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HSWA LANL 4/1129/35
LA-UR- 98-3825

1998
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Date: September 30, 1998
Refer to: EM/ER:98-395

Mr. Benito Garcia
NMED-HRMB
P.O.Box 26110
Santa Fe, NM 87501

SUBJECT: SUBMITTAL OF RFI REPORT FOR PRSs 35-003(a, b, c, and n) (FORMER OU 1129, FU 4) TO FULFILL FY98 WORK SCHEDULE COMMITMENTS

Dear Mr. Garcia:

Enclosed please find two copies of the Resource Conservation and Recovery Act Facility Investigation Report for Potential Release Sites 35-003(a, b, c, and n) and the Certification, which are being submitted to the New Mexico Environment Department for fulfillment of the Fiscal Year 1998 Work Schedule Commitment.

If you have any questions or comments, please contact Victoria George at (505) 665-6953.

Sincerely,

Julie A. Canepa, Program Manager
LANL/ER Project

Sincerely,

Theodore J. Taylor, Program Manager
DOE/LAAO

JC/TT/DB/dm

Enclosures: (1) Two RFI Reports for PRSs 35-003(a, b, c, and n) (Former OU 1129, FU 4)
(2) Certification

TU

5278

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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 gathered and evaluated 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: RFI Report for PRSs 35-003(a, b, c, and n) (Former OU 1129, FU 4)

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LA-UR-98-3825
September 1998

RFI Report for Potential Release Sites

35-003(a, b, c, and n)

Environmental Restoration Project
A Department of Energy Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY
Los Alamos, NM 87545

Data disk included with this document

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EXECUTIVE SUMMARY

This report describes the Phase I results of the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) to evaluate potential contamination at Technical Area (TA) -35. TA-35 is located within former Operable Unit 1129, which is now part of the Remedial Actions Focus Area of the Environmental Restoration (ER) Project at Los Alamos National Laboratory (LANL or the Laboratory). Included in this report are the results of investigations of Potential Release Sites (PRSs) 35-003(a, b, c, and n). Each of these PRSs is designated a solid waste management unit (SWMU).

PRS 35-003(n) is the site of the former phase separator pit (PSP) associated with the TA-35 wastewater treatment facility that operated from 1951 to about 1963. PRSs 35-003(a, b, and c) are the sites of three former stainless steel underground holding tanks associated with the PSP. These structures were decommissioned and removed in 1996. These four PRSs are grouped together for evaluation because of their close proximity to one another and because similar materials were processed or temporarily stored in the four structures during their period of operation.

The PSP was a large, subterranean, reinforced concrete structure that housed equipment used to treat vented air exhaust from laboratory hoods in building TA-35-2, a laboratory and office building. The three holding tanks were connected to the PSP by several underground pipelines and were used to retain the waste liquids before treatment and eventual discharge into larger waste holding tanks (former structure TA-35-10). Building TA-35-2 was used for a wide variety of research operations during the time the wastewater treatment facility was in use, including two experimental reactors, a hot cell used for preparing sources of lanthanum-140, plutonium research laboratories, and a facility that handled lithium tritide components (Emility 1958, ER ID 00793, pp. 1–10).

Samples collected from boreholes drilled in 1993 as part of characterization activities in preparation for decommissioning indicated that the bedding materials around the structures contained elevated levels of several radionuclides, including tritium, plutonium-238, and strontium-90. Radionuclides and several volatile organic compounds were detected in a decommissioning sample from the holding tank at PRS 35-003(b). Based on historical operations at building TA-35-2 and on results of the decommissioning samples, the list of potential contaminants initially identified for the PSP and holding tanks included radionuclides, metals, and volatile and semivolatile organic compounds. No contaminant releases were known to have occurred from the PSP or holding tanks.

The purpose of this Phase I RFI was to determine what contaminants, if any, were released from the PSP and holding tanks; which of those contaminants are present at concentrations above background or other levels of concern; and whether the extent of contamination is such that a corrective action could be completed in conjunction with decommissioning of the structures.

RFI sampling was performed in conjunction with decommissioning of the PSP and holding tanks in 1996. The RFI team was present before and during decommissioning to observe the condition of the structures and inspect them for signs of leakage. The holding tanks, when removed, were observed to be in good condition with no visible leaks or cracks. No cracks were found in the floor or walls of the phase separator pit, and no staining was observed under any of the structures. A radiation grid survey was conducted on the surface of the underlying bedding material prior to RFI sampling to determine whether any "hot spots" were present to help guide the sampling. This survey included 90 screening measurements of alpha and beta/gamma radiation, and organic vapors. Beta/gamma measurements were within the range of normal background radiation for TA-35, and no alpha radiation or organic vapors were detected. Neither visual observations nor field screening instruments indicated that a release had occurred. Therefore, sample

locations were biased on the basis of knowledge of the PSP and holding tank system design parameters. Samples were collected at locations considered most likely to have received any releases if they had occurred. These were judged to be directly under the holding tanks and under the low-lying portions of the PSP. Two depths were sampled at each of six locations—one location under each holding tank and three locations under the PSP—for a total of twelve samples, plus one field duplicate sample. Samples were taken at the surface of the excavation floor (i.e., directly beneath the structure) and at depths of 1.5 to 5 ft below the surface (20 to 33 ft below current grade). The material sampled was bedding material and underlying tuff bedrock. After RFI sample collection was completed and preliminary data analysis indicated that no further corrective action was warranted at the site, the excavation was backfilled with clean fill material, and the surface of the site was recontoured and covered with asphalt pavement. The area of the PRSs are now 20 to 33 ft below the current surface.

All twelve of the RFI samples were analyzed for radionuclides, including tritium, strontium-90, isotopes of plutonium and uranium, and a gamma spectroscopy suite. Six of the samples were also analyzed for volatile and semivolatile organic compounds and metals. The results of quality assurance/quality control (QA/QC) reviews of the data indicated no significant problems with data quality, with the exception of four inorganic analytes (antimony, cadmium, silver, and thallium), for which analytical detection limits were greater than LANL background values of those elements.

Based on the analytical results, several analytes were identified as contaminants of potential concern (COPCs) for PRSs 35-003-(a, b, c, and n) either because of their presence at concentrations slightly above background values or because of detection limits that were not sufficiently low. Inorganic COPCs are antimony, cadmium, calcium, mercury, silver, thallium, and zinc. Radionuclide COPCs are americium-241, cesium-137, cobalt-60, plutonium-239, strontium-90, and tritium. Organic COPCs are acetone and trichloroethene.

The RFI data were evaluated in the context of site conditions following decommissioning activities. As described in the revised Site Conceptual Model in Section 2.3.5, the presence of clean backfill at depths between 20 and 33 ft overlying the grade of the PRSs results in the severance of exposure pathways by which human or ecological receptors could come in contact with any residual contamination. For this reason, and because the results of both D&D and ER radiological surveys and visual inspections indicated that releases to the environment from these PRS were either minimal or nonexistent, it was concluded that collection of additional analytical data was unnecessary to support risk-based decisions. Although the analytical data alone are not adequate to perform quantitative risk analyses or to rigorously define the extent of contamination to background concentrations, they are adequate to confirm the hypothesis advanced in the preliminary Site Conceptual Model in Section 2.3.3, that no large-scale releases have occurred by which contaminants may have migrated a significant distance in the subsurface. An additional consideration at this site is that the area is expected to remain under industrial use by LANL for the foreseeable future and the signature contaminant associated with PRS activities, Sr-90, has a half-life of approximately 30 years. Therefore, any residual Sr-90 will naturally disappear within approximately 100 to 200 years.

The lack of migration pathways results in no calculable risk associated with the contaminants detected at the site. It is therefore recommended that PRSs 35-003(a, b, c, and n) be proposed for No Further Action (NFA) under NFA Criterion 5, as described in Section II.B.4.a.(4).(b), "No Further Action (NFA) Proposals Criteria," in the *NMED RCRA Permits Management Program Document Requirement Guide* (NMED 1998, ER ID 57897, p. 1). This recommendation is summarized in Table ES-1.

TABLE ES-1

PRSs 35-003(a, b, c, and n)
SUMMARY OF PROPOSED ACTIONS

PRS No.	PRS Description	HSWA[a]	Radionuclide Component[b]	Proposed Action	Rationale for Recommendation	Section No.
35-003(a)	Former underground holding tank	Yes	Yes	NFA, Criterion 5[c]	The SWMU has been characterized; contaminants pose an acceptable level of risk under current and projected future land use.	2.0
35-003(b)	Former underground holding tank	Yes	Yes	NFA, Criterion 5[c]	The SWMU has been characterized; contaminants pose an acceptable level of risk under current and projected future land use.	2.0
35-003(c)	Former underground holding tank	Yes	Yes	NFA, Criterion 5[c]	The SWMU has been characterized; contaminants pose an acceptable level of risk under current and projected future land use.	2.0
35-003(n)	Former phase separator pit	Yes	Yes	NFA, Criterion 5[c]	The SWMU has been characterized; contaminants pose an acceptable level of risk under current and projected future land use.	2.0

a. If the site is listed in Module VIII of the Laboratory's Hazardous Waste Facility Permit, then "yes" applies. Otherwise, "no" applies.

b. If a release has occurred at the PRS and radionuclides are associated with the release, then "yes" applies. Otherwise, "no" applies.

c. NFA Criteria are listed in Section II.B.4.a.(4).(b), "No Further Action (NFA) Proposals Criteria," in the *NMED RCRA Permits Management Program Document Requirement Guide* (NMED 1998, ER ID 57897, p. 1).

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1.0 INTRODUCTION

Los Alamos National Laboratory (LANL or the Laboratory) is a multidisciplinary research facility owned by the Department of Energy (DOE) and managed by the University of California. The Laboratory is located in north-central New Mexico, approximately 60 miles northeast of Albuquerque and 20 miles northwest of Santa Fe. The Laboratory site covers 43 square miles of the Pajarito Plateau, which consists of a series of fingerlike mesas that are separated by deep canyons. These canyons contain ephemeral and intermittent streams running from west to east. Mesa tops range in elevation from approximately 6,200 ft to 7,800 ft. The eastern portion of the plateau stands 300 to 900 ft above the Rio Grande.

The Laboratory's Environmental Restoration (ER) Project is involved in a national effort by the DOE to clean up facilities that were formerly involved in weapons production. The goal of the ER Project is to ensure that DOE's past operations do not threaten human or environmental health and safety in and around Los Alamos County, New Mexico. To achieve that goal, the ER Project is currently investigating sites potentially contaminated by past Laboratory operations.

The sites under investigation are either solid waste management units (SWMUs) or areas of concern (AOCs). In the LANL ER Project, SWMUs and AOCs are collectively referred to as potential release sites (PRSs).

This investigation, including sampling and analysis, is conducted under the requirements of the Resource Conservation and Recovery Act.

For PRSs 35-003(a, b, c, and n), the investigation is in accordance with the Hazardous and Solid Wastes Amendments (HSWA) of 1984 and follows the requirements in Module VIII of the Laboratory's Hazardous Waste Facility Permit (EPA 1990, ER ID 01585). Module VIII was issued to the Laboratory by the US Environmental Protection Agency (EPA) on May 23, 1990, and modified on May 19, 1994.

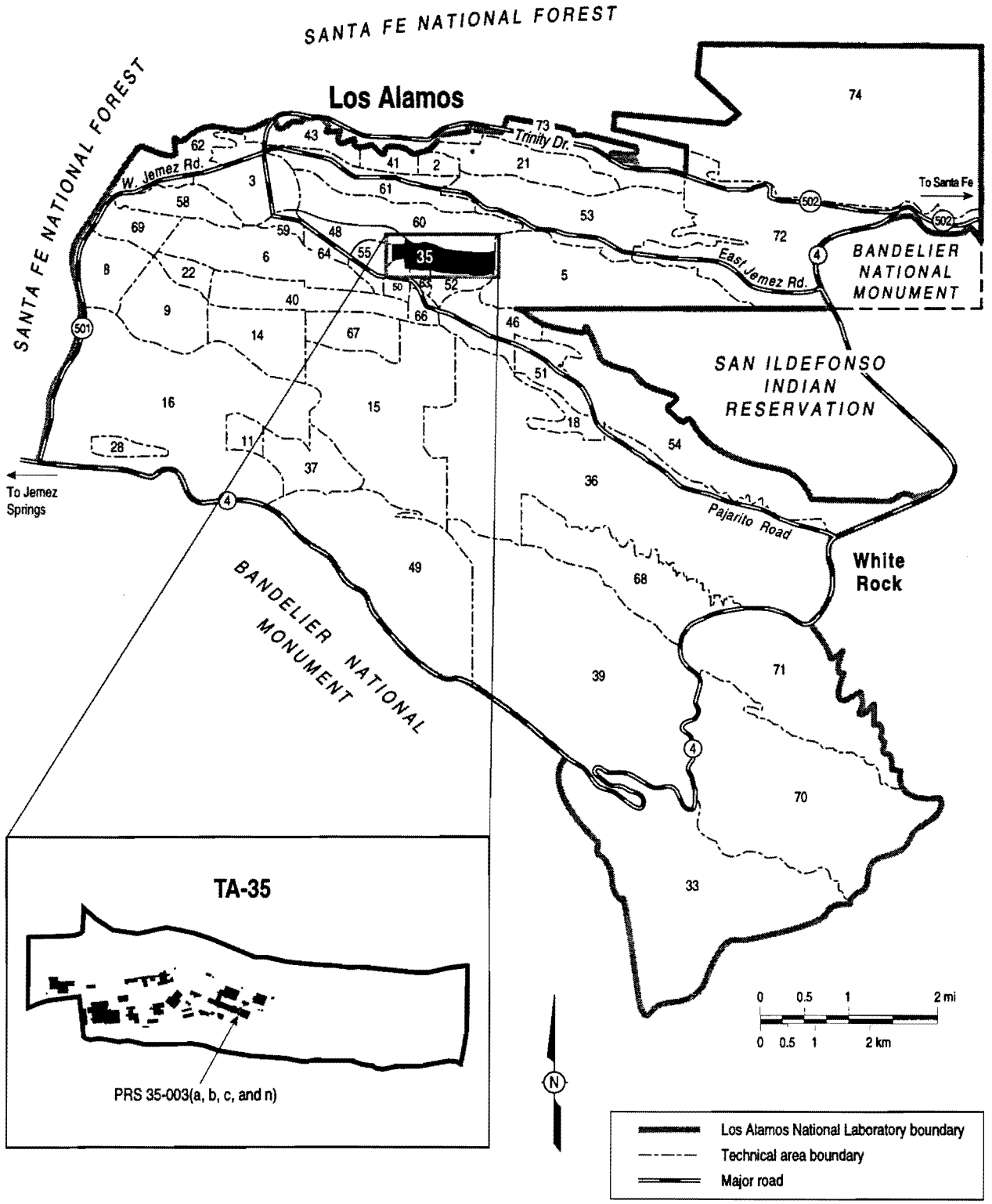
Radionuclides are regulated under DOE Order 5400.5, "Radiation Protection of the Public and the Environment," proposed rule 10 CFR 843.5 in 58 FR 16268. This report concludes that PRSs 35-003(a, b, c, and n) have a radionuclide component.

The current approved Installation Work Plan (IWP) (LANL 1996, ER ID 55574, pp. 3-1 through 3-22) describes the methodologies used in the investigation and analysis.

PRSs 35-003(a, b, c, and n) are the former sites of structures that were part of a wastewater treatment facility for Technical Area (TA) -35. All four PRSs are designated as HSWA SWMUs. The four PRSs are grouped for evaluation because of their close proximity to one another and because they represent a connected system, with similar materials having been processed or stored in each. PRSs 35-003(a, b, and c) were stainless steel underground holding tanks used to store liquids temporarily before processing them in the Phase Separator Pit (PSP). The PSP, an underground concrete structure, housed the wastewater treatment tanks and associated piping. The site of the PSP is PRS 35-003(n).

Figure 1.0-1 provides an overview of the Laboratory and shows the location of TA-35 and the general locations of the PRSs discussed in this report.

PRSs 35-003(a, b, c, and n) are discussed in Section 2.0, which includes a Summary, Description and Operational History, Investigatory Activities, Site Assessments, Conclusions, and Recommendations for those PRSs. Additional information is provided in the appendixes and attachments.



F1.0-1 / TA-35-003(a,b,c,n) RFI RPT / 090298

Figure 1.0-1. Location of TA-35 with respect to Laboratory technical areas and surrounding land holdings.

The parenthetical information following each reference provides the author, publication date, and the ER ID number, and, if applicable, the LANL ER Project Reference Library reference set number for each document. This information is also included in the citations in the text and can be used to locate the documents in the reference list. ER ID numbers are assigned by the Laboratory's ER Project to track material associated with LANL PRSs. This number can be used to locate the actual document at the ER Project's Records Processing Facility and, where applicable, within the ER Project Reference Library. All cited documents are assigned ER ID numbers.

A list of acronyms and a glossary of terms used in this report are located in Appendix A. The current and anticipated future land uses of the general area that includes PRSs 35-003(a, b, c, and n) are discussed in Appendix B-1.0, Operational History and Land Use. Appendix Sections B-2.0 through B-6.0 include a detailed discussion of the climate, geology, hydrology, ecological resources, and cultural resources for TA-35.

Appendix C includes the complete quality assurance/quality control results. Appendix D provides an abridged version of the data for the investigation. The complete data have been submitted to the administrative authority in electronic format. Appendix G-1.0 summarizes the administrative history of the PRSs and includes copies of all administrative authority correspondence and the Laboratory's responses. Appendix G-2.0 contains documents referenced in this report.

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2.0 POTENTIAL RELEASE SITES 35-003(a, b, c, and n)—FORMER PHASE SEPARATOR PIT AND ASSOCIATED UNDERGROUND HOLDING TANKS

2.1 Summary

Potential Release Sites (PRSs) 35-003(a, b, c, and n) are the former sites of the phase separator pit (PSP) (structure no. TA-35-3) and three associated underground storage tanks (structure nos. TA-35-4, -5, and -6) that were part of the TA-35 wastewater treatment plant that operated from 1951 to about 1963. The structures were removed in 1996, and the site was backfilled with 20–33 ft of clean fill material. This investigation was conducted to determine whether contaminants had been released from the structures and, if so, whether the contaminants pose a threat to human or ecological health. Details of the purpose and approach of the investigation are included in Section 2.3.3, Preliminary Conceptual Model.

Thirteen samples were collected in 1996 from bedding material and tuff under the former locations of the PSP and the three tanks. The samples were analyzed for inorganic chemicals, radionuclides, semivolatile organic compounds (SVOCs), and volatile organic compounds (VOCs). Details of sampling and analyses are included in Section 2.3.4.2, Field Investigation.

The RFI sample results show that several metals and radionuclides are present at concentrations above background values, and two organic chemicals were detected. Although radionuclide concentrations generally appear to decrease between the first and second sampling intervals, the data are inadequate to rigorously define the extent of contamination. Nevertheless, the existing data are adequate when used in conjunction with radiological survey results and visual inspection of the PRS structures to determine that a significant release of contamination has not occurred. Establishing whether a relatively large release may have occurred, rather than whether any release may have occurred, is sufficient to support risk-based decisions at this site because any residual contamination at this site is deeply buried by backfill and is unavailable to either human or ecological receptors. The depth of backfill placed on the site to recontour the area following decommissioning varies between 20 and 33 ft and is further covered with asphalt to serve as a parking area.

Tritium and Sr-90 were measured at elevated concentrations in both the RFI samples as well as in shallower samples from some of the D&D boreholes drilled in 1993 and 1994 to characterize the site prior to decommissioning. The presence of similar analytes in material above the grade of these PRSs suggests that some or all of the contamination detected in the RFI samples may have originated from other sources. Residual contamination adjacent to the location of these PRSs will be evaluated concomitantly with nearby PRSs including the site of the former air filter building TA-35-7 (PRS 35-003[p]) and former underground pipelines (PRS 35-003[misc.]).

Because the PRSs are so far below current grade and the site is paved with asphalt, there are no complete pathways for migration of contaminants to the surface, to nearby canyons, or to any subsurface water resources. Therefore, there is no likely mechanism for exposure of human or ecological receptors to any of the contaminants present at the site. The site and the surrounding area are part of a highly industrialized area and are expected to remain so for roughly the next 30 years (LANL 1995, ER ID 57224, p. 14). In the unlikely event that the land use of the site changed to residential or recreational, it is still unlikely that the contaminants would pose an unacceptable risk to any human or ecological receptors. Details of the nature and extent of contamination, and potential migration pathways are included in Section 2.3.5, Revised Site Conceptual Model.

Human health and ecological screening assessments were performed for the PRSs. Because of the lack of complete migration pathways, it was determined that no calculable risk exists to human or ecological receptors resulting from the contaminants present at the site. For this reason, no complete human health

or ecological risk assessments were performed. Details of the screening assessments are included in Sections 2.4.2.1 (Human Health) and 2.4.2.2 (Ecological).

Because there are no exposure pathways and no calculable risk to human or ecological health, PRSs 35-003(a, b, c, and n) are recommended for no further action (NFA) under NFA Criterion 5. Details of this recommendation are included in Section 2.5, Conclusions and Recommendations.

2.2 Description and Operational History

PRSs 35-003(a, b, c, and n) are SWMUs included in Module VIII of the Laboratory's Hazardous Waste Facility Permit.

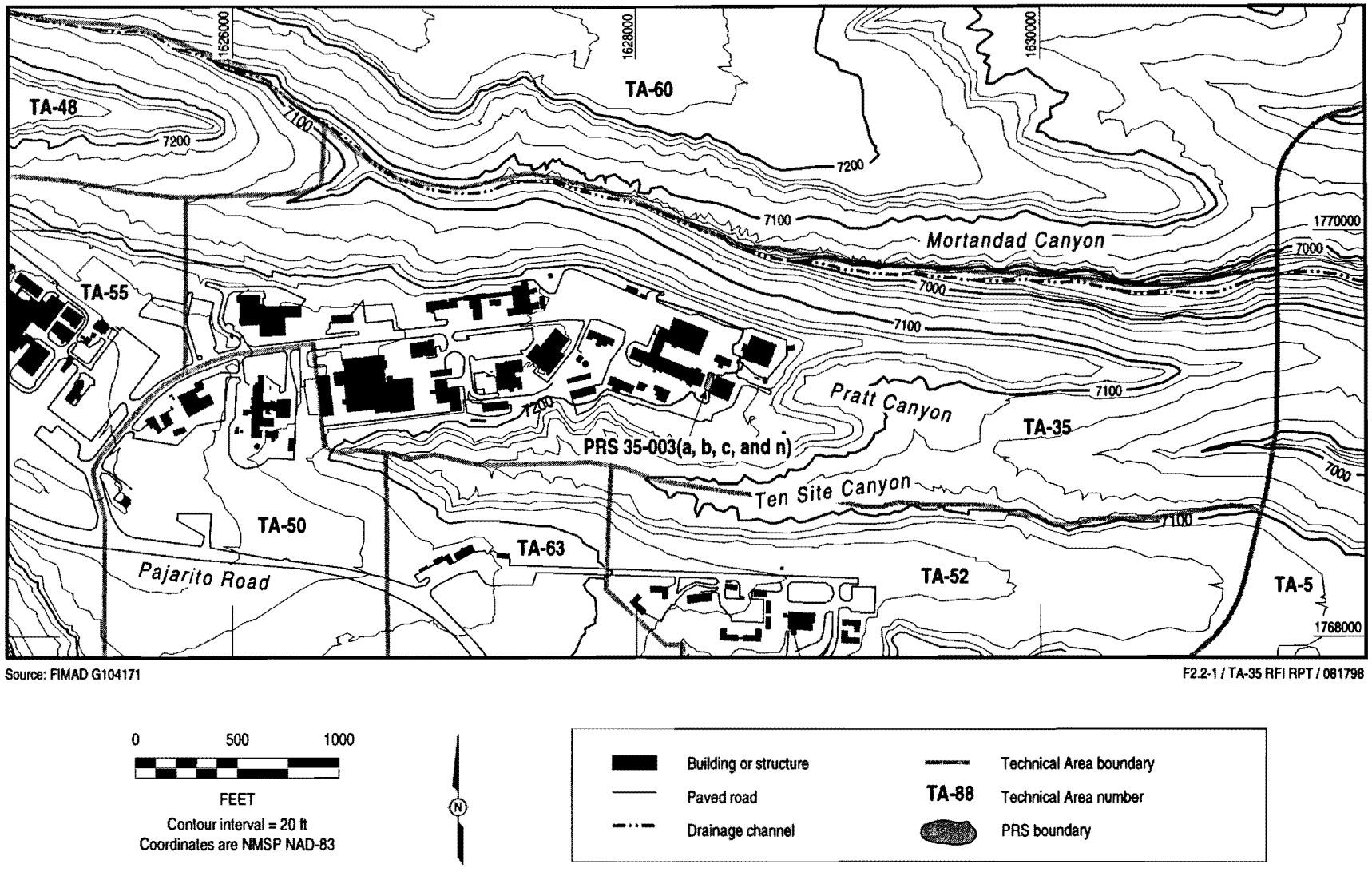
2.2.1 Site Description

Physical Description

PRS 35-003(n) is the former site of the PSP that was located between buildings TA-35-2 and TA-35-7 at LANL. Figure 2.2-1 shows the location of TA-35 and its surrounding physical features. The locations of the PRSs are shown in Figure 2.2-2. The PSP was a large, subterranean, reinforced concrete structure that housed equipment used to treat vented air exhaust from laboratory hoods in building TA-35-2. The PSP was approximately 90 ft long, 20 ft wide, and 12 ft deep; the top of the pit was located approximately at ground level. The structure housed air vent lines, air filters, seven stainless steel phase separator chambers, liquid drain lines, and a 600-gal. stainless steel caustic treatment tank. The floor of the PSP sloped to the east to a gutter drain that extended the length of the floor along the east wall of the pit. The gutter drain, which collected any spills in the pit, sloped to the north and discharged into a sump located at the northeast corner of the pit. The floor of the pit was approximately 12 ft below ground level, except at the northwest corner. In that corner, a deeper pit (about 9 ft by 12 ft) housed the caustic treatment tank, the floor of which was about 22 ft below ground level. A sump in the northeast corner of the caustic treatment tank pit collected any spills in that area. The two sumps pumped any spilled liquid back into the treatment system.

PRSs 35-003(a, b, and c) are the former sites of three underground stainless steel holding tanks, structure nos. TA-35-4, -5, and -6, that were located east of the PSP. The tanks were connected to the PSP by several underground pipelines. These holding tanks were used to retain the waste liquids before treatment and eventual discharge into the larger waste holding tanks (former structure TA-35-10). Each of these holding tanks was about 5 ft in diameter and 9 ft tall, with a 1,300-gal. capacity. The tops of the tanks were situated just below the floor level of the PSP to allow for gravity flow of the liquids into the tanks. The center of each tank was located about 9 ft from the PSP and about 11 ft from the west wall of building TA-35-7. Tank TSL-4 was about 23 ft from the north end of the PSP; tank TSL-5 was about 16 ft south of TSL-4; and tank TSL-6 was about 10 ft south of TSL-5. The total area of the four PRSs combined is approximately 2,550 ft^2. Figure 2.2-3 shows a cross-sectional view of the PSP, the holding tanks, and their relationship to other structures and the ground surface as they existed from 1951 until decommissioning in 1996.

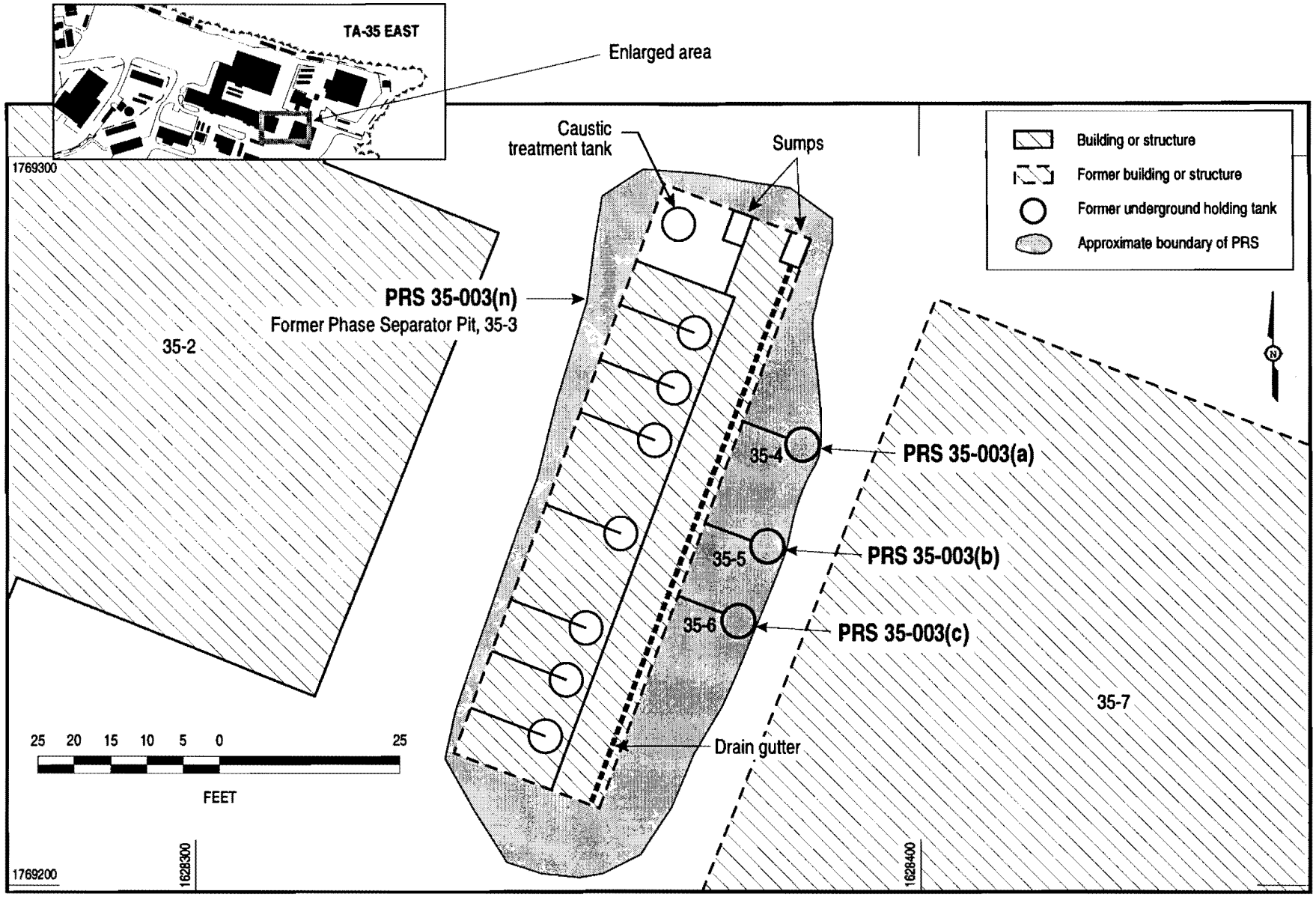
The PSP and holding tanks underwent decommissioning by the TA-35 Decontamination and Decommissioning (D&D) Project in 1996 and 1997. The PSP, the holding tanks, and all associated piping and ductwork were completely removed from the site, and any radiological contamination found in the bedding materials associated with the structures was also removed from the site. The building material and metals were either recycled or disposed of at appropriate waste disposal facilities (Byars 1997, ER ID 58737, p. 7).



Source: FIMAD G104171

F2.2-1 / TA-35 RFI RPT / 081798

Figure 2.2-1. Location of PRSs 35-003(a, b, c, and n) and associated physical features near TA-35.



F2.2-2 / TA-35 RFI RPT / 090198 / Source: FIMAD

Figure 2.2-2. Location map of PRSs 35-003(a, b, c, and n) and associated features in TA-35.

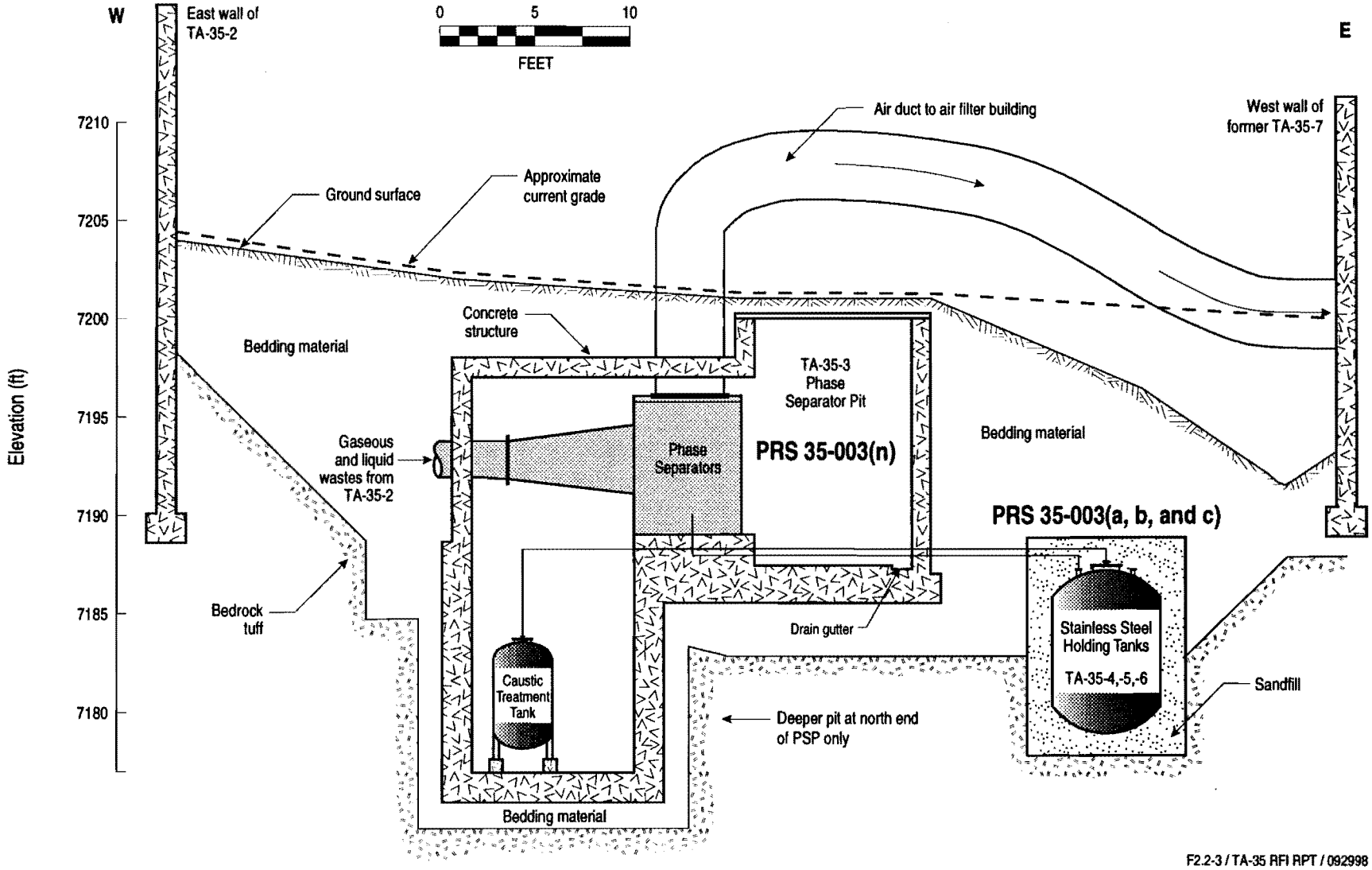


Figure 2.2-3 Schematic cross section through the phase separator pit and the underground holding tanks at PRSs 35-003(a, b, c, and n) as they existed before decommissioning in 1996.

The TA-35 D&D Project plan for the PSP and tanks was described in "TA-35 D&D Project: Implementing Plans for Support of Phase I Decommissioning Activities" (LANL 1995, ER ID 58732, pp. 1–15) Specific decommissioning activities conducted at PRSs 35-003(a, b, c, and n) are reported in a series of decommissioning reports (ICF Kaiser 1994, ER ID 53455, pp. 4–7; Rey 1996, ER ID 58979, pp. 3–9; Byars 1997, ER ID 58737, pp. 3–9).

The PSP was removed by TA-35 decommissioning personnel in phases. The holding tanks were removed in August and September 1996. Tank TA-35-4 (PRS 35-003[a]) was found to be empty. Tank TA-35-5 (PRS 35-003[b]) contained 1300 gal. of liquid mixed waste. Tank TA-35-6 (PRS 35-003[c]) contained approximately 300 gal. of liquid mixed waste. The caustic treatment tank inside the PSP was also found to contain liquid mixed waste. The tanks were pumped out, and the contents were sent to the Idaho National Engineering and Environmental Laboratory (INEEL) for treatment and disposal (Byars 1997, ER ID 58737, pp. 6–7). All pipelines associated with the PSP and PRS 35-003(misc.) were heavy stainless steel piping that was found to be intact. No leaks from the lines were noted, and no soil contamination was found (Koch 1996, ER ID 59420).

After the holding tanks were removed, the remaining surfaces at these PRSs consisted of open holes composed of bedrock tuff and the leftover imported bedding materials. The imported bedding materials at the sites remained from the original construction of the PSP and the holding tanks. To install the holding tanks in 1951, irregular cavities were excavated into the bedrock tuff and the bottoms of each were partially filled with imported sand and gravel material to provide a foundation for the holding tank. Sand and gravel materials were also placed around and above the holding tanks to stabilize them. When the holding tanks were removed, round-bottomed holes remained in the ground. A small amount of the sand and gravel material caved into the bottoms of the holes left by the tanks, but the surface remaining after removal of the tanks was generally competent.

The PSP structure was removed in December 1996. Prior to removal, an inspection found no visible cracks, leaks, or damage to the concrete of the PSP structure. Portions of the top cover were removed to gain access to the pit and remove the separator equipment and lead bricks; then the top cover was entirely removed. The east wall of the structure was removed in sections, progressing from south to north. The south wall was removed to gain open access to the site and remaining portions of the structure from the south. The west wall and the north wall were later removed, and the floor of the structure was the last to be removed. No staining or coloration that would indicate spills or leaks from the PSP were obvious at the remaining site after the structure was removed. The RFI samples referred to in this report were collected from the bedding material and bedrock tuff left in the floor of the excavation.

As a result of the TA-35 Decommissioning Project, the area of the PRSs currently consists of between 2 and 4 vertical feet of bedding material, upon which the former PSP and tanks rested. It has been covered with approximately 20–33 ft of clean backfill, and the surface of the entire site is now paved with asphalt (see Photos 2.2-1 and 2.2-2, Attachment 1).

Relation to Other PRSs

PRS 35-003(p)—the air filter building (TA-35-7)—was located about 11 ft east of the holding tanks (Figure 2.2-2). This building was also removed in 1996 as part of the TA-35 D&D Project activities. The north wall of the PSP and the north wall of the air filter building were aligned, approximately.

PRS 35-003(misc.) consists of numerous former underground pipelines that connected building TA-35-2 with the PSP, the air filter building, and the large (50,000 gal.) concrete holding tanks (TA-35-10, PRS 35-003[d]) located about 200 ft east of the PSP. Most of the underground pipelines were removed in 1981 and 1984. The concrete holding tanks were removed in 1985. Several other PRSs (35-003[d, e, f, g, l, m,

o, and q]) represent portions of the TA-35 wastewater treatment facility that were removed between 1980 and 1985. These PRSs have been sampled and are awaiting further action, which may include additional investigations or corrective actions.

Land Use

PRSs 35-003(a, b, c, and n) are currently identified as part of an industrial site. TA-35 is one of the most industrialized areas at LANL and is currently used for laser, fusion, and other research activities. The LANL Site Development Plan (LANL 1995, ER ID 57224, p. 14) indicates that this site is expected to remain under industrial land use for the foreseeable future.

Environment

The natural environment of this site and most other mesa-top sites at TA-35 is one of a temperate, semiarid, mountain woodland. The average annual precipitation is 16 in., about 40% of which comes in the form of intense summer thunderstorms during July and August (Bowen 1990, ER ID 06899, pp. 3–5). Further details on TA-35's climate are included in Appendix B-2.0 of this report.

PRSs 35-003(a, b, c, and n) are located at an elevation of about 7,200 ft near the eastern end of Ten Site Mesa, a narrow finger-like mesa that slopes approximately 2%–3% to the east. The mesa is bounded on the north by Mortandad Canyon and on the south by Ten Site Canyon. The geologic unit underlying these PRSs is Cooling Unit 3, Tshirege member of the Bandelier Tuff, identified as Qbt3 on geologic maps of the area. Additional details of site geology are included in Appendix B-3.0 of this report.

Soil

Soil at the site is identified as Hackroy sandy loam—a shallow, well-drained soil that ranges from 8–20 in. thick. The soil has moderate permeability that can be affected by the degree of development of the B horizon (soil horizons are defined in the glossary, Appendix A-2), where accumulations of clay can decrease the overall soil permeability. PRSs 35-003(a, b, c, and n) are well below the soil zone, and surface soil properties do not affect the conceptual site model. The surface soils were not characterized as part of this investigation. Detailed characteristics of Hackroy sandy loam soils are reported in "Soil Survey of Los Alamos County, New Mexico" (Nyhan et al. 1978, ER ID 05702, pp. 24–25). A summary of soils at TA-35 is provided in Appendix B-3.2 of this RFI report.

Hydrology

According to Part B of the LANL-ER-AP-4.5 Surface Water Site Assessment (included in Appendix B-4.2.1), a small portion of runoff from the site drains into the local storm water runoff system and then discharges into Ten Site Canyon. The majority of the runoff flows onto a parking area east of the site and ultimately discharges into either Ten Site Canyon or a small tributary of Ten Site Canyon, informally known as Pratt Canyon. Both of these canyons contain ephemeral stream channels that flow only during a small part of the year.

No erosion was observed during the site assessment. The site is covered with asphalt pavement that prevents infiltration and can generate sheet-flow runoff. A concrete curb upslope of the site diverts surface water, so there is no run-on to the site. Runoff from the site is therefore limited to what is generated directly at the site.

There is little or no potential for interflow at PRSs 35-003(a, b, c, and n) in either the soil or the tuff. Interflow on the Pajarito Plateau normally occurs only in the higher-precipitation ponderosa pine ecological zone and is largely limited to the soil zone above the tuff. This site is in the drier piñon-juniper

ecological zone, and the PRSs are located approximately 20 ft below the soil zone. The surface soil at the site (Hackroy sandy loam) does not contain the highly structured, clay-rich B horizon that is necessary for generating significant interflow volumes (Wilcox et al. 1997, ER ID 57577, pp. 2301–2314). Therefore, interflow is not considered a potential contaminant migration pathway at this site.

Cultural and Biological Resources

A cultural resource survey has been conducted at TA-35 to identify archeological or other cultural resources (Manz et al. 1994, ER ID 49508, pp. 2, 7, 26). No cultural resources or issues were identified in the immediate vicinity of PRSs 35-003(a, b, c, and n).

The natural vegetation of this portion of TA-35 consists of piñon-juniper (*Pinus edulis-juniperus monosperma*) woodland with a sparse understory of grasses, especially blue gramagrass (*Bouteloua gracilis*). The percentage of vegetative cover ranges from about 10% to 50%. PRSs 35-003(a, b, c, and n) are located in an area where essentially no undisturbed vegetation remains, so that biological resources are not a significant component of the conceptual site model.

All of TA-35 is listed as core area for the Mexican spotted owl. The biological assessment of TA-35, however, did not identify any suitable habitat for that species (Dunham 1992, ER ID 31276, Appendix 3). The ecological scoping checklist for PRSs 35-003(a, b, c, and n) is included in Appendix F-2.0 of this RFI report.

2.2.2 Operational History

The PSP and the underground holding tanks were part of the TA-35 wastewater treatment plant that operated from 1951 until 1963. The treatment plant received and processed air and liquid wastes from radiochemistry laboratories and from the operations of the radioactive lanthanum-140 hot cells located in building TA-35-2, where kilocurie sources of lanthanum-140 were prepared during the 1950s. The liquid wastes from the laboratories were acidic, and the radioactivity in the waste came from barium-140, lanthanum-140, strontium-89, strontium-90, and yttrium-90 (Emility 1958, ER ID 00793, p. 1).

The exhaust from laboratory hoods was routed to the PSP for removal of liquids before being sent to the air filter building (former TA-35-7). The liquid wastes from building TA-35-2 were stored temporarily in one of the three underground holding tanks. Then the liquid was caustic-treated for acidity before being sent to the large concrete holding tanks (former TA-35-10) at the east end of TA-35. The liquid wastes were held in the large concrete holding tanks to allow radioactive decay of the short-lived radionuclides, which was calculated to occur within about 6 months. However, longer-lived radioisotopes, such as strontium-90, were also present in the waste and concentrated in the waste water, prompting additional treatment of the wastes using cation exchange methods in building TA-35-7 (Emility 1958, ER ID 00793, pp. 1–3).

Processing wastes at the TA-35 wastewater treatment plant ended in 1963 when the TA-50 radioactive liquid waste treatment facility began operations. Wastes from building TA-35-2 continued to pass through the PSP and were temporarily stored in the concrete holding tanks (TA-35-10, PRS 35-003[d]) until those structures were removed in 1985. It is not known exactly when the PSP and the three holding tanks were last used—possibly in the mid-1970s or the early 1980s. The structures were probably not used after 1985, when the pipeline from building TA-35-10 to TA-50 was removed. However, during preliminary PSP decommissioning investigations, several feet of water was found in the bottom of the structure. The source of the water was identified as a sink drain located in building TA-35-2. This drain was disconnected from the PSP piping, stopping the flow into the PSP. The water that had accumulated in the PSP was pumped out in 1996, before decommissioning by the TA-35 decommissioning personnel. The water was characterized as low-level liquid waste, probably because of contact with residual

contamination in the PSP, and was disposed of through the TA-50 facility (Rey 1996, ER ID 58979, pp. 12–13). There was no evidence that there had been any releases of this water from the PSP.

During the course of the decommissioning project, workers discovered a steam vent line that had not been removed during decommissioning of the LAPRE-II reactor facility in 1991. The pipe was connected to the PSP and terminated at a cut end about 60 ft southwest of the south end of the PSP. The pipe itself was in good condition, and no leaks were found along its length (131 ft), although the cut end had resulted in a small quantity of contaminated soil. The pipe was removed, and the contaminated soil was excavated and disposed of (Rey 1996, ER ID 58979, pp. 5–11; Montoya 1993, ER ID 31451, pp. 1–8). There was no indication that this pipe resulted in any contaminant releases at PRSs 35-003(a, b, c, and n).

2.3 Investigatory Activities

2.3.1 Summary

Section 2.3 describes the investigatory activities for PRSs 35-003(a, b, c, and n), including previous investigations (Section 2.3.2), the preliminary conceptual model that guided the RFI fieldwork (Section 2.3.3), and the RFI field activities (Section 2.3.4.2). A review of the RFI data is also presented (Section 2.3.4.3) followed by a description of how the conceptual model for PRSs 35-003(a, b, c, and n) was revised based on information gained during the RFI (Section 2.3.5).

2.3.2 Previous Investigations

A series of boreholes was drilled by the D&D team in 1993–94 for the purpose of soil characterization sampling. The boreholes varied in depth from 7.5–20 ft, and samples were collected at 2.5-ft intervals. Several of the boreholes were in the immediate vicinity of the PSP and the holding tanks, as shown in Figure 2.3-1. The results of the analysis of those samples is reported in the 1994 "TA-35 Phase Separator Pit Decommissioning Project Characterization Report, Phase II-V" (ICF Kaiser 1994, ER ID 53455, p. 15) and in the 1996 "Voluntary Corrective Action Plan for Potential Release Sites 35-003(a), 35-003(b), 35-003(c), 35-003(n)—Phase Separator Pit and Underground Storage Tanks" (LANL 1996, ER ID 53733, p. 7-1), also referred to as the VCA Plan. Sample collection and analysis methods were not documented, and quality assurance/quality control (QA/QC) data is nonexistent for those samples. Because of the questionable quality of those data, they are presented here only as screening information. The data were used to help determine the analytical suites obtained in the RFI, and will also be evaluated in future assessments of other PRSs in the vicinity (35-003[e, f, g, m, n, o, p, q, r, and misc.]). A summary of the sample data for radionuclides from the boreholes is presented in Table 2.3-1. Several radionuclides were reported in concentrations greater than the screening action level (SAL) at depths ranging from 0–12.5 ft (the floor level of the PSP was about 12 ft below the surface). Those contaminants were tritium, potassium-40, plutonium-238, radium-226, and strontium-90. It should be noted that tritium concentrations were reported in units of pCi/l. The maximum detected concentration of tritium, when converted to pCi/g dry soil using the most conservative basis of a 50% moisture content, is 5.7 pCi/g.

2.3.3 Preliminary Conceptual Model

The PSP (PRS 35-003[n]) and the three holding tanks (PRSs 35-003[a, b, and c]) are considered to have been a closed system in which liquids flowed from Building 2 into the PSP, into the tanks for temporary storage, and at some later time, back into the PSP for treatment. There were no documented intentional or accidental releases of any contaminants from this system. Therefore, it was expected that any releases that might have occurred from the system were due to undocumented leaks in either the concrete PSP structure or the stainless steel holding tanks. This possibility was taken into consideration during decommissioning activities, and observations were made to determine whether any leaks were apparent.

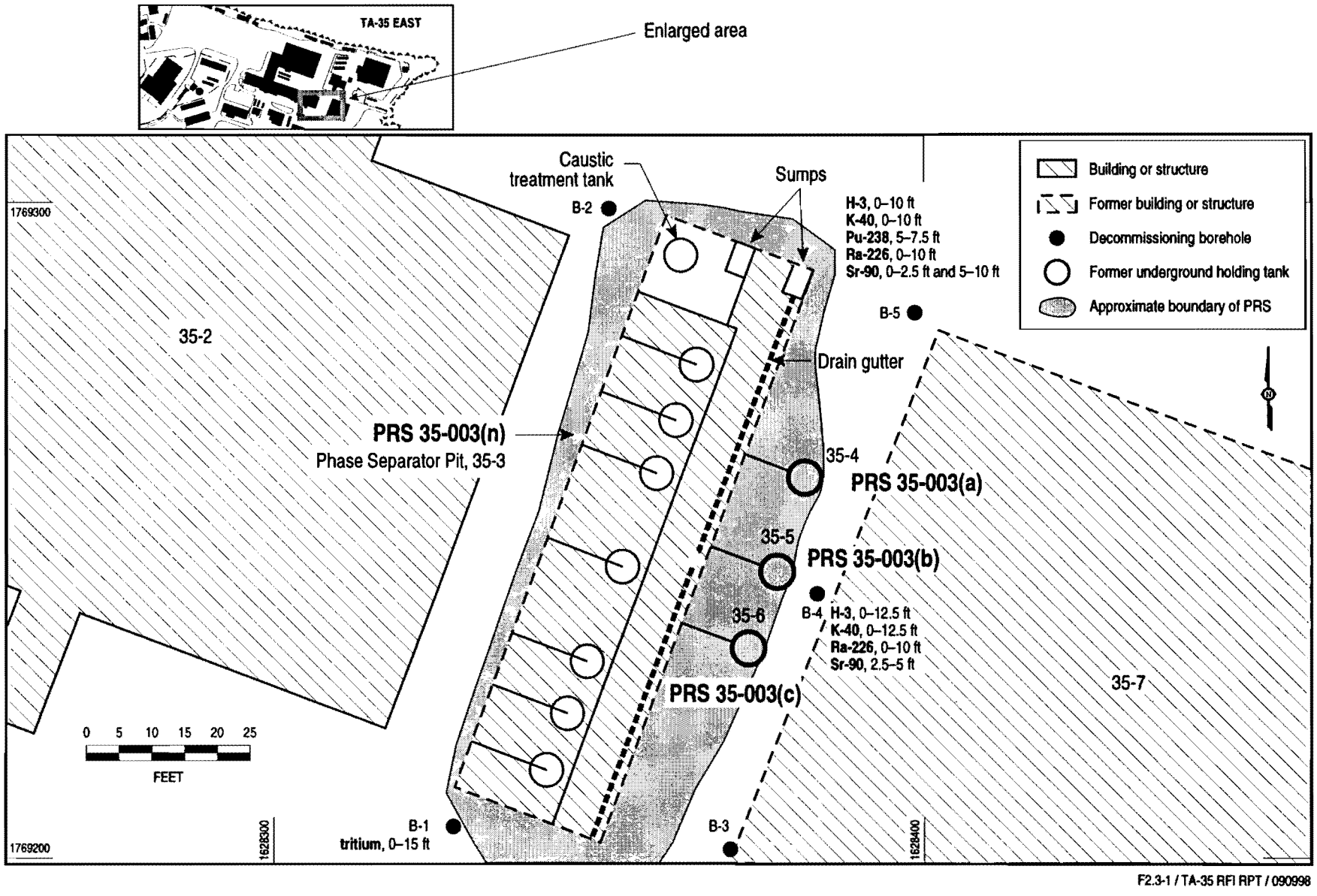


Figure 2.3-1. Map of PRSs 35-003(a, b, c, and n) showing locations of decommissioning samples having contaminants above SAL.

TABLE 2.3-1

PRSs 35-003(a, b, c, and n)
SUMMARY OF D&D BOREHOLE RESULTS FOR RADIONUCLIDES[a]

Location ID[b]	Depth (ft)	Tritium (pCi/l)[b]	Pu-238 (pCi/g)	Sr-90 (pCi/g)
B-1-SS	0–2.5	2653	N.A.[c]	N.A.
	2.5–5.0	2119	N.A.	N.A.
	5.0–7.5	4164	N.A.	N.A.
	7.5–10.0	5361	N.A.	N.A.
	10.0–12.5	3296	N.A.	N.A.
	12.5–15.0	5401	N.A.	N.A.
	15.0–17.5	5717	N.A.	N.A.
B-3-SS	0–2.5	N.A.	N.A.	N.A.
	2.5–5.0	N.A.	N.A.	N.A.
	5.0–7.5	N.A.	N.A.	N.A.
	7.5–10.0	N.A.	N.A.	N.A.
	10.0–12.5	N.A.	N.A.	N.A.
B-4-SS	0–2.5	372	N.A.	N.A.
	2.5–5.0	161	N.A.	9.81
	5.0–7.5	513	N.A.	N.A.
	7.5–10.0	295	N.A.	N.A.
	10.0–12.5	601	N.A.	N.A.
B-5-SS	0–2.5	983	N.A.	47.07
	2.5–5.0	194	N.A.	N.A.
	5.0–7.5	287	55	4.52
	7.5–10.0	638	N.A.	6.15

a. See Figure 2.3-1 for locations of boreholes.

b. Tritium concentrations may be converted to a dry soil basis using the following equation: CONC (in pCi/g) = CONC (in pCi/ml) * m / (100-m), where m = percent soil moisture of the sample. Soil moisture data is not available for these samples; assuming 50% moisture, the maximum tritium concentration is conservatively estimated as 5.717 pCi/g.

c. N.A. = Not available. Results not included in D&D report (only results above SAL were reported).

It was further expected that if there had been any major leaks resulting in the loss of large quantities of contaminants from either the PSP or the tanks, they would have been noted as part of the routine operation of the TA-35 wastewater treatment plant or in spill reports. Because no such losses or spills were reported, it is probable that if any releases occurred, they were minor in quantity and extent. Because the floor of the PSP was 12 ft or more below ground level during operation of the facility and the tops of the tanks were slightly below that level, it is unlikely that any surface water infiltrated deep enough to influence any contaminants that might have been released. Standing water found in the floor of the PSP prior to decommissioning could have been a significant transport mechanism if large quantities of that water had leaked through the floor. There is no evidence, however, to indicate that such leakage occurred. Thus, any releases would be expected to be detectable in the immediate vicinity of their release points.

In addition to possible releases from the PSP and/or holding tanks, the highly industrialized nature and operational history of the area surrounding these PRSs presents the possibility of contamination from

sources other than these structures. PRSs in the vicinity of the PSP will be addressed in a separate assessment (PRSs 35-003[e, f, g, m, n, o, p, q, r, and misc.]).

Investigatory Approach

The RFI sampling for PRSs 35-003(a, b, c, and n) was coordinated with the decommissioning activities. RFI samples were collected according to the sampling and analysis plan (SAP) presented in the 1996 VCA Plan (LANL 1996, ER ID 53733, p. 5-1). The VCA plan was written to provide a framework for remediating the site, if necessary, while the decommissioning team had the excavations open. The decommissioning team would only excavate down to 2 ft below the structures, but the VCA Plan would have allowed for deeper excavation if contamination levels warranted. As structures were exposed and removed, Environmental Restoration (ER) personnel performed site surveys, screened bedding material and tuff underlying the PRSs with hand-held beta/gamma instruments, and obtained samples for laboratory analyses. Existing data available at the time that the VCA Plan for PRSs 35-003(a, b, c, and n) was written (March 1996) were limited to the results from volatile organic, semivolatile organic, metals, and gross alpha/beta/gamma analyses from five D&D boreholes near the PSP. Radionuclides, including tritium, were detected in some of the samples, as were VOCs. Based on these results and on process knowledge concerning possible contaminants associated with the wastewater treatment plant, analytical suites proposed in the VCA Plan included tritium, gamma-emitting fission products, strontium-90, isotopic uranium and plutonium, VOCs, SVOCs, and metals.

In the VCA Plan, the locations of samples were proposed to be biased to areas where evidence of liquid releases (staining of the bedding material, breaches in the PSP or tanks, or high gross radioactivity) was discovered during decommissioning activities. In the PSP area, an additional bias for sampling was proposed to be the locations of the sumps and the drain trench because these structures represent low points in the PSP floor where any incidental releases might be expected. The sample medium was proposed to be finer-grained of the bedding material or underlying tuff. The assumption was that any release from the PSP or the tanks would have infiltrated these materials beneath the structures and would have been retained in sufficient concentrations to provide evidence of a release.

The objectives of the VCA Plan were to (1) determine the nature of released contaminants, if any, (2) determine the extent of contamination, (3) determine whether a final remedy or interim action should be completed, if necessary, while the excavation was open, and (4) confirm the completion of the VCA, if appropriate. The general approach of the VCA was to perform field screening and obtain 1-week turnaround laboratory data. The data were reviewed to determine whether any significant releases had occurred. If these data indicated a significant release, additional data were to have been collected to determine the extent and to guide remedial decisions. If remedial actions were initiated, additional confirmatory samples were to be collected to confirm the results of the remediation. Review of the laboratory and screening data indicated that the levels of contamination were insufficient to warrant further excavation under the VCA Plan. No further corrective action was performed, and the excavation was backfilled with 20 to 33 ft of clean fill material.

2.3.4 Field Investigation and Data Evaluation

2.3.4.1 Summary

Section 2.3.4 describes the field investigation and data evaluation for PRSs 35-003(a, b, c, and n). The field investigation is discussed in Section 2.3.4.2, and the data review is included in Section 2.3.4.3.

