LA-UR-07-7696
November 2007
EP2007-0707

Investigation Work Plan for Upper Mortandad Canyon Aggregate Area

Los Alamos
NATIONAL LABORATORY
EST. 1943

Prepared by the Environmental Programs Directorate

LA-UR-07-7696
EP2007-0707

Investigation Work Plan for Upper Mortandad Canyon Aggregate Area

November 2007

Responsible project leader:

Printed Name	Signature	Title	Organization	Date
Kent Rich		Project Leader	Environmental Programs	11/27/07

Responsible LANS representative:

Printed Name	Signature	Title	Organization	Date
Susan G. Stiger		Associate Director	Environmental Programs	11/29/07

Responsible DOE representative:

Printed Name	Signature	Title	Organization	Date
David R. Gregory		Project Director	DOE-LASO	11/29/07

EXECUTIVE SUMMARY

The Upper Mortandad Canyon Aggregate Area is located in Technical Areas (TAs) 03, 42, 48, 50, and 55 at Los Alamos National Laboratory. The Upper Mortandad Canyon Aggregate Area consists of 119 sites, 56 of which have been previously investigated and/or remediated and have been approved for no further action. This investigation work plan identifies and describes the activities needed to complete the investigation of the remaining 63 solid waste management units (SWMUs), areas of concern (AOCs), and consolidated units and to identify the sites where additional sampling is proposed to be delayed until the site becomes inactive, it is decommissioned, or access becomes possible. Details of previous investigations and analytical results for the 63 sites are provided in the historical investigation report for Upper Mortandad Canyon Aggregate Area. Of the 63 sites requiring additional characterization, 20 are located in TA-03, 6 are in TA-42, 17 are in TA-48, 19 are in TA-50, and 1 is in TA-55.

The objective of this work plan is to complete the evaluation of historical data and, based on that evaluation, to propose additional sampling as necessary to define the nature and extent of contamination associated with each SWMU, AOC, and consolidated unit.

CONTENTS

Figures

Tables

Appendixes

1.0 INTRODUCTION

Los Alamos National Laboratory (LANL or the Laboratory) is a multidisciplinary research facility owned by the U.S. Department of Energy (DOE) managed by the Los Alamos National Security, LLC. The Laboratory (Figure 1.0-1) is located in north-central New Mexico, approximately 60 mi northeast of Albuquerque and 20 mi northwest of Santa Fe. The Laboratory site covers 40 mi^2 of the Pajarito Plateau, which consists of a series of finger-like mesas separated by deep canyons containing perennial and intermittent streams running from west to east. Mesa tops range in elevation from approximately 6200 to 7800 ft. The Upper Mortandad Canyon Aggregate Area is shown in Figure 1.0-2.

The solid waste management units (SWMUs), areas of concern (AOCs), and consolidated units addressed in this investigation work plan are potentially contaminated with both hazardous and radioactive components. The New Mexico Environment Department (NMED), pursuant to the New Mexico Hazardous Waste Act (HWA), regulates cleanup of hazardous wastes and hazardous constituents. The DOE regulates cleanup of radioactive contamination, pursuant to DOE Order 5400.5, “Radiation Protection of the Public and the Environment,” and DOE Order 435.1, “Radioactive Waste Management.” Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with DOE policy.

Corrective actions at the Laboratory are subject to the March 1, 2005, Compliance Order on Consent (the Consent Order). This work plan describes proposed work activities that will be executed and completed in accordance with the Consent Order.

1.1 Work Plan Overview

The Upper Mortandad Canyon Aggregate Area SWMUs and AOCs are located in Technical Areas (TAs) 03, 42, 48, 50, and 55 of the Laboratory (Figure 1.0-2) with a total of 119 sites (Table 1.1-1). Historical details of previous investigations and data for all 119 sites are provided in the historical investigation report (HIR) for the Upper Mortandad Canyon Aggregate Area (LANL 2007, 098955). Of the 119 sites, 56 have been investigated and/or remediated and approved for no further action (NFA) status (NFA-approval documents are referenced in Table 1.1-1); these 56 sites are described in the HIR and are not discussed further in this work plan. This work plan addresses the remaining 63 sites using the information from previous field investigations or removal actions to evaluate current conditions at each site.

Section 2 presents the surface and subsurface conditions and the preliminary conceptual site model of the Upper Mortandad Canyon Aggregate Area. Sections 3 through 7 provide summaries of previous investigations and data collected and presents the scope of proposed activities for each site. The sites within the Upper Mortandad Canyon Aggregate Area are wide spread; therefore, they are organized by TA. Each TA subsection includes background information on operational history; summary of releases, transport mechanisms, and potential receptors; and current site use and status of the sites in the TAs. Section 8 provides investigation methods for proposed field activities. Section 9 is an overview of the anticipated schedule of the investigation and reporting activities. Appendix A of this work plan includes a list of acronyms and abbreviations, a glossary, and metric conversion and data qualifier definitions tables. Appendix B describes the management of investigation-derived waste (IDW).

1.2 Work Plan Objectives

The investigation objective for the sites described in this work plan is to determine the nature and extent of any releases from the 63 sites.

To accomplish this objective, this work plan

- presents historical and background information on the sites;
- describes the rationale for proposed data collection activities; and
- identifies and proposes appropriate methods and protocols for collecting, analyzing, and evaluating data to finalize characterization at these sites.

1.3 Data Overview

Samples from previous investigations were analyzed for inorganic chemicals, organic chemicals, and/or radionuclides either on-site by the Chemical Sciences and Technology (CST) Division at the Laboratory, by off-site fixed laboratories, or by both. Data obtained at on-site CST Division laboratories are screening-level-quality data and are used only to select sampling locations and analytical suites; these data are not discussed and are not reported. Only data obtained from off-site fixed laboratories (i.e. decision-level data) are discussed further in the summary of data sections.

Concentrations of detected inorganic chemicals are compared with background values (BVs) and the ranges of background concentrations (LANL 1998, 059730). Concentrations of detected organic chemicals are presented. Activities of detected radionuclides are compared with BVs or fallout values (FVs) and the ranges of the background/fallout activities for radionuclides (LANL 1998, 059730). These data are presented in their entirety in the HIR (LANL 2007, 098955).

This work plan summarizes these data to determine whether the nature and extent of contamination are defined for each site. Furthermore, this work plan proposes sampling activities and analytical suites to be collected at locations and sites where the nature and extent of contamination have not been defined. Sampling intervals are described for all proposed samples, but the volume of sample material collected is not defined because it depends on type of material being sampled, the recovery, and the amount of material required for the analyses requested. Therefore, exact depths are not provided, an only the top depth is given.

2.0 SITE CONDITIONS

2.1 Surface Conditions

2.1.1 Soil

Soil on the Pajarito Plateau was initially mapped and described by Nyhan et al. (1978, 005702). The soil on the slopes between the mesa tops and canyon floors was mapped as mostly steep rock outcrops consisting of approximately 90% bedrock outcrop and patches of shallow, weakly developed colluvial soil. South-facing canyon walls generally are steep and usually have shallow soil in limited, isolated patches between rock outcrops. In contrast, the north-facing canyon walls generally have more extensive areas of shallow, dark-colored soil under thicker forest vegetation. The canyon floors generally contain poorly developed, deep, well-drained soil on floodplain terraces or small alluvial fans (Nyhan et al. 1978, 005702).

The soil on the mesa top in the Upper Mortandad Canyon Aggregate Area belongs generally to the Hackroy series and the Carjo series (Nyhan et al. 1978, 005702). Hackroy soil consists of very shallow to shallow, well-drained, and moderately developed soil with an A-B horizon sequence. Soil textures can range from sandy loams to clay loams. The Carjo series consists of moderately deep, well-drained, and moderately developed soil with an A-B-C horizon sequence. The soil textures of the Carjo series can be very fine sandy loams. The parent material of the soil may range from Bandelier Tuff to sequences of alluvium/colluvium interstratified with moderately developed to well-developed buried soil.

A majority of the natural mesa-top surface soil has been altered by anthropogenic activities. Excavation and fill, paved roads, parking lots, landscaped areas, and buildings have changed the natural soil landscape considerably.

2.1.2 Surface Water

The Rio Grande is the primary river in north-central New Mexico. All surface-water drainage and groundwater discharge from the plateau ultimately arrive at the Rio Grande (Figure 2.1-1). Most surface water in the Los Alamos area occurs as ephemeral, intermittent, or interrupted streams in canyons cut into the Pajarito Plateau. Springs on the flanks of the Jemez Mountains, west of the Laboratory's western boundary, supply flow to the upper reaches of Cañon de Valle and to Guaje, Los Alamos, Pajarito, and Water Canyons (Purtymun 1975, 011787; Stoker 1993, 056021). These springs discharge water perched in the Bandelier Tuff and Tschicoma Formation at rates from 2 to 135 gal./min (Abeele et al. 1981, 006273). The volume of flow from the springs maintains natural perennial reaches of varying lengths in each of the canyons.

The mesa-top portion of the Upper Mortandad Canyon Aggregate Area is currently an industrially developed area. No natural surface water is present in this area. During summer thunderstorms and spring snowmelt, runoff flows from the mesa top down the hillsides and into the intermittent stream in Mortandad Canyon. Surface runoff from the mesa top enters Mortandad Canyon by way of several drainages (LANL 1992, 007672).

2.1.3 Land Use

Currently, land use of the Upper Mortandad Canyon Aggregate Area is industrial. The TAs comprise the core operational and administrative complex of the Laboratory. The area is highly developed with numerous office and Laboratory buildings, utilities, parking facilities, roads, and other paved areas. Most of TA-03 is located on the mesa top west of Mortandad Canyon. Most of TA-42, -48, -50, and -55 are located on the mesa top south of Mortandad Canyon (Figure 1.0-2).

2.2 Subsurface Conditions

2.2.1 Anticipated Stratigraphic Units

The stratigraphy of the Upper Mortandad Canyon Aggregate Area is summarized in this section. Additional information on the geologic setting of the area and information on the Pajarito Plateau can be found in the Laboratory's Hydrogeologic Workplan (LANL 1998, 059599).

The bedrock at or near the surface of the mesa top is the Bandelier Tuff. There are approximately 1250 ft of volcanic and sedimentary materials between any potential contaminant-bearing units at the mesa surface and the regional aquifer. The descriptions begin with the oldest (deepest) and proceed to the youngest (topmost). The stratigraphic units that may be encountered during investigation of the Upper Mortandad Canyon Aggregate Area are described briefly in the following sections and are shown in Figure 2.2-1.

The Bandelier Tuff

The Bandelier Tuff consists of the Otowi and Tshirege Members, which are stratigraphically separated in many places by the tephras and volcaniclastic sediment of the Cerro Toledo interval. The Bandelier Tuff was emplaced during cataclysmic eruptions of the Valles Caldera between 1.61 and 1.22 million yr ago. The tuff is composed of pumice, minor rock fragments, and crystals supported in an ashy matrix. It is a prominent cliff forming unit because of its generally strong consolidation (Broxton and Reneau 1995, 049726).

Otowi Member. Griggs and Hem (1964, 092516), Smith and Bailey (1966, 021584), Bailey et al. (1969, 021498), and Smith et al. (1970, 009752) describe the Otowi Member. It consists of moderately consolidated (indurated), porous, and nonwelded vitric tuff (ignimbrite) that forms gentle colluvium-covered slopes along the base of canyon walls. The Otowi ignimbrites contain light gray to orange pumice that is supported in a white to tan ash matrix (Broxton et al. 1995, 050121; Broxton et al. 1995, 050119; Goff 1995, 049682). The ash matrix consists of glass shards, broken pumice, and crystal fragments, and fragments of perlite.

The Guaje Pumice Bed. The Guaje Pumice Bed occurs at the base of the Otowi Member, making a significant and extensive marker horizon. The Guaje Pumice Bed (Bailey et al. 1969, 021498; Self et al. 1986, 021579) contains well-sorted pumice fragments whose mean size varies between 0.8 and 1.6 in. Its thickness averages approximately 28 ft below most of the plateau, with local areas of thickening and thinning. Its distinctive white color and texture make it easily identifiable in borehole cuttings and core, and it is an important marker bed for the base of the Bandelier Tuff.

Tephras and Volcaniclastic Sediment of the Cerro Toledo Interval. The Cerro Toledo interval is an informal name given to a sequence of volcaniclastic sediment and tephra of mixed provenance that separates the Otowi and Tshirege Members of the Bandelier Tuff (Broxton et al. 1995, 050121; Goff 1995, 049682; Broxton and Reneau 1995, 049726). Although it is located between the two members of the Bandelier Tuff, it is not considered part of that formation (Bailey et al. 1969, 021498). Outcrops of the Cerro Toledo interval generally occur wherever the top of the Otowi Member appears in Mortandad Canyon and in canyons to the north. The unit contains primary volcanic deposits described by Smith et al. (1970, 009752), as well as reworked volcaniclastic sediment. The occurrence of the Cerro Toledo interval is widespread; however, its thickness is variable, ranging between several feet and more than 100 ft.

The predominant rock types in the Cerro Toledo interval are rhyolitic tuffaceous sediment and tephra (Heiken et al. 1986, 048638; Stix et al. 1988, 049680; Broxton et al. 1995, 050121; Goff 1995, 049682). The tuffaceous sediment is the reworked equivalents of Cerro Toledo rhyolite tephra. Oxidation and clay-rich horizons indicate that at least two periods of soil development occurred within the Cerro Toledo deposits. Because the soil is rich in clay, it may act as a barrier to the movement of vadose zone moisture. Some of the deposits contain both crystal-poor and crystal-rich varieties of pumice. The pumice deposits tend to form porous and permeable horizons within the Cerro Toledo interval, and locally, may provide important pathways for moisture transport in the vadose zone. A subordinate lithology within the Cerro Toledo interval includes clast-supported gravel, cobble, and boulder deposits derived from the Tschicoma Formation (Broxton et al. 1995, 050121; Goff 1995, 049682; Broxton and Reneau 1996, 055429).

Tshirege Member. The Tshirege Member is the upper member of the Bandelier Tuff and is the most widely exposed bedrock unit of the Pajarito Plateau (Griggs and Hem 1964, 092516; Smith and Bailey 1966, 021584; Bailey et al. 1969, 021498; Smith et al. 1970, 009752). Emplacement of this unit occurred during eruptions of the Valles Caldera approximately 1.2 million yr ago (Izett and Obradovich 1994, 048817; Spell et al. 1996, 055542). The Tshirege Member is a multiple-flow, ash-and-pumice sheet that forms the prominent cliffs in most of the canyons on the Pajarito Plateau. It is a chemical cooling unit whose physical properties vary vertically and laterally. The consolidation in this member is largely from compaction and welding at high temperatures after the tuff was emplaced. Its light brown, orange-brown, purplish, and white cliffs have numerous, mostly vertical fractures that may extend from several feet up to several tens of feet. The Tshirege Member includes thin but distinctive layers of bedded, sand-sized particles called surge deposits that demark separate flow units within the tuff. The Tshirege Member is generally over 200 ft thick.

The Tshirege Member differs from the Otowi Member most notably in its generally greater degree of welding and compaction. Time breaks between the successive emplacement of flow units caused the tuff to cool as several distinct cooling units. For this reason, the Tshirege Member consists of at least four cooling subunits that display variable physical properties vertically and horizontally (Smith and Bailey 1966, 021584; Crowe et al. 1978, 005720; Broxton et al. 1995, 050121). The welding and crystallization variability in the Tshirege Member produce recognizable vertical variations in its properties, such as density, porosity, hardness, composition, color, and surface-weathering patterns. The subunits are mappable based on a combination of hydrologic properties and lithologic characteristics.

Broxton et al. (1995, 050121) provide extensive descriptions of the Tshirege Member cooling units. The following paragraphs describe, in ascending order, subunits of the Tshirege Member.

The Tsankawi Pumice Bed forms the base of the Tshirege Member. Where exposed, it is commonly 20 to 30 in. thick. This pumice-fall deposit contains moderately well-sorted pumice lapilli (diameters reaching about 2.5 in.) in a crystal-rich matrix. Several thin ash beds are interbedded with the pumice-fall deposits.

Subunit Qbt 1g is the lowermost tuff subunit of the Tshirege Member. It consists of porous, nonwelded, and poorly sorted ash-flow tuff. This unit is poorly indurated but nonetheless forms steep cliffs because of a resistant bench near the top of the unit; the bench forms a harder, protective cap over the softer underlying tuff. A thin (4 to 10 in.), pumice-poor surge deposit commonly occurs at the base of this unit.

Subunit Qbt 1v forms alternating cliff-like and sloping outcrops composed of porous, nonwelded, crystallized tuff. The base of this unit is a thin, horizontal zone of preferential weathering that marks the abrupt transition from glassy tuff below (in Unit Qbt 1g) to the crystallized tuff above. This feature forms a widespread marker horizon (locally termed the vapor-phase notch) throughout the Pajarito Plateau that is readily visible in canyon walls in parts of Mortandad Canyon. The lower part of Qbt 1v is orange-brown, resistant to weathering, and has distinctive columnar (vertical) joints; hence, the term “colonnade tuff” is appropriate for its description. A distinctive white band of alternating cliff- and slope-forming tuffs overlies the colonnade tuff. The tuff of Qbt 1v is commonly nonwelded (pumices and shards retain their initial equant shapes) and have an open, porous structure.

Subunit Qbt 2 forms a distinctive, medium-brown, vertical cliff that stands out in marked contrast to the slope-forming, lighter-colored tuff above and below. It displays the greatest degree of welding in the Tshirege Member. A series of surge beds commonly mark its base. It typically has low porosity and permeability relative to the other units of the Tshirege Member.

Subunit Qbt 3 is a nonwelded to partially welded, vapor-phase altered tuff that forms the upper cliffs in Mortandad Canyon. Its base consists of a purple-gray, unconsolidated, porous, and crystal-rich nonwelded tuff that forms a broad, gently sloping bench developed on top of Qbt 2. Abundant fractures extend through the upper units of the Bandelier Tuff, including the ignimbrite of the unit 3 of the Tshirege. The origin of the fractures has not been fully determined, but the most probable cause is brittle failure of the tuff caused by cooling contraction soon after initial emplacement (Vaniman 1991, 009995.1; Wohletz 1995, 054404).

2.2.2 Hydrogeology

The hydrogeology of the Pajarito Plateau is generally separable in terms of mesas and canyons forming the plateau. Mesas are generally devoid of water, both on the surface and within the rock forming the mesa. Canyons range from wet to relatively dry; the wettest canyons contain continuous streams and contain perennial groundwater in the canyon-bottom alluvium. Dry canyons have only occasional streamflow and may lack alluvial groundwater. Intermediate perched groundwater has been found at certain locations on the plateau at depths ranging between 100 and 400 ft. The regional aquifer is found at depths of about 600 to 1200 ft.

The hydrogeologic conceptual site model (LANL 1998, 059599) shows that, under natural conditions, relatively small volumes of water move beneath mesa tops because of low rainfall, high evaporation, and efficient water use by vegetation. Atmospheric evaporation may extend into mesas, further inhibiting downward flow.

2.2.2.1 Groundwater

In the Los Alamos area, groundwater occurs as (1) water in shallow alluvium in some of the larger canyons, (2) intermediate perched groundwater (a perched groundwater body lies above a less permeable layer and is separated from the underlying aquifer by an unsaturated zone), and (3) the regional aquifer. Numerous wells have been installed at the Laboratory and in the surrounding area to investigate the presence of groundwater in these zones and to monitor groundwater quality. The locations of the existing wells within the vicinity of the Upper Mortandad Canyon Aggregate Area are shown in Figure 2.2-2.

The Laboratory formulated a comprehensive groundwater protection plan (LANL 1995, 050124) for an enhanced set of characterization and monitoring activities. The approved Hydrogeologic Workplan (LANL 1998, 059599) details the implementation of extensive groundwater characterization across the Pajarito Plateau within an area potentially affected by past and present Laboratory operations.

Alluvial Groundwater

Intermittent and ephemeral streamflow in the canyons of the Pajarito Plateau have deposited alluvium that can be as thick as 100 ft. The alluvium in canyons of the Jemez Mountains is generally composed of sand, gravel, pebbles, cobbles, and boulders derived from the Tschicoma Formation and Bandelier Tuff. The alluvium in canyons is finer grained, consisting of clay, silt, sand, and gravel derived from the Bandelier Tuff.

In contrast to the underlying volcanic tuff and sediment, alluvium is relatively permeable. Ephemeral runoff in some canyons infiltrates the alluvium until downward movement is impeded by the less permeable tuff and sediment, which results in the buildup of a shallow alluvial groundwater body. Depletion by evapotranspiration and movement into the underlying rock limit the horizontal and vertical extent of the alluvial water (Purtymun et al. 1977, 011846). The limited saturated thickness and extent of the alluvial groundwater preclude its use as a viable source of water for municipal and industrial needs. Lateral flow of the alluvial perched groundwater is in an easterly, downcanyon direction (Purtymun et al. 1977, 011846).

Regional Aquifer

The regional aquifer of the Los Alamos area is the only aquifer capable of large-scale municipal water supply (Purtymun 1984, 006513). The surface of the regional aquifer rises westward from the Rio Grande within the Santa Fe Group into the lower part of the Puye Formation beneath the central and western part of the Pajarito Plateau. The depths to groundwater below the mesa tops range between about 1200 ft along the western margin of the plateau and about 600 ft at the eastern margin. The location of wells and generalized water-level contours on top of the regional aquifer are described in the 2007 General Facility Information report (LANL 2007, 095364). The regional aquifer is typically separated from the alluvial groundwater and intermediate perched zone groundwater by 350 to 620 ft of tuff, basalt, and sediments (LANL 1993, 023249).

Groundwater in the regional aquifer flows east-southeast, toward the Rio Grande. The velocity of groundwater flow ranges from about 20 to 250 ft/yr (LANL 1998, 058841, p. 2-7). Details of depths to the regional aquifer, flow directions and rates, and well locations are presented in various Laboratory documents (Purtymun 1995, 045344; LANL 1997, 055622; LANL 2000, 066802).

2.2.2.2 Vadose Zone

The unsaturated zone from the mesa surface to the top of the regional aquifer is referred to as the vadose zone. The source of moisture for the vadose zone is precipitation, but much of it runs off, evaporates, or is absorbed by plants. The subsurface vertical movement of water is influenced by properties and conditions of the materials that make up the vadose zone.

Although water moves slowly through the unsaturated tuff matrix, it can move rapidly through fractures if saturated conditions exist (Hollis et al. 1997, 063131). Fractures may provide conduits for fluid flow but probably only in discrete, disconnected intervals of the subsurface. Because they are open to the passage of both air and water, fractures can have both wetting and drying effects, depending on the relative abundance of water in the fractures and the tuff matrix.

The Bandelier Tuff is very dry and does not readily transmit moisture. Most of the pore spaces in the tuff are of capillary size and have a strong tendency to hold water against gravity by surface-tension forces. Vegetation is very effective at removing moisture near the surface. During the summer rainy season when rainfall is highest, near-surface moisture content is variable because of higher rates of evaporation and of transpiration by vegetation, which flourishes during this time.

The various units of the Bandelier Tuff tend to have relatively high porosities. Porosity ranges between 30% and 60% by volume, generally decreasing for more highly welded tuff. Permeability varies for each cooling unit of the Bandelier Tuff. The moisture content of native tuff is low, generally less than 5% by volume throughout the profile (Kearl et al. 1986, 015368; Purtymun and Stoker 1990, 007508).

2.3 Conceptual Site Model

The sampling proposed in this plan uses a conceptual site model to predict areas of potential contamination and allow for adequate characterization of these areas. A conceptual site model describes potential contaminant sources, transport mechanisms, and receptors.

2.3.1 Potential Contaminant Sources

Releases at the sites may have occurred as a result of air emissions; potential leaks from septic systems, sumps, tanks, waste lines, and drains; discharges from cooling towers and outfalls; and releases from storage areas, firing sites, and an incinerator. Previous sampling results indicate contamination from inorganic chemicals, organic chemicals, and radionuclides (LANL 2007, 098955). Additional sampling is needed to determine the nature and extent of contamination.

2.3.2 Potential Contaminant Transport Mechanisms

Current potential transport mechanisms that may lead to exposure include

- dissolution and/or particulate transport of surface contaminants during precipitation and runoff events,
- airborne transport of contaminated surface soil,
- continued dissolution and advective/dispersive transport of chemical contaminants contained in subsurface soil and tuff as a result of past operations,
- disturbance of contaminants in shallow soil and subsurface tuff by Laboratory operations, and
- disturbance and uptake of contaminants in shallow soil by plants and animals.

2.3.3 Potential Receptors

Potential receptors at one or more of the sites may include

- Laboratory workers,
- construction workers, and
- plants and animals both on-site and in areas immediately surrounding the sites.

2.3.4 Cleanup Standards

As specified in Section VII.B.1 of the Consent Order, the screening levels will be used as soil cleanup levels unless they are determined to be impracticable or unless values do not exist for the current and reasonably foreseeable future land use. The soil screening values for industrial and construction worker scenarios are provided in Table 2.3-1 for inorganic and organic chemicals that were previously detected. The screening action levels for industrial and construction worker scenarios are provided in Table 2.3-2 for radionuclides that were previously detected.

3.0 TA-03

3.1 Background

TA-03 is located on the western end of South Mesa and is almost completely developed. The core operational facilities for the Laboratory are located at TA-03, including the principal administration buildings, library, the Chemistry and Metallurgy Research (CMR) Building, Beryllium Technology Facility, a gas-fired electrical generating plant, and a former sanitary wastewater treatment plant and supporting structures. Figure 3.1-1 shows the site features for TA-03.

Ten AOCs, six SWMUs, and two consolidated units located in TA-03 are addressed in this work plan.

3.1.1 Operational History

TA-03 was built originally as a firing site before 1945. It contained several wooden structures that served as an administration building, a shop, hutments (10 x 10 ft fiberboard buildings used for storage, minor assembly, and checkout of scientific hardware), and magazines. The area also contained a burn pit for destroying explosives (LASL 1947, 005581). The site was decommissioned and cleared in 1949.

In 1950, construction began on the major buildings at TA-03 to replace operational facilities in the Los Alamos townsite. The Van de Graaf accelerator was built on the rim of Two Mile Canyon. The CMR Building (building 03-0029), built in 1952, is a large laboratory facility that houses diverse chemical and metallurgical operations involving plutonium, uranium, other radionuclides, metals, inorganic and organic chemicals, acids, and solvents.

The Administration Building was completed in 1956. In addition to offices, it housed laboratory and shop facilities and extensive photographic operations. In 1959, the Sigma Building (building 03-0066) was completed at the eastern end of the site. The building houses a complex array of equipment and activities concerned with metallurgical and ceramics research and fabrication. Construction of new facilities continued through the 1960s and 1970s. Office buildings, shops, storage areas, an addition to the wastewater treatment plan, a cement batch plant, and numerous transportable buildings filled the areas between the initial buildings. More recent constructions included the Oppenheimer Study Center in 1977, the Otowi Building, an annex to the Administration Building, in 1981, a computer facility, and several national centers for various scientific activities in the 1990s. A parking structure was completed in 2006.

The Upper Mortandad Canyon Aggregate Area includes only part of TA-03. The SWMUs, AOCs, and consolidated units that drain to Los Alamos Canyon are discussed in the work plan for Upper Los Alamos Canyon Aggregate Area (LANL 2006, 091916). The SWMUs, AOCs, and consolidated units that drain to Sandia Canyon will be discussed in the work plan for Upper Sandia Canyon Aggregate Area.

3.1.2 Summary of Releases, Transport Mechanisms, and Potential Receptors

Summary of Releases. Despite diverse activities, facilities at TA-03 have never contained or released significant amounts of hazardous constituents (LANL 1993, 020947). Radionuclides were and are used in experimental amounts. Releases to the environment have been only occasional short-term spills of low concentrations that were cleaned up quickly. However, potential contaminants at TA-03 may have been released into the environment through drainages, outfalls, or firing sites; may have been inadvertently released as liquid spills, leaks, or spattering to surface soil from storage areas, and storage tanks; or may have been released as operational releases.

Transport Mechanisms. No natural surface-water bodies are present in TA-03. During summer thunderstorms and spring snowmelt, runoff from the mesa top flows into storm drains and down hillsides and into an intermittent stream in Mortandad Canyon. Surface-water runoff and erosion of contaminated surface soil could lead to contamination of bench areas on the hillside and surface water off-site. Surface water may also access subsurface contaminants exposed by soil erosion.

The thickness of the unsaturated zone beneath TA-03 indicates that migration of contaminants from the mesa top to the regional aquifer is unlikely. However, recent studies have shown that infiltration of some contaminants may have occurred (LANL 2006, 094161). Although migration to groundwater is possible, this work plan will only address collection of soil and tuff samples. Groundwater sampling for Mortandad Canyon is addressed in Mortandad Canyon investigation report (LANL 2006, 094161).

Other potential transport mechanisms include

- airborne transport of contaminated surface soil,
- infiltration through the vadose zone,
- continued dissolution and advective/dispersive transport of chemical and radiological contaminants contained in subsurface soil and bedrock,
- disturbance and uptake of contaminants in shallow soil by plants and animals, and
- site disturbance through human activities.

Potential receptors at one or more of the sites may include

- Laboratory workers,
- construction workers, and
- ecological receptors in the nondeveloped areas (i.e., hillsides).

3.1.3 Current Site Usage and Status

TA-03 is almost completely developed. Roads and large paved parking areas surround the buildings. Unpaved areas are usually landscaped. Several building complexes are fenced for controlled access.

3.2 AOC 03-003(e)—Storage Area (Transformers)

AOC 03-003(e) is an area in the basement of the CMR Building (building 03-0029) where 13 polychlorinated biphenyl (PCB)-containing transformers were formerly located. The transformers, which had PCB ID numbers 85.5567 through 85.5579, contained PCB concentrations greater than 500,000 parts per million (ppm). Therefore, the transformers were regulated under Toxic Substances Control Act (TSCA). The PCB transformers were removed in 1989 and 1990 in accordance with the DOE/Albuquerque Operations Office Environmental Restoration and Waste Management Five-Year Plan (LANL 1995, 057590). Under this plan, any evidence of a release was sampled and cleaned up in accordance with TSCA requirements (40 Code of Federal Regulations [CFR] 761). Because no stains were visible on the concrete basement floor after the transformers were removed, the area was considered free of contamination (LANL 1995, 057590).

The site features of AOC 03-003(e) are shown in Figure 3.2-1.

3.2.1 Summary of Previous Investigations for AOC 03-003(e)

No Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) activities have been conducted at this AOC.

3.2.2 Summary of Data for AOC 03-003(e)

There are no decision-level data available for this AOC.

3.2.3 Scope of Activities for AOC 03-003(e)

AOC 03-003(e) is located within a basement of a building that is currently active; therefore, no sampling activities are proposed. It is proposed that site characterization and investigation be delayed until future decontamination and decommissioning (D&D) of the building has been completed.

3.3 AOC 03-003(i)—Storage Area (Transformers)

AOC 03-003(i) is the former location of a PCB-containing transformer in a vault beneath the Cryogenics Building (building 03-0032). The transformer, which had PCB ID number 85.5551, contained PCB concentrations greater than 500,000 ppm. Therefore, the transformer was regulated under TSCA. In September 1992, the PCB transformer was removed in accordance with the DOE/Albuquerque Operations Office Environmental Restoration and Waste Management Five-Year Plan (LANL 1995, 057590). Under this plan, any evidence of a release was sampled and cleaned up in accordance with TSCA requirements (40 CFR 761). Following the removal of the transformer, three large concrete slabs and three 55-gal. drums of soil and debris were also removed from the vault and were taken to the Laboratory's waste disposal site at TA-54, Area G (LANL 1995, 057590).

The site features of AOC 03-003(i) are shown in Figure 3.3-1.

3.3.1 Summary of Previous Investigations for AOC 03-003(i)

No RFI activities have been conducted at this AOC.

Swipes of the concrete collected by the Laboratory’s Environmental Management Division revealed PCB concentrations up to 94 µg/100 cm^2. However, a soil sample collected below the concrete slabs contained PCBs at a concentration of 0.27 ppm, which is below the TSCA cleanup standard of 10 ppm (LANL 1995, 057590).

3.3.2 Summary of Data for AOC 03-003(i)

There are no decision-level data available for this AOC.

3.3.3 Scope of Activities for AOC 03-003(i)

Sampling activities are not proposed for AOC 03-003(i) because the source and the vault have been removed. The former area is currently a loading dock. It is proposed that site characterization and investigation be delayed until future D&D of the building.

3.4 AOC 03-004(c)—Storage Area

AOC 03-004(c) is an active 85-ft x 50-ft dumpster storage area at the main loading dock of the CMR Building (building 03-0029). The area is level and paved with asphalt. Two dumpsters occupy the area. The dumpsters are used to stage boxed low-level waste (LLW) before disposal. The waste is generated from offices and material-handling areas in the CMR Building. One dumpster receives compactable waste, and the other receives noncompactable waste. Waste consists of gloves, paper products, glass, plastic, and metal. Runoff from the dumpster storage area flows to a storm drain inlet grate about 50 ft southwest of the area. The storm drain eventually discharges at an outfall [AOC 03-054(e)] in Upper Mortandad Canyon (LANL 1995, 057590).

The site features of AOC 03-004(c) are shown in Figure 3.2-1.

3.4.1 Summary of Previous Investigations for AOC 03-004(c)

An RFI was conducted at this site in July 1997. Samples were collected and field screened for organic chemicals and radioactivity. Screening results did not indicate the presence of organic chemicals, and radioactivity was at or below background. Samples were analyzed for target analyte list (TAL) metals, semi-volatile organic chemicals (SVOCs), and volatile organic chemicals (VOCs). The RFI activities and results were presented in the RFI report (LANL 1997, 056660.289). Section 2.3.1 of the HIR provides the details of previous investigations (LANL 2007, 098955).

3.4.2 Summary of Data for AOC 03-004(c)

A summary of the decision-level data for AOC 03-004(c) is presented below. Section 2.3.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 3.4-1 presents the analytical suite for each sample and Figure 3.2-1 shows the sampling locations.

- Samples from five locations were analyzed for TAL metals. Analytical results indicated that antimony, cadmium, calcium, and silver were either detected above the BVs or had detection limits above the BVs (Table 3.4-2). Figure 3.4-1 shows the analytical results and their locations.
- Samples from five locations were analyzed for SVOCs. Analytical results indicated that benzo(b)fluoranthene, benzo(k)fluoranthene, fluoranthene, phenanthrene, and pyrene were detected at location 03-03303 (Table 3.4-3). Figure 3.4-2 shows the analytical results and their locations.
- One sample was analyzed for VOCs. No VOCs were detected.

3.4.3 Scope of Activities for AOC 03-004(c)

The proposed sampling locations at AOC 03-004(c) are shown in Figure 3.4-3. Table 3.4-4 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at AOC 03-004(c) will consist of the following activities:

- Soil and tuff samples will be collected at seven sampling locations from three depth intervals: beneath the asphalt, at the soil/tuff interface interval, and the interval beginning 5 ft below the soil/tuff interface. Three of the sampling locations are adjacent to the dumpsters, and four of the sampling locations are downgradient of the two dumpsters.

Samples will be analyzed at off-site fixed laboratories for TAL metals, isotopic uranium, isotopic plutonium, SVOCs, VOCs (in samples deeper than 0.5 ft below ground surface [bgs]), perchlorate, tritium, nitrate, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the storage area.

3.5 AOC 03-004(d)—Storage Area

AOC 03-004(d) is a former 75-ft x 20-ft dumpster storage area located on a level, asphalt-covered surface south of the steps at the west end of Wing 9 at the CMR Building (building 03-0029). Runoff from this AOC flows to a storm drain inlet grate located approximately 100 ft west of the area. The storm drain discharges at an outfall [AOC 03-054(e)] into Upper Mortandad Canyon. The dumpster located at

AOC 03-004(d) was relocated in 1992 to inside Wing 9 of the CMR Building. It typically received contact-handled waste generated from operations of Wing 9 hot cells. The waste was comprised of rags, small hardware, paper, machine-shop waste, cleaning materials, and occasionally a decontaminated hot-cell item. All waste was bagged and boxed before it was placed in the dumpster.

The site features of AOC 03-004(d) are shown in Figure 3.2-1.

3.5.1 Summary of Previous Investigations for AOC 03-004(d)

An RFI was conducted at this site in July 1997. Samples were collected and field screened for organic chemicals and radioactivity. Screening results were negative for organic chemicals, and radioactivity was at or below background. Samples were analyzed for TAL metals, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, SVOCs, and VOCs. The RFI activities and results were presented in the RFI report (LANL 1997, 056660.289). Section 2.4.1 of the HIR provides the details of previous investigations (LANL 2007, 098955).

3.5.2 Summary of Data for AOC 03-004(d)

A summary of the decision-level data for AOC 03-004(d) is presented below. Section 2.4.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 3.5-1 presents the analytical suite for each sample, and Figure 3.2-1 shows the sampling locations.

- Eight samples from six locations were analyzed for TAL metals. Analytical results indicated that antimony, cadmium, calcium, chromium, lead, silver, thallium, and zinc were either detected above BVs or had detection limits above BVs (Table 3.5-2). Calcium, chromium, lead, silver, and zinc were detected at concentrations greater than the range of background concentrations. Figure 3.4-1 shows the analytical results and their locations.
- Seven samples from seven locations were analyzed for gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Analytical results indicated that cesium-137, plutonium-238, and plutonium-239/plutonium-240 were detected at depths where FVs do not apply (Table 3.5-3). Figure 3.5-1 shows the analytical results and their locations.
- Eight samples from six locations were analyzed for SVOCs. Analytical results indicated that anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, carbazole, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene were detected in at least one surface sample (Table 3.5-4). Figure 3.4-2 shows the analytical results and their locations.
- One sample was analyzed for VOCs. No VOCs were detected.

3.5.3 Scope of Activities for AOC 03-004(d)

The proposed sampling locations at AOC 03-004(d) are shown in Figure 3.5-2. Table 3.5-5 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at AOC 03-004(d) will consist of the following activities:

- Soil and tuff samples will be collected at seven sampling locations from three depth intervals: beneath the asphalt, at the soil/tuff interface interval, and the interval beginning 5 ft below the soil/tuff interface. Three of the sampling locations are within the former dumpster storage area and four are downgradient of the former storage area.

Samples will be analyzed at off-site fixed laboratories for TAL metals, isotopic uranium, isotopic plutonium, tritium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), perchlorate, nitrate, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the storage area.

3.6 AOC 03-007—Firing Site

AOC 03-007 is a decommissioned firing site located southwest of the Beryllium Technology Facility (building 03-0141) within the security fence at the Sigma Complex. This AOC includes a containment building for explosive experiments (building 03-0159) and a personnel safety barrier (structure 03-0160). Building 03-0159 sits on an 8 x 8 ft concrete slab and has 6-in.-thick x 8-ft high walls. An opening on one side serves as an entrance. Structure 03-0160 sits on a concrete slab and has two 8-ft-high x 4-ft-wide x 6-in.-thick walls. From 1970 to 1975, approximately 50 to 75 explosive shot experiments were detonated within building 03-0159. The building was rinsed with water after each shot. Wash-down water from within building 03-0159 was released to the environment (soil immediately surrounding the building) from engineered gaps between the concrete floor and structure walls. The rinse water drained into small drainages and catchment areas and eventually flowed into Mortandad Canyon. The site was remediated in the late 1970s, and no explosive compounds were detected (LANL 1995, 057590). In the mid-1980s, building 03-0159 was modified to serve as a storage building for thoria (oxide) and thorium (metal), which were containerized within the building (LANL 1995, 057590).

