.05382	TH	3.2	0.4	UG/G	6/21/93
TA15-SSE-40	93.05383	BE	1.2	0.9	UG/G	6/21/93
TA15-SSE-40	93.05383	GA	3.3	0.6	UG/G	6/21/93
TA15-SSE-40	93.05383	PB	24.9	2.3	UG/G	6/21/93
TA15-SSE-40	93.05383	TH	4.5	0.2	UG/G	6/21/93
TA15-SSE-80	93.05384	BE	1.2	0.3	UG/G	6/21/93
TA15-SSE-80	93.05384	GA	3.	0.7	UG/G	6/21/93
TA15-SSE-80	93.05384	PB	32.9	2.8	UG/G	6/21/93
TA15-SSE-80	93.05384	TH	3.8	1.2	UG/G	6/21/93
TA15-SSE-160	93.05385	BE	218.	28.	UG/G	6/21/93
TA15-SSE-160	93.05385	GA	2.5	0.6	UG/G	6/21/93
TA15-SSE-160	93.05385	PB	86.5	9.9	UG/G	6/21/93
TA15-SSE-160	93.05385	TH	3.8	0.3	UG/G	6/21/93
TA15-SSE-200	93.05386	BE	2.6	1.7	UG/G	6/21/93
TA15-SSE-200	93.05386	GA	1.6	0.7	UG/G	6/21/93
TA15-SSE-200	93.05386	PB	2.9	0.2	UG/G	6/21/93
TA15-SSE-200	93.05386	TH	2.8	0.2	UG/G	6/21/93
TA-15-W1	93.05387	BE	3.1	2.7	UG/G	6/21/93
TA-15-W1	93.05387	GA	5.8	1.	UG/G	6/21/93
TA-15-W1	93.05387	PB	16.	1.8	UG/G	6/21/93
TA-15-W1	93.05387	TH	4.2	0.3	UG/G	6/21/93
TA-15-S1	93.05388	BE	1.2	0.4	UG/G	6/21/93

TA-15-S1	93.05388	GA	4.6	1.3	UG/G	6/21/93
TA-15-S1	93.05388	PB	9.5	0.8	UG/G	6/21/93
TA-15-S1	93.05388	TH	4.8	0.3	UG/G	6/21/93
TA15-RINSATE	93.05389	BE	14.9	0.9	UG/L	6/21/93
TA15-RINSATE	93.05389	GA	< 1.		UG/L	6/21/93
TA15-RINSATE	93.05389	PB	< 1.		UG/L	6/21/93
TA15-RINSATE	93.05389	TH	< 1.		UG/L	6/21/93

CUSTOMER SAMPLE DUPLICATES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
TA15-SSE-40	93.05383	BE	5.8	1.8	UG/G	6/21/93	
TA15-SSE-40	93.05383	GA	3.	0.5	UG/G	6/21/93	
TA15-SSE-40	93.05383	PB	19.	1.6	UG/G	6/21/93	
TA15-SSE-40	93.05383	TH	3.9	0.3	UG/G	6/21/93	
TA15-RINSATE	93.05389	BE	6.4	1.5	UG/L	6/21/93	
TA15-RINSATE	93.05389	GA	< 1.		UG/L	6/21/93	
TA15-RINSATE	93.05389	PB	< 1.		UG/L	6/21/93	
TA15-RINSATE	93.05389	TH	< 1.		UG/L	6/21/93	

MATRIX SPIKES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT
TA15-SSE-40	93.05383	BE	51.45	44.2	UG/G	6/21/93	
TA15-SSE-40	93.05383	GA	5.45		UG/G	6/21/93	
TA15-SSE-40	93.05383	PB	51.45	43.8	UG/G	6/21/93	
TA15-SSE-40	93.05383	TH	5.45	4.1	UG/G	6/21/93	
TA15-RINSATE	93.05389	BE	100.	93.3	UG/L	6/21/93	DRY DURING PREP
TA15-RINSATE	93.05389	GA	10.		UG/L	6/21/93	DRY DURING PREP
TA15-RINSATE	93.05389	PB	100.	103.	UG/L	6/21/93	DRY DURING PREP
TA15-RINSATE	93.05389	TH	10.	10.7	UG/L	6/21/93	DRY DURING PREP

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REPORT NUMBER: 19235 (continued)