2.3.4.2 Field Investigation

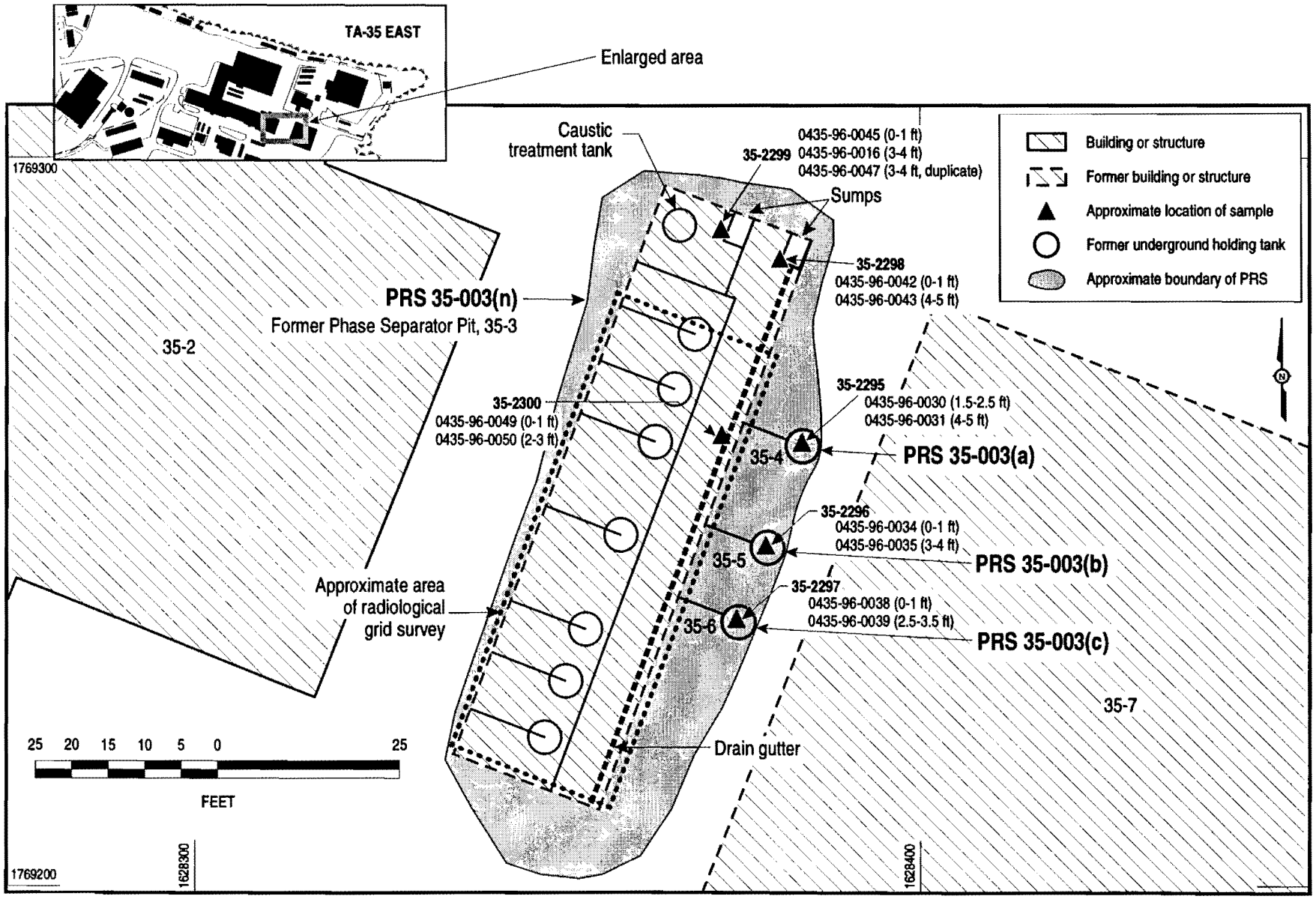
PRSs 35-003(a, b, and c) were sampled in conjunction with the removal of the holding tanks by the decommissioning team in August and September of 1996. PRS 35-003(n) was sampled in December 1996 after removal of the PSP. Sampling was conducted by members of the ER Project team according to the SAP included in Section 5.0 of the VCA Plan for PRS Nos. 35-003(a, b, c, and n) (LANL 1996, ER ID 53733, p. 5-1), as approved by the Department of Energy/Los Alamos Area Office (DOE/LAAO) (see Appendix G-2.0 for the VCA Checklist and Field Work Authorization Form). Field investigation activities did not result in any deviations from the SAP.

Because the tank excavations and the northern end of the PSP excavation were deep enough to pose a safety hazard to personnel, samples were collected from a backhoe bucket. Care was taken to collect samples from the interior of each bucket load in order to avoid cross-contamination from the bucket itself. Samples were collected in accordance with LANL-ER SOP-06.09, R.0, "Spade and Scoop Method for Collection of Soil Samples" (Wagner 1992, ER ID 57969). Decontamination of field and sampling equipment was performed in accordance with LANL-ER-SOP-1.08, R.0, "Field Decontamination of Drilling and Sampling Equipment" (Wilson 1995, ER ID 58724). All investigative derived waste was managed in accordance with the approved project Waste Characterization Strategy Form for TA-35 and LANL-ER-SOP-1.06, R.1, "Management of Environmental Restoration Project Wastes" (Tillery 1996, ER ID 57923, pp. 3–17).

A total of 12 samples were collected, plus one field duplicate sample. Sample locations and sample numbers are shown in Figure 2.3-2. Sample depths indicated on that figure and in this discussion are depths below the surface of the excavation. Actual depths below the current ground surface are between 20 and 33 ft, as indicated in Table 2.3-2. Because no evidence of a release was observed, the samples were collected at the former sump locations, the drain trench, and beneath each of the three tanks. These were the low points on the PSP floor, where any spills would have collected inside the PSP. The location of the field duplicate sample was selected at random from among the 12 regular sample locations. The matrix for all samples was either soil (media code ALLH for soil/crushed tuff or sand backfill) or tuff (media code Qbt3 for cooling unit 3, Tshirege member of the Bandelier Tuff). (Media codes are defined in the glossary, Appendix A-2.) All samples were screened in the field using a Foxboro 128 GC organic vapor analyzer (OVA), a Ludlum Model 139 meter with an air-proportional alpha probe, and an Eberline ESP-1 meter with an HP-260 beta/gamma probe. No field screening samples were collected. A summary of the samples collected and the analyses requested for each is provided in Table 2.3-2. Additional information, such as analytical laboratory names, has been submitted to the administrative authority, as discussed in Appendix D-2.0, RFI Analytical Results.

PRS 35-003(a)

PRS 35-003(a) was sampled on the afternoon of August 28, 1996. The prevailing climatic conditions were partly cloudy and 85°F. When the tank (TA-35-4) was removed, the material beneath the tank was observed to be dry, and radiological screening results were within TA-35 background levels (background at TA-35 is generally 250–500 cpm, depending on rock or substrate type; the average background reading at the site was reported as 180 cpm) (Sontag 1996, ER ID 58753). The upper sample was taken from the sand pack beneath the tank (1.5–2.5 ft below the base of the tank). The lower sample was taken from "tuff and sand pack beneath tank" that was 4–5 ft below the base of the tank (Sontag 1996, ER ID 58753). Screening results for the samples were 150 and 230 cpm beta/gamma radiation for the upper and lower samples, respectively.



F2.3-2 / TA-35 RFI RPT / 090198 / Source: FIMAD

Figure 2.3-2. Sample location map of PRSs 35-003(a, b, c, and n). Depths are below surface of excavation after removal of structures.

TABLE 2.3-2

PRSs 35-003(a, b, c, and n)
SUMMARY OF SAMPLES COLLECTED FOR FIXED-LABORATORY ANALYSIS

Location ID	Sample ID	Sample Type	Depth (ft)[a]	Current Depth (ft)[b]	Media	VOCs[c]	SVOCs[c]	Inorganic Chemicals[c]	Radionuclides[c]
35-2295	0435-96-0030	Regular	1.5–2.5	25.5–26.5	Soil	2571	2571	2572	2573
35-2295	0435-96-0031	Regular	4–5	28–29	Soil	NA[d]	NA	NA	2573
35-2296	0435-96-0034	Regular	0–1	20–21	Soil	2639	2639	2640	2641
35-2296	0435-96-0035	Regular	3–4	23–24	Qbt3	NA	NA	NA	2641
35-2297	0435-96-0038	Regular	0–1	20–21	Soil	2639	2639	2640	2641
35-2297	0435-96-0039	Regular	2.5–3.5	22.5–23.5	Qbt3	NA	NA	NA	2641
35-2298	0435-96-0042	Regular	0–1	28–29	Soil	2837	2837	2838	2839
35-2298	0435-96-0043	Regular	4–5	32–33	Qbt3	NA	NA	NA	2839
35-2299	0435-96-0045	Regular	0–1	28–29	Soil	2837	2837	2838	2839
35-2299	0435-96-0046	Regular	3–4	31–32	Soil	NA	NA	NA	2839
35-2299	0435-96-0047	Duplicate	3–4	31–32	Soil	NA	NA	NA	2839
35-2300	0435-96-0049	Regular	0–1	20–21	Soil	2837	2837	2838	2839
35-2300	0435-96-0050	Regular	2–3	22–23	Qbt3	NA	NA	NA	2839

a. Depth below excavation floor.
b. Approximate depth below current surface.
c. Numbers in the cells for each analytical suite are request numbers.
d. NA = Not analyzed.

PRSs 35-003(b and c)

PRSs 35-003(b and c) were sampled on September 24, 1996. The prevailing climatic conditions were partly cloudy and 65°F. The walls of the excavation, after removal of the tanks, were noted to have moisture present, which was attributed to recent rainfall in the open excavation. Screening of the walls did not indicate the presence of contaminants associated with the moisture. According to decommissioning staff, radiological screening upon removal of the tanks (September 23, 1998) detected beta/gamma activity of about 1,000 cpm on the tank bottoms (this was considered to be background activity by the decommissioning staff [Rey 1996, ER ID 58779, p. 7; Sontag 1996, ER ID 58753]).

The upper sample (0–1 ft interval) at location 35-2296 (PRS 35-003[b]) was taken from sand pack material beneath the tank and consisted of "moist coarse sand with minor tuff cobbles." The lower sample was taken from the tuff interface and consisted of dry grey crystalline tuff with minor moist sand pack material. Radiological screening detected 300 cpm beta/gamma in the upper sample and 170 cpm in the lower. Neither sample had any detectable alpha activity.

At location 35-2297 (PRS 35-003[c]), the upper sample (0–1 ft interval) was taken from moist sand pack and was described as coarse sand with minor tuff cobbles. The lower sample (2.5–3.5 ft interval) was taken from the tuff interface and consisted of dry grey crystalline tuff with minor coarse sand. Radiological screening detected beta/gamma activity of 230 cpm in the upper sample, 270 cpm in the lower sample, and no detectable alpha activity in either sample.

PRS 35-003(n)

PRS 35-003(n) was sampled on December 18, 1996. The prevailing climatic conditions were clear and near 0°F.

Location 35-2298 (former northeast sump location) was sampled in the 0–1 ft interval and in the 4–5 ft interval. The upper sample consisted of backfill with tuff cobbles. The lower sample was taken at the tuff interface and consisted of dry grey powdered tuff. Radiological screening detected beta/gamma activity of 200 cpm in the upper sample and 300 cpm in the lower sample. No alpha activity or organic vapors were detected in either sample.

Location 35-2299 (former caustic sump location) was sampled in the 0–1 ft interval and in the 3–4 ft interval. The upper sample consisted of backfill with tuff cobbles. The lower sample was taken at the tuff interface and consisted of dry grey powdery tuff. Radiological screening detected beta/gamma activity of 270 cpm in the upper sample and 230 cpm in the lower sample. No alpha activity or organic vapors were detected in either sample.

Location 35-2299 (former trough location, east side of the PSP) was sampled in the 0–1 ft interval and in the 2–3 ft interval. The upper sample consisted of bedding material. The lower sample was taken from the tuff interface and consisted of dry grey powdery tuff. Radiological screening detected beta/gamma activity of 250 cpm in the upper sample and 230 cpm in the lower sample. No alpha activity or organic vapors were detected in either sample.

Radiological grid survey

On December 17, 1996, prior to the sampling discussed above, ER Project personnel performed a radiological grid survey of the floor of the pit where the former PSP had been (Sontag 1996, ER ID 58753). The temperature was less that 30°F and snow was falling but not accumulating. The grid did not include the deeper portions of the excavation, where the caustic treatment tank and sumps were located, because of safety concerns (confined space and unshored excavation). The grid consisted of 90 locations spaced at 5-ft intervals, as shown in Figure 2.3-3. All measurements were taken on the floor of the excavation using 1-minute counts with a an Eberline ESP-1 (LANL property number 007433, calibrated by ESH-4 on August 12, 1996) and a Ludlum 139 (LANL property number 007731, calibrated by ESH-4 on May 31, 1996). No samples were collected from this grid. Beta/gamma screening measurements ranged from 194 cpm to 822 cpm. The average beta/gamma measurement was 293 cpm, near the low end of the range of background radiation typical of TA-35 (250 to 500 cpm). Three grid locations (35-9445, 35-9446, and 35-9447) had beta/gamma measurements above 500 cpm. Although these locations were slightly above background radiation levels, it was expected that the three locations sampled (the drain gutter and two sump locations) were more likely to have been release points. For that reason, the three grid survey locations with counts above 500 cpm were not sampled. The results of the radiological grid survey are presented in Table 2.3-3.

2.3.4.3 Data Review

Sections 2.3.4.3(a) through 2.3.4.3(d) present a review of the Phase I RFI data for PRSs 35-003(a, b, c, and n). Sample results for inorganic chemicals (Section 2.3.4.3[a]) and radionuclides (Section 2.3.4.3[b]) are compared to BVs and/or fallout concentrations. Sample results for organic chemicals (Section 2.3.4.3[c]) are examined to identify which organic compounds, if any, have been detected. Section 2.3.4.3(d) addresses any other applicable data not discussed in the previous sections.

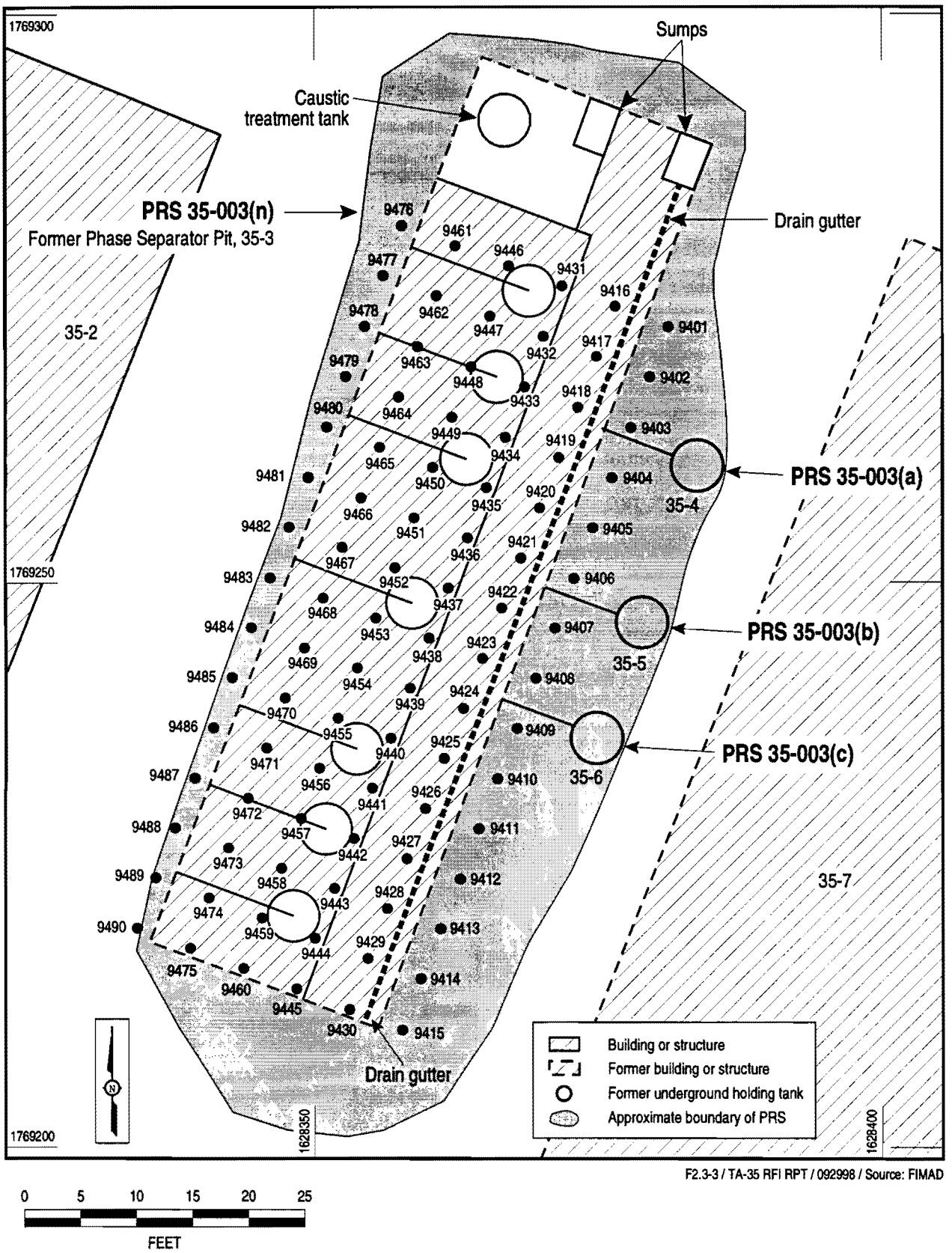


Figure 2.3-3. Radiation grid survey locations 35-9401 through 35-9490 at PRSs 35-003(a, b, c, and n).

TABLE 2.3-3

PRSs 35-003(a, b, c, and n)
SUMMARY OF RADIOLOGICAL GRID SURVEY[a]

Screening Location ID[b]	Media	Beta/Gamma (cpm)
35-9401	Soil/Qbt3	339
35-9402	Qbt3	282
35-9403	Soil/Qbt3	294
35-9404	Qbt3	276
35-9405	Soil/Qbt3	260
35-9406	Soil/Qbt3	278
35-9407	Qbt3	236
35-9408	Soil/Qbt3	297
35-9409	Soil	290
35-9410	Concrete	297
35-9411	Concrete/Qbt3	292
35-9412	Soil/Qbt3	282
35-9413	Soil	341
35-9414	Soil/Qbt3	261
35-9415	Soil	313
35-9416	Soil/Qbt3	290
35-9417	Soil	276
35-9418	Soil	228
35-9419	Soil	291
35-9420	Soil/Qbt3	256
35-9421	Soil	232
35-9422	Soil	273
35-9423	Soil	285
35-9424	Soil/Qbt3	296
35-9425	Soil	301
35-9426	Soil	313
35-9427	Soil	302
35-9428	Soil/Qbt3	279
35-9429	Soil/Qbt3	275
35-9430	Soil/Qbt3	300
35-9431	Qbt3	279
35-9432	Soil/Qbt3	311
35-9433	Soil	307
35-9434	Soil	247
35-9435	Soil	215
35-9436	Soil/Qbt3	258
35-9437	Soil	236
35-9438	Soil/Qbt3	219
35-9439	Soil/Qbt3	296
35-9440	Qbt3	264

a. In-place radiological field screening counts on floor of excavation, 1-min count times.

b. No fixed-laboratory samples were collected at any grid locations.

TABLE 2.3-3 (continued)

PRSs 35-003(a, b, c, and n)
SUMMARY OF RADIOLOGICAL GRID SURVEY[a]

Screening Location ID[b]	Media	Beta/Gamma (cpm)
35-9441	Qbt3	326
35-9442	Qbt3	288
35-9443	Soil/Qbt3	292
35-9444	Soil	275
35-9445	Soil	613
35-9446	Soil	556
35-9447	Soil/Qbt3	822
35-9448	Soil	315
35-9449	Soil	439
35-9450	Soil	226
35-9451	Soil	202
35-9452	Soil	347
35-9453	Qbt3	256
35-9454	Soil/Qbt3	383
35-9455	Soil	441
35-9456	Soil	273
35-9457	Soil	226
35-9458	Qbt3	320
35-9459	Soil/Qbt3	273
35-9460	Soil	310
35-9461	Soil	294
35-9462	Soil	305
35-9463	Soil	277
35-9464	Soil	241
35-9465	Soil	253
35-9466	Soil	279
35-9467	Soil	265
35-9468	Soil	241
35-9469	Qbt3	265
35-9470	Soil	279
35-9471	Soil	264
35-9472	Soil	330
35-9473	Soil	290
35-9474	Soil	343
35-9475	Soil	262
35-9476	Qbt3	290
35-9477	Soil	247
35-9478	Soil	266
35-9479	Soil	271
35-9480	Soil	228

a. In-place radiological field screening counts on floor of excavation, 1-min count times.

b. No fixed-laboratory samples were collected at any grid locations.

TABLE 2.3-3 (continued)

PRSs 35-003(a, b, c, and n)
SUMMARY OF RADIOLOGICAL GRID SURVEY[a]

Screening Location ID[b]	Media	Beta/Gamma (cpm)
35-9481	Soil	194
35-9482	Soil	251
35-9483	Soil	217
35-9484	Soil	247
35-9485	Soil	281
35-9486	Soil	281
35-9487	Soil	241
35-9488	Soil	256
35-9489	Soil	279
35-9490	Soil	297

a. In-place radiological field screening counts on floor of excavation, 1-min count times.

b. No fixed-laboratory samples were collected at any grid locations.

(a) Inorganic Chemical Comparison with Background

Description of RFI data. This section presents comparisons of fixed-laboratory analysis results to BVs for inorganic chemicals. An abridged version of the data is provided in Appendix D, and the complete data set has been submitted to the New Mexico Environment Department (NMED) in electronic format.

Six RFI samples from PRSs 35-003(a, b, c, and n) were analyzed for target analyte list (TAL) metals. A complete list of the analytes for this suite is included in Appendix D-1.0 of this RFI Report. Section 2.3.4.3(a) addresses only those analytes that were detected or that had reported detection limits (DLs) greater than their respective BVs. Results for nondetected analytes are included in Appendix D-2.0.

QA/QC findings and data validation results. The QA/QC findings for the inorganic data showed that the Laboratory Control Samples (LCSs) for all data packages were within the acceptance limits presented in Appendix C, Table C-2.2-1. Laboratory duplicate samples were outside of the acceptance limits for antimony, barium, calcium, mercury, and lead. Matrix spike samples were outside of the acceptance limits for antimony, copper, manganese, selenium, and zinc. All other QC samples were within acceptance limits. Antimony, copper, and zinc were qualified J– (estimated with potentially low bias [data qualifier flags are defined in the glossary, Appendix A-2]) in sample 0435-96-0030 because of low matrix spike recovery. Manganese was qualified J– in samples 0435-96-0042, 0435-96-0045, and 0435-96-0049 because of low matrix spike recovery. No problems occurred related to contract required quantitation limits (CRQLs). In some instances, focused validation resulted in modifications of routine validation qualifiers. These modifications are discussed in Appendix C.

Problems identified during the data validation do not impact the usability of detected analyte data. Problems were identified when comparing data for some undetected analytes to BVs for corresponding geologic units. For samples 0435-96-0030, 0435-96-0042, 0435-96-0045, and 0435-96-0049, the external lab used "reporting limits" for undetected analytes. In these samples, the reporting limits for undetected analytes silver, cadmium, antimony, and thallium were above the LANL BVs. In samples 0435-96-0034 and 0435-96-0038, the DLs were above BV for thallium. All other analytes' DLs were below BVs. When a DL is above the BV, it is impossible to ascertain whether the analyte was present at levels above or below the BV. A discussion of this issue is included in Appendix C, Section C-2.2.

Background data set. The background levels used for comparisons with site data were the BVs for soil and tuff summarized in "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments, and Bandelier Tuff at Los Alamos National Laboratory" (Ryti et al. 1998, ER ID 58093). The actual BVs used were taken from the tables identified as the current ER-Project-approved BVs as of January 30, 1998. No site-specific background data are available for TA-35. The RFI samples for PRSs 35-003(a, b, c, and n) were all collected from bedding material of unknown origin or underlying tuff. This bedding material was placed under the PSP and holding tanks when they were installed in 1951. It consisted primarily of sand-sized soil material with inclusions of tuff cobbles and crushed tuff. The medium for most of the samples was identified as ALLH (denoting soil material with no identified horizons), although some samples were clearly taken in undisturbed tuff and were identified as Qbt3. The medium for each sample was identified on the basis of descriptions included in the sample collection logs (Sontag 1996, ER ID 58753).

Statistical analyses. No statistical analyses were performed to evaluate the RFI data for this site. Because of the low number of samples at the site, and because sampling was biased toward locations judged to be the most likely sites of any releases, the samples do not represent a definable population.

Comparability of RFI and background sample methods. The RFI samples were prepared and analyzed by methods that were either identical to or comparable to those used for the samples included in the LANL background data set for soil and tuff. The only notable differences were in the analysis of arsenic, lead, selenium, and thallium. The RFI analyses for those analytes were done by graphite furnace atomic absorption (GFAA) spectroscopy. The background samples for arsenic and selenium were analyzed by electrothermal vapor atomic absorption spectroscopy; thallium was analyzed by inductively coupled plasma mass spectrometry (ICPMS); and lead was analyzed by inductively coupled plasma emission spectroscopy (ICPES). These methods are considered comparable, and the usability of the RFI data should not be affected by the difference. Details for all analytical suites and methods are included in Appendix C-1.0, Table C-1.0-1.

Detected inorganic chemicals. All inorganic chemicals detected at the site are summarized in Table 2.3-4. The complete list of analytes in the TAL metal analytical suite is provided in Appendix D-1.0. Three inorganic chemicals were detected at concentrations above their respective BV in one or more sample. Four additional analytes that were not detected but had DLs above the BV are also listed. Results for nondetected analytes are included in Appendix D-2.0.

Detected analytes with concentrations above BV are calcium, mercury, and zinc. Nondetected analytes with DLs exceeding BV are antimony, cadmium, silver, and thallium. These analytes are summarized in Table 2.3-5.

- Antimony was not detected in any samples, but the DL exceeded the BV for four of the six samples. The reported DLs for antimony ranged from 0.62 mg/kg to 11 mg/kg, compared to a BV of 0.83 mg/kg. The range of concentrations in the background data set for antimony was 0.2 mg/kg to 1.5 mg/kg.

- Cadmium was not detected in any samples, but the DL exceeded the BV for four of the six samples. The reported DLs for cadmium ranged from 0.06 mg/kg to 0.57 mg/kg, compared to a BV of 0.4 mg/kg. The range of concentrations in the background data set for cadmium was 0.4 mg/kg to 2.6 mg/kg.

- Calcium was detected at levels above BV in three of six samples. The reported concentration of calcium ranged from 2200 mg/kg to 24,000 mg/kg, compared to a BV of 6120 mg/kg. The range of concentrations in the background data set for calcium was 500 mg/kg to 14,000 mg/kg.

- Mercury was detected at a value above BV in one of six samples. The detected concentration of mercury was 1.4 mg/kg, compared to a BV of 0.1 mg/kg. The mercury background data set consisted entirely of DLs of 0.1 mg/kg.
- Silver was not detected in any samples, but the DL exceeded the BV for four of the six samples. The reported DL for silver ranged from 0.21 mg/kg to 2.3 mg/kg, compared to a BV of 1 mg/kg.
- Thallium was not detected in any samples, but the DL exceeded BV for all six samples. The reported DLs for thallium ranged from 1 mg/kg to 1.4 mg/kg, compared to a BV of 0.73 mg/kg. The range of concentrations in the background data set for thallium was 0.125 mg/kg to 1 mg/kg.
- Zinc was detected at a level above BV in one of six samples. The detected concentration of zinc was 69 mg/kg, compared to a BV of 48.8 mg/kg. The range of concentrations in the background data set for zinc was 14 mg/kg to 75.5 mg/kg.

TABLE 2.3-4

PRSs 35-003(a, b, c, and n)
FREQUENCY OF DETECTED INORGANIC CHEMICALS

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (mg/kg)	Background Value (mg/kg)	Frequency of Detects above Background Value[b]
Aluminum	ALLH	6	6	1460–9100	29200	0/6
Antimony	ALLH	6	0	[0.62–11]	0.83	DL>BV[c] (for 4/6 results)
Arsenic	ALLH	6	5	[1] –2.3	8.17	0/6
Barium	ALLH	6	6	77–122	295	0/6
Beryllium	ALLH	6	4	0.2–0.66	1.83	0/6
Cadmium	ALLH	6	0	[0.06–0.57]	0.4	DL>BV[c] (for 4/6 results)
Calcium	ALLH	6	6	2200–24000	6120	3/6
Chromium	ALLH	6	6	1.8	6.3	0/6
Cobalt	ALLH	6	6	1.8–3.5	8.64	0/6
Copper	ALLH	6	6	2.7–9.2	14.7	0/6
Iron	ALLH	6	6	3760–8000	21500	0/6
Lead	ALLH	6	6	2.4–18	22.3	0/6
Magnesium	ALLH	6	6	655–1600	4610	0/6
Manganese	ALLH	6	6	150–320	671	0/6
Mercury	ALLH	6	1	[0.01] –2	0.1	1/6
Nickel	ALLH	6	6	2.6–5.2	15.4	0/6
Potassium	ALLH	6	6	357–1300	3460	0/6
Selenium	ALLH	6	1	0.38–1.1	1.52	0/6
Silver	ALLH	6	0	[0.21–2.3]	1	DL>BV[c] (for 4/6 results)
Sodium	ALLH	6	6	67–430	915	0/6
Thallium	ALLH	6	0	[1–1.4]	0.73	DL>BV[c] (for 6/6 results)
Vanadium	ALLH	6	6	8.2–13	39.6	0/6
Zinc	ALLH	6	6	12.1–69	48.8	1/6

a. Values in square brackets indicate nondetected results.

b. Value is the ratio of the number of detected values exceeding the BV to the number of analyses.

c. The detection limit for this analyte exceeded the background value.

TABLE 2.3-5

PRSs 35-003(a, b, c, and n)
INORGANIC CHEMICALS WITH
CONCENTRATIONS AT OR EXCEEDING BACKGROUND VALUES[a]

Analyte	Location ID	Sample ID	Sample Concentration (mg/kg)[b]	Background Value (mg/kg)	Media	Depth (ft)[c]	Current Depth (ft)[d]
Antimony	35-2295	0435-96-0030	10 (UJ)	0.83	ALLH	1.5–2.5	25.5–26.5
	35-2298	0435-96-0042	11 (UJ)		ALLH	0–1	28–29
	35-2299	0435-96-0045	11 (UJ)		ALLH	0–1	28–29
	35-2300	0435-96-0049	11 (UJ)		ALLH	0–1	20–21
Cadmium	35-2295	0435-96-0030	0.52 (U)	0.4	ALLH	1.5–2.5	25.5–26.5
	35-2298	0435-96-0042	0.57 (U)		ALLH	0–1	28–29
	35-2299	0435-96-0045	0.57 (U)		ALLH	0–1	28–29
	35-2300	0435-96-0049	0.55 (U)		ALLH	0–1	20–21
Calcium	35-2298	0435-96-0042	6800	6120	ALLH	0–1	28–29
	35-2299	0435-96-0045	13000		ALLH	0–1	28–29
	35-2300	0435-96-0049	24000		ALLH	0–1	20–21
Mercury	35-2295	0435-96-0030	0.1 (U)	0.1	ALLH	1.5–2.5	25.5–26.5
	35-2298	0435-96-0042	1.4 (J)		ALLH	0–1	28–29
	35-2299	0435-96-0045	0.11 (UJ)		ALLH	0–1	28–29
	35-2300	0435-96-0049	2 (UJ)		ALLH	0–1	20–21
Silver	35-2295	0435-96-0030	2.1 (U)	1	ALLH	1.5–2.5	25.5–26.5
	35-2298	0435-96-0042	2.3 (U)		ALLH	0–1	28–29
	35-2299	0435-96-0045	2.3 (U)		ALLH	0–1	28–29
	35-2300	0435-96-0049	2.2 (U)		ALLH	0–1	20–21
Thallium	35-2295	0435-96-0030	1 (U)	0.73	ALLH	1.5–2.5	25.5–26.5
	35-2296	0435-96-0034	1.4 (UJ)		ALLH	0–1	20–21
	35-2297	0435-96-0038	1.2 (UJ)		ALLH	0–1	20–21
	35-2298	0435-96-0042	1.1 (U)		ALLH	0–1	28–29
	35-2299	0435-96-0045	1.1 (U)		ALLH	0–1	28–29
	35-2300	0435-96-0049	1.1 (U)		ALLH	0–1	20–21
Zinc	35-2300	0435-96-0049	69	48.8	ALLH	0–1	20–21

a. Descriptions of the analytical methods used for this PRS can be found in Appendix C-1, Table C-1.0-1. Detection limits can be found in Appendix D-1, Table D-1.0-1.

b. Data qualifier flags are defined in the glossary, Appendix A-2.

c. Depth below excavation floor.

d. Approximate depth below current surface.

The inorganic chemicals retained as chemicals of potential concern (COPCs) as a result of the data review are summarized in Table 2.3-6. Those COPCs are antimony, cadmium, calcium, mercury, silver, thallium, and zinc. Locations where inorganic COPCs were retained are shown in Figure 2.3-4.

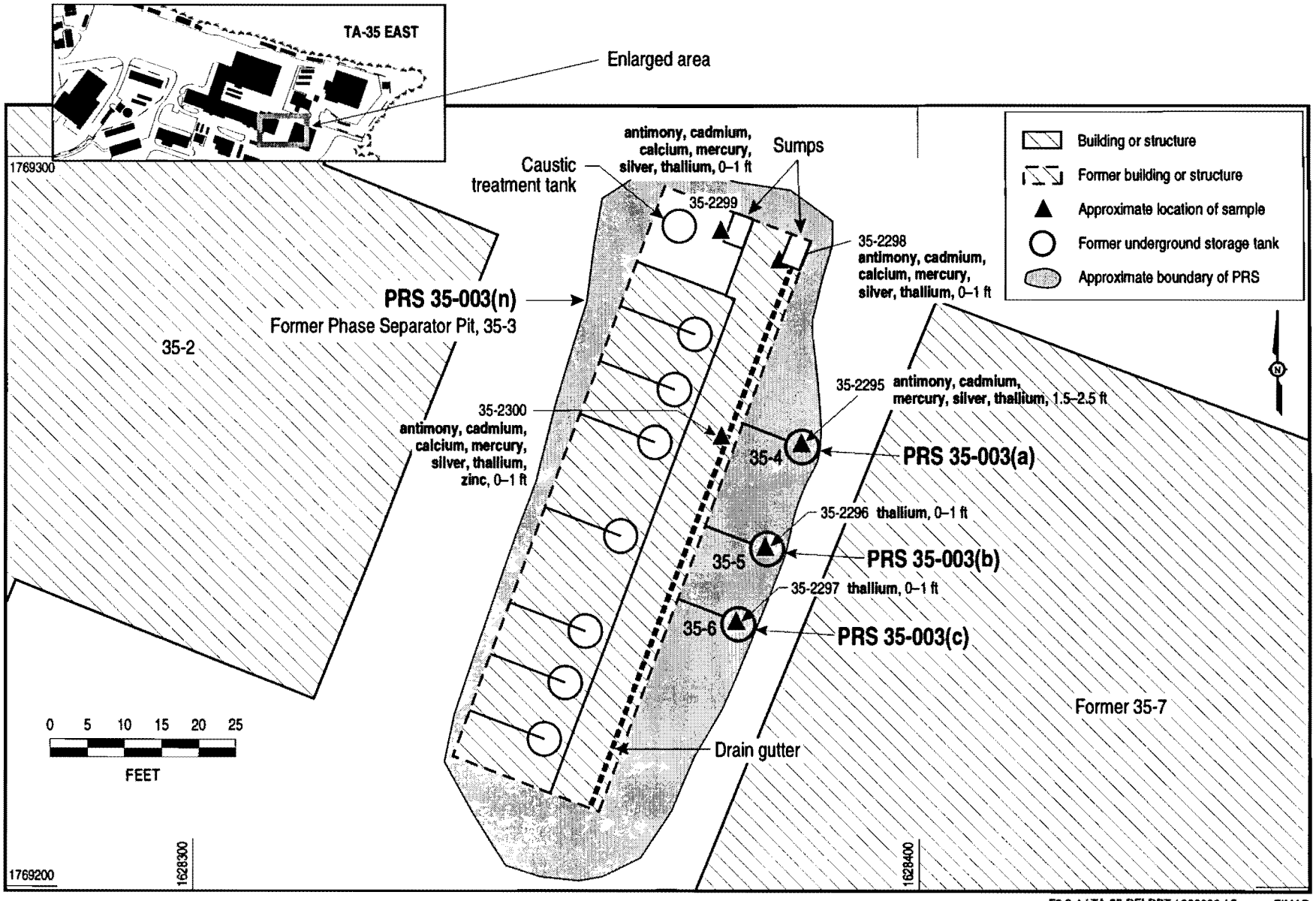


Figure 2.3-4. Sample map of PRSs 35-003(a, b, c, and n) showing locations where inorganic chemicals were retained as COPCs.

TABLE 2.3-6

PRSs 35-003(a, b, c, and n)
RESULTS OF INORGANIC DATA REVIEW

Analyte	Media	Result	Rationale
Antimony	ALLH	Retained	Not detected in any samples. Detection limit was above background value for four of six samples.
Cadmium	ALLH	Retained	Not detected in any samples. Detection limit was above background value for four of six samples.
Calcium	ALLH	Retained	Retained as COPC because three sample values exceeded the BV.
Mercury	ALLH	Retained	Retained as COPC because three sample values exceeded the BV.
Silver	ALLH	Retained	Not detected in any samples. Detection limit was above background value for four of six samples.
Thallium	ALLH	Retained	Not detected in any samples. Detection limit was above background value for six of six samples.
Zinc	ALLH	Retained	Retained as COPC because one sample value exceeded the BV.

(b) Radionuclide Comparison with Background/Fallout Radionuclide Concentrations

This section presents comparisons of detected radionuclide levels in RFI samples from PRSs 35-003(a, b, c, and n) to BVs or fallout concentrations. Appendix D includes an abridged version of the data set for this investigation, and the complete data set has been submitted to NMED in electronic form.

Description of RFI data. A total of 13 samples were submitted for fixed-laboratory radiological analyses. The analytical suites requested were the gamma spectroscopy suite (GSCAN), tritium (H3), strontium-90 (SR90), plutonium isotopes (ISOPU), uranium isotopes (ISOU), and gross-alpha and -beta radiation (GROSSAB). A complete list of the analytes for each suite is included in Appendix D-1.0. Samples from PRS 35-003(n) were collected and submitted at a later date and to a different laboratory than samples from PRS 35-003(a, b, and c), and the analyte list for the GSCAN at that laboratory (Environmental Science and Engineering, Inc.) was shorter. For that reason, fewer analytes are listed for PRS 35-003(n). Results for nondetected analytes are included in Appendix D-2.0

QA/QC findings and data validation results. The QA/QC findings for the radionuclide data showed that the LCSs for all data packages were within the acceptance limits presented in Appendix C, Table C-3.2-2. In some instances, focused validation resulted in modifications of routine validation qualifiers. Discussions of these modifications are included in Appendix C. No problems were identified during data validation that impact the usability of detected analyte data.

Background data set. The background values used for radionuclides are summarized in "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments, and Bandelier Tuff at LANL" (Ryti et al. 1998, ER ID 58093). All samples at this site were obtained from depths greater than 6 in. and from bedding material of unknown origin. For these reasons, sample concentrations of fallout radionuclides were not compared to fallout BVs, which are applicable only to surface (0–6 in.) samples. The appropriate BV was selected for each sample depending on the sampled media—i.e., bedding material (ALLH) or tuff (Qbt3).

Comparability of RFI and background sample methods. Most radionuclides in the RFI samples were analyzed by gamma spectroscopy. Fallout radionuclides were analyzed by the same methods as the background samples in all cases. Uranium isotopes were analyzed by alpha spectroscopy in the RFI samples, whereas in the background samples, they were analyzed by ICPMS. The two methods should

yield comparable results, and the DLs reported from the alpha spectroscopy analyses are well below the BVs obtained through ICPMS analyses.

Detected radionuclides. Nine radionuclides were detected at the site. The frequency of detection, including radionuclides for which no BVs are available or applicable, is summarized in Table 2.3-7. Applicable BVs for this data set are limited to those for isotopic uranium; no BV is available for cobalt-60, and the fallout BVs for the remaining radionuclides do not apply to these subsurface samples. If no applicable BVs were available, the detected radionuclides were retained as COPCs. COPCs are summarized in Table 2.3-8.

- Americium-241 was detected in 1 of 13 samples, at a concentration of 0.143 pCi/g. The fallout BV is not applicable to these samples.
- Cesium-137 was detected in 1 of 13 samples, at a concentration of 0.0107 pCi/g. The fallout BV is not applicable to these samples.
- Cobalt-60 was detected in 2 of 13 samples, at concentrations of 0.0337 pCi/g and 0.0174 pCi/g. No BV is available for this analyte.
- Plutonium-239 was detected in 2 of 13 samples, at concentrations of 0.024 pCi/g and 0.026 pCi/g. The fallout BV is not applicable to these samples.
- Strontium-90 was detected in 9 of 13 samples, at concentrations ranging from 2.09 pCi/g to 2.7 pCi/g. The fallout BV is not applicable to these samples.
- Tritium was detected in 7 of 13 samples, at concentrations ranging from 0.2 pCi/g to 0.416 pCi/g. The fallout BV is not applicable to these samples.

TABLE 2.3-7

PRSs 35-003(a, b, c, and n)
FREQUENCY OF DETECTED RADIONUCLIDES

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range[a] (pCi/g)	Background (pCi/g)	Frequency of Detects Above Background Value/Frequency of Detects[b]
Americium-241	ALLH	13	1	[0.003]–0.143	N/A[c] (fallout)	1/13
Cesium-137	ALLH	13	1	[0.001]–0.0107	N/A (fallout)	1/13
Cobalt-60	ALLH	13	2	[0.006]–0.0337	N.A.[d]	2/13
Plutonium-239	ALLH	13	2	[0.006]–0.026	N/A (fallout)	2/13
Strontium-90	ALLH	13	9	[0.05]–2.7	N/A (fallout)	2/13
Tritium	ALLH	13	7	0.2–0.416	N/A (fallout)	7/13
Uranium-234	ALLH	13	13	0.419–0.692	2.59	0/13
Uranium-235	ALLH	13	4	[0.016]–0.053	0.2	0/13
Uranium-238	ALLH	13	13	0.422–0.633	2.29	0/13

a. Values in square brackets indicate nondetected results.

b. Value is either the ratio of the number of detected values exceeding the BV to the number of analyses or the ratio of the number of detected values to the number of analyses.

c. N/A = The fallout BV is not applicable to these samples.

d. N.A. = No background value available.

TABLE 2.3-8

PRSs 35-003(a, b, c, and n)
RADIONUCLIDES WITH CONCENTRATIONS
AT OR EXCEEDING BACKGROUND VALUES[a]

Analyte	Location ID	Sample ID	Sample Concentration (pCi/g)	Background Value (pCi/g)	Media	Depth (ft)[b]	Current Depth (ft)[c]
Americium-241	35-2295	0435-96-0030	0.143	N/A (fallout)[d]	ALLH	1.5–2.5	25.5–26.5
Cesium-137	35-2296	0435-96-0035	0.0107	N/A (fallout)	ALLH	3–4	23–24
Cobalt-60	35-2295	0435-96-0031	0.0337	N.A.[e]	ALLH	4–5	28–29
	35-2296	0435-96-0035	0.0174		Qbt3	3–4	23–24
Plutonium-239	35-2298	0435-96-0042	0.026	N/A (fallout)	ALLH	0–1	28–29
	35-2299	0435-96-0045	0.024		ALLH	0–1	28–29
Strontium-90	35-2295	0435-96-0030	1.06	N/A (fallout)	ALLH	1.5–2.5	25.5–26.5
	35-2295	0435-96-0031	0.93		ALLH	4–5	28–29
	35-2296	0435-96-0034	0.32		ALLH	0–1	20–21
	35-2298	0435-96-0042	2.7		ALLH	0–1	28–29
	35-2298	0435-96-0043	1.13		ALLH	4–5	32–33
	35-2299	0435-96-0045	2.09		ALLH	0–1	28–29
	35-2299	0435-96-0046	0.93		ALLH	3–4	31–32
	35-2300	0435-96-0049	1.22		ALLH	0–1	20–21
	35-2300	0435-96-0050	0.56		ALLH	2–3	22–23
Tritium	35-2298	0435-96-0042	0.33	N/A (fallout)	ALLH	0–1	28–29
	35-2298	0435-96-0043	0.2		ALLH	4–5	32–33
	35-2299	0435-96-0045	0.416		ALLH	0–1	28–29
	35-2299	0435-96-0046	0.313		ALLH	3–4	31–32
	35-2299	0435-96-0047	0.246		ALLH	3–4	31–32
	35-2300	0435-96-0049	0.34		ALLH	0–1	20–21
	35-2300	0435-96-0050	0.303		ALLH	2–3	22–23

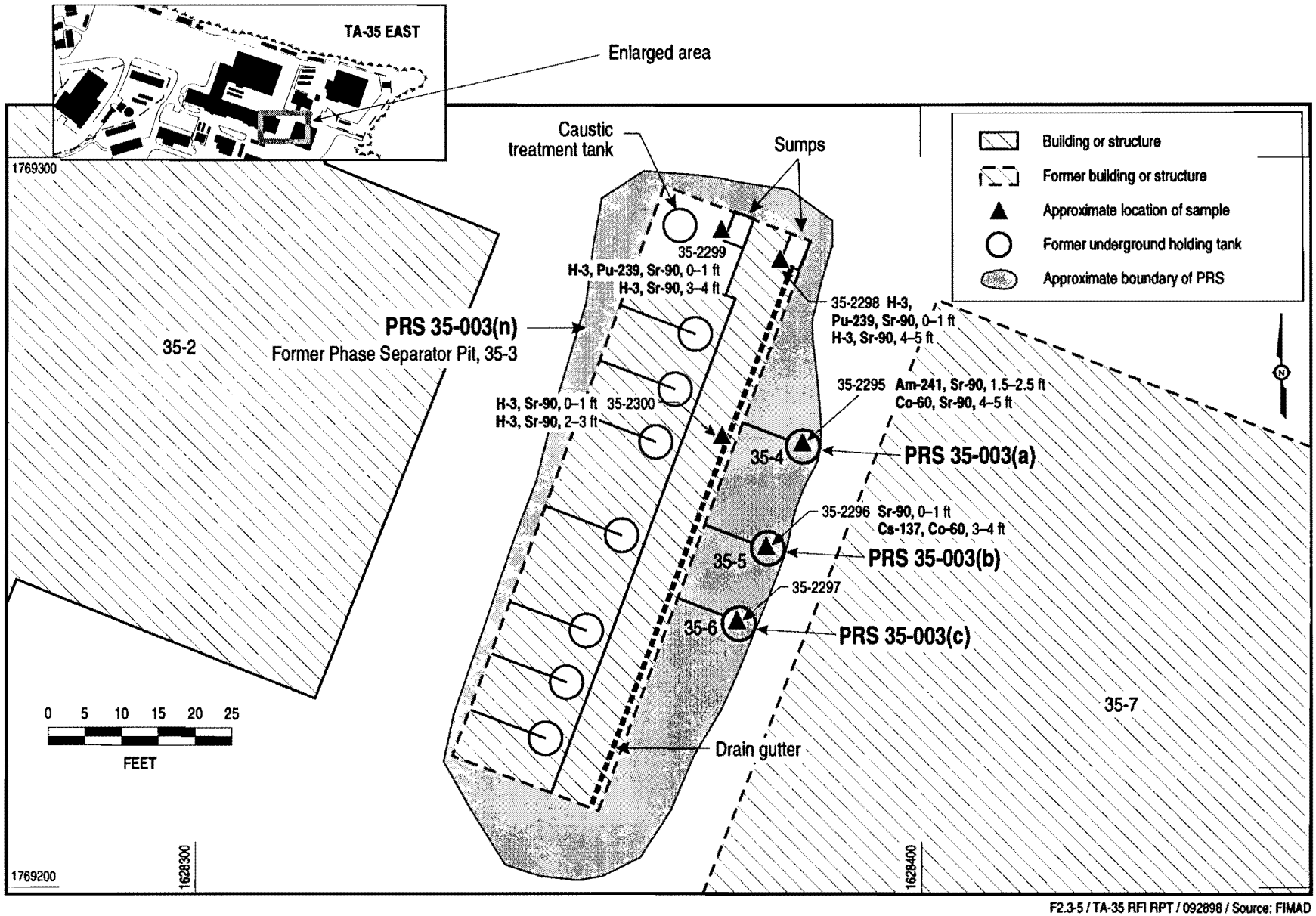
a. Descriptions of the analytical methods used for this PRS can be found in Appendix C-1, Table C-1.0-1. Detection limits can be found in Appendix D-1, Table D-1.0-1.
b. Depth below excavation floor.
c. Approximate depth below current surface.
d. N/A = Fallout BV is not applicable to these samples.
e. N.A. = No background value available.

COPCs retained for site assessments of PRSs 35-003(a, b, c, and n) are americium-241, cesium-137, cobalt-60, plutonium-239, strontium-90, and tritium. Rationales for retaining these analytes as COPCs are summarized in Table 2.3-9. Locations where radionuclide COPCs were retained are shown in Figure 2.3-5.

TABLE 2.3-9

PRSs 35-003(a, b, c, and n)
RESULTS OF RADIONUCLIDE DATA REVIEW

Analyte	Media	Result	Rationale
Americium-241	ALLH	Retained	Detected in one sample; fallout BV does not apply.
Cesium-137	ALLH	Retained	Detected in one sample; fallout BV does not apply.
Cobalt-60	ALLH	Retained	Detected in two samples; no BV available.
Plutonium-239	ALLH	Retained	Detected in two samples; fallout BV does not apply.
Strontium-90	ALLH	Retained	Detected in nine samples; fallout BV does not apply.
Tritium	ALLH	Retained	Detected in seven samples; fallout BV does not apply.



F2.3-5 / TA-35 RFI RPT / 092898 / Source: FIMAD

Figure 2.3-5. Sample map of PRSs 35-003(a, b, c, and n) showing locations where radionuclides were retained as COPCs.

(c) Evaluation of Organic Chemicals

This section summarizes the results of the data review for organic chemicals. Appendix D provides an abridged version of the RFI data, and the complete data set has been submitted to the administrative authority in electronic format.

Description of RFI data. Six samples were collected and submitted for VOC and SVOC analyses. During the sample collections at PRSs 35-003(a, b, and c) in August and September of 1996, the temperatures ranged from about 65°F to 85°F. The temperatures during the sampling of PRS 35-003(n) in January 1996 were near 0°F. Low temperatures decrease the probability of organic compounds being volatilized and during sampling.

One sample from each area of PRSs 35-003(a, b, and c) was analyzed for VOCs and SVOCs. Three samples from PRS 35-003(n) were analyzed for VOCs and SVOCs. A complete list of analytes for these analytical suites is included in Appendix D-1.0.

QA/QC findings and data validation results. The QA/QC findings showed that certain surrogate spike recoveries were not within acceptance limits for request number 2837 (see Appendix C-4.0) because of unknown sample matrix effects. Several analytes in the initial calibration, continuing calibration, and matrix spike/matrix spike duplicate were not within acceptance limits; however, these particular criteria were not a factor in qualifying the sample analytes. In request number 2837, acetone was negatively biased (J–) in all three samples. All request numbers contained estimated quantitation limits (EQLs) that were elevated from the contract EQLs. EQLs were subjected to modification because of soil moisture in the sample. In some instances, focused validation resulted in modifications of the routine validation qualifier. Discussions of these modifications are included in Appendix C.

In request number 2837, the concentration of acetone and trichloroethene (TCE) were usable as reported, even though surrogate spike recoveries indicated a sample matrix effect. In reviewing the chromatograms, the concentrations reported were judged to be reasonable estimates of the actual sample concentrations.

Detected organic chemicals. Two organic chemicals were detected at the site, as summarized in Table 2.3-10. Acetone was detected in three of six samples, with concentrations ranging from 0.06 mg/kg to 0.11 mg/kg. TCE was detected in three of six samples, with a concentration range of 0.01 mg/kg to 0.017 mg/kg. All detects were in samples collected from PRS 35-003(n) under the former PSP. No organic chemicals were detected at any of the three former holding tank locations. Results for nondetected analytes are included in Appendix D-2.0.

Results for all detected organic chemicals are summarized in Table 2.3-11. All sample concentrations of acetone include "J–" qualifiers, indicating that the results are estimated and that actual concentrations may be slightly higher than reported. TCE results are "J" qualified, indicating that these are estimated concentrations with no known or suspected upward or downward bias.

Figure 2.3-6 shows PRSs 35-003(a, b, c, and n) with locations where organic chemicals were retained as COPCs. Table 2.3-12 summarizes those organic chemicals retained as COPCs and the rationale used for retaining them. Both detected organic compounds were retained as COPCs.

TABLE 2.3-10

PRSs 35-003(a, b, c, and n)
FREQUENCY OF DETECTED ORGANIC CHEMICALS

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)	EQL (mg/kg)	Frequency of Detects*
Acetone	ALLH	6	3	0.06–0.11	0.02	3/6
Trichloroethene	ALLH	6	3	0.01–0.017	0.005	3/6

*Value is the ratio of the number of detects to the number of analyses.

TABLE 2.3-11

PRSs 35-003(a, b, c, and n)
DETECTED ORGANIC CHEMICALS[a]

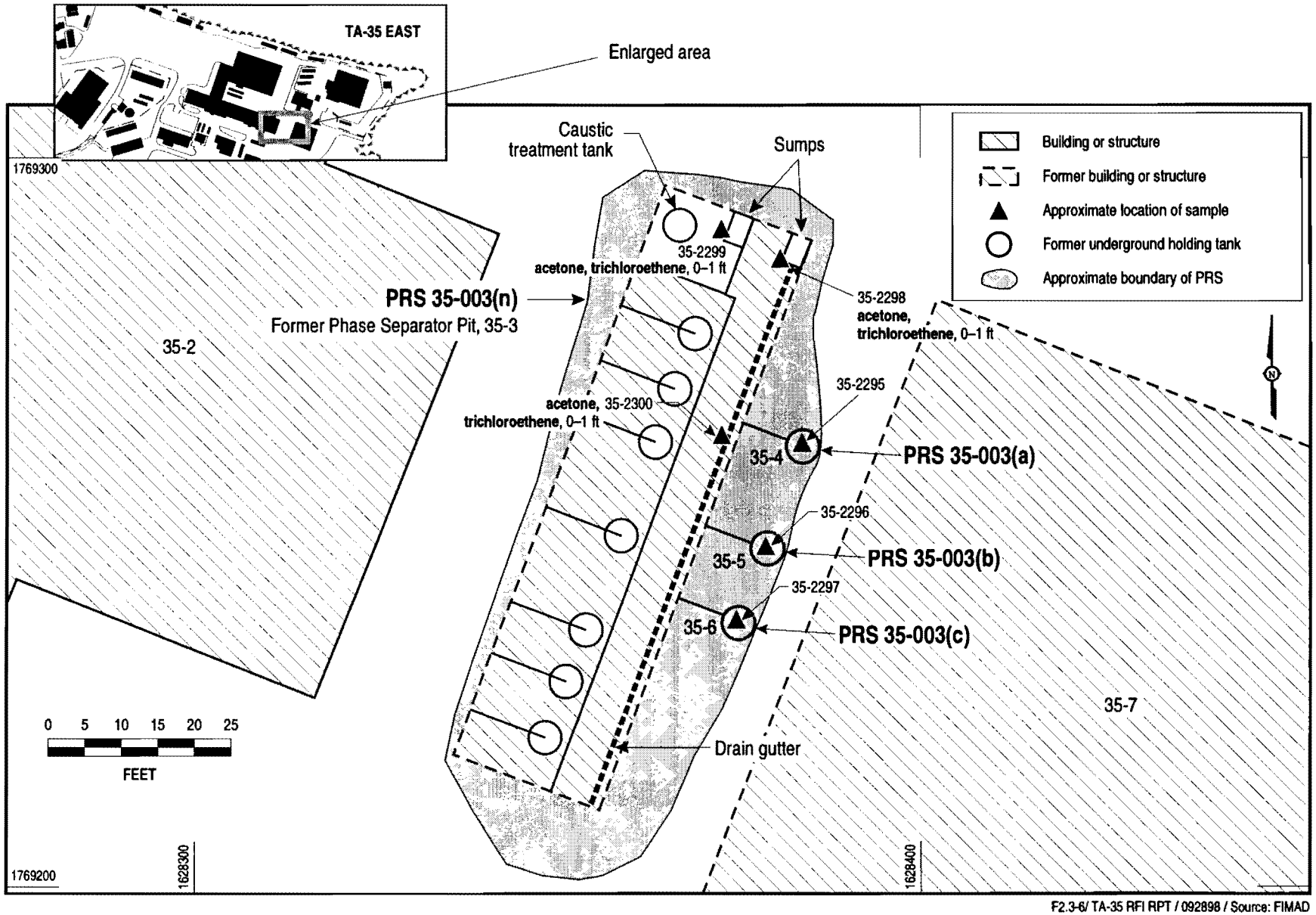
Analyte	Location ID	Sample ID	Sample Concentration[b] (mg/kg)	Media	Depth (ft)[c]	Current Depth (ft)[d]
Acetone	35-2298	0435-96-0042	0.06 (J–)	ALLH	0–1	28–29
	35-2299	0435-96-0045	0.08 (J–)	ALLH	0–1	28–29
	35-2300	0435-96-0049	0.11 (J–)	ALLH	0–1	20–21
Trichloroethene	35-2298	0435-96-0042	0.017 (J)	ALLH	0–1	28–29
	35-2299	0435-96-0045	0.01 (J)	ALLH	0–1	28–29
	35-2300	0435-96-0049	0.01 (J)	ALLH	0–1	20–21

a. Descriptions of the analytical methods used for this PRS can be found in Appendix C-1, Table C-1.0-1. Detection limits can be found in Appendix D-1, Table D-1.0-1.

b. Data qualifier flags are defined in the glossary, Appendix A-2.

c. Depth below excavation floor.

d. Approximate depth below current surface.



F2.3-6/ TA-35 RFI RPT / 092898 / Source: FIMAD

Figure 2.3-6. Sample map of PRSs 35-003(a, b, c, and n) showing locations where organic chemicals were retained as COPCs.

TABLE 2.3-12

PRSs 35-003(a, b, c, and n)
RESULTS OF ORGANIC DATA REVIEW

Analyte	Media	Result	Rationale
Acetone	ALLH	Retained	Detected in 3 of 6 samples.
Trichloroethene	ALLH	Retained	Detected in 3 of 6 samples.

(d) Other Applicable Data

Seven separator tanks and approximately 1,700 radioactively contaminated lead bricks from inside the PSP, components of the PSP structure (metal roof, concrete walls, and floor), and all associated piping were surveyed for radiological contamination and removed by the TA-35 Decommissioning Project personnel between January 1996 and May 1997. Radiological survey measurements of the PSP structure were less than the minimum detectable activity for alpha and ranged from less than the minimum detectable activity to 645,000 detections per minute (dpm)/100 cm^2 beta/gamma (Byars 1997, ER ID 58737, p. 5).

Decommissioning project personnel performed a radiological survey of the bedding material where the PSP structures had been located and reported measurements of less than the minimum detectable activity for alpha and for beta/gamma at all survey locations (the minimum detectable activity for alpha was generally 50 dpm/100 cm^2 and the minimum detectable activity for beta/gamma was generally 200 dpm/100 cm^2) (Byars 1997, ER ID 58737, p. 6).

No information was available documenting the methods used to obtain these decommissioning characterization data. Because of this and because locations do not correspond to any of the RFI sample locations, they do not directly corroborate the RFI data. They do, however, provide supplemental information that can be used to view the RFI data in a more complete context.

2.3.5 Revised Site Conceptual Model

The expectation stated in the preliminary site conceptual model (Section 2.3.3) was that no large releases had occurred from either the PSP or the three holding tanks. This was based on the operational history of the PSP and on field observations of the structures during decommissioning activities. Field observations confirmed that all three holding tanks and the PSP structure were free of visible leaks, cracks, or surface penetrations.

The RFI data presented in this report are largely consistent with the preliminary conceptual model. Low levels of a number of radionuclides and organic and inorganic chemicals were detected within the PRSs. The low concentrations and spatial distribution are not indicative of a large release of contaminants, but may indicate minor (low volume) releases through the floor of the PSP or contamination derived from sources other than the operation of the PSP. Section 2.3.5.1 discusses the nature and extent of the contamination detected, including possible sources and spatial distribution. Section 2.3.5.2 discusses the potential environmental fate of the detected contaminants as well as potential exposure pathways for human and ecological receptors.

2.3.5.1 Nature and Extent of Contamination

Possible Sources of Contamination

The contaminants detected at PRSs 35-003(a, b, c, and n) are only partially consistent with the wastes found in the holding tanks and the caustic treatment tank during the decommissioning activities in 1996. Tank 4 was found to be empty, whereas tank 5, tank 6, and the caustic treatment tank contained acetone (1,900 µg/l), benzene (56 µg/l), carbon tetrachloride (380 µg/l), 1,1-dichloroethene (15,000 µg/l), 2-butanone (75 µg/l), 1,1,1-trichloroethane (12,000 µg/l), methylene chloride (5,600 µg/l), lead (110 ppm), chromium (42 ppm), mercury (5.5 ppm) (Rey 1996, ER ID 58979, p. 8), and total alpha activity of 186 nCi/l (Sontag 1996, ER ID 59421). Americium-241, cesium-137, and strontium-90 were earlier identified as sources of the gross radioactivity in those tanks (ICF Kaiser 1994, ER ID 53455, p. 14).