The site features of AOC 03-007 are shown in Figure 3.3-1.

3.6.1 Summary of Previous Investigations for AOC 03-007

An RFI was conducted at this site in July 1997. Samples were collected on the north, east, and south sides of building 03-0159 and were field screened for organic chemicals and radioactivity. Screening results indicated that organic chemicals were not detected, and radioactivity was at or below local background. Samples were analyzed for TAL metals, gamma-emitting radionuclides, isotopic thorium, explosive compounds, SVOCs, and VOCs. The RFI activities and results were presented in the RFI report (LANL 1997, 056660.289). Section 2.5.1 of the HIR provides the details of previous investigations (LANL 2007, 098955).

3.6.2 Summary of Data for AOC 03-007

A summary of the decision-level data for AOC 03-007 is presented below. Section 2.5.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 3.6-1 presents the analytical suite for each sample, and Figure 3.3-1 shows the sampling locations.

- Samples from four locations were analyzed for TAL metals. Analytical results indicated that cadmium was detected above the range of background concentrations in at least one sample (Table 3.6-2). Antimony and silver had detection limits above BVs. Figure 3.6-1 presents the analytical results and their locations.
- Samples from four locations were analyzed for isotopic thorium. One sample (location 03-03313) was analyzed for gamma-emitting radionuclides. Analytical results indicated that cesium-137 was detected at one location in the surface sample (Table 3.6-3). Figure 3.6-2 presents the analytical results and their locations.

- Samples from four locations were analyzed for SVOCs. Analytical results indicated that benzoic acid was detected at one location (Table 3.6-4). Figure 3.6-3 presents the analytical results and their locations.
- Samples from four locations were analyzed for explosive compounds. Explosive compounds were not detected in any of the samples.
- Samples from two locations were analyzed for VOCs. VOCs were not detected in any of the samples.

3.6.3 Scope of Activities for AOC 03-007

The proposed sampling locations at AOC 03-007 are shown in Figure 3.6-4. Table 3.6-5 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at AOC 03-007 will consist of the following activities:

- Soil and tuff samples will be collected at nine locations from three depth intervals: the surface interval, the soil/tuff interface interval, and the interval beginning 5 ft below the soil/tuff interface at locations downgradient of the former firing site.
- Sediment samples will be collected at two locations from two depth intervals: surface sediment within the drainage and at the soil/tuff interface interval. The sampling locations will be downslope of the firing site in sediment pockets.

Samples will be analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, isotopic uranium, isotopic plutonium, isotopic thorium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), tritium, explosive compounds, dioxins, furans, cyanide, and pH, and by gamma spectroscopy. Samples will not be analyzed for PCBs because they are not related to the historical operations of the firing site.

3.7 AOC 03-014(w)—Floor Drain in CMR Building

AOC 03-014(w) is a floor drain in the CMR Building (building 03-0029). The drain was installed in 1953 and became inactive in 1991. Effluent from the CMR Building darkroom operations, including spent photographic solutions, may have been discharged to this floor drain (LANL 1993, 020947). The drain was connected to the sanitary sewer and the former TA-03 Waste Water Treatment Plant (WWTP). Currently, the floor drain is plugged.

The site features of AOC 03-014(w) are shown in Figure 3.2-1.

3.7.1 Summary of Previous Investigations for AOC 03-014(w)

No RFI activities have been conducted at this AOC.

3.7.2 Summary of Data for AOC 03-014(w)

There are no decision-level data available for this AOC.

3.7.3 Scope of Activities for AOC 03-014(w)

Sampling activities are not proposed for AOC 03-014(w) because it is located within a building that is currently active. It is proposed that site characterization and investigation be delayed until future D&D of the building.

3.8 AOC 03-014(x)—Floor Drain in Sigma Building

AOC 03-014(x) is an active floor drain in the Sigma Building (building 03-0066). The drain was installed in 1959. Effluent from the Sigma Building may have included spent photo-processing solutions. The drain was connected to the sanitary sewer and former TA-03 WWTP. The TA-03 WWTP was taken offline in 1992 when the TA-46 Sanitary Waste Systems Consolidation (SWSC) plant came online. All sewer lines currently flow to the SWSC.

The site features of AOC 03-014(x) are shown in Figure 3.3-1.

3.8.1 Summary of Previous Investigations for AOC 03-014(x)

No RFI activities have been conducted at this AOC.

3.8.2 Summary of Data for AOC 03-014(x)

There are no decision-level data available for this AOC.

3.8.3 Scope of Activities for AOC 03-014(x)

Sampling activities are not proposed for AOC 03-014(x) because it is an active drain location in a building that is currently active. It is proposed that site characterization and investigation be delayed until future D&D of the building.

3.9 AOC 03-026(a)—Sump

AOC 03-026(a) is an active sump located in the southeast corner of an open pump pit directly adjacent to and west of the SWMU 03-037 holding tanks. The sump was installed to contain any liquid accumulated in the pump pit. Any liquid in the sump was/is pumped to the acid waste line. The pump pit contains two electrically driven pumps that are used to evacuate waste fluids from the holding tanks. The pump pit measures 12-ft long x 10.7-ft wide x 8.5-ft deep, with 8-in.-thick concrete walls. The west edge of the pump pit is about 3 ft from the west wall of the Sigma Building (building 03-0066). No releases from the sump have been reported (LANL 1993, 020947).

The site features of AOC 03-026(a) are shown in Figure 3.3-1.

3.9.1 Summary of Previous Investigations for AOC 03-026(a)

No RFI activities have been conducted at this AOC.

3.9.2 Summary of Data for AOC 03-026(a)

There are no decision-level data available for this AOC.

3.9.3 Scope of Activities for AOC 03-026(a)

Sampling activities are not proposed for AOC 03-026(a) because it is located in a building that is currently active. It is proposed that site characterization and investigation be delayed until future D&D of the building.

3.10 SWMU 03-026(c)—Aboveground Holding Tanks

SWMU 03-026(c) is identified in the 1990 SWMU report as 11 sumps located at the base of cooling towers in the CMR Building (building 03-0029) that receive blow-down from the cooling tower (LANL 1990, 007511). However, SWMU 03-026(c) is actually composed of active aboveground holding tanks in the basement of the CMR Building (LANL 1995, 057590). The tanks are associated with chilled water systems in Wings 2, 3, 4, 5, and 7. The water chillers are located on the first floor. Chilled water is piped to each laboratory for circulation in equipment. Returning water is piped to the basement where it empties into aboveground tanks. There are five holding tanks in each wing, each approximately 16 ft long and 4 ft in diameter. Adjacent to each holding tank are two pumps that recirculate the water to the chillers. Pipes run from the tanks to floor drains connected to the radioactive liquid waste (RLW) line. Each tank is designed to discharge to the RLW line via the floor drain if both of the tank's recirculating pumps fail.

The site features of SWMU 03-026(c) are shown in Figure 3.2-1.

3.10.1 Summary of Previous Investigations for SWMU 03-026(c)

No RFI activities have been conducted at this SWMU.

3.10.2 Summary of Data for SWMU 03-026(c)

There are no decision-level data available for this SWMU.

3.10.3 Scope of Activities for SWMU 03-026(c)

Sampling activities are not proposed for AOC 03-026(c) because it is an active system located in a building that is currently active. It is proposed that site characterization and investigation be delayed until future D&D of the building.

3.11 SWMU 03-031—Radioactive Liquid Waste System in CMR Building

SWMU 03-031 is an inactive RLW collection system in the CMR Building (building 03-0029). The system consists of double-encased stainless-steel vaults, tanks, and drainlines that discharge to the RLW line for treatment at TA-50. Operations at the CMR Building drain liquid radioactive waste through sumps and tanks to the RLW line. Two 10,800-gal. concrete tanks and associated sumps are located in the basement. Engineering drawings illustrating the construction of the CMR Building show two 10,800-gal. tanks sited in the basement of each of five wings. The tanks in each wing are adjacent to each other and are made of 6-in.-thick concrete walls. The tanks are 10 ft long x 6 ft wide x 6 ft high. Although the tanks were designed as holding tanks, they are used primarily as a pass-through system. The valve at the bottom of each tank is always in the open position to allow all liquids to drain directly to the RLW line. The tanks serve as holding tanks if the inflow to the tank is greater than the rate of the outflow. From 1953 to 1982, liquid waste from the CMR Building was carried through the RLW line to pumping station 03-700 and then pumped to the Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50. Pumping station 03-700 was removed in the early 1980s. The present RLW system in the CMR Building, which routes wastes directly to TA-50, began operation in 1982 (LANL 1995, 057590).

The site features of SWMU 03-031 are shown in Figure 3.2-1.

3.11.1 Summary of Previous Investigations for SWMU 03-031

No RFI activities have been conducted at this SWMU.

3.11.2 Summary of Data for SWMU 03-031

There are no decision-level data available for this SWMU.

3.11.3 Scope of Activities for SWMU 03-031

Sampling activities are not proposed for AOC 03-031 because the system is located in a building that is currently active and is an active site. It is proposed that site characterization and investigation be delayed until future D&D of the building.

3.12 SWMU 03-034(a)—Pump House and Associated Radioactive Liquid Waste Tanks

SWMU 03-034(a) is an inactive pump house (building 03-0154) and the associated underground RLW storage tanks (two stainless-steel tanks and two concrete tanks) located partially beneath the pump house. Building 03-0154 was constructed in 1961 to house operating equipment of the four storage tanks that received radioactive waste from Wing 9 of the CMR Building (03-0029). SWMU 03-034(a) is located approximately 7 ft west of Wing 9.

From 1961 to 1983, the underground storage tanks (USTs) received RLW (fission products from the destructive testing of reactor fuel rods) from the hot cell of Wing 9 at the CMR Building. The RLW originally was routed to the stainless-steel tanks and stored to allow decay of short-lived radionuclides. The RLW was pumped through a series of stainless-steel transfer lines into the concrete storage tanks. The liquid was processed through ion exchange columns, which resulted in lower-activity RLW. The two cylindrical stainless-steel storage tanks located below grade beneath the north part of building 03-0154 are accessible from individual manholes outside the building. Each tank is 7 ft long and 5 ft in diameter, with a maximum capacity of approximately 1000 gal., and is located inside a concrete vault. The concrete vaults share a common wall, and each concrete vault contains pumps and stainless-steel piping associated with the tanks. Each concrete tank is approximately 17 ft long x 9 ft wide x 6 ft high, with a maximum capacity of 4900 gal. A single gravity-outflow sump pit, which served both concrete tanks, is located on the south side of the tanks and was used to drain liquid waste to the RLW line, which was pumped to TA-50.

The stainless-steel and concrete storage tanks were not used after 1983. Both sets of tanks were taken offline in 1985 when the former waste line was removed. The tanks were not reconnected to the new waste line that was installed at that time. There have been no reported releases from the SWMU 03-034(a) tanks. RLW is documented as having passed through the SWMU 03-034(a) system (LANL 1995, 057590).

The site features of SWMU 03-034(a) are shown in Figure 3.2-1.

3.12.1 Summary of Previous Investigations for SWMU 03-034(a)

In 1997, samples were collected and were analyzed for TAL metals, SVOCs, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium.

3.12.2 Summary of Data for SWMU 03-034(a)

A summary of decision-level data for SWMU 03-034(a) is presented below. Section 2.11.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 3.12-1 presents the analytical suite for each sample, and Figure 3.2-1 shows the sampling locations.

- Samples from two locations were analyzed for TAL metals. Analytical results indicated that antimony, cadmium, and thallium had detection limits above the BVs in at least one sample (Table 3.12-2). Figure 3.4-1 shows the analytical results and their locations.
- Samples from three locations were analyzed for gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Analytical results indicated that cesium-137, plutonium-238, and plutonium-239/ plutonium-240 were detected at depths where FVs do not apply (Table 3.12-3). Figure 3.5-1 shows the analytical results and their locations.
- Samples from two locations were analyzed for SVOCs. Analytical results indicated that pyrene was detected at both locations (Table 3.12-4). Figure 3.4-2 shows the analytical results and their locations.

3.12.3 Scope of Activities for SWMU 03-034(a)

The proposed sampling location at SWMU 03-034(a) is shown in Figure 3.5-2. Table 3.12-5 provides the proposed sampling locations, depths, the objective, and the proposed analytical suites. Only one location is proposed at this time because belowground utilities are present in the area. Sampling at SWMU 03-034(a) will consist of the following activities:

- Tuff samples will be collected at one sampling location from three depth intervals: the interval adjacent to the bottom of the concrete tanks, the interval beginning 5 ft below the bottom of the tanks, and the interval beginning 10 ft below the bottom of the tanks.

Samples will be analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, isotopic uranium, isotopic plutonium, tritium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the pump house and RLW storage tanks.

If the samples indicate that a release has occurred, then additional sampling to define nature and extent of potential contamination will be delayed until future D&D of the building. The additional sampling locations will be used to determine nature and extent if the tanks have been determined to have leaked.

3.13 SWMU 03-034(b)—Active Industrial Waste Sump

SWMU 03-034(b) is a 10-ft-long x 10-ft-wide x 11-ft-deep active industrial waste sump located on the west side of the Beryllium Technology Facility (building 03-0141). The concrete sump is an underground pit that provides secondary containment for a 50-gal. tank that processes water and liquid waste. The tank and the sump were installed in the 1960s and are active. The liquids may contain small quantities of radionuclides and acid wastes that are pumped into the RLW line from the tank for treatment at the TA-50 RLWTF (LANL 1995, 057590).

The site features of SWMU 03-034(b) are shown in Figure 3.3-1.

3.13.1 Summary of Previous Investigations for SWMU 03-034(b)

No RFI activities have been conducted at this SWMU.

3.13.2 Summary of Data for SWMU 03-034(b)

There are no decision-level data available for this SWMU.

3.13.3 Scope of Activities for SWMU 03-034(b)

Sampling activities are not proposed for SWMU 03-034(b) because it is currently active. It is proposed that site characterization and investigation be delayed until future D&D of the industrial waste sump.

3.14 AOC 03-041—Underground Tank

AOC 03-041 is an unloading station (building 03-1264) and is designed as a holding tank for industrial low-level radioactive wastewater. It is located in a below-grade concrete-lined vault approximately 140 ft southwest of the Sigma Building (building 03-0066). The tank is 15-ft-long x 20-ft-wide x 15-ft-high, double-walled fiberglass, and has a capacity of 2000 gal. It is corrosion-proof and has a leak-detection system. The holding tank connects to the industrial waste line. The tank was installed in 1982 to serve as a holding chamber for liquid waste collected from sites that were not connected to the industrial waste line. Although the unloading station is currently on active status, it has never been used. If used, the unloading station 03-1264 would act as an introduction point for waste into the industrial waste line (LANL 1995, 057590).

The site features of AOC 03-041 are shown in Figure 3.3-1.

3.14.1 Summary of Previous Investigations for AOC 03-041

No RFI activities have been conducted at this AOC.

3.14.2 Summary of Data for AOC 03-041

There are no decision-level data available for this AOC.

3.14.3 Scope of Activities for AOC 03-041

The proposed sampling locations at AOC 03-041 are shown in Figure 3.14-1. Table 3.14-1 provides the proposed sampling location, depths, the objectives, and the proposed analytical suites. Sampling at AOC 03-041 will consist of the following activities:

- Soil and tuff samples will be collected at three locations from four depth intervals: the surface interval, at the soil/tuff interface, the interval beginning 10 ft below the soil/tuff interface, and the interval beginning 15 ft below the soil/tuff interface. The sampling locations will be on the three downslope sides of the holding tank.

Samples will be analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, isotopic uranium, isotopic plutonium, tritium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the holding tank.

3.15 Consolidated Unit 03-045(h)-00—Drainlines and Outfalls

Consolidated Unit 03-045(h)-00 consists of SWMUs 03-045(h) and 03-049(a). SWMU 03-045(h) is a former National Pollutant Discharge Elimination System (NPDES)-permitted outfall 03A024 (it was removed from the permit in August 2007). SWMU 03-049(a) is a currently permitted NPDES outfall (03A022). Both outfalls are associated with cooling towers. The SWMUs within the consolidated unit will be discussed separately.

SWMU 03-045(h)

SWMU 03-045(h) consists of a cooling tower outlet pipe that discharged to a storm drain at the north perimeter of the TA-03 Sigma Complex security fence, approximately 50 ft north of a cooling tower (structure 03-0187). The cooling tower outlet pipe is a former NPDES-permitted outfall (03A024) that was removed from the NPDES permit on August 1, 2007 (EPA 2007, 099009). This outlet pipe discharged treated cooling water onto a small area of ground surface that drained into a buried corrugated metal storm drain that trended northeast of structure 03-0187 where it eventually combined with stormwater runoff from surrounding areas. The drainage continued northeast and joined a channel north of Eniwetok Drive that ultimately drained into Sandia Canyon (LANL 1995, 057590). The cooling tower outlet pipe was active from 1953 until the late 1980s. The pipe was reactivated in early 1995 and remained active until it was plugged in February 1997.

Routine water treatment began in 1968. Treatment included biocides and fungicides to reduce algae growth and chelating agents [such as ethylenediaminetetraacetic acid (EDTA)] to inhibit corrosion. The potential contamination resulting from the northward flow of the discharge from the cooling water outlet pipe into Sandia Canyon will be investigated as part of the Upper Sandia Canyon Aggregate work plan.

In addition, it is possible that the buried corrugated storm drain into which the cooling tower outlet pipe drained may not have been able to handle the large flow of storm water that results during a sporadic and heavy storm event. Should this have occurred, the overflow would have drained due south across asphalt pavement to a drainage located to the southwest of Building 03-0066. This drainage discharges into Upper Mortandad Canyon.

SWMU 03-049(a)

SWMU 03-049(a) is an outfall that is located south of the Sigma Building (building 03-0066). The outfall discharges treated cooling water from a cooling tower (structure 03-0127), which serves the Sigma Building (building 03-0066), and runoff from six roof drains on the Sigma Building. The cooling tower has operated since 1960. From 1984 to 1990, the outfall also received discharge from rinse tanks associated with the electroplating operation in the Sigma Building. The tanks contained the final rinse from electroplating and surface-finishing experimental components. Although the rinse tanks were flushed continually with tap water to preclude contaminant buildup, trace amounts of metals, acids, cyanide, and depleted uranium were introduced into the rinse water. The NPDES permit allowed discharge of 4680 gal./d of treated cooling water and 24,000 gal./d of electroplating rinse water. Since 1990, the outfall has received only treated cooling water and roof-drain runoff. The outfall discharges to Mortandad Canyon (LANL 1995, 057590).

The site features of Consolidated Unit 03-045(h)-00 are shown in Figure 3.3-1.

3.15.1 Summary of Previous Investigations for Consolidated Unit 03-045(h)-00

SWMU 03-045(h)

No RFI activities have been conducted at SWMU 03-045(h).

SWMU 03-049(a)

An RFI was conducted at SWMU 03-049(a) in July 1997. The investigation evaluated the point of discharge for the outfall and four associated sediment catchment basins through which the discharge flows before draining into Mortandad Canyon. Field activities included a site survey, geodetic survey, field screening, and sample collection. Sediment samples were collected from each of the sediment basins. Two water samples were collected: one at the NPDES outfall pipe before it entered the sediment catchment basin and the other from flowing water exiting the last sediment catchment basin before it entered Mortandad Canyon. Screening results did not indicate the presence of organic chemicals, and radioactivity was at or below background. The sediment samples were analyzed for hexavalent chromium, TAL metals, cyanide, isotopic uranium, and VOCs. The RFI activities and results were presented in the RFI report (LANL 1997, 056660.289).

Section 2.14 of the HIR provides the details of previous investigations (LANL 2007, 098955).

3.15.2 Summary of Data for Consolidated Unit 03-045(h)-00

SWMU 03-045(h)

There are no decision-level data available for SWMU 03-045(h).

SWMU 03-049(a)

A summary of decision-level data for SWMU 03-049(a) is presented below. Section 2.14.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 3.15-1 presents the analytical suite for each sample, and Figure 3.3-1 shows the sampling locations.

- Samples from seven locations were analyzed for TAL metals, chromium (hexavalent ion), and total cyanide. Analytical results indicated that arsenic, barium, calcium, chromium, cobalt, copper, iron, lead, manganese, nickel, silver, thallium, vanadium, and zinc were detected at concentrations greater than BVs in at least one sample (Table 3.15-2). Analytical results indicated that antimony and selenium had detection limits above BVs. Figure 3.6-1 shows the analytical results and their locations.
- Samples from seven locations were analyzed for isotopic uranium. Analytical results indicated that uranium-238 was detected above the BV in at least one sample (Table 3.15-3). Figure 3.6-2 shows the analytical results and their locations.
- Samples from two locations were analyzed for VOCs. Analytical results indicated that 2-butanone and methylene chloride were detected in at least one sample (Table 3.15-4). Figure 3.6-3 shows the analytical results and their locations.

3.15.3 Scope of Activities for Consolidated Unit 03-045(h)-00

SWMU 03-045(h)

Sampling for SWMU 03-045(h) outfall to the north will be discussed in the Upper Sandia Canyon investigation work plan.

The proposed sampling locations for the drainage south of SWMU 03-045(h) are shown in Figure 3.15-1. Sampling locations may be adjusted from the locations shown in Figure 3.15-1 based on the locations of sediment pockets. Table 3.15-5 provides the proposed sampling location, depths, the objectives, and the proposed analytical suites. Sampling at SWMU 03-045(h) will consist of the following activities:

- Sediment samples will be collected at four locations from two depth intervals: the surface sediment interval within the drainage and at the soil/tuff interface. The sampling locations will be in the drainage to the south of SWMU 03-045(h).

Samples will be analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, cyanide, pH, nitrate, perchlorate, isotopic uranium, tritium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), dioxins, and furans and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the drainlines and outfalls.

SWMU 03-049(a)

The proposed sampling locations at SWMU 03-049(a) are shown in Figure 3.15-1. Sampling locations may be adjusted from those shown in Figure 3.15-1 based on the locations of sediment pockets. Table 3.15-5 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at SWMU 03-049(a) will consist of the following activities:

- Sediment samples will be collected at six locations from two depth intervals: the surface sediment interval within the drainage and at the soil/tuff interface. The sampling locations will be downgradient of the outfall.
- Soil and tuff samples will be collected at seven locations from three depth intervals: the surface interval, the soil/tuff interface interval, and the interval beginning 5 ft below the soil/tuff interface.

Samples will be analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, cyanide, pH, nitrate, perchlorate, isotopic uranium, tritium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), dioxins, and furans and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the drainlines and outfalls.

3.16 Consolidated Unit 03-049(b)-00—Miscellaneous

Consolidated Unit 03-049(b)-00 consists of SWMU 03-049(b) and AOC C-03-014. These units were consolidated because surface water drainage from both sites collects in the same locations, and regrading and paving operations may have distributed contamination from one site to the other.

SWMU 03-049(b) is a 50 ft long x 20 ft wide discharge area at the south wall of the press building (03-0035). It is associated with an inactive vacuum pump that served furnaces in building 03-0035. The press building was built in 1953. The vacuum pump evacuated oil from furnaces in the building that were used for experiments. Experiments included fabricating enriched uranium-loaded graphite and carbide fuel elements. Also, enriched uranium was processed in the north part of the press building’s first floor. The outlet is located about 8 ft above the ground on the south wall of the press building. The vacuum pump was deactivated in the late 1980s; at about the same time, a 10 ft x 8 ft area under the exhaust pipe outlet was paved with asphalt. Runoff from this area drains southwest toward low-lying areas. The press building was declared surplus in November 1991 but was reactivated in 1995 (LANL 1995, 057590).

AOC C-03-014 is a 125 ft x 100 ft equipment-storage area located southwest of the press building (03-0035). The area is bounded by security fences to the north, south, and west and by building 03-0035 to the east. Most of the area is paved, except for a 15-ft-wide strip of grass along the southern security fence that widens to 30 ft southwest of building 03-0035. Various equipment and molds from building 03-0035 were stored at AOC C-03-014 for salvage or because of the building's space limitations. Equipment is no longer stored outside the building (LANL 1995, 057590).

The site features of Consolidated Unit 03-049(b)-00 are shown in Figure 3.3-1.

3.16.1 Summary of Previous Investigations for Consolidated Unit 03-049(b)-00

An RFI was conducted in July 1997. Field activities included a site survey, geodetic survey, field screening, and sample collection. Screening results indicated that organic chemicals were not detected, and radioactivity was at or below background. Samples were collected and analyzed for TAL metals, isotopic uranium, PCBs, total petroleum hydrocarbons–diesel range organics (TPH-DRO), and VOCs. The RFI activities and results were presented in the RFI report (LANL 1997, 056660.289).

3.16.2 Summary of Data for Consolidated Unit 03-049(b)-00

A summary of decision-level data for Consolidated Unit 03-049(b)-00 is presented below. Section 2.15.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 3.16-1 presents the analytical suite for each sample, and Figure 3.3-1 shows the sampling locations.

- Samples from 13 locations were analyzed for TAL metals. Analytical results indicated that copper, lead, and zinc were detected at concentrations greater than BVs in at least one sample (Table 3.16-2). Analytical results indicated that antimony and cadmium had detection limits above BVs. The sample locations are shown in Figure 3.16-1.
- Samples from four locations were analyzed for isotopic uranium. No isotopic uranium exceeded soil BVs.
- Samples from 13 locations were analyzed for PCBs and TPH-DRO. Analytical results indicated that Aroclor-1254 and TPH-DRO were detected in at least one sample (Table 3.16-3). Figure 3.16-2 shows the analytical results and their locations.
- Samples from three locations were analyzed for VOCs. Analytical results indicated that 4-isopropyltoluene and toluene were detected in at least one sample (Table 3.16-3). Figure 3.16-2 shows the analytical results and their locations.

3.16.3 Scope of Activities for Consolidated Unit 03-049(b)-00

The proposed sampling locations at Consolidated Unit 03-049(b)-00 are shown in Figure 3.16-3. Table 3.16-4 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at Consolidated Unit 03-049(b)-00 will consist of the following activities:

- Soil and tuff samples will be collected at 10 locations from 3 depth intervals: the surface interval, the soil/tuff interface interval, and the interval beginning 5 ft below the soil/tuff interface.

Samples will be analyzed at off-site fixed laboratories for TAL metals, perchlorate, nitrate, isotopic uranium, PCBs, TPH-DRO, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), cyanide, and pH and by gamma spectroscopy. Samples will not be analyzed for explosive compounds, dioxins, and furans because they are not related to the historical operations of the discharge area and storage area.

3.17 SWMU 03-049(e)—Outfall

SWMU 03-049(e) is identified in the 1990 SWMU report (LANL 1990, 007511) as an area located south of the Sigma Building (building 03-0066) that is potentially contaminated by an outfall pipe of unknown origin. The 1990 SWMU report also states that the outfall discharged to Mortandad Canyon (LANL 1990, 007511). Subsequent investigation at the Sigma Building determined that three of the building's roof drains connect to a single pipe and discharges to the outfall area of SWMU 03-049(e) (LANL 1995, 057590).

The site features of SWMU 03-049(e) are shown in Figure 3.3-1.

3.17.1 Summary of Previous Investigations for SWMU 03-049(e)

In 2001, samples were collected from the outfall and analyzed for anions and TAL metals. The data have not been reported to NMED.

3.17.2 Summary of Data for SWMU 03-049(e)

A summary of decision-level data for SWMU 03-049(e) is presented below. Section 2.16.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 3.17-1 presents the analytical suite for each sample and Figure 3.3-1 shows the sampling locations.

- Samples from four locations were analyzed for anions and TAL metals. Analytical results indicated that antimony, arsenic, chromium, copper, iron, lead, nickel, and zinc were detected at concentrations greater than BVs in at least one sample (Table 3.17-2). Figure 3.6-1 shows the analytical results and their locations.

3.17.3 Scope of Activities for SWMU 03-049(e)

The proposed sampling locations at SWMU 03-049(e) are shown in Figure 3.17-1. Sampling locations may be adjusted from those shown in Figure 3.17-1 based on the locations of sediment pockets. Table 3.17-3 provides the proposed sampling location, depths, the objectives each sample addresses, and the proposed analytical suites. Sampling at SWMU 03-049(e) will consist of the following activities:

- Sediment samples will be collected at six locations from two depth intervals: the surface sediment interval within the drainage and the soil/tuff interface interval. Four of the sampling locations will be near the previous 2001 sampling locations, and two will be downslope of both the previous and new sampling locations.

Samples will be analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, nitrate, perchlorate, tritium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), cyanide, pH, and dioxins/furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds or PCBs because they are not related to the historical operations of the outfall.

3.18 SWMU 03-054(e)—Outfall

SWMU 03-054(e) is an outfall located in Upper Mortandad Canyon. The outfall typically discharges a steady, low-volume flow of effluent that originates from several sources at the CMR Building (building 03-0029). These sources include drainage from roofs over the west wing, where towers vent filtered exhaust, and surface water runoff from the asphalt area around the building.

SWMU 03-054(e) received effluent from an unintentional one-time release in 1974 from an industrial waste manhole (AOC C-03-006). The overflow resulted from a plug in the industrial waste line and was estimated to be between 500 gal. and 1000 gal. of RLW. The overflow spilled to the surrounding paved area, traveled north along Diamond Drive, flowed into the storm sewer through a storm drain gate, and ultimately discharged into Upper Mortandad Canyon through the SWMU 03-054(e) outfall. A small dam was built in the streambed at the base of the canyon to contain the effluent. Subsequent cleanup action, based on residual radioactive contamination cleanup levels of 25 pCi/g, removed approximately 142 ft^3 of contaminated soil from Mortandad Canyon (LANL 1995, 057590).

The site features of SWMU 03-054(e) are shown in Figure 3.3-1.

3.18.1 Summary of Previous Investigations for SWMU 03-054(e)

An RFI was conducted at SWMU 03-054(e) in April 1995. Screening results indicated that organic chemicals were not detected, and radioactivity was at or below background. Samples were collected from the outfall area and were analyzed for TAL metals, total cyanide, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, PCBs, SVOCs, and VOCs. The RFI activities and results were presented in the RFI report (LANL 1997, 072611).

3.18.2 Summary of Data for SWMU 03-054(e)

A summary of decision-level data for SWMU 03-054(e) is presented below. Section 2.17.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 3.18-1 presents the analytical suite for each sample, and Figure 3.3-1 shows the sampling locations.

- Samples from six locations were analyzed for TAL metals and total cyanide. Analytical results indicated that zinc was detected at concentrations greater than BVs in at least one sample (Table 3.18-2). Analytical results indicated that total cyanide, mercury, and thallium had detection limits above BVs. Figure 3.16-1 shows the analytical results and their locations.
- Samples from six locations were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Analytical results indicated that europium-152, plutonium-238, plutonium-239/plutonium-240, and sodium-22 were detected or detected above FVs in at least one sample (Table 3.18-3). Figure 3.18-1 shows the analytical results and their locations.
- Samples from six locations were analyzed for PCBs and SVOCs. Analytical results indicated that Aroclor-1260, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, diethylphthalate, fluoranthene, and pyrene were detected in at least one sample (Table 3.18-4). Figure 3.16-2 shows the analytical results and their locations.
- Samples from two locations were analyzed for VOCs. VOCs were not detected.

3.18.3 Scope of Activities for SWMU 03-054(e)

The proposed sampling locations at SWMU 03-054(e) are shown in Figure 3.18-2. Table 3.18-5 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at SWMU 03-054(e) will consist of the following activities:

- Sediment samples will be collected at four locations from two depth intervals: the surface sediment interval within the drainage, and from the soil/tuff interface interval.

Samples will be analyzed at off-site fixed laboratories for TAL metals, cyanide, pH, nitrate, perchlorate, isotopic uranium, isotopic plutonium, tritium, PCBs, SVOCs, and VOCs (in samples deeper than 0.5 ft bgs) and by gamma spectroscopy. Samples will not be analyzed for explosive compounds, dioxins, and furans because they are not related to the historical operations of the outfall and spill.

Mortandad Canyon drainage samples will be used to determine if lateral extent has been defined.

3.19 AOC C-03-006—One-time Spill

AOC C-03-006 is the site of an unintentional release from a manhole connected to the industrial waste line. The manhole is located near the corner of Diamond Drive and Pajarito Road. The manhole is part of the liquid industrial waste collection system that runs from TA-03 to the RLWTF at TA-50. In 1974, the manhole overflowed to a storm sewer in TA-03 [see SWMU 03-054(e)] and discharged to Upper Mortandad Canyon. The overflow resulted from a plug in the industrial waste line and was estimated to be between 500 and 1000 gal. of RLW. The overflow spilled to the surrounding paved area, traveled north along Diamond Drive, flowed into the storm sewer via a storm drain gate, and ultimately discharged into upper Mortandad Canyon through an outfall [SWMU 03-054(e)]. A cleanup of the overflow-impacted area began the day following the release. A collection and pumping system was used to flush the contaminated storm drain. Approximately 176 m^3 of pavement were cut to the depth of the base course, excavated, and disposed of at Area G at TA-54. Newly exposed surfaces were monitored, and one section of curbing with radioactivity levels exceeding background levels was removed. Additional surveys and subsequent confirmation sampling determined that no radioactivity exceeding the decontamination criteria (25 pCi/g) was present in the base-course material. The area was restored by repaving and replacing the curb along Diamond Drive and around the manhole, removing the dam built in the stream bed at the base of the canyon, and installing engineering controls (LANL 1995, 057590).

The site features of AOC C-03-006 are shown in Figure 3.3-1.

3.19.1 Summary of Previous Investigations for AOC C-03-006

RFI activities in April 1995 were conducted around AOC C-03-006 at the outfall and canyon area associated with SWMU 03-054(e). The RFI activities and results were presented in the RFI report (LANL 1997, 072611).

3.19.2 Summary of Data for AOC C-03-006

There is no decision-level data available for this AOC.

3.19.3 Scope of Activities for AOC C-03-006

Investigation samples are described in Section 3.18.3 and shown in Table 3.18-8 and Figure 3.18-2, and are associated with SMWU 03-054(e).

4.0 FORMER TA-42

4.1 Background

Former TA-42, located within the current boundaries of TA-55, was located north of Pajarito Road and Pecos Drive on a narrow mesa formed between Mortandad Canyon on the north and Two Mile Canyon on the south. The former site is near the north edge of the mesa adjacent to the steep slope of the Mortandad Canyon wall. Figure 4.1-1 shows the site features for former TA-42.

4.1.1 Operational History

In 1951, an incinerator was built at former TA-42 for volume reduction of low-level plutonium-contaminated wastes. The incinerator, which was never fully operational, was shut down in 1952. In 1978, all structures, debris, and contaminated soil were removed and disposed of at Area G, TA-54. Following removal of contaminated materials, the site was contoured and revegetated (LANL 1992, 007666).

4.1.2 Summary of Releases, Transport Mechanisms, and Potential Receptors

Summary of Releases. Documentation of accidental spills or releases at former TA-42 has not been found. However, because of the inefficiency of the incinerator and problems with the off-gas cleanup system, radionuclides and possibly other contaminants were released through airborne emissions.

Some wastes were intentionally released from former TA-42. Liquid waste and some ash from the incinerator tank were discharged, presumably into Mortandad Canyon in October 1952. The septic system outfall also discharged liquid wastes to Mortandad Canyon.

Transport Mechanisms. No natural surface-water bodies are present in former TA-42. Surface water runoff and erosion of contaminated surface soil could lead to contamination of Mortandad Canyon. Surface water may also access subsurface contamination exposed by soil erosion.

The thickness of the unsaturated zone beneath former TA-42 indicates that migration of contaminants from the mesa top to the regional aquifer is unlikely. However, recent studies have shown that infiltration of some contaminants may have occurred (LANL 2006, 094161). Although migration to groundwater is possible, this work plan will address only the collection of soil and tuff samples. Groundwater sampling for Mortandad Canyon is addressed in Mortandad Canyon investigation report (LANL 2006, 094161).

Other potential transport mechanisms include

- airborne transport of contaminated surface soil,
- infiltration through the vadose zone,
- continued dissolution and advective/dispersive transport of chemical and radiological contaminants contained in subsurface soil and bedrock,
- disturbance and uptake of contaminants in shallow soil by plants and animals, and
- site disturbance through human activities.

Potential receptors include

- Laboratory workers and
- ecological receptors in the nondeveloped areas (i.e., hillsides).

4.1.3 Current Site Usage and Status

Former TA-42 is now part of TA-55.

4.2 Consolidated Unit 42-001(a)-99—Former TA-42 Incinerator Complex

Consolidated Unit 42-001(a)-99 consists of SWMUs 42-001(a), 42-001(b), and 42-001(c), 42-002(b), and 42-003 and AOC 42-002(a). These sites are associated with the former TA-42 radioactive waste incinerator that operated in 1951 and 1952. From 1957 to 1969, this incinerator facility was used to store and decontaminate radioactively contaminated equipment. In 1969, an unsuccessful attempt was made to reactivate the incinerator to burn uncontaminated classified wastes. By 1970, all operations were discontinued, and all combustibles were removed from the building. The facility was decommissioned in 1977, and the site was decontaminated in 1978 (LANL 1990, 007513).

SWMU 42-001(a) is the historical location of building 42-0001 that housed the incinerator. Building 42-0001 was a 2000-ft^2, steel-frame structure covered with corrugated metal. The building contained the incinerator, a cyclone dust collector, a spray cooler, a Venturi scrubber, a filter bank, and an ash separator. Combustion products passed through an off-gas cleanup system before they were emitted through an exhaust stack. The off-gas system consisted of a Venturi scrubber, a filter bank, and an ash separator. Ash trapped in the off-gas system and incinerator was transported by underground drainlines to two holding tanks [SWMUs 42-001(b and c)] located immediately north of the incinerator (LANL 1992, 007666).

SWMUs 42-001(b) and 42-001(c) are the historical locations of two former aboveground ash-holding tanks (structures 42-0002 and 42-0003) associated with the incinerator complex. Each tank was 22 ft in diameter and approximately 13 ft high, with a volume of 37,000 gal. The tanks were built in 1951 and removed in 1978. When the tanks were decommissioned in 1978, the contents were assayed and measured for plutonium. Contaminated sludge was removed, mixed with cement, and taken to MDA G for storage. The tanks were excavated and disposed of at Area G at TA-54. The tank drainlines were filled with hot asphalt to contain radioactive contamination. It is not known if the drainlines were removed (LANL 1992, 007666).