********** EM-9 QUALITY ASSURANCE REPORT *********

Prepared by: DJG on 7-Jul-1993

REQUEST NUMBER: 14434 MATRIX: SS ANALYST: CYNTHIA MAHAN PROGRAM CODE: M106

OWNER: Philip R. Fresquez GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0815

NOTEBOOK: Y04106 PAGE: 71

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
00.00378	BE	13.5	8.7	UG/L	23.2	2.2	6/21/93	UNDER CONTROL
00.00378	BE	12.8	8.2	UG/L	23.2	2.2	6/21/93	UNDER CONTROL
00.00378	BE	20.2	5.2	UG/L	23.2	2.2	6/21/93	UNDER CONTROL
00.00378	BE	12.6	7.2	UG/L	23.2	2.2	6/21/93	UNDER CONTROL
00.00378	BE	31.	13.5	UG/L	23.2	2.2	6/21/93	UNDER CONTROL
00.00378	BE	20.5	5.5	UG/L	23.2	2.2	6/21/93	UNDER CONTROL
00.00378	BE	29.7	8.	UG/L	23.2	2.2	6/21/93	UNDER CONTROL
00.00378	BE	42.8	23.5	UG/L	23.2	2.2	6/21/93	UNDER CONTROL
00.00378	BE	26.2	6.7	UG/L	23.2	2.2	6/21/93	UNDER CONTROL
00.00378	BE	24.	4.6	UG/L	23.2	2.2	6/21/93	UNDER CONTROL
00.00378	BE	11.3	7.5	UG/L	23.2	2.2	6/21/93	UNDER CONTROL
00.00378	BE	18.	7.6	UG/L	23.2	2.2	6/21/93	UNDER CONTROL
00.00378	GA	1.	1.	UG/L	0.0		6/21/93	UNDER CONTROL
00.00378	PB	33.6	2.6	UG/L	35.3	0.9	6/21/93	UNDER CONTROL
00.00378	PB	36.5	5.3	UG/L	35.3	0.9	6/21/93	UNDER CONTROL
00.00378	PB	33.2	3.5	UG/L	35.3	0.9	6/21/93	UNDER CONTROL
00.00378	PB	35.	2.5	UG/L	35.3	0.9	6/21/93	UNDER CONTROL
00.00378	PB	32.8	0.8	UG/L	35.3	0.9	6/21/93	WARNING 2-3 SIG
00.00378	PB	35.9	9.	UG/L	35.3	0.9	6/21/93	UNDER CONTROL
00.00378	PB	35.1	3.5	UG/L	35.3	0.9	6/21/93	UNDER CONTROL
00.00378	PB	37.2	2.6	UG/L	35.3	0.9	6/21/93	UNDER CONTROL
00.00378	PB	34.4	3.	UG/L	35.3	0.9	6/21/93	UNDER CONTROL
00.00378	TH	1.	1.	UG/L	0.0		6/21/93	UNDER CONTROL
00.00594	BE	0.35	0.22	UG/G	1.98	0.29	6/21/93	OUT OF CONTROL
00.00594	BE	1.1	0.3	UG/G	1.98	0.29	6/21/93	WARNING 2-3 SIG
00.00594	GA	10.2	0.9	UG/G	24.1	0.8	6/21/93	OUT OF CONTROL
00.00594	GA	12.	1.6	UG/G	24.1	0.8	6/21/93	OUT OF CONTROL
00.00594	PB	9.6	1.3	UG/G	21.	4.	6/21/93	WARNING 2-3 SIG
00.00594	PB	10.2	0.6	UG/G	21.	4.	6/21/93	WARNING 2-3 SIG
00.00594	TH	11.8	1.7	UG/G	12.4	1.2	6/21/93	UNDER CONTROL
00.00594	TH	9.5	0.5	UG/G	12.4	1.2	6/21/93	WARNING 2-3 SIG
00.00598	BE	0.5	0.2	UG/G	0.81	0.15	6/21/93	UNDER CONTROL
00.00598	BE	1.6	0.3	UG/G	0.81	0.15	6/21/93	WARNING 2-3 SIG

00.00598 GA	2.6	..2	UG/G	6.4	0	6/21/93	OUT OF CONTROL
00.00598 GA	2.3	0.4	UG/G	6.4	0.3	6/21/93	OUT OF CONTROL
00.00598 PB	7.2	0.4	UG/G	14.	3.	6/21/93	WARNING 2-3 SIG
00.00598 PB	7.9	0.5	UG/G	14.	3.	6/21/93	WARNING 2-3 SIG
00.00598 TH	2.2	0.6	UG/G	3.88	0.21	6/21/93	WARNING 2-3 SIG
00.00598 TH	2.5	0.3	UG/G	3.88	0.21	6/21/93	OUT OF CONTROL