The organic and inorganic constituents found in the holding tanks are completely absent from the material under the tanks and PSP, with the exception of acetone and mercury. This strongly suggests that the holding tanks had not leaked or released any contaminants in the 10 or more years that the system had been completely inactive. If not, the contaminants would, presumably, have had to come from an earlier period of operation of the PSP or from another source. The PSP itself could be a more likely source of releases, although no cracks, leaks, or soil staining were observed at that structure during decommissioning activities.

The RFI sample results also show similarities to the reported contaminants in the 1993-94 D&D borehole samples. In particular, borehole samples showed relatively high levels of tritium and strontium-90 at multiple locations and depths above the level of the RFI samples. It is possible that the contaminants detected in the RFI samples are derived from the same source as the contamination in the borehole samples. That source does not appear to have been either the PSP or the holding tanks because the contamination was present consistently at depths as much as 20 ft or more above the floor of the PSP and the tops of the tanks.

Numerous potential sources of contamination in the general vicinity of PRSs 35-003(a, b, c, and n) are summarized in the RFI Work Plan for OU 1129 (LANL 1992, ER ID 07666, pp. 3-64 through 3-71), including both liquid and atmospheric releases. Tritium and plutonium, in particular, are known to have been released from a stack at building TA-35-2 for at least 20 years, beginning in 1953. Potential soil contamination from those stack releases is addressed as PRS 35-014(a). PRS 35-003(misc.) consists of numerous lines associated with the wastewater treatment facility. These lines ran on the north and south sides of the PSP and tanks, at a depth of about 5 ft. It is not clear that any of these releases has contributed to contamination at PRSs 35-003(a, b, c, and n), but the possibility cannot be ruled out on the basis of existing data.

Spatial Distribution

Radionuclide data are available for all samples at this site. Inorganic and organic data are available only for the upper sample at each of the six sample locations. Because any releases from the PSP or holding tanks would have been in the form of liquid mixed waste, it is expected that detected radiological components of that liquid would be accompanied by the inorganic and organic components as well. Thus, where inorganic and organic data are not available, the presence or absence of those constituents may be inferred from the radionuclide data.

One or more of seven inorganic COPCs were reported in the upper sample at all six sample locations. Of these seven inorganic chemicals, only calcium (in three locations; 35-2298, 35-2299, and 35-2300),

mercury (in one location, 35-2298), and zinc (in one location, 35-2300) were considered detected without qualification. Mercury was also reported as nondetected (with U or UJ qualifiers) but at or above BV at three other locations. Antimony, cadmium, and silver were each reported (with U or UJ qualifiers) at four of the six locations. Thallium was reported (with U or UJ qualifiers) at all six locations.

Acetone and trichloroethene, the only organic chemicals detected at this site, were present in the upper sample at each of the three PSP locations (35-2298, 35-2299, and 35-2300). No organic chemicals were detected at any of the three holding tank locations.

Strontium-90 was detected in both the upper and lower samples at four of the six locations (all PSP locations and the north tank location, 35-2295) and in the upper sample at another location (35-2296). Tritium was detected in each of the six samples (plus one duplicate sample) in PRS 35-003(n), but in none of the holding tank locations. Plutonium-239 was detected in two samples (upper sample only at 35-2298 and 35-2299), and cobalt-60 was detected in two samples (lower sample only at 35-2295 and 35-2296). Americium-241 and cesium-137 were each found in only one sample (americium-241 in the upper sample only at 35-2295, cesium-137 in the lower sample only at 35-2296). One or more of six radionuclide COPCs were detected in both the upper and lower samples at five of the six locations, but in all but two cases (cobalt-60 and cesium-137 were found in the lower samples only) the deeper of the two samples had a lower concentration than the upper sample. To the degree that this distribution establishes a trend of decreasing radionuclide concentration with depth, a similar trend in concentrations of inorganic and organic constituents may be inferred.

The distribution and concentrations of the COPCs at this site clearly are not indicative of significant releases of the constituents associated with the PSP or holding tanks. The complete absence of several organic compounds known to have been present in the holding tanks supports this. Leaks from the tanks and PSP would also be expected to have resulted in considerably higher levels of radionuclides than the trace levels detected in the RFI samples, based on both process knowledge and the results of tank liquid samples documented in Rey 1996 (ER ID 58979). Further, the presence of some of the same radionuclides in D&D borehole samples above the PSP and tanks suggests that the bedding material surrounding these structures contained low levels of contaminants derived from another source. If some low-volume releases had occurred from these structures, the biased sample locations are likely to have captured the maximum concentrations of any residual contaminants.

2.3.5.2 Environmental Fate

The environmental fate of the contaminants present at PRSs 35-003(a, b, c, and n) is largely governed by the depth of clean backfill above the site. This depth precludes infiltration of surface water into the vadose zone directly above the contaminated area. The site is also well below the natural soil zone, which eliminates interflow (lateral flow within soil horizons) as a likely source of moisture input. For these reasons, it is unlikely that a sufficient hydraulic gradient can exist at this site to transport any of the residual contamination to greater depths or toward the mesa edge.

In the absence of surface sources of water, the only migration mechanism by which any residual contamination associated with these PRSs could move in the subsurface is if a large liquid release had occurred to provide a hydraulic driver. However, the RFI data as well as both D&D and ER radiological surveys and visual inspections indicate that releases to the environment from these PRS were either minimal or nonexistent. In the absence of any indication of a large release or any mechanism by which contamination could migrate in the subsurface, potentially complete exposure pathways are limited to those associated with intrusion from the surface.

Intrusion from the surface to the grade of the former PRS is considered possible only as a result of construction activities associated with a building having one or more subfloors, or possibly via deep-rooting plants. The use of the area for industrial purposes, and particularly the presence of asphalt above the backfill to create a parking area, renders the likelihood that a deep-rooting tree or other plant will establish itself on the site unlikely.

Although future construction of a building with subfloors on the site of these PRSs is possible, no such plans exist at the present time. The area is currently used for parking. Future construction of a slab-on-grade structure or placement of transportable buildings would not feasibly result in intrusion to depths exceeding 20 ft. Traditionally, depths of approximately 10 or 12 ft are used as likely depths to which basements or building footings might extend. However, the Laboratory has constructed buildings with subfloors beyond such depths in the past.

Both plant intrusion and building construction are associated with the potential for future, rather than present-day, contact with site contaminants. Radionuclides including Cs-137, Sr-90, and H-3 were detected in site samples and/or present in tank samples from these PRSs (ICF Kaiser 1994, ER ID 53455). In particular, Sr-90 is considered the signature contaminant in processes associated with these PRSs. These radionuclides have half-lives of approximately 30 years or less. Therefore, these radionuclides will not exist at these PRSs after approximately 100 to 200 years.

2.4 Site Assessments

2.4.1 Summary

A human health screening assessment and an ecological screening assessment were conducted for PRSs 35-003(a, b, c, and n). Despite the identification of a number of COPCs in the data review (Section 2.3.4.3 of this RFI report), the lack of complete exposure pathways or drivers for contaminant migration result in no calculable risk associated with those COPCs. Therefore, no complete human health risk assessment or ecological risk assessments were performed.

A LANL-ER-AP-4.5 Surface Water Site Assessment was conducted for each of these PRSs. These assessments identified the PRSs as exhibiting low erosion potential (Part B score of 27.6 for all four PRSs). Surface water issues are addressed in Section 2.4.4.1 of this RFI report, and Parts A and B of the AP-4.5 Surface Water Site assessment are included in Appendix B-4.2.1. No groundwater issues have been identified at this site. UST regulations do not apply to this site because the tanks at PRSs 35-003(a, b, and c) contained only radioactive or mixed wastes. Therefore, no UST assessment was performed.

2.4.2 Screening Assessments

A human health screening assessment is presented in Section 2.4.2.1 below. An ecological screening assessment is presented in Section 2.4.2.2. Both screening assessments were performed following guidance presented in the Hazardous and Radioactive Materials Bureau "Risk-Based Decision Tree" (NMED 1998, ER ID 57761).

2.4.2.1 Human Health

(a) Scoping

Both the holding tanks and PSP were observed to be in good condition when they were removed, and no visual evidence of staining that might be associated with leaks was observed. The results of the gross

radioactivity screening (Section 2.3.4.2) and analytical laboratory results (Section 2.3.4.3) confirm that large releases have not occurred. Residual contamination associated with PRSs 35-003(a, b, c, and n) is at present covered beneath 20–33 ft of backfill and debris. An asphalt parking area now covers the location of the PRSs. Because no liquid releases have occurred that might have resulted in vertical or horizontal migration of contaminants through the tuff and because any residual contamination is now inaccessible from the surface, there are no possible pathways by which human exposure to site-related contaminants could occur.

According to the Laboratory's Site Development Plan (LANL 1995, ER ID 57224, p. 14), the foreseeable future land use for TA-35 is industrial. Access to the area in the vicinity of the PRSs is not currently controlled (i.e., it is not "behind the fence"). The absence of complete exposure pathways at these PRSs would be unlikely to change regardless of accessibility or land use. Even under the most conservative residential land use scenario, it is unlikely that any excavations (i.e., residential basements or utilities excavations) would reach the residual contaminants at this site.

(b) Screening Evaluation

The screening evaluation is presented primarily for the purpose of providing a context for measured analytical values. As described above, there are no complete exposure pathways associated with these PRSs and, hence, no risk associated with any hazardous substances that may be present.

Inorganic chemicals and radionuclides that exceed background, and organic chemicals positively identified in one or more samples are compared with SALs to evaluate the potential for adverse health impacts. SALs for nonradioactive chemicals that were used in these comparisons are based on residential soil risk-based screening levels published in Environmental Protection Agency's (EPA's) "Region IX Preliminary Remediation Goals 1998" (Smucker 1998, ER ID 58751). SALs for radionuclides in soil are calculated using the RESRAD computer code, using residential exposure assumptions and an annual dose limit of 10 mrem.

EPA Region IX preliminary remediation goal (PRG) values are being used as interim screening levels while a protocol for calculating SALs and performing human health screening is being prepared by the ER Project (Smucker 1998, ER ID 58751). The screening protocol used here is based on the methodology described in the preamble to "EPA Region VI Human Health Media-Specific Screening Levels" (EPA 1997, ER ID 59103, pp. 1–3). The maximum detected value above background is used for the SAL comparison. The screening values for noncarcinogens are divided by 10 to obtain SAL values when two or more noncarcinogen COPCs are identified. Screening levels for EPA Class A, B1, and B2 carcinogens are compared directly with site values. For EPA Class C carcinogens, screening values are multiplied by 10 to obtain SAL values. When two or more radionuclide COPCs are identified, the maximum detected value above background is divided by the SAL for each radionuclide and the resulting normalized values are summed. If the normalized sum is less than one, the annual dose limit is not exceeded. Normalizing measured radionuclide values is necessary because the radionuclide SALs reflect, at the annual dose limit, the soil concentration of each single radionuclide resulting in exposure.

Calcium was detected in three of six samples at a maximum concentration of 24,000 mg/kg. Mercury and zinc were each detected in one of six samples at 1.4 (J) and 69 mg/kg, respectively. Acetone and trichloroethene were also detected at trace levels in three of six samples. Antimony, cadmium, silver, and thallium were not detected in any sample, but the DLs for these analytes exceed their respective BVs. These analytes are discussed below under Uncertainty Analysis. The results of the SAL comparisons for inorganic and organic chemicals are provided in Table 2.4-1.

TABLE 2.4-1

PRSs 35-003(a, b, c, and n)
SAL COMPARISON FOR INORGANIC AND ORGANIC CHEMICALS

Chemical	Location ID	Sample ID	Depth[a] (ft)	Current Depth[b] (ft)	Maximum Site Value[c] (mg/kg)	SAL (mg/kg)
Acetone	35-2300	0435-96-0049	0–1	20–21	0.11 (J-)	140[d]
Antimony	35-2298	0435-96-0042	0–1	28–29	11 (UJ)	3[d]
Cadmium	35-2298	0435-96-0042	0–1	28–29	0.57 (U)	3.7[d]
Calcium	35-2300	0435-96-0049	0–1	20–21	24,000	NA[e]
Silver	35-2298	0435-96-0042	0–1	28–29	2.3 (U)	37[d]
Thallium	35-2296	0435-96-0034	0–1	20–21	1.4 (UJ)	0.52[c]
Mercury	35-2298	0435-96-0042	0–1	28–29	1.4	2.2[d]
Trichloroethene	35-2298	0435-96-0042	0–1	28–29	0.017 (J)	2.7[f]
Zinc	35-2300	0435-96-0049	0–1	20–21	69	2,200[d]

a. Depth below excavation floor.
b. Approximate depth below current surface.
c. Data qualifier flags are defined in the glossary, Appendix A-2.
d. Noncarcinogen SAL is 1/10th of EPA's PRG value.
e. No EPA toxicity value available; generally recognized as nontoxic.
f. EPA Class B2 carcinogen.

One or more radionuclides were detected at PRSs 35-003(a), 35-003(b), and 35-003(n). As described in Section 2.3.4.3, radionuclides associated with global fallout from nuclear weapons testing were not compared to these fallout background levels because of the depth at which samples were collected. Strontium-90 was detected in one or more samples at each of the three PRSs where radionuclides were identified. Tritium and plutonium-239 were only detected at PRS 35-003(n). Americium-241 was detected in only one sample at PRS 35-003(a). Cesium-137 was detected in only one sample at PRS 35-003(b). Cobalt-60 was detected in one sample at both PRS 35-003(a) and (b). The results of the SAL comparisons for radionuclides are provided in Table 2.4-2.

(c) Uncertainty Analysis

Based on the Laboratory's Site Development Plan (LANL 1995, ER ID 57224, p. 14), TA-35 is expected to remain an industrial site under institutional control for the foreseeable future. The land use subsequent to the Laboratory's ownership is not defined for the area of this PRS at this time. However, the backfill cover depth of 20–33 ft is deep enough to discourage inadvertent intrusion in other land use scenarios such as residential or recreational use. Some uncertainty remains regarding residual contamination that may be associated with the backfill used at the site following decommissioning activities. Although the "Decommissioning Completion Report for Phase Separator Pit at TA-35" (Byars 1997, ER ID 58737, p. 9) states that clean fill was brought in for the regrading, it also states that clean concrete from the demolition of the PSP was also used as part of the backfill. The criteria for distinguishing clean concrete was not specified in the report. It is possible that the criteria for residual radioactive contamination on concrete were based on surface swipe measurements that were compared to authorized limits in DOE Order 5400.5.

TABLE 2.4-2

PRSs 35-003(a, b, c, and n)
SAL COMPARISON FOR RADIONUCLIDES

Chemical	Location ID	Sample ID	Depth[a] (ft)	Current Depth[b] (ft)	Maximum Site Value (pCi/g)	SAL (pCi/g)	Normalized Value
Americium-241	35-2395	0435-96-0030	1.5–2.5	25.5–26.5	0.143	22	0.0065
Cobalt-60	35-2395	0435-96-0031	4–5	28–29	0.0337	1.1	0.031
Cesium-137	35-2396	0435-96-0034	0–1	20–21	0.001	5.1	0.0002
Plutonium-239	35-2398	0435-96-0042	0–1	28–29	0.026	24	0.0011
Strontium-90	35-2398	0435-96-0042	0–1	28–29	2.7	4.4	0.62
Tritium	35-2399	0435-96-0045	0–1	28–29	0.416	260	0.0016
						Normalized Sum	**0.65**

a. Depth below excavation floor.
b. Approximate depth below current surface.

The origin of the COPCs identified in the Data Review section of this report is not known with certainty. Visual observation of the holding tanks following removal indicated that the structures were intact. Samples collected from D&D boreholes before initiating removal of the structures indicated that the original bedding material adjacent to the PRS and at shallower depths than the structures contained low levels of radiological contamination (see Section 2.3.2). It is possible that the low levels of contamination measured in the samples collected from beneath the holding tanks and PSP are likewise associated with this pre-existing contamination believed not be related to the PSP and holding tanks. In particular, measured concentrations of plutonium-239, cesium-137, and tritium were all less than the BVs associated with fallout in surface soils. All or part of the site concentrations of these radionuclides may be attributable to fallout, depending upon the origin of the bedding material.

Despite the fact that the origin of the identified COPCs cannot be attributed to a particular source with high certainty, there is relatively high confidence that the site characterization is adequate to describe the nature and extent of any releases. As discussed in Section 2.3.5, the results of field radiological surveys, visual observation, and RFI analytical data show that no large-scale liquid releases have occurred at these PRSs. Because no mechanisms have existed to redistribute contaminants in the tuff, the extent of site releases (if any) is necessarily constrained. Therefore, data from samples collected immediately below the structures should be adequate to bound the upper range of residual COPC concentrations associated with any incidental releases.

The principal contributor (95%) to the normalized sum of 0.62 for radionuclides in the Screening Evaluation is Sr-90. Strontium-90 is also the analyte which site history associates most closely with potential contaminants released to the environment from these PRSs. The fact that biased samples collected beneath the PRS structures did not contain sufficient Sr-90 to exceed the SAL value suggests that the potential future human health impacts associated with these PRSs are negligible. The samples were collected at depths that are presently 20 to 33 ft below grade while SAL values are calculated assuming that contaminated surface soils exist in an area sufficiently large to support a single family residence. As described in the revised Site Conceptual Model, the great depth of clean fill used to recontour the site has effectively eliminated any present-day exposure pathways. The relatively short half-

life of Sr-90 (approximately 30 years) will result in any existing contamination being reduced to negligible levels within 100 to 200 years.

One or more of the four inorganic chemicals for which DLs exceeded BVs (antimony, cadmium, silver, and thallium) may, in fact, have been present in site samples at concentrations above background but below the analytical DLs. This possibility would normally be of concern primarily for antimony and thallium because their maximum sample-specific DLs were also higher than 1/10 of their respective SAL values (Table 2.4-1). However, because of the absence of complete exposure pathways and evidence that indicates a significant release has not occurred at this site, further investigation of whether these chemicals are actually present at concentrations approaching their DLs is not warranted.

One additional uncertainty associated with the analytical data concerns the possible presence of unresolved hydrocarbons in some of the VOC samples. As discussed in Appendix C, matrix interferences were observed in a few VOC samples. Such interference in organic analyses is normally associated with the presence of unresolved compounds that decrease the resolution of specific chemicals with which they co-elute on the chromatogram. SVOC analyses were not performed for the samples exhibiting this interference, so the possibility that higher molecular weight compounds were present has not been resolved. It is unlikely that this interference was due to petroleum-related contamination because of the absence of certain compounds such as benzene and the substituted benzenes that are commonly found in such products.

(d) Interpretation

The RFI data provide confirmation that decommissioning activities did not leave behind unacceptable levels of contamination below the PRS structures. The RFI data have been evaluated in the context of other site information (including the results of decommissioning and RFI field radiological surveys, visual observations, and exposure pathway analysis) to assess the possible human health impacts at these PRSs. This information is considered adequate to form the basis for site decisions as they pertain to potential human health impacts.

2.4.2.2 Ecological

The ecological risk screening assessment methodology is described fully in Kelly et al. (1998, ER ID 57916, pp. 24–26). The ecological screening assessment consists of four parts: (1) the scoping evaluation, (2) the screening evaluation, (3) the uncertainty analysis, and (4) the interpretation section.

The scoping evaluation includes (1) evaluation of the PRS for its biotic associations, including threatened and endangered (T&E) associations; (2) evaluation of the PRS for the nature of suspected contamination and mechanisms of contaminant transport onto or away from the site; (3) evaluation of the PRS for aggregation with neighboring PRSs because of process knowledge and/or geographical associations; (4) the data assessment step, which identifies the list of contaminants of potential concern for the PRS; (5) evaluation of the ecological conceptual site model for the specific PRSs under investigation; and (6) evaluation of the level of concern from potential persistent bioaccumulators (PPBs) and biomagnifiers identified at the PRSs. The basis for the PRS-specific ecological problem formulation is found in the scoping checklist, which is included as Appendix F. The scoping checklist is a useful tool for organizing existing ecological information and focusing information needed to develop the site conceptual model. The scoping checklist also provides the basis for evaluating the adequacy of the data for ecological risk screening.

The screening evaluation methodology is described in Kelly et al. (1998, ER ID 57916, pp. 24–26) and is not described or summarized here because an ecological screening evaluation was not performed for these PRSs.

Following the scoping and the screening as necessary, the results are interpreted and discussed in the context of a risk management decision. This could lead to recommendations of corrective action or ecological "no further action" (NFA). Recommendations will be incorporated into an integrated risk management decision that will include human health risk evaluations, ground and surface-water issues, and applicable regulations. If the data are not adequate to support a recommendation, further investigation will be recommended to support an aggregate or baseline ecological risk assessment.

(a) Scoping

The ecological scoping checklist for PRSs 35-003(a, b, c, and n) is found in Appendix F (attachment). Information from this checklist is summarized in the sections below.

Biotic associations. A biological assessment was performed for TA-35 in 1992 (Dunham 1992, ER ID 31276, 52 pp.) This assessment includes a lengthy list of plants, animals, and other organisms found at large in TA-35. The industrial core of TA-35, including the area of PRSs 35-003(a, b, c, and n), does not provide suitable habitat for most organisms. PRSs 35-003(a, b, c, and n) are located at the periphery of the fully industrialized section of TA-35 but are clearly within those bounds. These PRSs are currently used for industrial operations, roadways, and/or parking. Biotic associations at this site are limited to weeds growing on the periphery of the paved section or to incidental wildlife crossing of the area.

All of TA-35 is listed as core area for the Mexican spotted owl. However, site visits confirm that there is no area near these PRSs that can be considered suitable owl habitat. The biological assessment of TA-35 does not indicate any habitat for the Mexican spotted owl. The biological assessment indicates that TA-35 is potential habitat for gramagrass cactus *(Toumeya paparacanthus)*, but the sites under consideration are fully industrialized and are not suitable habitat.

Suspected contamination effects on biotic media. Both the holding tanks (PRSs 35-003[a, b, and c]) and the PSP (PRS 35-003[n]) were observed to be in good condition when they were removed, and no visual evidence of staining that might be associated with leaks was observed. The results of the gross radioactivity screening (Section 2.3.4.2) and analytical laboratory results (Section 2.3.4.3) confirm that large releases have not occurred. Residual contamination associated with PRSs 35-003(a, b, c, and n) is now covered by 20–33 ft of backfill and an asphalt parking area. Because no liquid releases have occurred that might have resulted in vertical or horizontal migration of contaminants through the tuff, and because any residual contamination is now inaccessible from the surface, there are no likely pathways by which contaminants can reach ecological receptors. No shrubs or trees are present in this area that might root deeply enough to reach the PRSs.

There are no likely off-site pathways for contaminants from these PRSs to ecological receptors. Given the accuracy of the process knowledge of the area, there would appear to have been no visible or olfactory signs of contamination remaining in soil adjacent to or beneath the removed tanks and separator pit. The lack of these signs, in addition to the process knowledge of the PRSs, indicates that the necessity of VOC and SVOC data is diminished for these sites. Tritium is the most mobile of the COPCs identified in the data review section (Section 2.3.4.3 of this report). However, it is unlikely that tritium will reach ecological receptors either as surface vapor or by vertical transport to groundwater, considering the concentrations detected, the overburden of the site (20–33 ft), the likely depth to groundwater (700+ ft), and the short

half-life of tritium. The likelihood of any contaminant migration to groundwater is exceedingly small. Additional sampling for the full extent and rate estimation of contaminant movement subsequent to the removal of the PSP and holding tanks is not warranted.

PRSs 35-003(a, b, c, and n) had no impact to surface media. The holding tanks and the PSP were removed, and the area was backfilled and paved. A curb deters runon immediately upslope, rerouting rainwater to a storm drain that empties into Ten Site Canyon to the east. Other possible surface-water pathways include flow downslope into Pratt Canyon to the east. Surface water on these PRSs cannot result in contaminant transport. The possibility of significant erosion on this site is considered very low.

PRS aggregation for ecological evaluation. PRSs 35-003(a, b, c, and n) were once interconnected by underground conduits or piping. Upgradient, building 35-02 was a source of effluents to these PRSs through underground piping. The associated piping entering and exiting PRSs 35-003(a, b, c, and n) are included in PRSs 35-003(d, l, and q), 35-003(e, f, g, m, and o), 35-003(misc.), and 35-003(h). Decommissioning reports indicate that all of the piping entering and exiting those PRSs has been removed. Because of this knowledge, because the holding tanks and PSP at PRSs 35-003(a, b, c, and n) have been removed and the area has been filled and paved, and because the area is confined within the industrial environs of TA-35, it is unnecessary to aggregate PRSs 35-003(a, b, c, and n) with other PRSs in the area.

COPC identification. The RFI sampling for PRSs 35-003(a, b, c, and n) was coordinated with the decommissioning activities. As structures were exposed and removed, ER personnel performed site surveys, screened soil and tuff underlying the PRSs with hand-held beta/gamma instruments, and obtained soil samples for laboratory analyses. Existing soil/tuff data available at the time that the VCA Plan for PRSs 35-003(a, b, c, and n) (LANL 1996, ER ID 53733, p. 2-1) was written (March 1996) were limited to VOC, SVOC, metals, and gross alpha/beta/gamma results from three D&D boreholes near the PSP. Radionuclides, including tritium, were detected in some samples, as were VOCs. Based on these results and on process knowledge concerning possible contaminants associated with the wastewater treatment plant, the analytical suites proposed in the VCA Plan included tritium, gamma-emitting fission products, strontium-90, isotopic uranium and plutonium, VOCs, SVOCs, and metals.

Data gathered for characterization of PRSs 35-003(a, b, c, and n) (reviewed in Section 2.3.4.3 of this report) appear to be adequate for identification of the COPCs for the ecological screening assessment. The areas that were sampled were likely to have been where maximum contaminant concentrations would have been found in the PRSs, considering the nature of potential contaminant release. The tables found in Section 2.3.4.3 of this report summarize all inorganics and radionuclides detected above BV (where applicable) and all other radionuclides and detected organics.

Ecological pathways conceptual exposure model. The ecological pathways conceptual exposure model (EPCEM) is presented in Appendix F as part of the ecological scoping checklist. For PRSs 35-003(a, b, c, and n), there were no identified pathways to ecological receptors; therefore, the EPCEM reflects this evaluation.

(b) Screening Evaluation

No screening evaluation was carried out because no pathways to receptors exist.

(c) Uncertainty Analysis

No uncertainty analysis was carried out because no pathways to receptors exist.

(d) Interpretation

Because pathways to ecological receptors are lacking, and based on the use and intended future use of the site (industrial), and the current overburden at the site, there appears to be no threat posed by any residual contamination at PRSs 35-003(a, b, c, and n) to ecological receptors. Additionally, it is highly unlikely that any contaminants associated with PRSs 35-003(a, b, c, and n) will reach ecological receptors by processes of waterborne transport, mass transport, or mass wasting in the foreseeable future.

2.4.3 Risk Assessments

No risk assessments were performed because of the lack of exposure pathways at this site.

2.4.4 Other Applicable Assessments

Section 2.4.4.1 below presents a discussion of LANL-ER-AP-4.5, Surface Water Site Assessments for PRSs 35-003(a, b, c, and n). Section 2.4.4.2 presents a discussion of groundwater issues for the site.

2.4.4.1 Surface Water

A LANL-ER-AP-4.5 Surface Water Site Assessment was conducted at PRSs 35-003(a, b, c, and n) on May 20, 1998. That assessment determined that the PRSs are completely covered with asphalt and that no visible erosion has occurred at the site. A small portion of runoff from the site terminates in Ten Site Canyon, but most of the runoff flows onto the base course parking area east of the site. A concrete curb upslope of the site diverts run-on away from the site, and no natural drainage patterns are directing storm water onto the site. The PRSs each received a LANL-ER-AP-4.5 Erosion Matrix score of 27.6, which includes the effects of best management practices (BMPs) that are in place (curbs are currently in place that divert run-on away from the site). If the BMPs were not in place, the score is estimated to be 34.6. Parts A and B of the LANL-ER-AP-4.5, Surface Water Site Assessment are included in Appendix B-4.2.1. No surface-water sampling was conducted in association with these PRSs.

Surface-water issues for these PRSs are minimal because the PRSs are now more than 20 ft below grade and under an asphalt-paved surface. As such, it is extremely unlikely that surface water will impact the PRSs through either infiltration or erosion, as discussed in Section 2.3.5, Revised Site Conceptual Model. It is also extremely unlikely that interflow processes could impact this site because infiltration is limited by the high percentage of paved or covered areas surrounding the site and because of the 20-ft depth of the backfill over the site.

2.4.4.2 Groundwater

No groundwater issues have been identified at this site. No known perched groundwater zones exist below the mesa-top portions of TA-35. The minimum depth of the regional aquifer in this area is not known with certainty, but can be inferred from well data at other locations to be several hundred feet below the mesa top. A description of the PRSs, including their operational history, PRS-specific topography, surface geology, geomorphology, and hydrology, is included in Section 2.2, Description and

Operational History. Appendix B-4.0 includes a discussion of the hydrology of TA-35. Section B-4.3 specifically addresses groundwater.

Because the PRSs are more than 20 ft below grade and under pavement, no probable mechanism exists for transporting contaminants from these PRSs to any known perched groundwater zones or to the regional aquifer.

2.4.4.3 Underground Storage Tanks

Because the tanks at PRSs 35-003(a, b, and c) contained only radioactive and/or mixed wastes, UST regulations are not applicable to this site. The operational history of the site is presented in Section 2.2 of this RFI report, as well as in Appendix B-1.0.

2.4.4.4 Other

No other site assessments were performed at these PRSs.

2.5 Conclusions and Recommendations

Results of the RFI indicate that only low levels of radionuclides and inorganic and organic chemicals were detected at PRSs 35-003(a, b, c, and n). All detected contaminants are below their respective SALs, and most of the radionuclides decreased in concentration with depth. The RFI data, together with field observations and decommissioning sample results, indicate that if any releases occurred from the PSP or holding tanks, they were small in volume. There is some suggestion that low levels of residual contamination, possibly derived from a source other than PSP operations, were present in the fill surrounding the structures.

Because of the current condition of the PRSs—the PSP, the holding tanks, and most of the original fill having been removed and 20–33 ft of clean backfill placed over the excavation—there are no complete pathways for contaminant migration from the site (as discussed in Sections 2.4.2.1 and 2.4.2.2 of this report). Therefore, there is no calculable risk to either human or ecological receptors from any contaminants present at this site. The site is expected to remain under industrial land use for the foreseeable future (LANL 1995, ER ID 57224, p. 14), but even a change to residential land use would not result in an unacceptable level of risk to humans or ecological receptors.

Because there is no calculable risk associated with any contaminants detected at the site, it is recommended that PRSs 35-003(a, b, c, and n) be proposed for NFA under NFA Criterion 5, as described in Section II.B.4.a.(4)(b), "No Further Action (NFA) Proposals Criteria," in the *NMED RCRA Permits Management Program Document Requirement Guide* (NMED 1998, ER ID 57897, p. 1). A letter will be sent to the administrative authority at a later date formally requesting this recommended action.

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3.0 REFERENCES

The following list includes all of the documents cited in the body and appendixes of this report. The parenthetical information following each reference provides the author, publication date, and the ER ID number, and, if applicable, the LANL ER Project Reference Library reference set number for each document. This information is also included in the citations in the text. This information can be used to locate the documents in the reference list as follows.

ER ID numbers are assigned by the Laboratory's ER Project to track material associated with LANL PRSs. This number can be used to locate the actual document at the ER Project's Records Processing Facility and, where applicable, within the ER Project Reference Library. All cited documents are assigned ER ID numbers.

The reference set number is assigned to located material in the LANL Project Reference Library, which is housed at NMED, HRMB, DOE, and the ER Project Office. This library is a living document that was developed to ensure that the administrative authority has all of the necessary material to review the decisions and actions proposed in documents submitted by the ER Project. Documents previously submitted to the administrative authority and documents that are specific to this RFI report are not included in the Reference Library, and their citations do not include reference set numbers. Documents that are specific to this RFI report are attached in Appendix G-2.0, Referenced Documents.

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Appendix A

List of Acronyms and Glossary

APPENDIX A LIST OF ACRONYMS AND GLOSSARY

A-1.0 ACRONYMS

AA	Administrative authority or atomic absorption
AOC	Area of concern
ANSI	American National Standards Institute
AP	Administrative procedure
ASTM	American Society for Testing and Materials
BFB	Bromofluorobenzene
BMP	Best management practice
BV	Background value
CDM	Centralized Data Management
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CMS	Corrective measures study
COPC	Chemical of potential concern
COPEC	Contaminant of potential ecological concern
cpm	Counts per minute
CRDL	Contract required detection limit
CRQL	Contract required quantitation limit
CVAA	Cold vapor atomic absorption
D&D	Decontamination and decommissioning
DL	Detection limit
DOE	Department of Energy
EC	Expedited cleanup
EDL	Estimated Detection Limits
EPA	Environmental Protection Agency
EPCEM	Ecological pathways conceptual exposure model
EQL	Estimated quantitation limit
ER	Environmental Restoration
ESL	Ecological screening level
FIMAD	Facility for Information Management, Analysis, and Display
GC	Gas chromatograph(y)
GC/EC	Gas chromatography/electron capture
GC/MS	Gas chromatography/mass spectrometry
GFAA	Graphite furnace atomic absorption
GPC	Gel permeable chromatography
GSCAN	Gamma spectroscopy suite
HI	Hazard index

HPGE	High-purity germanium detector
HQ	Hazard quotient
HRMB	Hazardous and Radioactive Materials Bureau
HSWA	Hazardous and Solid Waste Amendments of 1984
ICPAES	Inductively coupled plasma atomic emission spectroscopy
ICPES	Inductively coupled plasma emission spectroscopy
ICPMS	Inductively coupled plasma mass spectrometry
ICPMS-FIA	Inductively coupled plasma mass spectrometry/flow injection analysis
ICS	Interference check sample
IDL	Instrument detection limit
IDW	Investigative derived waste
INEEL	Idaho National Engineering and Environmental Laboratory
IS	Internal standards
IWP	Installation Work Plan
KPA	Kinetic phosphorescence analysis
LAAO	Los Alamos Area Office
LAMPRE	Los Alamos Molten Plutonium Reactor Experiment
LANL	Los Alamos National Laboratory
LAPRE	Los Alamos Power Reactor Experiment
LCS	Laboratory control sample
MDC	Minimum detectable concentration
MDL	Minimum detection limit
MS	Mass spectrometer (spectrometry)
Myr	Million years
NaI(Tl)	Sodium iodide detector (thallium balance)
NMED	New Mexico Environment Department
NFA	No further action
NOD	Notice of deficiency
OU	Operable unit
PPB	Potential persistent bioaccumulator
PPM	Parts per million
PRG	Preliminary remediation goal
PRS	Potential release site
PSP	Phase separator pit
QA	Quality assurance
QAPjP	Quality assurance project plan
Qbt3	Cooling unit 3 of the Tshirege Member of the Bandelier Tuff
QC	Quality control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation

RFP	Request for proposal
RLWTF	Radioactive liquid waste treatment facility
RN	Request number
RPD	Relative percent difference
RPF	Records Processing Facility
RRF	Relative retention factor
RT	Retention time
SAL	Screening action level
SAP	Sampling and analysis plan
SHB	Seismic Hazards Borehole
SMO	Sample Management Office (formerly Sample Management Facility)
SOP	Standard operating procedure
SVOA	Semivolatile organic analysis
SVOC	Semivolatile organic compound
SWMU	Solid waste management unit
TA	Technical Area
TAL	Target analyte list
TCE	Trichloroethene
TCLP	Toxicity characterization leaching procedure
T&E	Threatened and endangered
TIC	Tentatively identified compound
TW	Test well
USATHAMA	US Army Toxic and Hazardous Materials Agency
UST	Underground storage tank
VCA	Voluntary corrective action
VCM	Voluntary corrective measure
VOA	Volatile organic analysis
VOC	Volatile organic compound

A-2.0 GLOSSARY

Abbreviated method A shortened form of a method. Usually refers to analytical methods that have been modified to require less rigorous sample preparation, analysis conditions or quality control.

Accuracy The extent to which the results of a calculation or measurement approach the true values of the calculated or measured quantities, and are free from error.

Action level A value that, when exceeded, will trigger a specified response.

Adsorption The surface retention of solid, liquid, or gas molecules, atoms, or ions by a solid or a liquid, as opposed to absorption, the penetration of substances into the bulk of the solid or liquid.

A horizon *See **Soil horizon**.*

Aliquot A representative sample of a larger quantity.

ALLH Media code indicating a sample comprising soil and/or fill material with no specific soil horizon identified.

Alluvial Said of materials or features deposited by running water.

Alluvial fan A fan-shaped piedmont accumulation of sediment deposited by a stream.

Alluvium Clay, silt, sand, gravel, or other rock materials transported by water and deposited in fairly recent geologic time as sorted or semisorted sediments in riverbeds, flood plains, lake shores, and fans at the base of mountain slopes.

Alpha radiation The form of radiation composed of alpha particles emitted in the radioactive decay of certain nuclides. The least penetrating of the three common types of radiation (alpha, beta, and gamma), it can be blocked by a sheet of paper or the outer dead layer of skin.

Analysis A process used to measure one or more attributes of a sample in a clearly defined, controlled, systematic manner. Often requires treating a sample chemically or physically before measurement.

Analyte The particular chemical or radiochemical species to be identified and/or quantified.

Analytical laboratory data qualifiers Data qualifiers that are attached to sample results by the analytical laboratory that performed the sample analysis.

The following letter qualifier flags are for **inorganic analyses**:

- **"U"** The compound was analyzed for but was not detected. The associated numerical value is the estimated detection limit.
- **"B"** The reported value was obtained from a reading that was less than the estimated detection limit but greater than or equal to the instrument detection limit.
- **"E"** The reported value is estimated because of the presence of interference.
- **"M"** Duplicate injection precision was not within control limits.
- **"N"** Spiked sample recovery was not within control limits.
- **"S"** The reported value was determined by the Method of Standard Additions.

"W" Post-digestion spike for GFAA analysis is out of control limits, whereas sample absorbance is less than 50% of spike absorbance.

"*" Duplicate sample analysis was not within control limits.

"+" Correlation coefficient for the Method of Standard Additions is less than 0.995.

The following letter qualifier flags are for **organic analyses**:

"U" The compound was analyzed for but was not detected. The reported numerical value is the estimated quantitation limit.

"J" Indicates an estimated value. The "J" flag is used if the compound is present but the result is less than the sample estimated quantitation limit and greater then the instrument detection limit.

"B" The analyte was found in the associated method blank as well as in the sample.

"E" The concentrations of the analyte exceeded the calibration range of the instrument.

"D" The analyte was identified in an analysis at a secondary dilution factor.

"C" Identification of a pesticide/PCB has been confirmed by GC/MS.

"P" The percent difference between a pesticide/PCB result obtained on the primary and secondary columns was greater than 25%.

"N" There is presumptive evidence of the presence of a tentatively identified compound based on mass spectral matching.

"A" A tentatively identified compound is a suspected aldol-condensation product.

Andesite A fine-grained volcanic rock, chiefly plagioclase and pyroxene.

Anomaly A deviation from normal variations; something that is abnormal.

Applicable, relevant, or appropriate requirement (ARARs) Those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, or that address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

Aquifer A permeable body of geologic material capable of yielding groundwater to wells or springs.

Aquitard A low permeability geologic material that does not readily yield groundwater to wells.

Area of concern An area at LANL known or suspected to be contaminated with radionuclides, but not contaminated by hazardous chemicals (or hazardous waste).

Assessment endpoint A quantitative or quantifiable expression of the environmental value considered to be at risk in a risk analysis (i.e. a 25% reduction in fish biomass or local extinction of an avian species).

As low as reasonably achievable (ALARA) An approach to radiation protection to control or manage exposures (both individual and collective to the work force and the general public) and releases of radioactive material to the environment as low as social, technical, economic, practical, and public policy considerations permit. Used in this sense, ALARA is not a dose limit.

Ash-flow tuff A tuff deposited by a hot dense volcanic current. Ash-flow tuff can be either welded or nonwelded.

Background level The naturally occurring concentrations of an inorganic chemical (including naturally occurring radionuclides) in soil.

Background radiation The amount of radioactivity naturally present in the environment, including cosmic rays from space.

Background value (BV) Background values exist for inorganic chemicals and radionuclides. The background values are the upper tolerance limits (UTLs) of background sample results, calculated as the upper 95% confidence limit for the 95th percentile. In cases where a UTL cannot be calculated, either the detection limit or maximum reported value is used as a BV. Background values are used as simple threshold numbers to identify potentially contaminated site sample results as greater than background levels.

Barrier Any material or structure that prevents or substantially delays movement of solid, liquid, or gaseous phase chemicals in environmental media.

Basalt A hard, dense, dark volcanic rock composed chiefly of plagioclase, augite, olivine, and magnetite.

Baseline level Anthropogenic, non-site-related concentrations of a given chemical in the soil. Examples of baseline levels are nuclear fallout and organic chemicals associated with urban activities.

Baseline risk assessment (Also known as ***Risk assessment***) A site-specific analysis of the potential adverse effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases. There are four steps in baseline risk assessment: data collection and analysis, exposure assessment, toxicity assessment, and risk characterization.

Bentonite A clay composed of the mineral montmorillonite and variable amounts of magnesium and iron, formed over time by the alteration of volcanic ash. As bentonite can adsorb large quantities of water and expand to several times its normal volume, it is a common additive to drilling mud.

Beta radiation Radioactive transformation of a nuclide in which the nucleus emits a beta particle (electron or positron). Beta radiation can be blocked by an inch of wood or by a thin sheet of aluminum.

B horizon *See **Soil horizon.***

Bias (1) The degree to which the value obtained for a measured parameter deviates from the value accepted as the true, or reference, value. (2) A systematic deviation from the true value that remains constant over replicated measurements within the statistical precision of the measurement process.

Blank sample A sample expected to have negligible or unmeasurable amounts of analytes. Results of blank sample analyses indicate whether or not field samples might have been contaminated during one or more steps of the sample collection, transport, storage, preparation and analysis process.

Blind sample See ***Single blind sample*** and ***Double blind sample.***

Breccia Coarse-grained rock consisting of angular fragments cemented together or embedded in a fine-grained matrix.

Caldera A more or less circular volcanic depression, generally on the order of tens of kilometers in diameter, formed during the eruption of large volumes (tens to hundreds of cubic kilometers) of dense rock equivalent, ash flow, and ash fall tuff deposits.

Calibration A process used to identify the relationship between the true, or reference, analyte concentration or other variable and the response of a measurement instrument, chemical analysis method, or other measurement system.

Calibration blank A calibration standard prepared to contain negligible or unmeasurable amounts of analytes. It is used to establish the zero concentration point for analytical measurement calibration.

Calibration standard A sample prepared to contain known amounts of the analytes of interest and of other constituents required for the analysis.

Caliche (Properly called ***pedogenic calcite***, also known as ***calcrete***) An accumulation of calcium carbonate, typically found in the near-surface.

Catchment A structure such as a basin or reservoir, for collecting or draining water; the collecting of water.

Chain of custody An unbroken, documented trail of accountability designed to ensure that the physical integrity of samples, data, and records remains uncompromised.

Chemical Any naturally occurring or man-made substance characterized by a definite molecular composition, including molecules that contain radionuclides.

Chemical of concern A chemical that is identified as a potential risk as the result of performing a site-specific human health or ecological risk assessment.

Chemical of potential concern (COPC) A chemical detected at a site that has the potential to adversely affect human and or ecological receptors due to its concentration, distribution, and mechanism of toxicity. The chemical remains a concern until exposure pathways and receptors are evaluated in a site-specific risk assessment.

C horizon *See* ***Soil horizon.***

Cleanup Action undertaken to physically remove or treat a hazardous substance that poses a threat or potential threat to human health and welfare and the environment. Sites are considered cleaned up when EPA removal or remedial programs have no further expectation or intention of returning to the site and threats have been mitigated or do not require further action.

Cleanup levels Media-specific target concentration levels for contaminants that must be met by a selected corrective action. Cleanup levels are established using criteria such as protection of human health and the environment; compliance with regulatory requirements; reduction of toxicity, mobility, or volume through treatment; long- and short- term effectiveness; implementability; cost; and public acceptance.

Code of Federal Regulation (CFR) A codification of all regulations developed and finalized by federal government agencies in the *Federal Register.*

Collocated sample One of two or more samples collected as close together in time and space as the sampling equipment allows so that each sample is expected to be equally representative for a given analyte within the common space and time interval.

Colluvium Rock debris accumulated at the base of a cliff or on a slope principally by the action of gravity.

Comparability A qualitative measure of the degree to which one item or data set can be compared with another.

Composite sample A sample that is formed by combining and homogenizing several grab samples.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. Amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. The acts created a special tax that goes into a trust fund, commonly known as Superfund, whose mandate is to investigate and clean up abandoned or uncontrolled hazardous waste sites that may endanger health or the environment. The EPA is responsible for managing Superfund.

Conceptual model See also ***Site conceptual model.***

Conceptual hydrogeologic model Perception of the occurrence, movement, and quality of groundwater in an area and the relationship of groundwater to the surface water, soil water, and geologic framework there.

Confluence The place where two or more streams meet; the point where a tributary meets the main stream.

Confined Said of groundwater in an artesian aquifer.

Constituent Any compound or element present in environmental media, including both naturally occurring and anthropogenic elements.

Contaminant Any chemical (including radionuclides) present in environmental media or on structural debris at a concentration that may present a risk to human health or the environment.

Controlled area Any Laboratory area to which access is controlled to protect individuals from exposure to radiation and/or hazardous materials.

Corrective action A measure taken to rectify conditions adverse to human health or the environment.

Corrective measures study If a RCRA facility investigation indicates that further action is required, a "corrective measures study" is performed to identify and evaluate cleanup alternatives for the release. This study assesses risks to human health and the environment, costs, and other factors such as disposal methods.

Corrective measures implementation (CMI) This third step of the corrective action process includes design, construction, maintenance, and monitoring of the chosen remedy.

Curie A unit of radioactivity defined as that quantity of any radioactive nuclide that has an activity of 3.7×10^{10} disintegrations per second.

Daily calibration A combination of calibration blank and calibration standard used to determine if the instrument response to analyte concentration is within acceptable bounds relative to the initial calibration. A daily calibration establishes the 24-hour relative response factors on which quantitations are based, thus verifying the satisfactory performance of an instrument on a day-to-day basis.

Data quality assessment A statistical and scientific evaluation of the data set to assess the validity and performance of the data collection design and statistical test, and to establish whether a data set is adequate for its intended use.

Data quality objectives (DQOs) The qualitative and quantitative goals that are developed before sampling begins that clarify the investigation objectives and identify the type, quantity and quality of data needed to support decisions.

Data validation A systematic process that applies a defined set of performance-based criteria to a body of data that may result in qualification of the data. This process is performed independently of the analytical laboratory generating the data set and occurs prior to drawing a conclusion from the data. It

may comprise a standardized review (routine validation) and/or a problem-specific review (focused validation) of the data.

Data validator The person who performs data validation in accordance with LANL ER procedures.

Data verification A process of evaluating the completeness, correctness, consistency, and compliance of a laboratory data package against a specified standard or contract. Completeness means all required information is present—both hard copy and electronic. Correctness means the reported results are based on properly documented and correctly applied algorithms. Consistency means that values are the same when they are reported in different reports or are transcribed from one report to another. Compliance means that the data pass numerical QC tests based on parameters or limits specified in a contract or in an auxiliary document.

Decommissioning The permanent removal from service of surface facilities and components only, after facility closure, in accordance with regulatory requirements and environmental policies.

Decontamination The removal of unwanted material from the surface of or from within another material, or the neutralizing of it.

Deferred action Postponement of the selection and implementation of a corrective measure until a future date, usually following decommissioning of an active site.

Detection limit The minimum concentration of a substance that can be measured by an instrument with a specified statistical confidence that the analytical concentration is greater than zero.

Discharge or Hazardous Waste Discharge (as defined under RCRA, 40 CFR 260.10) The accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous waste into or on any land or water.

Disposal The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.

Dose The quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body.

Dose equivalent An estimate of the amount of biological damage (in rems) done by the deposition in tissue of a given unit of absorbed radiation dose.

Double blind sample A sample with analyte concentration and sample identity unknown to the analyst.

Duplicate analysis An analysis performed on one of a pair of identically prepared subsamples of the same sample.

Duplicate measurement One of a pair of measurements performed on a prepared sample under identical conditions.

Ecological screening level (ESL) An organism's exposure-response threshold for a given chemical constituent. It is the concentration of a substance in a particular medium that corresponds to a hazard quotient (HQ) of 1.0 for a given organism and below which no risk is indicated.

Effluent A liquid discharged as a waste, such as contaminated water from a factory or the outflow from a sewage works; water discharged from a storm sewer or from land after irrigation.

Environmental Assessment (EA) A report that identifies potentially significant environmental impacts from any federally approved or funded project that may change the physical environment. If an EA shows significant impact, an Environmental Impact Statement (EIS) is required.

Environmental Impact Statement A detailed report, required by federal law, on the significant environmental impacts that proposed major federal projects would have on the environment.

Environmental surveillance The collection and analysis of samples of air, water, soil, foodstuffs, biota, and other media to determine environmental quality of an industry or community. It is commonly performed at sites containing nuclear facilities.

Environmental Protection Agency (EPA) The federal agency responsible for enforcing environmental laws. While state regulatory agencies may be authorized to administer some of this responsibility, EPA retains oversight authority to ensure protection of human health and the environment.

Eolian Pertaining to the wind, especially said of sediment deposition by the wind, of structures such as wind-formed ripple marks, or of erosion accomplished by the wind.

Ephemeral stream Said of a stream or spring that flows only during and immediately after periods of rainfall or snowmelt.

Equipment blank A blank sample that is used to rinse the sample collection equipment and is then transferred to a sampling container. The equipment blank is collected after equipment decontamination is completed but prior to collection of another field sample.

Error Any discrepancy between a computed, observed, or measured quantity and the expected or theoretically correct value of that quantity.

Estimated quantitation limit The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine analytical laboratory operating conditions. Sample estimated quantitation limits are highly matrix-dependent, and the specified estimated quantitation limits might not always be achievable.

Evapotranspiration The combined discharge of water from the earth's surface to the atmosphere by evaporation from lakes, streams, and soil surfaces, and by transpiration from plants.

Exposure unit The bounded area or volume within which a person or other receptor may be exposed to contaminants that have been released to the environment.

Fault A fracture, or zone of fractures, in rock along which there has been vertical or horizontal movement; adjacent rock surfaces are displaced.

Field blank A blank sample either prepared in the field or carried to the sampling site, exposed to sampling conditions (e.g., bottle caps removed, preservatives added), and returned to a laboratory for analysis in the same manner in which environmental samples are analyzed. Used to identify the presence of contamination potentially added during the sampling and analysis process.

Field duplicate A second sample collected as near as possible to the original sample.

Field matrix spike A known amount of a field sample to which a known amount of the target analyte has been added. Used to compute the proportion of added analyte that is recovered upon analysis.

Field reagent blank Same as ***Field blank***.

Field sample See also ***Sample***.

Field split A field sample that has been divided in the field into equally representative portions. See also ***Split sample.***

Flood plain The portion of a river valley that is built of overbank sediment deposited when the river floods.

Focused data validation A technically based analyte-, sample-, and potentially data use-specific process that extends the qualification of data beyond method or contractual compliance and provides a level of confidence that an analyte is present or absent. If the analyte is present, the quality of the quantitation may be obtained through focused validation.

Focused validation qualifiers *See* ***LANL data validation qualifiers.***

Gamma radiation A form of electromagnetic, high-energy radiation emitted from a nucleus. Gamma rays are essentially the same as x-rays and require heavy shieldings, such as concrete or steel, to be blocked.

Geohydrology The science that applies hydrologic methods to the understanding of geologic phenomena.

Grab sample A specimen collected by a single application of a field sampling procedure to a target population, e.g. the surface soil from a single hole collected following the spade and scoop sampling procedure, or a single air filter left in the field for three months.

Groundwater Water in a subsurface saturated zone.

Half-life The time required for one-half of the radioactive atoms initially present in a sample to decay. Each radionuclide has a characteristic half-life ranging from a fraction of a second to thousands of years.

Hazardous and Solid Waste Amendments (HSWA) Amendments to the Resource Conservation and Recovery Act, 1984. HSWA added land disposal restrictions, minimum technology requirements, and expanded corrective action authorities to the RCRA statue.

Hazardous substance (as defined by 40 CFR 302.3) Any substance designated pursuant to 40 CFR 302. 40 CFR 302.4 – Designation of Hazardous Substances:

(a) ***Listed hazardous substances.*** The elements, compounds and hazardous wastes appearing in Table 302.4 are designated as hazardous substances under section 102(a) of the CERCLA.

(b) ***Unlisted hazardous substances.*** A solid waste, defined in 40 CFR 261.2, which is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b), is a hazardous substance under Section 101(14) of the CERCLA if it exhibits any of the characteristics identified in 40 CFR 261.20 through 261.24. See ***Hazardous waste.*** Note: This definition incorporates by reference, substances listed in CWA Sections 311 and 307(a); CAA Section 112; RCRA Section 3001; and TSCA Section 7.

Hazardous waste (as defined by RCRA 40 CFR 261.3) Any solid waste is generally a hazardous waste if it is not excluded from regulation as a hazardous waste, is listed in the regulations as a hazardous waste, exhibits any of the defined characteristics of hazardous waste (ignitability, corrosivity, reactivity, or toxicity), or is a mixture of solid waste and hazardous waste.

Holding time The maximum elapse of time that one can expect to store a sample without unacceptable changes in analyte concentrations. Holding times apply under prescribed storage conditions and deviations in storage conditions may affect the holding time. *Extraction holding time* refers to the time

lapse from sample collection to sample preparation; *Analytical holding time* refers to the time lapse between sample preparation and analysis.

Hot pad An area located at an airport, or other terminal of public transportation, that is segregated from the general public for the purposes of loading and unloading hazardous, radiological, and/or biological cargo.

HSWA module A portion of the Laboratory's permit to operate under RCRA that contains requirements specific to Los Alamos National Laboratory. It is this portion of the permit that contains the list of solid waste management units that must be cleaned up in accordance with RCRA procedures.

Hydraulic conductivity The rate at which water moves through a medium in a unit of time under a unit hydraulic gradient through a unit area measured perpendicular to the direction of flow.

Hydraulic gradient The rate of change of hydraulic head per unit of distance in the direction of groundwater flow.

Hydraulic head Elevation of the water table or potentiometric surface as measured in a well.

Hydrogeology The science that applies geologic methods to the understanding of hydrologic phenomena.

Hypothesis A proposition stated as a basis for further investigation.

Industrial use scenario Industrial use is the future use scenario in which current Laboratory operations continue. Any necessary remediation involves cleanup to standards designed to ensure a safe and healthy work environment for Laboratory workers.

Infiltration Entry of water into the ground.

Interflow A runoff process that involves lateral subsurface flow in the soil zone.

Injection well A well used for adding water and/or tracers to the saturated zone during well tests of hydrologic behavior.

Initial calibration The process used to establish the relationship between instrument response and analyte concentration at several analyte concentration values to demonstrate that an instrument is capable of acceptable analytical performance.

Initiator A weapons device used as the first element of an explosion, which upon receipt of the proper mechanical or electrical impulse produces a burning or detonating action.

Interim measure The actions used to achieve the goal of stabilization at contaminated sites that present serious and immediate health hazards.

Interference A chemical or physical entity whose influence results in a decrease or increase in the response of an analytical method or other measurement system relative to the response obtained in the absence of the entity.

Intermittent stream Said of a stream that flows only in certain reaches due to losing and gaining characteristics of the channel bed.

Interrupted stream Said of a stream whose flow is discontinuous due to man-made structures.

Institutional controls Controls prohibiting or limiting access to contaminated media; may consist of deed restrictions, use restrictions, permitting requirements, etc.

Laboratory duplicate sample The portions of a sample taken from the same sample container, prepared for analysis and analyzed independently but under identical conditions. Each duplicate sample is expected to be equally representative of the original material.

Land disposal restrictions (LDR) A RCRA program that requires hazardous waste be treated (or meet specified levels for hazardous constituents) before land disposal is allowed. In addition to the disposal prohibition, there are prohibitions and limits in the LDR program regarding the dilution and storage of wastes.

Laboratory qualifiers *See* ***LANL data validation qualifiers.***

LANL data validation qualifiers Data qualifiers used in the LANL ER Project baseline validation process are as follows:

"A" Contractually required data are not available for data review and evaluation.

"U" The analyte was analyzed for but not detected.

"J" The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

"J+" The analyte was positively identified, and the result is likely to be biased high.

"J-" The analyte was positively identified, and the result is likely to be biased low.

"UJ" The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.

"RPM" Without further review of the raw data, the sample results are unusable due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. Presence or absence cannot be verified. Any results qualified as RPM must be evaluated for relevance to data use.

"P" Professional judgement should be applied to using the data in decision-making.

"PM" Professional judgement should be applied to using the data in decision-making. A manual review of raw data is recommended to determine if the defect impacts data use for decision-making.

"R" The data is rejected as a result of major problems with quality assurance/qualify control (QA/QC) parameters.

LANL qualifiers *See* ***LANL data validation qualifiers.***

Leachate A liquid that has percolated through waste, soil or rock material and mobilized chemical species in the process.

Leaching The separation or dissolving out of soluble constituents of a solid material by the natural action of percolating water or by chemicals.

Materials disposal area An area used any time between the beginning of Laboratory operations in the early 1940s and the present for disposing of chemically and/or radioactively contaminated materials.

Matrix See also ***Sample matrix.***

Matrix Relatively fine material in which coarser fragments or crystals are embedded; also called ***ground mass.***

Matrix spike An aliquot of sample spiked with a known concentration of target analyte(s). The spiking typically occurs before sample preparation and analysis.

Matrix spike duplicate An intralaboratory duplicate sample spiked with a known amount of target analyte(s). Spiking occurs prior to sample preparation and analysis.

Maximum contaminant level Under the Safe Drinking Water Act, the maximum permissible level of a contaminant in water that is delivered to any user of a public water system that serves 15 or more connections and 25 or more people. The standards set take into account the feasibility and cost of attaining the standard.

Media code Code used to refer to the soil or geologic unit from which a sample was taken.

Medium (environmental) Any material capable of absorbing or transporting constituents including tuffs, soils, and sediments derived from these tuffs, surface water, groundwater, air, structural surfaces, and debris.

Medium (geological) The solid part of the hydrogeological system; may be unsaturated or saturated.

Method A body of procedures and techniques for systematically performing an activity.

Method blank An analyte-free matrix to which all reagents are added in the same volumes or proportions as those used in the environmental sample processing and which is prepared and analyzed in the same manner as the corresponding environmental samples. The method blank is used to assess the potential for contamination to the sample during preparation and analysis.

Method detection limit (MDL) The minimum concentration of a substance that can be measured and reported with a known statistical confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of samples of a given matrix type containing the analyte after subjecting the sample to the usual preparation and analyses. The MDL is used to establish detection status.

Migration The movement of inorganic and organic species through unsaturated or saturated materials.

Migration pathway A route (e.g., a stream or subsurface flow path that controls the potential movement of contaminants to environmental receptors (plants, animals, humans).

Mitigation (1) Avoiding an impact altogether by not taking a certain action or parts of an action. (2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment. (4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action. (5) Compensating for the impact by replacing or providing substitute resources or environments.

Mixed waste Waste that contains both hazardous waste (as defined by RCRA and its amendments) and radioactive waste (as defined by the AEA and its amendments).

Model A mathematical approximation of a physical, biological, or social system.

Monitoring well A well drilled at a specific location on or off a hazardous waste site for the purpose of sampling groundwater or measuring water levels. Typically constructed with a moderate screen interval placed so as to straddle the water table or potentiometric surface associated with the saturated zone of interest.