AOC 42-002(a) is the historical location of an indoor storage (building 42-0001) and decontamination area. SWMU 42-002(b) is the location of a historical outdoor decontamination area. Between 1956 and 1969, the main floor of building 42-0001 was used to store and decontaminate equipment. During D&D, a vacublaster removed radionuclides and other contaminants from various pieces of equipment. The process generated wastes, some of which are believed to have been discharged to the building's septic system (structure 42-0003). It is believed that wastes in the form of fine solid residues were bagged and disposed of at an MDA. Objects (such as vehicles) that were too large to take inside the building were decontaminated at the end of the asphalt driveway located west and north of building 42-0001. Wash water from this activity flowed down an embankment on the northwest side of the parking lot. Potentially contaminated soil in that area was not addressed during the 1978 D&D activities (LANL 1992, 007666).

SWMU 42-003 is the historical location of a septic system that served the incinerator building 42-0001. The septic system was installed in 1951 and consisted of a 565-gal. septic tank (structure 42-0004), a drainline from building 42-0001 to the tank, a filter trench, a tile leach field, and an outfall to Mortandad Canyon. The septic tank received RLW from building 42-0001. According to the Operable Unit (OU) 1129 work plan, the system probably also received solvents, acids, and grease (LANL 1992, 007666). Radioactively contaminated liquids were removed periodically from the septic tank and disposed of at pit 4 at MDA L. Samples collected in Mortandad Canyon in 1952 downstream of former TA-42 showed radioactive contamination in the canyon. In 1973, the septic tank was observed to contain water and possibly may have overflowed (LANL 1992, 007666). Also in 1973, the tank slurry was sampled and was found to be radioactively contaminated. The septic system and associated contaminated soil were removed as part of 1978 D&D activities (Harper and Garde 1981, 006286). Before the tank was removed, liquid in the tank was pumped and treated at the RLWTF [SWMU 50-001(a)]. Tank sludge was solidified by adding cement, and the tank and sludge were disposed of at Area G at TA-54, and the excavated area was backfilled. In addition, contaminated soil in the drain field was excavated (LANL 1992, 007666).

The site features of Consolidated Unit 42-001(a)-99 are shown in Figure 4.1-1.

4.2.1 Summary of Previous Investigations for Consolidated Unit 42-001(a)-99

After D&D activities were conducted at the site in 1978, the Environmental Surveillance Group collected soil samples and analyzed them for radionuclides. Although low levels of contamination were found, the concentrations met regulatory standards at that time. After concurrence from DOE's Los Alamos Area Office (LAAO), the area was contoured and revegetated to minimize erosion (LANL 1992, 007666).

In 1991, the Environmental Protection Group performed a reconnaissance study and collected soil samples. Samples were analyzed for radionuclides, PCBs, SVOCs, VOCs, and metals. These results do not meet current data quality validation standards and are not discussed.

In 1992, an RFI was conducted at the historical locations of Consolidated Unit 42-001(a)-99 to determine whether potential contamination at the site would be exposed during construction of a new facility. Sample locations were selected to bound the extent of contamination detected during the 1991 reconnaissance study and to include locations where construction activities might adversely affect residual contamination around proposed structures or utility lines. Samples were collected and field screened for organic chemicals and radionuclides. The RFI activities and results were presented in the RFI report (LANL 1995, 050056).

4.2.2 Summary of Data for Consolidated Unit 42-001(a)-99

A summary of decision-level data for Consolidated Unit 42-001(a)-99 is presented below. Section 3.1.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 4.2-1 presents the analytical suite for each sample and Figure 4.1-1 shows the sampling locations.

- Samples from five locations were analyzed for TAL metals. Analytical results indicated that lead was detected at concentrations greater than its BV in at least one sample location (Table 4.2-2). Figure 4.2-1 shows the analytical results and their locations.
- Samples from 14 locations were analyzed for americium-241 and isotopic plutonium. Samples from three locations were analyzed for isotopic thorium. Samples from two locations were analyzed for isotopic uranium. Analytical results indicated that americium-241, plutonium-238, and plutonium-239/plutonium-240 were detected at depths where FVs do not apply in at least one sample (Table 4.2-3). Figure 4.2-2 shows the analytical results and their locations.

4.2.3 Scope of Activities for Consolidated Unit 42-001(a)-99

In 2010, the Laboratory will construct a security perimeter around TA-55, including the site of former TA-42. This plan will involve placing several feet of clean fill over Consolidated Unit 42-001(a)-99, then covering the fill with cobbles. Because access to former TA-42 will be more difficult or impossible, grid sampling is being proposed to characterize the nature and extent of potential contamination at Consolidated Unit 42-001(a)-99.

The proposed sampling locations at Consolidated Unit 42-001(a)-99 are shown in Figure 4.2-3. Table 4.2-4 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at Consolidated Unit 42-001(a)-99 will consist of the following activities:

- Soil and tuff samples will be collected at 31 locations from 6 depth intervals: the surface interval, the soil/tuff interface interval, and the intervals beginning 5 ft, 10 ft, 20 ft, and 30 ft below the soil/tuff interface at locations determined by a grid.
- Soil and tuff samples from the area filled in will be collected at four locations from six depth intervals: the soil/tuff interface interval, and the intervals beginning 10 ft, 20 ft, and 30 ft below the soil/tuff interface at locations determined by a grid.
- Sediment samples will be collected at eight locations from two depth intervals: the surface sediment interval within the drainage and the soil/tuff interface interval. The sampling locations will be determined by areas of sediment pockets.

Samples will be analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, isotopic uranium, isotopic plutonium, tritium, PCBs, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), explosive compounds, dioxins/furans, cyanide, and pH and by gamma spectroscopy.

5.0 TA-48

5.1 Background

TA-48 is located north of Pajarito Road, northwest of TA-55. The site is situated on Mesita del Buey (the southern finger of South Mesa) between Mortandad Canyon on the north and Two Mile Canyon on the south. TA-48 was established in 1957. The site is currently used for chemical and radiochemical analyses, radioactive waste disposal research, and radioisotope production for nuclear medicine. Figure 5.1-1 shows the site features for TA-48.

Three AOCs, eight SWMUs, and two consolidated units located in TA-48 are addressed in this work plan.

5.1.1 Operational History

TA-48, the Radiochemistry Site, was established in 1957 for work in radiochemistry. Initially, the major work was to study samples from bomb tests; however, that work evolved into other types of studies related to weapon tests, research in geochemistry and radiochemistry, and production of radioisotopes for nuclear medicine (DOE 1987, 008663; DOE 1987, 008664; LANL 1992, 007666). TA-48 facilities also have historically been and are currently used to study nuclear properties of radioactive materials using analytical and physical chemistry. Measurements of radioactive substances are performed, and hot cells are used for remote handling of radioactive materials (LANL 1988, 000344; LANL 1992, 007666).

5.1.2 Summary of Releases, Transport Mechanisms, and Potential Receptors

Summary of Releases. Releases from TA-48 may have occurred from ventilation stacks, a septic system, drainlines and outfalls, industrial waste lines, container storage areas, sumps and tanks, a disposal shaft, and soil contamination.

Transport Mechanisms. No natural surface-water bodies are present in TA-48. During summer thunderstorms and spring snowmelt, runoff from the mesa top flows into storm drains and down hillsides and into an intermittent stream in Mortandad Canyon. Surface-water runoff and erosion of contaminated surface soil could lead to contamination of bench areas on the hillside and contamination of surface waters off-site. Surface water may also access subsurface contaminants exposed by soil erosion.

The thickness of the unsaturated zone beneath TA-48 indicates that migration of contaminants from the mesa top to the regional aquifer is unlikely. However, recent studies have shown that infiltration of some contaminants may have occurred (LANL 2006, 094161). Although migration to groundwater is possible, this work plan will address only the collection of soil and tuff samples. Groundwater sampling for Mortandad Canyon is addressed in Mortandad Canyon investigation report (LANL 2006, 094161).

Other potential transport mechanisms include

- airborne transport of contaminated surface soil,
- infiltration through the vadose zone,
- continued dissolution and advective/dispersive transport of chemical and radiological contaminants contained in subsurface soil and bedrock,
- disturbance and uptake of contaminants in shallow soil by plants and animals, and
- site disturbance through human activities.

Potential receptors at one or more of the sites may include

- Laboratory workers,
- construction workers, and
- ecological receptors in the nondeveloped areas (i.e., hillsides).

5.1.3 Current Site Usage and Status

TA-48 is almost completely developed. Roads and large paved parking areas surround the buildings. Several building complexes are fenced for controlled access. A trail exists on the east and north side of TA-48.

5.2 AOC 48-001—Air Exhaust System

AOC 48-001 consists of the air exhaust system at the main radiochemistry laboratory in building 48-0001 and surface and near surface soil potentially impacted by deposition from the stack emissions. The radiochemistry laboratory in building 48-0001 was constructed in 1957 for analysis of samples collected from nuclear weapons tests. Currently, radiochemical analyses are conducted there to support a variety of programs. The building 48-0001 exhaust system consists of nine stacks. Three stacks exhaust unfiltered discharges from chemical hoods, three stacks are associated with combustion boilers, one stack exhausts individually filtered glove boxes, one stack exhausts filtered air from hot cell laboratories, and one stack exhausts air from a welding and degreasing booth. Discharges from the chemical hoods are not filtered because the chemicals used in the hoods (e.g., perchloric acid) degrade filters. However, these hoods are equipped with wet scrubbers. The glove box stack (stack FE54) is permitted and monitored under the National Emissions Standards for Hazardous Air Pollutants Program of the Clean Air Act. According to the RFI work plan, monitoring data are available for stack FE54 beginning in 1967 for plutonium and beginning in 1974 for uranium and fission products (LANL 1992, 007666). These data indicate releases of plutonium, uranium, and fission products, principally cesium-137, cerium-144, and strontium-90.

The site features of AOC 48-001 are shown in Figure 5.2-1.

5.2.1 Summary of Previous Investigations for AOC 48-001

In 1991, samples were collected east and northwest of building 48-0001. These samples contained elevated levels of alpha radioactivity, with surface samples slightly exceeding DOE guideline levels. Organic chemicals were detected at low concentrations.

In 1993, a Phase I RFI was conducted at AOC 48-001 to determine the presence of soil contamination associated with discharges from the air exhaust system. The U.S. Environmental Protection Agency (EPA) computer model, AIRDOS, was used to estimate the areal extent of potential contamination based on historical stack release data. This area was surveyed for radioactivity and organic vapors. Radiation levels were at background levels, and organic vapors were not detected. Samples were collected to the north and east of building 48-0001. All samples were field screened for radioactivity, and organic chemicals and were submitted for analysis of inorganic chemicals, radionuclides, and organic chemicals using a combination of fixed and mobile laboratories. The RFI activities and results were presented in the RFI report (LANL 1995, 050289).

5.2.2 Summary of Data for AOC 48-001

A summary of decision-level data for AOC 48-001 is presented below. Section 4.1.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 5.2-1 presents the analytical suite for each sample and Figure 5.2-1 shows the sampling locations.

- Samples from 13 locations were analyzed for TAL metals. Analytical results indicated that antimony, barium, calcium, chromium, copper, mercury, nickel, and zinc were detected at concentrations greater than BVs in at least one sample (Table 5.2-2). Analytical results indicated that antimony, cadmium, selenium, silver, and thallium had detection limits above the BVs in at least one sample. Figure 5.2-2 shows the analytical results and their locations.
- Samples from 13 locations were analyzed for americium-241. Samples from 40 locations were analyzed for gamma-emitting radionuclides. Samples from 30 locations were analyzed for isotopic plutonium. Samples from 34 locations were analyzed for isotopic thorium. Samples from 35 locations were analyzed for isotopic uranium. Samples from 17 locations were analyzed for strontium-90. Analytical results indicated that americium-241, cesium-137, plutonium-238, plutonium-239/plutonium-240, and strontium-90 were detected at depths where FVs do not apply (Table 5.2-3). Analytical results indicated that americium-241, plutonium-238, plutonium-239/plutonium-240, thorium-227, thorium-230, uranium-234, uranium-235, and uranium-238 were detected at an activity greater than the range of background activities. Figure 5.2-3 shows the analytical results and their locations.
- Samples from 14 locations were analyzed for SVOCs. Analytical results indicated that acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, carbazole, chrysene, di-n-butylphthalate, di-n-octylphthalate, fluoranthene, fluorene, phenanthrene, and pyrene were detected in at least one sample (Table 5.2-4). Figure 5.2-4 shows the analytical results and their locations.
- Samples from eight locations were analyzed for VOCs. Analytical results indicated that acetone, 2-butanone, 4-isopropyltoluene, methylene chloride, toluene, trichlorofluoromethane, and

1,2,4-trimethylbenzene were detected in at least one sample (Table 5.2-4). Figure 5.2-4 shows the analytical results and their locations.

5.2.3 Scope of Activities for AOC 48-001

Sampling activities are not proposed for AOC 48-001 because TA-48 is currently active and air emissions are ongoing. It is proposed that site characterization and investigation be delayed until air emissions cease. All surface samples proposed for collection within TA-48 may also be used for characterization of AOC 48-001.

5.3 SWMU 48-002(a)—Container Storage Area

SWMU 48-002(a) consists of a former container storage area located at the southwest corner of the main radiochemistry laboratory in building 48-0001 at TA-48. The storage area was located against the south wall of building 48-0001 on an area of soil between the building and an asphalt roadway. An inspection of SWMU 48-002(a) in 1986 noted the presence of approximately 200 rusty flasks in decayed and broken wooden-frame holders (Perkins 1986, 000808). Each of the flasks reportedly held about 2 qt of high purity mercury. The flasks are estimated to have been present at SWMU 48-002(a) since about 1976. The flasks were removed from the site in 1989 (LANL 1990, 007513). The RFI work plan reports that available documentation contained no indication of any spills or leaks associated with this site (LANL 1992, 007666).

SWMU 48-002(a) is located approximately 50 ft west of SWMU 48-002(b), another former storage area associated with building 48-0001.

The site features of SWMU 48-002(a) are shown in Figure 5.2-1.

5.3.1 Summary of Previous Investigations for SWMU 48-002(a)

A Phase I RFI was conducted at SWMUs 48-002(a) and 48-002(b). In July 1993, five sampling locations were hand-augered up to 8 ft, and soil samples were collected at 1-ft intervals. In addition, one surface soil sample was collected. All samples were submitted for analysis of metals, radionuclides, SVOCs, and VOCs using a combination of fixed and mobile laboratories. In October 1993, six surface soil samples were collected to evaluate possible mercury migration from the SWMU. Based on the results of the Phase I sampling for SWMU 48-002(a and b), an expedited cleanup (EC) plan was prepared (LANL 1995, 046092).

In 1995, an EC was implemented at SWMUs 48-002(a) and 48-002(b). The EC involved development of soil cleanup levels for mercury and polycyclic aromatic hydrocarbons (PAHs); soil sampling and analysis to delineate the area exceeding cleanup levels; excavation of soil contaminated above cleanup levels; confirmation sampling; and site restoration (backfilling, grading, and revegetation). The area of soil excavated during the cleanup was to the east of SWMU 48-002(a).

5.3.2 Summary of Data for SWMU 48-002(a)

A summary of decision-level data for SWMUs 48-002(a) and 48-002(b) is presented below. Section 4.2.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 5.3-1 presents the analytical suite for each sample, and Figure 5.2-1 shows the sampling locations.

- Samples from two locations were analyzed for TAL metals. Analytical results indicated that antimony and mercury were detected at concentrations greater than BVs in at least one sample (Table 5.3-2). Figure 5.2-2 shows the analytical results and their locations.
- Samples from one location were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, and isotopic uranium. Analytical results indicated that thorium-230 was detected above the BV (Table 5.3-3). Figure 5.2-3 shows the analytical results and their locations.
- Samples from two locations were analyzed for SVOCs. Analytical results indicated that benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene were detected in at least one sample (Table 5.3-4). Figure 5.2-4 shows the analytical results and their locations.

5.3.3 Scope of Activities for SWMU 48-002(a)

The proposed sampling locations at SWMU 48-002(a) and SWMU 48-002(b) are shown in Figure 5.3-1. Table 5.3-5 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at 48-002(a) and SWMU 48-002(b) will consist of the following activities:

- Soil and tuff samples will be collected at 13 locations from 4 depth intervals: the surface interval, soil/tuff interface interval, the interval beginning 5 ft below the soil/tuff interface, and the interval beginning 10 ft below the soil/tuff interface.

Samples will be analyzed at off-site fixed laboratories for TAL metals, isotopic uranium, isotopic plutonium, tritium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), perchlorate, nitrate, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the container storage area.

5.4 SWMU 48-002(b)—Container Storage Area

SWMU 48-002(b) consists of a former container storage area located at a loading dock on the south side of the main radiochemistry laboratory in building 48-0001 at TA-48. The storage area was located against the south wall of building 48-0001, near the southeast corner of the building. An inspection of SMWU 48-002(b) in 1986 noted the presence of labeled and unlabeled drums and evidence of spills and leaks (Perkins 1986, 000808). Spills from leaky drums were also observed at the site during a November 1988 field survey (LANL 1990, 007513). The date that materials began to be stored at this site is unknown, and no evidence was found that the site was managed as a formal container storage area. All materials were removed from the site by July 1991 (LANL 1992, 007666).

SWMU 48-002(b) is located approximately 50 ft east of SWMU 48-002(a), another storage area associated with building 48-0001.

The site features of SWMU 48-002(b) are shown in Figure 5.2-1.

5.4.1 Summary of Previous Investigations for SWMU 48-002(b)

The summary of previous investigations for SWMU 48-002(b) is discussed in Section 5.3.1.

5.4.2 Summary of Data for SWMU 48-002(b)

Analytical results for SWMU 48-002(a) discussed above are applicable to this SWMU because sampling was conducted in the general area of both SWMUs.

5.4.3 Scope of Activities for SWMU 48-002(b)

Investigation samples, described in Section 5.3.3 and shown in Table 5.3-5 and Figure 5.3-1, are associated with SMWU 48-002(a).

5.5 AOC 48-002(e)—Container Storage Area

AOC 48-002(e) consists of a storage area located on the east side of the main radiochemistry laboratory in building 48-0001. This storage area was located against the east wall of building 48-0001, just north of building 48-0017. The storage area is almost entirely paved with asphalt, except for one small section (several square feet) of soil left unpaved to allow access to underground utilities. The RFI work plan states that AOC 48-002(e) was used for many years to store solvents (LANL 1992, 007666). The 1990 SWMU report states this area operated as a satellite accumulation area from the late 1980s (LANL 1990, 007513). Solvents were not stored in the area after about 1989 or 1990 (LANL 1992, 007666). Since 1992, the area has been used to store a tank containing liquid nitrogen and cylinders of compressed-gas.

The site features of AOC 48-002(e) are shown in Figure 5.2-1.

5.5.1 Summary of Previous Investigations for AOC 48-002(e)

A Phase I RFI was conducted in 1993 to determine the presence of contamination at the exposed soil. This area was surveyed for radioactivity and organic vapors. Radiation levels were at background levels, and organic vapors were not detected. Surface and subsurface samples were collected, and all samples were field screened for radioactivity and organic chemicals and submitted for analysis of inorganic chemicals, radionuclides, and organic chemicals using a combination of fixed and mobile laboratories. The RFI activities and results were presented in the RFI report (LANL 1995, 050289).

In 1997, additional soil samples were collected and submitted for laboratory analysis of radionuclides. No radionuclides were detected above BVs/FVs. The sampling activities were presented in the RFI report addendum (LANL 1997, 056565)

5.5.2 Summary of Data for AOC 48-002(e)

A summary of decision-level data for AOC 48-002(e) is presented below. Section 4.4.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 5.5-1 presents the analytical suite for each sample, and Figure 5.2-1 shows the sampling locations.

Samples from two locations were analyzed for americium-241, isotopic plutonium, isotopic thorium, and isotopic uranium. Samples from two locations were analyzed for gamma-emitting radionuclides. No radionuclides were detected above BVs/FVs at SWMU 48-002(e).

5.5.3 Scope of Activities for AOC 48-002(e)

The proposed sampling locations at AOC 48-002(e) are shown in Figure 5.5-1. Table 5.5-2 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at AOC 48-002(e) will consist of the following activities:

- Soil and tuff samples will be collected at three locations from three depth intervals: the surface interval, soil/tuff interface interval, and the interval beginning 5 ft below the soil/tuff interface. Two locations will be collected near the previous sampling locations and one location will be downgradient of the former satellite waste accumulation area.

Samples will be analyzed at off-site fixed laboratories for TAL metals, isotopic uranium, isotopic plutonium, tritium, americium-241, isotopic thorium, perchlorate, nitrate, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the container storage area.

5.6 SWMU 48-003—Septic System

SWMU 48-003 consists of a former septic system that served TA-48 from 1957 to 1986. This septic system consisted of a septic tank (structure 48-0005), a dosing chamber, a filter bed (structure 48-0006), and an outfall that discharged into Mortandad Canyon. The septic tank and dosing chamber were 21 ft 7 in. long and the filter bed measured 81 ft 2 in. long x 40 ft 7 in. wide. The septic system operated until 1986, at which time the septic tank and filter bed were decommissioned and removed (LANL 1990, 007513). A laboratory and diagnostics facility (building 48-0045) was constructed over the site of the septic tank and filter bed. After the septic system was decommissioned, sanitary wastewater from TA-48 was sent to the sanitary lagoons at TA-35 and later to the consolidated treatment plant at TA-46. Although this septic system primarily received sanitary wastewater from TA-48 facilities, the system reportedly received hazardous and radioactive materials through accidental discharges (LANL 1992, 007666).

The site features of SWMU 48-003 are shown in Figure 5.2-1.

5.6.1 Summary of Previous Investigations for SWMU 48-003

A Phase I RFI was conducted in 1993 to determine the presence of surface and subsurface contamination at the former location of the septic system. A radiation survey conducted in this area determined that radiation levels were at background levels. Surface and subsurface samples were collected. All samples were field screened for radioactivity and organic chemicals and submitted for analysis of inorganic chemicals, radionuclides, and organic chemicals using a combination of fixed and mobile laboratories. The RFI activities and results were presented in the RFI report (LANL 1995, 050289).

Based on the responses to NMED's review of the Phase I RFI report (LANL 1996, 054448; LANL 1996, 055064), a sampling and analysis plan (SAP) was prepared to collect additional samples for analysis of metals, radionuclides, and SVOCs (LANL 1997, 055326). Sampling was conducted in 1997, but this data has not been reported to NMED.

5.6.2 Summary of Data for SWMU 48-003

A summary of decision-level data for SWMU 48-003 is presented below. Section 4.5.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 5.6-1 presents the analytical suite for each sample, and Figure 5.2-1 shows the sampling locations.

- Samples from five locations were analyzed for TAL metals. Analytical results indicated that antimony and cadmium had detection limits above the BVs in at least one sample (Table 5.6-2).
- Samples from seven locations were analyzed for americium-241. Samples from 15 locations were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, and isotopic uranium. Samples from five locations were analyzed for strontium-90. Analytical results indicated that americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/plutonium-240, strontium-90, thorium-230, uranium-234, and uranium-238 were detected or detected above BVs in at least one sample (Table 5.6-3). Figure 5.2-3 shows the analytical results and their locations.
- Samples from five locations were analyzed for SVOCs. Analytical results indicated that benzoic acid and bis(2-ethylhexyl)phthalate were detected (Table 5.6-4). Figure 5.2-4 shows the analytical results and their locations.

5.6.3 Scope of Activities for SWMU 48-003

The proposed sampling locations at SWMU 48-003 are shown in Figure 5.6-1. Table 5.6-5 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at SWMU 48-003 will consist of the following activities:

- Soil and tuff samples will be collected at 18 locations on mesa top from five depth intervals: the surface interval, the soil/tuff interface interval, the intervals beginning 5 ft, 10 ft, and 15 ft below the soil/tuff interface.
- Soil and tuff samples on slope (sediment pockets) will be collected at five locations from two depth intervals: the surface sediment interval and the soil/tuff interface interval.

Samples will be analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, isotopic uranium, isotopic plutonium, tritium, americium-241, strontium-90, isotopic thorium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), perchlorate, nitrate, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the septic system.

5.7 Consolidated Unit 48-004(a)-99—Sumps and Tanks

Consolidated Unit 48-004(a)-99 consists of SWMUs 48-004(a), 48-004(b), and 48-004(c). These SWMUs include inactive sumps and tanks formerly used to treat RLW generated in the main radiochemistry laboratory in building 48-0001. These sumps and tanks were part of the neutralization process at building 48-0001. Caustic (sodium hydroxide) solution was automatically added to the sumps or tanks to neutralize acidic wastewaters, which were pumped from the sumps or tanks to the RLW lines for subsequent treatment at TA-45 or TA-50. The neutralization process caused sludge to precipitate in the sumps or tanks. This sludge was removed and disposed of as radioactive waste. No drainlines or outfalls are associated with these sumps and tanks, which were equipped with automatic level controls to prevent overfilling. The tanks and sumps operated from the late 1950s until the 1970s. Some of the tanks were subsequently removed. The RFI work plan states that there is no documentation of past releases or spills from these sumps and tanks but that some residual contamination may remain (LANL 1992, 007666).

SWMU 48-004(a) consists of two sumps located below the floor of the shop in building 48-0001, Room 50. One of these sumps is approximately 4 ft x 3 ft x 2 ft deep and the other is approximately 6 ft x 6 ft x 5 ft deep. The sumps comprising SWMU 48-004(a) were inspected during preparation of the RFI work plan (LANL 1992, 007666). The inspection revealed no physical evidence of releases or external contamination.

SWMU 48-004(b) consists of three sets of tanks located in the south basement of building 48-0001 in Room 80. The numbers and size of the tanks in each set were not reported in the RFI work plan (LANL 1992, 007666). One set of these tanks is located in a pit area where a sump is also present. Precipitates containing radioactive contamination were reportedly removed from the second set of tanks. The tanks comprising SWMU 48-004(b) were inspected during preparation of the RFI work plan (LANL 1992, 007666), and no physical evidence of releases or external contamination was found.

SWMU 48-004(c) consists of two tanks that contained caustic (sodium hydroxide) solution from the caustic tanks. These tanks and sumps are located in the north basement of building 48-0001. The tanks comprising SWMU 48-004(c) were inspected during preparation of the RFI work plan (LANL 1992, 007666). The inspection revealed no physical evidence of releases or external contamination.

The site features of Consolidated Unit 48-004(a)-99 are shown in Figure 5.2-1.

5.7.1 Summary of Previous Investigations for Consolidated Unit 48-004(a)-99

No RFI activities have been conducted at this consolidated unit.

5.7.2 Summary of Data for Consolidated Unit 48-004(a)-99

There are no decision-level data available for this consolidated unit.

5.7.3 Scope of Activities for Consolidated Unit 48-004(a)-99

Sampling activities are not proposed for Consolidated Unit 48-004(a)-99 because the building is still active. It is proposed that site characterization and investigation be delayed until D&D of the building.

5.8 SWMU 48-005—Waste Lines

SWMU 48-005 consists of segments of inactive RLW lines at TA-48 and an associated outfall. From 1957 to 1965, these waste lines were part of the system used to convey RLW from TA-48 to the treatment plant at TA-45 (Consolidated Unit 45-001-00). Beginning in 1963, new waste lines were installed to carry wastes to the new treatment facilities at TA-50. By 1967, the waste lines leading to TA-45 were decommissioned but remained in place. Some of the waste lines were removed in two campaigns conducted in 1981 and 1984 (LANL 1992, 007513). SWMU 48-005 contains the remaining portions of waste lines, which are all inside the TA-48 security fence. The remaining waste lines are all 3-in.-diameter cast-iron pipe and consist of a 200-ft section of line 34 running westward from building 48-0001, a 300-ft section of line 36 that runs southward from the north wing of building 48-0001, and a 50-ft section of line 38 that runs southward from building 48-0001. These lines, located at depths of 10 to 11 ft, were not removed because they lie beneath structures, roadways, or utilities. The remaining sections of lines 34 and 36 were surveyed during the line removal activities. Line 34 was found to have low levels of alpha activity, and line 36 had no detectable activity (Elder et al. 1986, 003089). The remaining portion of line 38 was not surveyed. SWMU 48-005 also includes an outfall on the edge of Mortandad Canyon north of building 48-0001 that was the discharge point of line 37. Line 37 was connected to sumps in the north basement of building 48-0001 and was completely removed in 1981 (LANL 1992, 007666).

The site features of SWMU 48-005 are shown in Figure 5.2-1.

5.8.1 Summary of Previous Investigations for SWMU 48-005

A Phase I RFI was conducted in 1993 to determine the presence of surface and subsurface contamination at SWMU 48-005. Surface and subsurface samples were collected. All samples were field screened for radioactivity and organic chemicals and submitted for analysis of inorganic chemicals, radionuclides, and organic chemicals using a combination of fixed and mobile laboratories. The RFI activities and results were presented in the RFI report (LANL 1995, 050289).

Based on the responses to NMED's review of the Phase I RFI (LANL 1996, 054448; LANL 1996, 055064), a SAP was prepared to collect of additional samples to be analyzed for metals, radionuclides, SVOCs, and VOCs (LANL 1997, 055326). Sampling was conducted in 1997, but the data have not been reported to NMED.

5.8.2 Summary of Data for SWMU 48-005

A summary of decision-level data for SWMU 48-005 is presented below. Section 4.7.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 5.8-1 presents the analytical suite for each sample and Figure 5.2-1 shows the sampling locations.

- Samples from three locations were analyzed for TAL metals. Analytical results indicated that chromium and zinc were detected at concentrations greater than BVs in at least one sample (Table 5.8-2). Analytical results indicated that antimony, cadmium, mercury, and silver had detection limits above BVs in at least one sample. Figure 5.2-2 shows the analytical results and their locations.
- Samples from six locations were analyzed for americium-241. Samples from 15 locations were analyzed for gamma-emitting radionuclides. Samples from 12 locations were analyzed for isotopic plutonium. Samples from 17 locations were analyzed for isotopic thorium and isotopic uranium. Samples from 11 locations were analyzed for strontium-90. Analytical results indicated that americium-241, cesium-137, plutonium-238, plutonium-239/plutonium-240, and strontium-90 were detected at depths where FVs do not apply in at least one sample (Table 5.8-3). Analytical results indicated that thorium-230 and uranium-234 were detected above BVs in at least one sample. Figure 5.2-3 shows the analytical results and their locations.
- Samples from six locations were analyzed for SVOCs. Analytical results indicated that bis(2-ethylhexyl)phthalate, butylbenzylphthalate, di-n-butylphthalate, di-n-octylphthalate, and pyrene were detected in at least one sample (Table 5.8-4). Figure 5.2-4 shows the analytical results and their locations.
- Samples from three locations were analyzed for VOCs. Analytical results indicated that acetone and methylene chloride were detected in at least one sample (Table 5.8-4). Figure 5.2-4 shows the analytical results and their locations.

5.8.3 Scope of Activities for SWMU 48-005

Sampling activities are not proposed for SWMU 48-005 because the lines lie beneath structures, roadways, or utilities. It is proposed that site characterization and investigation be delayed until D&D of TA-48.

5.9 Consolidated Unit 48-007(a)-00—Drainlines and Outfalls

Consolidated Unit 48-007(a)-00 consists of SWMUs 48-007(a), 48-007(d), and 48-010. These SWMUs include two active stormwater outfalls and a surface impoundment that receives discharge from the outfalls. These SWMUs formerly received wastewater from the main radiochemistry laboratory in building 48-0001.

SWMU 48-007(a) is an outfall formerly used to discharge treated cooling tower blowdown from two cooling towers located on the roof of building 48-0001. This outfall is located east of building 48-0001. Up to 750 gal./h of cooling tower blowdown were discharged from the outfall. Discharge from this outfall flowed to an unlined surface impoundment, SWMU 48-010. Water used in these cooling towers was treated to control scale, corrosion, and biological growth. Additives used included Garratt Callahan (G.C.) Formula 227-L, a corrosion and scaling inhibitor, and G.C. Formula 314-T, a biocide. Specific hazardous chemicals present in these additives, if any, are not known. Approximately 60% of the water in the cooling towers was evaporated, causing the chemical additives to be concentrated in the blowdown. This outfall formerly operated as an NPDES-permitted outfall (045/046 EPA 03A) but was removed from the NPDES permit on December 6, 1999, because industrial wastewater discharges to the outfall had been discontinued earlier in the year (LANL 1992, 007666). Stormwater continues to flow through the outfall.

SWMU 48-007(d) is an outfall formerly used to discharge noncontact cooling water that cooled a vacuum pump housed in the south end of building 48-0001. This outfall is located east of building 48-0001. Up to 4000 gal./d of cooling water was discharged from the outfall. Discharge from this outfall flowed to SWMU 48-010. This outfall operated as an NPDES-permitted outfall (153 EPA 04A) but was removed from the NPDES permit July 20, 1998, because industrial wastewater discharges to the outfall had been discontinued earlier in the year (LANL 1992, 007666). Stormwater continues to flow through the outfall.

SWMU 48-010 is an unlined surface impoundment that was constructed in 1978 by excavating directly into the tuff. The surface impoundment is located approximately 300 ft east of building 48-0001 and 150 ft south of building 48-0045. The surface impoundment formerly received cooling tower blowdown discharged from SWMU 48-007(a), noncontact cooling water discharged from SWMU 48-007(d), and stormwater runoff from the parking lot for building 48-0045. Currently, the impoundment receives only stormwater. A wetland has developed around the impoundment. The impoundment and surrounding wetland cover approximately 100 ft x 150 ft. SWMU 48-010 discharges to the east into a side canyon that is a tributary to Mortandad Canyon (LANL 1992, 007666).

The site features of Consolidated Unit 48-007(a)-00 are shown in Figure 5.2-1.

5.9.1 Summary of Previous Investigations for Consolidated Unit 48-007(a)-00

In 1993, a Phase I RFI was conducted at the SWMU 48-007(a) and 48-007(d) outfalls to determine the presence of contamination. The outfall locations were surveyed for radiation and organic vapors. The survey results indicated radiation levels were at background levels, and organic vapors were not detected. A parking lot was constructed east of building 48-0001 that required the outfalls to be moved. The discharge from the SWMU 48-007(d) outfall was combined with the discharge from the SWMU 48-007(a) outfall. Therefore, samples were collected where the combined flows discharge to the impoundment. The samples were field screened for radioactivity and organic chemicals and submitted for analysis of inorganic chemicals and radionuclides using a combination of fixed and mobile laboratories. Because the fixed analytical laboratory was not able to complete all required analyses, soil and water samples were collected again in May 1995. The RFI activities and results were presented in the RFI report (LANL 1995, 050289).

A Phase I RFI was conducted in 1993 at SWMU 48-010 in 1993 to determine the presence of contamination. The locations around the impoundment and wetlands were screened for radiation and organic vapors. The survey results indicated radiation levels were at background levels, and organic vapors were not detected. Samples were collected and were field screened for radioactivity and organic chemicals and submitted for analysis of inorganic chemicals and radionuclides using a combination of fixed and mobile laboratories. Because the fixed analytical laboratory was not able to complete all required analyses, soil and water samples were collected again in May 1995. The RFI activities and results were presented in the RFI report (LANL 1995, 050289).

Based on the responses to NMED's review of the Phase I RFI report (LANL 1996, 054448; LANL 1996, 055064), a SAP was prepared to collect additional samples to be analyzed for metals, radionuclides, SVOCs, and VOCs (LANL 1997, 055326). Sampling was conducted in 1997, but the data have not been reported to NMED.

5.9.2 Summary of Data for Consolidated Unit 48-007(a)-00

A summary of decision-level data for Consolidated Unit 48-007(a)-00 is presented below. Section 4.8.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 5.9-1 presents the analytical suite for each sample, and Figure 5.2-1 shows the sampling locations.

- Samples from eight locations were analyzed for TAL metals. Analytical results indicated that arsenic, barium, calcium, chromium, copper, lead, mercury, nickel, thallium, and zinc were detected at concentrations greater than BVs in at least one sample (Table 5.9-2). Analytical results indicated that antimony, cadmium, selenium, and thallium had detection limits above BVs in at least one sample. Figure 5.9-1 shows the analytical results and their locations.
- Samples from six locations were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, and strontium-90. An additional sample at one location was analyzed for isotopic plutonium and isotopic uranium. Analytical results indicate that plutonium-238, plutonium-239/plutonium-240, and thorium-227 were detected in at least one sample (Table 5.9-3). Analytical results indicate that cesium-137, plutonium-239/plutonium-240, and thorium-227 were detected or detected at depths where FVs do not apply in at least one sample. Figure 5.9-2 shows the analytical results and their locations.
- Samples from six locations were analyzed for SVOCs and VOCs. Analytical results indicated that acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, 2-butanone, carbazole, chrysene, fluoranthene, fluorene, 4-isopropyltoluene, methylene chloride, phenanthrene, pyrene, toluene, trichlorofluoromethane, and 1,2,4-trimethylbenzene were detected (Table 5.9-4). Figure 5.9-3 shows the analytical results and their locations.

5.9.3 Scope of Activities for Consolidated Unit 48-007(a)-00

The proposed sampling locations at Consolidated Unit 48-007(a)-00 are shown in Figure 5.9-4. Table 5.9-5 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at Consolidated Unit 48-007(a)-00 will consist of the following activities:

- Soil and tuff samples will be collected at six locations from four depth intervals: the surface interval, the soil/tuff interface interval, the intervals beginning 10 ft and 15 ft below the soil/tuff interface. Two of the new sampling locations will be downgradient of the outfalls.

Samples will be analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, isotopic uranium, isotopic plutonium, isotopic thorium, strontium-90, tritium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), nitrate, perchlorate, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the outfalls and surface impoundments.

Samples collected from the Mortandad Canyon drainage will be used to determine whether lateral extent has been defined.

5.10 SWMU 48-007(b)—Cooling Tower Outfall

SWMU 48-007(b) is an outfall formerly which discharged noncontact cooling water used to cool a magnet and laser housed in the main radiochemistry laboratory in building 48-0001. This outfall is located north of building 48-0001 and formerly discharged up to 4300 gal./d of cooling water. Water discharged from the outfall flowed into Mortandad Canyon (LANL 1992, 007666). This outfall formerly operated as an NPDES-permitted outfall (016 EPA 04A) but was removed from the NPDES permit on September 19, 1997, because industrial wastewater discharges were discontinued. Presently, the outfall receives only stormwater.

The site features of SWMU 48-007(b) are shown in Figure 5.2-1.

5.10.1 Summary of Previous Investigations for SWMU 48-007(b)

A Phase I RFI was conducted in 1993 at SWMU 48-007(b) to determine the presence of contamination associated with discharges to the outfall. The outfall location was surveyed for radiation and organic vapors. The survey results indicated radiation levels were at background levels, and organic vapors were not detected. Samples were collected and were field screened for radioactivity and organic chemicals and submitted for analysis of inorganic chemicals and radionuclides using a combination of fixed and mobile laboratories. The RFI activities and results were presented in the RFI report (LANL 1995, 050289).

In 1997, additional soil samples were collected at SWMU 48-007(b) and submitted for laboratory analysis of radionuclides. The RFI activities and results were presented in the RFI report (LANL 1997, 056565).