SUMMARY OF CONTROL STATUS OF BLIND QC SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT
93.05445	BE	50.5	9.4	UG/L	48.	2.	6/21/93	UNDER CONTROL
93.05445	PB	7.1	0.9	UG/L	6.	0.3	6/16/93	UNDER CONTROL
93.05446	BE	11.7	5.2	UG/L	15.	1.	6/21/93	UNDER CONTROL
93.05446	PB	< 1.		UG/L	0.0		6/21/93	UNDER CONTROL
93.05447	BE	10.8	6.3	UG/L	7.	0.3	6/21/93	UNDER CONTROL
93.05447	PB	19.5	0.6	UG/L	18.	1.	6/21/93	UNDER CONTROL
93.05451	TH	55.9	5.8	UG/L	46.	2.	6/21/93	UNDER CONTROL
93.05452	TH	10.3	0.6	UG/L	9.	0.39	6/21/93	UNDER CONTROL
93.05453	TH	6.2	1.6	UG/L	5.5	0.24	6/21/93	UNDER CONTROL
93.05454	GA	112.	9.4	UG/L	100.	4.	6/21/93	UNDER CONTROL
93.05454	GA	90.3	6.8	UG/L	100.	4.	6/21/93	UNDER CONTROL
93.05455	GA	5.7	0.6	UG/L	5.	0.22	6/21/93	UNDER CONTROL
93.05456	GA	55.1	3.5	UG/L	50.	2.	6/21/93	UNDER CONTROL
93.07083	CD	17.6	1.8	UG/L	15.	1.	5/10/93	UNDER CONTROL
93.07083	CR	42.9	4.3	UG/L	42.	2.	5/10/93	UNDER CONTROL
93.07083	PB	9.4	1.	UG/L	7.	0.3	5/11/93	WARNING 2-3 SIG

REPORT NUMBER: 19235

Analyst	Reviewer	Section Leader	QA Officer
7/7/93	7/7/93	7/8/93	7/8/93
Date	Date	Date	Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

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July 8, 1993

To: Phil Fresquez

From: Martin Koby, EM-9

Subject: Trace Metal Analytical Results - RN14434

This summary pertains to the analytical results obtained for beryllium, gallium, lead, and thorium for Request Number 14434. Each sample was prepared for analysis by digesting with a combination of nitric acid and hydrogen peroxide. Two standard reference material soils were taken through the analytical process concurrently with the submitted samples. This was performed in duplicate and the results obtained give an indication of the method efficiency. You will note that an out of control status is indicated for several of the open QC results. It should be emphasized that the preparation technique used is essentially a leaching method and does not constitute a total decomposition of the soil matrix. Thus, when the obtained results, which reflect a leachable concentration, are compared to the certified values expressed as a total concentration, it is not unexpected that the status could be "out-of-control".

These results can be summarized on an element specific basis:

Beryllium	results were inconsistent with recoveries between 17.7 and 197 %
Gallium	results were consistent, but out of control, with recoveries between 35.9 and 49.8 %
Lead	results were consistent, but low, with recoveries between 45.7 and 56.4 %
Thorium	results were generally in control with recoveries between 56.7 and 95.2 %

The blind QC samples all had acceptable results and no problems were noted with the submitted samples. If you have any questions or concerns regarding this data please contact me at 667-9996. You will be receiving additional results for the TCLP extractable elements in the near future.

Regards,

Martin W. Koby

Martin

ok CMA 7/8/93

EGG-ES-8204

Los Alamos Environmental Restoration Records Processing Facility

ER Record I.D.# 0015365

Los Alamos National Laboratory

Sampling and Analysis Data Document

This document contains uninterpreted sampling and analytical data. The data will be interpreted by the DOE Environmental Survey Team and used to modify, as appropriate, the tentative Survey findings contained in the Environmental Survey Preliminary Report. Final Survey findings will be presented in the Environmental Survey Summary Report.

DOE 1989, 0271

DRAFT

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Volume I-A

November 1989

DEPARTMENT OF ENERGY

ENVIRONMENTAL SURVEY