National Pollutant Discharge Elimination System (NPDES) A federal regulation under the Clean Water Act requiring permits for discharge into surface waterways.

National Priorities List (NPL) EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response using money from the Trust Fund. Updated annually.

No further action (NFA) A decision that no further investigation or remediation is warranted for a PRS, based on risk levels for residential use, recreational use, or industrial use.

Notice of Deficiency (NOD) A notice issued to DOE and the Laboratory by EPA or NMED stating that some aspect(s) of a plan or report does not meet their requirements. The ER Project must then propose a solution acceptable to the EPA/NMED before the plan or report will be approved.

Operable unit (OU) At LANL, one of 24 areas originally established for administering the ER Project. Set up as groups of potential release sites, the OUs were aggregated based on geographic proximity for the purpose of planning and conducting the cleanup effort. As the project matured, it became apparent that 24 were too many to allow efficient communication and to ensure consistency in approach. Therefore, in 1994, the 24 OUs were reduced to six administrative "field units."

Outfall The vent or end of a drain, pipe, sewer, ditch, or other conduit that carries waste water, sewage, storm runoff or other effluent into a stream.

Out of control A condition in which a measured quality control parameter does not meet specified control or acceptance criteria.

Perched groundwater Groundwater that lies above the regional water table and is separated from it by an unsaturated zone.

Percolation Gravity flow of groundwater through the pore spaces in rock or soil below the ground surface.

Perennial stream Said of a stream or reach that flows continuously throughout the year.

Performance evaluation sample A sample of known composition with respect to selected analytes which, upon analysis, is expected to yield results that fall within a prescribed range. Performance evaluation samples are selected to mimic as closely as possible those matrices representative of environmental samples from a particular location.

Permit modification A process in which changes to requirements of the Laboratory's operating permit is requested by application to the EPA. The process includes a public hearing and a 60-day comment period on the proposed changes.

Piezometer A well drilled for the purpose of measuring hydraulic head or water level; ideally only open at the bottom but usually constructed with a very short screen interval.

Piezometric surface Also called ***potentiometric surface.*** The level to which water will rise in a well tightly cased into an aquifer.

Pollutant Includes, but is not limited to, any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring; except that the terms "pollutant or contaminant" shall not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under Subparagraphs (A)

through (F) of Paragraph (14) and shall not include natural gas, liquefied natural gas, or synthetic gas of pipeline quality (or mixtures of natural gas and such synthetic gas).

Population (statistical) A set of entities or a continuum in a physical, biological or social system of interest, e.g., the residents of Los Alamos County, the water in an alluvial aquifer, or the plants in Pajarito Canyon.

Porosity The ratio of the volume of interstices in rock or soil to its total volume expressed as a percentage or as a fraction.

Porphyritic Said of the texture of an igneous rock in which larger crystals (phenocrysts) are set in a finer ground mass.

Potential release site (PRS) A site suspected of releasing contaminants into the environment. PRS is a generic term that includes SWMUs, hazardous waste sites listed in Module VII of the Laboratory's Hazardous Waste Facility Permit, and sites that have been identified as potentially contaminated by radioactivity.

Precambrian All geologic time prior to the beginning of the Paleozoic era (the Paleozoic began about 600 million years ago), equivalent to about 90% of all geologic time.

Precision A concept used to describe dispersion of measurements with respect to a measure of location or central tendency. Precision may be represented by the inverse of the standard deviation of a set of measurements.

Preliminary assessment The process of collecting and reviewing available information about a known or suspected hazardous waste site or release. The extent of release and degree of threat to human health and the environment are evaluated to determine whether further study is needed and whether the release meets the criteria for a CERCLA-funded removal. **(DOE 1991)**

Prepared sample A sample treated in such a manner as to render it amenable to analysis. May include digestate, distillate, electroplate, extract, filter retentate, filtrate, homogenate, precipitate, pulverized/sieved portion of sample, residue, etc.

Qualifier flag A letter code indicating, on a gross scale, a verifiable or potential data deficiency. Qualifier flags are assigned to data based on the outcome of data validation checks.

Quality assessment sample A sample submitted for analysis, the data from which are used to assess the quality of performance of a sampling or analysis process. May include performance evaluation samples, field duplicates, field blanks, etc.

Quality control (QC) sample A sample which, upon analysis, provides information useful for adjusting, controlling, or verifying continuing acceptability of sampling and/or analysis activities that are in progress.

Quaternary The second period of the Cenozoic Era, following the Tertiary, and including the last 2–3 million years.

Qbt3 Cooling unit 3 of the Tshirege member of the Bandelier Tuff.

Radiation Energy emitted in the form of rays or particles that are thrown off by disintegrating atoms. The rays or particles emitted may consist of alpha, beta, or gamma radiation.

Radioactive decay (1) The process whereby radioactive materials undergo a change from one nuclide, element, or state to another, releasing radiation in the process. This action ultimately results in a

decrease in the number of radioactive nuclei present in the sample. (2) The spontaneous transformation of one nuclide into a different nuclide or into a different isotope of the same nuclide accompanied by either the emission of particles from the nucleus, nuclear capture or ejection of orbital electrons, or fission.

Radioactive tracer A radioactive material added to, or induced in, a sample for the purpose of monitoring chemical or physical losses of the target analytes. The tracer is assumed to behave in the same manner as that of the target analytes.

Radioactive waste Waste material containing radionuclides, or contaminated by radionuclides.

Radionuclide A nuclide (species of atom) that exhibits radioactivity.

Randomized sample A sampling design where every possible sample has an equal probability of being selected.

RCRA facility assessment (RFA) Usually the first step in the RCRA corrective action process, to identify potential and actual releases from SWMUs and make preliminary determinations about releases, the need for corrective action, and interim measures. The RFA is generally equivalent to the preliminary assessment/site investigation taken under Superfund.

RCRA facility investigation (RFI) The second step of a RCRA corrective action, to gather enough data to fully characterize the nature, extent, and rate of migration of contaminants to determine the appropriate response action. The RFI is generally equivalent to the RI portion of the Superfund process.

Reason code A code used in the ER data validation process to indicate why a qualifier flag has been assigned to a datum.

Receptor A person, plant, animal, or geographical location that is exposed to a chemical or physical agent released to the environment by human activities.

Recharge The process by which water is added to the zone of saturation, either directly from the overlying unsaturated zone or indirectly by way of another material in the saturated zone.

Recreational use scenario Recreational use refers to current and future use scenarios in which cleanup of a PRS is completed to a level that permits the public to safely use it on an intermittent basis for activities such as hiking and camping. The standards are more stringent than they are for the industrial use scenario but not as stringent as those for residential use.

Regulatory standard Media-specific contaminant concentration levels of potential concern that are mandated by federal or state legislation or regulation (e.g., the Safe Drinking Water Act, New Mexico Water Quality Control Commission regulations).

Release Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance or pollutant or contaminant), but excludes

(A) any release which results in exposure to persons solely within a workplace, with respect to a claim which such persons may assert against the employer of such persons;

(B) emissions from the engine exhaust of a motor vehicle, rolling, stock, aircraft, vessel, or pipeline pumping station engine;

(C) release of source, byproduct, or special nuclear material from a nuclear incident, as those terms are defined in the Atomic Energy Act, if such release is subject to requirements with respect to financial protection established by the Nuclear Regulatory Commission under Section 170 of such act, or, for the purposes of Section 104 of this title or any other response action, any release of source, byproduct, or special nuclear material from any processing site designated under Section 102(a)(1) or 302(a) of the Uranium Mill Tailings Radiation Control Act of 1978; and

(D) the normal application of fertilizer. **[CERCLA 101(22)]**

Relative precision Precision measured relative to a particular value. Relative precision expressed as the relative standard deviation (RSD) may be calculated as the ratio of the standard deviation to the selected value.

Relevant and appropriate requirements Those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate. **(DOE 1991)**

Remediation The process of reducing the concentration of a contaminant (or contaminants) in air, water, or soil media to a level that poses an acceptable risk to human health; the act of restoring a contaminated area to a usable condition based on specified standards.

Remedy or remedial action Those actions consistent with permanent remedy instead of or in addition to removal actions in the event of a release or threatened release of a hazardous substance into the environment, to prevent or minimize the release of hazardous substances so that they do not migrate to cause substantial danger to present or future public health or welfare or the environment. The term includes, but is not limited to, such actions at the location of the release as storage, confinement, perimeter protection using dikes, trenches, or ditches, clay cover, neutralization, cleanup of released hazardous substances and associated contaminated materials, recycling or reuse, diversion, destruction, segregation of reactive wastes, dredging or excavations, repair or replacement of leaking containers, collection of leachate and run-off, on-site treatment or incineration, provision of alternative water supplies, and any monitoring reasonably required to assure that such actions protect the public health and welfare and the environment. **[CERCLA 101(24)]** Activities conducted at DOE facilities to reduce potential risks to people and/or harm to the environment from radioactive and/or hazardous substance contamination. **(DOE Order 5820.2A)**

Remove or removal The cleanup or removal of released hazardous substances from the environment; such actions as may be necessary taken in the event of the threat of release of hazardous substances into the environment; such actions as may be necessary to monitor, assess, and evaluate the release or threat of release of hazardous substances; the disposal of removed material; or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from a release or threat of release. **[CERCLA 101 (23)]**

Removal action An immediate action taken over the short term to address a release or threatened release of hazardous substances. **(DOE 1991)**

Replicate measurement A re-analysis (remeasurement) of a prepared sample.

Reportable quantity For any CERCLA hazardous substance, the quantity established in Table 302.4 and Appendix B of 40 CFR 302, the release of which requires notification unless federally permitted. **(DOE Order 5000.3A)**

Representativeness The degree to which data accurately and precisely represent a characteristic of a population or an environmental condition.

Residential use scenario The standards for residential use are the most stringent of the three current and future use scenarios being considered by the ER Project and is the level of cleanup EPA is currently specifying for SWMUs located off the Laboratory site and for those released for non-Laboratory use.

Resource Conservation and Recovery Act (RCRA) The RCRA regulations establish a comprehensive hazardous waste management system under the authority of RCRA Subtitle C. RCRA regulates hazardous waste from its point of generation through its point of final disposal. RCRA also regulates solid waste under Subtitle D.

Respond or response (as defined by Section 101 (25) of CERCLA) Remove, removal, remedy, or remedial action, including enforcement activities related thereto. **(DOE 1991)**

Response action A CERCLA-authorized action at a Superfund site involving either a short-term removal action or a long-term remedial response that may include, but is not limited to, the following activities.

- Removing hazardous materials from a site to an EPA-approved, licensed hazardous waste facility for treatment, containment, or destruction.
- Containing the waste safely on site to eliminate further problems.
- Destroying or treating the waste on site using incineration or other technologies.
- Identifying and removing the source of groundwater contamination and halting further movement of the contaminants.

Restricted Area Any area access to which is controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials. "Restricted area" shall not include areas used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area. **(10 CFR 60.2)**

Retardation The act or process that reduces the rate of movement of a chemical substance in water relative to the average velocity of the water. The movement of chemical substances in water can be retarded by adsorption and precipitation reactions, and by diffusion into the pore water of the rock matrix.

Risk A measure of a negative or undesirable impact associated with an event.

Risk assessment See ***Baseline risk assessment.***

Risk assessment, preliminary A risk assessment conducted using conservative assumptions and scenarios and assuming no mitigating or corrective measures beyond those already in place.

Risk characterization The summarization and integration of the results of toxicity and exposure assessments into quantitative and qualitative expressions of risk. The major assumptions, scientific judgments, and sources of uncertainty related to the assessment are also presented.

Risk management Risk management is the integration of risk characterization with other nonscientific considerations specified in applicable statutes to make and justify regulatory decisions. ***(RCRA/CERCLA Update*, June 1992)**

Rinsate blank See ***Equipment blank***.

Routine analysis The analysis categories of inorganics, metals, organics, radiochemistry and high explosives as defined in the current contract laboratory statement of work.

Routine data validation The process of reviewing analytical data relative to quantitative routine acceptance criteria. The objective of routine data validation is twofold: one objective is to estimate the technical quality of the data relative to minimum national standards adopted by LANL ER; the other objective is to indicate to data users the technical data quality at a gross level by assigning qualifier flags to environmental data whose quality indicators do not meet acceptance criteria.

Sample A portion of a material (e.g., rock, soil, water, air), which, alone or in combination with other samples, is expected to be representative of the material or area from which it is taken. Samples are typically sent to a laboratory for analysis or inspection or are analyzed in the field. When referring to samples of environmental media, the term *field sample* may be used.

Sample matrix In chemical analysis, that portion of a sample which is exclusive of the analytes of interest. Together, the matrix and analytes of interest form the sample.

Screening action level (SAL) Medium-specific concentration level for a chemical derived using conservative criteria below which it is generally assumed that there is no potential for unacceptable risk to human health. The derivation of a SAL is based on conservative exposure and land use assumptions. However, if an applicable regulatory standard exists that is less than the value derived by risk-based computations, it will be used for the SAL.

Screening assessment A process designed to determine whether contamination detected in a particular medium at a site may present a potential unacceptable human health and/or ecological risk. The assessment utilizes screening levels that are either human-health or ecologically-based concentrations derived using chemical specific toxicity information and standardized exposure assumptions below which no additional actions are generally warranted.

Sensitivity An indication of the lowest analyte concentration that can be measured with a specified degree of confidence.

Single blind sample A sample submitted for analysis whose composition is known to the submitter but not to the analyst.

Site characterization The program of exploration and research, both in the laboratory and in the field, undertaken to establish the geological, hydrological, and chemical conditions at a site. Site characterization includes borings, surface excavations, excavation of exploratory shafts, limited subsurface lateral excavations and borings and geophysical testing. **(10 CFR 60.2)**

Site conceptual model A qualitative or quantitative description of sources of contamination, environmental transport pathways for contamination, and biota that may be impacted by contamination (called receptors) and whose relationships describe qualitatively or quantitatively the release of contamination from the sources, the movement of contamination along the pathways to the exposure points, and the uptake of contaminant by the receptors.

Soil gas Those gaseous elements and compounds that occur in the void spaces in rock or soil. Such gases can move through or leave the soil or rock, depending on changes in pressure.

Soil horizon Distinct zones or layers within a soil profile, distinguished by differences in one or more physical properties, including but not limited to particle size distribution, structure, mineralogy, color, organic matter content, and bulk density.

- **A horizon** – a soil horizon usually characterized by accumulations of organic matter from root and plant decay, and often exhibiting a darker color than other horizons in the same profile. The A horizon is typically the uppermost horizon in a soil profile, but may be below organic litter horizons or buried by recent sediment deposition.
- **B horizon** – a soil horizon found below an A horizon, exhibiting better developed soil structure, clay films, color, or accumulations of secondary minerals such as calcite, gypsum, silica, or silicate clays.
- **C horizon** – a soil horizon consisting of unconsolidated sediment or disaggregated bedrock, usually comprising the bulk of the parent material for the soil. C horizons are found beneath B horizons, and are only slightly altered by soil-forming processes.

Soil water Water in the unsaturated zone, regardless of whether it occurs in soil or rock.

Solid waste Any discarded material, including any material which is abandoned, recycled, inherently waste-like, or certain military munitions.

Solid waste management unit (SWMU) Any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste.

Split sample A sample that has been subdivided into two or more portions expected to be of the same composition. Used to characterize within-sample heterogeneity, sample handling, and measurement variability.

Stakeholder As used in this document, stakeholder refers to any party or agency, whether inside or outside the Laboratory, interested in or affected by Environmental Restoration Project issues and activities.

Standard operating procedure (SOP) A written document that details the method for an operation, analysis, or action with thoroughly prescribed techniques and steps, and is officially approved as the method for performing certain routine or repetitive tasks.

Stratification Classification of the target population into two or more non-overlapping and exhaustive categories (strata) on the basis of characteristics which are known *a priori* for the entire population.

Stratified sample A sample including one or more specimens from each of several subpopulations of the target population. (Note: If the specimens are selected from within each subpopulation using *simple random sampling*, then the sample is called a stratified random sample.)

Stratigraphy The science dealing with the succession, age, composition and history of strata.

Surrogate compound (Surrogate) An organic compound used in the analyses of organic target analytes that is similar in composition and behavior to target analytes but is not normally found in field samples. Surrogates are added to every blank and spike sample to evaluate the efficiency with which analytes are recovered during extraction and analysis.

Target analyte A chemical or parameter, the concentration, mass or magnitude of which is designed to be quantified by use of a particular test method.

Technical area (TA) The Laboratory established technical areas as administrative units for all its operations. There are currently 49 active TAs spread over 43 square miles.

Topography The physical features of a place or region.

Toxic pollutants The 126 individual priority toxic pollutants contained in 65 toxic compounds or classes of compounds (including organic pollutants and metals) adopted by EPA pursuant to Section 307 (a) (1) of the Clean Water Act. **(DOE 1991)**

Transmission loss Reduction in surface water flow by seepage into the channel bed.

Transmissivity A measure of the amount of water that can be transmitted horizontally by the full saturated thickness of the aquifer under a hydraulic gradient of 1. **(DOE 1991)**

Transport or transportation The movement of a hazardous substance by any mode, including pipeline (as defined in the Pipeline Safety Act), and in the case of hazardous substance which has been accepted for transportation by a common or contract carrier, the term "transport" or "transportation" shall include any stoppage in transit which is temporary, incidental to the transportation movement, and at the ordinary operating convenience of a common or contract carrier, and any such stoppage shall be considered as a continuity of movement and not as the storage of a hazardous substance. **[CERCLA 101(26)]**

Treatment Any method, technique, or process, including elementary neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material resources from the waste, or so as to render such waste non-hazardous, or less hazardous; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume.

Treatment, storage, and disposal facility (TSDF) Any building, structure, or installation where a hazardous waste has been treated, stored, or disposed. TSD facilities are regulated by EPA and states under RCRA.

Trip blank A sample of analyte-free media taken to the sampling site and returned to the analytical laboratory unopened along with samples taken in the field. Used to monitor cross contamination of samples during handling and storage both in the field and in the analytical laboratory.

Tuff A compacted deposit of volcanic ash and dust that contains rock and mineral fragments accumulated during an eruption.

Ultimate disposal The final disposal of hazardous substances resulting from a removal action. It does not include temporary storage or other temporary measures of managing the waste from a removal action. **(DOE 1991)**

Unconfined Said of water in a saturated zone that is open to the atmosphere (that is, not beneath a confining bed or under artesian pressure).

Underflow Groundwater flow beneath the bed of a non-flowing stream; such water is often perched in the channel alluvium atop the bedrock surface.

Underground storage tank (as defined in Section 9001(1) of the Solid Waste Disposal Act) The term "underground storage tank" means any one or combination of tanks (including underground pipes connected thereto) which is used to contain an accumulation of regulated substances, and the volume of which (including the volume of the underground pipes connected thereto) is 10% or more beneath the surface of the ground. Such term does not include any

(A) farm or residential tank of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;

(B) tank used for string heating oil for consumptive use on the premises where stored;

(C) septic tank;

(D) pipeline facility (including gathering lines) regulated under

i) the Natural Gas Pipeline Safety Act of 1968 (49 USC App. 1671 et seq.),

ii) the Hazardous Liquid Pipeline Safety Act of 1979 (49 USC App. 2001 et seq.), or

iii) which is an intrastate pipeline facility regulated under state laws comparable to the provisions of law referred to in Clause (i) or (ii) of this subparagraph;

(E) surface impoundment, pit, pond, or lagoon,

(F) storm water or waste water collection system;

(G) flow-through process tank;

(H) liquid trap or associated gathering lines directly related to oil or gas production and gathering operations; or

(I) storage tank situated in an underground area (such as a basement, cellar, mine working, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

Unrestricted area Any area, access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials and any area used for residential quarters. **(10 CFR 60.2)**

Unsaturated zone The zone between the land surface and the regional water table. Generally, fluid pressure in this zone is less than atmospheric pressure, and some of the voids may contain air or other gases at atmospheric pressure. Alternatively, the unsaturated zone generally has moisture contents less than saturation.

U.S. Department of Energy (DOE) The federal agency that sponsors energy research and regulates nuclear materials for weapons production.

Water balance The relationship between water input (precipitation) and output (runoff, evapotranspiration, and recharge) in a hydrological system; the portioning of precipitation into these components of the hydrological cycle.

Water content (also gravimetric moisture content) The amount of water in an unsaturated medium, expressed as the ratio of the weight of water in a sample to the weight of the oven-dried sample; often expressed as a percent.

Water table The top of the saturated zone; the water level associated with an unconfined aquifer.

Welded tuff A volcanic deposit hardened by the action of heat, pressures from overlying material, and hot gases.

Appendix B

Operational and Environmental Setting

APPENDIX B OPERATIONAL AND ENVIRONMENTAL SETTING

This appendix provides both information reproduced directly from the "RFI Work Plan for Operable Unit 1129" (LANL 1992, ER ID 07666, pp. 2-1 through 3-78) and additional information that has been obtained since the work plan was submitted in 1992.

Sections B-1.0 through B-4.0 of this appendix provide a foundation for the conceptual hydrogeological model presented in Sections B-4.1 through B-4.3.

Sections B-5.0 and B-6.0 provide information on biological and cultural resources that may be used to formulate decisions that include ecological considerations and historic preservation concerns.

B-1.0 OPERATIONAL HISTORY AND LAND USE

TA-35 is located off Pajarito Road in the north-central part of the Laboratory on Mesita del Buey. To the north and east, it is bounded by Mortandad Canyon and a small tributary canyon known as Effluent Canyon. Ten Site Canyon and a small tributary known as Pratt Canyon form its boundaries to the south (see Figure 1.0-1). The elevation of TA-35 is approximately 7,200 ft above sea level.

TA-35 (also known as Ten Site) is one of the largest areas at the Laboratory, with approximately 300 designated structures. It is currently used for laser and fusion research that involves development, fabrication, and operation of lasers and laser targets; nuclear safeguards research and the development of assay instrumentation; and research concerning ceramics, robotics, polymer synthesis, high-speed impact studies, and strain-rate measurements on a variety of materials.

Operations at TA-35 began in 1951 with completion of the original Ten Site Laboratory and office building (TA-35-2). The building has been used for a wide variety of research operations, including housing two experimental reactors (the Los Alamos Power Reactor Experiment [LAPRE] –1 and the Los Alamos Molten Plutonium Reactor Experiment [LAMPRE]) between 1956 and 1964. The building has also housed a hot cell used for preparing kilocurie sources of radioactive lanthanum (La-140), various plutonium research laboratories, and a facility where lithium titride compounds were developed and handled (Department of Energy [DOE] 1987, ER ID 08663).

The TA-35 wastewater treatment plant operated from 1951 to 1963. Waste liquids, which were generated by washings of the hot cell, were stored in four tanks to allow decay of short-lived La-140. The wastewater treatment plant was constantly beset with problems and required numerous retrofittings and additional equipment. When concentrations of other radionuclides with longer half-lives, such as Sr-90, were discovered in the stored liquid wastes, a wastewater treatment plant with ion-exchange capabilities was constructed.

Other major facilities at TA-35 include the following:

- Fast Reactor Core Test Building (TA-35-27) built in 1968 to house the LAPRE-II reactor, which was never completed;
- Gas Laser Building (TA-35-29) built in 1961 to house a small reactor test pit and currently used to house the Gemini gas laser facility, which uses helium and nitrogen lasers;
- Sodium Testing Building (TA-35-34) built in 1958 and used as a high-voltage switching laboratory;

- Chemical Laser Facility (TA-35-85) completed in 1977 and used for research and development of krypton fluoride (KrF) lasers;
- Carbon Dioxide Laser Building (TA-35-86) that housed the Helios carbon dioxide (CO_2) laser facility and now houses the Z-Pinch machine, which is used to focus electron beams on targets;
- Building TA-35-124, -125, and -126 completed in the mid-1980s that housed the Antares CO_2 laser experiments, which used large CO_2 lasers and tritium/deuterium microsphere targets;
- High-Voltage Development Laboratory (TA-35-188) completed in 1976 in which the components for the KrF laser facility are assembled; and
- Target Fabrication Facility (TA-35-213) completed in 1976 and used for processing deuterium and tritium microsphere targets for various laser operations at TA-35 and also for processing beryllium.

Possible effluent and emission routes from TA-35 include ventilation stacks, septic systems, storm sewer lines and discharge channels, industrial waste lines and outfalls, and leaking storage structures such as underground and above-ground tanks and surface compounds. Chemicals and other constituents used at the site that contributed to the chemicals of potential concern investigated during Phase I include metals, volatile organic compounds, semivolatile organic compounds, polychlorinated biphenyl compounds, and radionuclides.

The current land use at TA-35 is laser and fusion research. The ER Project designates all of the current and future land-use types for TA-35 in the industrial land use scenario. Future and current land-use maps can be found in the Site Development Plan Annual Update 1995 (LANL 1995, ER ID 57224, p. 14).

B-2.0 CLIMATE

Bowen (1990, ER ID 06899, 254 pp.) has compiled and interpreted climatological data for the Los Alamos area. This information is summarized below.

Los Alamos County has a semiarid, temperate, mountain climate typical of the northern New Mexico area. Summers are generally sunny with moderate, warm days and cool nights. Maximum daily temperatures usually do not exceed 90°F. High altitude, light winds, clear skies, and dry atmosphere allow summer temperatures to range from 50°F to 95°F in the TA-35 area. During the winter, temperatures typically range from 15°F to 50°F. However, winter temperatures occasionally drop to 0°F or below.

The average annual rainfall in the TA-35 area is about 16 in. In a typical year, approximately 40% of the annual precipitation occurs during intense thunderstorms in July and August. Winter precipitation falls primarily as snow, with accumulations of about 51 in. annually. Snowfall is common in the TA-35 area, and accumulations exceeding 4 in. are not unusual. Individual snowfalls can occasionally exceed 12 in. and can be associated with frigid air and strong winds. Stream flow in canyons can occur as a result of summer thunderstorms and spring snowmelt runoff.

Winds are usually light and blow predominantly from the southwest to the northeast. However, strong winds are common in early spring, and winds can gust to more than 60 mph. Strong dust devils can develop on the mesa tops during the summer and can cause brief gusts of 75 mph or more in the

immediate area of the dust devils. Strong winds can also occur during summer thunderstorms and winter snowstorms.

B-3.0 GEOLOGY

The operations area at TA-35 is on Mesita del Buey, which is bounded on the north by Mortandad Canyon and on the south by Ten Site Canyon. Mortandad Canyon drains to the Rio Grande approximately 9 miles to the east of TA-35. Ten Site Canyon is a tributary to Mortandad Canyon and drains into it about one mile east of TA-35.

B-3.1 Geologic Setting

A detailed discussion of the geology of the entire Los Alamos area can be found in Chapter 2 of the "RFI Work Plan for Operable Unit 1129" (LANL 1992, ER ID 07666, pp. 2-4 through 2-13) and in Section 2.4.1 of the "Installation Work Plan for Environmental Restoration Program, Rev. 6" (LANL 1996, ER ID 52009, pp. 2-13 through 2-21), also referred to as the IWP.

B-3.1.1 Stratigraphy

Figure B-3.1-1 depicts a generalized stratigraphic cross section of the geologic units described in this section.

TA-35 is located on the Pajarito Plateau, which is a large volcanic feature composed of a series of deep east-west trending canyons and finger-like mesas. Pajarito Plateau flanks the western side of the Española Basin in the Rio Grande rift, a major tectonic feature of western North America. The plateau was formed by a massive outpouring of volcanic ash and tuffs from the Jemez volcanic field, immediately west of the plateau. The Jemez volcanic field has been active for the last 13 million years (Myr), and the latest volcanic activity is estimated to have occurred about 60,000 years ago (Wolff and Gardner 1995, ER ID 48821, pp. 411–414).

The thicknesses of the stratigraphic units described below are derived from a constructed cross section, which was created from geologic logs from the following five borings: water supply well PM-5 (located on Mesita del Buey east of TA-35); test well TW-8 (located in Mortandad Canyon east of TA-5); a borehole drilled in the eastern part of TA-35 (ER Location ID No. 35-2028); seismic hazard borehole SHB-1 (located in TA-55 west of TA-35); and test hole H-19 (located in Los Alamos Canyon near the Diamond Drive bridge). The stratigraphic units in PM-5, TW-8, and H-19 are described by Purtymun (1995, ER ID 45344). The stratigraphic units in SHB-1 are described by Gardner et al. (1993, ER ID 12582). The stratigraphic units in Location ID No. 35-2028 are described in LANL (1996, ER ID 54763, pp. 2-3 to 2-4).

Bandelier Tuff

The Pajarito Plateau in the TA-35 area is capped by the Tshirege Member of the Bandelier Tuff. This unit is composed of crystal-rich ash-flow tuffs formed about 1.22 Myr ago (Izett and Obradovich 1994, ER ID 48817) by multiple eruptions of the Valles Caldera in the Jemez Mountains. This unit is approximately 300 ft thick in the TA-35 area. The Tshirege Member is subdivided into four mappable cooling units. The area of TA-35 that is located on the mesa top lies on cooling unit 3 (Qbt3 [media codes are defined in the glossary, Appendix A-2]), a poorly welded cliff-forming tuff that forms the surface of Mesita del Buey.

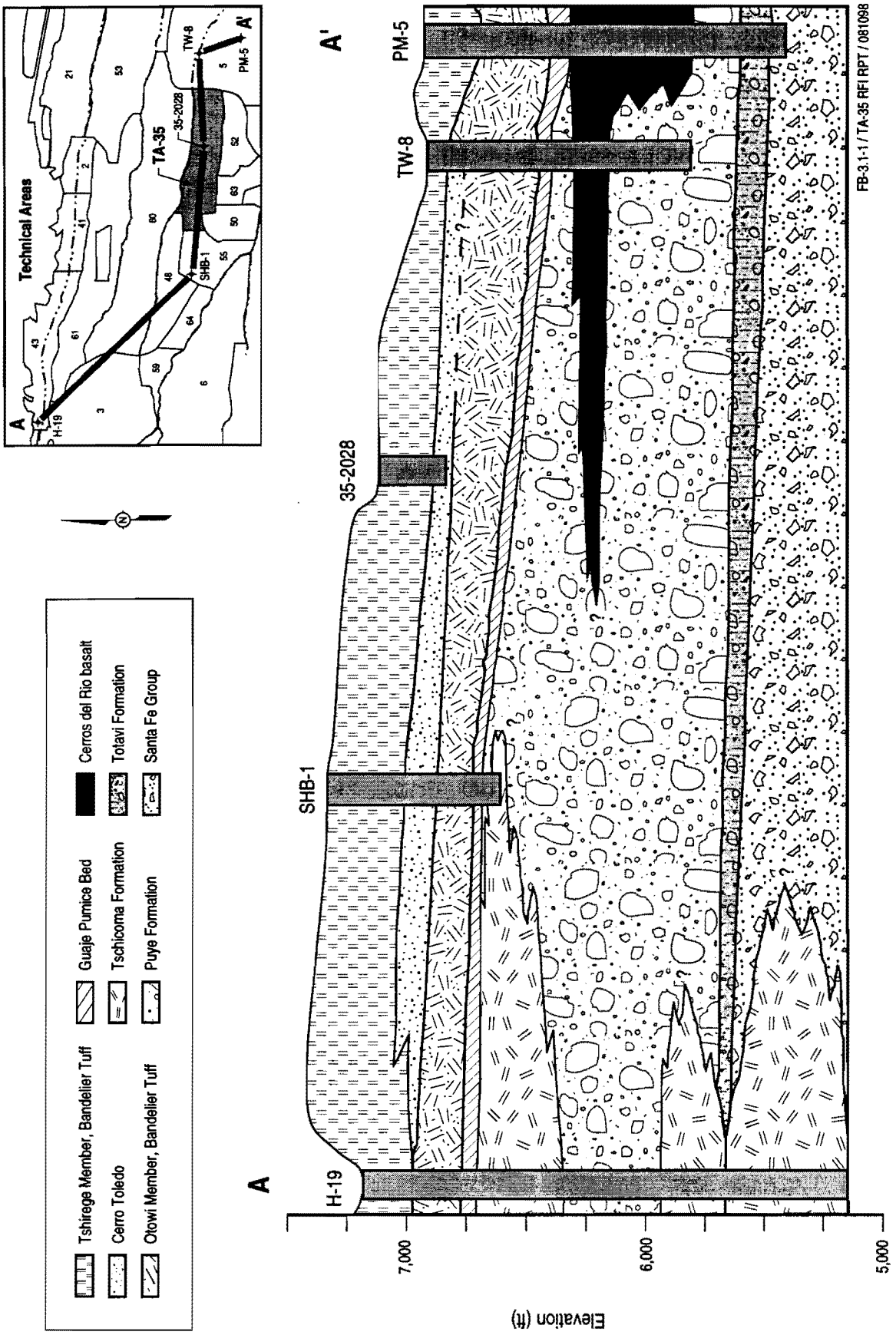


Figure B-3.1-1. Generalized stratigraphy of TA-35.

Underlying the Tshirege Member is the Otowi Member of the Bandelier Tuff. The Otowi Member is composed of multiple flow units of soft, unwelded ash-flow tuffs that were formed by eruptions about 1.61 Myr ago (Izett and Obradovich 1994, ER ID 48817). This unit is approximately 200 ft thick in the TA-35 area.

At the base of the Otowi Member is the Guaje pumice bed. It is an ashfall of pumice with some water-laid or surge-bed pumiceous tuff that rests unconformably on older rocks (Purtymun 1995, 45344).

Cerro Toledo Rhyolite and Interbedded Sediments

An interbedded sequence of rhyolitic tuffs and sediments commonly occurs between the Otowi and Tshirege Members of the Bandelier Tuff. The rhyolitic tuffs were formed between 1.2 and 1.5 Myr ago, predominantly by eruptions from the Cerro Toledo domes in the northeastern Jemez Mountains (Heiken et al. 1986, ER ID 48638, pp. 1799–1815). The sediments are epiclastic sands and sandy gravels that lithologically resemble the fanglomerates of the Puye Formation, discussed below.

Cerros del Rio Basalts

Basaltic flows, breccias, and scoria of the Cerros del Rio occur in the subsurface beneath much of the Pajarito Plateau (Dransfield and Gardner 1985, ER ID 06612), and nearby deep boreholes suggest that they are present beneath TA-35. These rocks have been dated at 2.0 to 4.6 Myr old (Gardner et al. 1986, ER ID 21527, pp. 1763–1778).

Puye Formation

Underlying the Bandelier Tuff is the Puye Formation (Turbeville et al. 1989, ER ID 21587, pp. 267–291), a volcanogenic alluvial fan sequence that was formed by the erosion of the Tschicoma volcanic center to the west. The Puye Formation was deposited between 1.9 and 3.5 Myr ago (Pliocene to Pleistocene age). Deep wells near the TA-35 area indicate that the Puye Formation is interstratified with basalt flows from the Cerros del Rio volcanic center. The thickness of the Puye Formation at TA-35 has not been determined; however, deep wells nearby indicate an overall thickness of as much as 1,000 ft.

Totavi Formation

The Totavi Formation, formerly the Totavi Lentil, (Turbeville et al. 1989, ER ID 21587, 270 pp.) interfingers with the Puye Formation in the TA-35 area—thickening and possibly replacing the Puye Formation to the east. The Totavi Formation is a coarse, poorly consolidated conglomerate composed of granitic and metamorphic cobbles with an arkosic matrix. This formation was probably deposited between 2.5 and 3.5 Myr ago. A deep water supply well (PM-5) near TA-35 indicates that the Totavi Formation is 60 to 80 ft thick in the TA-35 area.

Tschicoma Formation

The Tschicoma Formation consists of a sequence of dacitic domes and lavas that erupted from vents in the central to northeastern Jemez Mountains between 3 and 7 Myr ago (Gardner et al. 1986, ER ID 21527, pp. 1763–1778). These rocks crop out extensively in the mountains west of TA-35, and some may be present in the subsurface near TA-35.

Santa Fe Group

Below the Totavi Formation are the formations of the Santa Fe Group (Galusha and Blick 1971, ER ID 21526, pp. 40–74), which were deposited during the Miocene and early Pliocene Epochs. The rocks of the Santa Fe Group are a thick series of terrestrial conglomerates, sandstones, and mudstones with minor limestones, evaporites, volcanic tuffs, and intercalated basalts. In the Los Alamos area, the Santa Fe Group is divided into the Chaquehui Formation, the Chamita Formation, and the Tesuque Formation. The Chaquehui Formation and the Chamita Formation have been dated at 4.5 to 6 Myr old, and the Tesuque Formation is estimated to be 7 to 21 Myr old. The total thickness of the Santa Fe Group in the area of TA-35 has not been determined.

B-3.1.2 Geological Structure

The Pajarito Plateau dips gently several degrees to the east and southeast. Most of the stratigraphic units that comprise the plateau reflect this gentle regional dip.

The plateau is bounded on the west by the Pajarito fault system, which also describes the western boundary of the Española basin referred to above. The Pajarito fault system consists of three active, or potentially active, fault segments: the Frijoles Canyon, Rendija Canyon, and Guaje Mountain segments. Figure B-3.1-2 shows the surface faulting features in the LANL area. Vaniman and Wohletz (1993, ER ID 48822) have projected the Guaje Mountain and Rendija Canyon segments near TA-35. Although little or no vertical offset has been documented in the TA-35 area, the fault systems are often expressed as areas of increased fracturing of the Bandelier Tuff.

B-3.2 Soils

A detailed discussion of the soils in the Los Alamos area can be found in Section 2.4.1.3 of the IWP (LANL 1996, ER ID 55574, pp. 2–19).

A large variety of soils have developed on the Pajarito Plateau because of interactions among the underlying bedrock, the slope of the area, and the climate (Nyhan et al. 1978, 05702.2). The mineral components of the soil are primarily derived from the Bandelier Tuff, with some contribution from Tschicoma Formation rocks and from younger pumice eruptions from the Jemez Mountains. Windblown sediments from other areas in northern New Mexico may also contribute to the soil composition. Mesa-top soils in the TA-35 area are generally poorly developed because of the arid climate.

The predominant soils at TA-35, as described by Nyhan et al. (1978, ER ID 05702, pp. 24–25), are the Hackroy sandy loam, the Tocal very fine sandy loam, the Totavi gravelly loamy sand, and a small amount of the Carjo loam. The Hackroy soils consist of very shallow to shallow, well-drained soils that formed from material weathered from tuff on the mesa tops. The Hackroy soil thickness ranges from 8 to 20 in. The Tocal series is similar to the Hackroy soils and consists of shallow, well-drained soils that formed from weathered tuff on slightly sloping mesa tops. Tocal soil thickness ranges from 8 to 20 in. The Totavi soils consist of deep, well-drained soils that formed in the alluvium on the canyon floor. The thickness of the Totavi soils is 60 in. (5 ft) or more. The Carjo series is described as moderately deep, well-drained soil that formed from weathered tuff on slightly sloping mesa tops. Carjo soil thickness ranges from 20 to 40 in. Figure B-3.2-1 is a soils map of the TA-35 area.

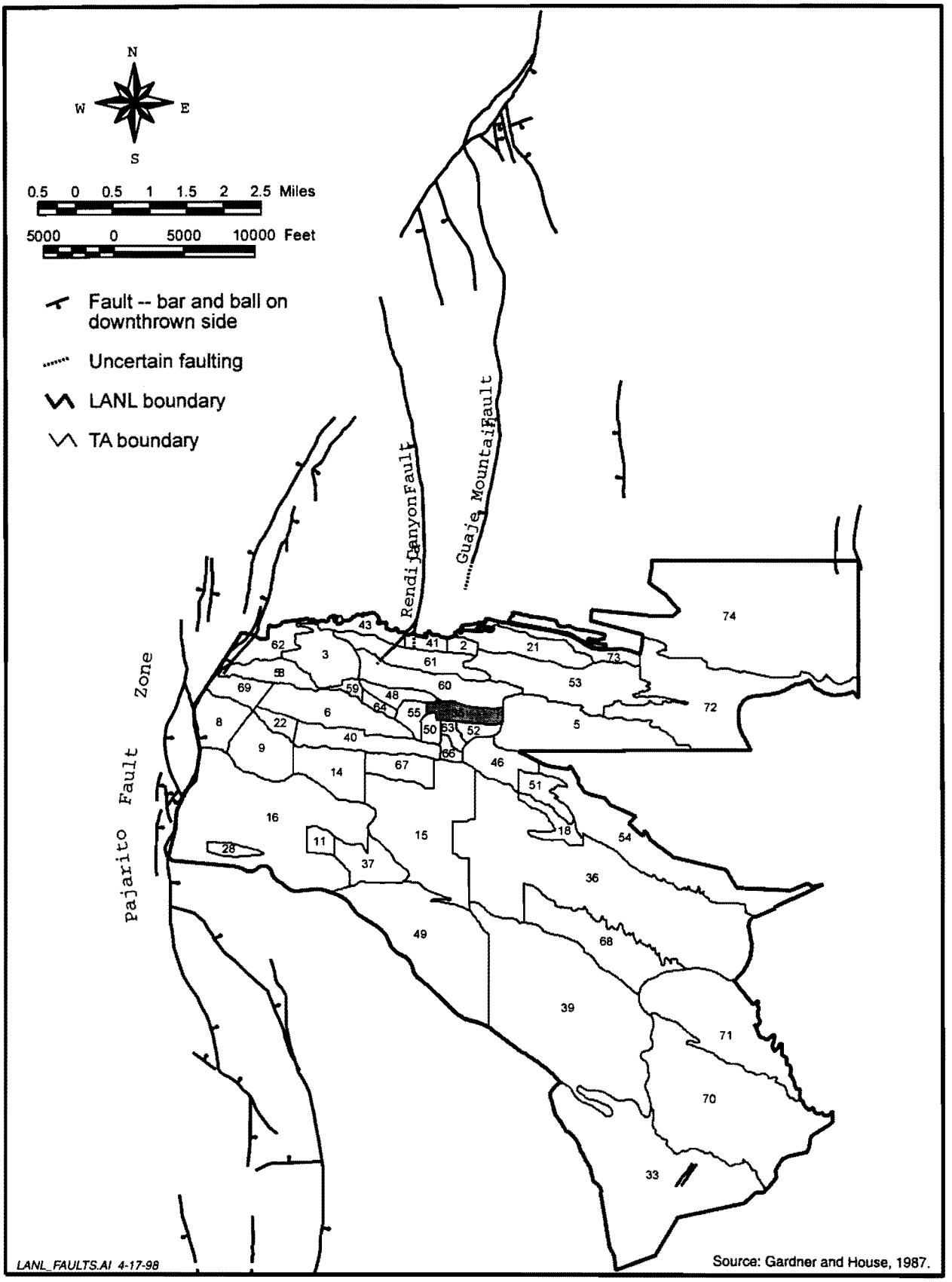
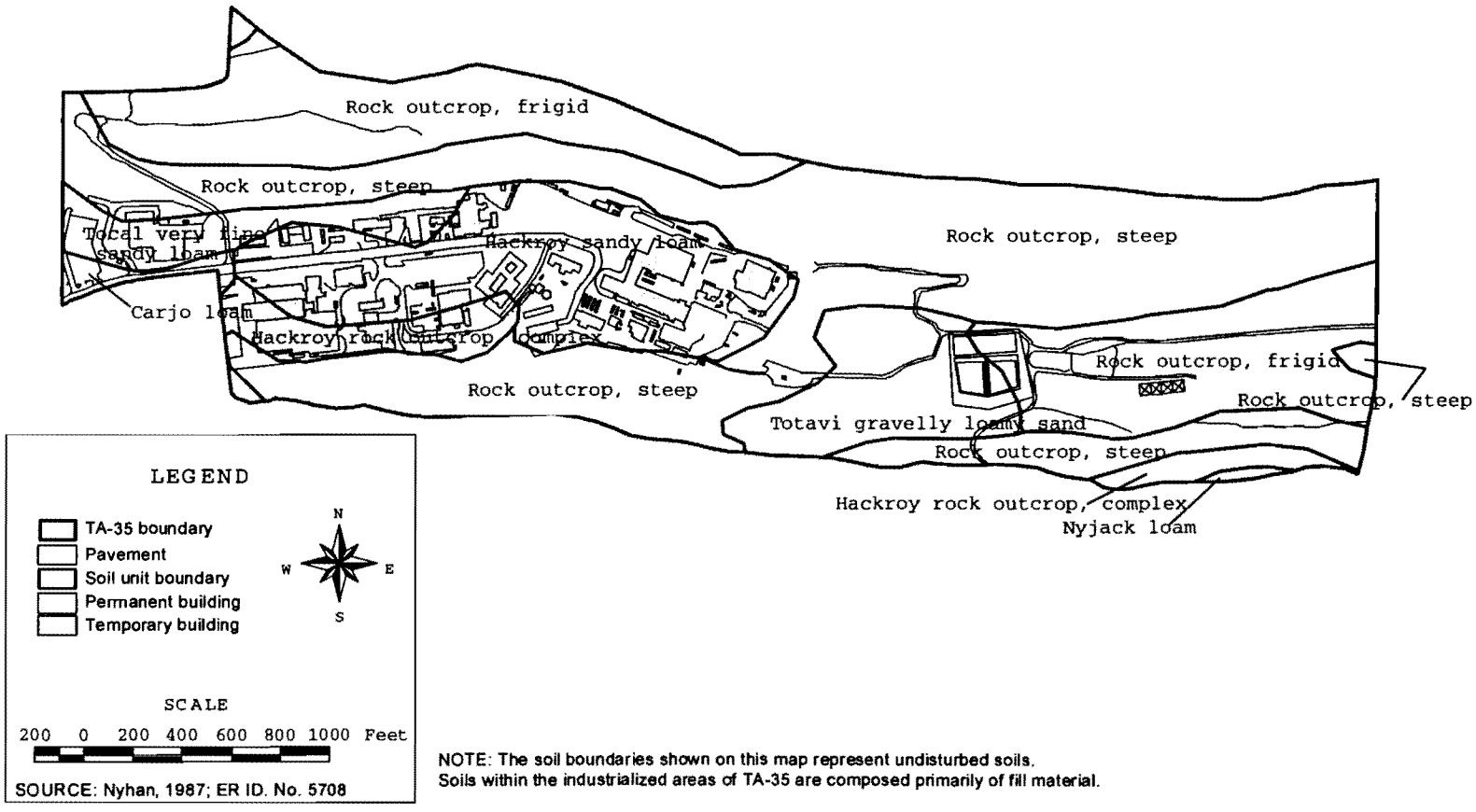


Figure B-3.1-2. Major surface faults in the LANL area.



NOTE: The soil boundaries shown on this map represent undisturbed soils.
Soils within the industrialized areas of TA-35 are composed primarily of fill material.

Figure B-3.2-1. Soils map of TA-35.

No geomorphological surveys to determine the rate of soil accumulation have been conducted in the TA-35 area.

The soils over most of the mesa-top area of TA-35 have been disturbed and reworked by construction and road building.

B-4.0 HYDROLOGY

The hydrology of the Pajarito Plateau is summarized in Section 2.4.2 of the IWP (LANL 1996, 55574, p. 2-22). TA-35 site-specific conditions are summarized below.

B-4.1 Hydrological Conceptual Model

Groundwater occurs under saturated conditions in the following three water-bearing zones in the Los Alamos area: shallow stream-associated alluvium in the canyons, perched water underlying the alluvium, and the regional aquifer of the Los Alamos area.

The shallowest depth to the regional aquifer at TA-35 is unknown. No shallow perched aquifers or alluvial aquifers are known to exist under the mesa top portions of TA-35. Alluvial aquifers are present in Mortandad Canyon and its tributary, Effluent Canyon, as seen in four moisture access holes and in two observation wells. Alluvial aquifers are also likely to be present in Ten Site Canyon.

B-4.2 Surface Water

Surface waters drain generally eastward from the Jemez Mountains, across San Ildefonso Pueblo land, and down to the Rio Grande. They continue draining south to the Cochiti Reservoir through White Rock Canyon.

The surface water runoff from TA-35 flows directly into Mortandad Canyon (immediately north of TA-35), into Ten Site Canyon (immediately south of TA-55), and into a small tributary canyon informally known as Pratt Canyon (to the east of TA-35). Runoff occurs in drainage rills found on the mesa top and in the larger drainage gullies that are characteristic of the canyon walls. No perennial springs are present in Mortandad Canyon or in Ten Site Canyon. However, water flow is present in Mortandad Canyon; its source is storm water outfalls from Pajarito Road and outfalls from Laboratory facilities west of TA-35, which also flow into Mortandad Canyon (Figure 2.2-1).

For the Laboratory, surface water runoff and sediment transport are the migration pathways of greatest concern for transport of contaminants to off-site receptors. At TA-35, natural topographic features and man-made diversions direct surface water runoff to flow toward the canyons.

Throughout the Laboratory, soil erosion and mass wasting are long-term release mechanisms that may expose subsurface contaminants or allow water to access previously contained wastes. Erosion of subsurface soils depends on soil properties: vegetative and man-made cover, slope, exposure, intensity and frequency of precipitation, and seismic activity. Mass movement of rock from canyon walls is a discontinuous process that generally proceeds at a slow rate but can be an important mechanism for exposing subsurface contaminants located near canyon rims.

B-4.2.1 AP 4.5 Surface Water Site Assessment

At the Laboratory, surface water runoff and sediment transport are among the potential migration pathways by which contaminants might be transported to off-site receptors. Surface water may also access subsurface contaminants exposed by soil erosion. Soil erosion is dependent on several factors including soil properties, amount of vegetative cover, slope of the contaminated area, exposure, intensity and frequency of precipitation, and seismic activity.

The Laboratory's ER Project has developed the Surface Water Site Assessment, formerly known as AP-4.5, to assess sediment transport and erosion concerns at specific PRSs. The Surface Water Site Assessment provides a basis for prioritizing and scheduling actions to control erosion of potentially contaminated soils at specific PRSs. The procedure is a two-part evaluation. Part A is a compilation of existing PRS analytical data, site maps, and knowledge-of-process information. Part B is an assessment of the erosion/sediment transport potential at the PRS. Erosion potential is numerically rated from 1 to 100 using a matrix system. PRSs that score below 40 have a low erosion potential; those that score from 40 to 60 have a medium erosion potential; and those that score above 60 have a high erosion potential. Part A of this assessment is initiated and completed by the LANL ER Project; Part B is completed by the Laboratory's Water Quality and Hydrology Group (ESH-18). A Surface Water Site Assessment Team comprised of representatives from the ER Project, ESH-18, the Laboratory's Facility Management Group (FSS-7), and the DOE Oversight Bureau evaluates each completed assessment. If necessary, a best management practice or other action is implemented based on the results of the assessment.
The Surface Water Site Assessments for the PRSs addressed in the RFI report are included as an attachment to Appendix B.

B-4.3 Groundwater

Appendixes B-4.3.1 through B-4.3.4 discuss the alluvial waters, perched aquifers, regional aquifer, and vadose zone in the vicinity of TA-35.

B-4.3.1 Alluvial Waters

The northern boundary of TA-35 includes the canyon floor in Effluent Canyon and Mortandad Canyon. Four shallow moisture access holes (MCM-2A, MCM-2B, MCM-2.2, and MCA-2.8) and one observation well (MCO-2) are present in the floor of Effluent Canyon at TA-35. Three shallow moisture access holes (MCM-3A, MCM-3B, and MCM-3.9) and one observation well (MCO-3) are present in the floor of Mortandad Canyon at TA-35. These wells indicate the presence of a shallow alluvial aquifer in Effluent and Mortandad Canyons.

The southern and eastern boundaries of TA-35 include the canyon floor in Ten Site Canyon and a small tributary canyon informally known as Pratt Canyon. No shallow wells are present in the floor of Ten Site Canyon at TA-35. One exploratory hole (35-2028) is present in Pratt Canyon. This hole indicated the possibility of a shallow alluvial aquifer in Pratt Canyon.

No alluvial waters are known to occur under the mesa-top areas of TA-35 where the PRSs discussed in this report are located.

B-4.3.2 Perched Waters

No perched waters are known to occur within the boundary of TA-35.

B-4.3.3 Regional Aquifer

Studies performed near TA-35 have not indicated the presence of any other shallow or perched aquifers (Devaurs and Purtymun 1985, ER ID 07415, pp. 13–14); therefore, the saturated zone under the PRSs at TA-35 appears to be restricted to the deep regional aquifer. According to the water level elevations in nearby wells TW-8 and PM-5, the top of the main aquifer at TA-35 is located in the lower Puye Formation about 950 ft beneath the surface. No evidence exists to indicate any direct interconnection between surface waters and the main aquifer in the TA-35 area.

Groundwater in the main aquifer flows eastward toward the Rio Grande. The hydraulic gradient in the area of TA-35 is 60 to 80 ft per mile, and the rate of movement varies from 20 ft per year to more than 300 ft per year, depending on the permeability of the Puye Formation and the underlying Santa Fe Group rocks.

B-4.3.4 Vadose Zone

TA-35 overlies approximately 950 ft of unsaturated volcanic tuff, sediments, and basalts of the geologic formations discussed in Section B-3.1.1. Studies of the moisture content of the Bandelier Tuff have not been conducted at TA-35; however, no shallow perched aquifers are known to be present beneath the mesa tops at TA-35. The moisture content of the Tshirege Member of the Bandelier Tuff is expected to decrease dramatically with depth, so that the tuff is essentially dry a few tens of feet beneath the ground surface. Fractures in the tuff associated with the fault zones described above may allow moisture to penetrate locally somewhat deeper into the tuff, which allows higher moisture content in the more porous zones at depth.

B-5.0 ECOLOGICAL RESOURCES

During the months of August and October 1991, the Environmental Protection Group (EM-8) Biological Resource Evaluations Team conducted reconnaissance and habitat evaluations surveys for Operable Unit 1129. A brief summary of the results is presented in this appendix.

The mesa-top portions and south-facing canyon slopes of TA-35 are within a piñon-juniper woodland with an understory of blue gramagrass. North-facing canyon slopes are mixed conifer forests, and canyon floors are open ponderosa forests. A number of species of birds, mammals, and plants have been identified as species of concern. Results of the habitat evaluation suggest that the habitat elements needed for sensitive and endangered species are not present. Field surveys suggest that there are no floodplain or wetland concerns that must be addressed during sampling at TA-35. The report concluded that surface sampling at TA-35 will not cause any adverse impact to any known critical habitat or sensitive area.

The full results of these surveys can be found in Dunham (1992, ER ID 31276, 52 pp.).

B-6.0 CULTURAL RESOURCES

A cultural resource survey has been conducted in the area of TA-35 (Manz et al. 1994, ER ID 49508, pp. 2, 7, 26) as required by the National Historic Preservation Act (amended). No cultural resources were identified at TA-35.

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Attachment

to Appendix B

Los Alamos National Laboratory
Environmental Restoration Program
CONSTITUENT ASSESSMENT

LANL-ER-AP-4.5
Part A

SITE INFORMATION

1. PRS Number: 35-003(a)
(Please use preceding zeros in TA)

2. Date (M/D/Y): 12/08/97 Time (am/pm): 2:15:00 PM

3. ER Point of Contact Gabriela Lopez Escobedo

4. FMU/Responsible Party Contact Peter Bussolini?

5. HSWA Yes

6. Site Ranking System (SRS) # 69

7. Description of the historical operations of this PRS:

Wastewater treatment plant (WTP) storage tank (600-gal. stainless steal storage tank TA-35-4) that was used to retain waste liquids before treatment and discharge to the larte waste hjolding tanks (TA-35-10). Liquid was caustic-treated for acidity in the tank.

8. Description of the current operations of this PRS (if any):

Decomissioned in 1996, site was regraded and paved over. Site is inactive.

PRS STATUS

9. Action/Status to Date (check all that apply)

	Date Completed or Anticipated
☐ None	
☐ Field Investigation ☒ Phase I ☐ Phase II	09/24/96
☐ Interim Measures ☐ IM ☐ BMP	IM: BMPs:
☒ VCA ☐ VCM	
☐ Other ☐ Monitoring ☐ CMS	
☐ Report Status ☐ SAP ☐ RFI Report	SAP: RFI RPTs:
SAP INFO:	
☐ NFA/DOU If checked, supply HH NFA criteria number and date:	

SAMPLE INFORMATION

○ Yes ◉ No **10. Have surface/sediment (depth less than12 inches) samples been collected that reflect current site conditions?**

If yes: 1) Attach data
2) Include analyte name, value, units, location ID, sample ID, SAL, depth, and media (soil, tuff, etc.)
3) Please attach existing map, showing where samples were taken, if available.

○ Yes ◉ No **11. Have surface water samples been collected that reflect current site conditions?**

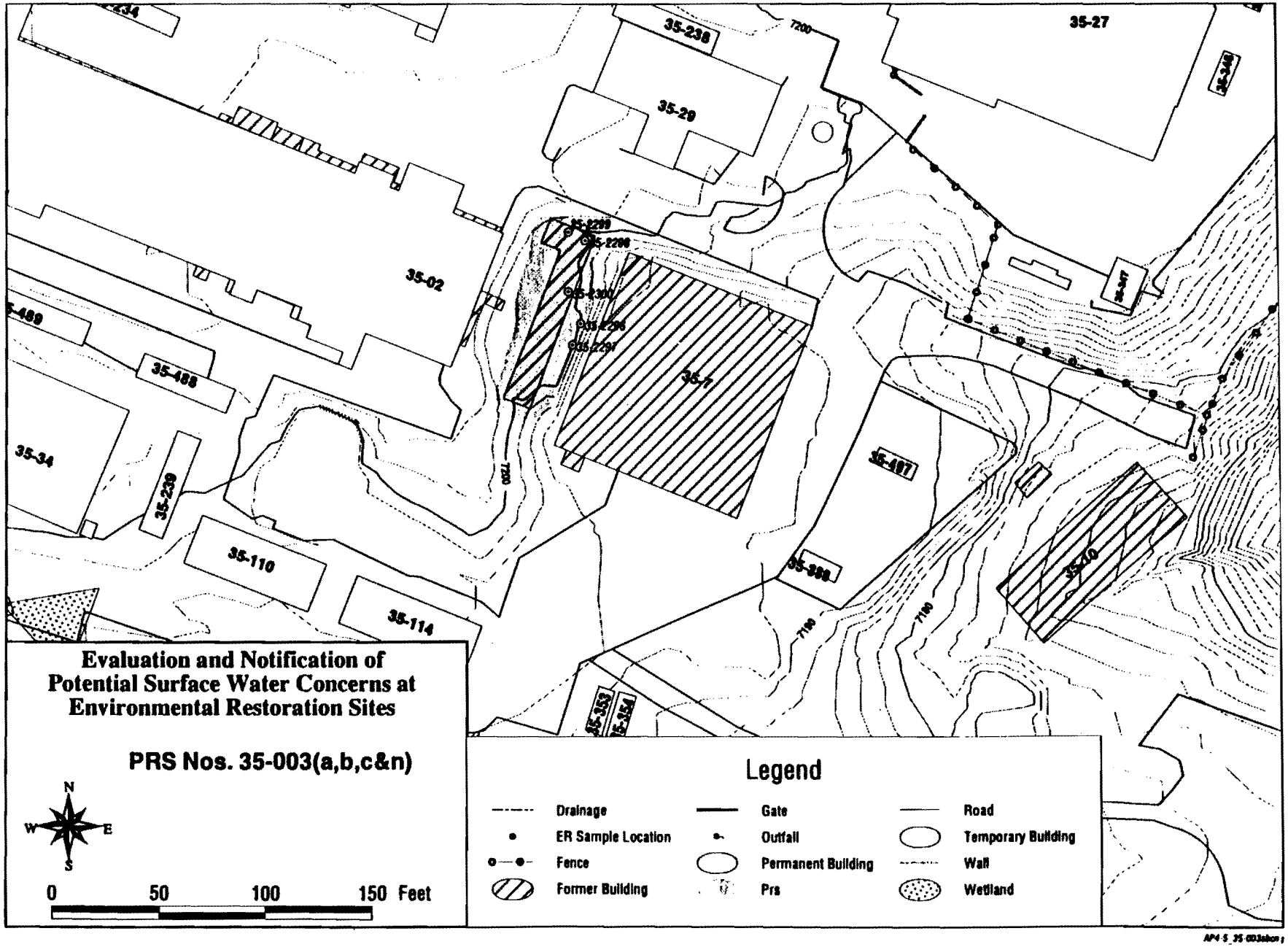
If yes: 1) Attach data
2) Include analyte name, value, units, location ID, filtered/non-filtered, & flow data, if available.
3) Please attach existing map, showing where samples were taken, if available.