5.10.2 Summary of Data for SWMU 48-007(b)

A summary of decision-level data for SWMU 48-007(b) is presented below. Section 4.9.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 5.10-1 presents the analytical suite for each sample, and Figure 5.2-2 shows the sampling locations.

- Samples from two locations were analyzed for gamma-emitting radionuclides. Analytical results indicated that cesium-137 was detected at depths where the FV does not apply (Table 5.10-2). Figure 5.2-2 shows the analytical results and their locations.

5.10.3 Scope of Activities for SWMU 48-007(b)

The proposed sampling locations at SWMU 48-007(b) are shown in Figure 5.10-1. Table 5.10-3 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at SWMU 48-007(b) will consist of the following activities:

- Soil and tuff samples will be collected at four locations from three depth intervals: the surface interval, the soil/tuff interface interval, and the interval beginning 2 ft below the soil/tuff interface at locations downgradient of the outfall.

Samples will be analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, tritium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), perchlorate, nitrate, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the outfall.

Samples collected from the Mortandad Canyon drainage will be used to determine whether lateral extent has been defined.

5.11 SWMU 48-007(c)—Floor Drain Outfall

SWMU 48-007(c) is an outfall that formerly received discharges from nine floor drains, a trench drain, and six roof drains at building 48-0001. This outfall is located north of building 48-0001 and discharges into Mortandad Canyon (LANL 1992, 007666). Former sources of discharge to the floor drains included floor washings, backflow preventers, drainage and condensate from a vacuum pump, steam condensate, a boiler drain, a fire drain, and a water heater pressure relief valve. This outfall operated as an NPDES-permitted outfall (131 EPA 04A), but was removed from the NPDES permit on January 14, 1998, because industrial wastewater discharges were discontinued (LANL 1997, 056565). Currently, this outfall receives only stormwater.

The site features of SWMU 48-007(c) are shown in Figure 5.2-1.

5.11.1 Summary of Previous Investigations for SWMU 48-007(c)

A Phase I RFI was conducted in 1993 at SWMU 48-007(c) to determine the presence of contamination associated with former discharges to the outfall. The outfall location was surveyed for radiation and organic vapors. The survey determined radiation levels to be at background and no organic vapors were detected. Samples were collected and were field screened for radioactivity and organic chemicals and submitted for analysis of inorganic chemicals and radionuclides using a combination of fixed and mobile laboratories. The RFI activities and results were presented in the RFI report (LANL 1995, 050289).

In 1997, additional soil samples at SWMU 48-007(c) were collected and submitted for laboratory analysis of radionuclides. The RFI activities and results were presented in the RFI report (LANL 1997, 056565).

5.11.2 Summary of Data for SWMU 48-007(c)

A summary of decision-level data for SWMU 48-007(c) is presented below. Section 4.10.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 5.11-1 presents the analytical suite for each sample and Figure 5.2-1 shows the sampling locations.

- Samples from four locations were analyzed for gamma-emitting radionuclides. Analytical results indicated that cesium-137 was detected at a depth where the FV does not apply, and uranium-235 was detected at a concentration greater than the BV in at least one sample (Table 5.11-2). Figure 5.2-2 shows the analytical results and their locations.

5.11.3 Scope of Activities for SWMU 48-007(c)

The proposed sampling locations at SWMU 48-007(c) are shown in Figure 5.11-1. Table 5.11-3 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at SWMU 48-007(c) will consist of the following activities:

- Soil and tuff samples will be collected at four locations from three depth intervals: the surface interval, the soil/tuff interface interval, and the interval beginning 2 ft below the soil/tuff interface at locations downgradient of the outfall.

Samples will be analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, tritium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), perchlorates, nitrate, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the outfall.

Samples collected from the Mortandad Canyon drainage will be used to determine whether lateral extent has been defined.

5.12 SWMU 48-007(f)—Outfall

SWMU 48-007(f) is an inactive outfall that formerly received discharges from two sink drains in an office and laboratory building (building 48-0046). This outfall is located north of building 48-0001 and discharged into Mortandad Canyon (LANL 1992, 007666). The approximate date that the outfall ceased operating is 1993. This outfall operated as an NPDES-permitted outfall (137 EPA 04A) but was removed from the NPDES permit on December 6, 1995.

The site features of SWMU 48-007(f) are shown in Figure 5.2-1.

5.12.1 Summary of Previous Investigations for SWMU 48-007(f)

A Phase I RFI was conducted in 1993 at SWMU 48-007(f) to determine the presence of contamination associated with discharges to the outfall. The outfall location was surveyed for radiation and organic vapors. The survey results indicated radiation was at background levels and organic vapors were not detected. Samples were collected and were field screened for radioactivity and organic chemicals and submitted for analysis of inorganic chemicals and radionuclides using a combination of fixed and mobile laboratories. The RFI activities and results were presented in the RFI report (LANL 1995, 050289).

In 1997, additional soil samples were collected at SWMU 48-007(f) and analyzed for radionuclides. The RFI activities and results were presented in the RFI report (LANL 1997, 056565).

5.12.2 Summary of Data for SWMU 48-007(f)

A summary of decision-level data for SWMU 48-007(f) is presented below. Section 4.11.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 5.12-1 presents the analytical suite for each sample, and Figure 5.2-2 shows the sampling locations.

- Samples from two locations were analyzed for gamma-emitting radionuclides. Analytical results indicated that uranium-235 was detected at a concentration greater than the BV in the sample in at least one sample (Table 5.12-2). Figure 5.2-3 shows the analytical results and their locations.

5.12.3 Scope of Activities for SWMU 48-007(f)

The proposed sampling locations at SWMU 48-007(f) are shown in Figure 5.12-1. Table 5.12-3 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at SWMU 48-007(f) will consist of the following activities:

- Soil and tuff samples will be collected at four locations from three depth intervals: the surface interval, the soil/tuff interface interval, and the interval beginning 2 ft below the soil/tuff interface at locations downgradient of the outfall.

Samples will be analyzed at off-site fixed laboratories for TAL metals, tritium, isotopic uranium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), perchlorate, nitrate, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the outfall.

Samples collected from the Mortandad Canyon drainage will be used to determine whether lateral extent has been defined.

5.13 AOC 48-011—Disposal Shaft

AOC 48-011 consists of a 3-ft-diameter x 65-ft-deep shaft reportedly drilled in 1976 or 1977 into the tuff on the east side of building 48-0001 for use in radiation-counting experiments. As part of these experiments, a 2-ft-diameter x 3-ft-long stainless-steel cylinder containing a sodium-iodide radiation detector was lowered into the shaft. This cylinder also contained approximately 3000 lb of lead shielding. As the cylinder was being lowered into the shaft, the cable broke and the cylinder fell to the bottom of the shaft. Because efforts to retrieve the cylinder were unsuccessful, it was left in place (LANL 1992, 007666) and covered.

The site features of AOC 48-011 are shown in Figure 5.2-1.

5.13.1 Summary of Previous Investigations for AOC 48-011

No RFI activities have been conducted at this AOC.

5.13.2 Summary of Data for AOC 48-011

There are no decision-level data available for this AOC.

5.13.3 Scope of Activities for AOC 48-011

The proposed sampling location at AOC 48-011 is shown in Figure 5.13-1. Table 5.13-1 provides the proposed sampling location, depths, the objectives, and the proposed analytical suites. Sampling at AOC 48-011 will consist of the following activities:

- Tuff samples will be collected at one location from three depth intervals: the intervals beginning 65 ft bgs, 75 ft bgs, and 85 ft bgs. The sampling location will be collected on the downslope side of the shaft.

Samples will be analyzed at off-site fixed laboratories for TAL metals, tritium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), PCBs, perchlorate, nitrate, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the shaft.

5.14 AOC 48-012—Soil Contamination

AOC 48-012 is a small area of stained soil discovered in August 2002 during routine trenching operations east of building 48-0001. After the stained soil was discovered, trenching operations were shut down in the area, and the site was reported to NMED as a one-time spill.

The site features of AOC 48-012 are shown in Figure 5.2-1.

5.14.1 Summary of Previous Investigations for AOC 48-012

The former Environmental Restoration Project, working in collaboration with other Laboratory groups, mobilized to determine the source of the contamination and to characterize the nature and extent of contamination. Lack of residual contamination in the upper 3 ft of the fill indicated a subsurface release. A preliminary sample was collected from the stained area, and the results showed elevated concentrations of TPH, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene. Several organic chemicals, including ethylbenzene, toluene, xylenes, and some PAHs, were also detected but at much lower concentrations.

Using a ground-penetrating radar (GPR) survey, a 50-sample surface grid was established to define the lateral extent of contamination. At each sampling location, soil gas was measured for VOC concentrations using EMFLUX collectors. Based on the results of the EMFLUX sampling, three boreholes were drilled and sampled for SVOCs and VOCs. This drilling was conducted to determine the vertical extent of the contamination. Removal of contaminated soil began in September 2002 as a voluntary corrective action (VCA). Approximately 190 yd^3 of contaminated soil was excavated and removed from the site. The area of excavation was approximately 30 ft x 37 ft and 6 ft deep in the center of the excavation area. Following the excavation, confirmation samples were collected, and the excavated area was backfilled with clean fill. The site was restored to its original condition.

In May 2003, a VCA report was submitted to NMED (LANL 2003, 080917). The VCA report details the investigation and the cleanup activities associated with AOC 48-012.

5.14.2 Summary of Data for AOC 48-012

A summary of decision-level data for AOC 48-012 is presented below. Section 4.13.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 5.14-1 presents the analytical suite for each sample and Figure 5.2-1 shows the sampling locations.

- Samples from 10 locations were analyzed for SVOCs and VOCs. Analytical results indicated that acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, 2,4-dimethylphenol, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, 2-methylphenol, 4-methylphenol, naphthalene, phenanthrene, and pyrene were detected in at least one sample (Table 5.14-2). Figure 5.2-4 shows the analytical results and their locations.

5.14.3 Scope of Activities for AOC 48-012

The proposed sampling locations at AOC 48-012 are shown in Figure 5.14-1. Table 5.14-3 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at AOC 48-012 will consist of the following activities:

- Soil and tuff samples will be collected at four locations from three depth intervals: the soil/tuff interface interval, and intervals beginning 10 ft and 15 ft below the soil/tuff interface. The samples will be collected from the perimeter of the former excavation.

Based on the NMED letter dated January 13, 2004 (NMED 2004, 082285) and previous analytical results, samples will be analyzed for SVOCs, VOCs, and TPH-DRO at off-site fixed laboratories.

6.0 TA-50

6.1 Background

TA-50 is located immediately northeast of the intersection of Pajarito Road and Pecos Drive and occupies an area of approximately 21 acres: 11.8 acres are associated with MDA C, and 8.7 acres are associated with the RLWTF. MDA C was used from 1948 until it was decommissioned in 1974 and consists of pits and shafts that received radioactive and hazardous wastes. Treatment facilities include the RLWTF and associated waste transfer and storage systems, equipment decontamination areas, and solid waste volume-reduction facilities. Figure 6.1-1 shows the site features for TA-50.

6.1.1 Operational History

The TA-50 RLWTF was built in 1963 to meet the need for expanded treatment capability and to locate a treatment facility nearer the TAs that were generating the waste. This treatment plant treats low level wastewater from various areas of the Laboratory.

The incinerator complex (building 50-0037), built in 1975, and the volume reductions facility (building 50-0069), built in 1983, were prototype facilities for developing and testing improved methods of handling and treating certain types of radioactive waste.

MDA C is a decommissioned material disposal area established to replace MDA B at TA-21 for disposal of Laboratory-derived waste. MDA C operated from May 1948 to April 1974 but received waste only intermittently from 1968 until it was decommissioned in 1974.

6.1.2 Summary of Releases, Transport Mechanisms, and Potential Receptors

Summary of Releases. Process wastes were generated at TA-50 by the radioactive and nonradioactive liquid and solid waste treatment facilities. Liquid wastes were monitored and then released to Mortandad Canyon. Most of the liquid wastes from the volume reduction and incinerator facilities are transferred by drainline to the liquid waste treatment plant, where they are treated as radioactive industrial waste. Liquid transuranic (TRU) wastes are transferred to the special TRU-treatment facilities in the liquid waste treatment plant.

Stack air from hoods, off-gas, and/or ventilation systems in the liquid treatment, volume reductions, and incinerator facilities was monitored and filtered to remove particulates and contaminants.

Contaminants may have been released to surface soil during the period when wastes were actively disposed of at MDA C. Fires in the disposal pits at MDA C have been recorded (LANL 1992, 007672) and may have released contamination to surface soils and air. Gas or vapor-phase contaminants may diffuse from waste and mix with air in the shafts or pits, the diffuse through the air-filled pores in the subsurface rock.

Transport Mechanisms. No natural surface-water bodies are present in TA-50. During summer thunderstorms and spring snowmelt, runoff from the mesa top flows into storm drains and down hillsides and into an intermittent stream in Mortandad Canyon. Surface-water runoff and erosion of contaminated surface soil could lead to contamination of bench areas on the hillside and contamination of surface water off-site. Surface water may also access subsurface contaminants exposed by soil erosion.

The thickness of the unsaturated zone beneath TA-50 indicates that migration of contaminants from the mesa top to the regional aquifer is unlikely. However, recent studies have shown that infiltration of some contaminants may have occurred (LANL 2006, 094161). Although migration to groundwater is possible, this work plan will only address collection of soil and tuff samples. Groundwater sampling for Mortandad Canyon is addressed in Mortandad Canyon investigation report (LANL 2006, 094161).

Other potential transport mechanisms include

- airborne transport of contaminated surface soil,
- infiltration through the vadose zone,
- continued dissolution and advective/dispersive transport of chemical and radiological contaminants contained in subsurface soil and bedrock,
- disturbance and uptake of contaminants in shallow soil by plants and animals, and
- site disturbance through human activities.

Potential receptors at one or more of the sites may include

- Laboratory workers,
- construction workers, and
- ecological receptors in the nondeveloped areas (i.e., hillsides).

6.1.3 Current Site Usage and Status

TA-50 is an active site and is almost completely developed with the exception of the 1.8 acres that comprises MDA C. Roads and large paved parking areas surround the buildings and structures.

6.2 SWMU 50-001(a)—Wastewater Treatment Facility

SWMU 50-001(a) consists of the TA-50 RLWTF (building 50-0001). This treatment plant treats low-level wastewater from various parts of the Laboratory. The TA-50 RLWTF has operated continuously since its construction in 1963. The TA-50 RLWTF primarily removes TRU elements using neutralization, flocculation and clarification, potential of hydrogen (pH) control, ion-exchange filtration, and ultrafiltration on reverse-osmosis processes. Treated effluent is monitored and discharged to an NPDES-permitted outfall [SWMU 50-006(d)] in Mortandad Canyon. Associated with the TA-50 RLWTF is a system of drainlines and tanks that transferred, treated, and temporarily stored the liquid waste and treated sludge. The drainlines and tanks are not part of SWMU 50-001(a). The drainlines are SWMU 50-002(b) and the tanks are SWMU 50-002(a) and Consolidated Unit 50-002(b)-00.

In July 1990, core samples collected from boreholes drilled through the floor of building 50-0001, around the pH-adjustment tank (also known as the grit chamber), indicated that the inlet line to the pH-adjustment tank had leaked. Therefore, influent wastes were rerouted to building 50-0002 (LANL 1992, 007672).

The site features of SWMU 50-001(a) are shown in Figure 6.2-1.

6.2.1 Summary of Previous Investigations for SWMU 50-001(a)

No RFI activities have been conducted at SWMU 50-001(a).

6.2.2 Summary of Data for SWMU 50-001(a)

There are no decision-level data available for this SWMU.

6.2.3 Scope of Activities for SWMU 50-001(a)

Sampling activities are not proposed for SWMU 50-001(a) because it consists of an active RLWTF that is also a Hazard Category 2 Nuclear Facility. Site characterization and investigation will be delayed until future D&D of the RLTWF.

6.3 AOC 50-001(b)—Waste Lines and Manholes

AOC 50-001(b) is the active underground drainline system through which liquid waste is transferred to the RLWTF (building 50-0001) at TA-50. A manhole (structure 50-0072) is the central collection area for most incoming liquid waste. Three lines feed into manhole 50-0072:

- In 1982, a major line connecting several TAs to this vault was constructed to replace an old line [Consolidated Unit 50-004(a)-00]. The new line consists of a double polyethylene pipe that enters structure 50-0072 from the north side of Pecos Drive (LANL 1992, 007672).
- Another waste line into structure 50-0072, completed in 1982, transports low-level radioactive liquids from structure 50-0073 (a manhole), which receives wastes from building 50-0069 (a volume reduction facility, AOC 50-008) and building 50-0037 (the incinerator complex, AOC 50-007). This line is a 6-in. polyethylene line encased in a 10-in. polyethylene line that has leak monitor and vacuum-test capabilities.

- A third line, also installed in 1982, transports LLW from TA-55 to structure 50-0072 through two manholes (structures 50-0016 and 50-0078). The line consists of an inner stainless-steel pipe encased in a polyvinyl chloride (PVC) pipe and has leak-monitor and vacuum test capabilities.

A single drainline carried all influent from structure 50-0072 into the grit tank at building 50-0001 until a leak around the grit tank was detected in 1990 (LANL 1992, 007672). The line now bypasses the grit chamber and passes through the neutralization chamber before it connects to the building 50-0002 tank vault [SWMU 50-002(a)]. The line consists of an inner 8-in. Schedule 40 stainless-steel pipe and an outer 10-in. Schedule 10 stainless-steel pipe. Structure 50-0007, another manhole of the influent waste system, is connected to the waste line from the tank truck unloading station (structure 50-0077). Structure 50-0007 has been out of service since the early 1990s (LANL 1992, 007672).

Four other waste lines run from TA-55 to building 50-0001 through structure 50-0106 to tanks in an underground vault (structure 50-0066). Three of the lines are 1.5-in. stainless-steel lines, each encased in 3-in. PVC. Two of the three lines carry caustic and acid wastes with high radioactivity. The third line is a spare that has never been used. The fourth line, which is for industrial waste, is a 2-in.-diameter stainless-steel line encased in 3-in. PVC. The lines operate by gravity flow, and the end of each is monitored continuously at TA-55, at two acid pits (structures 50-0057 and 50-0066) by a drip-tray and conductivity probe system wired to a computer for continuous readout. The three nonindustrial waste lines were replaced in 1994. However, the new lines have not yet been put into service. According to the 1990 SWMU report, there was some concern about contamination from the waste lines carrying TA-55 effluent because the original vacuum seals lost their integrity (LANL 1990, 007513). However, the drip pans have never collected fluid that showed the inner lines were leaking. The area where the lines enter building 50-0001 and the area west and north of the tank farm (building 50-0002) were sampled in August 1990.

The site features of AOC 50-001(b) are shown in Figure 6.2-1.

6.3.1 Summary of Previous Investigations for AOC 50-001(b)

In 2001 and 2005, samples were collected and analyzed for anions, TAL metals, perchlorate, total cyanide, radionuclides, PCBs, pesticides, TPH-DRO, and VOCs.

6.3.2 Summary of Data for AOC 50-001(b)

A summary of decision-level data for AOC 50-001(b) is presented below. Section 5.2.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 6.3-1 presents the analytical suite for each sample and Figure 6.2-1 shows the sampling locations.

- Samples from six locations were analyzed for anions, TAL metals, perchlorate, and total cyanide. Analytical results indicated that arsenic, selenium, and total cyanide had detection limits above the BVs in at least one sample (Table 6.3-2). Analytical results indicated that total cyanide had detection limits above the BVs in at least one sample. Chromium, lead, and zinc were detected at concentrations greater than BVs in at least one sample. Nitrate was detected in at least one sample. Figures 6.3-1 and 6.3-2 show the analytical results and their locations.
- Samples from six locations were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Tritium was detected in at least one sample (Table 6.3-3). Figure 6.3-3 shows the analytical results and their locations.

- Samples from one location were analyzed for PCBs, pesticides, TPH-DRO, and SVOCs. Samples from six locations were analyzed for VOCs. Methylene chloride was detected in at least one sample (Table 6.3-4). Figure 6.3-4 shows the analytical results and their locations.

6.3.3 Scope of Activities for AOC 50-001(b)

Sampling activities are not proposed for AOC 50-001(b) because it is currently active. It is proposed that site characterization and investigation be delayed until future D&D of the drainline.

6.4 SWMU 50-002(a)—Underground Tanks

SWMU 50-002(a) consists of an underground, reinforced-concrete vault (building 50-0002) that houses an equipment room, six flow-through process tanks, and several waste-transfer lines, all of which are associated with the TA-50 RLWTF (building 50-0001). The floor of the vault is 17 ft below ground. The holding tanks located within the vault (building 50-0002) include two incoming raw-waste tanks (25,000 gal. and 75,000 gal.) and two 25,000-gal. tanks used to store treated waste for reuse. The fifth tank (capacity 25,000 gal.) flows into the 75,000-gal. tank and was previously used to store waste during D&D activities; currently, this tank receives waste from chemistry laboratories in the building. The sixth tank (capacity 30,000 gal.) originally functioned as a holding tank for low-level sludge. In June 2001, the 30,000-gal. tank was drained, rinsed, and taken off-line by closing its valve; currently, this tank is available for standby use.

Wastes are transported to the vault (building 50-0002) through a system of transfer lines. Waste transfer lines include six cast-iron lines (including lines 55 and 67) connecting the RLWTF (building 50-0001) to the equipment room in the vault (building 50-0002); four steel lines added in 1984 to connect Room 61 to the equipment room in building 50-0002; five cast-iron lines from drains in building 50-0001 and one cast-iron line from a sink in the former vehicle-decontamination bay in building 50-0001 to the former D&D tank in building 50-0002; an influent line connecting building 50-0002 to a 100,000-gal. holding tank (structure 50-0090); and an effluent line connecting the holding tank to one of the 25,000-gal. influent tanks in the building 50-0002 vault.

In July and September 1974, two separate unintentional operational releases occurred from the overflow of a sump in building 50-0002. Both releases caused untreated wastewater to be discharged to waste lines 55 and 67 (the waste lines for treated effluent) and into the outfall area at the head of Ten Site Canyon [SWMU 50-006(a)]. In February 1975, waste line 67 was plugged at its outfall. In 1990, the integrity of the building 50-0002 tank vault and the pipelines tied from the vault to building 50-0001 were checked, and no leaks were found (LANL 1992, 007672).

The site features of SWMU 50-002(a) are shown in Figure 6.2-1.

6.4.1 Summary of Previous Investigations for SWMU 50-002(a)

One sample was collected at SWMU 50-002(a); no additional RFI activities have been conducted at this SWMU.

6.4.2 Summary of Data for SWMU 50-002(a)

A summary of decision-level data for SWMU 50-002(a) is presented below. Section 5.3.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 6.4-1 presents the analytical suite for each sample, and Figure 6.2-1 shows the sampling locations.

- A sample from one location was analyzed for TAL metals. Analytical results indicated that antimony, chromium, cobalt, and selenium were either detected at concentrations greater than the BVs or had detection limits greater than BVs in the sample (Table 6.4-2). Figure 6.3-2 shows the analytical results and their locations.
- A sample from one location was analyzed for total uranium, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Analytical results indicated that tritium was detected in the sample (Table 6.4-3). Figure 6.4-1 shows the analytical results and their locations.
- A sample from one location was analyzed for PCBs and pesticides as a combined suite, SVOCs, and VOCs. No organic chemicals were detected.

6.4.3 Scope of Activities for SWMU 50-002(a)

Sampling activities are not proposed for AOC 50-002(a) because it is in an active building. It is proposed that site characterization and investigation be delayed until the vault is decommissioned when the new RLWTF becomes active.

6.5 Consolidated Unit 50-002(b)-00—Vaulted Underground Tanks for TA-55 Waste

Consolidated Unit 50-002(b)-00 consists of SWMUs 50-002(b) and 50-002(c), two waste tanks (structures 50-0067 and 50-0068) and their associated inlet and outlet lines housed in an underground reinforced-concrete tank vault (structure 50-0066) at the TA-50 RLWTF [building 50-0001, SWMU 50-001(a)]. The concrete vault measures 18 ft x 16 ft x 14 ft deep and is located about 30 ft from the southwest corner of building 50-0001. The two waste tanks and the tank vault were constructed exclusively to store radioactive caustic waste (structure 50-0067) and acidic waste (structure 50-0068) from TA-55, where TRU wastes are generated. TRU wastes are processed separately from other wastes. The inlet lines consist of four stainless-steel pipes encased in PVC. One line is a capped backup. The second line carries radioactive acid waste to the acid waste tank. The third line carries radioactive caustic waste to the caustic tank. Wastes are transferred from the tanks through two double stainless-steel lines to Room 60, building 50-0001. The operation is monitored for criticality hazards, and necessary adjustments are made before treatment. The fourth line carries RLW to a manhole (structure 50-0072) [AOC 50-001(b)]. No documented releases are associated with Consolidated Unit 50-002(b)-00 (LANL 1992, 007672).

The site features of Consolidated Unit 50-002(b)-00 are shown in Figure 6.2-1.

6.5.1 Summary of Previous Investigations for Consolidated Unit 50-002(b)-00

No RFI activities have been conducted at Consolidated Unit 50-002(b)-00.

6.5.2 Summary of Data for Consolidated Unit 50-002(b)-00

There are no decision-level data available for this consolidated unit.

6.5.3 Scope of Activities for Consolidated Unit 50-002(b)-00

Sampling activities are not proposed for Consolidated Unit 50-002(b)-00 because the system is currently active. It is proposed that site characterization and investigation be delayed until the tanks are removed.

6.6 AOC 50-002(d)—Aboveground Storage Tank

AOC 50-002(d) is a decommissioned aboveground 5000-gal. stainless-steel tank (structure 50-0005) located at TA-50, building 50-0001 (the RLWTF). The tank is outside and adjacent to the north wall of Room 63D. Before decommissioning, the tank was used for the storage of product (nitric acid). The storage tank was part of the ion-exchange column system at the RLWTF (building 50-0001). The ion-exchange system was designed to remove any radioisotopes not previously removed by the clariflocculator system at the RLWTF. Because the clariflocculator system was so successful in removing radioisotopes from wastewater to levels consistently below DOE limits at the time, the ion-exchange column was rarely used and the tank was consequently never filled to capacity. In late 1964, a new tank (structure 50-0005) replaced the original nitric acid tank after the original rubber-lined carbon steel tank reportedly leaked. The new tank is supported on concrete saddles that extend 5 ft bgs. A concrete sump filled with limestone chips (structure 50-0012) was installed beneath the new tank. The tank was vented to the sump to neutralize any nitric acid vapors emitted when the tank was filled. In 1988, retaining walls and a concrete slab were installed to contain any spillage. Structure 50-0005 was managed in accordance with the Laboratory's Spill Prevention Control and Countermeasures Plan (40 CFR 112). In 1996, the tank was decommissioned (emptied, triple rinsed, and all piping disconnected) (LANL 2000, 067470.24).

The site features of AOC 50-002(d) are shown in Figure 6.2-1.

6.6.1 Summary of Previous Investigations for AOC 50-002(d)

No RFI activities have been conducted at AOC 50-002(d).

6.6.2 Summary of Data for AOC 50-002(d)

There are no decision-level data available for this AOC.

6.6.3 Scope of Activities for AOC 50-002(d)

Sampling activities are not proposed for AOC 50-002(d) because it is located within an active nuclear facility. It is proposed that site characterization and investigation be delayed until the vault is decommissioned when the new RLWTF becomes active.

6.7 AOC 50-003(a)—Container Storage Area

AOC 50-003(a) is a former RCRA interim-status unit that was located in Room 59 of building 50-0001. This unit was used to store containers of solid, cemented, mixed-TRU sludge resulting from waste treatment activities. During its period of operation, this AOC operated in accordance with the requirements of 20.4.1.600 New Mexico Administrative Code (NMAC) 4.1 and 40 CFR 265, Subparts A–D and I. NMED approved clean closure for AOC 50-003(a) in November 2004 (NMED 2004, 098488).

The site features of AOC 50-003(a) are shown in Figure 6.2-1.

6.7.1 Summary of Previous Investigations for AOC 50-003(a)

No RFI activities have been conducted at AOC 50-003(a).

6.7.2 Summary of Data for AOC 50-003(a)

There are no decision-level data available for this AOC.

6.7.3 Scope of Activities for AOC 50-003(a)

Sampling activities are not proposed for AOC 50-003(a) because it was approved for clean closure by NMED in November 2004 (NMED 2004, 098488).

6.8 Consolidated Unit 50-004(a)-00—Historical Waste Lines and Underground Vault

Consolidated Unit 50-004(a)-00 consists of SWMUs 50-004(a), 50-004(b), and 50-004(c), which are former components and one existing component (waste line 56) of the TA-50 RLWTF.

SWMU 50-004(a) consists of the former locations of underground RLW and industrial waste lines. These waste lines routed wastes to the TA-50 RLWTF from TAs located along Pajarito Road. Most of these waste lines were decommissioned and removed in 1975, when excavated soil was characterized for radioactive constituents and remediated to meet regulatory levels (LANL 1992, 007672).

SWMU 50-004(b) is the location of a decommissioned underground vault (structure 50-0003) that housed three stainless-steel-lined concrete storage tanks. The tanks, ranging in volume from 1000 to 4500 gal., were used to collect and store wastewater from the Omega Reactor, formerly at TA-02. Waste lines to this tank vault included waste line 49 from TA-35 and waste line 50 from building 50-0001. Waste line 49, the vault, and the tanks were removed in 1989. Soil sampled during decommissioning was screened for radionuclides and chemical constituents. No elevated concentrations were detected (LANL 1992, 007672).

SWMU 50-004(c) consists of 13 industrial waste lines (lines 44, 45, 45a, 46, 47, 48, 48a, 49, 54, 55, 56, 65, and 67) and three associated manholes (structures 50-0006, 50-0055, and 50-0056) that discharged to the decommissioned underground tank vault (structure 50-0003). With the exception of waste line 56, all waste lines and manholes associated with the underground vault [SWMU 50-004(b)] were removed between 1981 and 1989 (Elder et al. 1986, 003089; LANL 1992, 007672). Waste line 56 remains in service. Radionuclide contamination encountered during decommissioning of the waste lines and manholes was remediated to regulatory levels through removal of the pipe and soil to approximately 19 ft belowgrade. Field screening for radionuclides confirmed that regulatory levels were met (LANL 1992, 007672).

The site features of Consolidated Unit 50-004(a)-00 are shown in Figure 6.2-1.

6.8.1 Summary of Previous Investigations for Consolidated Unit 50-004(a)-00

In 1994, an RFI was conducted at SWMUs 50-004(a) and 50-004(c) with the objective of determining the presence of radionuclides and hazardous constituents from historical operational releases.

During the RFI at SWMU 50-004(a), a 520-ft length of the original 6-in. vitrified clay pipe (VCP) waste line trench and the manholes were investigated. Five vertical boreholes located approximately 100 ft apart were advanced along the waste line trench. Eleven samples, collected from the five boreholes, were field screened for radionuclides and organic vapors. Radionuclide screening results were all at or near background. The samples were submitted to an off-site laboratory for analysis of inorganic chemicals, organic chemicals, and radionuclides. The RFI activities and results were presented in the RFI report (LANL 1996, 054836).

At SWMU 50-004(c), 67 samples were collected from depths up to approximately 14 ft in 29 locations. Samples were field screened for radionuclides and organic vapors and submitted for off-site laboratory analysis of organic chemicals, inorganic chemicals, and radionuclides. The RFI activities and results were presented in the RFI report (LANL 1996, 054836).

In 2001, additional samples were collected and analyzed for metals, radionuclides, PCBs, pesticides, SVOCs, TPH-DRO, and VOCs (SEA 2002, 087834).

6.8.2 Summary of Data for Consolidated Unit 50-004(a)-00

A summary of decision-level data for Consolidated Unit 50-004(a)-00 is presented below. Section 5.7.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 6.8-1 presents the analytical suite for each sample, and Figure 6.2-1 shows the sampling locations.

- Samples from 30 locations were analyzed for TAL metals. Analytical results indicated that aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, copper, lead, magnesium, mercury, nickel, potassium, thallium, and zinc were detected at concentrations greater than BVs in at least one sample (Table 6.8-2). Analytical results indicated that antimony, cadmium, magnesium, mercury, selenium, and silver had detection limits above BVs in at least one sample. Figures 6.3-1 and 6.3-2 show the analytical results and their locations.
- Samples from five locations were analyzed for perchlorate. Perchlorate was not detected.
- Samples from the 31 locations were analyzed for gamma-emitting radionuclides, isotopic uranium, and tritium. Samples from 30 locations were analyzed for isotopic plutonium. One sample at location 50-05031 was analyzed for strontium-90. Analytical results indicated that americium-241, cesium-137, plutonium-238, and plutonium-239/plutonium-240 were detected at depths where FVs do not apply in at least one sample (Table 6.8-3). Analytical results indicated that plutonium-239/plutonium-240, tritium, and uranium-235 were detected at activities greater than BVs/FVs in at least one sample. Figures 6.3-3 and 6.4-1 show the analytical results and their locations.
- One sample at location 50-05031 was analyzed for SVOCs. Organic chemicals were not detected.

6.8.3 Scope of Activities for Consolidated Unit 50-004(a)-00

The proposed sampling locations at Consolidated Unit 50-004(a)-00 are shown in Figure 6.8-1. Table 6.8-4 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at Consolidated Unit 50-004(a)-00 will consist of the following activities:

- Tuff samples will be collected at two locations (previous sampling locations 50-03038 and 50-03021) from two depth intervals: the intervals beginning 15 ft bgs and 20 ft bgs.
- Tuff samples will be collected at two locations (previous sampling locations 50-03005 and 50-03001) from three depth intervals: the intervals beginning 10 ft bgs, 15 ft bgs, and 20 ft bgs.

- Tuff samples will be collected at four locations from five depth intervals: the surface interval, soil/tuff interface interval, the interval beginning 5 ft below the soil/tuff interface, the interval beginning 10 ft below the soil/tuff interface, and the interval beginning 15 ft below the soil/tuff interface. Three locations are downgradient of former locations to define lateral extent. One location is at a bend in the waste line.

Samples will be analyzed at off-site fixed laboratories for TAL metals, isotopic uranium, isotopic plutonium, tritium, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), perchlorate, nitrate, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds and PCBs because they are not related to the historical operations of the waste lines.

6.9 SWMU 50-006(a)—Operational Release

SWMU 50-006(a) is the outfall area at the head of Ten Site Canyon impacted by two accidental operational releases when a sump in a pumping station (building 50-0002) overflowed, causing untreated wastewater to be discharged to waste lines 55 and 67 (the waste lines for treated effluent). The releases occurred in July and September 1974 (LANL 1995, 049925). In February 1975, waste line 67 was plugged at its outfall. A soil sample collected from the outfall area when waste line 67 was plugged showed elevated levels of gross alpha radioactivity. Analysis of additional soil samples collected below the waste line 67 outfall in September 1976 showed elevated levels of gross-alpha radioactivity extending 984 ft downgradient from the outfall. In 1981, both waste lines 55 and 67 were completely removed (Elder et al. 1986, 003089). During waste line removal, elevated levels of radionuclides, including plutonium-239, ruthenium-106, cesium-137, strontium-89, and yttrium-90 were detected. As a result, the outfall area was partially decontaminated by the removal of 70 m^3 of contaminated soil from the outfall location (LANL 1992, 007672).

The site features of SWMU 50-006(a) are shown in Figure 6.9-1.

6.9.1 Summary of Previous Investigations for SWMU 50-006(a)

A Phase I RFI was conducted in 1993 at SWMU 50-006(a) to determine the nature and extent of radionuclide and hazardous chemical contamination in and around the area of the Ten Site Canyon outfall. Samples were collected below the former waste line outfall, on both banks of the drainage channel, and in the canyon drainage channel at regular intervals over a distance of approximately 1300 ft downstream from the TA-50 boundary. Samples were field screened for organic vapors and radioactivity. Elevated gross-alpha radiation was detected at one screening sampling location, resulting in the selection of additional sampling locations upstream and downstream from the area with elevated gross-alpha radiation. A total of 134 samples were collected from 53 locations. Samples were analyzed for inorganic chemicals, VOCs, SVOCs, PCBs, and radionuclides. The RFI activities and results were presented in the RFI report (LANL 1995, 049925).

In 1996, an interim action (IA) was implemented to remove the contaminated sediment. Approximately 0.72 yd^3 of radioactively contaminated soil was excavated and removed. Ten confirmation samples were collected from the excavated area and analyzed for gross-alpha and beta radioactivity. Results were reported in the 1997 IA report (LANL 1997, 055834).

6.9.2 Summary of Data for SWMU 50-006(a)

A summary of decision-level data for SWMU 50-006(a) is presented below. Section 5.8.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 6.9-1 presents the analytical suite for each sample, and Figure 6.9-1 shows the sampling locations.

- One sample was analyzed for anions, perchlorate, and phosphorous. Analytical results indicated that total phosphorus was detected (Table 6.9-2). Figure 6.9-2 shows the analytical results and their locations.
- Samples from 31 locations were analyzed for TAL metals. Analytical results indicated that barium, cadmium, lead, nickel, and selenium were detected at a concentration greater than BVs in at least one sample (Table 6.9-2). Analytical results indicated that antimony, cadmium, selenium, silver, and thallium had detection limits above BVs in at least one sample. Figure 6.9-2 shows the analytical results and their locations.
- Samples from 20 locations were analyzed for americium-241. Samples from 62 locations were analyzed for gamma-emitting radionuclides, isotopic plutonium, and strontium-90. Samples from all 62 locations were analyzed for isotopic uranium and tritium. Analytical results indicated that plutonium-238, plutonium-239/plutonium-240, and tritium were detected in at least one sample at depths where FVs do not apply (Table 6.9-3). Analytical results indicated that americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/plutonium-240, strontium-90, tritium, uranium-234, uranium-235, and uranium-238 were detected at an activity greater than the range of BVs/FVs in at least one sample. Figures 6.9-3, 6.9-4, 6.9-5, and 6.9-6 show the analytical results and their locations.
- One sample was analyzed for PAHs and pesticides. Samples from 21 locations were analyzed for PCBs. Samples from 57 locations were analyzed for SVOCs. Samples from 15 locations were analyzed for VOCs. Analytical results indicated that acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, carbon tetrachloride, chrysene, dibenzo(a,h)anthracene, dibenzofuran, diethylphthalate, di-n-butylphthalate, fluoranthene, fluorene, 2-hexanone, indeno(1,2,3-cd)pyrene, 4-methyl-2-pentanone, methylene chloride, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, and toluene were detected in at least one sample (Table 6.9-4). Figures 6.9-7 and 6.9-8 show the analytical results and their locations.

6.9.3 Scope of Activities for SWMU 50-006(a)

The proposed sampling locations at SWMU 50-006(a) are shown in Figure 6.9-9. Table 6.9-5 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at SWMU 50-006(a) will consist of the following activities:

- Soil and tuff samples will be collected at three locations from three depth intervals: the surface interval, the soil/tuff interface interval, and the interval beginning 5 ft below the soil/tuff interface.

Samples will be analyzed at off-site fixed laboratories for TAL metals, anions, isotopic uranium, isotopic plutonium, tritium, americium-241, strontium-90, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), PCBs, perchlorate, phosphorous, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds because they are not related to the historical operations of the operational release.

6.10 SWMU 50-006(c)—Operational Release

SWMU 50-006(c) consists of the surface soil contamination at TA-50 resulting from the deposition of radioactive contaminants (primarily plutonium and americium) from historical stack emissions at TA-50. Emission sources included seven exhaust stacks that ventilated hoods for specific operations at the facility. Buildings 50-0001, 50-0037, and 50-0069 are monitored for radioactive emissions, and the resulting data were reported to EPA Region 6 (LANL 1992, 007672; LANL 1995, 049925).

The site features of SWMU 50-006(c) are shown in Figure 6.2-1.

6.10.1 Summary of Previous Investigations for SWMU 50-006(c)

A Phase I RFI was conducted in 1993 at SWMU 50-006(c) to determine the nature and extent of any radionuclides and hazardous constituents. The RFI also included AOCs 50-007 and 50-008, potential surface soil contamination from airborne releases from the incinerator complex (building 50-0037) and the volume reduction facility (building 50-0069). The SWMU and AOCs were investigated as an aggregate because their boundaries are indistinguishable. Samples were collected from five unpaved areas around buildings 50-0001, 50-0037, and 50-0069. Sampling locations were biased toward natural drainage channels and soil samples were collected from a total of 51 locations. The samples were analyzed for inorganic chemicals, organic chemicals, PCBs, and radionuclides. The RFI activities and results were presented in the RFI report (LANL 1995, 049925).

6.10.2 Summary of Data for SWMU 50-006(c)

A summary of decision-level data for SWMU 50-004(c) is presented below. Section 5.9.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 6.10-1 presents the analytical suite for each sample, and Figure 6.2-1 shows the sampling locations.

- Samples from 51 locations were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Samples from 21 locations were analyzed for strontium-90. Analytical results indicated that cobalt-60, plutonium-238, plutonium-239/plutonium-240, thorium-232, and tritium were detected at an activity greater than BVs/FVs in at least one sample (Table 6.10-2). Figures 6.3-3 and 6.4-1 show the analytical results and their locations.
- Sample from 43 locations were analyzed for SVOCs. Analytical results indicated that acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, dibenzo(a,h)anthracene, diethylphthalate, di-n-butylphthalate, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene were detected in at least one sample (Table 6.10-3). Figures 6.3-4 and 6.10-1 show the analytical results and their locations.

6.10.3 Scope of Activities for SWMU 50-006(c)

Sampling activities are not proposed for SWMU 50-006(c) because no air emissions have occurred since 1993. The site has been recontoured and regraded. It is proposed that site characterization and investigation be delayed until future D&D of TA-50.

6.11 SWMU 50-006(d)—Effluent Discharge

SWMU 50-006(d) consists of a TA-50 drainline (structure 50-0064) and associated NPDES-permitted outfall 051 in Mortandad Canyon for treated wastewater from the RLWTF (building 50-0001).

Structure 50-0064 is a 6-in.-diameter iron discharge pipe that was rerouted in 1983 to accommodate construction of the TA-35 target fabrication facility (building 35-0213). In 1985, EPA Region 6 issued an administrative order to DOE requiring modification of the outfall to mitigate ongoing stream-bank erosion caused by the discharge pipe ending 25 ft short of the stream channel. DOE extended the pipe into the stream channel, and EPA Region 6 subsequently closed the order in 1986 (LANL 1992, 007672).

The site features of SWMU 50-006(d) are shown in Figure 6.11-1.

6.11.1 Summary of Previous Investigations for SWMU 50-006(d)

In 1993, samples were collected in the canyon downgradient from the SWMU.

6.11.2 Summary of Data for SWMU 50-006(d)

A summary of decision-level data for SWMU 50-006(d) is presented below. Section 5.10.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 6.11-1 presents the analytical suite for each sample and Figure 6.11-1 shows the sampling locations.

- Samples from 27 locations were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Analytical results indicated that americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/plutonium-240, strontium-90, tritium, uranium-234, uranium-235, and uranium-238 were detected at an activity greater than BVs/FVs in at least one sample (Table 6.11-2). Analytical results indicated that americium-241, cesium-137, plutonium-238, plutonium-239/plutonium-240, and strontium-90 were detected at depths where FVs do not apply in at least one sample. Figure 6.11-2 shows the analytical results and their locations.
- Samples from 10 locations were analyzed for PCBs. Samples from 26 locations were analyzed for SVOCs. Analytical results indicated that Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, phenanthrene, and pyrene were detected in at least one sample (Table 6.11-3). Figure 6.11-3 shows the analytical results and their locations.

6.11.3 Scope of Activities for SWMU 50-006(d)

The proposed sampling locations at SWMU 50-006(d) are shown in Figure 6.11-4. Table 6.11-4 provides the proposed sampling locations, depths, the objectives, and the proposed analytical suites. Sampling at SWMU 50-006(d) will consist of the following activities:

- Soil and tuff samples will be collected at four locations from three depth intervals; the surface interval, the soil/tuff interface interval, and the interval beginning 5 ft below the soil/tuff interface. The samples will be collected from below the outfall.

Samples will be analyzed at off-site fixed laboratories for TAL metals, isotopic uranium, isotopic plutonium, tritium, strontium-90, PCBs, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), perchlorate, nitrate, cyanide, pH, dioxins, and furans, and by gamma spectroscopy. Samples will not be analyzed for explosive compounds because they are not related to the historical operations of the drainline.

6.12 AOC 50-007—Incinerator

AOC 50-007 is a former incinerator complex that was housed in building 50-0037. The incinerator complex was constructed in 1975 and consisted of the incinerator, various waste-feed components, and two waste-feed tanks. The incinerator was located in Room 112. The former solid and liquid waste-feed system was located in Room 115. The liquid feed system preparation room was bermed and had no floor drains. The maximum waste inventory allowed in Room 115 was 600 gal. in two waste-feed tanks.

The incinerator complex was equipped with an off-gas treatment unit, and the exhaust air system from the incinerator included two high-efficiency particulate air (HEPA) filters. Liquid effluent generated by the off-gas aqueous scrub system was filtered to remove solids before transfer to a double instrument-monitored pipeline to the RLWTF (building 50-0001). Ash was stabilized in concrete.

From 1978 to 1987, 23 test burns were successfully conducted for RCRA and TSCA wastes. EPA issued a permit for the incineration of PCBs in 1984, and NMED included the incinerator in a 1989 Hazardous Waste Facility Permit (HWFP) (LANL 1992, 007672). Actual waste streams incinerated at building 50-0037 after the permits were issued included radioactively contaminated PCBs and scintillation cocktails. Operation of the incinerator was discontinued in 1987 (LANL 1992, 007672). The incinerator and associated equipment has been removed and the unit was closed under the RCRA permit.

The site features of AOC 50-007 are shown in Figure 6.2-1.

6.12.1 Summary of Previous Investigations for AOC 50-007

A Phase I RFI was conducted in 1993 at AOC 50-007.

6.12.2 Summary of Data for AOC 50-007

There are no decision-level data available for this AOC.

6.12.3 Scope of Activities for AOC 50-007

Sampling activities are not proposed for AOC 50-007 because it is closed under the RCRA permit.

6.13 AOC 50-008—Reduction Site

AOC 50-008 is the waste characterization, reduction, and repackaging facility (formerly the volume reduction facility) located at TA-50 in building 50-0069. This active facility was constructed in 1979 to size-reduce large TRU-contaminated metallic items and repackage them into standard-sized containers. The facility, first used in 1982, is an active permitted storage unit operated in accordance with the requirements of 20.4.1.500 NMAC; 40 CFR 264, Subparts A–D and I; and the Laboratory HWFP.

The site features of AOC 50-008 are shown in Figure 6.2-1.

6.13.1 Summary of Previous Investigations for AOC 50-008

A Phase I RFI was conducted in 1993 at AOC 50-008.

6.13.2 Summary of Data for AOC 50-008

There are no decision-level data available for this AOC.

6.13.3 Scope of Activities for AOC 50-008

Sampling activities are not proposed for AOC 50-008. AOC 50-008 is an active permitted storage unit operated in accordance with the requirements of 20.4.1.500 NMAC, 40 CFR 264, Subparts A–D and I. As such, it is subject to RCRA closure requirements and not to Consent Order requirements. Therefore, no activities are proposed for AOC 50-008 in this work plan.

6.14 SWMU 50-009—Material Disposal Area C

SWMU 50-009 consists of decommissioned MDA C, established to replace MDA B at TA 21 as a disposal area for Laboratory-derived waste. MDA C operated from May 1948 to April 1974. Wastes disposed at MDA C included liquids, solids, and gases generated from a broad range of nuclear energy research and development activities conducted at the Laboratory; they included uncontaminated classified materials, metals, hazardous materials, and radionuclides. Historical reports indicate that it was common practice for chemicals to be burned in the chemical disposal pit at MDA C. At MDA C, 7 pits (6 pits and 1 chemical pit) and 108 shafts were excavated into the overlying soil and tuff (LANL 1992, 007672).

SWMU 50-009, MDA C is currently under investigation. A Phase I investigation was completed in August 2006, and the investigation report (LANL 2006, 094688) was submitted to NMED in December 2006. A Phase II work plan was submitted to NMED (LANL 2007, 098425) in July 2007, and the field activity will start in November 2007.

6.14.1 Summary of Previous Investigations for SWMU 50-009

Previous investigations at SWMU 50-009 (MDA C) are presented in the investigation report for MDA C (LANL 2006, 094688).

6.14.2 Summary of Data for SWMU 50-009

Analytical results related to this SWMU are presented in the investigation report for MDA C (LANL 2006, 094688).

6.14.3 Scope of Activities for SWMU 50-009

Sampling activities are not proposed for SWMU 50-009 in this work plan because it is being sampled under a separate investigation (LANL 2007, 098425).

6.15 AOC 50-010—Decontamination Facility

AOC 50-010 is a former vehicle decontamination bay that was located in Room 34B of the TA-50 RLWTF (building 50-0001). The area was used to clean radioactive contamination from vehicles and large objects used to transport RLW to TA-50. Liquid wastes generated during decontamination activities were transferred to tanks at building 50-0002 through a floor drain and waste line. The decontamination bay was operated from 1963 through October 1999. It was enclosed in 1983. No documented evidence of contaminant releases from this facility was found (LANL 1992, 007672).

The site features of AOC 50-010 are shown in Figure 6.2-1.

6.15.1 Summary of Previous Investigations for AOC 50-010

No RFI activities have been conducted at AOC 50-010.

6.15.2 Summary of Data for AOC 50-010

There are no decision-level data available for this AOC.

6.15.3 Scope of Activities for AOC 50-010

Sampling activities are not proposed for AOC 50-010 because it is within an active building. It is proposed that site characterization and investigation be delayed until future D&D of the building.

6.16 SWMU 50-011(a)—Septic System

SWMU 50-011(a) is the location of a former septic system that was installed at TA-50 in 1964 at the south end of the RLWTF (building 50-0001). The septic system consisted of an influent line from building 50-0001 that discharged to a manhole (structure 50-0009) and then to a septic tank (structure 50-0010). The effluent line from the tank tied to a distribution box (structure 50-0011), which discharged to four parallel perforated pipes traversing a leach field.

In 1978, a 4-ft-diameter x 50-ft-deep shaft was drilled at the east end of the leach field to address problems with standing water on the ground surface. A 4-in. perforated pipe was installed in the shaft, and the annulus was backfilled to within 4 ft of the ground surface. The outlets of the four parallel pipes were then tied into the newly installed perforated pipe.

With the exception of the perforated pipe installed in the leach field in 1978, the entire septic system was removed in 1983. Currently, a storage building (building 50-0083) and an asphalt pad cover the area formerly occupied by the septic system. The 50-ft-deep shaft and perforated pipe remain in place beneath storage building 50-0083 (LANL 1992, 007672).

The site features of SWMU 50-011(a) are shown in Figure 6.2-1.

6.16.1 Summary of Previous Investigations for SWMU 50-011(a)

A Phase I RFI was conducted in 1994 at SWMU 50-011(a). Samples were collected and analyzed for metals, radionuclides, PCBs, SVOCs, and VOCs. The RFI activities and results were presented in the RFI report (LANL 1996, 054836).

In December 2001, geotechnical and waste characterization samples were collected from eight boreholes, including one adjacent to the seepage pit, to determine the feasibility of constructing a new pump house and influent storage tank vault at TA-50. Samples were collected and analyzed for metals, radionuclides, PCBs, pesticides, SVOCs, TPH-DRO, and VOCs. The results were presented in a report (SEA 2002, 087834).

In 2004, supplemental RFI sampling was conducted. Samples were collected and analyzed for anions, metals, radionuclides, and VOCs (SEA 2002, 087834).

6.16.2 Summary of Data for SWMU 50-011(a)

A summary of decision-level data for SWMU 50-011(a) is presented below. Section 5.15.2 of the HIR provides the details of data evaluation (LANL 2007, 098955). Table 6.16-1 presents the analytical suite for each sample and Figure 6.2-1 shows the sampling locations.

- Samples from six locations were analyzed for TAL metals. Samples from two locations were analyzed for perchlorate. Analytical results indicated that antimony and selenium were either detected above the BVs or had detection limits above the BVs in at least one sample (Table 6.16-2). Figure 6.3-2 shows the analytical results and their locations.
- Samples from two locations were analyzed for americium-241. Samples from six locations were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Analytical results indicated that plutonium-238, plutonium-239/plutonium-240, and tritium were detected in at least one sample (Table 6.16-3). Figure 6.4-1 shows the analytical results and their locations.
- Samples from two locations were analyzed for VOCs. Analytical results indicated that acetone was detected in at least one sample (Table 6.16-4). Figure 6.10-1 shows the analytical results and their locations.

6.16.3 Scope of Activities for SWMU 50-011(a)

It is proposed that site characterization and investigation be delayed for SWMU 50-011(a) because it is partially within an active building.

6.17 AOC 50-011(b)—Lift Station

AOC 50-011(b) consists of two active sanitary wastewater lift stations (structures 50-0091 and 50-0092) and approximately 400 ft of piping that transport sanitary wastewater from the TA-50 RLWTF (building 50-0001) to the main line that serves the TA-46 SWSC plant. The lift stations are located at TA-50 on the north and south sides of building 50-0001. These sanitary lift stations and associated drainlines were installed in 1983 as part of a utility upgrade. One lift station serves the north end of building 50-0001, and the second lift station serves the south end of the building. This sanitary wastewater system is still active. The wastewater is pumped through each lift station to a 6-in. main on the west side of the building. The 6-in. main runs across Pecos Drive to a sanitary sewer manhole and joins the 5-in. gravity main to the SWSC plant at TA-46 (LANL 1992, 007672).

The site features of AOC 50-011(b) are shown in Figure 6.2-1.

6.17.1 Summary of Previous Investigations for AOC 50-011(b)

No RFI activities have been conducted at AOC 50-011(b).

6.17.2 Summary of Data for AOC 50-011(b)

There are no decision-level data available for this AOC.

6.17.3 Scope of Activities for AOC 50-011(b)

Sampling activities are not proposed for AOC 50-011(b) because it is currently active. It is proposed that site characterization and investigation be delayed until D&D of the lift stations.

7.0 TA-55

7.1 Background

TA-55 is located on Pecos Drive north of Pajarito Road. The 21-acre site is located on a finger mesa between a branch of Mortandad Canyon on the north and Two Mile Canyon on the south. TA-55 was established for operation of a Plutonium Processing Facility in 1973. Principal operations conducted at TA-55 include fabrication of plutonium metal components, plutonium processing, and basic research on TRU materials (LANL 1992, 007666). Figure 7.1-1 shows the site features for TA-55.

One SWMU (55-008) located in TA-55 is addressed in this work plan.

7.1.1 Operational History

The Plutonium Processing Facility at TA-55 was constructed in the 1970s to provide more advanced equipment and a safer working environment than was possible at TA-21.

The following activities are conducted at TA-55: preparation of ultrapure plutonium metal, alloys, and compounds; large-scale preparation of certain specific alloys; metal machining and fabrication to form these materials into specific shapes; and research and development of isotope separation programs (LANL 1992, 007666).

7.1.2 Summary of Releases, Transport Mechanisms, and Potential Receptors

Summary of Releases. Plutonium machining and recovery operations are performed in sealed glove boxes under inert or dry conditions and under negative pressure. Exhaust from glove boxes and facility rooms is filtered through banks of HEPA filters and continuously monitored before being discharged to the atmosphere.

Liquid wastes generated at TA-55 are from two sources primarily: the plutonium scrap recovery/purification operations and the sanitary waste systems. Radioactive liquid wastes are generated from glove box cooling water. Liquids from the recover/purification operations are distilled in an evaporator to reduce volume and as part of the extraction process for recoverable plutonium. The distillate is piped to the TA-50 RLWTF for processing.

Transport Mechanisms. No natural surface-water bodies are present in TA-55. During summer thunderstorms and spring snowmelt, runoff from the mesa top flows into storm drains and down hillsides and into an intermittent stream in Mortandad Canyon. Surface-water runoff and erosion of contaminated surface soil could lead to contamination of bench areas on the hillside and contamination of surface water off-site. Surface water may also access subsurface contaminants exposed by soil erosion.

The thickness of the unsaturated zone beneath TA-55 indicates that migration of contaminants from the mesa top to the regional aquifer is unlikely. However, recent studies have shown that infiltration of some contaminants may have occurred (LANL 2006, 094161). Although migration to groundwater is possible, this work plan will only address collection of soil and tuff samples. Groundwater sampling for Mortandad Canyon is addressed in Mortandad Canyon investigation report (LANL 2006, 094161).

Other potential transport mechanisms include

- airborne transport of contaminated surface soil,
- infiltration through the vadose zone,
- disturbance and uptake of contaminants in shallow soil by plants and animals, and
- site disturbance through human activities.

Potential receptors may include

- Laboratory workers and
- ecological receptors in the nondeveloped areas (i.e., hillsides).

7.1.3 Current Site Usage and Status

TA-55 is an active site and is almost completely developed. Roads and large paved parking areas surround the buildings, which are fenced for controlled access.

7.2 SWMU 55-008—Sumps and Tanks

SWMU 55-008 consists of active sumps, tanks, and pumps in the basement of the plutonium building (building 55-0004), which is the primary site for plutonium processing, fabrication, and research at the Laboratory. Six sumps/pumps, each with a capacity of 3 ft^3, collect spills and mop-water generated in the building. Four 8-in.-diameter x 4-ft-long condensate tank pumps and eight 8-in.-diameter x 4-ft-long blowdown tanks receive condensate from cooling coils. It is possible that the liquids discharged to these units may have contained small amounts of hazardous and/or radioactive constituents. All liquids collected and contained within these units are transferred through a direct pipeline to the RLWTF at TA-50, and none of these units release liquids to the environment (LANL 1992, 007672).

The site features of SWMU 55-008 are shown in Figure 7.1-1.

7.2.1 Summary of Previous Investigations for SWMU 55-008

No RFI activities have been conducted at this SWMU.

7.2.2 Summary of Data for SWMU 55-008

There are no decision-level data available for this SWMU.

7.2.3 Scope of Activities for SWMU 55-008

Sampling activities are not proposed for SWMU 55-008 because it is within an active building. It is proposed that site characterization and investigation be delayed until D&D of the building.

8.0 INVESTIGATION METHODS

A summary of investigation methods to be implemented is presented in Table 8.0-1. The standard operating procedures (SOPs) are available on the Laboratory's Waste and Environmental Services Division web page at http://www.lanl.gov/environment/all/qa.shtml.

Summaries of the field investigation methods are provided below. Additional procedures may be added as necessary to describe and document quality-affecting activities.

Chemical analyses will be performed in accordance with the analytical statement of work (LANL 2000, 071233). Accredited contract laboratories will use the most recent EPA- and industry-accepted extraction and analytical methods for chemical analyses for analytical suites.

8.1 Geodetic Surveys

Geodetic surveys will be conducted in accordance to the latest version of SOP-5028, Coordinating and Evaluating Geodetic Surveys, to locate historical structures and previous sampling locations, and to document field activities such as sample collection. The surveyors will use a Trimble GeoXT hand-held GPS or equivalent for the surveys. The coordinate values will be expressed in the New Mexico State Plane Coordinate System (transverse mercator), Central Zone, North American Datum 1983. Elevations will be reported as per the National Geodetic Vertical Datum of 1929. Horizontal positions shall be measured to the nearest 0.1 ft, and vertical elevations shall be measured to the nearest 0.01-ft. All GPS equipment used will meet the accuracy requirements specified in the SOP.

8.2 Surface and Subsurface Characterization

8.2.1 Hand Auger

Hand augers may be used to bore shallow holes. The hand auger is advanced by turning the auger into the soil or tuff until the barrel is filled. The auger is removed and the sample is placed in a stainless-steel bowl.

8.2.2 Hollow-Stem Auger

The hollow-stem auger consists of a hollow-steel shaft with a continuous spiraled steel flight welded onto the exterior of the stem. The stem is connected to an auger bit; when it is rotated, it transports cuttings to the surface. The hollow stem of the auger also acts to case the borehole core temporarily so a well casing (riser) may be inserted down through the center of the auger once the desired depth is reached, thus minimizing the risk of possible borehole collapse. A bottom plug or pilot bit can be fastened onto the bottom of the auger to keep out most of the soil that has a tendency to clog the bottom of the augers during drilling.

8.2.3 Borehole Abandonment

Boreholes will be abandoned according to the most recent version of SOP-05.03, Monitoring Well and RFI Borehole Abandonment, using one of the following methods.

- Shallow boreholes, with a total depth of 20 ft or less, will be abandoned by filling the borehole with bentonite chips and hydrating with clean water.
- Intermediate and deep boreholes, those greater than 20 ft in depth, will be pressure-grouted from the bottom of the borehole to the surface using the tremie pipe method. Acceptable grout materials include cement or bentonite grout, neat cement, or concrete.

8.3 Sample Collection

8.3.1 Surface Samples

Soil and rock samples will be collected by the most efficient and least invasive method practicable. The methods will be determined by the field team based on site conditions such as topography, the nature of the material to be sampled, the depth intervals required, accessibility, and level of disruption to laboratory activities. Typically, samples will be collected using spade and scoop (SOP-06.09), hand auger (SOP-06.10), or drill rig (SOP-06.26).

Surface sample (0–0.5 ft bgs) collection will be in accordance with the most current revision of SOP-06.09, Spade and Scoop Method for the Collection of Soil Samples. Stainless-steel shovels, spades, scoops, and bowls will be used. Decontamination will be completed using a dry decontamination method with paper towels and over-the-counter cleaner, such as Fantastik. For deeper sample intervals, sample collection will be in accordance with the most current revision of SOP-06.10, Hand Auger and Thin-Wall Tube Sampler. Stainless-steel hand-augering tools will be used.

8.3.2 Subsurface Samples

Following the current version of SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials, subsurface samples will be collected from core extracted in a split-spoon core barrel. Samples collected for chemical analysis will be placed in the appropriate sample containers depending on the analytical method requirement in the current version of SOP-5055, General Instructions for Field Investigations.

Field documentation will include detailed borehole logs for each borehole drilled. The borehole logs will document the matrix material in detail and will include the results of all field screening. All field documentation will be completed in accordance with the current version of Quality Procedure (QP) 05.07, Notebook Documentation for Environmental Restoration Technical Activities.

8.3.3 Quality Assurance/Quality Control Samples

Quality assurance/quality control (QA/QC) samples will include field duplicate, equipment rinsate, and field trip blank samples collected in accordance with SOP-01.05. Field duplicate samples will be collected at an overall frequency of at least 1 for every 10 regular samples as directed by Section IX.C.3.b of the Consent Order.

8.4 Field-Screening Methods

The primary field-screening methods to be used on samples include radiological screening and vapor screening for VOCs using a photoionization detector (PID).

8.4.1 Radiological Screening

Radiological field surveys will be conducted at the Upper Mortandad Canyon Aggregate Area sites that previous investigations have demonstrated that radionuclides are of concern.

Radiological screening will target gross alpha-, beta-, and gamma-emitting radionuclides. Field screening will be conducted of the sample material by a radiation control technician. All radiological screening will be conducted using an Eberline E-600 radiation meter with an SHP-380AB alpha/beta scintillation detector, or equivalent. The operational range of this equipment varies from trace emissions to 1 million disintegrations per minute.

Local background levels will be recorded, at least once a day. Radiological screening will be conducted in accordance with SOP-10.14, Performing and Documenting Gross Gamma Radiation Scoping Surveys. Boreholes completed using mechanical drilling methods will be advanced 10 ft beyond elevated field screening results for any field screen. If elevated field-screening results are recorded within 10 ft of the target depth, the borehole will be advanced in 5-ft intervals until no elevated field screening results are recorded over a 10-ft interval.

8.4.2 Vapor Screening for VOCs

Organic vapor screening of subsurface core will be conducted using a portable VOC monitor equipped with an 11.7-electron volt lamp. Before each day's field work begins, the PID will be calibrated to the manufacturer's standard for instrument operation (all daily calibration results will be documented).

Boreholes completed using mechanical drilling methods will be advanced 10 ft beyond elevated field screening results for any field screen. If elevated field-screening results are recorded within 10 ft of the target depth, the borehole will be advanced in 5-ft intervals until no elevated field screening results are recorded over a 10-ft interval.

8.4.3 Fixed Laboratory Analytical Methods

The analytical suites required for fixed laboratory analyses vary by site as specified in the sections pertaining to the individual sites and are listed in the corresponding proposed sampling tables. All laboratory analytical suites are presented in the statement of work for analytical laboratories (LANL 2000, 071233). Sample collection and analysis will be coordinated with the Sample Management Office (SMO).

8.5 Equipment Decontamination

Following investigation activities, project personnel will decontaminate all equipment. Sampling equipment will be decontaminated after each sample is collected. Residual material adhering to the equipment will be removed using dry decontamination methods, including wire-brushing and scraping (SOP-5061). Dry decontamination of sampling equipment may include use of a nonphosphate detergent such as Fantastik.

8.6 Waste Management

Investigation-derived waste is generated during field investigation activities and may include, but is not limited to drill cuttings; contaminated soil; contaminated person protective equipment (PPE); sampling supplies; fluids from the decontamination of PPE and sampling equipment; and all other material that has potentially come into contact with contaminants (returned samples, etc.)

All IDW generated during the Upper Mortandad Canyon field-investigation activities will be managed in accordance with applicable SOPs. These SOPs incorporate the requirements of all applicable EPA and NMED regulations, DOE orders, and Laboratory requirements. Appendix B provides details the IDW management plan.

9.0 SCHEDULE

This investigation work plan will be submitted to NMED by November 30, 2007. Assuming a 120-day period for NMED review and comment resolution, the work plan will be approved by March 29, 2008.

Preparation of investigation activities is scheduled to start by May 2, 2008. Fieldwork is expected to start in October 2008 and will take approximately 6 months to complete, with a scheduled finish date of April 30, 2009. The investigation report will be delivered to NMED on or before September 28, 2009.

10.0 REFERENCES AND DATA SOURCES FOR FIGURES

10.1 References

The following list includes all documents cited in this investigation work plan. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau; the U.S. Department of Energy–Los Alamos Site Office; the U.S. Environmental Protection Agency, Region 6; and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

Abeele, W.V., M.L. Wheeler, and B.W. Burton, October 1981. "Geohydrology of Bandelier Tuff," Los Alamos National Laboratory report LA-8962-MS, Los Alamos, New Mexico. (Abeele et al. 1981, 006273)

Bailey, R.A., R.L. Smith, and C.S. Ross, 1969. "Stratigraphic Nomenclature of Volcanic Rocks in the Jemez Mountains, New Mexico," in *Contributions to Stratigraphy*, U.S. Geological Survey Bulletin 1274-P, Washington, D.C. (Bailey at el. 1969, 021498)

Broxton, D.E., G.H. Heiken, S.J. Chipera, and F.M. Byers, Jr., June 1995. "Stratigraphy, Petrography, and Mineralogy of Bandelier Tuff and Cerro Toledo Deposits," in *Earth Science Investigation for Environmental Restoration—Los Alamos National Laboratory, Technical Area 21*, Los Alamos National Laboratory report LA-12934-MS, Los Alamos, New Mexico, pp. 33-63. (Broxton et al. 1995, 050121)

Broxton, D.E., P.A. Longmire, P.G. Eller, and D. Flores, June 1995. "Preliminary Drilling Results for Boreholes LADP-3 and LADP-4," in *Earth Science Investigation for Environmental Restoration—Los Alamos National Laboratory, Technical Area 21*, Los Alamos National Laboratory report LA-12934-MS, Los Alamos, New Mexico, pp. 93-109. (Broxton et al. 1995, 050119)

Broxton, D.E., and S.L. Reneau, August 1995. "Stratigraphic Nomenclature of the Bandelier Tuff for the Environmental Restoration Project at Los Alamos National Laboratory," Los Alamos National Laboratory report LA-13010-MS, Los Alamos, New Mexico. (Broxton and Reneau 1995, 049726)

Broxton, D.E., and S.L. Reneau, 1996. "Buried Early Pleistocene Landscapes Beneath the Pajarito Plateau, Northern New Mexico," New Mexico Geological Society Guidebook: 47th Field Conference, Jemez Mountains Region, New Mexico, pp. 325-334. (Broxton and Reneau 1996, 055429)

Crowe, B.M., G.W. Linn, G. Heiken, and M.L. Bevier, April 1978. "Stratigraphy of the Bandelier Tuff in the Pajarito Plateau, Applications to Waste Management," Los Alamos Scientific Laboratory report LA-7225-MS, Los Alamos, New Mexico. (Crowe et al. 1978, 005720)

DOE (U.S. Department of Energy), October 1987. "Phase I: Installation Assessment, Los Alamos National Laboratory," draft, Volume 1 of 2, Comprehensive Environmental Assessment and Response Program, Environment and Health Division, Environmental Programs Branch, Albuquerque Operations Office, Albuquerque, New Mexico. (DOE 1987, 008663)

DOE (U.S. Department of Energy), October 1987. "Phase I: Installation Assessment, Los Alamos National Laboratory," draft, Volume 2 of 2, Comprehensive Environmental Assessment and Response Program, Environment and Health Division, Environmental Programs Branch, Albuquerque Operations Office, Albuquerque, New Mexico. (DOE 1987, 008664)

Elder, J.C., E.J. Cox, D.P. Hohner, and A.M. Valentine, September 1986. "Radioactive Liquid Waste Lines Removal Project at Los Alamos (1981–1986)," Los Alamos National Laboratory report LA-10821-MS, Los Alamos, New Mexico. (Elder et al. 1986, 003089)

EPA (U.S. Environmental Protection Agency), January 21, 2005. "EPA's Prior Decisions on SWMU/AOC Sites at Los Alamos National Laboratory (LANL)," U.S. Environmental Protection Agency letter to J. Bearzi (NMED-HRMB) from L.F. King (EPA Federal Facilities Section Chief), Dallas, Texas. (EPA 2005, 088464)

EPA (U.S. Environmental Protection Agency), June 8, 2007. "Authorization to Discharge under the National Pollutant Discharge Elimination System, NPDES Permit No. NM 0028355," Region 6, Dallas, Texas. (EPA 2007, 099009)

Goff, F., June 1995. "Geologic Map of Technical Area 21," in *Earth Science Investigations for Environmental Restoration—Los Alamos National Laboratory, Technical Area 21*, Los Alamos National Laboratory report LA-12934-MS, Los Alamos, New Mexico, pp. 7–18. (Goff 1995, 049682)

Griggs, R.L., and J.D. Hem, 1964. "Geology and Ground-Water Resources of the Los Alamos Area, New Mexico," U.S. Geological Survey Water Supply Paper 1753, Washington, D.C. (Griggs and Hem 1964, 092516)

Harper, J.R., and R. Garde, November 1981. "The Decommissioning of the TA-42 Plutonium Contaminated Incinerator Facility," Los Alamos National Laboratory report LA-9077-MS, Los Alamos, New Mexico. (Harper and Garde 1981, 006286)

Heiken, G., F.E. Goff, J. Stix, S. Tamanyu, M. Shafiqullah, S.R. Garcia, and R.C. Hagan, February 10, 1986. "Intracaldera Volcanic Activity, Toledo Caldera and Embayment, Jemez Mountains, New Mexico," *Journal of Geophysical Research,* Vol. 91, No. B2, pp. 1799-1816. (Heiken et al. 1986, 048638)

Hollis, D., E. Vold, R. Shuman, K.H. Birdsell, K. Bower, W.R. Hansen, D. Krier, P.A. Longmire, B. Newman, D.B. Rogers, and E.P. Springer, March 27, 1997. "Performance Assessment and Composite Analysis for Los Alamos National Laboratory Material Disposal Area G," Rev. 2.1, Los Alamos National Laboratory document LA-UR-97-85, Los Alamos, New Mexico. (Hollis et al. 1997, 063131)

Izett, G.A., and J.D. Obradovich, February 10, 1994. "$^{40}Ar/^{39}Ar$ Age Constraints for the Jaramillo Normal Subchron and the Matuyama-Brunhes Geomagnetic Boundary," *Journal of Geophysical Research,* Vol. 99, No. B2, pp. 2925-2934. (Izett and Obradovich 1994, 048817)

Kearl, P.M., J. Dexter, and M. Kautsky, December 1986. "Vadose Zone Characterization of Technical Area 54, Waste Disposal Areas G and L, Los Alamos National Laboratory, New Mexico, Report 4: Preliminary Assessment of the Hydrogeologic System through Fiscal Year 1986," UNC Technical Services report GJ-54, Grand Junction, Colorado. (Kearl et al. 1986, 015368)

LANL (Los Alamos National Laboratory), 1988. "1988 Inventory of Federal Hazardous Waste Activities," Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 1988, 000344)

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Vol III of IV (TA-26 through TA-50), Los Alamos National Laboratory document LA-UR-90-3400, Los Alamos, New Mexico. (LANL 1990, 007513)

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Vol. I of IV (TA-0 through TA-9), Los Alamos National Laboratory document LA-UR-90-3400, Los Alamos, New Mexico. (LANL 1990, 007511)

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1147," Los Alamos National Laboratory document LA-UR-92-969, Los Alamos, New Mexico. (LANL 1992, 007672)

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1129," Los Alamos National Laboratory document LA-UR-92-800, Los Alamos, New Mexico. (LANL 1992, 007666)

LANL (Los Alamos National Laboratory), July 1993. "RFI Work Plan for Operable Unit 1114," Los Alamos National Laboratory document LA-UR-93-1000, Los Alamos, New Mexico. (LANL 1993, 020947)

LANL (Los Alamos National Laboratory), August 1993. "Environmental Surveillance at Los Alamos During 1991," Los Alamos National Laboratory report LA-12572-ENV, Los Alamos, New Mexico. (LANL 1993, 023249)

LANL (Los Alamos National Laboratory), September 1995. "RFI Report for Potential Release Sites 50-006(a), 50-006(c), 50-007 (formerly Operable Unit 1147), Field Unit 5," Environmental Restoration Project, Los Alamos National Laboratory document LA-UR-95-2738, Los Alamos, New Mexico. (LANL 1995, 049925)

LANL (Los Alamos National Laboratory), April 1995. "Expedited Cleanup Plan for Solid Waste Management Unit 8-003(a)," Rev. 1, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 1995, 046092)

LANL (Los Alamos National Laboratory), July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory document LA-UR-95-731, Los Alamos, New Mexico. (LANL 1995, 057590)

LANL (Los Alamos National Laboratory), August 1995. "RFI Report for Potential Release Sites 42-001(a), 42-001(b), 42-001(c), 42-002(a), 42-002(b), 42-003," Los Alamos National Laboratory document LA-UR-95-2881, Los Alamos, New Mexico. (LANL 1995, 050056)

LANL (Los Alamos National Laboratory), September 1995. "RFI Report for Potential Release Sites 48-001, 48-002(e), 48-003, 48-005, 48-007(a), 48-007(b), 48-007(c), 48-007(d), 48-007(f), 48-010," Los Alamos National Laboratory document LA-UR-95-3328, Los Alamos, New Mexico. (LANL 1995, 050289)

LANL (Los Alamos National Laboratory), October 25, 1995. "Draft Groundwater Protection Management Program Plan," Rev. 2, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 1995, 050124)

LANL (Los Alamos National Laboratory), February 1996. "RFI Report for Potential Release Sites at TA-50, 50-004(a), 50-004(c), 50-011(a) (located in former Operable Unit 1147)," Los Alamos National Laboratory document LA-UR-96-148, Los Alamos, New Mexico. (LANL 1996, 054836)

LANL (Los Alamos National Laboratory), May 6, 1996. "Response to the Notice of Deficiency (NOD) for Technical Area (TA) 48 Resource Conservation and Recovery Act Facility Investigation (RFI) Report," Los Alamos National Laboratory letter (EM/ER:96-231) to B. Garcia (NMED) from J. Jansen (EM/ER) and T.J. Taylor (DOE/LAAO), Los Alamos, New Mexico. (LANL 1996, 054448)

LANL (Los Alamos National Laboratory), October 17, 1996. "Response to Request for Additional Information for TA-48 RFI Report," Los Alamos National Laboratory letter (EM/ER:96-533) to B. Garcia (NMED) from J. Jansen (EM/ER) and T.J. Taylor (DOE/LAAO), Los Alamos, New Mexico. (LANL 1996, 055064)

LANL (Los Alamos National Laboratory), January 1997. "Sampling and Analysis Plan for TA-48," Los Alamos National Laboratory document LA-UR-97-4839, Los Alamos, New Mexico. (LANL 1997, 055326)

LANL (Los Alamos National Laboratory), April 1997. "Core Document for Canyons Investigations," Los Alamos National Laboratory document LA-UR-96-2083, Los Alamos, New Mexico. (LANL 1997, 055622)

LANL (Los Alamos National Laboratory), May 22, 1997. "Interim Action Report for TA-50, PRS 50-006(a) Activities," Los Alamos National Laboratory letter (EM/ER:97-178) to T.J. Taylor (DOE ER Program Manager) from J. Jansen (ER Program Manager), Los Alamos, New Mexico. (LANL 1997, 055834)

LANL (Los Alamos National Laboratory), September 1997. "RFI Report for Potential Release Sites at TA-16: 16-024(c,d,f,g,k,m,o,p–s), 16-025(b2,d,g,h,j,k,m–o,y), 16-034(c–f,l,m), C-16-005, C-16-017," Los Alamos National Laboratory document LA-UR-97-3770, Los Alamos, New Mexico. (LANL 1997, 056660.289)

LANL (Los Alamos National Laboratory), September 1997. "Addendum to the RFI Report for Potential Release Sites at Technical Area 48 (Located in Former Operable Unit 1129)," Los Alamos National Laboratory document LA-UR-97-3112, Los Alamos, New Mexico. (LANL 1997, 056565)