○ Yes ◉ No **12. Are data pending?**

If yes: 1) List date data are anticipated:
2) Provide list of COPCs identified in RFI Work Plan as an attachment.

Gabriela G. Lopez

13. Signature of ER Representative


Evaluation and Notification of
Potential Surface Water Concerns at
Environmental Restoration Sites
PRS Nos. 35-003(a,b,c&n)
N
W
E
S
0
50
100
150 Feet
Legend
Drainage
ER Sample Location
Fence
Former Building
Gate
Outfall
Permanent Building
Prs
Road
Temporary Building
Wall
Wetland
35-27
35-238
35-29
35-02
35-7
35-34
35-110
35-114
35-239
35-488
35-489
35-487
35-10
7200
7100

Los Alamos National Laboratory

Environment, Safety and Health Division
ESH-18 Water Quality and Hydrology Group

Surface Water Assessment
Erosion Matrix for PRS 35-003(a)

CRITERIA EVALUATED	Value	Erosion/Sediment Transport Potential Low 0.1	Medium 0.5	High 1.0	Calculated Score
Site Setting (43)					
On mesa top	1	Defined based on topographic setting			1.0
Within bench of canyon	4				
Within the canyon floodplain but not watercourse	13				
Within bottom of canyon channel in watercourse	17				
Estimated % ground and canopy cover	13	>75%	25-75%	<25%	1.3
Slope	13	0-10%	10-30%	>30%	1.3
Surface Water Factors-Run-off (46)					
Visible evidence of runoff discharging? (Yes/No)	5	If no, score of 0 for runoff section.			5.0
		If yes, score 5 and proceed with section.			
Where does runoff terminate?	19	Other	Bench Setting	Drainage/Wetland	19.0
Has runoff caused visible erosion? (Yes/No)	22	Sheet	Rill	Gully	0.0
		If no, score as 0. If yes, calculate as appropriate.			
Surface Water Factors-Run-on (11)					
Structures adversely affecting run-on (Yes/No)	7*	If yes, score as 7. If no, score as 0.			0.0
Current operations adversely impacting (Yes/No)	4	If yes, score as 4. If no, score as 0.			0.0
Natural drainages onto site (Yes/No)	7*	If yes, score as 7. If no, score as 0.			0.0
**Select either structures or natural drainages.*					
MAX. POSSIBLE EROSION MATRIX SCORE:	**100**			**Total Score**	27.6**

** Indicates BMPs in place. Erosion potential without BMPs may be greater.

REVISED PART B

Report Printed 7/15/98 1:56:13 PM.

Los Alamos National Laboratory
SURFACE WATER
SITE ASSESSMENT

Revised Part B. Please discard previous.

SITE INFORMATION

1a) PRS Number 35-003(a) **1b) Structure Number** 35-2 **1c) FMU Number** 75

2. Date/Time (M/D/Y H:M am/pm) 5/20/98

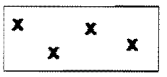
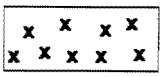
SITE SETTING (check all that apply)

3. ◉ **On mesa top (a).** ○ **In the canyon floor, but not in an established channel (c).**

○ **Within a bench of a canyon (b).** ○ **Within established channel in the canyon floor (d).**

Explanation: Location of former Building 35-7, removed 1996. Underground tank associated with the phase separator pit.

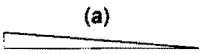
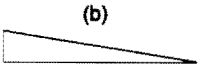
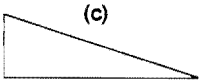
4. Estimated ground and/or canopy cover at site: (deciduous leaves, pine needles, rocks, vegetation, trees, structures, asphalt, etc.)

(illustration) (a)  (b)  (c)

Estimated % of ground/canopy cover: ○ 0% to 25% ○ 25% to 75% ◉ 75% to 100%

Explanation: Former building location leveled (35-7) and stabilized with base course. The PRS is totally covered with asphalt.

5. Steepest slope at the area impacted:

(a)  (b)  (c) 

◉ Less than 10% ○ 10% to 30% ○ 30% and greater

Explanation: Slight slope to NE onto base course parking area.

RUNOFF FACTORS

Y / N

☑ ☐ **6. Is there visible evidence of runoff discharging from site? If yes, answer a) - c) below:**

☑ ☐ 6a) Is runoff channelized? If yes, describe: ◉ Man-made channel. ○ Natural channel.

Explanation: Sheet flow onto parking area & adjacent storm water catch basin which discharges into Ten-Site Canyon to the south.

RUNOFF FACTORS, CONT'D

6b) Where does evidence of runoff terminate?

- (●) **Drainage or wetland (name)** Ten Site Canyon
- ( ) **Within bench of canyon setting (name)**
- ( ) **Other (i.e., retention pond, meadow, mesa top)**

Explanation: Small portion of site drains into the local storm water runoff system and discharges into Ten Site Canyon. Most of site sheet flows onto base course parking area east of site.

Y / N

☐ ☑ 6c) Has runoff caused visible erosion at the site? If yes, explain below: (●) Sheet ( ) Rill ( ) Gully

Explanation: None observed at site.

RUN-ON FACTORS

Please rate the potential for storm water to run on to this site: (Check EITHER #7 or #9)

☐ ☑ 7. Are structures (i.e., buildings, roof drains, parking lots, storm drains) creating run-on to the site?

Explanation: Concrete curb upslope diverts run-on.

☐ ☑ 8. Are current operations (i.e., fire hydrants, NPDES outfalls) adversely impacting run-on to the site?

Explanation: All operations ceased, all facilities removed.

☐ ☑ 9. Are natural drainage patterns directing stormwater onto site?

Explanation:

ASSESSMENT FINDING:

☐ ☑ **10. Based on the above criteria and the assessment of this site, does soil erosion potential exist? (REFER TO EROSION POTENTIAL MATRIX.)**

D. Mays

11. Signature of Water Quality/Hydrology Representative

_____ Initials of independent reviewer.

Check here when information is entered in database: ☑

This page is for ESH-18 notes, recommendations, and photos.

	Y	N	
12. a)	○	◉	Is there visible trash/debris on the site?
b)	○	◉	Is there visible trash/debris in a watercourse?

Description of existing BMPs:

Asphalt cover, concrete curb for run-on control

◉ ○ Are BMPs being properly maintained? If no, describe in "Other Internal Notes."

◉ ○ Are BMPs effectively keeping sediment in place and reducing erosion potential?

OTHER INTERNAL NOTES:

Site originally assessed on 9/24/97. Site re-visited based on a request from G. Lopez-Escobed who thought the wrong site had originally been assessed. The site was originally grouped with some other downslope PRSs. Original date to NMED: 12/18/97 date to ESH-18 10/1/97

Los Alamos National Laboratory
Environmental Restoration Program
CONSTITUENT ASSESSMENT

LANL-ER-AP-4.5
Part A

SITE INFORMATION

1. PRS Number: 35-003(b)
(Please use preceding zeros in TA)

2. Date (M/D/Y): 12/08/97 **Time (am/pm):** 1:30:00 PM

3. ER Point of Contact Gabriela Lopez Escobedo

4. FMU/Responsible Party Contact Peter Bussolini?

5. HSWA Yes

6. Site Ranking System (SRS) # 69

7. Description of the historical operations of this PRS:

Wastewater treatment plant (WTP) storage tank (600-gal. stainless steal storage tank TA-35-5) that was used to retain waste liquids before treatment and discharge to the larte waste hjolding tanks (TA-35-10). Liquid was caustic-treated for acidity in the tank.

8. Description of the current operations of this PRS (If any):

Decomissioned in 1996, site was regraded and paved over. Site is inactive.

PRS STATUS

9. Action/Status to Date (check all that apply)

	Date Completed or Anticipated
☐ **None**	
☐ **Field Investigation** ☒ **Phase I** ☐ **Phase II**	09/24/96
☐ **Interim Measures** ☐ **IM** ☐ **BMP**	**IM:**
	BMPs:
☒ **VCA** ☐ **VCM**	
☐ **Other** ☐ **Monitoring** ☐ **CMS**	
☐ **Report Status** ☐ **SAP** ☐ **RFI Report**	**SAP:** **RFI RPTs:**
SAP INFO:	
☐ **NFA/DOU** If checked, supply HH NFA criteria number and date:	

SAMPLE INFORMATION

◉ Yes ○ No **10. Have surface/sediment (depth less than12 inches) samples been collected that reflect current site conditions?**

If yes: 1) Attach data
2) Include analyte name, value, units, location ID, sample ID, SAL, depth, and media (soil, tuff, etc.)
3) Please attach existing map, showing where samples were taken, if available.

○ Yes ◉ No **11. Have surface water samples been collected that reflect current site conditions?**

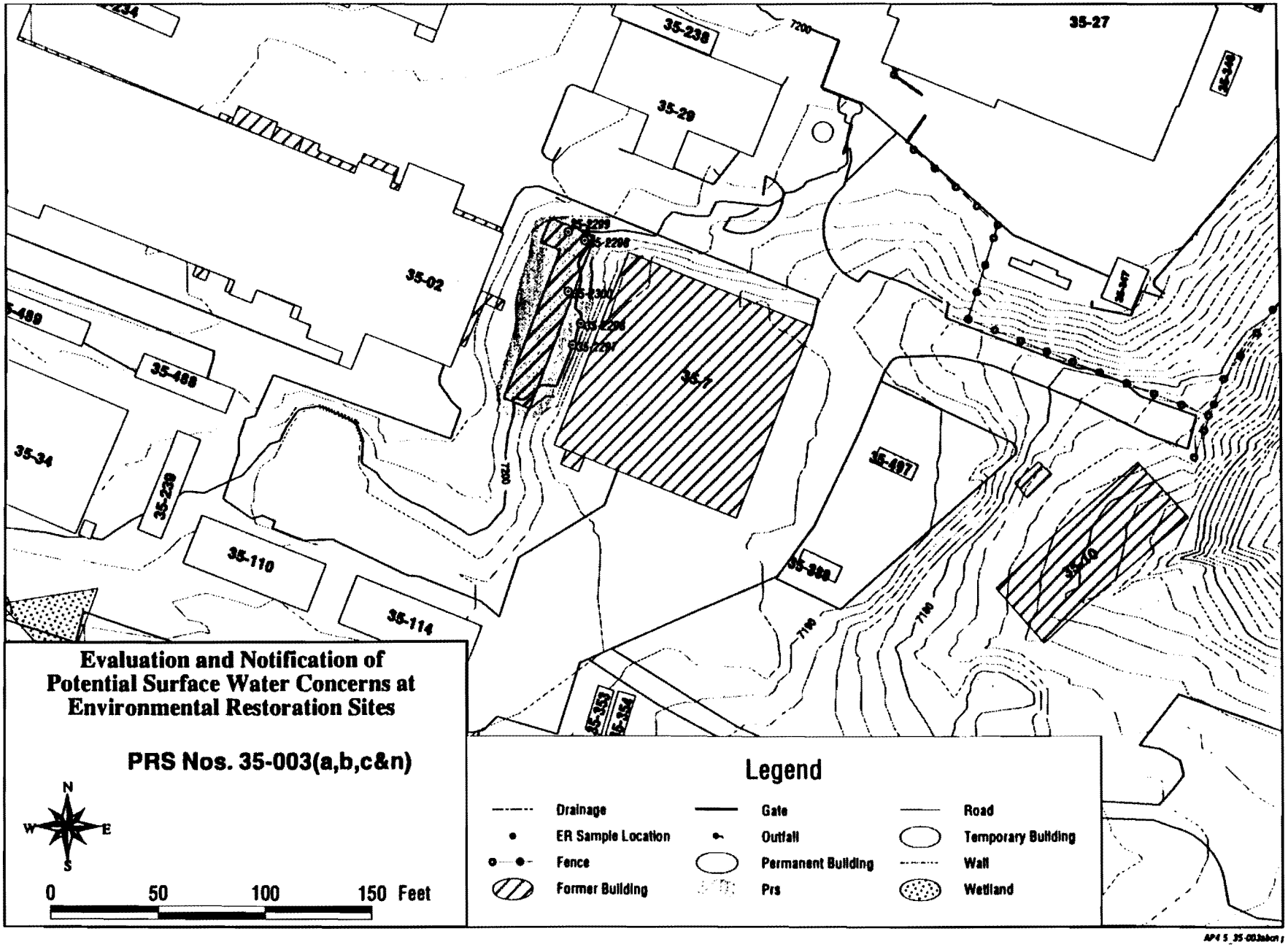
If yes: 1) Attach data
2) Include analyte name, value, units, location ID, filtered/non-filtered, & flow data, if available.
3) Please attach existing map, showing where samples were taken, if available.

○ Yes ◉ No **12. Are data pending?**

If yes: 1) List date data are anticipated:
2) Provide list of COPCs identified in RFI Work Plan as an attachment.

Gabriela Lopez

13. Signature of ER Representative


Evaluation and Notification of
Potential Surface Water Concerns at
Environmental Restoration Sites
PRS Nos. 35-003(a,b,c&n)
N
W
E
S
0
50
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150 Feet
Legend
Drainage
ER Sample Location
Fence
Former Building
Gate
Outfall
Permanent Building
Prs
Road
Temporary Building
Wall
Wetland
35-238
35-29
35-27
35-02
35-489
35-488
35-34
35-239
35-110
35-114
35-497
35-353
35-354
7200
7100

Los Alamos National Laboratory

Environment, Safety and Health Division
ESH-18 Water Quality and Hydrology Group

Surface Water Assessment
Erosion Matrix for PRS 35-003(b)

CRITERIA EVALUATED	Value	Erosion/Sediment Transport Potential Low 0.1	Medium 0.5	High 1.0	Calculated Score
Site Setting (43)					
On mesa top	1	Defined based on topographic setting			1.0
Within bench of canyon	4				
Within the canyon floodplain but not watercourse	13				
Within bottom of canyon channel in watercourse	17				
Estimated % ground and canopy cover	13	>75%	25-75%	<25%	1.3
Slope	13	0-10%	10-30%	>30%	1.3
Surface Water Factors-Run-off (46)					
Visible evidence of runoff discharging? (Yes/No)	5	If no, score of 0 for runoff section.			5.0
		If yes, score 5 and proceed with section.			
Where does runoff terminate?	19	Other	Bench Setting	Drainage/Wetland	19.0
Has runoff caused visible erosion? (Yes/No)	22	Sheet	Rill	Gully	0.0
		If no, score as 0. If yes, calculate as appropriate.			
Surface Water Factors-Run-on (11)					
Structures adversely affecting run-on (Yes/No)	7*	If yes, score as 7. If no, score as 0.			0.0
Current operations adversely impacting (Yes/No)	4	If yes, score as 4. If no, score as 0.			0.0
Natural drainages onto site (Yes/No)	7*	If yes, score as 7. If no, score as 0.			0.0
**Select either structures or natural drainages.*					
MAX. POSSIBLE EROSION MATRIX SCORE:	**100**			**Total Score**	27.6**

** Indicates BMPs in place. Erosion potential without BMPs may be greater.

REVISED PART B

Report Printed 7/15/98 7:51:08 AM.

Los Alamos National Laboratory
SURFACE WATER
SITE ASSESSMENT

Revised Part B. Please discard previous.

SITE INFORMATION

1a) PRS Number 35-003(b) **1b) Structure Number** 35-2 **1c) FMU Number**

2. Date/Time (M/D/Y H:M am/pm) 5/20/98

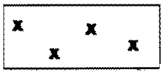
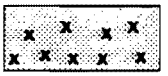
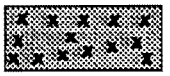
SITE SETTING (check all that apply)

3. ◉ **On mesa top (a).** ○ **In the canyon floor, but not in an established channel (c).**

○ **Within a bench of a canyon (b).** ○ **Within established channel in the canyon floor (d).**

Explanation: Location of former Building 35-7, removed 1996. Underground tank associated with the phase separator pit.

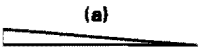
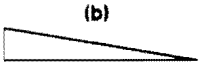
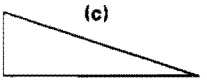
4. Estimated ground and/or canopy cover at site: (deciduous leaves, pine needles, rocks, vegetation, trees, structures, asphalt, etc.)

(illustration) (a)  (b)  (c) 

Estimated % of ground/canopy cover: ○ 0% to 25% ○ 25% to 75 ◉ 75% to 100

Explanation: Former building location leveled (35-7) and stabilized with base course. The PRS is totally covered with asphalt.

5. Steepest slope at the area impacted:

(a)  (b)  (c) 

◉ Less than 10% ○ 10% to 30% ○ 30% and greater

Explanation: Slight slope to NE onto base course parking area.

RUNOFF FACTORS

Y / N

☑ ☐ **6. Is there visible evidence of runoff discharging from site? If yes, answer a) - c) below:**

☑ ☐ **6a) Is runoff channelized? If yes, describe** ◉ Man-made channel. ○ Natural channel.

Explanation: Sheet flow onto parking area & adjacent storm water catch basin which discharges into Ten-Site Canyon to the south.

RUNOFF FACTORS, CONT'D

6b) Where does evidence of runoff terminate?

- (●) **Drainage or wetland (name)** Pratt Canyon
- ( ) **Within bench of canyon setting (name)**
- ( ) **Other (i.e., retention pond, meadow, mesa top)**

Explanation: Small portion of site drains into the local storm water runoff system and discharges into Ten Site Canyon. Most of site sheet flows onto base course parking area east of site.

Y / N

☐ ☑ 6c) Has runoff caused visible erosion at the site? If yes, explain below (●) Sheet ( ) Rill ( ) Gully

Explanation: None observed at site.

RUN-ON FACTORS

Please rate the potential for storm water to run on to this site: (Check EITHER #7 or #9)

☐ ☑ 7. Are structures (i.e., buildings, roof drains, parking lots, storm drains) creating run-on to the site?

Explanation: Concrete curb upslope diverts run-on.

☐ ☑ 8. Are current operations (i.e., fire hydrants, NPDES outfalls) adversely impacting run-on to the site?

Explanation: All operations ceased, all facilities removed.

☐ ☑ 9. Are natural drainage patterns directing stormwater onto site?

Explanation:

ASSESSMENT FINDING:

☐ ☑ **10. Based on the above criteria and the assessment of this site, does soil erosion potential exist? (REFER TO EROSION POTENTIAL MATRIX.)**

D. Mays

11. Signature of Water Quality/Hydrology Representative

_____ Initials of independent reviewer.

Check here when information is entered in database: ☑

This page is for ESH-18 notes, recommendations, and photos.

	Y	N	
12 a)	○	◉	Is there visible trash/debris on the site?
b)	○	◉	Is there visible trash/debris in a watercourse?

Description of existing BMPs:

Asphalt cover, concrete curb for run-on control

◉ ○ Are BMPs being properly maintained? If no, describe in "Other Internal Notes."

◉ ○ Are BMPs effectively keeping sediment in place and reducing erosion potential?

OTHER INTERNAL NOTES:

Site originally assessed on 9/24/97. Site re-visited based on a request from G. Lopez-Escobed who thought the wrong site had originally been assessed. The site was originally grouped with some other downslope PRSs. Original date to NMED: 12/18/97 date to ESH-18 10/1/97

Los Alamos National Laboratory
Environmental Restoration Program
CONSTITUENT ASSESSMENT

LANL-ER-AP-4.5
Part A

SITE INFORMATION

1. PRS Number: 35-003(c)
(Please use preceding zeros in TA)

2. Date (M/D/Y): 12/08/97 **Time (am/pm):** 2:20:00 PM

3. ER Point of Contact Gabriela Lopez Escobedo

4. FMU/Responsible Party Contact Peter Bussolini?

5. HSWA Yes

6. Site Ranking System (SRS) # 69

7. Description of the historical operations of this PRS:

Wastewater treatment plant (WTP) storage tank (600-gal. stainless steal storage tank TA-35--6) that was used to retain waste liquids before treatment and discharge to the larte waste hjolding tanks (TA-35-10). Liquid was caustic-treated for acidity in the tank.

8. Description of the current operations of this PRS (if any):

Decomissioned in 1996, site was regraded and paved over. Site is inactive.

PRS STATUS

9. Action/Status to Date (check all that apply)

	Date Completed or Anticipated
☐ **None**	
☐ **Field Investigation** ☒ **Phase I** ☐ **Phase II**	09/24/96
☐ **Interim Measures** ☐ **IM** ☐ **BMP**	**IM:**
	BMPs:
☒ **VCA** ☐ **VCM**	
☐ **Other** ☐ **Monitoring** ☐ **CMS**	
☐ **Report Status** ☐ **SAP** ☐ **RFI Report**	**SAP:** **RFI RPTs:**
SAP INFO:	

☐ **NFA/DOU** If checked, supply HH NFA criteria number and date:

SAMPLE INFORMATION

◉ Yes ○ No **10. Have surface/sediment (depth less than12 inches) samples been collected that reflect current site conditions?**

If yes: 1) Attach data
2) Include analyte name, value, units, location ID, sample ID, SAL, depth, and media (soil, tuff, etc.)
3) Please attach existing map, showing where samples were taken, if available.

○ Yes ◉ No **11. Have surface water samples been collected that reflect current site conditions?**

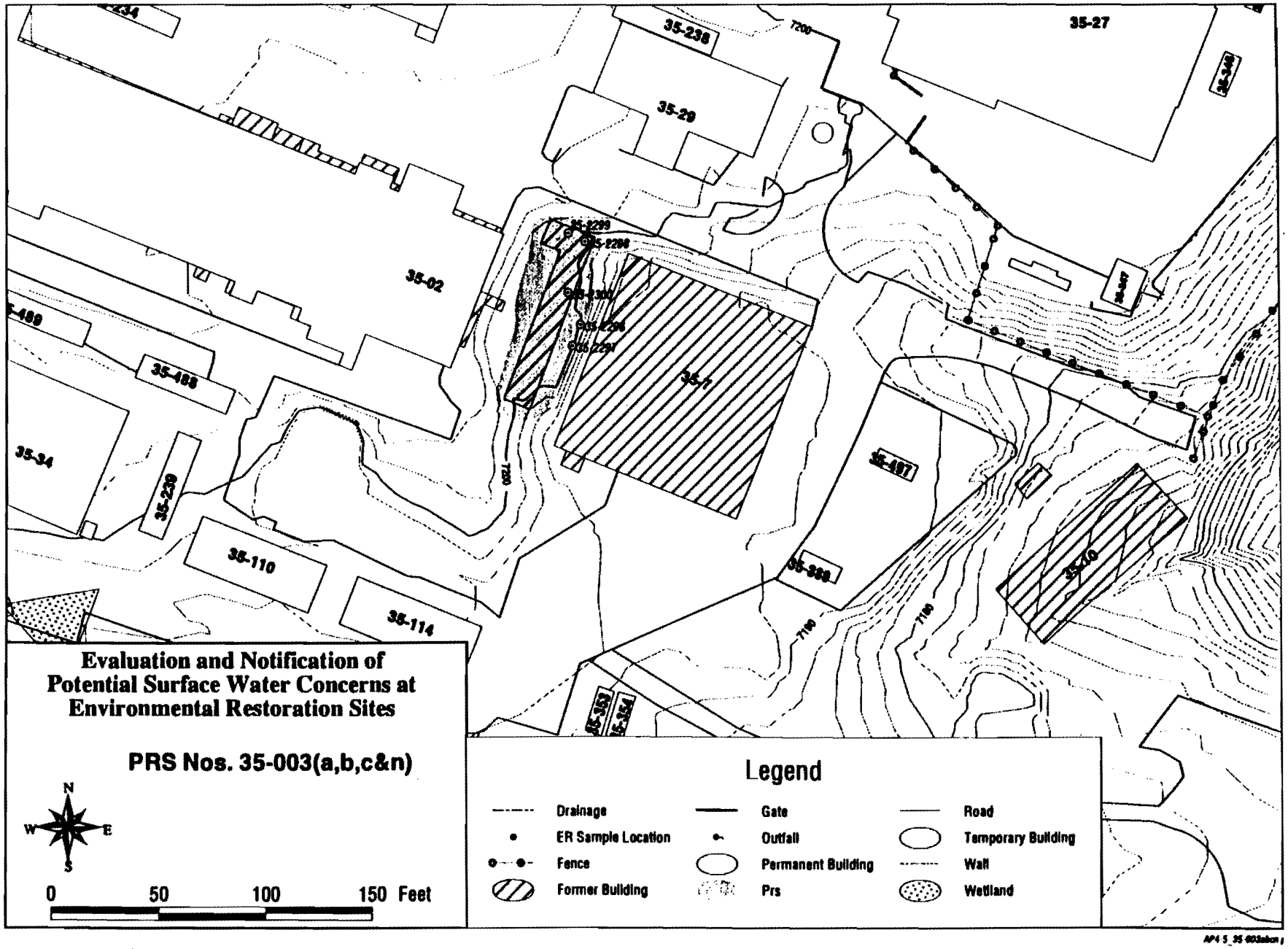
If yes: 1) Attach data
2) Include analyte name, value, units, location ID, filtered/non-filtered, & flow data, if available.
3) Please attach existing map, showing where samples were taken, if available.

○ Yes ◉ No **12. Are data pending?**

If yes: 1) List date data are anticipated:
2) Provide list of COPCs identified in RFI Work Plan as an attachment.

Gabriela G. Lopez

13. Signature of ER Representative


Evaluation and Notification of Potential Surface Water Concerns at Environmental Restoration Sites
PRS Nos. 35-003(a,b,c&n)
N
W
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150 Feet
Legend
Drainage
ER Sample Location
Fence
Former Building
Gate
Outfall
Permanent Building
Prs
Road
Temporary Building
Wall
Wetland
35-238
35-29
35-27
35-02
35-488
35-34
35-220
35-110
35-114
35-497
35-368
35-410
35-353
35-354
7200
7100

Los Alamos National Laboratory

Environment, Safety and Health Division
ESH-18 Water Quality and Hydrology Group

Surface Water Assessment
Erosion Matrix for PRS 35-003(c)

CRITERIA EVALUATED	Value	Erosion/Sediment Transport Potential Low 0.1	Medium 0.5	High 1.0	Calculated Score
Site Setting (43)					
On mesa top	1	Defined based on topographic setting			1.0
Within bench of canyon	4				
Within the canyon floodplain but not watercourse	13				
Within bottom of canyon channel in watercourse	17				
Estimated % ground and canopy cover	13	>75%	25-75%	<25%	1.3
Slope	13	0-10%	10-30%	>30%	1.3
Surface Water Factors-Run-off (46)					
Visible evidence of runoff discharging? (Yes/No)	5	If no, score of 0 for runoff section.			5.0
		If yes, score 5 and proceed with section.			
Where does runoff terminate?	19	Other	Bench Setting	Drainage/Wetland	19.0
Has runoff caused visible erosion? (Yes/No)	22	Sheet	Rill	Gully	0.0
		If no, score as 0. If yes, calculate as appropriate.			
Surface Water Factors-Run-on (11)					
Structures adversely affecting run-on (Yes/No)	7*	If yes, score as 7. If no, score as 0.			0.0
Current operations adversely impacting (Yes/No)	4	If yes, score as 4. If no, score as 0.			0.0
Natural drainages onto site (Yes/No)	7*	If yes, score as 7. If no, score as 0.			0.0
**Select either structures or natural drainages.*					
MAX. POSSIBLE EROSION MATRIX SCORE:	100			**Total Score**	27.6**

** Indicates BMPs in place. Erosion potential without BMPs may be greater.

REVISED PART B

Report Printed 7/15/98 7:51:53 AM.

Los Alamos National Laboratory
SURFACE WATER
SITE ASSESSMENT

Revised Part B. Please discard previous.

SITE INFORMATION

1a) PRS Number 35-003(c) **1b) Structure Number** 35-2 **1c) FMU Number**

2. Date/Time (M/D/Y H:M am/pm) 5/20/98

SITE SETTING (check all that apply)

3. ◉ **On mesa top (a).** ○ **In the canyon floor, but not in an established channel (c).**
   ○ **Within a bench of a canyon (b).** ○ **Within established channel in the canyon floor (d).**

Explanation: Location of former Building 35-7, removed 1996. Underground tank associated with the phase separator pit.

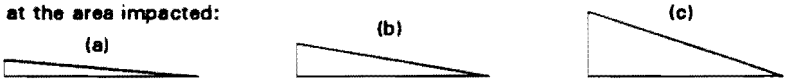
4. Estimated ground and/or canopy cover at site: (deciduous leaves, pine needles, rocks, vegetation, trees, structures, asphalt, etc.)

(illustration)

Estimated % of ground/canopy cover: ○ 0% to 25% ○ 25% to 75 ◉ 75% to 100

Explanation: Former building location leveled (35-7) and stabilized with base course. The PRS is totally covered with asphalt.

5. Steepest slope at the area impacted:



◉ Less than 10% ○ 10% to 30% ○ 30% and greater

Explanation: Slight slope to NE onto base course parking area.

RUNOFF FACTORS

Y / N

☑ ☐ **6. Is there visible evidence of runoff discharging from site? If yes, answer a) - c) below:**

☑ ☐ 6a) Is runoff channelized? If yes, describe ◉ Man-made channel. ○ Natural channel.

Explanation: Sheet flow onto parking area & adjacent storm water catch basin which discharges into Ten-Site Canyon to the south.

RUNOFF FACTORS, CONT'D

6b) Where does evidence of runoff terminate?

- (●) **Drainage or wetland (name)** Pratt Canyon
- ( ) **Within bench of canyon setting (name)**
- ( ) **Other (i.e., retention pond, meadow, mesa top)**

Explanation: Small portion of site drains into the local storm water runoff system and discharges into Ten Site Canyon. Most of site sheet flows onto base course parking area east of site.

Y / N

☐ ☑ 6c) Has runoff caused visible erosion at the site? If yes, explain below (●) Sheet ( ) Rill ( ) Gully

Explanation: None observed at site.

RUN-ON FACTORS

Please rate the potential for storm water to run on to this site: (Check EITHER #7 or #9)

☐ ☑ 7. Are structures (i.e., buildings, roof drains, parking lots, storm drains) creating run-on to the site?

Explanation: Concrete curb upslope diverts run-on.

☐ ☑ 8. Are current operations (i.e., fire hydrants, NPDES outfalls) adversely impacting run-on to the site?

Explanation: All operations ceased, all facilities removed.

☐ ☑ 9. Are natural drainage patterns directing stormwater onto site?

Explanation:

ASSESSMENT FINDING:

☐ ☑ **10. Based on the above criteria and the assessment of this site, does soil erosion potential exist? (REFER TO EROSION POTENTIAL MATRIX.)**

D. Mays

11. Signature of Water Quality/Hydrology Representative

_____ Initials of independent reviewer.

Check here when information is entered in database: ☑

This page is for ESH-18 notes, recommendations, and photos.

	Y	N	
12 a)	○	◉	Is there visible trash/debris on the site?
b)	○	◉	Is there visible trash/debris in a watercourse?

Description of existing BMPs:

Asphalt cover, concrete curb for run-on control

◉ ○ Are BMPs being properly maintained? If no, describe in "Other Internal Notes."

◉ ○ Are BMPs effectively keeping sediment in place and reducing erosion potential?

OTHER INTERNAL NOTES:

Site originally assessed on 9/24/97. Site re-visited based on a request from G. Lopez-Escobed who thought the wrong site had originally been assessed. The site was originally grouped with some other downslope PRSs. Original date to NMED: 12/18/97 date to ESH-18 10/1/97

Los Alamos National Laboratory
Environmental Restoration Program
CONSTITUENT ASSESSMENT

LANL-ER-AP-4.5
Part A

SITE INFORMATION

1. PRS Number: 35-003(n)
(Please use preceding zeros in TA)

2. Date (M/D/Y): 12/08/97 **Time (am/pm):** 3:10:00 PM

3. ER Point of Contact Gabriela Lopez Escobedo

4. FMU/Responsible Party Contact Peter Bussolini?

5. HSWA Yes

6. Site Ranking System (SRS) # 69

7. Description of the historical operations of this PRS:

Liquid waste phase separator pit (TA-35-3) was a large subterranean, reinforced concrete structure that housed equipment used to treat vented air exhaust from laboratory hoods in building TA-35-2. The structure housed air vent lines, air filters, phase separator chambers, liquid drain lines, and a caustic treatment tank.

8. Description of the current operations of this PRS (if any):

Decomissioned in 1996, site was regraded and paved over. Site is inactive.

PRS STATUS

9. Action/Status to Date (check all that apply)

	Date Completed or Anticipated
☐ **None**	
☐ **Field Investigation** ☒ **Phase I** ☐ **Phase II**	12/18/96
☐ **Interim Measures** ☐ **IM** ☐ **BMP**	**IM:**
	BMPs:
☒ **VCA** ☐ **VCM**	
☐ **Other** ☐ **Monitoring** ☐ **CMS**	
☐ **Report Status** ☐ **SAP** ☐ **RFI Report**	**SAP:** **RFI RPTs:**
SAP INFO:	
☐ **NFA/DOU** If checked, supply HH NFA criteria number and date:	

SAMPLE INFORMATION

◉ Yes ○ No **10. Have surface/sediment (depth less than12 inches) samples been collected that reflect current site conditions?**

If yes: 1) Attach data
2) Include analyte name, value, units, location ID, sample ID, SAL, depth, and media (soil, tuff, etc.)
3) Please attach existing map, showing where samples were taken, if available.

○ Yes ◉ No **11. Have surface water samples been collected that reflect current site conditions?**

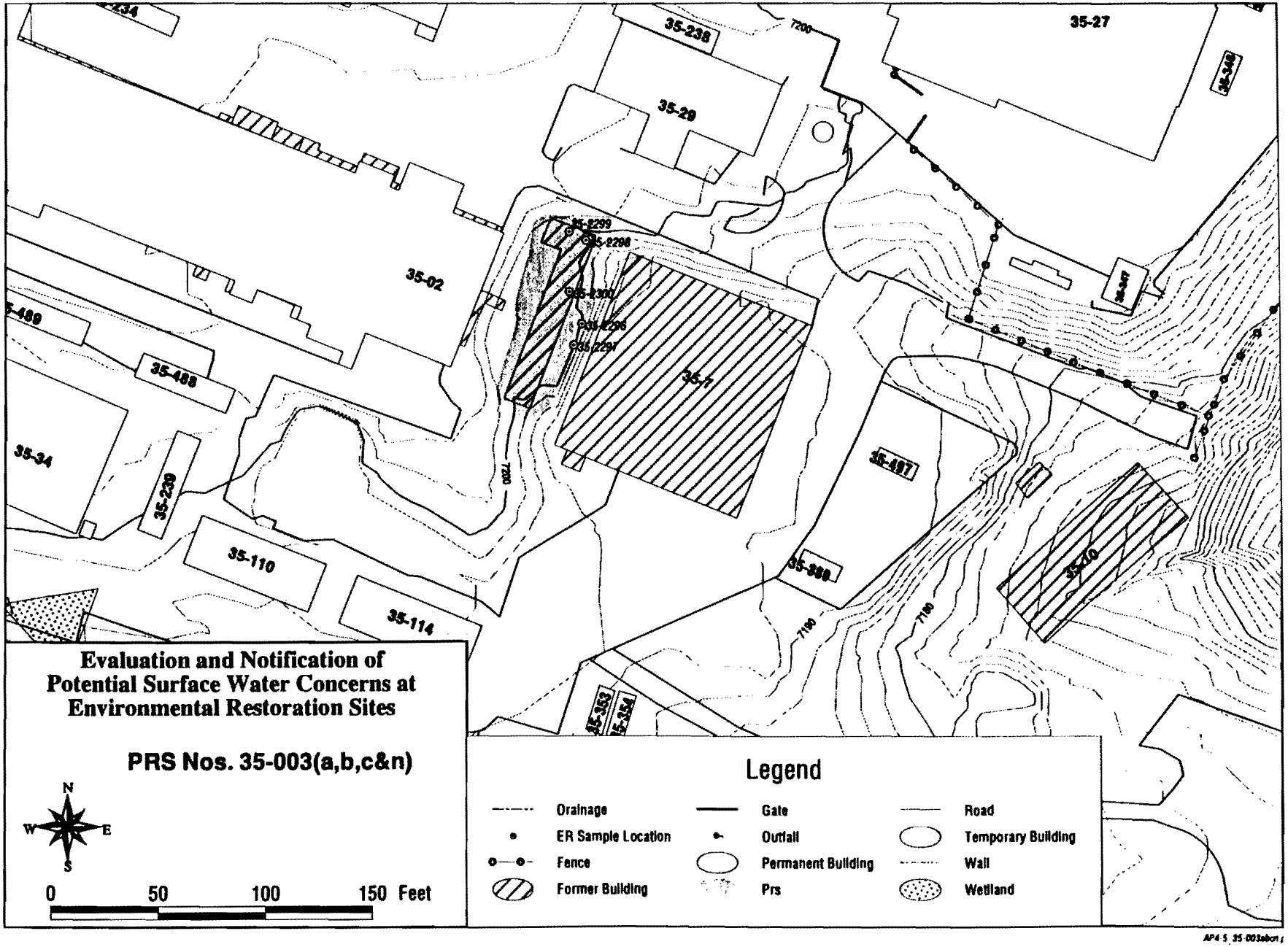
If yes: 1) Attach data
2) Include analyte name, value, units, location ID, filtered/non-filtered, & flow data, if available.
3) Please attach existing map, showing where samples were taken, if available.

○ Yes ◉ No **12. Are data pending?**

If yes: 1) List date data are anticipated:
2) Provide list of COPCs identified in RFI Work Plan as an attachment.

Gabriela Lopez-Escobedo

13. Signature of ER Representative



AP4.5_35-003abcn

Los Alamos National Laboratory

Environment, Safety and Health Division
ESH-18 Water Quality and Hydrology Group

Surface Water Assessment
Erosion Matrix for PRS 35-003(n)

CRITERIA EVALUATED	Value	Erosion/Sediment Transport Potential Low 0.1	Medium 0.5	High 1.0	Calculated Score
Site Setting (43)					
On mesa top	1	Defined based on topographic setting			1.0
Within bench of canyon	4				
Within the canyon floodplain but not watercourse	13				
Within bottom of canyon channel in watercourse	17				
Estimated % ground and canopy cover	13	>75%	25-75%	<25%	1.3
Slope	13	0-10%	10-30%	>30%	1.3
Surface Water Factors-Run-off (46)					
Visible evidence of runoff discharging? (Yes/No)	5	If no, score of 0 for runoff section.			5.0
		If yes, score 5 and proceed with section.			
Where does runoff terminate?	19	Other	Bench Setting	Drainage/Wetland	19.0
Has runoff caused visible erosion? (Yes/No)	22	Sheet	Rill	Gully	0.0
		If no, score as 0. If yes, calculate as appropriate.			
Surface Water Factors-Run-on (11)					
Structures adversely affecting run-on (Yes/No)	7*	If yes, score as 7. If no, score as 0.			0.0
Current operations adversely impacting (Yes/No)	4	If yes, score as 4. If no, score as 0.			0.0
Natural drainages onto site (Yes/No)	7*	If yes, score as 7. If no, score as 0.			0.0
**Select either structures or natural drainages.*					
MAX. POSSIBLE EROSION MATRIX SCORE:	**100**			**Total Score**	27.6**

** Indicates BMPs in place. Erosion potential without BMPs may be greater.

REVISED PART B

Report Printed 7/15/98 7:52:24 AM.

Los Alamos National Laboratory
SURFACE WATER
SITE ASSESSMENT

Revised Part B. Please discard previous.

SITE INFORMATION

1a) PRS Number 35-003(n) **1b) Structure Number** 35-2 **1c) FMU Number**

2. Date/Time (M/D/Y H:M am/pm) 5/20/98

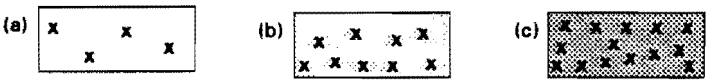
SITE SETTING (check all that apply)

3. (●) **On mesa top (a).** ( ) **In the canyon floor, but not in an established channel (c).**
( ) **Within a bench of a canyon (b).** ( ) **Within established channel in the canyon floor (d).**

Explanation: Location of former Building 35-7, removed 1996. Underground tank associated with the phase separator pit.

4. Estimated ground and/or canopy cover at site: (deciduous leaves, pine needles, rocks, vegetation, trees, structures, asphalt, etc.)

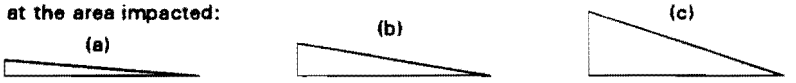
(illustration)



Estimated % of ground/canopy cover: ( ) 0% to 25% ( ) 25% to 75 (●) 75% to 100

Explanation: Former building location leveled (35-7) and stabilized with base course. The PRS is totally covered with asphalt.

5. Steepest slope at the area impacted:



(●) Less than 10% ( ) 10% to 30% ( ) 30% and greater

Explanation: Slight slope to NE onto base course parking area.

RUNOFF FACTORS

Y / N

☑ ☐ **6. Is there visible evidence of runoff discharging from site? If yes, answer a) - c) below:**

☑ ☐ **6a) Is runoff channelized? If yes, describe** (●) Man-made channel. ( ) Natural channel.

Explanation: Sheet flow onto parking area & adjacent storm water catch basin which discharges into Ten-Site Canyon to the south.

RUNOFF FACTORS, CONT'D

6b) Where does evidence of runoff terminate?

- (●) **Drainage or wetland (name)** Pratt Canyon
- ( ) **Within bench of canyon setting (name)**
- ( ) **Other (i.e., retention pond, meadow, mesa top)**

Explanation: Small portion of site drains into the local storm water runoff system and discharges into Ten Site Canyon. Most of site sheet flows onto base course parking area east of site.

Y / N

☐ ☑ 6c) Has runoff caused visible erosion at the site? If yes, explain below (●) Sheet ( ) Rill ( ) Gully

Explanation: None observed at site.

RUN-ON FACTORS

Please rate the potential for storm water to run on to this site: (Check EITHER #7 or #9)

☐ ☑ 7. Are structures (i.e., buildings, roof drains, parking lots, storm drains) creating run-on to the site?

Explanation: Concrete curb upslope diverts run-on.

☐ ☑ 8. Are current operations (i.e., fire hydrants, NPDES outfalls) adversely impacting run-on to the site?

Explanation: All operations ceased, all facilities removed.

☐ ☑ 9. Are natural drainage patterns directing stormwater onto site?

Explanation:

ASSESSMENT FINDING:

☐ ☑ **10. Based on the above criteria and the assessment of this site, does soil erosion potential exist? (REFER TO EROSION POTENTIAL MATRIX.)**

D. Mays

11. Signature of Water Quality/Hydrology Representative

_____ Initials of independent reviewer.

Check here when information is entered in database: ☑

This page is for ESH-18 notes, recommendations, and photos.

	Y	N	
12 a)	○	◉	Is there visible trash/debris on the site?
b)	○	◉	Is there visible trash/debris in a watercourse?

Description of existing BMPs:

Asphalt cover, concrete curb for run-on control

◉ ○ Are BMPs being properly maintained? If no, describe in "Other Internal Notes."

◉ ○ Are BMPs effectively keeping sediment in place and reducing erosion potential?

OTHER INTERNAL NOTES:

Site originally assessed on 9/24/97. Site re-visited based on a request from G. Lopez-Escobed who thought the wrong site had originally been assessed. The site was originally grouped with some other downslope PRSs. Original date to NMED: 12/18/97 date to ESH-18 10/1/97

Appendix C

Results of Quality Assurance/Quality Control Activities

APPENDIX C RESULTS OF QUALITY ASSURANCE/QUALITY CONTROL ACTIVITIES

C-1.0 SUMMARY

Field Analysis

No field analyses were conducted for PRSs 35-003(a, b, c, and n).

Fixed-Laboratory Analysis

Thirteen soil samples were analyzed from PRSs 35-003(a, b, c, and n). No PRS-specific performance evaluation samples were analyzed.

Samples were analyzed for inorganic, radiochemical, and organic constituents. Target analytes for each suite are listed in Appendix D-1.0, Target Analytes and Detection Limits.

Sample preservation and holding time requirements are provided in LANL ER SOP 1.02 (Wagner 1992, ER ID 59517, 27 pp.). There were no deviations from these requirements. See Sections C-2.0 through C-5.0 regarding individual analytical suites for details.

Samples were analyzed at four ER Project-approved external subcontract laboratories.

Requirements of the Sampling and Analysis Plan (SAP) for OU-1129 (LANL 1992, 07666, pp. 7-35 through 7-42), the ER Project Quality Assurance Project Plan (QAPjP – LANL 1996, ER ID 53450), and the ER Project Statement of Work for Analytical Services (LANL 1995, ER ID 49738, 78 pp.) were followed during analytical data collection and evaluation. There were no deviations from these requirements.

QA/QC samples evaluated to prepare this appendix included laboratory blank samples, surrogates, tracers, matrix and postdigestion spikes, LCSs, laboratory duplicate samples, field duplicate samples, and matrix spike duplicate samples. The type and frequency of QC samples required for fixed-laboratory analyses are described in the ER Project Statement of Work for Analytical Services (LANL 1995, ER ID 49738). Definitions of the QA/QC sample types and processes are included in the glossary, Appendix A-2.0.

Data packages generated from the analytical process were reviewed for compliance with ER Project requirements from both the administrative and technical quality perspectives. Administrative checks ensured that the analytical laboratories provided the required information and that the data packages are complete. The data verification process ensured that all the analytical data was transmitted correctly to the Facility for Information Management, Analysis, and Display. The technical quality review began with routine (baseline) data validation, which identified potential technical problems associated with sample handling and analyses. Routine data validation also consisted of comparing QC data against numerical acceptance criteria. During the routine validation process, appropriate qualifier flags were assigned to data not meeting acceptance criteria. The procedure for validation is described in the Installation Work Plan (LANL 1995, ER ID 52009). The ER Project data validation protocol is based on the National Functional Guidelines for Data Review (EPA 1994, ER Ids 48639 and 48640).

Focused validation consisted of detailed reviews of the data packages. A more detailed description of focused validation is located in the ER Project protocol described in the QAPjP (LANL 1996, 53450).

Focused validation was conducted to verify usability of the data. During focused validation, the operational history of the site was considered in addition to the QC data included in each data package. See Sections C-2.0 through C-5.0 for details.

In general, the analytical data are still usable although qualifier flags may have been applied during validation. Definitions of laboratory qualifiers, LANL qualifiers, and focused validation qualifiers are included in the glossary in Appendix A-2.0. The QA/QC evaluation indicated that the analytical data were of sufficient quality for their intended use. Usability of the data was only affected when data were rejected or when detection limits used by the external laboratory were above the LANL BV of the reported analyte. The data for cadmium-109, and neptunium-237 were rejected because these radionuclides were consistently misidentified by gamma spectrometry analysis. See Section C-3.2 for details. Detailed results of data validation are presented in Section C-5.0, Results of Data Validation. Discussions of data usability on a PRS-specific basis are included in the body of the report in Section 2.3.4.3, Data Review.

TABLE C-1.0-1

PRSs 35-003(a, b, c, and n)
ANALYTE SUITES, ANALYTICAL TECHNIQUE, AND METHODS USED

Analyte Suite	Analytical Technique	Analytical Method
Metals Digestion (excluding Hg)	Microwave-Assisted Digestion	SW-846 3051
	Hot Plate Digestion	SW-846 3050
Metals (excluding Hg, As, Pb, Se, and Tl)	Inductively-Coupled Plasma Atomic Emission Spectroscopy (ICPES)	SW-846 6010A
As, Pb, Se, Tl	Graphite Furnace Atomic Absorption (GFAA)	SW-846 7060A (As), 7421 (Pb), 7740 (Se), and 7841 (Tl)
Hg	Cold Vapor Atomic Absorption (CVAA)	
Pu-238, Pu-239, Pu-240	Alpha Spectrometry	905.0 (Modified)
U-234, U-235, U-238	Alpha Spectrometry	905.0 (Modified)
Standard Gamma Spectrometry Analytes*	Gamma Spectrometry	901.1 (Modified)
Gross Alpha/Beta	Gas Proportional Counting	900.0/9310 (Modified)
Sr-90	Alpha Spectrometry	905.0 (Modified)
H-3 (tritium)	Liquid Scintillation	906.0 (Modified)
Semivolatile Organic Compounds	Gas Chromatography/Mass Spectrometry (GC/MS)	SW-846 8270
Volatile Organic Compounds	GC/MS	SW-846 8260

*See Appendix D for a complete list of radionuclides analyzed by gamma spectrometer. Detection limits are provided in Appendix D-1.0, Target Analytes and Detection Limits.

C-2.0 INORGANIC ANALYSES

C-2.1 Field Analyses

No field analyses were conducted for these PRSs.

C-2.2 Fixed-Laboratory Analyses

Six soil samples in request numbers 2572, 2640, and 2838 underwent inorganic analyses for metals content using SW-846 Methods 6010A, 7060A, 7421, 7740, 7841 and 7471A. Samples were prepared for analyses using SW-846 Methods 3050 and 3051. Refer to Table C-1.0-1 for a list of analytical suites, analytical techniques, and analytical methods, including preparation methods.

Detection limits for inorganic analytes were compared to BVs for corresponding soil or geologic units. For samples 0435-96-0030, 0435-96-0042, 0435-96-0045, and 0435-96-0049, the external lab used "reporting limits" for undetected analytes. In these samples, the reporting limits for undetected analytes silver, cadmium, antimony, and thallium were above the LANL BVs. In samples 0435-96-0034 and 0435-96-0038, the detection limits were above background for thallium. All other analytes' detection limits were below BVs. There were no detection limits greater than SALs. A listing of the contractually required detection limits for routine analytical services is included in Appendix D, Analytical Suites and Results. Nonroutine analytical methods were not used.

All contract-required detection limits were met by the contract laboratories.

The results of the inorganic QC samples are as follows:

The LCSs for all data packages were within the acceptance limits presented in Table C-2.2-1.

TABLE C-2.2-1

PRSs 35-003(a, b, c, and n)
INORGANIC QUALITY CONTROL SAMPLES AND ACCEPTANCE LIMITS

QC Sample Name	Acceptance Limits
Initial and Continuing Calibration Verifications	90% to 110% Recovery (%R)[a]
For ICPES – Interference Check Sample (ICS)	80% to 120% Recovery
Laboratory Control Sample (LCS)	Water: 80% to 120% Recovery Soil: LCS Vendor Supplied
Preparation Blank	Each analyte must be less than contract-required detection limit[b]
Duplicate	Relative Percent Difference (RPD)[c] <35
Matrix Spike	75% to 125% Recovery[d]

a. %R = (SR/TV) x 100; SR = QC sample result; TV = true value of QC sample.

b. In many cases, the external laboratory qualified blank data B, indicating the result was above the instrument detection limit but below the contract-required detection limit. In these instances, if the associated sample data was <5x the prep blank, the sample analyte was qualified U.

c. RPD = (2|SR-DR|/SR+DR)x100; SR = sample result; DR = duplicate result.

d. Matrix Spike Recovery = [(SSR-SR)/SV]x100; SSR = spiked sample result; SR = sample result; SV = spike value.

Request No. (RN) 2572 – sample 0435-96-0030: The laboratory duplicate had 50 Relative Percent Difference (RPD) for lead; the acceptance limit is <35 RPD. The matrix spike had 41% recovery for antimony, 73% recovery for copper, and 53% recovery for zinc; the acceptance limits are 75% to 125%. All data for the preparation blank were below the CRDL.

RN 2640 – samples 0435-96-0034 and 0435-96-0038: The laboratory duplicate had 55 RPD for calcium; the acceptance limit is <35 RPD. All matrix spike data was within acceptance limits. All data for the preparation blank were below the CRDL.

RN 2838 – samples 0435-96-0042, 0435-96-0045, and 0435-96-0049: The Laboratory duplicate had 134 RPD for antimony, 60 RPD for barium, and 140 RPD for mercury; the acceptance limit is <35 RPD. The matrix spike had 134% recovery for antimony, 51% recovery for manganese, and 72% recovery for selenium; the acceptance limits are 75% to 125%. All data for the preparation blank were below the CRDL.

QC samples and their acceptance criteria are shown in Table C-2.2-1.

No field QC samples were obtained from PRSs 35-003(a, b, c, and n).

Focused validation for inorganic analytes consisted of reviewing the case narratives reported by the external laboratory, reviewing the baseline validation results, modifying qualifier flags as needed, and using the context of the PRS to ascertain the validity of laboratory results. Data were qualified if associated QC data fell outside of the acceptance limits listed in Table C-2.2-1. In addition, analytes which were reported by the external laboratory as detected, but which were less than 2x the instrument detection limit (IDL), were judged to be undetected during focused validation and were qualified U.

The following is the outcome of the inorganic focused validation including modification of routine validation qualifiers:

Sample 0435-96-0030: Lead data were qualified J, estimated. Antimony, copper, and zinc were qualified J-, estimated with potentially low bias. All analytes were qualified A in routine validation, meaning the spike analysis was run on an unknown sample. The A qualifier was deleted during focused validation.

Samples 0435-96-0034 and 0435-96-0038: Arsenic, beryllium, calcium, cobalt, copper, magnesium, nickel, potassium, selenium (0435-96-0038 only), sodium, and vanadium (0435-96-0038 only) data were qualified J, estimated. Thallium data were qualified UJ, estimated as undetected. Arsenic, beryllium, selenium, and thallium were qualified U, undetected, during routine validation. The U qualifier was modified during focused validation. Calcium was qualified P, use professional judgement in data use, during routine validation. The P qualifier was modified to J during focused validation.

Samples 0435-96-0042, 0435-96-0045, and 0435-96-0049: Barium and mercury data were qualified J, estimated. Antimony and selenium data were qualified UJ, estimated as undetected. Manganese was qualified J-, estimated with potentially low bias. All analytes were qualified A in routine validation, meaning the spike analysis was run on an unknown sample. The A qualifier was deleted during focused validation. Barium, calcium, mercury, and zinc were qualified P, use professional judgement in data use, during routine validation. The P qualifier was modified to J or J- during focused validation.

Results of the data evaluation are presented in Section C-5.0, Results of Data Validation.

All holding times were met for inorganic analyses.

All of the inorganic fixed-laboratory data were judged to be usable as reported and qualified except for those instances when detection limits used by the external laboratory were above the LANL BV of the reported analyte. The following presents possible bias as determined by the data quality evaluation:

Sample 0435-96-0030: Copper and zinc data had possible negative bias, based on low matrix spike results.

Samples 0435-96-0034 and 0435-96-0038: No bias was determined to exist in these samples.

Samples 0435-96-0042, 0435-96-0045, and 0435-96-0049: Manganese data had possible negative bias, based on low matrix spike results.

C-3.0 RADIOCHEMICAL ANALYSES

C-3.1 Field Analyses

No field analyses were performed for these PRSs.

C-3.2 Fixed-Laboratory Analyses

Fixed-site laboratory radiochemical analyses were performed on 13 samples. A list of the target analytes and analytical methods, including sample preparation methods for radionuclides, is included in Table C-1.0-1.

Detection status for radionuclides was determined by comparison to the minimum detectable concentration (MDC) for each analyte. If the concentration of an analyte in a sample was less than the MDC, that analyte was assigned a U qualifier for that sample and was considered undetected. If the MDC was not available, the concentration was compared to the EQL or the blank decision level to determine detection status. Blank decision levels were calculated as recommended by ANSI N42.2. Contractually required detection limits for routine analytical services are listed in Appendix D, Analytical Suites and Results. All required detection limits were met by the contract laboratories, and none of the detection limits, as determined by the blank decision levels, exceeded BVs or SALs for the target analyte radionuclides.

Potential gamma spectrum interference from lead-214 affects the single peak determinations of cadmium-109, bismuth-211, radium-224, and neptunium-237. The data for cadmium-109 and neptunium-237 are consistently misidentified, and therefore, all results from these two analytes are rejected.

The results of gamma spectroscopy measurements were evaluated on the basis of the nature of the isotope (Table C-3.2-1), following the guidance included in "Recommendation for Qualification of the ER Project Gamma Spectroscopy Data Set" (LANL 1997, ER ID 59061). Analytes identified as naturally occurring or data-quality analytes are not generally considered to be potential contaminants at LANL ER Project sites unless the site operational history indicates otherwise. Analytes with short half-lives are not normally evaluated as historic contaminants at ER Project sites if the site has been inactive for at least 10 half-lives of the analyte. A number of analytes are not reliably measured by gamma spectroscopy but may be used in some cases as indicators of contamination by other analytes, notably uranium-235 and uranium-238, or to provide corroboration of isotopic uranium results.

TABLE C-3.2-1

PRSs 35-003(a, b, c, and n)
SUMMARY OF THE NATURE OF GAMMA SPECTROSCOPY ANALYTES

Analytes	Comment
Am-241, Co-60, Cs-134, Cs-137, Eu-152, Na-22, Ru-106, U-235	Half-life less than 365 days, nongaseous, and good gamma emission/detection properties. **Potential historic contaminants.**
Ce-144, Co-57, Mn-54, Pa-233, Se-75, Zn-65	Anthropogenic radionuclide measured by gamma spectroscopy with half-life less than 365 days.
Ac-228, Ba-140, Bi-212, I-129, La-140, Np-237, Pa-231, Pa-234m, Pb-210, Pb-211, Ra-223, Ra-224, Ra-226, Rn-219	Radionuclide is not reliably measured by gamma spectroscopy.
Bi-211, Bi-214, K-40, Pb-212, Pb-214, Th-227, Th-234, Tl-208, Ann-Radionuclide	Naturally-occurring radionuclide measured by gamma spectroscopy.
Cd-109, Ce-139, Hg-203, Sn-113, Sr-85, Y-88	Radionuclide measured by gamma spectroscopy for quality control purposes only.

Tritium results were expressed in units of pCi/g of dry soil after conversion from pCi/L using percent moisture data for each sample.

RESULTS OF QC SAMPLE ANALYSES

A number of QC samples were included in the radiochemical analyses. These included lab control, matrix spike, method blank, duplicate, EQL, and carrier recovery samples. Qualifiers were assigned to analytes and/or samples on the basis of QC sample results reported by the laboratories. The types of QC samples, their respective acceptance limits, and the resulting qualifiers are listed in Table C-3.2-2.

TABLE C-3.2-2

PRSs 35-003(a, b, c, and n)
QUALITY CONTROL SAMPLE TYPES AND ACCEPTANCE LIMITS FOR RADIONUCLIDES

QC Sample Name	Acceptance Limits
Lab Control Sample (LCS)	75–125% recovery
Matrix Spike[a]	75–125% recovery
Method Blank	Analyte must be less than blank decision level
Duplicate	Sample result and duplicate result must differ by less than 3-sigma
EQL	Analyte must be less than EQL or MDC
Tracer/Carrier recovery[b]	>40% for Sr-90, >30% for other alpha spectroscopy analytes

a. Required for Sr-90 and tritium only.
b. Required for alpha spectrometry analytes only.

For the radiochemical results from PRSs 35-003(a, b, c, and n), all matrix spikes, duplicate, and tracer/carrier recovery samples were within the acceptance limits described above. All LCSs were within acceptance limits except request number 2839R, in which the gross alpha recovery was only 73.6%. A

number of samples received U qualifiers because the sample result was below either the method blank decision level or the EQL.

No field QC samples from PRSs 35-003(a, b, c, and n) were analyzed for radionuclides.

No contractually required criteria for sample holding times have been specified for radiochemical samples. For PRSs 35-003(a, b, c, and n), request number 2573 samples were analyzed within 9 days; request number 2641 samples within 3 days; and request number 2839 samples within 14 days.

FOCUSED VALIDATION

Focused validation consisted of reviewing the case narratives reported by the laboratory, noting any problems that may have occurred during the analyses. Information used to perform the focused validation included the analytical method, detection status, blank data, and EQL (or MDC) data.

Baseline validation qualifiers were reviewed. Results qualified in the baseline validation were checked and integrated with focused validation qualifiers.

The data in PRSs 35-003(a, b, c, and n) are usable as reported and qualified by routine and focused validation, with the exception of cadmium-109 and neptunium-237, which were consistently misidentified because of gamma spectral interference. The data for those analytes were rejected for all samples. Matrix spike and duplicate samples were not run on the tritium analyses because of insufficient quantities of samples, but this did not result in assignment of qualifiers. Results of focused validation of the radiochemical data are presented in Section C-5.0.