LANL (Los Alamos National Laboratory), September 1997. "RFI Report for AOC C-3-006 and PRS 3-054(e), Manhole and Outfall," Los Alamos National Laboratory document LA-UR-97-3392, Los Alamos, New Mexico. (LANL 1997, 072611)

LANL (Los Alamos National Laboratory), May 22, 1998. "Hydrogeologic Workplan," Los Alamos National Laboratory document LA-UR-01-6511, Los Alamos, New Mexico. (LANL 1998, 059599)

LANL (Los Alamos National Laboratory), June 1998. "RFI Work Plan and SAP for Potential Release Sites 53-002(a), 53-002(b), and Associated Piping and Drainages at TA-53," Los Alamos National Laboratory document LA-UR-98-2547, Los Alamos, New Mexico. (LANL 1998, 058841)

LANL (Los Alamos National Laboratory), September 22, 1998. "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments, and Bandelier Tuff at Los Alamos National Laboratory," Los Alamos National Laboratory document LA-UR-98-4847, Los Alamos, New Mexico. (LANL 1998, 059730)

LANL (Los Alamos National Laboratory), March 2000. "Installation Work Plan for Environmental Restoration Project, Revision 8," Los Alamos National Laboratory document LA-UR-00-1336, Los Alamos, New Mexico. (LANL 2000, 066802)

LANL (Los Alamos National Laboratory), June 2000. "RFI Report for Potential Release Site 50-002(d)," Los Alamos National Laboratory document LA-UR-00-2514, Los Alamos, New Mexico. (LANL 2000, 067470.24)

LANL (Los Alamos National Laboratory), December 2000. "University of California, Los Alamos National Laboratory (LANL), I8980SOW0-8S, Statement of Work for Analytical Laboratories," Rev. 1, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2000, 071233)

LANL (Los Alamos National Laboratory), May 2003. "Voluntary Corrective Action Completion Report for Area of Concern 48-012 at Technical Area 48," Los Alamos National Laboratory document LA-UR-03-3314, Los Alamos, New Mexico. (LANL 2003, 080917)

LANL (Los Alamos National Laboratory), May 2005. "Derivation and Use of Radionuclide Screening Action Levels, Revision 1," Los Alamos National Laboratory document LA-UR-05-1849, Los Alamos, New Mexico. (LANL 2005, 088493)

LANL (Los Alamos National Laboratory), April 2006. "Investigation Work Plan for Upper Los Alamos Canyon Aggregate Area," Los Alamos National Laboratory document LA-UR-06-2464, Los Alamos, New Mexico. (LANL 2006, 091916)

LANL (Los Alamos National Laboratory), October 2006. "Mortandad Canyon Investigation Report," Los Alamos National Laboratory document LA-UR-06-6752, Los Alamos, New Mexico. (LANL 2006, 094161)

LANL (Los Alamos National Laboratory), December 2006. "Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Los Alamos National Laboratory document LA-UR-06-8096, Los Alamos, New Mexico. (LANL 2006, 094688)

LANL (Los Alamos National Laboratory), March 2007. "2007 General Facility Information," Los Alamos National Laboratory document LA-UR-07-1839, Los Alamos, New Mexico. (LANL 2007, 095364)

LANL (Los Alamos National Laboratory), July 2007. "Phase II Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1," Los Alamos National Laboratory document LA-UR-07-5083, Los Alamos, New Mexico. (LANL 2007, 098425)

LANL (Los Alamos National Laboratory), November 2007. "Historical Investigation Report for Upper Mortandad Canyon Aggregate Area," Los Alamos National Laboratory document LA-UR-07-7802, Los Alamos, New Mexico. (LANL 2007, 098955)

LASL (Los Alamos Scientific Laboratory), September 11, 1947. "A Technical Maintenance Group Report on General Background Data Concerning the Los Alamos Scientific Laboratory Required for Planning Purposes," Los Alamos Scientific Laboratory report LAB-A-5, Los Alamos, New Mexico. (LASL 1947, 005581)

NMED (New Mexico Environment Department), December 23, 1998. "Approval: Class III Permit Modification to Remove Ninety-nine (99) Solid Waste Management Units from the Department of Energy/Los Alamos National Laboratory RCRA Permit NM 0890010515," New Mexico Environment Department letter to T. Taylor (DOE-LAAO) and J.C. Browne (LANL Director) from E. Kelley (NMED-HRMB), Santa Fe, New Mexico. (NMED 1998, 063042)

NMED (New Mexico Environment Department), May 2, 2001. "Approval of Class III Permit Modification to Remove Thirty (30) Solid Waste Management Units from the Department of Energy / Los Alamos National Laboratory RCRA Permit NM 0890010515," New Mexico Environment Department letter to D.A. Gurule (Area Manager/LAAO) and J.C. Browne (LANL Director) from G.J. Lewis (NMED WWMD Director), Santa Fe, New Mexico. (NMED 2001, 070010)

NMED (New Mexico Environment Department), January 13, 2004. "Technical Area 48, 48-012 Fee Appeal Dispute Proposal," New Mexico Environment Department letter to R. Erickson (DOE LASO) and G.P. Nanos (LANL Director) from S. Martin (NMED-HWB), Los Alamos, New Mexico. (NMED 2004, 082285)

NMED (New Mexico Environment Department), November 15, 2004. "Los Alamos National Laboratory Closure Certification Report, Technical Area 50 (TA-50), Building 1, Room 59, Interim Status Container Storage Unit, Revision 0.0, LA-UR-04-6713," New Mexico Environment Department letter to G.P. Nanos (LANL Director) and E. Wilmot (DOE-LASO) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2004, 098488)

NMED (New Mexico Environment Department), March 23, 2007. "Approval of Class 3 Permit Modification for No Further Action of 20 Solid Waste Management Units," New Mexico Environment Department letter to D. Glenn (DOE LASO) and R. Watkins (LANL) from C. Padilla (NMED), Santa Fe, New Mexico. (NMED 2007, 095495)

Nyhan, J.W., L.W. Hacker, T.E. Calhoun, and D.L. Young, June 1978. "Soil Survey of Los Alamos County, New Mexico," Los Alamos Scientific Laboratory report LA-6779-MS, Los Alamos, New Mexico. (Nyhan et al. 1978, 005702)

Perkins, B.A., March. "Environmental Surveillance HSE 8 Initial Field Observation Report," Los Alamos National Laboratory, Los Alamos, New Mexico. (Perkins 1986, 000808)

Purtymun, W.D., December 1975. "Geohydrology of the Pajarito Plateau with Reference to Quality of Water, 1949-1972," Informal Report, Los Alamos Scientific Laboratory document LA-UR-02-4726, Los Alamos, New Mexico. (Purtymun 1975, 011787)

Purtymun, W.D., January 1984. "Hydrologic Characteristics of the Main Aquifer in the Los Alamos Area: Development of Ground Water Supplies," Los Alamos National Laboratory report LA-9957-MS, Los Alamos, New Mexico. (Purtymun 1984, 006513)

Purtymun, W.D., January 1995. "Geologic and Hydrologic Records of Observation Wells, Test Holes, Test Wells, Supply Wells, Springs, and Surface Water Stations in the Los Alamos Area," Los Alamos National Laboratory report LA-12883-MS, Los Alamos, New Mexico. (Purtymun 1995, 045344)

Purtymun, W.D., J.R. Buchholz, and T.E. Hakonson, 1977. "Chemical Quality of Effluents and Their Influence on Water Quality in a Shallow Aquifer," *Journal of Environmental Quality,* Vol. 6, No. 1, pp. 29-32. (Purtymun et al. 1977, 011846)

Purtymun, W.D., and A.K. Stoker, September 1990. "Perched Zone Monitoring Well Installation," Los Alamos National Laboratory document LA-UR-90-3230, Los Alamos, New Mexico. (Purtymun and Stoker 1990, 007508)

SEA (Science & Engineering Associates, Inc.), February 11, 2002. "TA-50 Soil Characterization Analytical Summary Report," report prepared for Los Alamos National Laboratory, Science & Engineering Associates report no SEASF-TR-02-270, Los Alamos National Laboratory document LA-UR-05-0841, Los Alamos, New Mexico. (SEA 2002, 087834)

Self, S., F.E. Goff, J.N. Gardner, J.V. Wright, and W.M. Kite, February 10, 1986. "Explosive Rhyolitic Volcanism in the Jemez Mountains: Vent Locations, Caldera Development, and Relation to Regional Structure," *Journal of Geophysical Research,* Vol. 91, No. B2, pp. 1779-1798. (Self et al. 1986, 021579)

Smith, R.L., and R.A. Bailey, 1966. "The Bandelier Tuff: A Study of Ash-Flow Eruption Cycles from Zoned Magma Chambers," *Bulletin Volcanologique,* Vol. 29, pp. 83-103. (Smith and Bailey 1966, 021584)

Smith, R.L., R.A. Bailey, and C.S. Ross, 1970. "Geologic Map of the Jemez Mountains, New Mexico," U.S. Geological Survey Miscellaneous Investigations Series, Map I-571, Washington, D.C. (Smith et al. 1970, 009752)

Spell, T.L., I. McDougall, and A.P. Doulgeris, December 1996. "Cerro Toledo Rhyolite, Jemez Volcanic Field, New Mexico: $^{40}Ar/^{39}Ar$ Geochronology of Eruptions between Two Caldera-Forming Events," *Geological Society of America Bulletin,* Vol. 108, No. 12, pp. 1549-1566. (Spell et al. 1996, 055542)

Stix, J., F.E. Goff, M.P. Gorton, G. Heiken, and S.R. Garcia, June 10, 1988. "Restoration of Compositional Zonation in the Bandelier Silicic Magma Chamber Between Two Caldera-Forming Eruptions: Geochemistry and Origin of the Cerro Toledo Rhyolite, Jemez Mountains, New Mexico," *Journal of Geophysical Research,* Vol. 93, No. B6, pp. 6129-6147. (Stix et al. 1988, 049680)

Stoker, A.K., March 31, 1993. "Direct Testimony of Alan K. Stoker on Behalf of Petitioners before the New Mexico Water Quality Control Commission," Los Alamos, New Mexico. (Stoker 1993, 056021)

Vaniman, D., July 29, 1991. "Revisions to report EES1-SH90-17," Los Alamos National Laboratory memorandum EES1-SH91-12 to J.L. Gardner (EES-1) from D. Vaniman (EES-1), Los Alamos, New Mexico. (Vaniman 1991, 009995.1)

Wohletz, K., June 1995. "Measurement and Analysis of Rock Fractures in the Tshirege Member of the Bandelier Tuff Along Los Alamos Canyon Adjacent to Technical Area-21," in *Earth Science Investigations for Environmental Restoration—Los Alamos National Laboratory, Technical Area 21*, Los Alamos National Laboratory report LA-12934-MS, Los Alamos, New Mexico. (Wohletz 1995, 054404)

10.2 Data Sources for Figures

er_agg_areas_ply

Aggregate Areas; Los Alamos National Laboratory, ENV Environmental Remediation & Surveillance Program, ER2005-0496; 1:2,500 Scale Data; 22 September 2005.

er_location_ids_pnt

Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Environment and Remediation Support Services Division, EP2006-1002; 09 November 2006.

er_outfalls_pnt

Outfalls; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; Unknown publication date.

er_prs_all_reg

Potential Release Sites; Los Alamos National Laboratory, Environment and Remediation Support Services Division, GIS/Geotechnical Services Group, EP2006-1018; 1:2,500 Scale Data; 17 November 2006.

er_watershed_ply

Watersheds; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; EP2006-0942; 1:2,500 Scale Data; 27 October 2006.

er_wells_erdb_pnt

Well Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program, ER2003-0390; 03 June 2003.

frmr_structures_arc

Former Sanitary Sewer Lines, Industial Waste Lines, Building Drain Lines and Storm Drain Lines of the Los Alamos Site; Los Alamos National Laboratory, ERSS Division, EP2006-0952; 1:2,500 Scale Data; 23 October 2006.

frmr_structures_ply

Former Structures of the Los Alamos Site; Los Alamos National Laboratory, Environment and Remediation Support Services Division, EP2006-0986; 1:2,500 Scale Data; 15 November 2006.

lanl_contour1991_002_arc

Hypsography, 2 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Programt; 1991.

lanl_contour1991_010_arc

Hypsography, 10 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.

lanl_contour1991_020_arc

Hypsography, 20 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Programt; 1991.

lanl_contour1991_100_arc

Hypsography, 100 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.

fwo_doe_bndry_arc

LANL DOE Boundary; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; Development Edition of 05 January 2005.

fwo_pmdoebnd03_ply

LANL DOE Boundary; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; Development Edition of 05 January 2005.

fwo_pmtabnd03_ply

LANL Technical Areas; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; Development Edition of 05 January 2005.

ksl_comm_arc

Communication Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 08 August 2002; as published 27 October 2006.

ksl_dirt_rds_arc

Dirt Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

ksl_electric_arc

Primary Electric Grid; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

ksl_fences_arc

Security and Industrial Fences and Gates; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

ksl_fmu_structures_ply

Facilities Management Unit Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; as published 27 October 2006.

ksl_gas_arc

Primary Gas Distribution Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

ksl_gates_arc

Primary Gates; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 12 August 2002; as published 27 October 2006.

ksl_paved_prking_arc

Paved Parking; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 12 August 2002; as published 27 October 2006.

ksl_paved_prking_ply

Paved Parking; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

ksl_paved_rds_arc

Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

ksl_pavprk_stormdrn_arc

Storm Drain Structures Located in Paved Parking Lots, Line Features; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; as published 27 October 2006.

ksl_pavprk_stormdrn_pnt

Storm Drain Structures Located in Paved Parking Lots, Point Features; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; as published 27 October 2006.

ksl_sewer_arc

Sewer Line System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

ksl_sewer_pnt

Point Features of the Sewer Line System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

ksl_steam_arc

Steam Line Distribution System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

ksl_stormdrn_arc

Storm Drain Line Distribution System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

ksl_structures_arc

Structures, line feature data; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

ksl_structures_ply

Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

ksl_tabndry_arc

LANL Technical Areas; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 12 August 2002; as published 27 October 2006.

ksl_tabndry_ply

LANL Technical Areas; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 12 August 2002; as published 27 October 2006.

ksl_water_arc

Water Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

pm_tabnd03_ply

LANL Technical Areas; Los Alamos National Laboratory, Site and Project Planning Group; 01 February 2003 as captured 07 September 2004.

wfm_indstrl_waste_arc

Primary Industrial Waste Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 October 2006.

wqh_npdes_outfall_pnt

National Pollutant Discharge Elimination System (NPDES) Outfalls; Los Alamos National Laboratory; ENV Water Quality & Hydrology Group, WQH Ed beta 1.0, ER2003-0407; 20 February 2003.

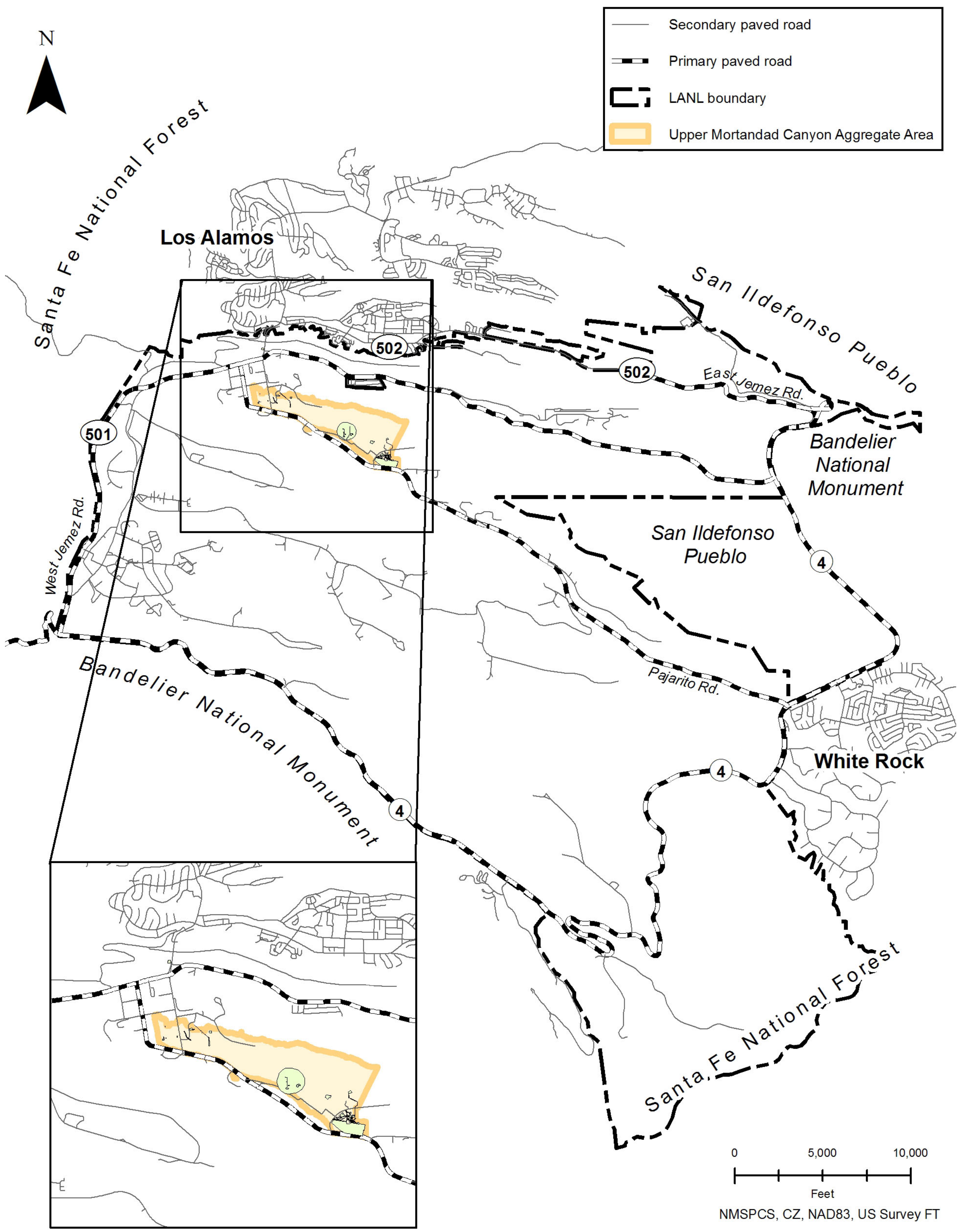

Figure 1.0-1 Location of Upper Mortandad Canyon Aggregate Area with respect to the Laboratory and surrounding land holdings

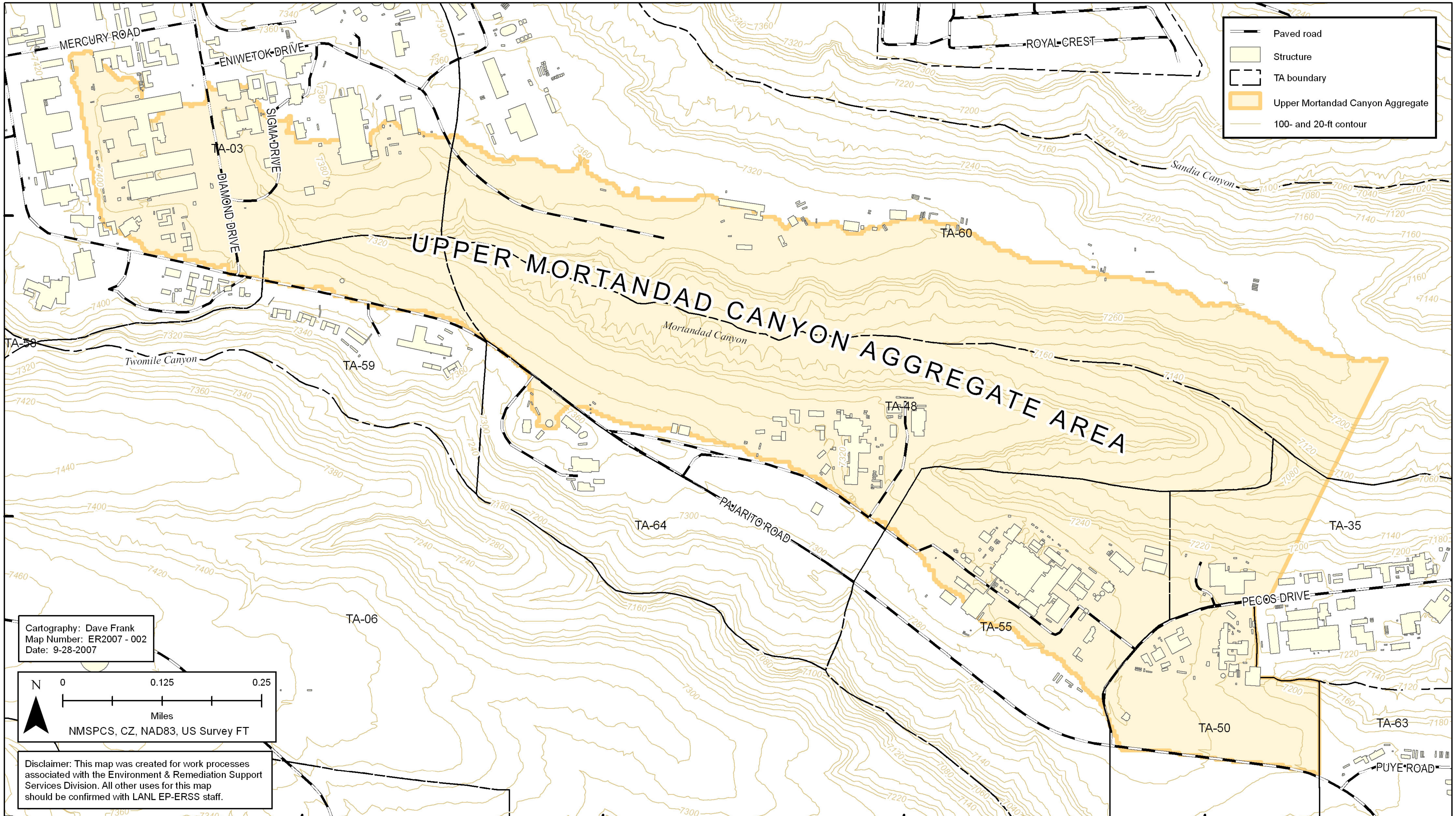

Figure 1.0-2 Location of Upper Mortandad Canyon Aggregate Area with respect to Laboratory technical areas

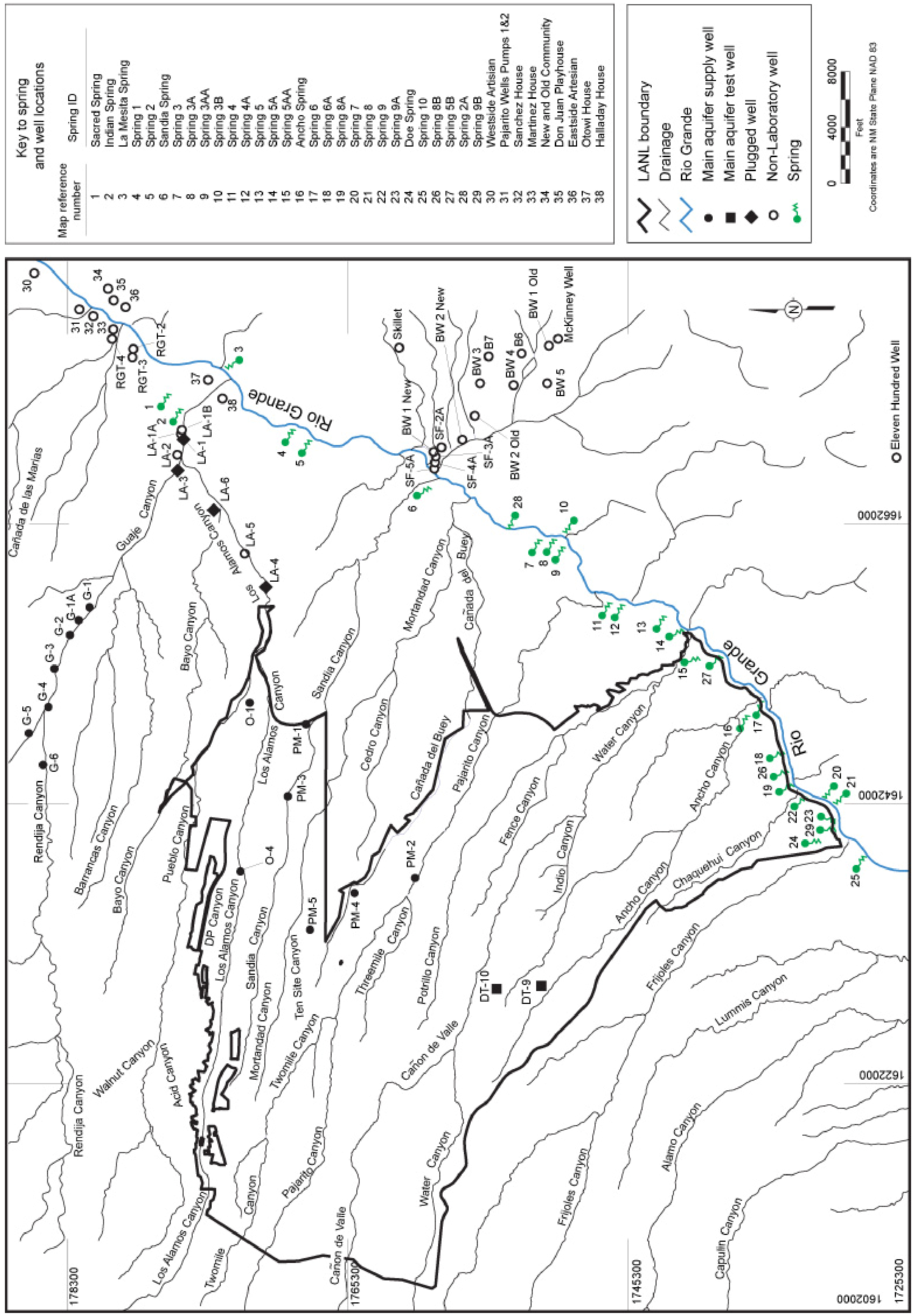

Figure 2.1-1 Surface water drainage to the Rio Grande

Bandelier Tuff	Tshirege Member	Qbt 4	Ash-flow units
		Qbt 3	
		Qbt 2	
		Qbt 1v	
		Qbt 1g	
		Tsankawi Pumice Bed	
	Cerro Toledo interval	Volcaniclastic sediments and ash-falls	
Bandelier Tuff	Otowi Member	Ash-flow units	
		Guaje Pumice Bed	
Puye Formation and intercalated volcanic rocks	Fanglomerate	Fanglomerate facies includes sand, gravel, conglomerate, and tuffaceous sediments	
	Volcanic rocks	Cerros del Rio basalts intercalated within the Puye Formation, includes up to four interlayered basaltic flows. Andesites of the Tschicoma Formation present in western part of plateau	
	Fanglomerate	Fanglomerate facies includes sand, gravel, conglomerate, and tuffaceous sediments; includes "old alluvium"	
	Axial facies deposits of the ancestral Rio Grande	Totavi Lentil	
Santa Fe Group	Coarse sediments	Coarse-grained upper facies (called the "Chaquehui Formation" by Purtymun 1995, 45344)	
	Basalt		
	Coarse sediments		
	Basalt		
	Coarse sediments		
	Basalt		
	Coarse sediments		
	Basalt		
	Coarse sediments		
	Arkosic clastic sedimentary deposits	Undivided Santa Fe Group (includes Chamita[?] and Tesuque Formations	

Source: Baltz et al. 1963, 8402; Purtymun 1995, 45344; LANL 1998, 59599; Broxton and Reneau 1995, 49726.

Figure 2.2-1 Generalized stratigraphy of bedrock geologic units of the Pajarito Plateau

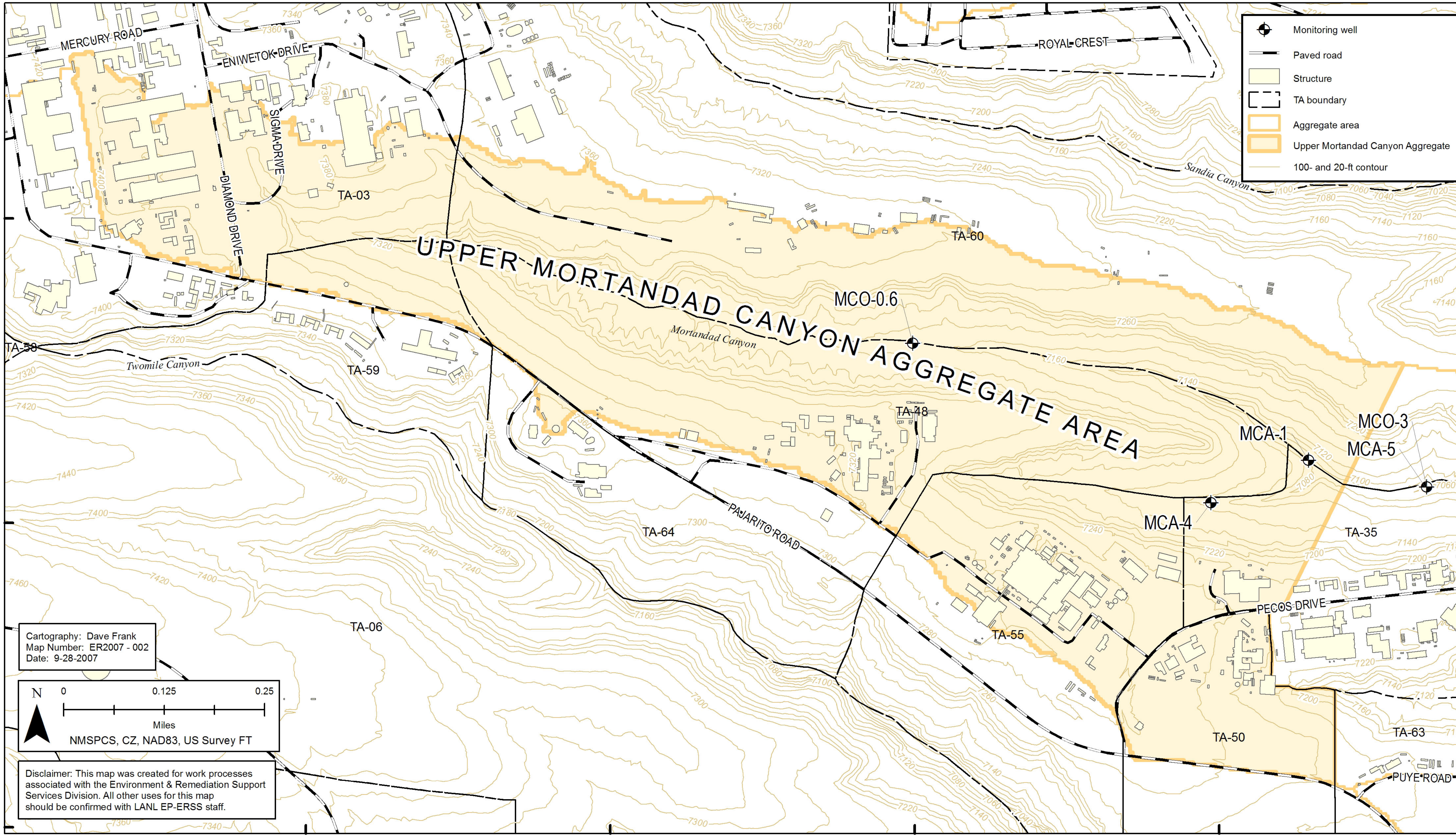

Figure 2.2-2 Existing groundwater monitoring wells in the vicinity of Upper Mortandad Canyon Aggregate Area

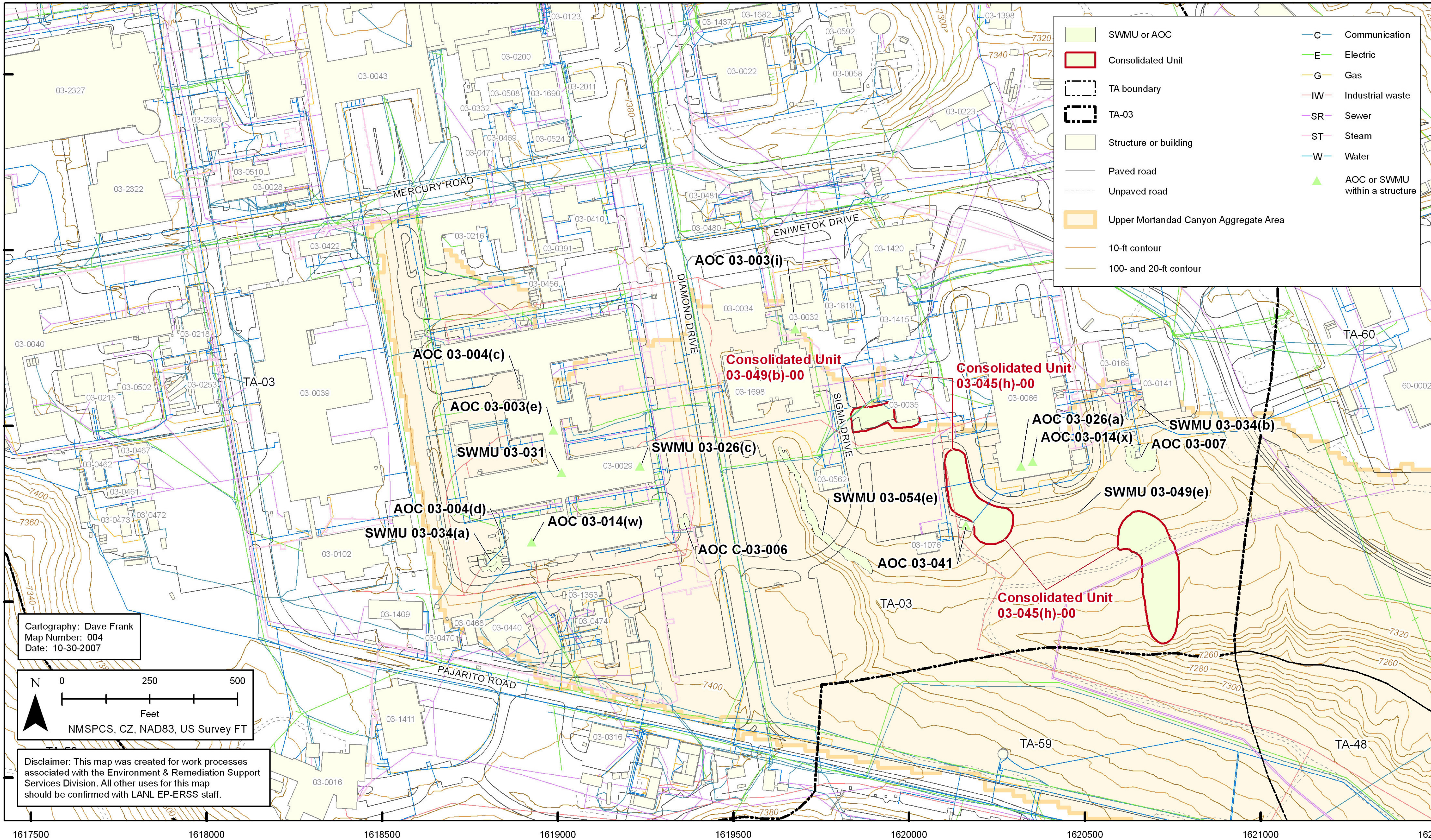

Figure 3.1-1 Site features for TA-03 SWMUs, AOCs, and consolidated units in Upper Mortandad Canyon Aggregate Area

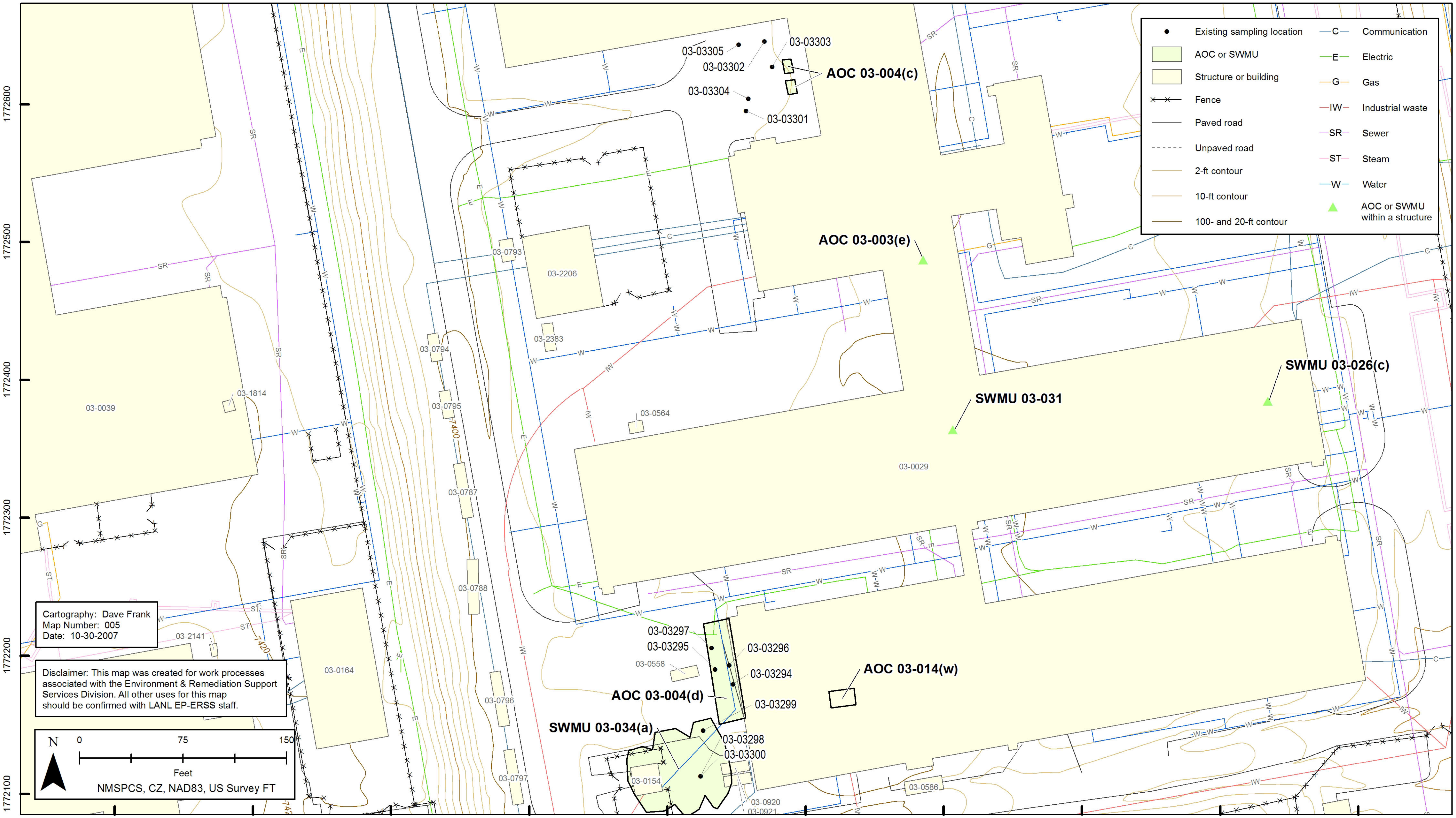

Figure 3.2-1 Site features and previous sampling locations for AOCs 03-004(c) and 03-004(d), and SWMU 03-034(a)