C-4.0 ORGANIC ANALYSES

C-4.1 Field Analyses

No field analyses for organic chemicals were performed for these PRSs.

C-4.2 Fixed-Laboratory Analyses

Volatile Organic Compound Analysis:

Six soil samples in request numbers 2571, 2639, and 2837 were analyzed for VOCs at an external laboratory using SW-846 Method 8260. Samples were extracted using the SW 5030/5035 purge and trap method. Sample-specific EQLs may have been higher or lower than the contract-required EQLs, depending on sample-specific matrix effects, dilution factors, and moisture contents. All request numbers contained EQLs that were elevated from the contract EQLs. EQLs were subjected to modification because of current soil moisture content. The routine target analyte list and contract-required estimated quantitation limits (EQLs) are listed in Appendix D, Analytical Suites and Results. Acceptance criteria for VOCs are summarized in Table C-4.2-1

There was no contamination detected in any of the associated blanks analyzed with these samples. Sample surrogate recoveries for request number 2837 were not within acceptance limits (Table C-4.2-2); however, QC surrogates were within acceptance limits. In the initial calibration, continuing calibration, and matrix spike/matrix spike duplicate, several analytes were not within acceptance limits; however, these

criteria did not play a factor in qualifying the sample analytes. Matrix spike compound recoveries can be related to the behavior of compounds of similar chemical structure or similar volatility. Failure to meet acceptance criteria for QC results (Table C-4.2-1) were possibly caused by matrix interference within the sample, as shown by laboratory reanalysis in request number 2837.

TABLE C-4.2-1

PRSs 35-003(a, b, c, and n)
VOLATILE QUALITY CONTROL SAMPLES AND ACCEPTANCE LIMITS

QC Sample Name	Acceptance Limits
Instrument Performance Check	Bromofluorobenzene (BFB) - Ion abundance criteria for 95 m/z, base peak must be at 100% relative abundance.
Initial Calibration	RRF ≥0.05, %RSD ≤30%.
Continuing Calibration	RRF ≥0.05, %D = ±25%.
Blank	Must be analyte-free of any volatiles.
Internal Standards	The retention time (RT) of the internal standards (IS) in the samples and blank should not vary by more than ±30 seconds from the RT of the associated 12-hr calibration std. The criteria are to have the area counts of the IS in the sample within a factor of two (50% to 200%) of the area counts exhibited on the last continuing calibration.
Surrogate Spikes	**Soil %R** **Water %R**
1. Dibromofluoromethane	80–120 86–118
2. p-Bromofluorobenzene	74–121 86–115
3. Toluene-d8	81–117 88–110
Matrix Spike/ Matrix Spike Duplicate	Each spike analyte should fall within the upper and lower QC limits and below the QC RPD.

TABLE C-4.2-2

PRSs 35-003(a, b, c, and n)

SURROGATE SPIKE RECOVERIES OUTSIDE OF ACCEPTANCE LIMITS

Sample No.	Surrogate Spike	% Recovery	Acceptance Limits
0435-96-0042	Dibromofluoromethane	39	80–120
	p-Bromofluorobenzene	133	74–121
0435-96-0045	Dibromofluoromethane	10	80–120
0435-96-0049	Dibromofluoromethane	6	80–120
	p-Bromofluorobenzene	126	74–121

Focused validation consisted of reviewing the baseline validation and volatile data submitted by the external laboratory. All QC data were reviewed, and sample data were qualified accordingly. If an analyte was analyzed for, but not detected, the results were typically reported as the EQL with a U flag attached by the external laboratory. The external laboratory qualified detected values that fell below the contract-required EQL but that were above the instrument detection limit with a J flag. For the intent of this report, all organic results by the external laboratory reported with a J flag have been qualified as estimated (J

flag) to indicate that there may be a higher level of uncertainly associated with detected values reported below the EQL. Nondetects that have an estimated value were qualified with a UJ flag.

All the volatile analytes for request numbers 2639 and 2571 were qualified as nondetects (U).

In request number 2837, the routine validation qualified sample 0435-96-0042 as UJ and qualified samples 0435-96-0045 and 0435-96-0049 as R,PM because of poor surrogate recoveries. Focus validation revealed unknown sample matrix interferences for all three samples. Acetone and trichloroethene (qualified J) were detected in all three samples. The remaining volatile analytes in the samples were qualified as UJ because of poor surrogate recoveries (sample matrix interferences). Acetone and trichloroethene were not detected in the blank, verifying that the detected analytes in the field samples were not due to laboratory contamination. Detailed results of the volatile evaluation are presented in Section C-5.0, Results of Data Validation.

All six of the soil samples were analyzed within 14 days of sample collection. Technical holding times were met for volatile analyses.

The data in PRSs 35-003(a, b, c, and n) have been routine and focused validated. The data were usable as reported except in request number 2837. Acetone and trichloroethene in this request number indicated a level of uncertainty because the detected value was reported below the EQL. Acetone may be negatively biased because of associated low surrogate recoveries. All other volatile analytes in request number 2837 were qualified as undetected because of sample matrix interference.

Semivolatile Organic Compound Analysis

Six soil samples in request numbers 2571, 2639, and 2837 were analyzed for SVOCs at an external laboratory using SW-846 Method 8270. Method 3500 was utilized for extraction method selection. Sample-specific EQLs may have been higher or lower than the contract-required EQLs, depending on sample-specific matrix effects, dilution factors, and moisture contents. All request numbers contained EQLs that were elevated from the contract EQLs. EQLs were subject to modification because of existing soil moisture content. The routine target analyte list and contract-required estimated quantitation limits (EQLs) are listed in Appendix D, Analytical Suites and Results. Acceptance criteria for SVOCs are summarized in Table C-4.2-3.

During analysis of the originally extracted samples in request number 2639, phthalate contamination was found in the method blank. No phthalates were present after the second extraction, confirming laboratory contamination. Sample surrogate recoveries for request number 2837 were not within acceptance limits (see Table C-4.2-4); however, most QC surrogates were within acceptance limits. Internal standards were within acceptance limits. Several analytes in the initial calibration, continuing calibration, and matrix spike/matrix spike duplicate were not within acceptance limits; however, these criteria did not play a factor in qualifying the sample analytes. Matrix spike compound recoveries can be related to the behavior of compounds of similar chemical structure or similar volatility. Failure to meet acceptance criteria for QC results (see Table C-4.2-3) were possibly caused by matrix interference within the samples, as shown by laboratory reanalysis in request number 2837. In request number 2639, the laboratory noted in the case narrative that a spiking mixture was inadvertently added to sample 96-0038.

TABLE C-4.2-3

PRSs 35-003(a, b, c, and n)
SEMIVOLATILE QUALITY CONTROL SAMPLES AND ACCEPTANCE LIMITS

Semivolatile QC Criteria	Semivolatile QC Acceptance Limits
Instrument Performance Check	DFTPP - Ion abundance criteria for 198 m/z, base peak must be at 100% relative abundance.
Initial Calibration	RRF ≥0.05, %RSD ≤30%.
Continuing Calibration	RRF ≥0.05, %D = ±25%.
Blank	Must be analyte-free of any semivolatiles.
Internal Standards	The RT of the IS in the samples and blank should not vary by more than ±30 seconds from the RT of the associated 12-hr calibration std. The criteria are to have the area counts of the ISs in the sample within a factor of two (50% to 200%) of the area counts exhibited on the last continuing calibration.
Surrogate Spikes	**Soil %R** **Water %R**
1. Nitrobenzene	23–120 35–114
2. 2-fluorobiphenol	30–115 43–116
3. p-terphenol	18–137 33–141
4. phenol-d5	24–113 10–94
5. 2-fluorophenol	25–121 21–100
6. 2,4,6-tribromophenol	19–122 10–123
Matrix Spike/Matrix Spike Duplicate	Each spike analyte should fall within the upper and lower QC limits and below the QC RPD.

TABLE C-4.2-4

PRSs 35-003(a, b, c, and n)
SURROGATE SPIKE RECOVERIES OUTSIDE OF ACCEPTANCE LIMITS

Sample #	Surrogate Spike	% Recovery	Acceptance Limits
0435-96-0045	2,4,6-tribromophenol	7	19–122
	2-fluorophenol	18	25–121
0435-96-0049	2,4,6-tribromophenol	4	19–122
	2-fluorophenol	15	25–121
0435-96-0049-MS	2,4,6-tribromophenol	10	19–122
	2-fluorophenol	12	25–121
0435-96-0049-MSD	2,4,6-tribromophenol	11	19–122
	2-fluorophenol	13	25–121

Focused validation consisted of reviewing the baseline validation and semivolatile data submitted by the external laboratory. All QC data were reviewed and sample data were qualified accordingly. If an analyte was analyzed for, but not detected, the results were typically reported as the EQL with a U flag attached by the external laboratory. The external laboratory qualified detected values that fell below the contract-required EQL but that were above the instrument detection limit with a J flag. For the intent of this report, all organic results reported with a J flag by the external laboratory have been qualified as estimated (J flag) to indicate that there may be a higher level of uncertainly associated with detected values reported below the EQL. Nondetects that have an estimated value were qualified with a UJ flag.

All the semivolatile analytes for request number 2571 were qualified as nondetects (U).

In request number 2837, the routine validation qualified samples 0435-96-0045 and 0435-96-0049 as R,PM because of poor surrogate recoveries. Focus validation revealed unknown sample matrix interferences for the two samples. All the analytes in samples 0435-96-0045 and 0435-96-0049 were qualified as UJ because of poor surrogate recoveries (Table C-4.2-3). In sample 0435-96-0042, all semivolatile analytes were qualified as undetected (U). Semivolatile analytes were not detected in the blank, which signified that the UJs in the field samples were not due to laboratory contamination.

In request number 2639, samples 0435-96-0034 and 0435-96-0038 were extracted twice. After the first extraction, phthalates were discovered in the blank and samples (laboratory contamination), but no other semivolatile analytes were found. In the second extraction, no phthalates were discovered in the blank and samples, but spiking solution analytes were accidentally added by the laboratory in sample 0435-96-0038. These analytes were flagged 'S' by the laboratory. All semivolatile analytes from the original sample 0435-96-0038 results were qualified as undetected (U), including the phthalates. All semivolatile analytes from (second extraction) sample 0435-96-0034 were qualified as undetected (U). U qualifiers were assigned to sample 0435-96-0038, based on the fact that laboratory contamination of phthalates was proved by the second extraction, and no spiking mixture analytes were found in the first extraction. Detailed results of the semivolatile evaluation are presented in Section C-5.0, Results of Data Validation.

All six of the soil samples were analyzed within 14 days of sample collection. Technical holding times were met for semivolatile analyses.

The data in PRSs 35-003(a, b, c, and n) have been routine and focused validated. The data were usable as reported, except in request number 2837, sample numbers 96-0045 and 96-0049. All semivolatile analytes for these sample numbers were estimated undetected (UJ) because of sample matrix interferences.

C-5.0 RESULTS OF DATA VALIDATION

TABLE C-5.0-1

PRSs 35-003(a, b, c, and n)
RESULTS OF DATA VALIDATION

Request Number	Sample Number	Analytical Suite	Analyte	Qualifier	Reason
2571	0435-96-0030	Organic	No qualifiers assigned during validation.		
2572	0435-96-0030	Inorganic	Sb	UJ	Matrix spike: 41% recovery, sample <2x IDL
			Cu, Zn	J-	Matrix spike: 73% and 53% recoveries, sample >2x IDL
			Pb	J	Duplicate: 50 RPD
2573	0435-96-0030 0435-96-0031	Isotopic Pu	Pu-238,239	U	<MDC, EQL, or blank decision level.
		Isotopic U	U-234, 238	U	<MDC, EQL, or blank decision level.
		Tritium	H-3	U	<MDC, EQL, or blank decision level.
2639	0435-96-0034 0435-96-0038	Organic	No qualifiers assigned during validation.		
2640	0435-96-0034 0435-96-0038	Inorganic	As, Be, Ca, Co, Cu, Mg, Ni, K, Na	J	Ca Duplicate: 55 RPD; Other analytes were flagged "B" by the lab and were >2x IDL
			Tl	UJ	Flagged "B" by the lab and was <2x IDL
	0435-96-0034		Ag	U	Prep blank qualified "B" by lab, sample value <5x Prep Blank value
	0435-96-0038		Hg	U	Prep blank qualified "B" by lab, sample value <5x Prep Blank value
			Cr, Se, V	J	Flagged "B" by the lab and were >2x IDL
2641	0435-96-0034 0435-96-0035 0435-96-0038 0435-96-0039	Gross Alpha/Beta	Beta	U	<MDC, EQL, or blank decision level.
	0435-96-0035 0435-96-0038 0435-96-0039	Radchem	Sr-90	U	<MDC, EQL, or blank decision level.
	0435-96-0038 0435-96-0039	Isotopic Pu	Pu-238, -239	U	<MDC, EQL, or blank decision level.
		Isotopic U	U-235	U	<MDC, EQL, or blank decision level.
		Tritium	H-3	U	<MDC, EQL, or blank decision level.

TABLE C-5.0-1 (continued)

PRSs 35-003(a, b, c, and n)
RESULTS OF DATA VALIDATION

Request Number	Sample Number	Analytical Suite	Analyte	Qualifier	Reason
2837	0435-96-0042 0435-96-0045 0435-96-0049	Volatile Organic	Acetone	J-	Unacceptable surrogate spike recoveries indicated sample matrix interference.
			Trichloroethene	J	
			All other compounds	UJ	
	0435-96-0042	Semivolatile Organic	No qualifiers assigned during validation.		
	0435-96-0045 0435-96-0049	Semivolatile Organic	All compounds	UJ	Unacceptable surrogate spike recoveries indicated sample matrix interference.
2838	0435-96-0042 0435-96-0045 0435-96-0049	Inorganic	Sb, Se	UJ	Matrix spike – Sb: 49% recovery, Se: 72%; sample values <2x IDL
			Ba	J	Duplicate: 60 RPD, sample value >2x IDL
			Mn	J-	Matrix spike: 51%, sample value >2x IDL
	0435-96-0042	Inorganic	Hg	J	Duplicate 140 RPD, sample value >2x IDL
	0435-96-0045 0435-96-0048	Inorganic	Hg	UJ	Duplicate 140 RPD, sample value <2x IDL
2839	0435-96-0042 0435-96-0043 0435-96-0045 0435-96-0046 0435-96-0047 0435-96-0049 0435-96-0050	Gross Alpha/Beta	Alpha	J-	Laboratory control sample – 74% recovery.
	0435-96-0042	Isotopic Pu	Pu-238	U	<MDC, EQL, or blank decision level.
	0435-96-0043 0435-96-0045 0435-96-0046 0435-96-0047 0435-96-0049 0435-96-0050	Isotopic Pu	Pu-238,239	U	<MDC, EQL, or blank decision level.
	0435-96-0047	Radchem	Sr-90	U	<MDC, EQL, or blank decision level.

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Appendix D

Analytical Suites and Results

APPENDIX D ANALYTICAL SUITES AND RESULTS

D-1.0 TARGET ANALYTES AND DETECTION LIMITS

Routine analytical services through the LANL ER Sample Management Office were used for this work. Tables of the target analytes and the contractually required detection or quantitation limits for inorganic, organic, and radiochemical analyses conducted for this RFI are included below. Applicable information is taken from the "Statement of Work (formerly called 'Requirements Document') - Analytical Support (Request for Proposal [RFP] Number 9-XS1-Q4257) (Revision 2 - July 1995)" (LANL 1995, ER ID 49738, 78 pp.) and updated to agree with the LANL-ER Quality Assurance Project Plan (QAPjP) from the IWP, Revision 6, dated December 1996 (LANL 1996, ER ID 55574, pp. 4-1 through R-2). This is the current statement of work document that the analytical laboratories must follow. No deviations from routine analyses were requested. No deviations from routine analyses were noted in analytical data packages received.

INORGANIC ANALYSES

Target Analyte Lists and Estimated Detection Limits

Estimated Detection Limits (EDLs) for water samples are based on Contract Laboratory Program (CLP) Contract Required Detection Limits.

Inductively Coupled Plasma Atomic Emission Spectroscopy (ICPAES)
(Recommended Method SW-6010A)

Analyte	Water EDL (µg/l)	Soil EDL (mg/kg)
Aluminum	200	40
Antimony	60	12
Barium	200	40
Beryllium	5	1
Cadmium*	5	1
Calcium	5000	1000
Chromium*	10	2
Cobalt	50	10
Copper	25	5
Iron	100	20
Lead*	3	0.6
Magnesium	5000	1000
Manganese	15	3
Nickel	40	8
Potassium	5000	1000
Silver*	10	2
Sodium	5000	1000
Vanadium	50	10
Zinc	20	4

*Toxicity characteristic leaching procedure (TCLP) metals.

Atomic absorption (AA) methods or inductively coupled plasma mass spectroscopy (ICPMS) may also be used for these analytes. In cases where the EDL cannot be met using ICPAES or where false positives are known to be a problem historically within a laboratory, the subcontractor must use furnace AA techniques (e.g., Method 7841 for thallium and Method 7421 for lead) or ICPMS (e.g., SW846 Method 6020).

Graphite Furnace Atomic Absorption (GFAA), ICPMS

Analyte	Water EDL (µg/l)	Soil EDL (mg/kg)
Arsenic*	10	2
Lead*	1	0.2
Selenium*	5	1
Thallium	10	2
*TCLP metals.		

Cold Vapor AA

Analyte	Water EDL (µg/l)	Soil EDL (mg/kg)
Mercury*	0.2	0.1
*TCLP metals.		

Methods SW-9010, 9010A, 9012, EPA 335.2

Analyte	Water EDL (µg/l)	Soil EDL (mg/kg)
Total Cyanide	10	0.05

Soil EDLs for ICPAES, GFAA, and ICPMS analytes are based upon a 0.2-g sample taken to a final volume of 200 mL.

Soil EDLs for Cold Vapor AA are based upon a 0.2-g sample taken to a final volume of 100 mL.

Soil EDLs for CLP ILM03.0 Method 335.2 (cyanide) are based upon a 5-g sample taken to a final volume of 250 mL.

The contractor may vary weights and final volumes for metals and cyanide analyses; however, any allowable variance must still meet the EDL.

Toxicity characterization leaching procedure (TCLP) metals may be requested as a separate determination. Laboratories should consider EDLs for TCLP metals using the TCLP to be the regulatory limits. Method SW-1311 (7/92) is the method to be used for the TCLP.

RADIOCHEMICAL ANALYSES

Target Analytes, Estimated Quantitation Limits, and Required Techniques

The methods used by contract laboratories for the analyses below must be submitted to LANL for approval.

Target Analyte and Estimated Quantitation Limits by Matrix

Analyte	Soil pCi/g	Water pCi/l	Technique[a]
Gross Alpha/Beta	10.0	3.0	Gas Proportional
Gross Alpha/Beta	10.0	N/A[b]	Liquid Scintillation
Strontium-90[c]	2.0	5.0	Gas Proportional
Americium-241	0.1	0.1	Alpha Spectroscopy
Plutonium-238, -239	0.1	0.1	Alpha Spectroscopy
Thorium-228, -230, -232	0.1	0.1	Alpha Spectroscopy
Thorium-230, -232	0.1	0.1	ICPMS-FIA (commonly requested nonroutine analysis)
Uranium-234, -235, -238	0.1	0.1	Alpha Spectroscopy
Uranium-234, -235, -238	0.1	0.1	ICPMS-FIA (commonly requested nonroutine analysis)
Tritium	300 pCi/l	300	Liquid Scintillation
Multiple Isotopes (see "Gamma Spectroscopy Analyte Requirements" table)	Am-241: 1 Cs-137: 1	Am-241: 20 Cs-137: 20	Gamma Spectroscopy
Gross Gamma	2.0	100	NaI(Tl) or HPGE Detection
Total Uranium	0.5 µg/g	1 µg/l	KPA[d] (commonly requested nonroutine analysis)
Total Uranium	0.5 µg/g	1 µg/l	ICPMS (commonly requested nonroutine analysis)
Radium-226	1.0	1.0	Assorted
Radium-228	0.5	0.5	Assorted
Thorium-234	1.0	20	Assorted
Lead-210	2.0	5.0	Assorted

a. The Los Alamos National Laboratory methods for these analytes are contained in LA-10300-M, "Health and Environmental Chemistry: Analytical Techniques, Data Management, and Quality Assurance."

b. N/A = not applicable.

c. It may be presumed that strontium-89 is not present.

d. Kinetic phosphorescence analysis, also referred to as pulsed-laser phosphorimetry (ASTM D 5174-91) or kinetic laser phosphorescence.

Gamma Spectroscopy Analyte Requirements

Nuclide Symbol	Nuclide Name	Nuclide Symbol	Nuclide Name
Ac-228	Actinium-228	Pa-231	Protactinium-231
Am-241	Americium-241	Pa-233	Pratactinium-233
Ann Rad	Annihilation Radiation	Pa-234m	Protactinium-234m
Ba-140	Barium-140	Pb-210	Lead-210
Bi-211	Bismuth-211	Pb-211	Lead-211
Bi-212	Bismuth-212	Pb-212	Lead-212
Bi-214	Bismuth-214	Pb-214	Lead-214
Cd-109	Cadmium-109	Ra-223	Radium-223
Ce-139	Cerium-139	Ra-224	Radium-224
Ce-144	Cerium-144	Ra-226	Radium-226
Co-57	Cobalt-57	Ru-106	Ruthenium-106
Co-60	Cobalt-60	Rn-219	Radon-219
Cs-134	Cesium-134	Se-75	Selenium-75
Cs-137	Cesium-137	Sn-113	Tin-113
Eu-152	Europium-152	Sr-85	Strontium-85
Hg-203	Mercury-203	Th-227	Thorium-227
I-129	Iodine-129	Th-234	Thorium-234
K-40	Potassium-40	Tl-208	Thallium-208
La-140	Lanthanum-140	U-235	Uranium-235
Mn-54	Manganese-54	Y-88	Yttrium-88
Na-22	Sodium-22	Zn-65	Zinc-65
Np-237	Neptunium-237	None	None

ORGANIC ANALYSES

Volatile Organic Analyses

Target compounds, estimated quantitation limits, and methods citations

Estimated Quantitation Limits (EQLs)

Volatile Organic Compounds	Water (µg/l)	Soil/Solids (µg/kg)	Volatile Organic Compounds	Water (µg/l)	Soil/Solids (µg/kg)
Chloromethane	10	10	1,3-Dichloropropane	5	5
Vinyl Chloride	10	10	Chlorodibromomethane	5	5
Bromomethane	10	10	4-Methyl-2-Pentanone	20	20
Chloroethane	10	10	Toluene	5	5
Acetone	20	20	2-Hexanone	20	20
Dichlorodifluoromethane	10	10	1,2-Dibromoethane	5	5
Lodomethane	5	5	Tetrachloroethene	5	5
Trichlorotrifluoroethane	5	5	Chlorobenzene	5	5
Trichlorofluoromethane	5	5	1,1,1,2-Tetrachloroethane	5	5
Methylene Chloride	5	5	Ethylbenzene	5	5
1,1-Dichloroethene	5	5	o,m,p-Xylene (mixed)	5	5
Carbon Disulfide	5	5	Styrene	5	5
1,1-Dichloroethane	5	5	Bromoform	5	5
1,2-Dichloroethene (total)	10	10	1,1,2,2-Tetrachloroethane	5	5
Bromochloromethane	5	5	1 2,3-Trichloropropane	5	5
Chloroform	5	5	Isopropylbenzene	5	5
1,2-Dichloroethane	5	5	Bromobenzene	5	5
1,1-Dichloropropene	5	5	n-Propylbenzene	5	5
2-Butanone	20	20	2-Chlorotoluene	5	5
2,2-Dichloropropane	5	5	4-Chlorotoluene	5	5
1,1,1-Trichloroethane	5	5	1,3,5-Trimethylbenzene	5	5
Carbon Tetrachloride	5	5	tert-Butylbenzene	5	5
Benzene	5	5	1,2,4-Trimethylbenzene	5	5
1,2-Dichloropropane	5	5	sec-Butylbenzene	5	5
Trichloroethene	5	5	1,3-Dichlorobenzene	5	5
Dibromomethane	5	5	1,4-Dichlorobenzene	5	5
Bromodichloromethane	5	5	p-Isopropyltoluene	5	5
t-1,3-Dichloropropene	5	5	1,2-Dichlorobenzene	5	5
c-1,3-Dichloropropene	5	5	n-Butylbenzene	5	5
1,1,2-Trichloroethane	5	5	1,2-Dibromo-3-Chloropropane	10	10

Tentatively Identified Compounds (TICs) may be requested. If requested, they should be identified and quantitated per the CLP method for volatiles, OLM02.0 (or more recent).

Methods

The U.S. EPA methods that are options for use are Method SW-8260 (11/90 or more recent) or the CLP method for volatiles (OLM02.0 or more recent, using capillary column). These methods are based on purge and trap sample extraction/concentration followed by gas chromatography/mass spectrometry analysis.

Semivolatile Organic Analyses

Target compounds, estimated quantitation limits, and methods citations

Estimated Quantitation Limits (EQLs)

Semivolatile Organic Compounds	Water (µg/l)	Soil/Solids (µg/kg)	Semivolatile Organic Compounds	Water (µg/l)	Soil/Solids (µg/kg)
Acenaphthene	10	330	4,6-Dinitro-2-methylphenol	50	1600
Acenaphthylene	10	330	2,4-Dinitrotoluene	10	330
Aniline	20	660	2,6-Dinitrotoluene	10	330
Anthracene	10	330	Di-n-octyl phthalate	10	330
Azobenzene	20	660	Bis(2-ethylhexyl)phthalate	10	330
Benz(a)anthracene	10	330	Fluoranthene	10	330
Benzoic acid	50	3300	Fluorene	10	330
Benzo(b)fluoranthene	10	330	Hexachlorobenzene	10	330
Benzo(k)fluoranthene	10	330	Hexachlorobutadiene	10	330
Benzo(g, h, i)perylene	10	330	Hexachlorocyclopentadiene	10	330
Benzo(a)pyrene	10	330	Hexachloroethane	10	330
Benzyl alcohol	20	1300	Indeno(1,2,3-cd)pyrene	10	330
Bis(2-chloroethoxy)methane	10	330	Isophorone	10	330
Bis(2-chloroethyl)ether	10	330	2-Methylnaphthalene	10	330
4-Bromophenyl phenylether	10	330	2-Methylphenol	10	330
Butylbenzylphthalate	10	330	4-Methylphenol	10	330
4-Chloroaniline	20	1300	Naphthalene	10	330
4-Chloro-3-methylphenol	20	660	2-Nitroaniline	50	1600
2-Chloronaphthalene	10	330	3-Nitroaniline	50	1600
2-Chlorophenol	10	330	4-Nitroaniline	20	660
4-Chlorophenyl phenylether	10	330	Nitrobenzene	10	330
Chrysene	10	330	2-Nitrophenol	10	330
Dibenz(a,h)anthracene	10	330	4-Nitrophenol	50	1600
Dibenzofuran	10	330	N-Nitrosodimethylamine	10	330
1,2-Dichlorobenzene	10	330	N-Nitrosodiphenylamine	10	330
1,3-Dichlorobenzene	10	330	N-Nitroso-di-n-propylamine	10	330
1,4-Dichlorobenzene	10	330	2,2'-oxybis(1-Chloropropane)	10	330
3,3'-Dichlorobenzidine	20	660	Pentachlorophenol	50	1600
2,4-Dichlorophenol	10	330	Phenanthrene	10	330
Diethylphthalate	10	330	Phenol	10	330
Dimethyl phthalate	10	330	Pyrene	10	330
2,4-Dimethylphenol	10	330	1,2,4-Trichlorobenzene	10	330
2,4-Dinitrophenol	50	1600	2,4,5-Trichlorophenol	50	1600
Di-n-butylphthalate	10	330	2,4,6-Trichlorophenol	10	330

EQLs soil is based on no gel permeable chromatography (GPC) being performed. The laboratories' GPC equipment will determine what the EQL is, based on the volume of extract the GPC equipment uses. However, in order to provide the lowest possible quantitation limits, the laboratories should concentrate the GPC extract to a volume that makes the EQL for a sample that underwent GPC cleanup no more than twice the listed EQL, if it is possible.

TICs may be requested. If requested, they should be identified and quantitated per the CLP method for semivolatiles, OLM02.0 (or more recent).

Methods

The U.S. EPA methods that are options for use are Method SW-8270 (11/90 or more recent) or the CLP method for semivolatiles (OLM02.0 or more recent). These methods are based on solvent extraction, concentration, and GC/MS detection and quantitation.

D-2.0 RFI ANALYTICAL RESULTS

This section presents the analytical data for the PRSs in this RFI report. Prior to download, the analytical data available from the Facility for Information Management, Analysis, and Display (FIMAD) was manually verified by FIMAD Centralized Data Management (CDM) personnel against hard copy data packages from the analytical laboratories. During entry of focused validation qualifiers, the electronic data was reviewed against analytical report hard copies and LANL-ER baseline validation reports. Any inconsistencies found were corrected locally, summarized, and submitted to CDM personnel for correction in FIMAD.

An abridged version of all the analytical data collected during the RFI is attached. This data is for fixed-laboratory results. The abridged tables are composed of all chemical results including nondetected values. The specific fields displayed, for the grouping composed of PRSs 35-003(a, b, c, and n), include location ID (LOC_ID), sample ID (SAMPLE_ID), depth and units (DEPTH), sample medium (MEDIA), request number (REQUEST), analyte name (ANALYTE), sample results (STD_RESULTS) and units (STD_UNITS), and the RFI focused data validation qualifier (FV_QUAL)—which is based on the laboratory qualifier, the LANL baseline validation qualifier, and the results of the focused validation. The attached tables are

PRSs 35-003(a, b, c, n) Analytical Results, INORGANIC

PRSs 35-003(a, b, c, n) Analytical Results, RADIONUCLIDES

PRSs 35-003(a, b, c, n) Analytical Results, ORGANIC

A more detailed version of the data set has been submitted in electronic format to New Mexico Environment Department (NMED) Hazardous and Radioactive Materials Bureau (HRMB), the Department of Energy (DOE), and the LANL ER Project Records Processing Facility (RPF). Copies of the reports that include electronic versions of the data set can be recognized by the notation "Data disks included with this copy" that is clearly displayed on the covers.

To augment the information presented in the abridged version, the following additional fields are included in the electronic version: collection date for each sample (COLL_DATE), standard sample matrix (STD_MATRIX), date of shipment to the analytical lab (SHIP_DATE), date of analysis (AN_DATE), analytical laboratory name (LAB), analytical suite (SUITE), analytical laboratory qualifiers (LAB_QUAL), and LANL baseline validation qualifiers (LANL_QUAL). In addition to the sample chemical results that were included in the abridged tables, the quality control (QC) data is included in the electronic version of the data set. The QC data set includes the fields of sample type (SAMPLE_TYPE) and analyte type (ANALYTE_TYPE) to clarify the type of QC sample.

Table Notes

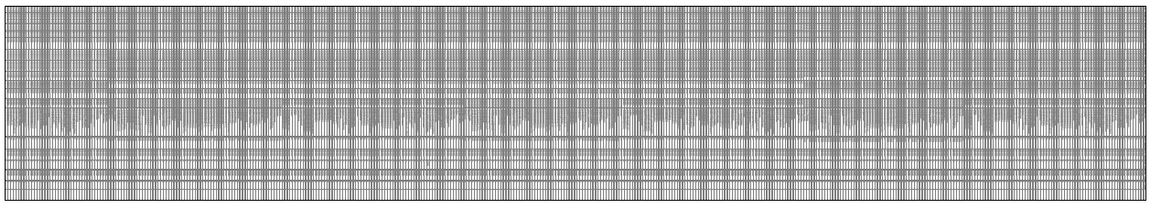
1. "NONE" in the FV_QUAL field indicates that no qualifier flag was assigned during focused validation; "NONE" in the LAB_QUAL or LANL_QUAL fields indicates that a null value was downloaded from FIMAD and was not updated based on review against the LANL baseline validation report. "N/A" in the FV_QUAL field (only used in the QC data sets) indicates that a focused validation qualifier field is not applicable. "NONE" and "N/A" were added to the data set locally and are not in FIMAD.

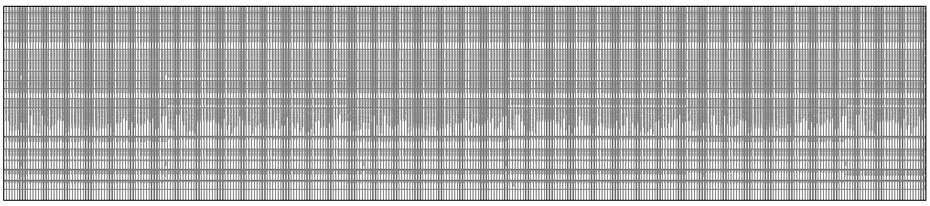
2. "NULL" in any field, other than qualifier fields, indicates that a null value was downloaded from FIMAD. "NULL" was added to the data set locally and is not in FIMAD.

3. "N.A." in any field, other than qualifier fields, indicates that the value was not available in FIMAD due to local manual entry of the analytical record. The manually entered records were summarized and submitted to CDM personnel for complete entry into FIMAD. "N.A." was added to the data set locally and is not in FIMAD.

The electronic version of the data set is presented in spreadsheets, using Microsoft Excel Version 4.0. One disk was required to accommodate the data set. Names of files are as follows.

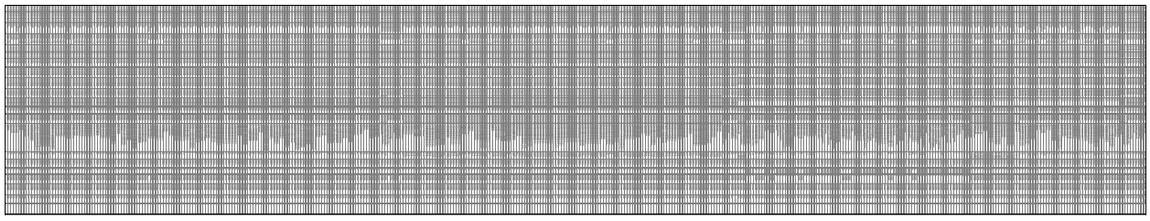
Disk #	Disk Name	Excel Files on Disk
1	TA-35 RFI Report for PRSs 35-003(a, b, c, and n), Analytical Results (1/1)	INORG.xls INORG_QC.xls ORG.xls ORG_QC.xls RAD.xls RAD_QC.xls

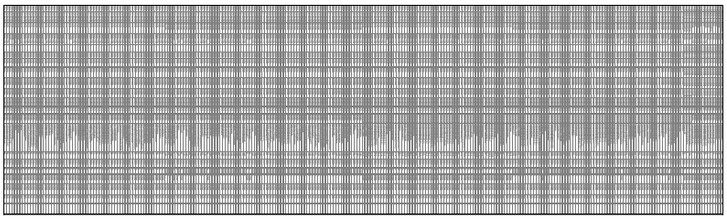


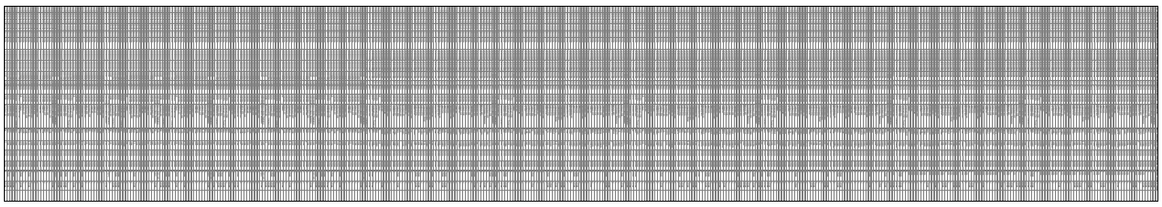


LOC_ID	SAMPLE_ID	SAMPLE_TYPE	ANALYTE_TYPE	DEPTH	MEDIA	STD_MATRIX	COLL_DATE	SHIP_DATE	AN_DATE	LAB	REQUEST	SUITE	ANALYTE	STD_RESULT	STD_UNC	STD_UNITS	LAB_QUAL	LANL_QUAL	FV_QUAL
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Aluminum	1391.53	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Antimony	79.1229	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Antimony	.6	NULL	MG/KG	U	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Arsenic	.804	NULL	MG/KG	B	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Arsenic	421.925	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Barium	107.83	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Barium	545.5771	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Beryllium	.164	NULL	MG/KG	B	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Beryllium	11.2604	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Cadmium	10.5354	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Cadmium	.06	NULL	MG/KG	U	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Calcium	2357.736	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Chromium, Total	42.2125	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Chromium, Total	2.13	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Cobalt	1.784	NULL	MG/KG	B	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Cobalt	106.5625	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Copper	56.4125	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Copper	2.762	NULL	MG/KG	B	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Iron	3708.346	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Lead	2.526	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Lead	108.0792	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Magnesium	664.674	NULL	MG/KG	B	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Manganese	293.775	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Manganese	169.048	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2640	METTAL	Mercury	101.2	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Mercury	.526	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2640	METTAL	Mercury	.0219	NULL	MG/KG	B	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Mercury	.021	NULL	MG/KG	B	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Nickel	2.762	NULL	MG/KG	B	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Nickel	110.6229	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Potassium	322.476	NULL	MG/KG	B	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Selenium	425.4729	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Selenium	.36	NULL	MG/KG	U	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Silver	9.3646	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Silver	.2	NULL	MG/KG	U	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Sodium	52.508	NULL	MG/KG	B	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Thallium	.68	NULL	MG/KG	U	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Thallium	421.8229	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Vanadium	115.3688	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Vanadium	9.32	NULL	MG/KG	B	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Zinc	9.9	NULL	MG/KG	NONE	NONE	N/A
35-2296	0435-96-0034	MS	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	NULL	ATI	2640	METTAL	Zinc	113.5958	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Aluminum	7494.2529	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Antimony	1.3544	NULL	MG/KG	*	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	1/2/97	KEMRON	2838	METTAL	Arsenic	1.2518	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Barium	151.8734	NULL	MG/KG	*	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Beryllium	.6452	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Cadmium	.2105	NULL	MG/KG	U*	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Calcium	8774.7126	NULL	MG/KG	*	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Chromium, Total	4.9537	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Cobalt	2.6406	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Copper	6.689	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Iron	7247.1264	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Lead	12.1771	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Magnesium	1737.6761	NULL	MG/KG	*	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Manganese	307.5923	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/30/96	KEMRON	2838	METTAL	Mercury	.2391	NULL	MG/KG	*	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Nickel	3.8513	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Potassium	1101.5945	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Selenium	.0512	NULL	MG/KG	U	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Silver	.314	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Sodium	207.0274	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Thallium	1.707	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Vanadium	10.8971	NULL	MG/KG	NONE	NONE	N/A
35-2298	0435-96-0042	DUP	ANALYTE	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/31/96	KEMRON	2838	METTAL	Zinc	60.1362	NULL	MG/KG	*	NONE	N/A
NULL	QC-96-10252	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/4/96	KEMRON	2572	METTAL	Lead	102	NULL	%	NONE	NONE	N/A
NULL	QC-96-10255	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/4/96	KEMRON	2572	METTAL	Mercury	.008	NULL	MG/KG	NONE	NONE	N/A
NULL	QC-96-10256	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/4/96	KEMRON	2572	METTAL	Mercury	100.9	NULL	%	NONE	NONE	N/A
NULL	QC-96-10287	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/4/96	KEMRON	2572	METTAL	Thallium	102.7	NULL	%	NONE	NONE	N/A
NULL	QC-96-10674	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/4/96	KEMRON	2572	METTAL	Selenium	99.3	NULL	%	NONE	NONE	N/A
NULL	QC-96-10675	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/4/96	KEMRON	2572	METTAL	Arsenic	.06	NULL	MG/KG	U	NONE	N/A
NULL	QC-96-10675	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/4/96	KEMRON	2572	METTAL	Lead	.035	NULL	MG/KG	U	NONE	N/A
NULL	QC-96-10675	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/4/96	KEMRON	2572	METTAL	Selenium	.085	NULL	MG/KG	U	NONE	N/A
NULL	QC-96-10675	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/4/96	KEMRON	2572	METTAL	Thallium	.03	NULL	MG/KG	U	NONE	N/A
NULL	QC-96-10676	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/4/96	KEMRON	2572	METTAL	Arsenic	106.1	NULL	%	NONE	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Aluminum	2.555	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Antimony	1.93	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Barium	.05	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Beryllium	.025	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Cadmium	.215	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Calcium	.745	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Chromium, Total	.175	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Cobalt	.23	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Copper	.135	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Iron	.12	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Magnesium	2.12	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Manganese	.09	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Nickel	.94	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Potassium	40.5	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Silver	.14	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Sodium	10.7	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Vanadium	.1	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11888	BLANK	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Zinc	.175	NULL	MG/KG	U	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Aluminum	95.3	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Antimony	158.7	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Barium	95.6	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Beryllium	98.2	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Cadmium	97.7	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Calcium	103.6	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Chromium, Total	100.6	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Cobalt	96.9	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Copper	97.1	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Iron	101.4	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Magnesium	97.7	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Manganese	97.8	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Nickel	100.4	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Potassium	96.1	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Silver	127.5	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Sodium	103.6	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Vanadium	94.6	NULL	%	NONE	NONE	N/A
NULL	QC-97-11889	LCS	ANALYTE	-	NULL	SOIL	NULL	8/29/96	9/3/96	KEMRON	2572	METTAL	Zinc	101.1	NULL	%	NONE	NONE	N/A

LOC_ID	SAMPLE_ID	DEPTH	MEDIA	STD_MATRIX	COLL_DATE	SMP_DATE	AN_DATE	LAB	REQUEST	SUITE	ANALYTE	STD_RESULT	STD_UNITS	LAB_QUAL	LANL_QUAL	FV_QUAL
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Aluminum	2000	MG/KG	IND	A	NONE
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Antimony	10	MG/KG	U	A	UJ
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/4/96	KEMRON	2572	METTAL	Arsenic	1	MG/KG	U	A	U
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Barium	110	MG/KG	IND	A	NONE
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Beryllium	.52	MG/KG	U	A	U
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Cadmium	.52	MG/KG	U	A	U
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Calcium	3200	MG/KG	IND	A	NONE
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Chromium, Total	3.9	MG/KG	IND	A	NONE
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Cobalt	2	MG/KG	IND	A	NONE
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Copper	3.7	MG/KG	IND	A	J- 27% tbw
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Iron	5100	MG/KG	IND	A	NONE
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/4/96	KEMRON	2572	METTAL	Lead	2.4	MG/KG	IND	A	J
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Magnesium	920	MG/KG	IND	A	NONE
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Manganese	150	MG/KG	IND	A	NONE
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/4/96	KEMRON	2572	METTAL	Mercury	.1	MG/KG	U	A	U
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Nickel	3.4	MG/KG	IND	A	NONE
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Potassium	430	MG/KG	IND	A	NONE
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/4/96	KEMRON	2572	METTAL	Selenium	.1	MG/KG	U	A	U
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Silver	2.1	MG/KG	U	A	U
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Sodium	89	MG/KG	IND	A	NONE
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/4/96	KEMRON	2572	METTAL	Thallium	.1	MG/KG	U	A	U
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Vanadium	12	MG/KG	IND	A	NONE
35-2295	0435-96-00301	18-30 IN	ALLH	SOIL	8/28/1996	3530	8/3/96	KEMRON	2572	METTAL	Zinc	19	MG/KG	IND	A	J- 47% tbw
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Aluminum	1700	MG/KG	IND	INONE	NONE
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Antimony	1.62	MG/KG	U	INONE	U
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Arsenic	1.2	MG/KG	IB	U	J
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Barium	122	MG/KG	IND	INONE	NONE
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Beryllium	.2	MG/KG	IB	U	J
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Cadmium	.06	MG/KG	U	INONE	U
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Calcium	4310	MG/KG	F	IP	J
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Chromium, Total	3.1	MG/KG	IND	INONE	NONE
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Cobalt	2.2	MG/KG	IB	INONE	J
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Copper	3.5	MG/KG	IB	INONE	J
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Iron	4460	MG/KG	IND	INONE	NONE
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Lead	2.7	MG/KG	IND	INONE	NONE
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Magnesium	840	MG/KG	IB	INONE	J
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Manganese	198	MG/KG	IND	INONE	NONE
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Mercury	.01	MG/KG	U	INONE	U
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Nickel	3.6	MG/KG	IB	INONE	J
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Potassium	382	MG/KG	IB	INONE	J
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Selenium	.38	MG/KG	U	INONE	U
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Silver	.21	MG/KG	IB	U	U
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Sodium	67	MG/KG	IBE	INONE	J
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Thallium	1.4	MG/KG	IB	U	J
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Vanadium	11.2	MG/KG	IND	INONE	NONE
35-2296	0435-96-00341	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Zinc	12.1	MG/KG	IND	INONE	NONE
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Aluminum	1460	MG/KG	IND	INONE	NONE
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Antimony	.63	MG/KG	U	INONE	U
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Arsenic	1.2	MG/KG	IB	U	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Barium	80.1	MG/KG	IND	INONE	NONE
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Beryllium	.26	MG/KG	IB	U	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Cadmium	.06	MG/KG	U	INONE	U
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Calcium	2200	MG/KG	F	IP	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Chromium, Total	1.8	MG/KG	IB	INONE	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Cobalt	1.8	MG/KG	IB	INONE	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Copper	2.2	MG/KG	IB	INONE	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Iron	3790	MG/KG	IND	INONE	NONE
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Lead	2.7	MG/KG	IND	INONE	NONE
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Magnesium	655	MG/KG	IB	INONE	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Manganese	183	MG/KG	IND	INONE	NONE
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Mercury	.02	MG/KG	IB	U	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Nickel	2.6	MG/KG	IB	INONE	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Potassium	267	MG/KG	IB	INONE	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Selenium	.66	MG/KG	IB	U	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Silver	.21	MG/KG	U	INONE	U
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Sodium	91.9	MG/KG	IBE	INONE	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Thallium	1.2	MG/KG	IB	U	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Vanadium	8.3	MG/KG	IB	INONE	J
35-2297	0435-96-00381	0-12 IN	ALLH	SOIL	9/24/1996	3532	NULL	ATI	2640	METTAL	Zinc	14.3	MG/KG	IND	INONE	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Aluminum	9100	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Antimony	.11	MG/KG	U	A	UJ
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	1/2/97	KEMRON	2838	METTAL	Arsenic	1.1	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Barium	82	MG/KG	IND	[SA]P1	J
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Beryllium	.64	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Cadmium	.57	MG/KG	U	A	U
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Calcium	6800	MG/KG	IND	[SA]P1	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Chromium, Total	5.6	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Cobalt	2.4	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Copper	5.6	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Iron	8600	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Lead	11	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Magnesium	1400	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Manganese	250	MG/KG	IND	A	J- 49% tbw
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/30/96	KEMRON	2838	METTAL	Mercury	1.4	MG/KG	IND	[SA]P1	J
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Nickel	3.9	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Potassium	1100	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Selenium	1.1	MG/KG	U	A	UJ
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Silver	2.3	MG/KG	U	A	U
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Sodium	180	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Thallium	1.1	MG/KG	U	A	U
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Vanadium	11	MG/KG	IND	A	NONE
35-2298	0435-96-00421	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Zinc	44	MG/KG	IND	[SA]P1	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Aluminum	8300	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Antimony	11	MG/KG	U	A	UJ
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	1/2/97	KEMRON	2838	METTAL	Arsenic	2.3	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Barium	93	MG/KG	IND	[SA]P1	J
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Beryllium	.66	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Cadmium	.57	MG/KG	U	A	U
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Calcium	13000	MG/KG	IND	[SA]P1	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Chromium, Total	6.3	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Cobalt	3.5	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Copper	9.1	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Iron	7800	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Lead	15	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Magnesium	15000	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Manganese	320	MG/KG	IND	A	J- 49% tbw
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/30/96	KEMRON	2838	METTAL	Mercury	.11	MG/KG	U	[SA]P1	UJ
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Nickel	6.2	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Potassium	1300	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Selenium	1.1	MG/KG	U	A	UJ
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Silver	2.3	MG/KG	U	A	U
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Sodium	280	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Thallium	1.1	MG/KG	U	A	U
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Vanadium	13	MG/KG	IND	A	NONE
35-2299	0435-96-00451	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Zinc	48	MG/KG	IND	[SA]P1	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Aluminum	6300	MG/KG	IND	A	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Antimony	11	MG/KG	U	A	UJ
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	1/2/97	KEMRON	2838	METTAL	Arsenic	2.2	MG/KG	IND	A	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Barium	77	MG/KG	IND	[SA]P1	J
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Beryllium	.55	MG/KG	U	A	U
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Cadmium	.55	MG/KG	U	A	U
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Calcium	24000	MG/KG	IND	[SA]P1	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Chromium, Total	4.7	MG/KG	IND	A	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Cobalt	2.5	MG/KG	IND	A	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Copper	9.2	MG/KG	IND	A	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Iron	6800	MG/KG	IND	A	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Lead	18	MG/KG	IND	A	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Magnesium	1600	MG/KG	IND	A	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Manganese	270	MG/KG	IND	A	J- 49% tbw
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/30/96	KEMRON	2838	METTAL	Mercury	.2	MG/KG	IND	[SA]P1	UJ
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Nickel	4.3	MG/KG	IND	A	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Potassium	1100	MG/KG	IND	A	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Selenium	1.1	MG/KG	U	A	UJ
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Silver	2.2	MG/KG	U	A	U
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Sodium	430	MG/KG	IND	A	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Thallium	1.1	MG/KG	U	A	U
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Vanadium	10	MG/KG	IND	A	NONE
35-2300	0435-96-00491	0-12 IN	ALLH	SOIL	12/18/1996	3541	12/31/96	KEMRON	2838	METTAL	Zinc	69	MG/KG	IND	[SA]P1	NONE







LOC_ID	SAMPLE_ID	SAMPLE_TYPE	ANALYTE_TYPE	DEPTH	MEDIA	STD_MATR	COLL_DAT	SHIP_DAT	AN_DATE	LAB	REQUEST	SUITE	ANALYTE	STD_RESULT	STD_UNC	STD_UNITS	LAB_QUAL	LANL_QUAL	FV_QUAL
35-2295	0435-96-0030	DUP	ANALYTE	18-30 IN	ALLH	SOIL	8/28/96	8/29/96	9/5/96	ATI	2573	GROSSAB	Gross Alpha Radiation	.86	.129	PCI/G	NONE	U	N/A
35-2295	0435-96-0030	DUP	ANALYTE	18-30 IN	ALLH	SOIL	8/28/96	8/29/96	9/5/96	ATI	2573	GROSSAB	Gross Beta Radiation	1.97	.264	PCI/G	NONE	NONE	N/A
35-2295	0435-96-0030	SAMPLE	TRACER	18-30 IN	ALLH	SOIL	8/28/96	8/29/96	9/4/96	ATI	2573	ISOPU	Plutonium Tracer	81.2	NULL	%	NONE	NONE	N/A
35-2295	0435-96-0030	DUP	TRACER	18-30 IN	ALLH	SOIL	8/28/96	8/29/96	9/4/96	ATI	2573	ISOPU	Plutonium Tracer	72.1	NULL	%	NONE	NONE	N/A
35-2295	0435-96-0030	DUP	ANALYTE	18-30 IN	ALLH	SOIL	8/28/96	8/29/96	9/4/96	ATI	2573	ISOPU	Plutonium-238	.002	.0055	PCI/G	NONE	U	N/A
35-2295	0435-96-0030	DUP	ANALYTE	18-30 IN	ALLH	SOIL	8/28/96	8/29/96	9/4/96	ATI	2573	ISOPU	Plutonium-239 + Plutonium-24	.007	.004	PCI/G	NONE	U	N/A
35-2295	0435-96-0030	DUP	TRACER	18-30 IN	ALLH	SOIL	8/28/96	8/29/96	9/4/96	ATI	2573	ISOU	Uranium Tracer	72.6	NULL	%	NONE	NONE	N/A
35-2295	0435-96-0030	SAMPLE	TRACER	18-30 IN	ALLH	SOIL	8/28/96	8/29/96	9/4/96	ATI	2573	ISOU	Uranium Tracer	87.2	NULL	%	NONE	NONE	N/A
35-2295	0435-96-0030	DUP	ANALYTE	18-30 IN	ALLH	SOIL	8/28/96	8/29/96	9/4/96	ATI	2573	ISOU	Uranium-234	.514	.0481	PCI/G	NONE	NONE	N/A
35-2295	0435-96-0030	DUP	ANALYTE	18-30 IN	ALLH	SOIL	8/28/96	8/29/96	9/4/96	ATI	2573	ISOU	Uranium-238	.579	.0522	PCI/G	NONE	NONE	N/A
35-2295	0435-96-0030	DUP	ANALYTE	18-30 IN	ALLH	SOIL	8/28/96	8/29/96	9/4/96	ATI	2573	ISOU	Uranium235 + Uranium-236	.0498	.0137	PCI/G	NONE	U	N/A
35-2295	0435-96-0030	DUP	ANALYTE	18-30 IN	ALLH	SOIL	8/28/96	8/29/96	NULL	ATI	2573	SR90	Strontium-90	1.12	.181	PCI/G	NONE	NONE	N/A
35-2295	0435-96-0031	SAMPLE	TRACER	48-60 IN	ALLH	SOIL	8/28/96	8/29/96	9/4/96	ATI	2573	ISOPU	Plutonium Tracer	80.4	NULL	%	NONE	NONE	N/A
35-2295	0435-96-0031	SAMPLE	TRACER	48-60 IN	ALLH	SOIL	8/28/96	8/29/96	9/4/96	ATI	2573	ISOU	Uranium Tracer	90.5	NULL	%	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/26/96	ATI	2641	GROSSAB	Gross Alpha Radiation	1.27	.19	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/26/96	ATI	2641	GROSSAB	Gross Beta Radiation	1.21	.285	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Actinium-228	.48	.0548	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Americium-241	.0316	.0108	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Annihilation Radiation	.0419	.0188	PCI/G	NONE	NONE	P, R16c
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Barium-140	.0091	.0297	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Bismuth-211	0	0	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Bismuth-212	.557	.376	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Bismuth-214	.464	.0427	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Cadmium-109	.752	.177	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Cerium-139	-.0064	.00495	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Cerium-144	.0402	.0284	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Cesium-134	-.007	.0082	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Cesium-137	.0113	.0098	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Cobalt-57	0	.00335	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Cobalt-60	-.0056	.0133	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Europium-152	.0163	.0189	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Lanthanum-140	-.043	.0422	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Lead-211	.188	.205	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Lead-212	.505	.0304	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Lead-214	.498	.0325	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Manganese-54	.0075	.0095	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Mercury-203	-.001	.0065	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Neptunium-237	.221	.052	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Potassium-40	17.8	.788	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Protactinium-231	.83	.217	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Protactinium-233	.0109	.0119	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Protactinium-234M	2.3	1.85	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Radium-223	-.069	.111	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Radium-224	.311	.01	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Radium-226	1.14	.26	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Radon-219	.0429	.0884	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Ruthenium-106	-.0484	.0744	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Selenium-75	.001	.00715	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Sodium-22	.0163	.0132	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Strontium-85	-.039	.0096	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Strontium-90	.32	NULL	PCI/G	NONE	U	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Thallium-208	.158	.0184	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Thorium-227	-.028	.0385	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Thorium-234	.0099	.198	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Tin-113	-.0109	.00915	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Uranium-235	.0362	.0121	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Yttrium-88	.013	.0114	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	GSCAN	Zinc-65	.0065	.026	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	SAMPLE	TRACER	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	ISOPU	Plutonium Tracer	64.6	NULL	%	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	TRACER	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	10/1/96	ATI	2641	ISOPU	Plutonium Tracer	76.4	NULL	%	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	10/1/96	ATI	2641	ISOPU	Plutonium-238	.009	.026	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	10/1/96	ATI	2641	ISOPU	Plutonium-239 + Plutonium-24	-.009	.0195	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	TRACER	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	10/1/96	ATI	2641	ISOU	Uranium Tracer	94.4	NULL	%	NONE	NONE	N/A
35-2296	0435-96-0034	SAMPLE	TRACER	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	ISOU	Uranium Tracer	94.2	NULL	%	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	10/1/96	ATI	2641	ISOU	Uranium-234	.592	.0787	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	10/1/96	ATI	2641	ISOU	Uranium-238	.45	.0675	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	10/1/96	ATI	2641	ISOU	Uranium235 + Uranium-236	.0707	.0284	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0034	DUP	ANALYTE	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	SR90	Strontium-90	.01	.145	PCI/G	NONE	NONE	N/A
35-2296	0435-96-0035	SAMPLE	TRACER	36-48 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	ISOPU	Plutonium Tracer	55.8	NULL	%	NONE	NONE	N/A
35-2296	0435-96-0035	SAMPLE	TRACER	36-48 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	ISOU	Uranium Tracer	75.7	NULL	%	NONE	NONE	N/A
35-2297	0435-96-0038	SAMPLE	TRACER	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	ISOPU	Plutonium Tracer	54.2	NULL	%	NONE	NONE	N/A
35-2297	0435-96-0038	SAMPLE	TRACER	0-12 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	ISOU	Uranium Tracer	87.1	NULL	%	NONE	NONE	N/A
35-2297	0435-96-0039	MS	ANALYTE	30-42 IN	ALLH	SOIL	9/24/96	9/24/96	9/26/96	ATI	2641	GROSSAB	Gross Alpha Radiation	108.4	2.62	%	NONE	U	N/A
35-2297	0435-96-0039	MS	ANALYTE	30-42 IN	ALLH	SOIL	9/24/96	9/24/96	9/26/96	ATI	2641	GROSSAB	Gross Beta Radiation	90.7	1.85	%	NONE	U	N/A
35-2297	0435-96-0039	SAMPLE	TRACER	30-42 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	ISOPU	Plutonium Tracer	59.6	NULL	%	NONE	NONE	N/A
35-2297	0435-96-0039	SAMPLE	TRACER	30-42 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	ISOU	Uranium Tracer	80.2	NULL	%	NONE	NONE	N/A
35-2297	0435-96-0039	MS	ANALYTE	30-42 IN	ALLH	SOIL	9/24/96	9/24/96	9/27/96	ATI	2641	SR90	Strontium-90	93	NULL	%	NONE	NONE	N/A
35-2298	0435-96-0042	SAMPLE	TRACER	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOPU	Plutonium Tracer	88.5	NULL	%	NONE	NONE	N/A
35-2298	0435-96-0042	SAMPLE	TRACER	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOU	Uranium Tracer	90.3	NULL	%	NONE	NONE	N/A
35-2298	0435-96-0042	SAMPLE	CARRIER	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	1/1/97	ESE	2839	SR90	Strontium Carrier	86.08	NULL	%	NONE	NONE	N/A
35-2298	0435-96-0043	DUP	TRACER	48-60 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOPU	Plutonium Tracer	99	NULL	%	NONE	NONE	N/A
35-2298	0435-96-0043	SAMPLE	TRACER	48-60 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOPU	Plutonium Tracer	97.6	NULL	%	NONE	NONE	N/A
35-2298	0435-96-0043	DUP	ANALYTE	48-60 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOPU	Plutonium-238	-.009	.003	PCI/G	NONE	NONE	N/A
35-2298	0435-96-0043	DUP	ANALYTE	48-60 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOPU	Plutonium-239 + Plutonium-24	.017	.004	PCI/G	NONE	NONE	N/A
35-2298	0435-96-0043	SAMPLE	TRACER	48-60 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOU	Uranium Tracer	89.5	NULL	%	NONE	NONE	N/A
35-2298	0435-96-0043	DUP	TRACER	48-60 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOU	Uranium Tracer	99.3	NULL	%	NONE	NONE	N/A
35-2298	0435-96-0043	DUP	ANALYTE	48-60 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOU	Uranium-234	.436	.049	PCI/G	NONE	NONE	N/A
35-2298	0435-96-0043	DUP	ANALYTE	48-60 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOU	Uranium-235	.016	.005	PCI/G	NONE	NONE	N/A
35-2298	0435-96-0043	DUP	ANALYTE	48-60 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOU	Uranium-238	.458	.051	PCI/G	NONE	NONE	N/A
35-2298	0435-96-0043	SAMPLE	CARRIER	48-60 IN	ALLH	SOIL	12/18/96	12/19/96	1/1/97	ESE	2839	SR90	Strontium Carrier	85.29	NULL	%	NONE	NONE	N/A
35-2298	0435-96-0045	SAMPLE	TRACER	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOPU	Plutonium Tracer	94.8	NULL	%	NONE	NONE	N/A
35-2298	0435-96-0045	SAMPLE	TRACER	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOU	Uranium Tracer	86.7	NULL	%	NONE	NONE	N/A
35-2298	0435-96-0045	SAMPLE	CARRIER	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	1/1/97	ESE	2839	SR90	Strontium Carrier	86.68	NULL	%	NONE	NONE	N/A
35-2299	0435-96-0046	SAMPLE	TRACER	36-48 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOPU	Plutonium Tracer	85.4	NULL	%	NONE	NONE	N/A
35-2299	0435-96-0046	SAMPLE	TRACER	36-48 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOU	Uranium Tracer	89.4	NULL	%	NONE	NONE	N/A
35-2299	0435-96-0046	SAMPLE	CARRIER	36-48 IN	ALLH	SOIL	12/18/96	12/19/96	1/1/97	ESE	2839	SR90	Strontium Carrier	100.35	NULL	%	NONE	NONE	N/A
35-2299	0435-96-0047	SAMPLE	TRACER	36-48 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOPU	Plutonium Tracer	87.6	NULL	%	NONE	NONE	N/A
35-2299	0435-96-0047	SAMPLE	TRACER	36-48 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOU	Uranium Tracer	101.9	NULL	%	NONE	NONE	N/A
35-2299	0435-96-0047	SAMPLE	CARRIER	36-48 IN	ALLH	SOIL	12/18/96	12/19/96	1/1/97	ESE	2839	SR90	Strontium Carrier	93.16	NULL	%	NONE	NONE	N/A
35-2300	0435-96-0048	SAMPLE	TRACER	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOPU	Plutonium Tracer	95.7	NULL	%	NONE	NONE	N/A
35-2300	0435-96-0048	SAMPLE	TRACER	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOU	Uranium Tracer	97.9	NULL	%	NONE	NONE	N/A
35-2300	0435-96-0048	SAMPLE	CARRIER	0-12 IN	ALLH	SOIL	12/18/96	12/19/96	1/1/97	ESE	2839	SR90	Strontium Carrier	94.53	NULL	%	NONE	NONE	N/A
35-2300	0435-96-0050	DUP	ANALYTE	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	12/30/96	ESE	2839	GSCAN	Americium-241	-.057	.056	PCI/G	NONE	NONE	N/A
35-2300	0435-96-0050	DUP	ANALYTE	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	12/30/96	ESE	2839	GSCAN	Cerium-144	-.751	.761	PCI/G	NONE	NONE	N/A
35-2300	0435-96-0050	DUP	ANALYTE	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	12/30/96	ESE	2839	GSCAN	Cesium-137	.003	.018	PCI/G	NONE	NONE	N/A
35-2300	0435-96-0050	DUP	ANALYTE	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	12/30/96	ESE	2839	GSCAN	Cobalt-57	.001	.01	PCI/G	NONE	NONE	N/A
35-2300	0435-96-0050	DUP	ANALYTE	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	12/30/96	ESE	2839	GSCAN	Cobalt-60	.04	.025	PCI/G	NONE	NONE	N/A
35-2300	0435-96-0050	DUP	ANALYTE	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	12/30/96	ESE	2839	GSCAN	Europium-152	.143	.114	PCI/G	NONE	NONE	N/A
35-2300	0435-96-0050	DUP	ANALYTE	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	12/30/96	ESE	2839	GSCAN	Neptunium-237	.004	.026	PCI/G	NONE	NONE	N/A
35-2300	0435-96-0050	DUP	ANALYTE	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	12/30/96	ESE	2839	GSCAN	Potassium-40	30	2.09	PCI/G	NONE	NONE	N/A
35-2300	0435-96-0050	DUP	ANALYTE	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	12/30/96	ESE	2839	GSCAN	Ruthenium-106	-.062	.141	PCI/G	NONE	NONE	N/A
35-2300	0435-96-0050	DUP	ANALYTE	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	12/30/96	ESE	2839	GSCAN	Sodium-22	-.04	.021	PCI/G	NONE	NONE	N/A
35-2300	0435-96-0050	SAMPLE	TRACER	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOPU	Plutonium Tracer	95	NULL	%	NONE	NONE	N/A
35-2300	0435-96-0050	SAMPLE	TRACER	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	12/27/96	ESE	2839	ISOU	Uranium Tracer	91	NULL	%	NONE	NONE	N/A
35-2300	0435-96-0050	SAMPLE	CARRIER	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	1/1/97	ESE	2839	SR90	Strontium Carrier	92.77	NULL	%	NONE	NONE	N/A
35-2300	0435-96-0050	SAMPLE	CARRIER	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	1/1/97	ESE	2839	SR90	Strontium Carrier	94.18	NULL	%	NONE	NONE	N/A
35-2300	0435-96-0050	DUP	ANALYTE	24-36 IN	ALLH	SOIL	12/18/96	12/19/96	1/1/97	ESE	2839	SR90	Strontium-90	.64	.22	PCI/G	NONE	NONE	N/A

Attachment

to Appendix D

LOCID	SAMPLE ID	DEPTH	MEDIA	REQUEST	ANALYTE	RESULT	UNITS	QUAL
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Aluminum	2000	MG/KG	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Antimony	10	MG/KG	UJ
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Arsenic	1	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Barium	110	MG/KG	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Beryllium	.52	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Cadmium	.52	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Calcium	3200	MG/KG	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Chromium, Total	3.9	MG/KG	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Cobalt	2	MG/KG	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Copper	3.7	MG/KG	J- 27% low
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Iron	5100	MG/KG	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Lead	2.4	MG/KG	J
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Magnesium	820	MG/KG	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Manganese	150	MG/KG	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Mercury	.1	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Nickel	3.4	MG/KG	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Potassium	430	MG/KG	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Selenium	1	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Silver	2.1	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Sodium	89	MG/KG	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Thallium	1	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Vanadium	12	MG/KG	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2572	Zinc	19	MG/KG	J- 47% low
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Aluminum	1700	MG/KG	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Antimony	.62	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Arsenic	1.2	MG/KG	J
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Barium	122	MG/KG	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Beryllium	.2	MG/KG	J
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Cadmium	.06	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Calcium	4310	MG/KG	J
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Chromium, Total	3.1	MG/KG	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Cobalt	2.2	MG/KG	J
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Copper	3.5	MG/KG	J
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Iron	4460	MG/KG	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Lead	2.7	MG/KG	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Magnesium	840	MG/KG	J
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Manganese	198	MG/KG	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Mercury	.01	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Nickel	3.6	MG/KG	J
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Potassium	382	MG/KG	J
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Selenium	.38	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Silver	.21	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Sodium	67	MG/KG	J
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Thallium	1.4	MG/KG	J
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Vanadium	11.2	MG/KG	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2640	Zinc	12.1	MG/KG	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Aluminum	1460	MG/KG	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Antimony	.63	MG/KG	U

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Arsenic	1.2	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Barium	80.1	MG/KG	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Beryllium	.26	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Cadmium	.06	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Calcium	2200	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Chromium, Total	1.8	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Cobalt	1.8	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Copper	2.7	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Iron	3760	MG/KG	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Lead	2.7	MG/KG	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Magnesium	655	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Manganese	183	MG/KG	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Mercury	.02	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Nickel	2.6	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Potassium	357	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Selenium	.86	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Silver	.21	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Sodium	91.9	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Thallium	1.2	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Vanadium	8.2	MG/KG	J
35-2297	0435-96-0038	0-12 IN	ALLH	2640	Zinc	14.3	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Aluminum	9100	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Antimony	11	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Arsenic	1.1	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Barium	82	MG/KG	J
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Beryllium	.64	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Cadmium	.57	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Calcium	6800	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Chromium, Total	5.6	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Cobalt	2.4	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Copper	5.6	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Iron	8000	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Lead	11	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Magnesium	1400	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Manganese	250	MG/KG	J- 49% low
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Mercury	1.4	MG/KG	J
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Nickel	3.9	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Potassium	1100	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Selenium	1.1	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Silver	2.3	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Sodium	180	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Thallium	1.1	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Vanadium	11	MG/KG	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2838	Zinc	44	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Aluminum	8300	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Antimony	11	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Arsenic	2.3	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Barium	93	MG/KG	J

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Beryllium	.66	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Cadmium	.57	MG/KG	U
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Calcium	13000	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Chromium, Total	6.3	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Cobalt	3.5	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Copper	9.1	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Iron	7800	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Lead	15	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Magnesium	1500	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Manganese	320	MG/KG	J- 49% low
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Mercury	.11	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Nickel	5.2	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Potassium	1300	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Selenium	1.1	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Silver	2.3	MG/KG	U
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Sodium	260	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Thallium	1.1	MG/KG	U
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Vanadium	13	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2838	Zinc	48	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Aluminum	6300	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Antimony	11	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Arsenic	2.2	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Barium	77	MG/KG	J
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Beryllium	.55	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Cadmium	.55	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Calcium	24000	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Chromium, Total	4.7	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Cobalt	2.5	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Copper	9.2	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Iron	6600	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Lead	18	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Magnesium	1600	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Manganese	270	MG/KG	J- 49% low
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Mercury	2	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Nickel	4.3	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Potassium	1100	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Selenium	1.1	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Silver	2.2	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Sodium	430	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Thallium	1.1	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Vanadium	10	MG/KG	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2838	Zinc	69	MG/KG	NONE

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Actinium-228	.487	.0576	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Americium-241	.143	.0919	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Annihilation Radiation	.0422	.0186	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Barium-140	-.0121	.0442	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Bismuth-211	.0073	0	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Bismuth-212	.743	.338	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Bismuth-214	.516	.041	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Cadmium-109	1.04	.289	PCI/G	R
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Cerium-139	.003	.006	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Cerium-144	-.0437	.0436	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Cesium-134	0	.0092	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Cesium-137	-.0106	.0095	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Cobalt-57	.0079	.00595	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Cobalt-60	-.0012	.0115	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Europium-152	-.0075	.0215	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Gross Alpha Radiation	1.15	.0725	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Gross Beta Radiation	2.15	.13	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Lanthanum-140	-.238	.197	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Lead-211	.247	.208	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Lead-212	.542	.0335	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Lead-214	.612	.0365	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Manganese-54	.0013	.00955	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Mercury-203	.001	.0085	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Neptunium-237	-.0935	.0848	PCI/G	R
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Plutonium-238	.0045	.0055	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Plutonium-239 + Plutonium-240	.0045	.003	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Potassium-40	17.5	.737	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Protactinium-231	1.09	.275	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Protactinium-233	-.0172	.0151	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Protactinium-234M	.697	1.57	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Radium-223	.153	.153	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Radium-224	.623	.294	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Radium-226	.594	.283	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Radon-219	-.0107	.0935	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Ruthenium-106	-.0535	.0765	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Selenium-75	-.0045	.0095	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Sodium-22	-.0099	.0121	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Strontium-85	-.0389	.0112	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Strontium-90	1.06	.194	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Thallium-208	.175	.0215	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Thorium-227	-.0264	.0448	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Thorium-234	-.565	.405	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Tin-113	-.0026	.00925	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Tritium	.02	.0125	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Uranium-234	.505	.0442	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Uranium-235	.0277	.0125	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Uranium-238	.462	.0412	PCI/G	NONE
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Uranium235 + Uranium-236	.0248	.00785	PCI/G	NONE

[illegible]	SAMPLE [illegible]	DEPTH	MEDIA	REQUEST	ANALYTE	[illegible]	[illegible]	[illegible]	[illegible]
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Yttrium-88	-.0054	.012	PCI/G	U
35-2295	0435-96-0030	18-30 IN	ALLH	2573	Zinc-65	-.0167	.0246	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Actinium-228	1.3	.0835	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Americium-241	-.0707	.0919	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Annihilation Radiation	.0999	.025	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Barium-140	.0502	.052	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Bismuth-211	.229	.156	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Bismuth-212	.0615	.425	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Bismuth-214	.979	.0605	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Cadmium-109	1.61	.325	PCI/G	R
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Cerium-139	.0071	.0085	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Cerium-144	-.0792	.0581	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Cesium-134	.001	.011	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Cesium-137	.0457	.0119	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Cobalt-57	-.0112	.0077	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Cobalt-60	.0337	.0162	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Europium-152	-.0028	.0314	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Gross Alpha Radiation	1.49	.0905	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Gross Beta Radiation	3.05	.175	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Lanthanum-140	-.188	.157	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Lead-211	.282	.31	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Lead-212	1.27	.0587	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Lead-214	.873	.0515	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Manganese-54	.0051	.0124	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Mercury-203	.0012	0	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Neptunium-237	-.244	.0915	PCI/G	R
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Plutonium-238	-.00442	.027	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Plutonium-239 + Plutonium-240	.015	.0045	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Potassium-40	28.7	1.14	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Protactinium-231	1.26	.355	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Protactinium-233	.0167	.0182	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Protactinium-234M	1.76	2.63	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Radium-223	.0653	.177	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Radium-224	1.19	.385	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Radium-226	1.48	.399	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Radon-219	-.0346	.132	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Ruthenium-106	.0858	.0948	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Selenium-75	.0235	.0117	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Sodium-22	-.0088	.0152	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Strontium-85	-.0732	.0136	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Strontium-90	.93	.177	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Thallium-208	.433	.0309	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Thorium-227	-.0261	.0638	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Thorium-234	-2.05	.521	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Tin-113	-.0348	.0145	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Tritium	.027	.0155	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Uranium-234	.656	.0537	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Uranium-235	-.0143	.017	PCI/G	U

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Uranium-238	.612	.0498	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Uranium235 + Uranium-236	.0265	.00893	PCI/G	NONE
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Yttrium-88	-.0047	.0163	PCI/G	U
35-2295	0435-96-0031	48-60 IN	ALLH	2573	Zinc-65	.0053	.0288	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Actinium-228	.416	.0527	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Americium-241	-.0581	.0453	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Annihilation Radiation	.0547	.0194	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Barium-140	-.0051	.0336	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Bismuth-211	.0664	.002	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Bismuth-212	.116	.317	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Bismuth-214	.541	.0437	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Cadmium-109	.928	.208	PCI/G	R
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Cerium-139	-.0091	.0054	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Cerium-144	-.0479	.0419	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Cesium-134	.0061	.00865	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Cesium-137	.001	.0101	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Cobalt-57	.0017	.00525	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Cobalt-60	-.0039	.0126	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Europium-152	-.0131	.0229	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Gross Alpha Radiation	1.19	.185	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Gross Beta Radiation	.88	.265	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Lanthanum-140	.0038	.0321	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Lead-211	-.138	.228	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Lead-212	.516	.0342	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Lead-214	.531	.0385	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Manganese-54	.001	.0083	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Mercury-203	-.005	.00725	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Neptunium-237	-.138	.0602	PCI/G	R
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Plutonium-238	.0353	.013	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Plutonium-239 + Plutonium-240	.0177	.009	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Potassium-40	17.7	.769	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Protactinium-231	.366	.25	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Protactinium-233	-.0105	.0131	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Protactinium-234M	1.15	1.75	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Radium-223	-.0111	.136	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Radium-224	.647	.296	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Radium-226	.986	.287	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Radon-219	-.0092	.0978	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Ruthenium-106	.0986	.0773	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Selenium-75	.0094	.0083	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Sodium-22	-.0057	.0104	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Strontium-85	-.0428	.01	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Strontium-90	.32	.15	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Thallium-208	.167	.0213	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Thorium-227	-.0668	.0456	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Thorium-234	-1.04	.311	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Tin-113	-.0063	.0104	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Tritium	.04	.01	PCI/G	U

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Uranium-234	.446	.0498	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Uranium-235	.0396	.0128	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Uranium-238	.517	.054	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Uranium235 + Uranium-236	.053	.017	PCI/G	NONE
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Yttrium-88	.0129	.0091	PCI/G	U
35-2296	0435-96-0034	0-12 IN	ALLH	2641	Zinc-65	-.0468	.0257	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Actinium-228	.942	.0736	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Americium-241	-.0188	.0146	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Annihilation Radiation	.0888	.0249	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Barium-140	.0718	.0379	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Bismuth-211	.0997	.003	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Bismuth-212	.707	.47	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Bismuth-214	.764	.0581	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Cadmium-109	1.31	.205	PCI/G	R
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Cerium-139	.0032	.00625	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Cerium-144	-.0023	.0363	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Cesium-134	-.0149	.0101	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Cesium-137	.0107	.012	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Cobalt-57	.0031	.00455	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Cobalt-60	.0174	.0182	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Europium-152	-.0063	.0246	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Gross Alpha Radiation	1.04	.163	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Gross Beta Radiation	.357	.228	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Lanthanum-140	-.0116	.0531	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Lead-211	.0523	.258	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Lead-212	1.05	.0509	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Lead-214	.809	.0456	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Manganese-54	.0023	.0137	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Mercury-203	-.0282	.0078	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Neptunium-237	.724	.0753	PCI/G	R
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Plutonium-238	-.007	.033	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Plutonium-239 + Plutonium-240	-.0045	.0115	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Potassium-40	27.3	1.15	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Protactinium-231	1.09	.303	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Protactinium-233	-.0122	.0151	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Protactinium-234M	5.02	2.48	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Radium-223	-.182	.155	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Radium-224	.905	.314	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Radium-226	2.23	.365	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Radon-219	.0675	.121	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Ruthenium-106	.0426	.101	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Selenium-75	-.015	.00905	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Sodium-22	-.0172	.0196	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Strontium-85	-.0373	.013	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Strontium-90	-.15		PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Thallium-208	.316	.0258	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Thorium-227	-.151	.0521	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Thorium-234	-.0652	.264	PCI/G	U

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Tin-113	-.0053	.0126	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Tritium	.14	.02	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Uranium-234	.583	.051	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Uranium-235	.085	.0162	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Uranium-238	.48	.0445	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Uranium235 + Uranium-236	.0248	.011	PCI/G	NONE
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Yttrium-88	.0053	.0138	PCI/G	U
35-2296	0435-96-0035	36-48 IN	ALLH	2641	Zinc-65	.0092	.032	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Actinium-228	.472	.0679	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Americium-241	-.19	.0603	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Annihilation Radiation	-.0171	.0181	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Barium-140	.0034	.0439	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Bismuth-211	0	0	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Bismuth-212	.643	.454	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Bismuth-214	.478	.0478	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Cadmium-109	.776	.257	PCI/G	R
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Cerium-139	.0036	.00625	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Cerium-144	.0148	.0458	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Cesium-134	.0024	.0107	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Cesium-137	.009	.0119	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Cobalt-57	.0092	.00615	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Cobalt-60	-.0056	.017	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Europium-152	.0071	.0269	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Gross Alpha Radiation	1.95	.24	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Gross Beta Radiation	1.02	.277	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Lanthanum-140	-.0615	.0574	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Lead-211	.184	.243	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Lead-212	.731	.0424	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Lead-214	.635	.0402	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Manganese-54	-.0107	.0127	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Mercury-203	-.0057	.0091	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Neptunium-237	-.346	.074	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Plutonium-238	-.002	.0095	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Plutonium-239 + Plutonium-240	.002	.002	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Potassium-40	20.3	.911	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Protactinium-231	.649	.309	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Protactinium-233	-.0236	.0163	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Protactinium-234M	4.15	2.47	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Radium-223	.0054	.171	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Radium-224	.433	.0135	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Radium-226	1.76	.352	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Radon-219	.02	.109	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Ruthenium-106	-.0623	.0955	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Selenium-75	-.0173	.0102	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Sodium-22	-.0022	.0177	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Strontium-85	-.0529	.0135	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Strontium-90	-.15	.125	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Thallium-208	.19	.0239	PCI/G	NONE

LOCATID	SAMPLEID	DEPTH	MEDIA	REQUEST	ANALYTE	STD RESULT	STD ERROR	STD UNITS	RESQUAL
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Thorium-227	-.449	.057	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Thorium-234	-1.88	.367	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Tin-113	-.0118	.0109	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Tritium	.07	.015	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Uranium-234	.419	.0396	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Uranium-235	-.0026	.0135	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Uranium-238	.498	.0442	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Uranium235 + Uranium-236	.0315	.011	PCI/G	NONE
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Yttrium-88	.014	.0119	PCI/G	U
35-2297	0435-96-0038	0-12 IN	ALLH	2641	Zinc-65	.0089	.0306	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Actinium-228	1.11	.0774	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Americium-241	-.0396	.0627	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Annihilation Radiation	.091	.0235	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Barium-140	-.0133	.0357	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Bismuth-211	.105	.0035	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Bismuth-212	.507	.38	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Bismuth-214	.873	.0561	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Cadmium-109	2.03	.301	PCI/G	R
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Cerium-139	-.0014	.0069	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Cerium-144	.0167	.0538	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Cesium-134	.0106	.0102	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Cesium-137	-.0034	.0108	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Cobalt-57	.005	.00665	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Cobalt-60	-.0018	.014	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Europium-152	.0081	.0286	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Gross Alpha Radiation	1.35	.186	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Gross Beta Radiation	.342	.229	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Lanthanum-140	-.0042	.0417	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Lead-211	-.614	.274	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Lead-212	1.06	.0514	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Lead-214	.828	.0483	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Manganese-54	.0071	.012	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Mercury-203	-.0087	.0089	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Neptunium-237	-.396	.0841	PCI/G	R
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Plutonium-238	.004	.0055	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Plutonium-239 + Plutonium-240	.002	.004	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Potassium-40	25.7	1.05	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Protactinium-231	.665	.31	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Protactinium-233	-.0012	.0162	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Protactinium-234M	.778	2.05	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Radium-223	-.0201	.198	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Radium-224	1.29	.404	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Radium-226	2	.386	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Radon-219	-.0229	.127	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Ruthenium-106	-.12	.0948	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Selenium-75	-.0161	.01	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Sodium-22	.0078	.0137	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Strontium-85	-.0441	.0136	PCI/G	U

LOCATION	SAMPLE ID	DEPTH	MEDIA	REQUEST	ANALYTE	RESULT	STD. UNCERT.	UNITS	QUALIFIER
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Strontium-90	-.02		PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Thallium-208	.313	.0267	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Thorium-227	-.0768	.0587	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Thorium-234	-1.15	.406	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Tin-113	.0031	.0117	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Tritium	.1	.02	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Uranium-234	.571	.0495	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Uranium-235	-.0287	.0154	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Uranium-238	.593	.0505	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Uranium235 + Uranium-236	.0424	.012	PCI/G	NONE
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Yttrium-88	-.0116	.0137	PCI/G	U
35-2297	0435-96-0039	30-42 IN	ALLH	2641	Zinc-65	.0348	.0285	PCI/G	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Americium-241	-.035	.058	PCI/G	U
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Cerium-144	.481	.794	PCI/G	U
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Cesium-137	.058	.027	PCI/G	U
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Cobalt-57	.011	.01	PCI/G	U
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Cobalt-60	.045	.024	PCI/G	U
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Europium-152	.231	.103	PCI/G	U
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Gross Alpha Radiation	3.4	.457	PCI/G	J-
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Gross Beta Radiation	10.6	1.14	PCI/G	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Neptunium-237	-.036	.029	PCI/G	U
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Plutonium-238	-.001	.003	PCI/G	U
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Plutonium-239 + Plutonium-240	.026	.005	PCI/G	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Potassium-40	25.2	1.79	PCI/G	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Ruthenium-106	.01	.133	PCI/G	U
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Sodium-22	-.034	.02	PCI/G	U
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Strontium-90	2.7	.52	PCI/G	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Tritium	.33	.116	PCI/G	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Uranium-234	.692	.074	PCI/G	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Uranium-238	.623	.067	PCI/G	NONE
35-2298	0435-96-0042	0-12 IN	ALLH	2839	Uranium235 + Uranium-236	.036	.007	PCI/G	NONE
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Americium-241	.078	.236	PCI/G	U
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Cerium-144	.394	2	PCI/G	U
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Cesium-137	.069	.028	PCI/G	U
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Cobalt-57	.004	.015	PCI/G	U
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Cobalt-60	.006	.033	PCI/G	U
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Europium-152	.153	.124	PCI/G	U
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Gross Alpha Radiation	1.96	.261	PCI/G	J-
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Gross Beta Radiation	3.12	.354	PCI/G	NONE
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Neptunium-237	-.039	.043	PCI/G	U
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Plutonium-238	-.002	.003	PCI/G	U
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Plutonium-239 + Plutonium-240	.012	.004	PCI/G	U
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Potassium-40	30.6	2.28	PCI/G	NONE
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Ruthenium-106	.219	.213	PCI/G	U
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Sodium-22	-.045	.033	PCI/G	U
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Strontium-90	1.13	.3	PCI/G	NONE
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Tritium	.2	.083	PCI/G	NONE
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Uranium-234	.467	.052	PCI/G	NONE

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Uranium-238	.436	.048	PCI/G	NONE
35-2298	0435-96-0043	48-60 IN	ALLH	2839	Uranium235 + Uranium-236	.023	.005	PCI/G	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Americium-241	.026	.024	PCI/G	U
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Cerium-144	-.556	.624	PCI/G	U
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Cesium-137	.082	.024	PCI/G	U
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Cobalt-57	-.028	.01	PCI/G	U
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Cobalt-60	-.05	.024	PCI/G	U
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Europium-152	-.013	.098	PCI/G	U
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Gross Alpha Radiation	3.74	.582	PCI/G	J-
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Gross Beta Radiation	7.76	.918	PCI/G	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Iodine-129	-.038	.136	PCI/G	U
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Neptunium-237	-.039	.03	PCI/G	U
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Plutonium-238	.011	.002	PCI/G	U
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Plutonium-239 + Plutonium-240	.024	.005	PCI/G	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Potassium-40	23.1	1.68	PCI/G	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Ruthenium-106	-.173	.167	PCI/G	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Sodium-22	-.044	.024	PCI/G	U
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Strontium-90	2.09	.43	PCI/G	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Tritium	.416	.107	PCI/G	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Uranium-234	.438	.049	PCI/G	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Uranium-238	.422	.047	PCI/G	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2839	Uranium235 + Uranium-236	.022	.005	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Americium-241	.011	.022	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Cerium-144	-1.17	.469	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Cesium-137	.018	.018	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Cobalt-57	.015	.008	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Cobalt-60	-.028	.021	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Europium-152	.105	.084	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Gross Alpha Radiation	1.75	.287	PCI/G	J-
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Gross Beta Radiation	3.58	.427	PCI/G	NONE
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Iodine-129	.15	.122	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Neptunium-237	-.016	.024	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Plutonium-238	-.007	.003	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Plutonium-239 + Plutonium-240	.016	.004	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Potassium-40	25.6	1.79	PCI/G	NONE
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Ruthenium-106	-.123	.147	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Sodium-22	-.013	.021	PCI/G	U
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Strontium-90	.93	.23	PCI/G	NONE
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Tritium	.313	.09	PCI/G	NONE
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Uranium-234	.463	.05	PCI/G	NONE
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Uranium-238	.466	.051	PCI/G	NONE
35-2299	0435-96-0046	36-48 IN	ALLH	2839	Uranium235 + Uranium-236	.023	.005	PCI/G	NONE
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Americium-241	-.006	.067	PCI/G	U
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Cerium-144	.631	.833	PCI/G	U
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Cesium-137	.015	.02	PCI/G	U
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Cobalt-57	.003	.012	PCI/G	U
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Cobalt-60	.007	.025	PCI/G	U
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Europium-152	.314	.116	PCI/G	U

LOCATION	SAMPLE ID	DEPTH	MEDIA	REQUEST	ANALYTE	RESULT	SD/DL	UNITS	FLAG
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Gross Alpha Radiation	2.06	.307	PCI/G	J-
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Gross Beta Radiation	3.6	.436	PCI/G	NONE
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Neptunium-237	-.006	.034	PCI/G	U
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Plutonium-238	.003	.0008	PCI/G	U
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Plutonium-239 + Plutonium-240	.01	.003	PCI/G	U
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Potassium-40	29.6	2.1	PCI/G	NONE
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Ruthenium-106	.015	.156	PCI/G	U
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Sodium-22	-.002	.023	PCI/G	U
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Strontium-90	.05	.19	PCI/G	U
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Tritium	.246	.08	PCI/G	U
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Uranium-234	.438	.048	PCI/G	NONE
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Uranium-238	.453	.049	PCI/G	NONE
35-2299	0435-96-0047	36-48 IN	ALLH	2839	Uranium235 + Uranium-236	.016	.004	PCI/G	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Americium-241	.003	.027	PCI/G	U
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Cerium-144	-1.65	.753	PCI/G	U
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Cesium-137	.039	.028	PCI/G	U
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Cobalt-57	.017	.012	PCI/G	U
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Cobalt-60	.031	.028	PCI/G	U
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Europium-152	.25	.134	PCI/G	U
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Gross Alpha Radiation	20.3	2.72	PCI/G	J-
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Gross Beta Radiation	45.3	4.83	PCI/G	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Iodine-129	.202	.15	PCI/G	U
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Neptunium-237	.053	.038	PCI/G	U
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Plutonium-238	-.002	.003	PCI/G	U
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Plutonium-239 + Plutonium-240	.006	.002	PCI/G	U
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Potassium-40	23.5	1.73	PCI/G	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Ruthenium-106	-.012	.177	PCI/G	U
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Sodium-22	-.004	.03	PCI/G	U
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Strontium-90	1.22	.28	PCI/G	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Tritium	.34	.093	PCI/G	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Uranium-234	.424	.046	PCI/G	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Uranium-235	.027	.005	PCI/G	NONE
35-2300	0435-96-0049	0-12 IN	ALLH	2839	Uranium-238	.44	.048	PCI/G	NONE
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Americium-241	-.018	.024	PCI/G	U
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Cerium-144	.297	.555	PCI/G	U
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Cesium-137	.007	.019	PCI/G	U
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Cobalt-57	-.009	.009	PCI/G	U
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Cobalt-60	.023	.024	PCI/G	U
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Europium-152	-.145	.114	PCI/G	U
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Gross Alpha Radiation	2.22	.304	PCI/G	J-
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Gross Beta Radiation	2.8	.324	PCI/G	NONE
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Iodine-129	.152	.139	PCI/G	U
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Neptunium-237	.038	.029	PCI/G	U
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Plutonium-238	-.008	.003	PCI/G	U
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Plutonium-239 + Plutonium-240	.011	.004	PCI/G	U
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Potassium-40	28.9	2.01	PCI/G	NONE
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Ruthenium-106	-.348	.161	PCI/G	U
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Sodium-22	-.002	.023	PCI/G	U

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Strontium-90	.56	.2	PCI/G	NONE
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Tritium	.303	.073	PCI/G	NONE
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Uranium-234	.564	.061	PCI/G	NONE
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Uranium-235	.032	.006	PCI/G	NONE
35-2300	0435-96-0050	24-36 IN	ALLH	2839	Uranium-238	.633	.068	PCI/G	NONE

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Acenaphthene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Acenaphthylene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Acetone	.021	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Aniline	.34	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Anthracene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Azobenzene	.34	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Benzene	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Benzo(a)anthracene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Benzo(a)pyrene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Benzo(b)fluoranthene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Benzo(g,h,i)perylene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Benzo(k)fluoranthene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Benzoic Acid	.85	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Benzyl Alcohol	.34	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Bis(2-chloroethoxy)methane	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Bis(2-chloroethyl)ether	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Bis(2-ethylhexyl)phthalate	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Bromobenzene	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Bromochloromethane	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Bromodichloromethane	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Bromoform	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Bromomethane	.01	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Bromophenyl-phenylether[4-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Butanone[2-]	.021	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Butylbenzene[n-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Butylbenzene[sec-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Butylbenzene[tert-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Butylbenzylphthalate	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Carbon Disulfide	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Carbon Tetrachloride	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chloro-3-methylphenol[4-]	.34	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chloroaniline[4-]	.34	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chlorobenzene	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chlorodibromomethane	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chloroethane	.01	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chloroform	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chloromethane	.01	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chloronaphthalene[2-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chlorophenol[2-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chlorophenyl-phenyl[4-] Ether	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chlorotoluene[2-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chlorotoluene[4-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Chrysene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Di-n-butylphthalate	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Di-n-octylphthalate	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dibenz(a,h)anthracene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dibenzofuran	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dibromo-3-chloropropane[1,2-]	.01	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dibromoethane[1,2-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dibromomethane	.0052	MG/KG	U

LOCATION	SAMPLE ID	DEPTH	MEDIA	REQUEST	ANALYTE	STD RESULT	STD UNITS	TOX QUAL
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichlorobenzene[1,2-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichlorobenzene[1,2-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichlorobenzene[1,3-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichlorobenzene[1,3-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichlorobenzene[1,4-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichlorobenzene[1,4-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichlorobenzidine[3,3'-]	.34	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichlorodifluoromethane	.01	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichloroethane[1,1-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichloroethane[1,2-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichloroethene[1,1-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichloroethene[cis-1,2-]	.01	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichloroethene[trans-1,2-]	.01	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichlorophenol[2,4-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichloropropane[1,2-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichloropropane[1,3-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichloropropane[2,2-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichloropropene[1,1-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichloropropene[cis-1,3-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dichloropropene[trans-1,3-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Diethylphthalate	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dimethyl Phthalate	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dimethylphenol[2,4-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dinitro-2-methylphenol[4,6-]	.85	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dinitrophenol[2,4-]	.85	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dinitrotoluene[2,4-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Dinitrotoluene[2,6-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Ethylbenzene	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Fluoranthene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Fluorene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Hexachlorobenzene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Hexachlorobutadiene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Hexachlorocyclopentadiene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Hexachloroethane	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Hexanone[2-]	.021	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Indeno(1,2,3-cd)pyrene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Iodomethane	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Isophorone	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Isopropylbenzene	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Isopropyltoluene[4-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Methyl-2-pentanone[4-]	.021	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Methylene Chloride	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Methylnaphthalene[2-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Methylphenol[2-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Methylphenol[4-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Naphthalene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Nitroaniline[2-]	.85	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Nitroaniline[3-]	.85	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Nitroaniline[4-]	.34	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Nitrobenzene	.17	MG/KG	U

[illegible]	SAMPLE ID	DEPTH	MEDIA	REQUEST	ANALYTE	STD RESULT	STD UNITS	LAB QUAL
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Nitrophenol[2-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Nitrophenol[4-]	.85	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Nitroso-di-n-propylamine[N-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Nitrosodimethylamine[N-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Nitrosodiphenylamine[N-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Oxybis(1-chloropropane)[2,2'-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Pentachlorophenol	.85	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Phenanthrene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Phenol	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Propylbenzene[1-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Pyrene	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Styrene	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Tetrachloroethane[1,1,1,2-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Tetrachloroethane[1,1,2,2-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Tetrachloroethene	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Toluene	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Trichloro-1,2,2-trifluoroethane[1,1,2-	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Trichlorobenzene[1,2,4-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Trichloroethane[1,1,1-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Trichloroethane[1,1,2-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Trichloroethene	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Trichlorofluoromethane	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Trichlorophenol[2,4,5-]	.85	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Trichlorophenol[2,4,6-]	.17	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Trichloropropane[1,2,3-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Trimethylbenzene[1,2,4-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Trimethylbenzene[1,3,5-]	.0052	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Vinyl Chloride	.01	MG/KG	U
35-2295	0435-96-0030	18-30 IN	ALLH	2571	Xylene (Total)	.0052	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Acenaphthene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Acenaphthylene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Acetone	.021	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Aniline	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Anthracene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Azobenzene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Benzene	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Benzo(a)anthracene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Benzo(a)pyrene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Benzo(b)fluoranthene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Benzo(g,h,i)perylene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Benzoic Acid	3.5	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Benzyl Alcohol	1.4	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Bis(2-chloroethoxy)methane	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Bis(2-chloroethyl)ether	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Bis(2-ethylhexyl)phthalate	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Bromobenzene	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Bromochloromethane	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Bromodichloromethane	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Bromoform	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Bromomethane	.01	MG/KG	U

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Bromophenyl-phenylether[4-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Butanone[2-]	.021	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Butylbenzene[n-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Butylbenzene[sec-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Butylbenzene[tert-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Butylbenzylphthalate	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Carbazole	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Carbon Disulfide	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Carbon Tetrachloride	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chloro-3-methylphenol[4-]	.69	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chloroaniline[4-]	1.4	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chlorobenzene	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chlorodibromomethane	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chloroethane	.01	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chloroform	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chloromethane	.01	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chloronaphthalene[2-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chlorophenol[2-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chlorophenyl-phenyl[4-] Ether	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chlorotoluene[2-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chlorotoluene[4-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Chrysene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Di-n-butylphthalate	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Di-n-octylphthalate	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dibenz(a,h)anthracene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dibenzofuran	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dibromo-3-chloropropane[1,2-]	.01	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dibromoethane[1,2-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dibromomethane	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichlorobenzene[1,2-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichlorobenzene[1,3-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichlorobenzene[1,4-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichlorobenzidine[3,3'-]	.69	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichlorodifluoromethane	.01	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichloroethane[1,1-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichloroethane[1,2-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichloroethene[1,1-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichloroethene[cis-1,2-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichloroethene[trans-1,2-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichlorophenol[2,4-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichloropropane[1,2-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichloropropane[1,3-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichloropropane[2,2-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichloropropene[1,1-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichloropropene[cis-1,3-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dichloropropene[trans-1,3-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Diethylphthalate	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dimethyl Phthalate	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dimethylphenol[2,4-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dinitro-2-methylphenol[4,6-]	1.7	MG/KG	U

LOCID	SAMPLE ID	DEPTH	MEDIA	REQUEST	ANALYTE	STD RESULT	STD UNITS	VALIDATION
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dinitrophenol[2,4-]	1.7	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dinitrotoluene[2,4-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Dinitrotoluene[2,6-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Ethylbenzene	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Fluoranthene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Fluorene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Hexachlorobenzene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Hexachlorobutadiene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Hexachlorocyclopentadiene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Hexachloroethane	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Hexanone[2-]	.021	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Indeno(1,2,3-cd)pyrene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Iodomethane	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Isophorone	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Isopropylbenzene	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Isopropyltoluene[4-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Methyl-2-pentanone[4-]	.021	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Methylene Chloride	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Methylnaphthalene[2-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Methylphenol[2-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Methylphenol[4-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Naphthalene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Nitroaniline[2-]	1.7	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Nitroaniline[3-]	1.7	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Nitroaniline[4-]	.63	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Nitrobenzene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Nitrophenol[2-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Nitrophenol[4-]	1.7	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Nitroso-di-n-propylamine[N-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Nitrosodimethylamine[N-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Nitrosodiphenylamine[N-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Oxybis(1-chloropropane)[2,2'-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Pentachlorophenol	1.7	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Phenanthrene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Phenol	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Propylbenzene[1-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Pyrene	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Pyridine	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Styrene	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Tetrachloroethane[1,1,1,2-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Tetrachloroethane[1,1,2,2-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Tetrachloroethene	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Toluene	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Trichloro-1,2,2-trifluoroethane[1,1,2-	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Trichlorobenzene[1,2,3-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Trichlorobenzene[1,2,4-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Trichloroethane[1,1,1-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Trichloroethane[1,1,2-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Trichloroethene	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Trichlorofluoromethane	.005	MG/KG	U

[illegible]	[illegible]	[illegible]	MEDIA	REQUEST	[illegible]	STD RESULT	STD UNITS	[illegible]
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Trichlorophenol[2,4,5-]	1.7	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Trichlorophenol[2,4,6-]	.35	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Trichloropropane[1,2,3-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Trimethylbenzene[1,2,4-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Trimethylbenzene[1,3,5-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Vinyl Chloride	.01	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Xylene[1,2-]	.005	MG/KG	U
35-2296	0435-96-0034	0-12 IN	ALLH	2639	Xylene[1,3-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Acenaphthene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Acenaphthylene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Acetone	.021	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Aniline	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Anthracene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Azobenzene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Benzene	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Benzo(a)anthracene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Benzo(a)pyrene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Benzo(b)fluoranthene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Benzo(g,h,i)perylene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Benzoic Acid	3.5	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Benzyl Alcohol	1.4	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Bis(2-chloroethoxy)methane	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Bis(2-chloroethyl)ether	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Bis(2-ethylhexyl)phthalate	.5	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Bromobenzene	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Bromochloromethane	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Bromodichloromethane	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Bromoform	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Bromomethane	.01	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Bromophenyl-phenylether[4-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Butanone[2-]	.021	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Butylbenzene[n-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Butylbenzene[sec-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Butylbenzene[tert-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Butylbenzylphthalate	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Carbazole	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Carbon Disulfide	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Carbon Tetrachloride	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chloro-3-methylphenol[4-]	.7	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chloroaniline[4-]	1.4	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chlorobenzene	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chlorodibromomethane	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chloroethane	.01	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chloroform	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chloromethane	.01	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chloronaphthalene[2-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chlorophenol[2-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chlorophenyl-phenyl[4-] Ether	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chlorotoluene[2-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chlorotoluene[4-]	.005	MG/KG	U

LOCATION	SAMPLE ID	DEPTH	MEDIA	REQUEST	ANALYTE	STD RESULT	STD UNITS	QUAL
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Chrysene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Di-n-butylphthalate	5.2	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Di-n-octylphthalate	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dibenz(a,h)anthracene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dibenzofuran	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dibromo-3-chloropropane[1,2-]	.01	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dibromoethane[1,2-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dibromomethane	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichlorobenzene[1,2-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichlorobenzene[1,2-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichlorobenzene[1,3-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichlorobenzene[1,3-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichlorobenzene[1,4-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichlorobenzene[1,4-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichlorobenzidine[3,3'-]	.7	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichlorodifluoromethane	.01	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichloroethane[1,1-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichloroethane[1,2-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichloroethene[1,1-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichloroethene[cis-1,2-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichloroethene[trans-1,2-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichlorophenol[2,4-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichloropropane[1,2-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichloropropane[1,3-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichloropropane[2,2-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichloropropene[1,1-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichloropropene[cis-1,3-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dichloropropene[trans-1,3-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Diethylphthalate	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dimethyl Phthalate	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dimethylphenol[2,4-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dinitro-2-methylphenol[4,6-]	1.7	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dinitrophenol[2,4-]	1.7	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dinitrotoluene[2,4-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Dinitrotoluene[2,6-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Ethylbenzene	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Fluoranthene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Fluorene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Hexachlorobenzene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Hexachlorobutadiene	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Hexachlorobutadiene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Hexachlorocyclopentadiene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Hexachloroethane	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Hexanone[2-]	.021	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Indeno(1,2,3-cd)pyrene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Iodomethane	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Isophorone	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Isopropylbenzene	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Isopropyltoluene[4-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Methyl-2-pentanone[4-]	.021	MG/KG	U

LOC-ID	SAMPLE-ID	DEPTH	MEDIA	REQUEST	ANALYTE	STD RESULT	STD UNITS	STD QUAL
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Methylene Chloride	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Methylnaphthalene[2-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Methylphenol[2-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Methylphenol[4-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Naphthalene	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Naphthalene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Nitroaniline[2-]	1.7	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Nitroaniline[3-]	1.7	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Nitroaniline[4-]	.63	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Nitrobenzene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Nitrophenol[2-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Nitrophenol[4-]	1.7	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Nitroso-di-n-propylamine[N-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Nitrosodimethylamine[N-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Nitrosodiphenylamine[N-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Oxybis(1-chloropropane)[2,2'-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Pentachlorophenol	1.7	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Phenanthrene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Phenol	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Propylbenzene[1-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Pyrene	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Pyridine	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Styrene	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Tetrachloroethane[1,1,1,2-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Tetrachloroethane[1,1,2,2-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Tetrachloroethene	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Toluene	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trichloro-1,2,2-trifluoroethane[1,1,2-	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trichlorobenzene[1,2,3-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trichlorobenzene[1,2,4-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trichlorobenzene[1,2,4-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trichloroethane[1,1,1-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trichloroethane[1,1,2-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trichloroethene	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trichlorofluoromethane	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trichlorophenol[2,4,5-]	1.7	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trichlorophenol[2,4,6-]	.35	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trichloropropane[1,2,3-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trimethylbenzene[1,2,4-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Trimethylbenzene[1,3,5-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Vinyl Chloride	.01	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Xylene[1,2-]	.005	MG/KG	U
35-2297	0435-96-0038	0-12 IN	ALLH	2639	Xylene[1,3-]	.005	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Acenaphthene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Acenaphthylene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Acetone	.06	MG/KG	J-
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Aniline	.74	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Anthracene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Azobenzene	.74	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Benzene	.0056	MG/KG	UJ

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Benzo(a)anthracene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Benzo(a)pyrene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Benzo(b)fluoranthene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Benzo(g,h,i)perylene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Benzo(k)fluoranthene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Benzoic Acid	3.7	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Benzyl Alcohol	1.5	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Bis(2-chloroethoxy)methane	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Bis(2-chloroethyl)ether	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Bis(2-ethylhexyl)phthalate	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Bromobenzene	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Bromochloromethane	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Bromodichloromethane	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Bromoform	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Bromomethane	.011	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Bromophenyl-phenylether[4-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Butanone[2-]	.022	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Butylbenzene[n-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Butylbenzene[sec-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Butylbenzene[tert-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Butylbenzylphthalate	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Carbon Disulfide	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Carbon Tetrachloride	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chloro-3-methylphenol[4-]	.74	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chloroaniline[4-]	1.5	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chlorobenzene	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chlorodibromomethane	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chloroethane	.011	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chloroform	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chloromethane	.011	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chloronaphthalene[2-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chlorophenol[2-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chlorophenyl-phenyl[4-] Ether	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chlorotoluene[2-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chlorotoluene[4-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Chrysene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Di-n-butylphthalate	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Di-n-octylphthalate	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dibenz(a,h)anthracene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dibenzofuran	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dibromo-3-chloropropane[1,2-]	.011	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dibromoethane[1,2-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dibromomethane	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichlorobenzene[1,2-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichlorobenzene[1,2-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichlorobenzene[1,3-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichlorobenzene[1,3-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichlorobenzene[1,4-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichlorobenzene[1,4-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichlorobenzidine[3,3'-]	.74	MG/KG	U

LOC ID	SAMPLE ID	DEPTH	MEDIA	REQUEST	ANALYTE	RESULT	UNITS	QUAL
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichlorodifluoromethane	.011	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichloroethane[1,1-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichloroethane[1,2-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichloroethene[1,1-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichloroethene[cis-1,2-]	.011	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichloroethene[cis/trans-1,2-]	.011	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichlorophenol[2,4-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichloropropane[1,2-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichloropropane[1,3-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichloropropane[2,2-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichloropropene[1,1-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichloropropene[cis-1,3-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dichloropropene[trans-1,3-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Diethylphthalate	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dimethyl Phthalate	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dimethylphenol[2,4-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dinitro-2-methylphenol[4,6-]	1.8	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dinitrophenol[2,4-]	1.8	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dinitrotoluene[2,4-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Dinitrotoluene[2,6-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Ethylbenzene	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Fluoranthene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Fluorene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Hexachlorobenzene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Hexachlorobutadiene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Hexachlorocyclopentadiene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Hexachloroethane	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Hexanone[2-]	.022	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Indeno(1,2,3-cd)pyrene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Iodomethane	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Isophorone	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Isopropylbenzene	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Isopropyltoluene[4-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Methyl-2-pentanone[4-]	.022	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Methylene Chloride	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Methylnaphthalene[2-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Methylphenol[2-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Methylphenol[4-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Naphthalene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Nitroaniline[2-]	1.8	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Nitroaniline[3-]	1.8	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Nitroaniline[4-]	.74	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Nitrobenzene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Nitrophenol[2-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Nitrophenol[4-]	1.8	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Nitroso-di-n-propylamine[N-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Nitrosodimethylamine[N-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Nitrosodiphenylamine[N-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Oxybis(1-chloropropane)[2,2'-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Pentachlorophenol	1.8	MG/KG	U

LOCID	SAMPLE ID	DEPTH	MEDIA	REQUEST	ANALYTE	RESULT	UNITS	QUAL
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Phenanthrene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Phenol	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Propylbenzene[1-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Pyrene	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Styrene	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Tetrachloroethane[1,1,1,2-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Tetrachloroethane[1,1,2,2-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Tetrachloroethene	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Toluene	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Trichloro-1,2,2-trifluoroethane[1,1,2-	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Trichlorobenzene[1,2,4-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Trichloroethane[1,1,1-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Trichloroethane[1,1,2-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Trichloroethene	.017	MG/KG	J
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Trichlorofluoromethane	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Trichlorophenol[2,4,5-]	1.8	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Trichlorophenol[2,4,6-]	.37	MG/KG	U
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Trichloropropane[1,2,3-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Trimethylbenzene[1,2,4-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Trimethylbenzene[1,3,5-]	.0056	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Vinyl Chloride	.011	MG/KG	UJ
35-2298	0435-96-0042	0-12 IN	ALLH	2837	Xylene (Total)	.0056	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Acenaphthene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Acenaphthylene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Acetone	.086	MG/KG	J-
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Aniline	.76	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Anthracene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Azobenzene	.76	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Benzene	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Benzo(a)anthracene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Benzo(a)pyrene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Benzo(b)fluoranthene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Benzo(g,h,i)perylene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Benzo(k)fluoranthene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Benzoic Acid	3.8	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Benzyl Alcohol	1.5	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Bis(2-chloroethoxy)methane	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Bis(2-chloroethyl)ether	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Bis(2-ethylhexyl)phthalate	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Bromobenzene	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Bromochloromethane	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Bromodichloromethane	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Bromoform	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Bromomethane	.011	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Bromophenyl-phenylether[4-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Butanone[2-]	.023	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Butylbenzene[n-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Butylbenzene[sec-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Butylbenzene[tert-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Butylbenzylphthalate	.38	MG/KG	UJ

[illegible]	[illegible]	[illegible]	MEDIA	REQUEST	ANALYTE	[illegible]	[illegible]	[illegible]
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Carbon Disulfide	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Carbon Tetrachloride	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chloro-3-methylphenol[4-]	.76	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chloroaniline[4-]	1.5	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chlorobenzene	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chlorodibromomethane	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chloroethane	.011	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chloroform	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chloromethane	.011	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chloronaphthalene[2-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chlorophenol[2-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chlorophenyl-phenyl[4-] Ether	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chlorotoluene[2-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chlorotoluene[4-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Chrysene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Di-n-butylphthalate	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Di-n-octylphthalate	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dibenz(a,h)anthracene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dibenzofuran	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dibromo-3-chloropropane[1,2-]	.011	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dibromoethane[1,2-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dibromomethane	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichlorobenzene[1,2-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichlorobenzene[1,2-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichlorobenzene[1,3-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichlorobenzene[1,3-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichlorobenzene[1,4-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichlorobenzene[1,4-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichlorobenzidine[3,3'-]	.76	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichlorodifluoromethane	.011	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichloroethane[1,1-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichloroethane[1,2-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichloroethene[1,1-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichloroethene[cis-1,2-]	.011	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichloroethene[cis/trans-1,2-]	.011	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichlorophenol[2,4-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichloropropane[1,2-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichloropropane[1,3-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichloropropane[2,2-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichloropropene[1,1-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichloropropene[cis-1,3-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dichloropropene[trans-1,3-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Diethylphthalate	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dimethyl Phthalate	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dimethylphenol[2,4-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dinitro-2-methylphenol[4,6-]	1.8	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dinitrophenol[2,4-]	1.8	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dinitrotoluene[2,4-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Dinitrotoluene[2,6-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Ethylbenzene	.0057	MG/KG	UJ

LOCID	SAMPLE ID	DEPTH	MEDIA	REQUEST	ANALYTE	STD RESULT	STD UNITS	FV QUAL
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Fluoranthene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Fluorene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Hexachlorobenzene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Hexachlorobutadiene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Hexachlorocyclopentadiene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Hexachloroethane	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Hexanone[2-]	.023	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Indeno(1,2,3-cd)pyrene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Iodomethane	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Isophorone	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Isopropylbenzene	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Isopropyltoluene[4-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Methyl-2-pentanone[4-]	.023	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Methylene Chloride	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Methylnaphthalene[2-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Methylphenol[2-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Methylphenol[4-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Naphthalene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Nitroaniline[2-]	1.8	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Nitroaniline[3-]	1.8	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Nitroaniline[4-]	.76	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Nitrobenzene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Nitrophenol[2-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Nitrophenol[4-]	1.8	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Nitroso-di-n-propylamine[N-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Nitrosodimethylamine[N-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Nitrosodiphenylamine[N-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Oxybis(1-chloropropane)[2,2'-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Pentachlorophenol	1.8	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Phenanthrene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Phenol	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Propylbenzene[1-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Pyrene	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Styrene	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Tetrachloroethane[1,1,1,2-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Tetrachloroethane[1,1,2,2-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Tetrachloroethene	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Toluene	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Trichloro-1,2,2-trifluoroethane[1,1,2-	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Trichlorobenzene[1,2,4-]	.38	MG/KG	NONE
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Trichloroethane[1,1,1-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Trichloroethane[1,1,2-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Trichloroethene	.01	MG/KG	J
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Trichlorofluoromethane	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Trichlorophenol[2,4,5-]	1.8	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Trichlorophenol[2,4,6-]	.38	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Trichloropropane[1,2,3-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Trimethylbenzene[1,2,4-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Trimethylbenzene[1,3,5-]	.0057	MG/KG	UJ
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Vinyl Chloride	.011	MG/KG	UJ

LOC ID	SAMPLE ID	DEPTH	MEDIA	REQUEST	ANALYTE	STD RESULT	STD UNITS	DV QUAL
35-2299	0435-96-0045	0-12 IN	ALLH	2837	Xylene (Total)	.0057	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Acenaphthene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Acenaphthylene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Acetone	0.110	MG/KG	J-
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Aniline	.72	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Anthracene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Azobenzene	.72	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Benzene	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Benzo(a)anthracene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Benzo(a)pyrene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Benzo(b)fluoranthene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Benzo(g,h,i)perylene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Benzo(k)fluoranthene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Benzoic Acid	3.6	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Benzyl Alcohol	1.4	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Bis(2-chloroethoxy)methane	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Bis(2-chloroethyl)ether	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Bis(2-ethylhexyl)phthalate	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Bromobenzene	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Bromochloromethane	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Bromodichloromethane	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Bromoform	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Bromomethane	.011	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Bromophenyl-phenylether[4-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Butanone[2-]	.022	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Butylbenzene[n-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Butylbenzene[sec-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Butylbenzene[tert-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Butylbenzylphthalate	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Carbon Disulfide	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Carbon Tetrachloride	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chloro-3-methylphenol[4-]	.72	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chloroaniline[4-]	1.4	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chlorobenzene	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chlorodibromomethane	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chloroethane	.011	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chloroform	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chloromethane	.011	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chloronaphthalene[2-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chlorophenol[2-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chlorophenyl-phenyl[4-] Ether	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chlorotoluene[2-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chlorotoluene[4-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Chrysene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Di-n-butylphthalate	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Di-n-octylphthalate	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dibenz(a,h)anthracene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dibenzofuran	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dibromo-3-chloropropane[1,2-]	.011	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dibromoethane[1,2-]	.0054	MG/KG	UJ

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dibromomethane	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichlorobenzene[1,2-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichlorobenzene[1,2-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichlorobenzene[1,3-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichlorobenzene[1,3-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichlorobenzene[1,4-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichlorobenzene[1,4-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichlorobenzidine[3,3'-]	.72	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichlorodifluoromethane	.011	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichloroethane[1,1-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichloroethane[1,2-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichloroethene[1,1-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichloroethene[cis-1,2-]	.011	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichloroethene[cis-1,2-]	.011	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichloroethene[cis/trans-1,2-]	.011	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichlorophenol[2,4-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichloropropane[1,2-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichloropropane[1,3-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichloropropane[2,2-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichloropropene[1,1-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichloropropene[cis-1,3-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dichloropropene[trans-1,3-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Diethylphthalate	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dimethyl Phthalate	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dimethylphenol[2,4-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dinitro-2-methylphenol[4,6-]	1.7	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dinitrophenol[2,4-]	1.7	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dinitrotoluene[2,4-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Dinitrotoluene[2,6-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Ethylbenzene	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Fluoranthene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Fluorene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Hexachlorobenzene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Hexachlorobutadiene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Hexachlorocyclopentadiene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Hexachloroethane	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Hexanone[2-]	.022	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Indeno(1,2,3-cd)pyrene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Iodomethane	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Isophorone	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Isopropylbenzene	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Isopropyltoluene[4-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Methyl-2-pentanone[4-]	.022	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Methylene Chloride	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Methylnaphthalene[2-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Methylphenol[2-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Methylphenol[4-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Naphthalene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Nitroaniline[2-]	1.7	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Nitroaniline[3-]	1.7	MG/KG	U

[illegible]	SAMPLE ID	DEPTH	MEDIA	REQUEST	ANALYTE	RESULT	UNITS	QUAL
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Nitroaniline[4-]	.72	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Nitrobenzene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Nitrophenol[2-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Nitrophenol[4-]	1.7	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Nitroso-di-n-propylamine[N-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Nitrosodimethylamine[N-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Nitrosodiphenylamine[N-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Oxybis(1-chloropropane)[2,2'-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Pentachlorophenol	1.7	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Phenanthrene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Phenol	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Propylbenzene[1-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Pyrene	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Styrene	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Tetrachloroethane[1,1,1,2-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Tetrachloroethane[1,1,2,2-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Tetrachloroethene	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Toluene	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Trichloro-1,2,2-trifluoroethane[1,1,2-	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Trichlorobenzene[1,2,4-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Trichloroethane[1,1,1-]	.0054	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Trichloroethane[1,1,2-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Trichloroethene	0.015	MG/KG	J
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Trichlorofluoromethane	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Trichlorophenol[2,4,5-]	1.7	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Trichlorophenol[2,4,6-]	.36	MG/KG	U
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Trichloropropane[1,2,3-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Trimethylbenzene[1,2,4-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Trimethylbenzene[1,3,5-]	.0054	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Vinyl Chloride	.011	MG/KG	UJ
35-2300	0435-96-0049	0-12 IN	ALLH	2837	Xylene (Total)	.0054	MG/KG	UJ

Appendix E

Statistical Analyses

APPENDIX E STATISTICAL ANALYSES

Because of the small number of samples collected at PRSs 35-003(a, b, c, and n) and the nonstatistical sampling design, no formal statistical analyses were performed and no summary statistics are presented. The quantity of data was such that exploratory data analysis plots also were not informative. To determine which analytes were to be retained as COPCs, sample results were compared directly to established LANL background values.

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Appendix F

Risk Assessment Calculations

APPENDIX F RISK ASSESSMENT CALCULATIONS

F-1.0 HUMAN HEALTH

No quantitative human health risk assessment was performed for PRSs 35-003(a, b, c, and n).

F-2.0 ECOLOGICAL

No quantitative ecological risk assessment was performed for PRSs 35-003(a, b, c, and n). The ecological risk scoping checklist is attached to this appendix.

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Attachment

to Appendix F

Ecological Scoping Checklist
Objectives and Preparation Instructions

Objectives of checklist:

1. Confirm that ecological receptors can be affected by release

2. Determine if PRSs should be combined for screening

3. Evaluate data adequacy - primarily related to nature, rate and extent of contamination

4. Prepare for HQ/HI analysis (determine which screen is appropriate: terrestrial, aquatic screen, both?)

5. Provide information for prioritization / uncertainty analysis, e.g. what are the dominant/important transport pathways, exposure routes, and receptors

Scoping checklist instructions:

1. Obtain the following information to prepare for the scoping meeting
    - Most current biological information for the PRS, which is typically the Biological and Floodplain Assessment for applicable OU and/or TA
    - Surface runoff and erosion information from AP 4.5 Parts A,B
    - RFI Work Plan or Report, as applicable, that provide: contamination source, sample locations, analytical suites, results
    - FIMAD - ArcInfo maps that show the following features: neighboring PRSs, sample locations, vegetation types, watershed name, wetlands

1. Focus area manager for PRS or PRS aggregate will arrange a meeting prior to the site visit

2. Complete Section A of the checklist during the scoping meeting

3. Arrange site visit at an appropriate time of year (ideally spring or summer) to properly evaluate biological resources at the site (if the site visit is planned for another time of year make note of any uncertainties introduced in the initial biological assessment by such timing). The following resources are typically needed for the site visit:
    - Maps showing sample locations and results should be taken on site visit
    - Camera to record site conditions
    - If significant biological or contaminant transport features are noted, the following items will be useful:
        - ⇒ Distance measuring device, either a measuring tape or rangefinder
        - ⇒ GPS or markers to specify locations for surveying

1. Complete Section B of the checklist during the site visit

2. Complete Section C of the checklist after the site visit (should be completed within 1-2 days of site visit)

Ecological Scoping Checklist: Part A
Scoping Meeting Documentation

Note: This scoping was handled very early in the process of developing scoping procedures. Consequently, no scoping meeting was held. Part A of this checklist is provided from information gathered during the field survey of the site and from post-survey inquiry.