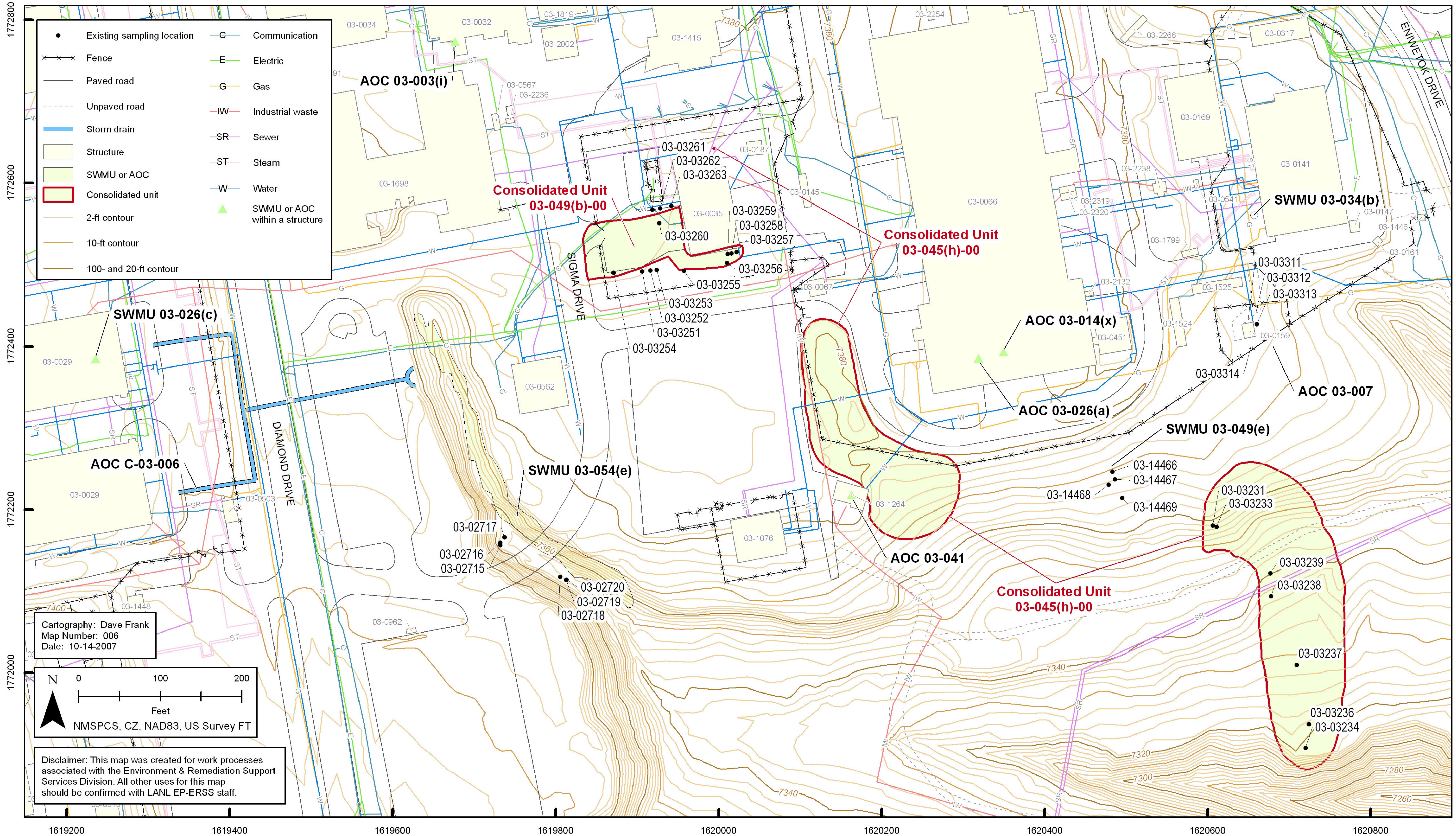

Figure 3.3-1 Site features and previous sampling locations for AOCs 03-007 and 03-003(i), Consolidated Units 03-045(h)-00 and 03-049(b)-00, and SWMUs 03-049(e) and 03-054(e)

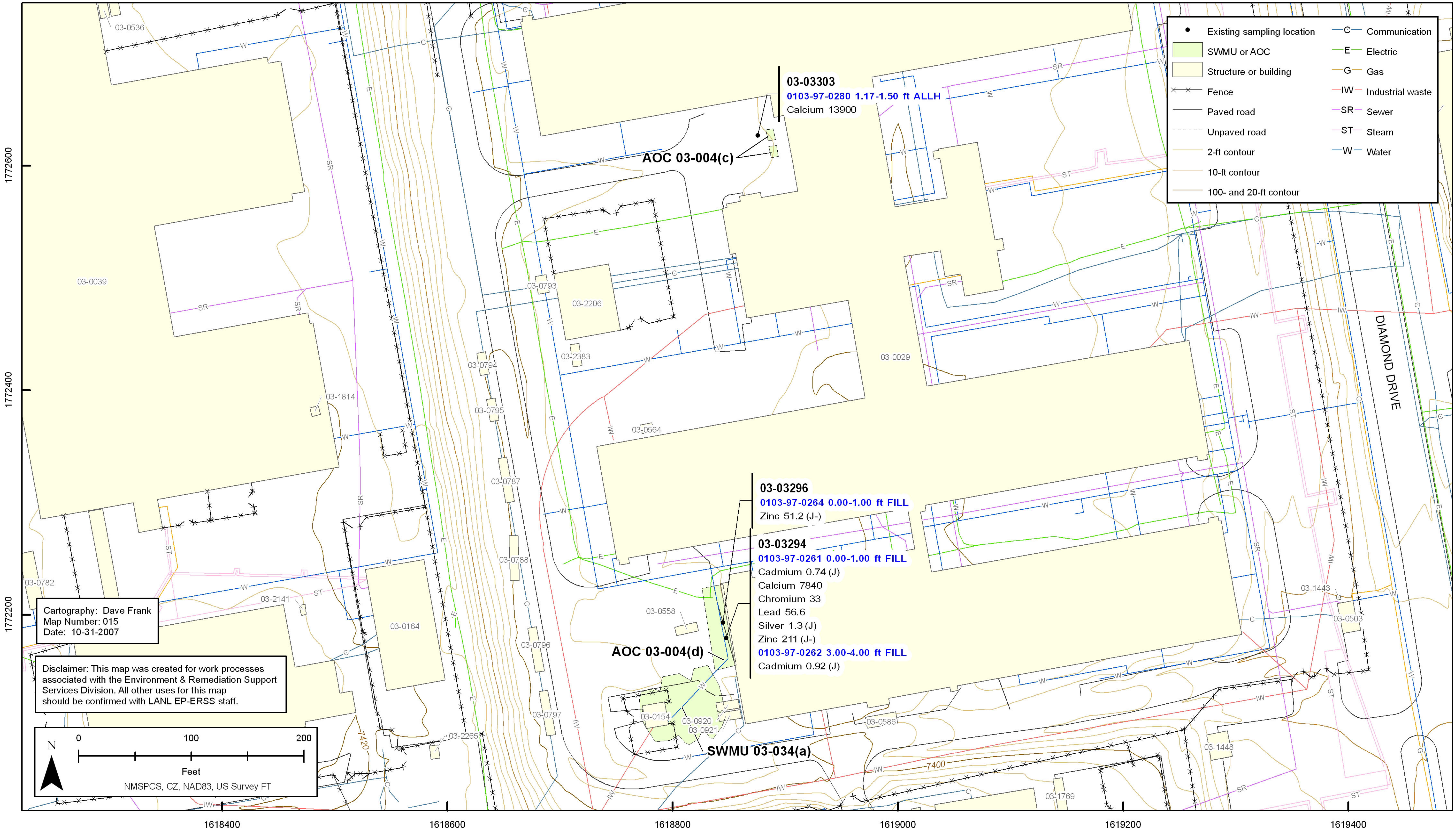

Figure 3.4-1 Inorganic chemicals detected above BVs at AOCs 03-004(c) and 03-004(d) and SWMU 03-034(a)

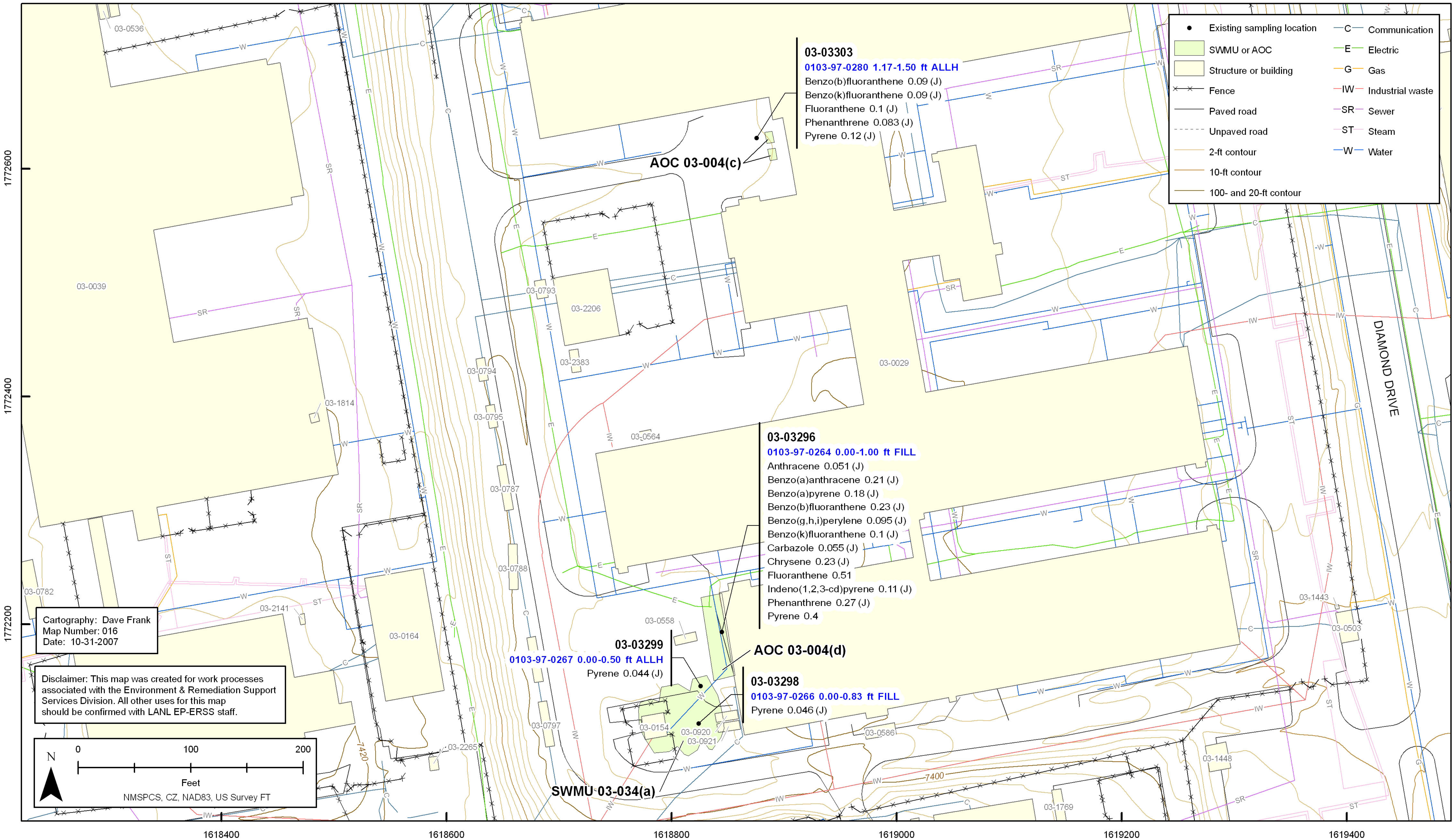

Figure 3.4-2 Organic chemicals detected at AOCs 03-004(c) and 03-004(d) and SWMU 03-034(a)

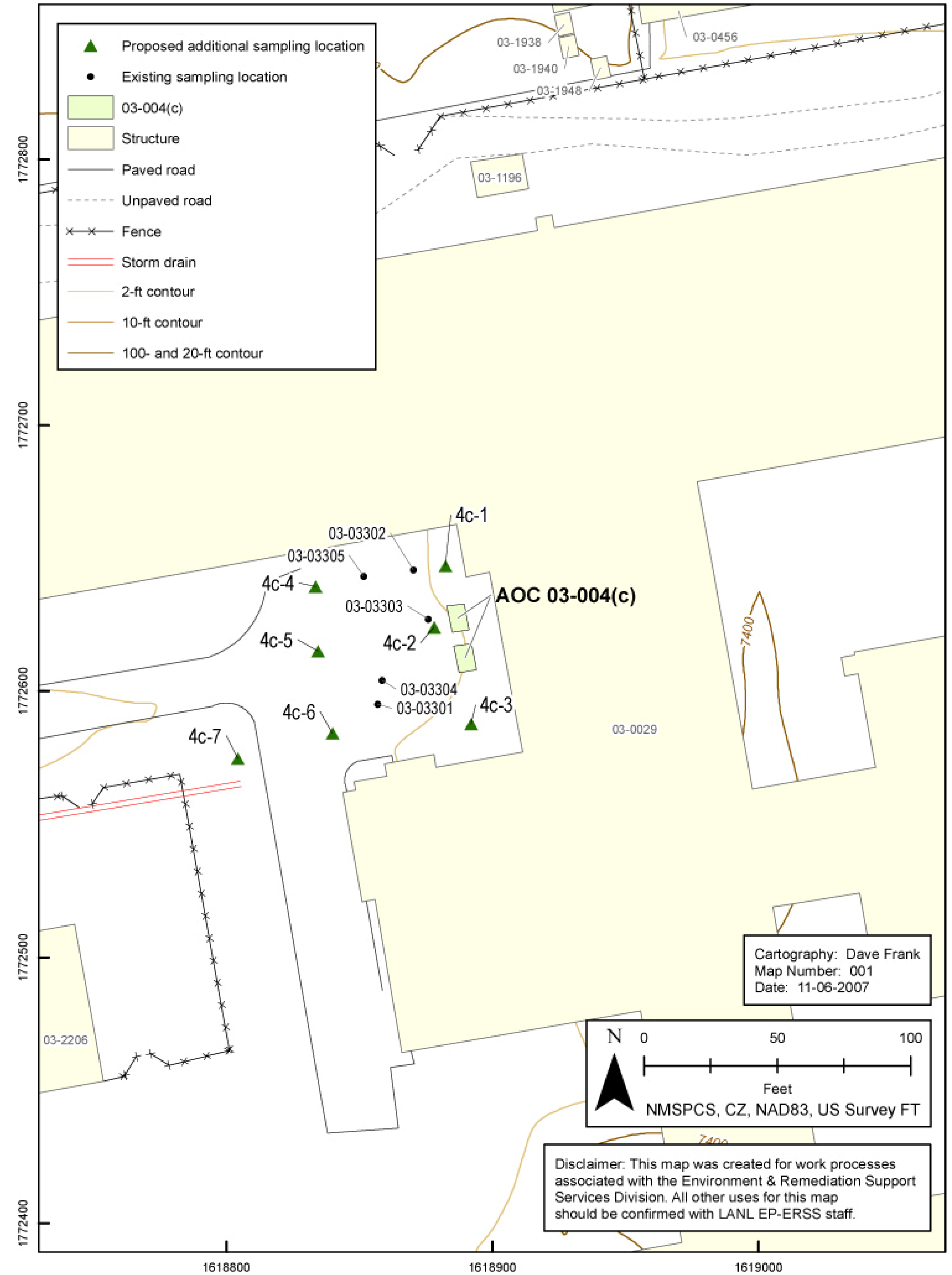

Figure 3.4-3 Proposed sampling locations at AOC 03-004(c)

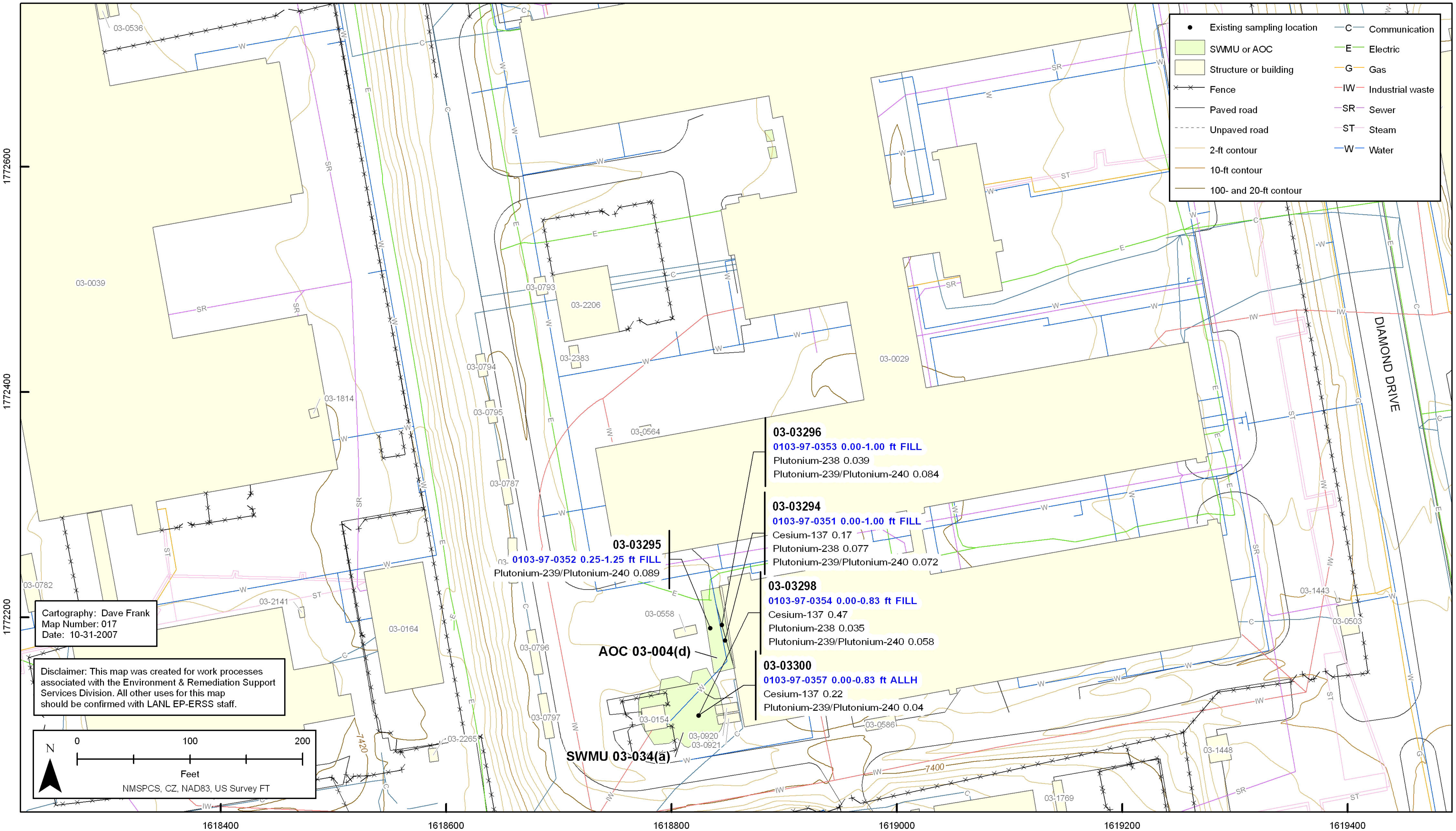

Figure 3.5-1 Radionuclides detected or detected above BV/FV at AOC 03-004(d) and SWMU 03-034(a)

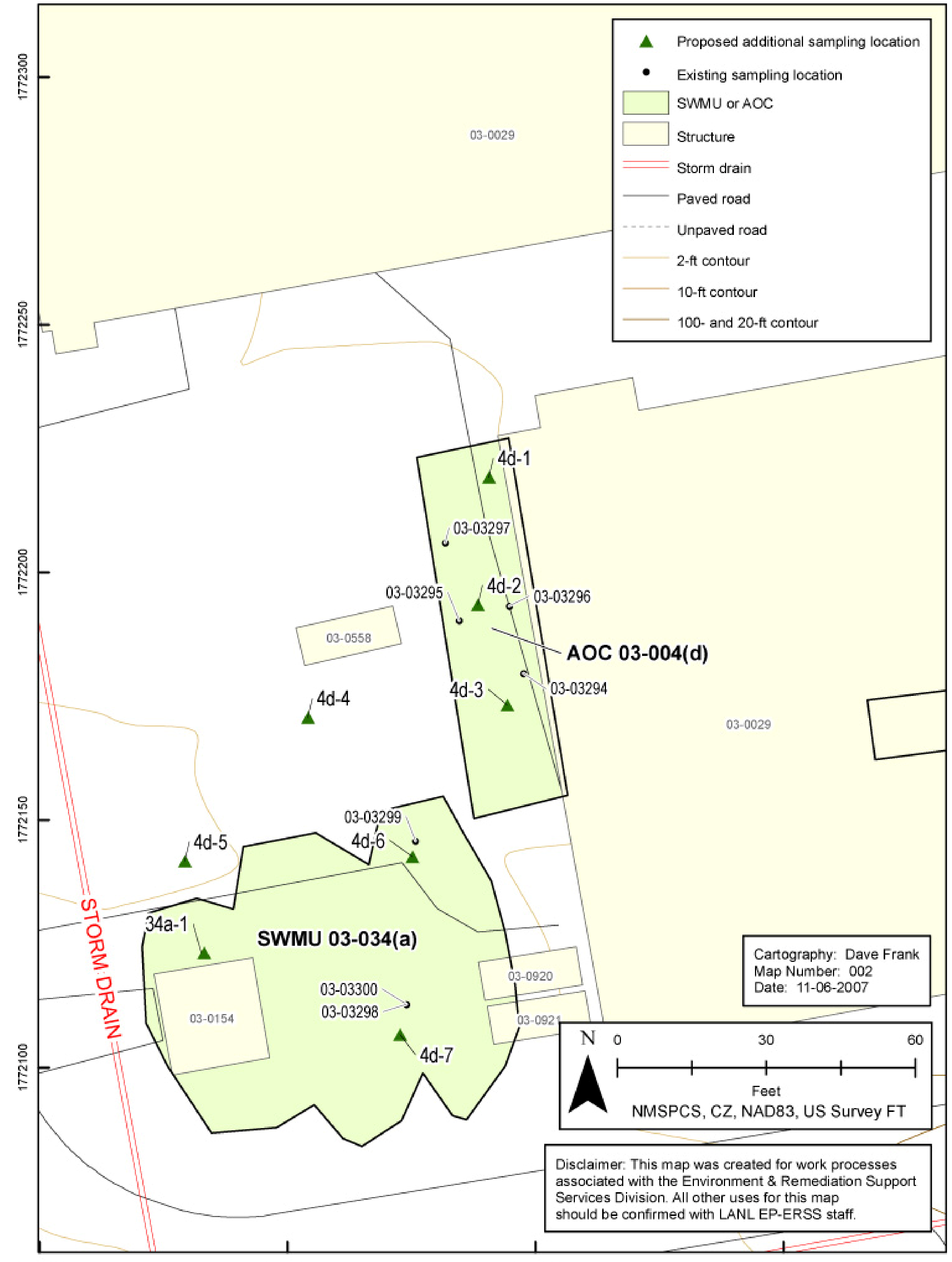

Figure 3.5-2 Proposed sampling locations at AOC 03-004(d) and SWMU 03-034(a)

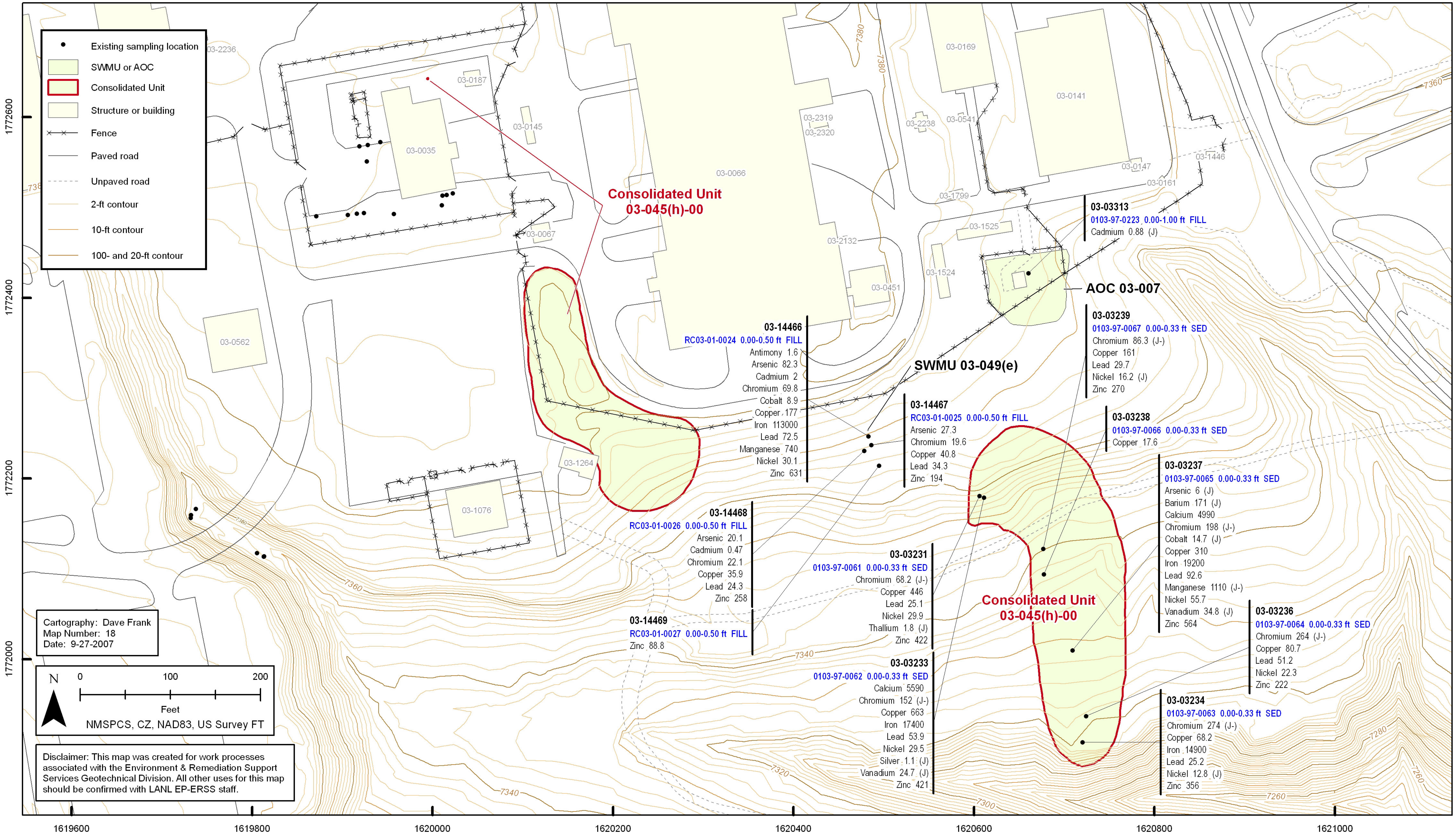

Figure 3.6-1 Inorganic chemicals detected above BVs at AOC 03-007, Consolidated Unit 03-045(h)-00, and SWMU 03-049(e)

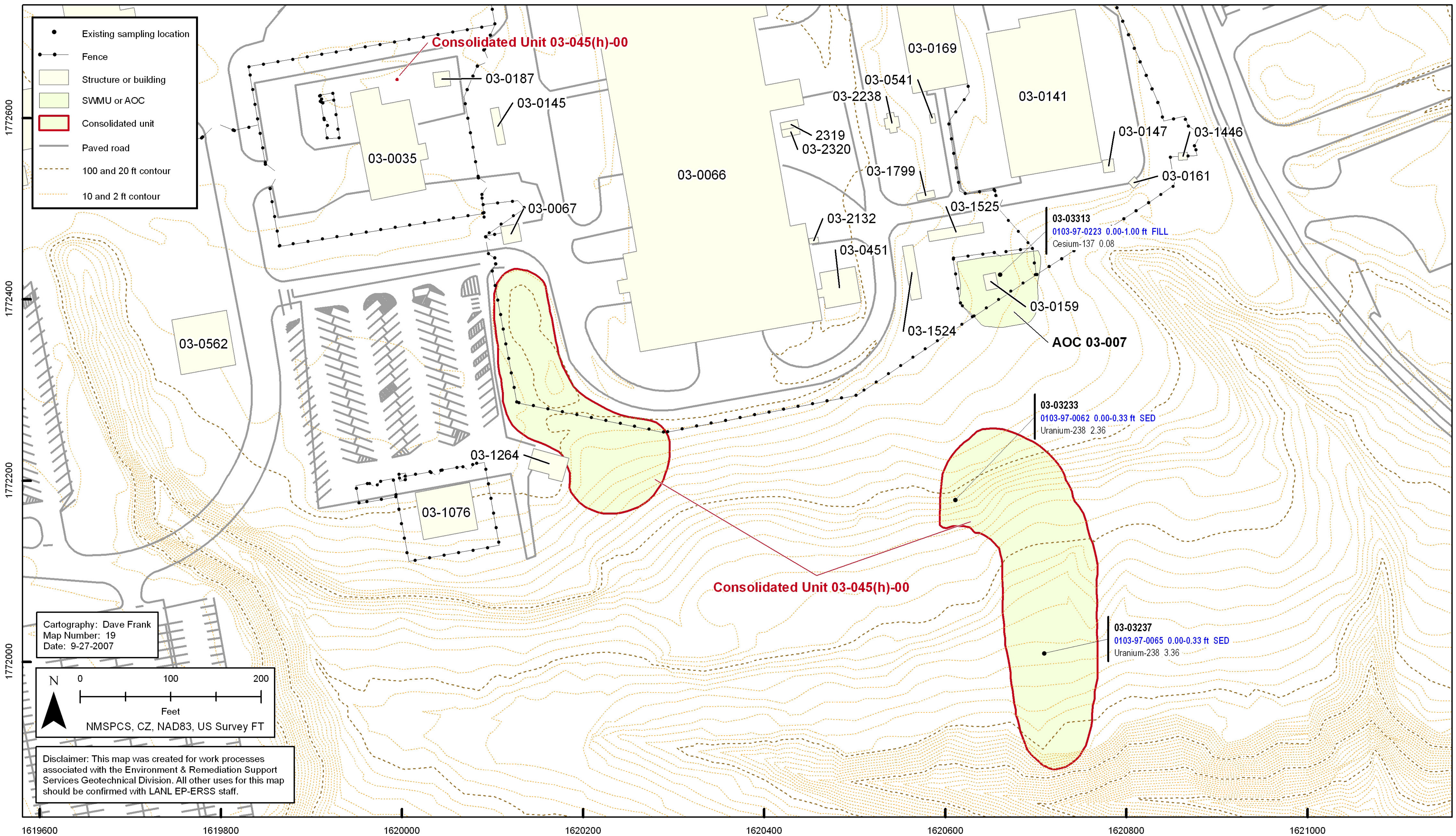

Figure 3.6-2 Radionuclides detected or detected above BV/FV at AOC 03-007 and Consolidated Unit 03-045(h)-00

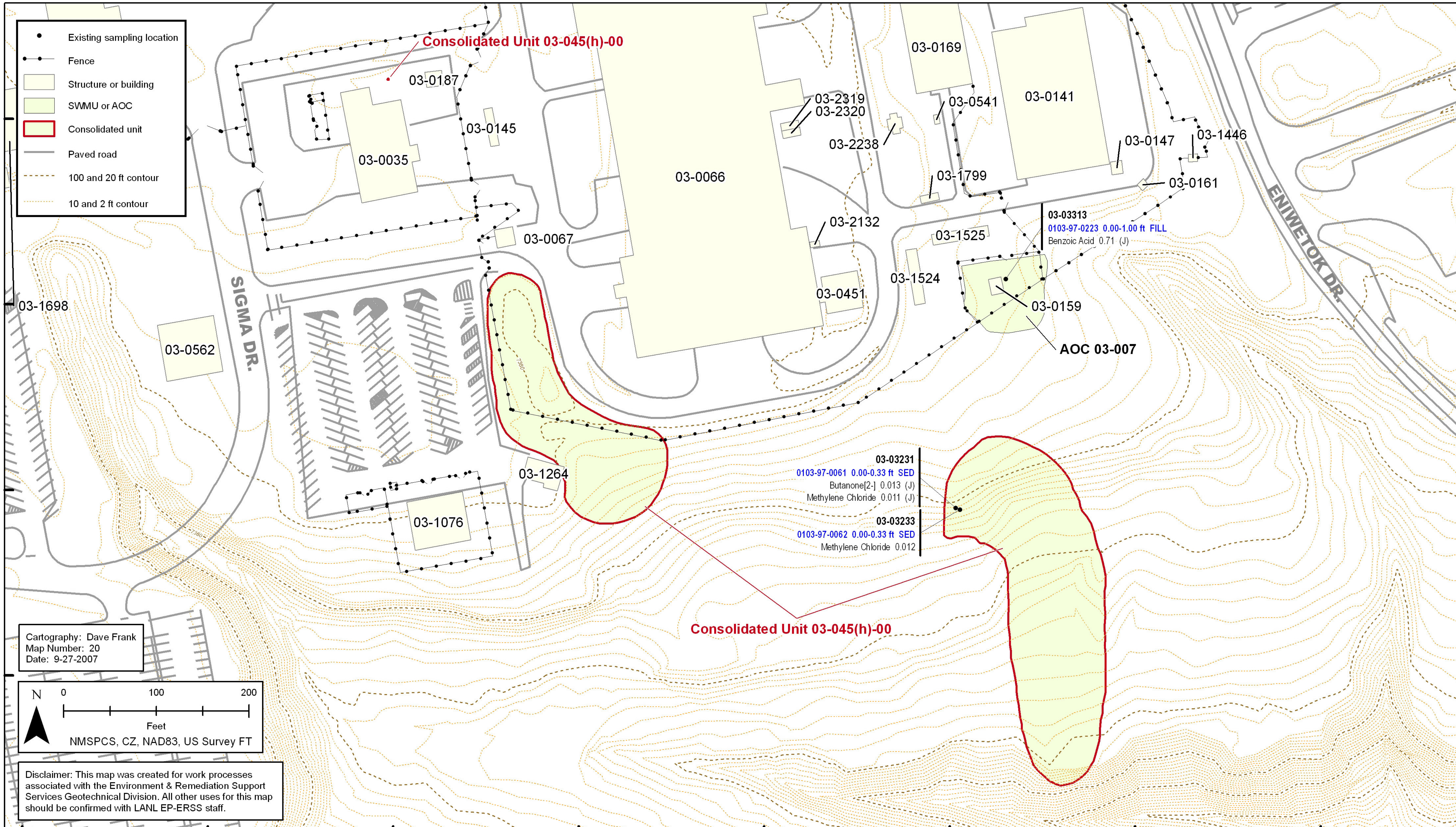

Figure 3.6-3 Organic chemicals detected at AOC 03-007 and Consolidated Unit 03-045(h)-00