Site ID	35-003 (a, b, c, n)	
Nature of PRS releases (indicate all that apply)	Solid Liquid Gaseous Other, explain	 XXX (uncertain)
List of Primary Impacted Media (indicate all that apply)	Surface soil Surface water/sediment Subsurface Groundwater Other, explain	 XXX (uncertain) XXX (uncertain)
FIMAD vegetation class (indicate all that apply)	Water Bare Ground Spruce/fir/aspen/mixed conifer Ponderosa pine Piñon juniper/juniper woodland Grassland/shrubland Developed	 XXX
Is T&E Habitat Present? list species if applicable	All of TA-35 is listed as core area of the Mexican spotted owl, however, upon site visit there is clearly no area over or near these PRSs that may be considered suitable owl habitat. The biological assessment of TA-35 (LA-UR-93=1055) does not indicate any habitat for the Mexican spotted owl. This biological assessment indicates that TA-35 is, at large, potential habitat for grama grass cactus *(Toumeya paparacanthus)*, yet the sites under consideration are fully industrialized and not suitable habitat.	
Provide list and description of Neighboring/ Contiguous/ Upgradient PRSs (consider need to aggregate PRS for screening)	These PRSs were once connected by underground conduits or piping. Upgradient, building 35-02 was a source of effluents to these PRSs via underground piping. Process knowledge indicates that all piping entering and exiting these PRSs has been removed. The associated piping to and from these tanks are included in other PRSs [35-003(d,l,q), 35-003(e,f,g,m,o), 35-003(misc), 35-003(h)].	
AP 4.5 Part B Information Run-off score (out of 46) Terminal point of surface water transport	Not available at the time of scoping.	
Other Scoping Meeting Notes	Phase separator [35-003 (n)] and underground storage tanks [35-003 (a, b, c)] were removed in 1996 The area was backfilled and paved.	

Ecological Scoping Checklist: Part B
Site Visit Documentation

Site ID	PRS 35-003 (a, b, c, n)
Date of Site Visit	May 13, 1998.
Site Visit Conducted by	Mark M. Hooten, Rick Kelly (LATA)

Receptor Information:

Estimate cover	% vegetated % wetland % structures/asphalt, etc.	0% 0% 100%
Field notes on the FIMAD vegetation class	The area is entirely paved.	
Field notes on T&E Habitat, if applicable	n/a	
Are ecological receptors present at the PRS? (yes/no/uncertain) Provide explanation	No.	

Contaminant Transport Information:

Surface water transport Field notes on the terminal point of surface water transport (if applicable)	n/a PRSs had no impact to surface media. The area was backfilled and paved with a curb deterring runoff immediately downslope, rerouting rainwater to a storm drain that daylights into Ten Site Canyon to the east. Other possible surface water pathways include flow downslope into Pratt Canyon to the east. Surface water on the PRSs does not confer contaminant transport.
Are there any other off-site transport pathways? (yes/no/uncertain). Provide explanation	Uncertain. There is a remote possibility that any contaminants from the storage tanks and phase separator, or from backfill material may migrate downward toward groundwater. Depth to groundwater is unknown in this area. To the east (approximately ½ mile), Ten-Site Canyon has intermittent flow.

Ecological Effects Information:

Physical Disturbance (provide list of major types of disturbances)	The area and its vicinity is full developed. The paving of the PRSs and the installation of surface runoff BMPs downslope have minimized the potential for effects from erosion.
Are there obvious ecological effects? (yes/no/uncertain). Provide explanation	As the area is fully developed and industrialized, the effects are those that are expected from such designated use.

No Receptor/ No Pathways:

If there are no receptors and no offsite transport pathways the remainder of the checklist should not be completed. Stop here and provide any additional explanation/justification for proposing an ecological No Further Action recommendation (if needed).

There appear to be no off-site pathways of contaminants from these PRSs to ecological receptors. The potentiality of contaminant migration to groundwater appears to be very small. Given the accuracy of process knowledge of the area, there would appear to have been no visible or olfactory signs of contamination remaining in soil adjacent to or beneath the tanks and separator pit that were removed. Tritium is the most mobile of the COPCs identified in the Work Plan and VCA Plan. Sampling subsequent to the removal of the tanks, the separator pit and the associated effluent lines would confirm these contentions, but probably would be unnecessary.

Data Adequacy:

Do existing data provide information on the nature, rate and extent of contamination? (yes/no/uncertain) Provide explanation. (consider if the maximum value was captured by existing sample data).	Sampling the separator pit and the associated effluent lines subsequent to the removal of the tanks, would confirm the presence/absence of COPCs, but would not change the likelihood of COPCs reaching ecological receptors.
Do existing data for the PRS address potential pathways of off-site contamination? (yes/no/uncertain) Provide explanation (consider if other sites could be impacting this PRS)	Yes. PRS 35-003(p) [downslope of 35-003(a, b, c, n)] was sampled. However, off-site migration pathways for COPCs from 35-003(a, b, c, n) have not been directly addressed with PRS 35-003(p) data. Process knowledge of sites 35-003(a, b, c, n) does not indicate that one should expect surface contamination of 35-003(p) from these sites.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors.

Downslope, best management practices (BMPs) for the control of surface runoff from 35-003(a, b, c, n) and the vicinity, have been effective. It is noteworthy, however, that the current BMPs for the downslope PRSs [35-003(p), 35-003(f, g), 35-003(m), 35-003(d, l, q) are not well maintained.

Ecological Scoping Checklist: Part C
Ecological Pathways Conceptual Exposure Model

This section is not necessary for these PRSs.

Provide answers to Questions A to Q and use this information to complete the Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant $>10^{-5}$ atm-me/mol and molecular weight <200 g/mol).

Answer (yes/no/uncertain):

Provide explanation:

Question B:

Could the soil contaminants identified above reach receptors through fugitive dust carried in air?

- Soil contamination would have to be on the actual surface of the soil to become available for dust.
- In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.

Answer (yes/no/uncertain):

Provide explanation:

Question C:

Can contaminated soil be transported to aquatic ecological communities (use AP 4.5 run-off score and terminal point of surface water runoff to help answer this question)?

- If the AP 4.5 run-off score* equal to zero, this suggests that erosion at PRS is not a transport pathway. (* note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points)
- If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected.

Answer (yes/no/uncertain):

Provide explanation:

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs?

- Known or suspected presence of contaminants in groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (yes/no/uncertain):

Provide explanation:

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport pathway?

- Suspected ability of contaminants to migrate to groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.
- Also consider the importance of mass wasting as a potential release mechanism for subsurface material.

Answer (yes/no/uncertain):

Provide explanation:

Question F:

Could airborne contaminants interact with plants or animals through respiration of vapors?

- Contaminants must be present as volatiles in the air.
- Consider the importance of inhalation of vapors for burrowing animals.
- Foliar uptake of organic vapors is typically not a significant pathway.

Provide quantification of pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Provide explanation:

Question G:

Could airborne contaminants interact with plants or animals through deposition of particulates or with animals through inhalation of fugitive dust?

- Contaminants must be present as particulates in the air or as dust for this pathway to be viable.
- Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.

Provide quantification of pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Provide explanation:

Question H:

Could contaminants interact with plants through root uptake or rain splash from surface soils?

- Contaminants in bulk soil may partition into soil solution, making them available to roots.
- Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).

Provide quantification of pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Provide explanation:

Question I:

Could contaminants interact with receptors through food web transport from surface soils?

- The chemicals may bioaccumulate in animals (see list of potentially persistent bioaccumulators and biomagnifiers, presented in Table 1).
- Animals may ingest contaminated prey.

Provide quantification of pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Provide explanation:

Question J:

Could contaminants interact with receptors via incidental ingestion of surface soils?

- Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.

Provide quantification of pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Provide explanation:

Question K:

Could contaminants interact with receptors through dermal contact with surface soils?

- Significant exposure via dermal contact would generally be limited to organic contaminants which are lipophilic and can cross epidermal barriers.

Provide quantification of pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Provide explanation: For fossorial invertebrates and vertebrates, this is a viable pathway.

Question L:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination severely attenuates radiological exposure.

Provide quantification of pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Provide explanation:

Question M:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.
- Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash on sediments *not* soils). in an area that is only periodically inundated with water.
- Contaminants in sediment may partition into soil solution, making them available to roots.
- Aquatic plants are in direct contact with water.

Provide quantification of pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Provide explanation:

Question N:

Could contaminants interact with receptors through food web transport from water and sediment?

- The chemicals may bioaccumulate in animals (see list of potentially persistent bioaccumulators and biomagnifiers, presented in Table 1.)
- Animals may ingest contaminated prey.

Provide quantification of pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Provide explanation:

Question O:

Could contaminants interact with receptors via incidental ingestion of water and sediment?

- If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.
- Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.
- Aquatic receptors may regularly or incidentally ingest sediment while foraging.

Provide quantification of pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Provide explanation:

Question P:

Could contaminants interact with receptors through dermal contact with water and sediment?

- If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.
- Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.
- Aquatic receptors may be directly exposed to sediments or may be exposed through osmotic exchange, respiration, or ventilation of sediment pore waters.
- Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.

Provide quantification of pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Provide explanation:

Question Q:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination severely attenuates radiological exposure.
- The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.

Provide quantification of pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

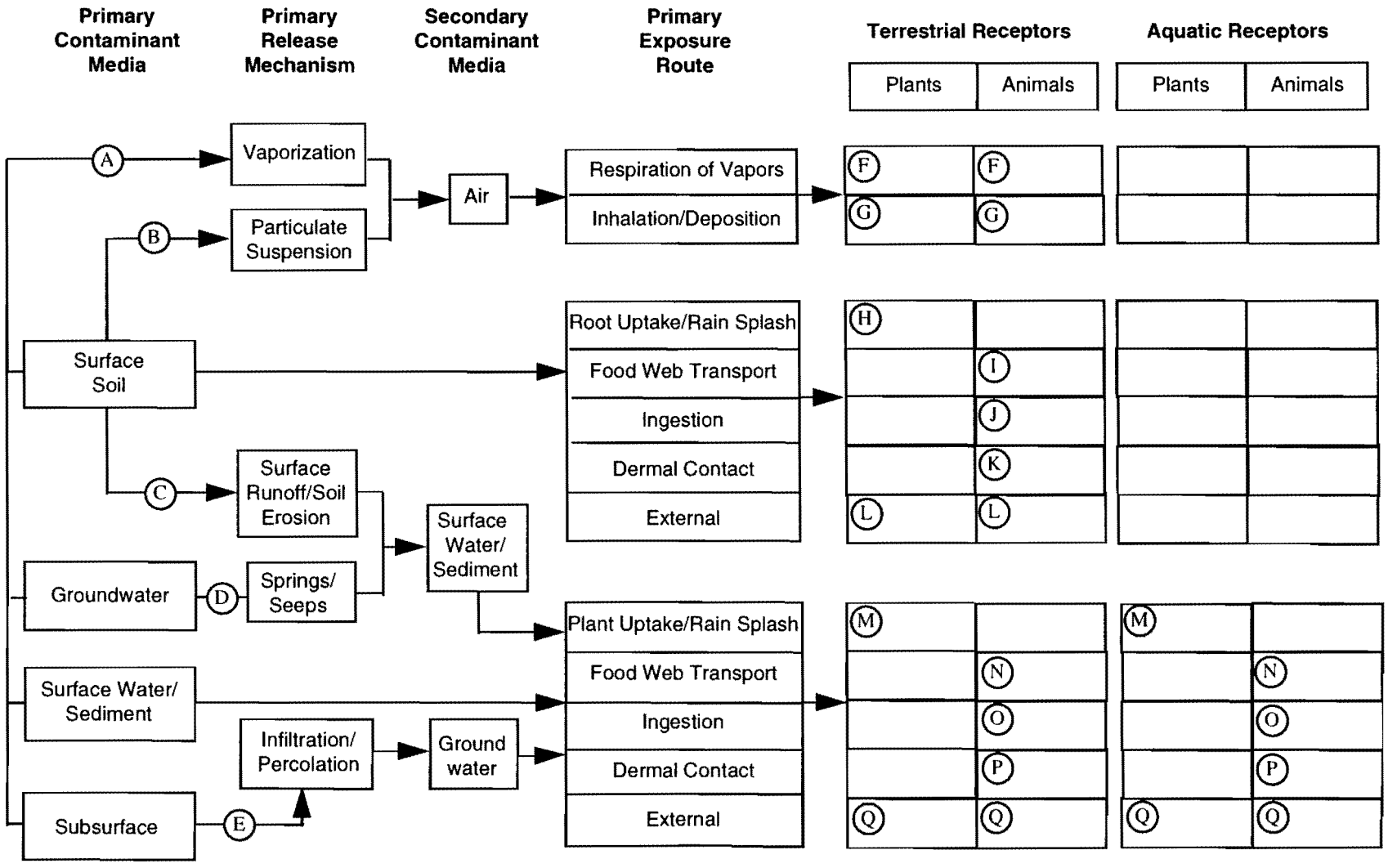
Provide explanation:

Table 1
List of Bioaccumulating Chemicals

Volatile Organics	**PCBs/Pesticides**
Bis(2-ethylhexyl)phthalate	All Aroclors
Butyl benzyl phthalate	beta-BHC
Dichlorobenzene[1,4-]	BHC-mixed isomers
Di-n-butyl phthalate	Chlordane
Di-n-octyl phthalate	Chlorecone (Kepone)
Trichlorobenzene[1,2,4-]	DDT and metabolites
Xylene (mixed isomers)	Dieldrin
	Endosulfan
Semivolatile Organics	Endrin
Acenaphthene	Heptaclor
Anthracene	Lindane
Benzo(a)anthracene	Methoxyclor
Benzo(a)pyrene	Toxaphene
Benzo(b)fluoranthene	
Benzo(g,h,i)perylene	**Inorganics**
Benzo(k)fluoranthene	Aluminum
Chrysene	Cadmium
Dibenzo(a,h)anthracene	Copper
Fluoranthene	Lead
Fluorene	Mercury
Indeno(1,2,3-cd)pyrene	Nickel
Phenanthrene	Selenium
Pyrene	
Pentachloronitrobenzene	**Radionuclides**
Pentachlorophenol	Americium-241
	Cesium-137
Dioxins/Furans	Radium-226,-228
Dibenzofuran	Strontium-90
2,3,7,8-tetrachloro-dibenzo(p)dioxin	Thorium-228,-230,-232
2,3,7,8-tetrachloro-dibenzo(p)furan	Uranium-234,-235,-238

Ecological Scoping Checklist: Ecological Pathways Conceptual Exposure Model

KEY
0 - No Pathway
1 - Unlikely Pathway
2 - Minor Pathway
3 - Major Pathway



Signatures and certifications:

Checklist completed by (provide name, organization and phone number)

Name (printed):	Mark M. Hooten
Name (signature):	Mark M. Hooten
Organization:	Neptune and Co., Inc.
Phone number:	505-662-2121
Date completed:	May 13 and 18, 1998.

Verification by a member of ER Project Ecological Risk Task Team (provide name, organization and phone number)

Name (printed):	Gregory J. McDermott
Name (signature):	Gregory J. McDermott
Organization:	NEPTUNE + CO.
Phone number:	505-662-0730 x 21

Appendix G

Relevant Documents

APPENDIX G RELEVANT DOCUMENTS

G-1.0 DOCUMENTATION OF REGULATORY HISTORY

G-1.1 Corrective Action History

An SAP for PRSs 35-003(a, b, c, and n) was submitted to the EPA in the "RFI Work Plan for Operable Unit 1129" (LANL 1992, ER ID 07666). That SAP was noted to be deficient during the EPA review of the work plan (attachments to Appendix G). The Laboratory's final comment response to the notice of deficiency (NOD) was sent to the EPA on September 30, 1993 (attachments to Appendix G). At that time, a delay of transmittal of the formal SAP was requested so that the RFI investigation could be performed in conjunction with decommissioning of the structures associated with these PRSs.

A VCA plan was submitted to DOE in March 1996 (LANL 1996, ER ID 53733). This plan included an SAP for collection of RFI data during decommissioning. Approval was granted for implementation of this SAP by the DOE ER program manager on March 28, 1996 (VCA Checklist and Field Work Authorization Form, EM/ER:96-134 attached).

Following is a chronological list of Administrative Authority actions and LANL responses.

- Notice of Deficiency for RFI Work Plan Operable Unit 1129 Los Alamos National Laboratory. EPA, July 15, 1993 (Letter from William K. Honker to Joseph C. Vozella).
- Response by Los Alamos National Laboratory to the Notice of Deficiency for Operable Unit 1129, October 4, 1993 (Letter from Joseph C. Vozella to Barbara Driscoll).
- VCA Checklist and Field Work Authorization Form, March 28, 1996, EM/ER:96-134.

G-1.2 Other Regulatory Documents

No other regulatory documents are applicable to PRSs 35-003(a, b, c, and n).

G-2.0 REFERENCED DOCUMENTS

This section includes the following archival and technical documents referenced in this report. These documents are specific only to this RFI report and are in the Attachments to Appendix G.

Notice of Deficiencies for RFI Work Plan for OU 1129. EPA, July 15, 1993 (Letter from William K. Honker to Joseph C. Vozella).

Response by LANL to the notice of deficiencies for Operable Unit 1129, October 4, 1993 (Letter from Joseph C. Vozella to Barbara Driscoll).

VCA Checklist and Field Work Authorization Form, March 28, 1996, EM/ER:96-134.

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Attachments

to Appendix G

7B 6/15/93

122895

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

JUN 15 1993

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Mr. Joseph C. Vozella
Acting Chief
Environment, Safety
and Health Branch
Department of Energy
Los Alamos Area Office
Los Alamos, New Mexico 87544

Re: Notice of Deficiency for RFI Work Plan Operable Unit 1129
Los Alamos National Laboratory (LANL)
NM0890100515

Dear Mr. Vozella:

The Environmental Protection Agency (EPA) has reviewed your RCRA Facility Investigation (RFI) for Operable Unit 1129 (OU 1129), and has found the work plan to be deficient. You have thirty days from receipt of this letter to address the enclosed list of deficiencies.

This work plan was stylistically more difficult to review than previous workplans, and there were numerous inconsistencies between text and tables. When LANL pursues a Class III Modification for withdrawal of potential "No Further Action" (NFA) Solid Waste Management Units (SWMUs) from the HSWA permit, LANL should reference the SWMUs by the numbers as they are used in the HSWA permit.

Should you have any questions or comments, please contact Barbara Driscoll at (214) 655-7441.

Sincerely,

for William K. Honker, P.E., Chief
RCRA Permits Branch (6H-P)

cc: Benito Garcia, NMED
Al Tiedman, LANL

Enclosure

JUN 22 10 01 AM '93

FILE 93-1049

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List of Deficiencies

General Comments:

1. LANL shall provide information on which miscellaneous analytes will be analyzed and which methods will be used for the analysis.

2. All the SWMUs discussed in Chapter 3, should be addressed either by sampling plans in Chapter 7 or by the No Further Action Recommendations in Chapter 6. LANL needs to submit the sampling information for the SWMUs as soon as possible.

3. **Chapter 6, SWMUs Recommended for No Further Action:**

a. SWMU 5-003, Calibration Chamber - LANL shall test the bricks for TCLP. EPA recommends that LANL remove the bricks and recycle them using their Lead Decontamination trailer if necessary.

b. SWMU 35-002 - Additional information needs to be submitted concerning this SWMU. What were the hazardous constituents of concern? Who at EPA concurred on the decontamination and decommissioning effort and soil sampling plan? Was a plan submitted to EPA for approval? When will the results of the completed project be submitted to EPA?

c. SWMU 42-004, Canyon Disposal - Sampling locations and information should be submitted to EPA for review prior to a decision being made on this unit.

d. SWMU 48-004(a-c), Sumps and Tanks - Any decision related to these units will be deferred until D&D has been completed. When is D&D scheduled to occur for this building? LANL has not determined whether a release has occurred from these units.

e. SWMU 52-003(b), Industrial Waste Lines - More information needs to be submitted, including sampling data and depth of sampling prior to a decision on this unit.

f. All other SWMUs for which no further action (NFA) was requested, and that are not currently in the HSWA permit, do not need to be added to the permit. For SWMUs currently in the permit for which a NFA decision is required LANL must submit a Class III permit modification prior to removal of those SWMUs from the permit.

Specific Comments:

1. **SWMU Nos. 52-002(a-g), p. 3-114** - Text on page 3-115 identifies SWMU No. 52-002(e) as now being SWMU No. 63-001(a) while <u>Table 1-1, Current Listing of Operable Unit 1129 SWMUS and AOCs as of 1990</u> lists SWMUS 52-00(k) as being SWMU 63-001(a-b). Please clarify the SWMU numbers and text.

2. 5.1 Summary of OU 1129 Technical Approach, p. 5-2 - As part of the technical approach, one of the listed approaches indicates that "SWMUs are recommended for CMS when the analytical sample mean exceeds action levels for individual components". Under the proposed Subpart S Regulations, when concentrations of hazardous constituents in ground water, surface water, soils or air exceed an action level, and there is reason to believe that such hazardous constituents have been released from a solid waste management unit at the facility, EPA may require a corrective measure study (CMS). The use of a sample mean for determination of a CMS is not acceptable. This comment also applies to Section 5.2.7 Decision Point 4 on page 5-9. In addition, EPA risk assessment guidance calls for calculating the 95 percent upper-confidence limit (95% UCL) on the arithmetic mean of site contamination rather than the 90 percent confidence interval used by LANL.

3. 7.5.2 Phase I Field Activities Investigation, SWMU Aggregate A, p. 7-17 -

a. Soil samples should be analyzed for metals as well as radioactive components, as indicated in section 7.5.3.

b. SWMU 4-002, the canyonside disposal area, should have at least one corehole through the debris material which is sampled at several intervals, as continuous bulldozing of material may have covered contaminated material. High Explosive (HE) spot testing should also be conducted if possible.

4. 7.6 SWMU Aggregate B, Phase I, p.7-20 -

a. Samples should be analyzed for metals as is indicated in Section 7.6.3. Analysis for metals was left out of Section 7.6.2.

b. Additional sampling should be conducted for SWMU 5-002, Canyonside Disposal as this SWMU is subject to additional erosion due to location on the canyon-side. LANL shall submit an additional work plan for both SWMUs 4-002 and 5-002.

5. SWMU No 5-004, Septic Tank - Subsurface Investigation p. 7-30

a. This borehole should be field screened for VOCs and samples should be analyzed for VOCs.

b. It is unclear from the text, the number of samples which will be collected if no radioactivity is encountered. Table 7-2 shows that two samples will be collected, one each at the 5-10 foot depth and the 10-15 foot depth. The tables should be consistent with the text.

c. There is no reason to believe that hazardous constituents are collocated with the radioactive constituents for this liquid discharge area. A sample from each 5-foot section of core should be analyzed for VOCs, SVOCs, and metals.

as located for outfalls from lines 71 and 95.

12. **SWMU Nos. 35-003 (e, f, g, m, and o) Surface and Subsurface Investigation, p. 7-44 -** Was contamination found when SWMUs 35-003 e, f, g, and o were removed? More information from the previous D&D (p. 3-75) should be provided and this information should be used to create a sampling plan. Boreholes should be located based on best professional judgement where previous spills may have occurred. The area designated as SWMU 35-003(m) should be sampled to a depth of 30 feet, or until field screening indicates no contamination whichever is deeper. Sampling should begin below fill material or at fill/tuff interface.

13. **Statement on page 7-45 -** The statement beneath Table 7-5 is contradictory to the Table. The Table indicates that all samples will be analyzed for all the contaminants of concern (COC) while the statement indicates that 10 percent of the samples will be analyzed for COCs. All the samples collected from the boreholes should be analyzed for VOCs, metals, PCBs and SVOCs. A reduction in analysis may be requested from EPA after initial results are reviewed.

14. **SWMU No. 35-003(r) Surface and Subsurface Investigation, p. 7-46 -** Text indicates that "To complement the samples taken at the prescribed intervals, samples will be collected from any sections indicating contamination from field screening techniques". Will these additional samples be analyzed for all potential contaminants? Samples which indicate contamination should be analyzed preferentially.

15. **SWMU Nos. 35-009(a-d) -Subsurface Investigations p. 7-60 -** Text on this page indicates that the initial 10 percent of sample locations from each SWMU will be analyzed for Level III VOCs, SVOCs, metals, and radioactive contamination and then analysis may be reduced based on results. Table 7-9 and Section 7.10.3 indicate that all samples will be analyzed for Level III VOCs, SVOCs, metals and radioactive constituents. LANL shall clarify what analysis will be conducted.

16. **7.12 SWMU Aggregate E, Phase I,p. 7-71 -** Text on page 3-70 indicates that nonradioactive hazardous material may have been emitted from the stack; although, this cannot be verified. What are the possible nonradioactive contaminants of concern? If this SWMU 35-014(a) only has a radioactive component then it should not be listed as a SWMU.

17. **7.14 SWMU Aggregate J, Phase I p. 7-82 -** SWMUs 42-001(a-c), 42-002(a,b,) and 42-003 are not listed in the HSWA Module VIII.

18. **SWMU Nos. 42-001(a) and 42-002(a) -Subsurface Investigation p.7-87 -**

a. Table 7-13, indicates that analysis will conducted for constituents other than radioactive constituents, while text

d. What are the miscellaneous analytes being analyzed, and what are the analytical methods being used?

6. SWMU No 5-004, Septic Tank - Surface Investigation p. 7-30 -
a. What miscellaneous analytes are being analyzed, and what are the methods used in analysis?

b. At what depth will surface samples be collected?

7. SWMU 5-005(a), French Drain - Subsurface Investigation p. 7-31 - At least 10 percent of the samples should be analyzed for VOCs.

8. SWMU 5-005(a) Surface investigation p. 7-31 - At what depth will samples be collected?

9. SWMU Nos.35-003 (a, b, c, and n) Surface and Subsurface Investigations p. 7-35 -

a. Boreholes should be located based on best judgement rather than randomly from a grid. If the pit and tanks were removed in 1991, it should have been determined at that time whether there was any leakage. If this removal has not been conducted then boreholes should be placed next to the pits where the connection with the inflow and outflow lines occurs. Additional boreholes may be required for the pit. Can the pit be inspected for leaks? Did overflows occur?

b. It is unclear by comparing the text with Table 7-3 which intervals will be sampled. Text indicates samples will definitely be collected within the top 2 feet and at the bottom 5-foot interval. Text than indicates samples will be collected at two areas determined by random generation, at the interval with the highest contamination from radioactive field screening, and if no radioactive contamination is found then at the section's midpoint. Sampling locations need to be clarified and match the Table.

10. SWMU Nos. 35-003(a-q) Wastewater Treatment Plant: p. 3-38 - What is the construction of the phase separator pit? Was this an open pit, and did it overflow?

11. SWMU Nos. 35-003(d, l and q) Surface and Subsurface Investigations, p. 7-42 - The history of this area and the previous D&D work should be utilized in developing the sampling plan for these SWMUs rather than using a grid and random boreholes. Boreholes should be located preferentially in areas where spills occurred if these are known.

In the area which underwent D&D, contaminated soil was removed to a depth of around 20 feet. The first borehole sample should be collected around the interval where the backfill meets original soil or tuff. Samples should then be collected on 10-15 foot intervals down to 50 feet, and then at total depth unless field screening (radioactive and VOCs) or visual inspection indicates contamination below 50 feet. Boreholes B-11 and B-12 should remain

indicates that sample analysis will be limited to radiological constituents. LANL should clarify what analysis will be conducted. Table 7-13 should be corrected to indicate actual analysis planned for all SWMUs in TA-42.

b. Was there leakage from the influent line to the septic system? If so, then borehole, B-4, should have the same analysis as boreholes, B-12 and others, for the septic tank system.

19. SWMU No. 42-003-Subsurface Investigation, p. 7-95 - Were metals previously analyzed at this SWMU? Text on page 7-95 indicates that SVOCs were previously encountered, and text on page 3-82 indicates that possible contaminants included solvents, acids and greases. For these reasons, a percentage (20%) of the samples collected should be analyzed for metals and SVOCs.

20. 7.15 SWMU Aggregate K, Phase I, p. 7-99 - SWMU 48-0001 is not listed in the HSWA Module VIII.

21. 7.16.3 Sample Screening and Analysis, p. 7-112 - LANL might consider using an X-Ray Fluorescence for screening metals.

(1)

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

OCT 04 1993

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

Dear Ms. Driscoll:

Enclosed is the response by Los Alamos National Laboratory to the Notice of Deficiency for Operable Unit 1129.

If you have questions, please call Steve Slaten of my staff at 505-665-5050.

Sincerely,

Joseph C. Vozella
Chief
Environment, Safety and Health Branch

Enclosure

cc w/ enclosure:
K. Bisnerds, New Mexico Environment Department
S. Slaten, ESH, LAAO
T. Taylor, ESH, LAAO
K. Bitner, ERPO, AL, MS-A906
cc w/o enclosure:
R. Harris, EM-452, HQ
J. Shipley, ES-ARTO, UC-LANL, MS-F643
T. Gunderson, EM-DO, UC-LANL, MS-J591
R. Vocke, EM-13, UC-LANL, MS-M992
D. Sankey, PIN-1B, UC-LANL, MS-A107

Received by ER-RPF
OCT 14 1993
YCG

10-6

cy Paul
Pat Shanley
[redacted]

10-12-93
EM-13 Group Office does not have the enclosures as stated in this letter.

RWV

This form is subject to change, please contact RPF for latest version.

Los Alamos Environmental Restoration Records Processing Facility

ER Record I.D.# 30207

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LOS ALAMOS NATIONAL LABORATORY

ENVIRONMENTAL RESTORATION
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ER Record Index Form

DATE RECEIVED: 10/14/93 PROCESSOR: YA

PAGE COUNT: 1

Quick Index: Complete all fields; indicate if not applicable or appropriate; please write legibly.

DOCUMENT TO: Barbara Driscoll ORGANIZATION: EPA, Region 6

ORIGINATOR NAME: Joseph C. Vozella ORGANIZATION: DOE

SYMBOL: — DOCUMENT DATE: 10/14/93

SUBJECT/TITLE: Response by LANL to the Notice of Deficiency for Operable Unit 1129 (Cover Letter Only)

RECORD TYPE (Circle relevant type for primary record; type of attachments should be selected on *Keywords List*):

Analytical Data	Excerpt	Map	Procedure	Summary
Article	FAX	Memo	Purchase Request	Table
Chain-of-Custody	Figure	Microform	Receipt Acknowledgment	Telephone Record
Chart	Form	Notebook	Report	TOC
Computer Output	Interview	Outline	Review	Transcription
Contract	Letter	Personal Notes	Sow	Video
Controlled Distribution	List	Photo	Study	Work Plan
Drawing	Logbook	Plan		Other ____

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DETAIL INDEX: Complete all fields; indicate if not applicable or appropriate; please write legibly.

TECH AREA(S)	ADS NO(S)	STRUCTURE NO(S)/MDA	SWMU/PRS NO(S)
LIST RELEVANT TECH AREAS.	LIST RELEVANT ADS NOS.	LIST RELEVANT STRUCTURE NOS.	LIST RELEVANT SWMU NOS/PRS.
—	—	—	—

DOCUMENT TO:	ORIGINATOR NAMES
LIST RELEVANT RECIPIENTS.	LIST MULTIPLE ORIGINATORS.
—	—

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CORRECTION DESCRIPTION:

MISCELLANEOUS (List other indexing criteria as necessary; please write legibly):

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EPA Notice of Deficiencies and OU 1129 Corresponding Responses for RCRA Facility Investigation (RFI) Work Plan for OU 1129

GENERAL COMMENTS:

1. **Los Alamos National Laboratory (LANL) shall provide information on which miscellaneous analytes will be analyzed and which methods will be used for the analysis.**

   All of the sampling and analysis plans (SAPs) that require analysis for miscellaneous analytes will be revised to state the specific analysis to be conducted. The methods listed in the *LANL Quality Program Plan for Environmental Restoration Activities*, Table IX.1, LA-UR-91-1844, June 1991, will be used and mentioned in the appropriate SAPs and corresponding tables. The revised SAPs will be forwarded to EPA on September 1, 1993 with other *RFI Work Plan for OU 1129* pages affected by EPA NODs.

2. **All the solid waste management units (SWMUs) discussed in Chapter 3 should be addressed either by sampling plans in Chapter 7 or by the no further action (NFA) recommendations in Chapter 6. LANL needs to submit the sampling information for the SWMUs as soon as possible.**

   All SWMUs discussed in Chapter 3, except SWMU No. 35-017, are either recommended for NFA in Table 6-1 (as amended) or appear in a SAP in Chapter 7 (as amended). An addendum to the original *RFI Work Plan for OU 1129* has been submitted. This addendum covers all other SWMUs not in the original *RFI Work Plan for OU 1129*.

   SWMU No. 35-017 (a non-HSWA SWMU) was specifically not included in the original *RFI Work Plan for OU 1129* pending the removal of the LAPRE II reactor and receipt of the final decontamination and decommissioning (D&D) report. OU 1129 has now received *Final Project Report TA-35 Los Alamos Power Reactor Experiment No. II (LAPRE II) Decommissioning Project*, LA-12464, February 1993. On the basis of the results in the D&D report, SWMU No. 35-017 is recommended for NFA and will be added to Table 6-1.

3. **Chapter 6, SWMUs Recommended for No Further Action:**

a. **SWMU No. 5-003, Calibration Chamber. LANL shall test the bricks for TCLP. EPA recommends that LANL remove the bricks and recycle them using their Lead Decontamination trailer, if necessary.**

   A reconnaissance sampling plan will be written for SWMU No. 5-003 and included in Aggregate A Phase I investigations. This plan will call for the use of geophysical methods (electromagnetics, gravimetrics, and magnetics) to help define the exact location of the old calibration chamber. Based on the results of this initial survey data and cost estimates for removal versus more characterization, LANL may decide to remove the lead bricks. The environmental conditions necessary to solubilize and mobilize lead at the site are not present, so they pose no immediate concern to human health or the environment. The purpose of the lead bricks was to shield instruments being calibrated from background levels of radiation. Historical records indicate that no other source term of RCRA concern was ever present in the chamber. OU 1129 does not think that it is necessary to test the bricks for TCLP because all evidence indicates they are made of lead and doing a leaching procedure on the bricks will not provide new information.

b. **SWMU No. 35-002. Additional information needs to be submitted concerning this SWMU. What were the hazardous constituents of concern? Who at EPA concurred on the D&D effort and soil sampling plan? Was a plan submitted to EPA for approval? When will the results of the completed project be submitted to EPA?**

Additional information concerning this SWMU can be found in the SAP, *Plan for Environmental Sampling–Removal of Los Alamos Power Reactor Experiment No. 2 (LAPRE II) Reactor Vessel and Fuel Reservoir*, March 28, 1991. This SAP was produced for the D&D of LAPRE II. Following this D&D effort, LANL published *Final Project Report TA-35 Los Alamos Power Reactor Experiment No. II (LAPRE II) Decommissioning Project*, LA-12464, February 1993. On the basis of the D&D report, LA-12464, Section 2.2, the lead in the bricks is the only RCRA contaminant of concern (COC). The bricks were removed and stored under EPA and state regulations. OU 1129 has researched EPA's involvement in the SAP and D&D effort and has not confirmed its concurrence; therefore, the third sentence, "The decontamination and decommissioning..." will be deleted from the description/justification block for SWMU No. 35-002 in Table 6-1. Information in the RFI *Work Plan for OU 1129*, Chapter 3 concerning this SWMU will be updated to reflect the information in LA-12464.

c. **SWMU No. 42-004, Canyon Disposal. Sampling locations and information should be submitted to EPA for review prior to a decision being made on this unit.**

D&D activities were conducted at TA-42 in 1978 and a final report was produced, *The Decommissioning of the TA-42 Plutonium Contaminated Incinerator Facility*, LA-9077-MS, November 1981. In January 1991, Phil Fresquez of LANL's Environmental Protection Group (EM-8) conducted a reconnaissance survey. Finally, in July 1992, OU 1129 personnel sampled TA-42 after verbal notification to EPA from DOE/LAAO to allow for characterization to proceed for construction validation of the Nuclear Safeguards Technology Laboratory. The *Revised Sampling and Analysis Plan for OU 1129 Aggregate J*, LA-UR-92-2120, July 1992, and memoranda EES-13-ER-04-93-040 and EES-13-ER-05-93-055 contain the most current SAP and sample data from TA-42. This data has been reported to EPA in the LANL ER Quarterly Report, April-June 1993, and will also be reported in the phase report for this area. On the basis of the D&D effort, the reconnaissance survey, and the OU 1129 sampling, the results indicate that this site is appropriate for recommending NFA at the present time.

d. **SWMU Nos. 48-004(a through c), Sumps and Tanks. Any decision related to these units will be deferred until D&D has been completed. When is D&D scheduled to occur for this building? LANL has not determined whether a release has occurred from these units.**

OU 1129 recommends an NFA decision at the present time; there is no plan to D&D this facility. SWMU Nos. 48-004(a through c) are considered under institutional control. No mechanism for release to the environment can be determined. These drains and small basement sumps were designed not to leak, and archival information documents no spills or releases. Building TA-48-1 is the primary structure for the Isotope and Nuclear Chemistry Division and LANL has no current plans for near-term D&D. Therefore, the SWMU can be considered for NFA if site design, conditions, or institutional controls preclude any release from the SWMU that would pose a threat to human health or the environment, these SWMUs are recommended for NFA. OU 1129 will revise the text in Table 6-1 to clarify this information.

e. **SWMU No. 52-003(b), Industrial Waste Lines. More information needs to be submitted, including sampling data and depth of sampling prior to a decision on this unit.**

LANL published *Decommissioning of the UHTREX Reactor Facility,* LA-12356, August 1992, after the UHTREX Reactor and associated industrial waste lines were completely decommissioned in September 1990. The report includes sampling depths and data in Section 5.0, Post-Decommissioning Radiological Survey Procedures and Results. Memorandum HSE8-88-603, "Results of Screening Analyses of Soil Material Collected from Industrial Waste Line 66 Connecting TA-52 to TA-50," October 12, 1988; and memorandum HS-3-FSA:91-206, "TA-52 Facilities Decommissioned in UHTREX D&D Project: Remove from SWMU and RPIS Lists," October 30, 1991, discuss D&D activities at this site. Information concerning this SWMU in the *RFI Work Plan for OU 1129* will be updated to reflect the information in LA-12356.

f. **All other SWMUs for which NFA was requested, and that are not currently in the HSWA permit, do not need to be added to the permit. For SWMUs currently in the permit for which an NFA decision is required, LANL must submit a Class III permit modification prior to removal of those SWMUs from the permit.**

LANL will submit a Class III permit modification as necessary; OU 1129 will coordinate the list of approved non-HSWA permit NFA SWMUs with the ER Program office to ensure that they are not added to the permit.

SPECIFIC COMMENTS

1. **SWMU Nos. 52-002(a through g), page 3-114. Text on page 3-115 identifies SWMU No. 52-002(e) as now being SWMU No. 63-001(a) while <u>Table 1-1. Current Listing of Operable Unit 1129 SWMUs and AOCs as of 1990</u> lists SWMU No. 52-002(k) as being SWMU No. 63-001(a and b). Please clarify the SWMU numbers and text.**

According to unit information and maps in the 1988 and 1990 SWMU reports, an active, 1,000-gal. septic tank, TA-52-49, designated as SWMU No. 52-002(f), and the associated seepage pit, TA-52-50, designated as SWMU No. 52-002(g), in the 1988 SWMU Report were combined and became SWMU No. 52-002(e) in the 1990 SWMU Report. SWMU No. 52-002(e) is the same as SWMU No. 63-001(a) because the western portion of TA-52 and associated structures became TA-63 in 1989. The text on pages 3-114 and 3-134 is correct.

According to unit information and maps in the 1988 SWMU Report, an active, 920-gal. septic tank, TA-52-154, and associated seepage pit, TA-0-462, were designated as SWMU No. 52-002(k). According to unit information and maps in the 1990 SWMU Report, septic tank TA-52-154 became part of TA-63 in 1989, and SWMU No. 52-002(k) was redesignated as SWMU No. 63-001(b). The text on pages 3-134 and 3-136 is correct.

Table 1-1 of the *RFI Work Plan for OU 1129* will be changed to reflect this information more clearly.

2. **5.1, Summary of OU 1129 Technical Approach, page 5-2. As part of the technical approach, one of the listed approaches indicates that "SWMUs are recommended for CMS when the analytical sample mean exceeds action levels for individual components." Under the proposed Subpart S Regulations, when concentrations of hazardous constituents in ground water, surface water, soils or air exceed an action level, and there is reason to believe that such hazardous constituents have been released from a SWMU at the facility, EPA may require a corrective measure study (CMS). The use of a sample mean for determination of a CMS is not acceptable. This comment also applies to Section 5.2.7, Decision Point 4, on page 5-9. In addition, EPA risk assessment guidance calls for calculating the 95 percent upper-confidence limit (UCL) on the arithmetic mean of site contamination rather than the 90 percent confidence interval used by LANL.**

   Referenced sections will be changed to reflect that these decisions will be based on the 95 percent UCL for comparison of a contaminant's concentration to its screening action level (SAL). Those SWMUs at which this criterion is met may be recommended for either VCA or a focused CMS. This statement is based on the assumption that the LANL Installation Work Plan, Appendix K (when published), will adopt this strategy for data analysis, and that the EPA Region 6 guidance will in fact be to use the 95 percent UCL (per proposed Subpart S section 264.511[a][7]).

   The last bullet, second sentence, under Section 5.1 will be changed to read, "SWMUs are recommended for CMS when the 95 percent upper confidence limit (95% UCL) on the arithmetic mean concentration of an individual site contaminant exceeds the screening action level (SAL) for that contaminant, or when ...."

   The first bullet under Section 5.2.7 will be changed to read as follows, "the 95% UCL on the arithmetic mean concentration of an individual site contaminant does not exceed the SAL for that contaminant, and."

3. **7.5.2 Phase I Field Activities Investigation, SWMU Aggregate A, page 7-17.**

a. **Soil samples should be analyzed for metals as well as radioactive components, as indicated in Section 7.5.3.**

The total list of RCRA metals will be added to the list of analytes.

b. **SWMU No. 4-002, the canyonside disposal area, which is sampled at several intervals, should have at least one borehole through the debris material, as continuous bulldozing of material may have covered contaminated material. High explosive (HE) spot testing should also be conducted if possible.**

The sampling locations indicated in the SAP are examples only and depend entirely on the outcome of initial geophysical surveying. OU 1129 believes that the SAP as written represents a conservative and professionally safe and sound approach to this investigation. However, additional text will be added to Section 7.5.2 to indicate that an aerial gamma survey is planned for the summer of 1993 and that the results will be used to locate potential residual radioactive material for future sampling. Additional text will also explain the types of instruments to be used and the expected results of the survey. Because of the documented presence of large metal debris such as steel girders, rebar, and metal containers and gas cylinders in the detritus of the disposal area, additional reconnaissance information from geophysical methods will be used to choose an appropriate discrete sampling method. The revised SAP will show that spot testing for HE will be conducted where reconnaissance suggests that HE is most likely to be present in the vicinity of the old firing pits.

4. **7.6 SWMU Aggregate B, Phase I, page 7-20.**

a. **Samples should be analyzed for metals as is indicated in Section 7.6.3. Analysis for metal was left out of Section 7.6.2.**

The total list of RCRA metals will be added to the list of analytes.

b. **Additional sampling should be conducted for SWMU No. 5-002, Canyonside Disposal, as this SWMU is subject to additional erosion due to location on the canyonside. LANL shall submit an additional work plan for both SWMU Nos. 4-002 and 5-002.**

Text will be added to the appropriate SAPs to indicate that additional downslope surface geophysical surveying and surface sampling for the specified contaminants will be conducted. Attention will be given to the possible need for engineered slope/erosion control if surveys indicate the need to prevent possible debris migration.

5. **SWMU No. 5-004, Septic Tank, Subsurface Investigation, page 7-30.**

a. **This borehole should be field screened for volatile organic compounds (VOCs) and samples should be analyzed for VOCs.**

The septic tank was abandoned more than 34 years ago, and the tank and pipe were removed, which aerated the soil, 33 years ago. Therefore, OU 1129 has no reason to believe that any of the VOCs would still be present in this area. Samples from this site will be analyzed for semivolatile organic compounds (SVOCs) because if organics were present in this septic system, there is a possibility that SVOCs could still be present.

OU 1129 will change all SAPs to reflect that for SWMUs with potential VOC source terms older than 10 years, all collected core and auger material will be screened with the appropriate organic vapor analyzer, flame ionization detector, or photoionization detector field instrument for VOCs. If VOCs are indicated, then a discrete sample will be collected and analyzed for VOCs. Other-wise, routine VOC analysis will be conducted for SWMUs with more recent VOC source terms.

b. **It is unclear from the text the number of samples which will be collected if no radioactivity is encountered. Table 7-2 shows that two samples will be collected, one each at the 5-10 ft depth and the 10-15 ft depth. The tables should be consistent with the text.**

SWMU No. 5-004, Septic Tank, Subsurface Investigation, page 7-30, third paragraph, will be revised to state, "The borings will be drilled to a minimum depth of 15 ft. Drilling will stop when screening with field instruments determines that two consecutive 5-ft core intervals do not exceed background for radiation. Coring will begin at a depth of 5 ft to avoid sampling soils above the level of the septic tank. A 5-ft-long split-barrel core sampler will be used to collect soil/rock cores in 5-ft intervals. Upon core retrieval, the entire length of the core will be screened for radiation (Section 7.7.3, Sample Screening and Analysis). One sample for each required analytical method (Table 7-2) will be collected in each 5-ft section of core with the highest observed radioactivity, or in sections that show staining or other anomalies. If no above-background radioactivity is detected in a particular 5-ft interval, the sample will be collected from a random core interval. The total depth of the hole and the exact depth of each sample collected will be documented in the field."

c. **There is no reason to believe that hazardous constituents are collocated with the radioactive constituents for this liquid discharge area. A sample from each 5-ft section of core should be analyzed for VOCs, SVOCs, and metals.**

A sample from each 5-ft section of core will be analyzed for gross-alpha, -beta, and -gamma, metals by ICPES, SVOCs, and using gamma spectrometry and alpha spectroscopy. These samples will not be analyzed for VOCs; see response for comment 5a for further explanation.

d. **What are the miscellaneous analytes being analyzed, and what are the analytical methods being used?**

Miscellaneous analytes will not be analyzed during the subsurface investigation of SWMU No. 5-004 as shown on Table 7-2, the text on page 7-30 is in error, and OU 1129 will correct it.

6. **SWMU No. 5-004, Septic Tank, Surface Investigation, page 7-30.**

a. **What miscellaneous analytes are being analyzed, and what are the methods used in analysis?**

The miscellaneous analytes that will be analyzed for are HEs: HMX, RDX, NB, 1,3-DNB, 1,3,5-TNB, 2,4-DNT, 2,6-DNT, 2,4,6-TNT, and TETRYL. The method used to analyze all of these HEs will be USATHAMA (U.S. Army Toxic and Hazardous Materials Agency) by High Performance Liquid. OU 1129 will revise the *RFI Work Plan for OU 1129* to clarify miscellaneous analytes.

b. **At what depth will surface samples be collected?**

Surface samples will be taken from the top 0 to 6 in.; OU 1129 will revise the *RFI Work Plan for OU 1129* accordingly.

7. **SWMU No. 5-005(a), French Drain, Subsurface Investigation, page 7-31. At least 10 percent of the samples should be analyzed for VOCs.**

The French drain was abandoned more than 30 years ago and removed in 1985; on the basis of published research on VOC environmental behavior, there is no reason to believe that any of the VOCs would still be present in this area. Samples from this site will be analyzed for SVOCs because if organics were present in this French drain system, they could still be detected.

8. **SWMU No. 5-005(a), Surface Investigation, page 7-31. At what depth will samples be collected?**

Surface samples will be taken from the top 0 to 6 in.; OU 1129 will revise the *RFI Work Plan for OU 1129* accordingly.

9. **SWMU Nos. 35-003(a, b, c, and n), Surface and Subsurface Investigations, page 7-35.**

a. **Boreholes should be located based on best judgment rather than randomly from a grid. If the pit and tanks were removed in 1991, it should have been determined at that time whether there was any leakage. If this removal has not been conducted, then boreholes should be placed next to the pits where the connection with the inflow and outflow lines occurs. Additional boreholes may be required for the pit. Can the pit be inspected for leaks? Did overflows occur?**

Scheduling changes within LANL D&D operations since this *RFI Work Plan for OU 1129* was written have invalidated the assumptions used in creating the SAP for SWMU Nos. 35-003(a,b,c, and n). The phase separator pit and associated lines and tanks have not been removed; they will likely be removed in either FY94 or 95. The LANL D&D Program is now part of the ER Program and will be conducted in cooperation with other ER activities. OU 1129 will now have an opportunity to ensure that any sampling during D&D complements the objectives of the *RFI Work Plan for OU 1129*.

OU 1129 requests that a formal SAP for these SWMUs be delayed and done in concert with D&D planning. Concerns of the reviewer can be addressed at that time. Because this area is fully under institutional control and environmental surveillance data indicate no immediate concerns to human health or the environment, deferring the SAP until D&D planning will allow for a much more cost-effective and thorough SAP to be developed.

LANL will notify EPA as a soon as a SAP is developed is complete for these SWMUs; this SAP will be an addendum to the *RFI Work Plan for OU 1129*. Status will be updated in each quarterly report.

b. **It is unclear when comparing the text with Table 7-3 which intervals will be sampled. Text indicates samples will definitely be collected within the top two feet and at the bottom five foot interval. Text then indicates samples will be collected at two areas determined by random generation, at the interval with the highest contamination from radioactive field screening, and if no radioactive contamination is found then at the section's midpoint. Sampling locations need to be clarified and match the Table.**

See response for specific comment 9a.

10. **SWMUs Nos. 35-003(a-q), Wastewater Treatment Plant, page 3-38. What is the construction of the phase separator pit? Was this an open pit, and did it overflow?**

As-built drawings of the phase separator pit provided construction information. The phase separator pit was not an open pit, and there is no documented evidence of the pit ever overflowing. Also, see response for specific comment 9a.

11. **SWMUs Nos. 35-003(d, l, and q), Surface and Subsurface Investigations, page 7-42. The history of this area and the previous D&D work should be utilized in developing the sampling plan for these SWMUs rather than using a grid and random boreholes. Boreholes should be located preferentially in areas where spills occurred if these are known.**

Operational history and D&D information were exhaustively reviewed in preparing the SAP. Because of the lack of reliable detailed spatial information, the present sampling plan represents the best professional judgment of appropriate sampling strategies.

In the area which underwent D&D, contaminated soil was removed to a depth of around 20 ft. The first borehole sample should be collected around the interval where the backfill meets original soil or tuff. Samples should then be collected on 10- to 15 -ft intervals down to 50 ft, and then at total depth unless field screening (radioactive and VOCs) or visual inspection indicates contamination below 50 ft. Boreholes B-11 and B-12 should remain as located for outfalls from lines 71 and 95.

All historical information was used in developing the SAPs for this area. The previous spills at these SWMUs were recorded, but their exact locations were not documented. The grid and random sample points technique is often used for locating COC plumes of unknown direction but with a documented source. The source of the fill material is not documented. There is also a potential for additional contamination of the surface fill area from up-gradient rain-wash over potentially contaminated soil.

The possibility for transport to depth exists because the area is dominated by vertical to near-vertical fractures, and modeling indicates that COCs could reach the depths described in the SAP. The post-D&D activities around the site, as well as the surface drainage patterns in the area, make it prudent to sample at the surface. Additional sample points in these boreholes will be added to the SAP to cover the interval in which the backfill intersects the tuff. All other sample points will be left as is, which is consistent with the overall Phase I technical approach.

12. **SWMU Nos. 35-003(e, f, g, m, and o), Surface and Subsurface Investigation, page 7-44. Was contamination found when SWMU Nos. 35-003(e, f, g, and o) were removed? More information from the previous D&D (page 3-75) should be provided and this information should be used to create a sampling plan. Boreholes should be located based on best professional judgment where previous spills may have occurred. The area designated as SWMU No. 35-003(m) should be sampled to a depth of 30 ft, or until field screening indicates no contamination, whichever is deeper. Sampling should begin below fill material or at fill/tuff interface.**

All historical information was used to develop the SAPs for this area, and the borehole locations for these SWMUs represent best professional judgment (Figure 7-14). The SWMU No. 35-003(m) investigation will require a borehole to 30 ft (Table 7-5, B-3). Field screening will be used, but this portion of the investigation is to determine the nature and not the extent of contamination. Sampling boreholes beyond 30 ft is unlikely to provide additional information on the <u>nature</u> of COCs at the site. There is no documentation that clean fill was used at the sites for backfill nor how much fill was brought in during D&D. OU 1129 is planning to sample according to the proposed SAP.

13. **Statement on page 7-45. The statement beneath Table 7-5 is contradictory to the table. The table indicates that all samples will be analyzed for all the COCs while the statement indicates that 10 percent of the samples will be analyzed for COCs. All the samples collected from the boreholes should be analyzed for VOCs, metals, PCBs, and SVOCs. A reduction in analysis may be requested from EPA after initial results are reviewed.**

The text under Table 7-5 is misplaced and does not belong with the discussion of Aggregate D and Table 7-5. The text correctly belongs in Section 7.10.1 on page 7-58 of the *RFI Work Plan for OU 1129* . OU 1129 does not contemplate a reduction in analysis for the sampling in Aggregate D, Table 7-5. The *RFI Work Plan for OU 1129* revision will put the text in its proper location.

14. **SWMU No. 35-003(r), Surface and Subsurface Investigation, page 7-46. Text indicates that "To complement the samples taken at the prescribed intervals, samples will be collected from any sections indicating contamination from field screening techniques." Will these additional samples be analyzed for all potential contaminants? Samples which indicate contamination should be analyzed preferentially.**

    Additional samples will be analyzed for all of the same potential contaminants that the samples at prescribed intervals will be analyzed for (Table 7-7). OU 1129 will revise the *RFI Work Plan for OU 1129* accordingly.

15. **SWMU Nos. 35-009(a through d). Subsurface Investigations, page 7-60. Text on this page indicates that the initial 10 percent of sample locations from each SWMU will be analyzed for Level III VOCs, SVOCs, metals, and radioactive contamination, and then analysis may be reduced based on results. Table 7-9 and Section 7.10.3 indicate that all samples will be analyzed for Level III VOCs, SVOCs, metals, and radioactive constituents. LANL shall clarify what analysis will be conducted.**

    The phrase "Initial 10% of" will be deleted from the sentence. All samples will be analyzed according to Table 7-9.

16. **7.12 SWMU Aggregate H, Phase I, page 7-71. Text on page 3-70 indicates that nonradioactive hazardous material may have been emitted from the stack; although this cannot be verified. What are the possible nonradioactive COCs? If this SWMU No. 35-014(a) only has a radioactive component, then it should not be listed as a SWMU.**

    The text on page 3-70 will be revised to reflect that a review of documented stack emissions list no nonradioactive effluents. Although SWMU No. 35-014(a) is a radiological concern only, it is also a listed HSWA SWMU. OU 1129 has chosen to investigate the PCB spills of SWMU No. 35-014(b) along with SWMU No. 35-014(a) for operational efficiency reasons. Analytical requirements listed in Table 7-11 are still valid.

17. **7.14 SWMU Aggregate J, Phase I, page 7-82. SWMU No. 42-001(a through c), and 42-003 are not listed in the HSWA Module VIII.**

    These SWMUs are not on the HSWA list. However, the entire SAP for TA-42 was revised in June 1992 with verbal notification to EPA from DOE/LAAO to allow for characterization to proceed for construction validation of the Nuclear Safeguards Technology Laboratory. This SAP revision was able to incorporate a set of reconnaissance sampling data collected in 1991 by LANL Group EM-8 for RCRA contaminants that were not available when the original *RFI Work Plan for OU 1129* was written. The revised SAP for TA-42 (as implemented in June 1992) will be included in the revised *RFI Work Plan for OU 1129*. The data from the TA-42 investigation last year has been reported to EPA in the LANL Quarterly Report, April-June 1993. The outfall SWMUs in TA-42 will be investigated as part of TA-55 fieldwork. See response to general comment 3c.

18. SWMU Nos. 42-001(a) and 42-002 (a). Subsurface Investigation, page 7-87.

a. Table 7-13 indicates that analysis will conducted for constituents other than radioactive constituents, while text indicates that sample analysis will be limited to radiological constituents. LANL should clarify what analysis will be conducted. Table 7-13 should be corrected to indicate actual analysis planned for all SWMUs in TA-42.

See response for specific comment 17.

b. Was there leakage from the influent line to the septic system? If so, then borehole B-4 should have the same analysis as boreholes B-12 and others, for the septic tank system.

See response for specific comment 17.

19. SWMU No. 42-003, Subsurface Investigations, page 7-95. Were metals previously analyzed at this SWMU? Text on page 7-95 indicates that SVOCs were previously encountered, and text on page 3-82 indicates that possible contaminants included solvents, acids, and greases. For these reasons, a percentage (20%) of the samples collected should be analyzed for metals and SVOCs.

See response for specific comment 17.

20. 7.15 SWMU Aggregate K, Phase I, page 7-99. SWMU No. 48-001 is not listed in the HSWA Module VIII.

The text will be changed to reflect that SWMU No. 48-001 is not listed in the HSWA Module. Sampling activities for TA-48 SWMUs are currently scheduled for July 1993. Initial data will be reported in the October 1993 quarterly report.

21. 7.16.3 Sample Screening and Analysis, page 7-112. LANL might consider using an x-ray Fluorescence for screening metals.

X-ray fluorescence will be used for screening metals in this aggregate and any other aggregate for which metal analysis have been identified. OU 1129 used x-ray fluorescence during the investigations at TA-42 in July 1992 with very good results.

Voluntary Corrective Action (VCA)
Checklist and Field Work Authorization Form

PRS Nos. 35-003(a, b, c, and n) **HSWA or AOC**

__√__ COPC(s) defined.

__√__ Nature and extent Defined or field screening method available to guide where not defined.

__√__ Remedy is obvious.

__√__ Time for removal is less than 6 months.

__√__ Remedy is final.

__√__ Land use assumptions straightforward.

__√__ Treatment, Storage, Disposal Facilities are available for waste type and volume.

__√__ Cleanup cost is reasonable for the planned action, and meets accelerated decision logic criterion for decision to proceed with VCA.

Explain criteria not checked above. _____

Through reviewing the above criteria associated with this site, I believe that a VCA is the appropriate Accelerated Cleanup approach

Allyn Pratt — 3/18/96
Allyn Pratt, FU 4, FPL — Date

Bob Simeone — 3/27/96
Bob Simeone, FPC — Date

The undersigned have reviewed the final plan and believe that it fully satisfies the appropriate Accelerated Cleanup approach.

Allyn Pratt — 3/18/96
Allyn Pratt, FU 4, FPL — Date

Bob Simeone — 3/27/96
Bob Simeone, FPC — Date

Through reviewing the VCA Plan, for site(s) PRS Nos. 35-003(a, b, c, and n), and believing that the above criteria have been met, I authorize the fieldwork to proceed.

3/28/96
DOE ER Program Manager — Date

Attachment 1

Photos

Photo 2.2-1. PRS 35-003(a,b,c and n). Looking south, showing asphalt cover outside of Building 2.

Photo 2.2-2. PRS 35-003(a,b,c and n). Looking west at Building 2 showing asphalt.