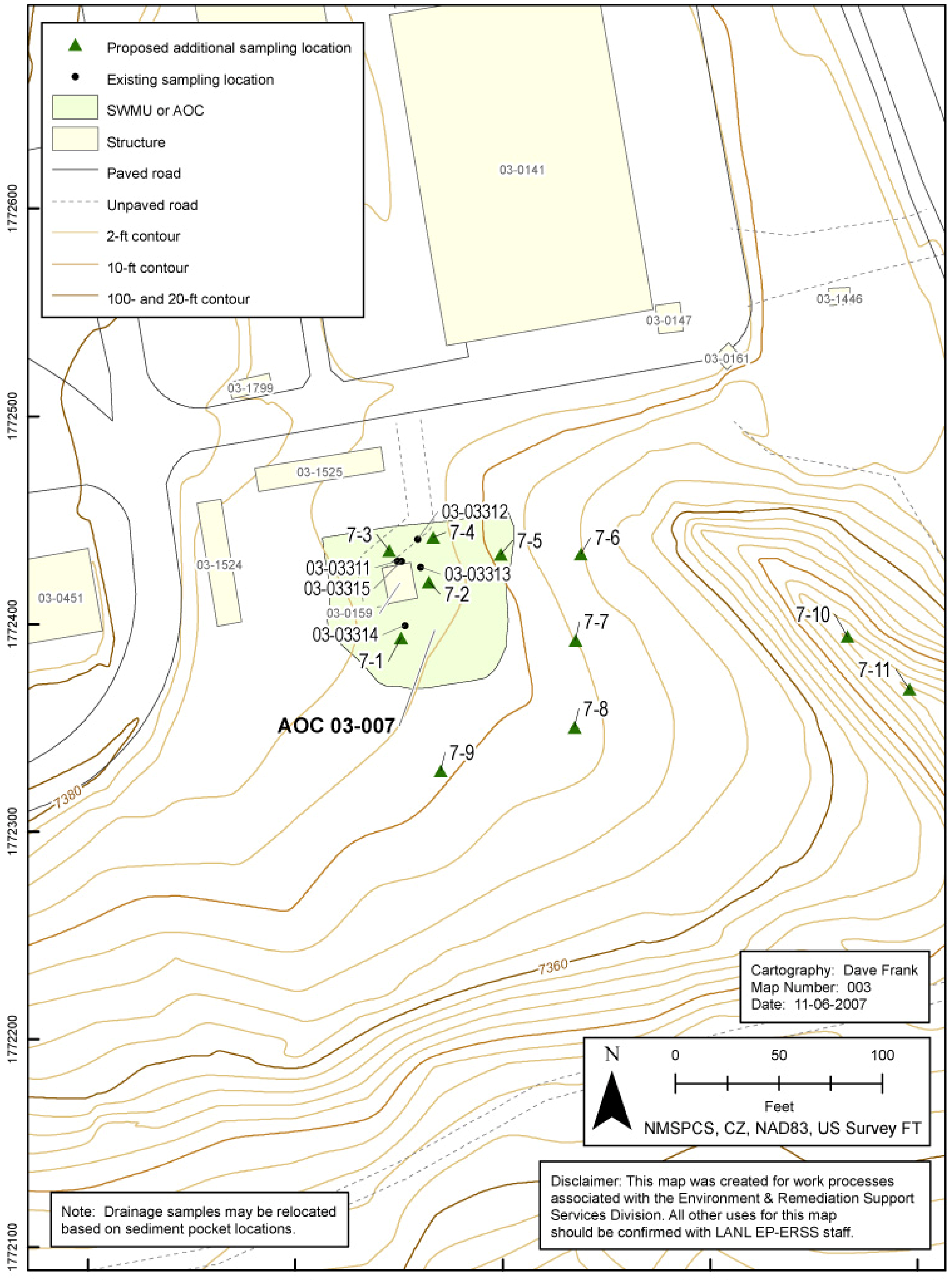

Figure 3.6-4 Proposed sampling locations at AOC 03-007

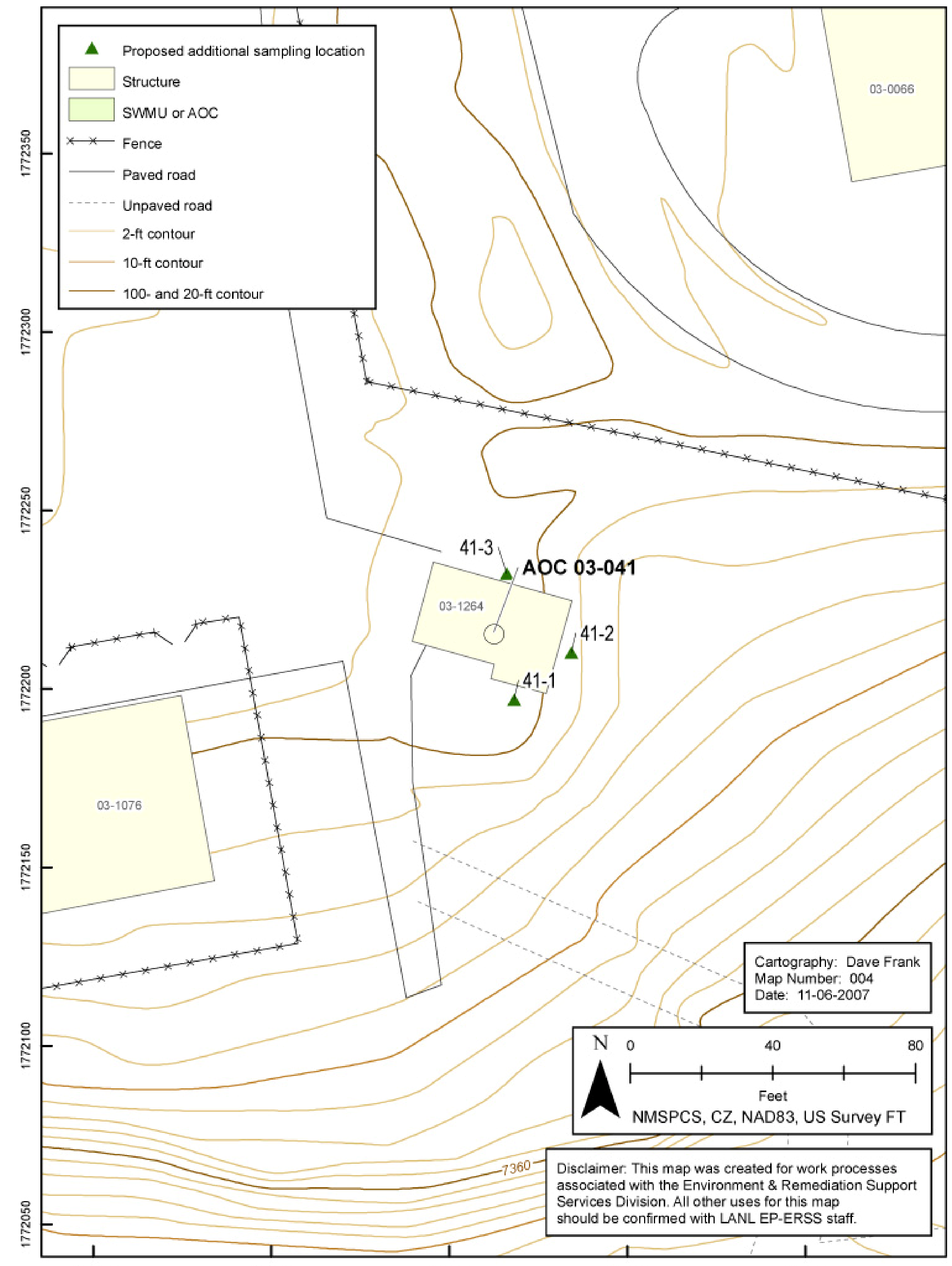

Figure 3.14-1 Proposed sampling locations at AOC 03-041

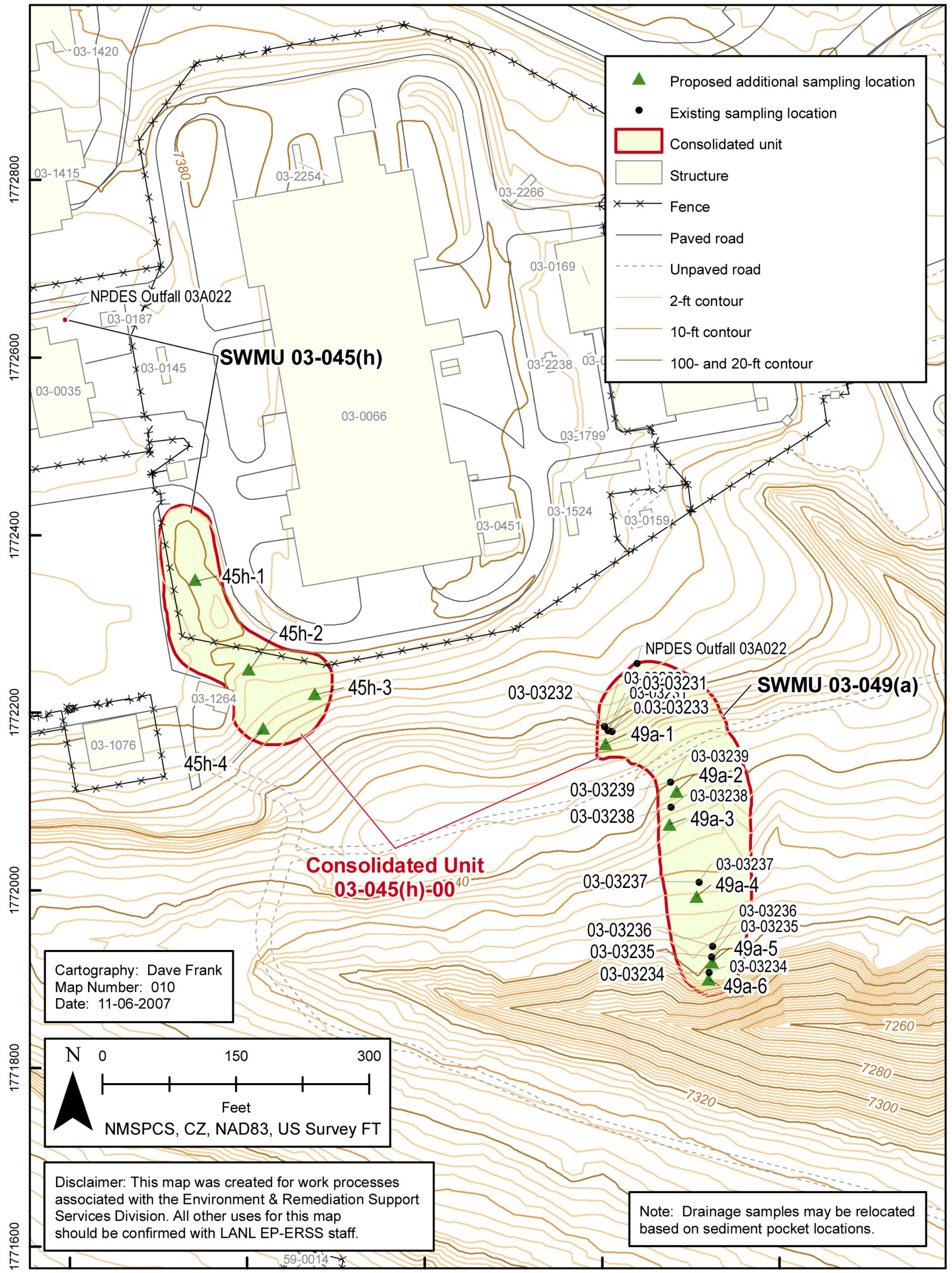

Figure 3.15-1 Proposed sampling locations at SWMU 03-045(h) and SWMU 03-049(a) [Consolidated Unit 03-045(h)-00]

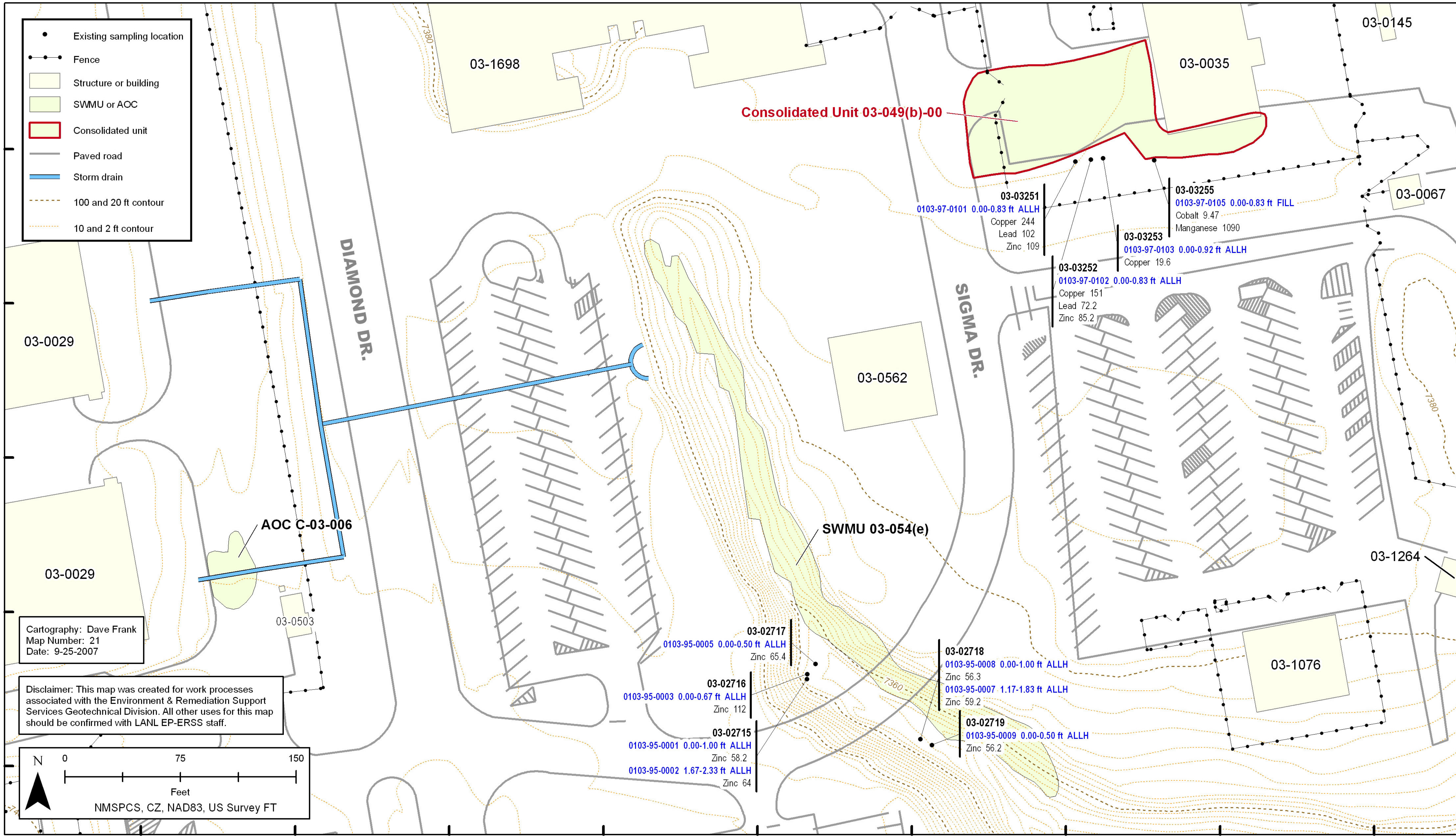

Figure 3.16-1 Inorganic chemicals detected above BVs at SWMU 03-054(e) and AOC C-03-006

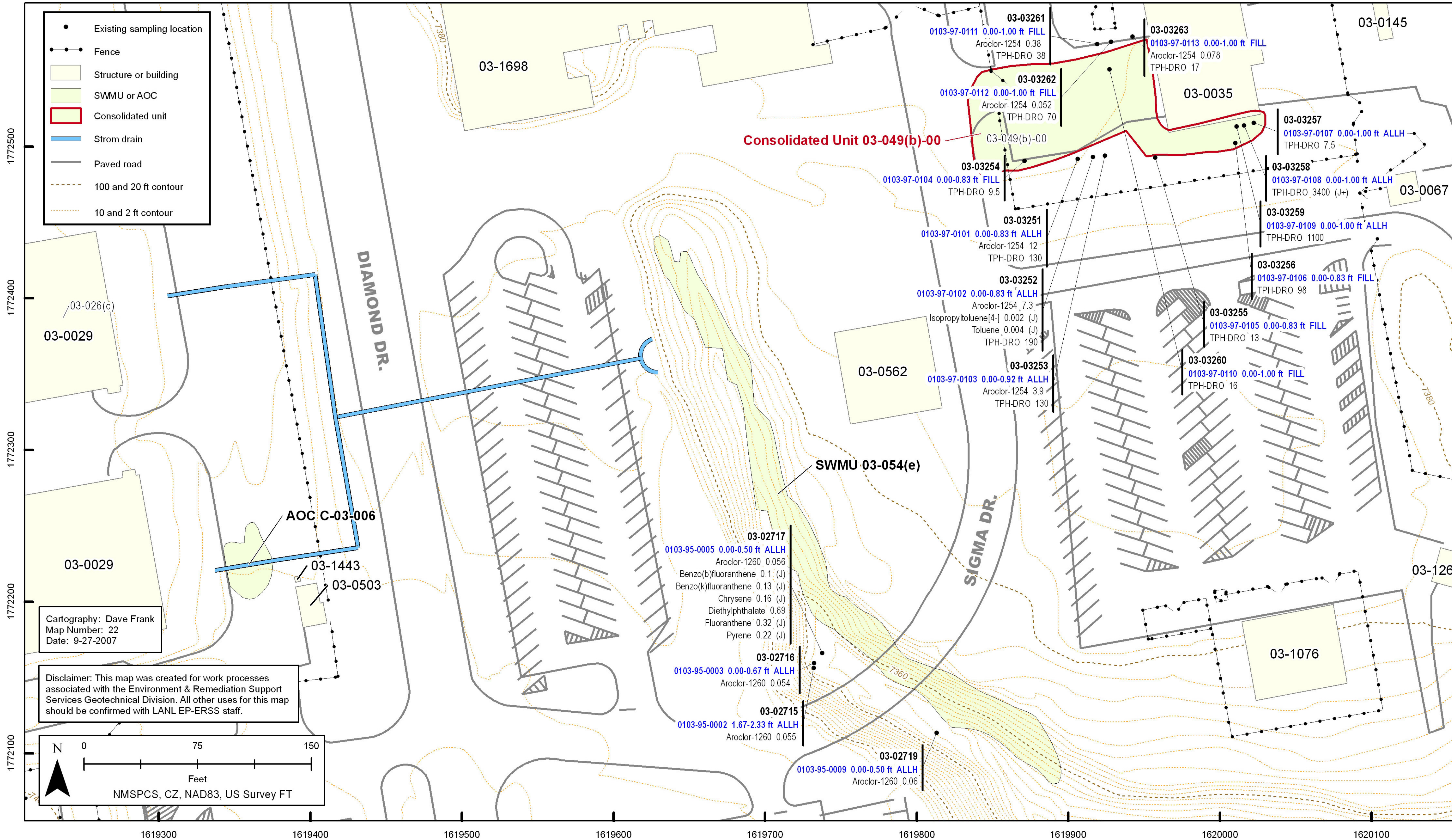

Figure 3.16-2 Organic chemicals detected at Consolidated Unit 03-049(b)-00, SWMU 03-054(e), and AOC C-03-006

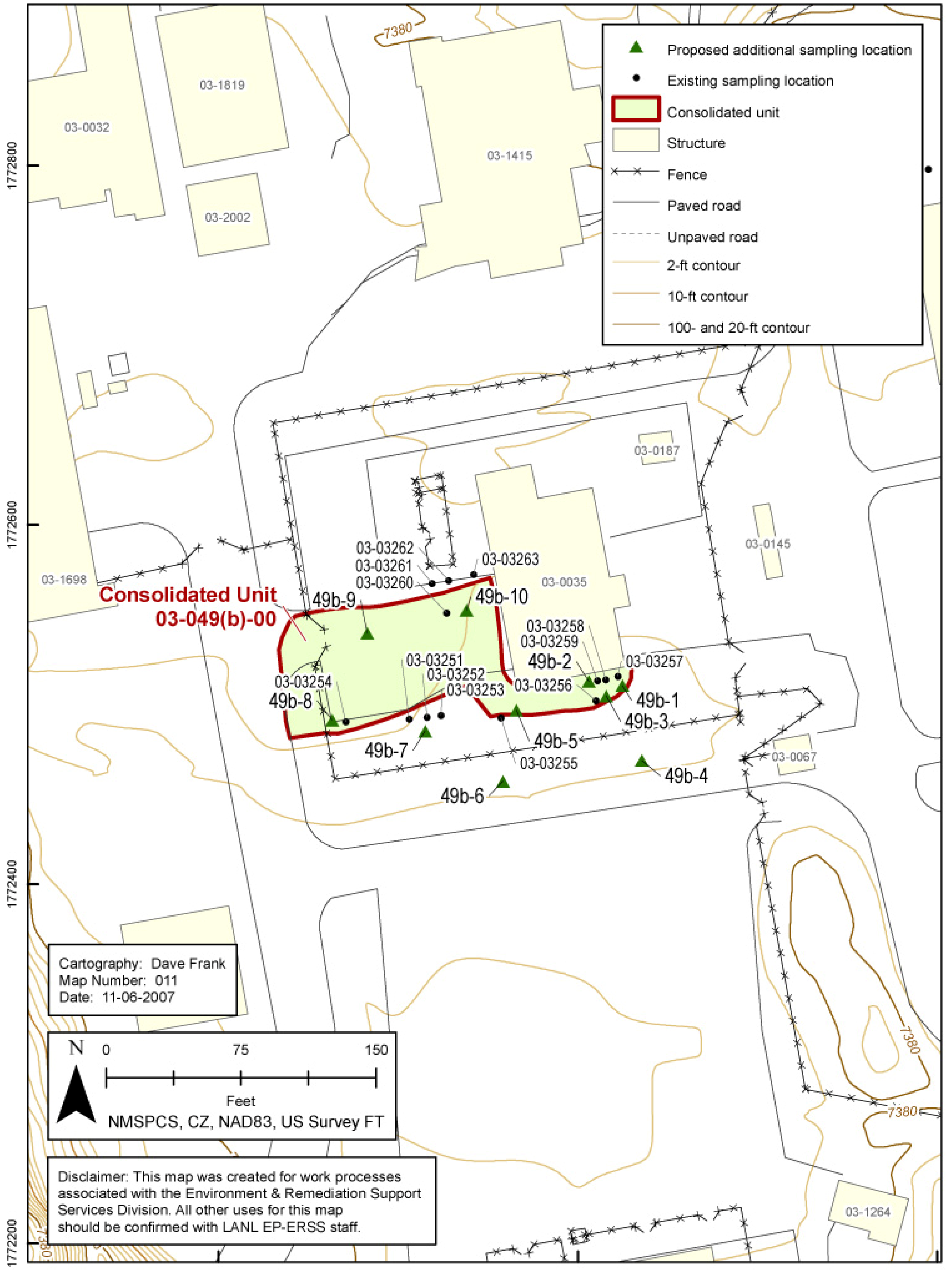

Figure 3.16-3 Proposed sampling locations at Consolidated Unit 03-049(b)-00

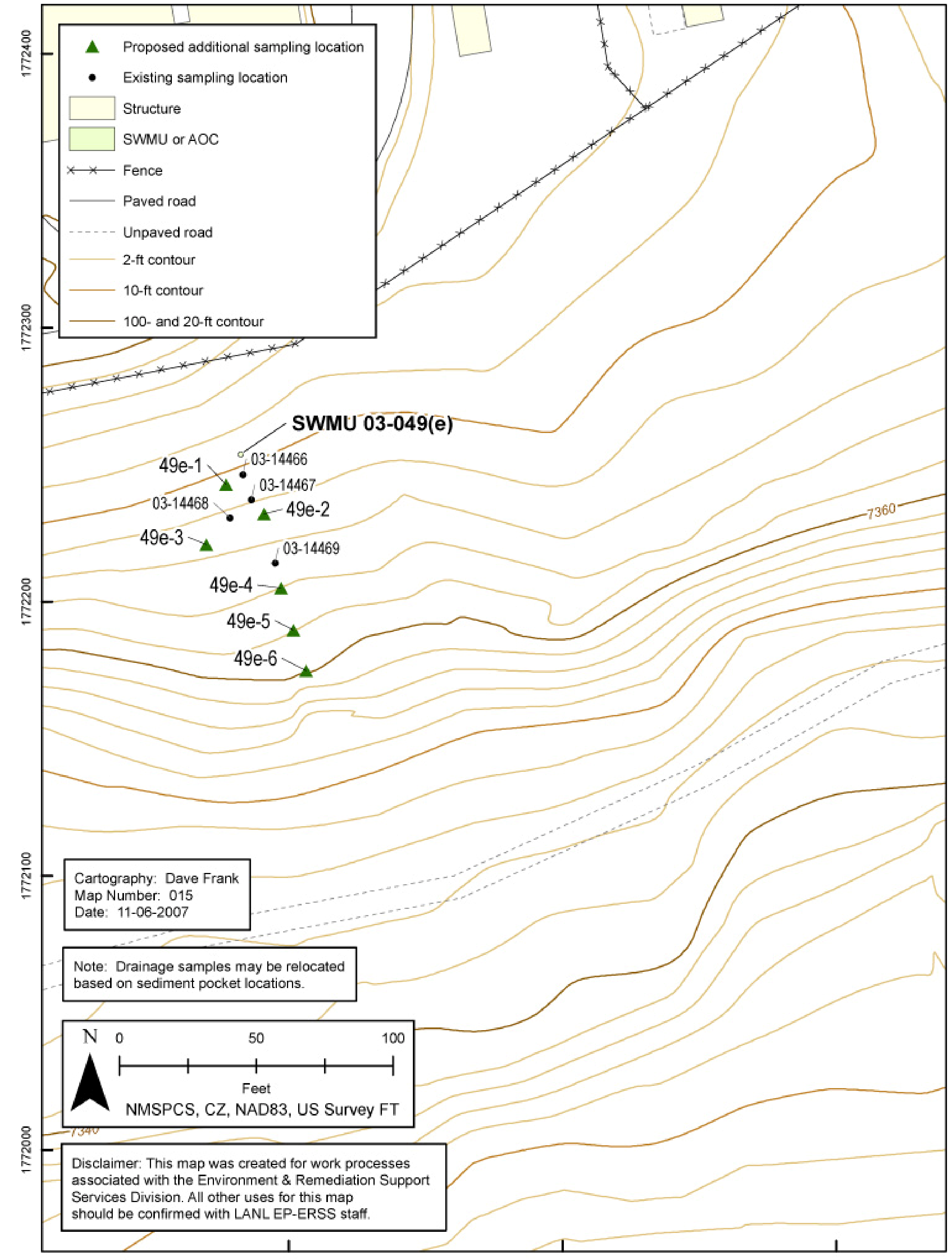

Figure 3.17-1 Proposed sampling locations at SWMU 03-049(e)

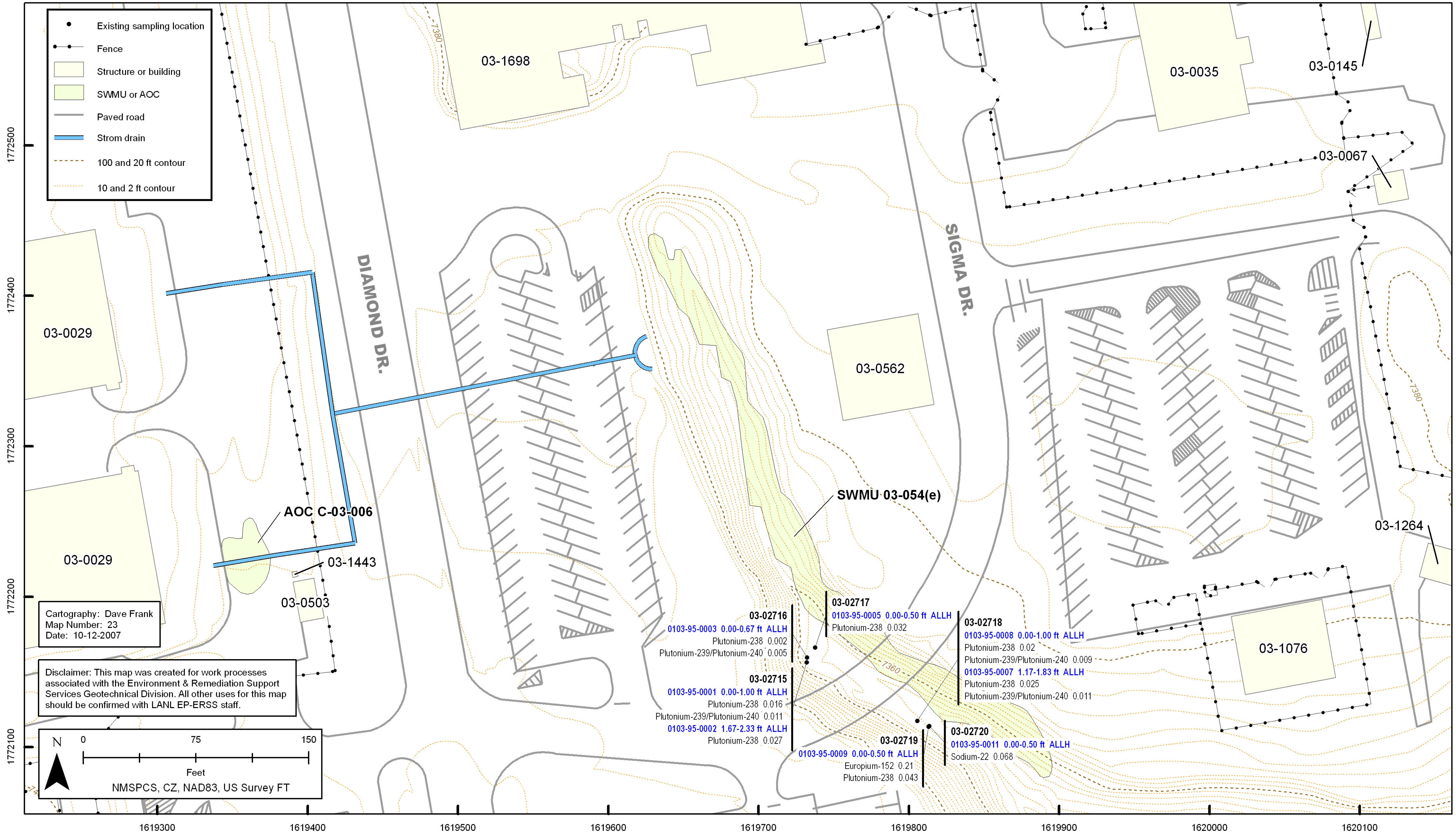

Figure 3.18-1 Radionuclides detected or detected above BV/FV at SWMU 03-054(e) and AOC C-03-006

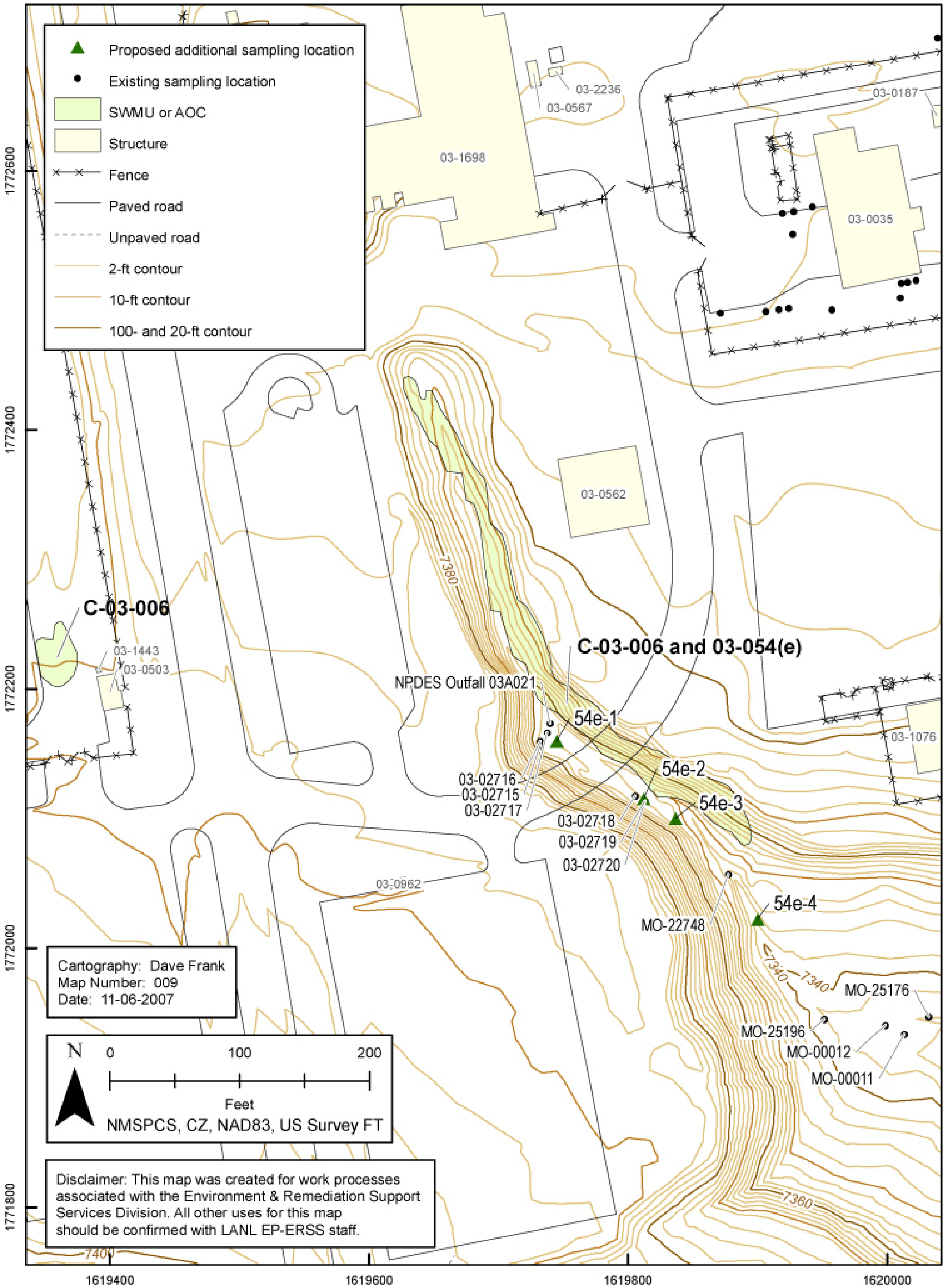

Figure 3.18-2 Proposed sampling locations at SWMU 03-054(e) and AOC C-03-006

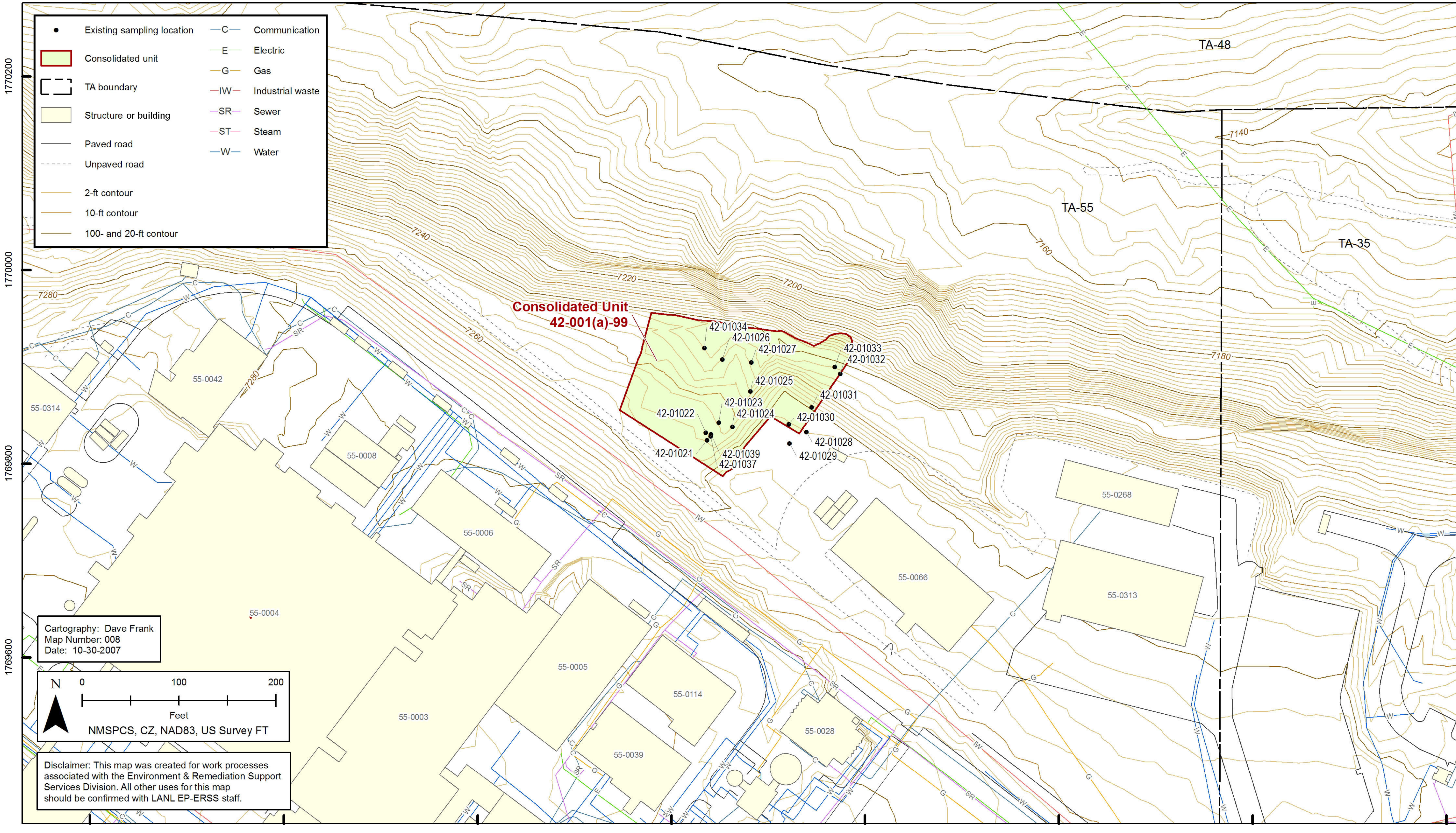

Figure 4.1-1 Site features and previous sampling locations for TA-42 Consolidated Unit 42-001(a)-99

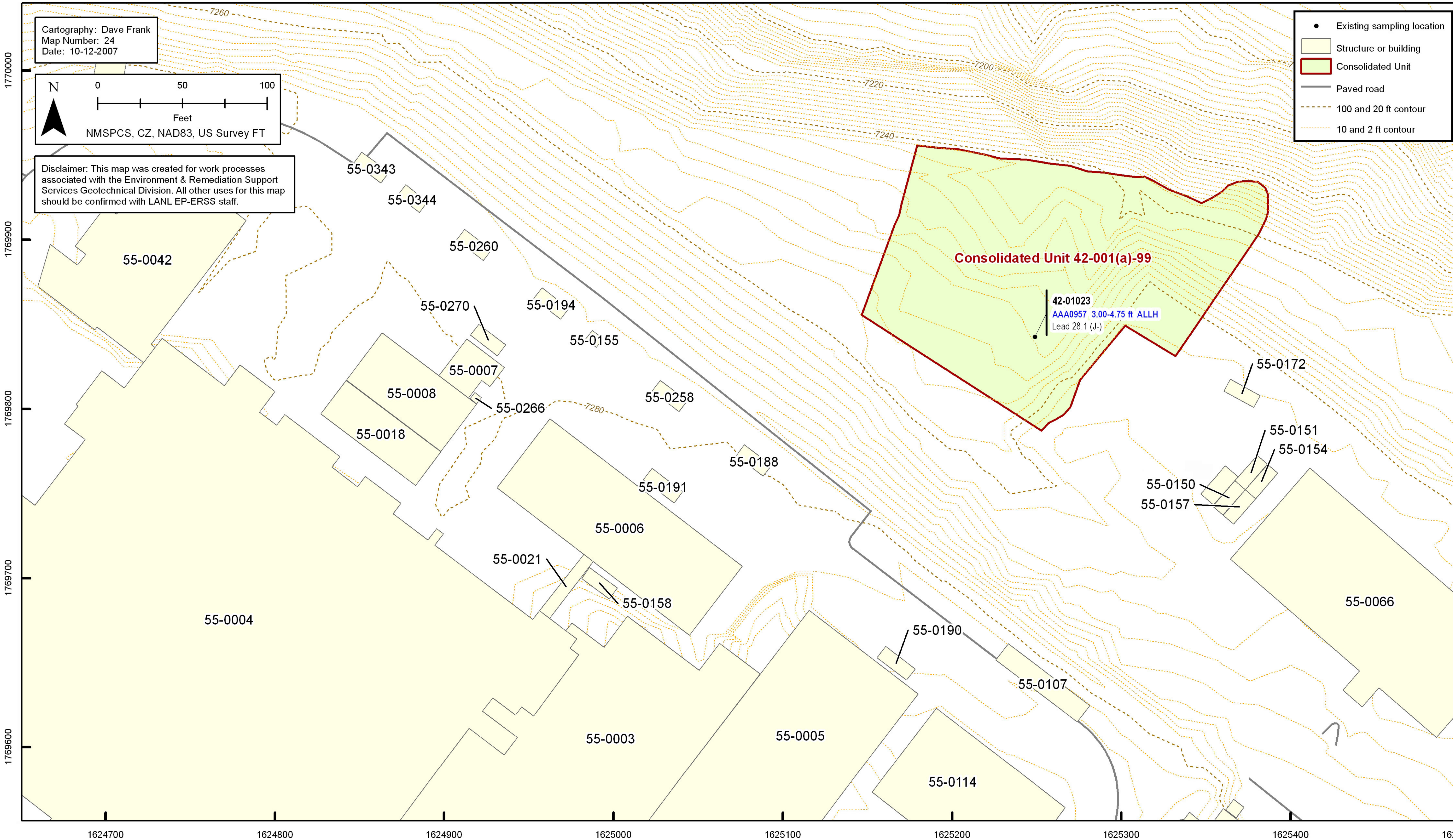

Figure 4.2-1 Inorganic chemicals detected above BVs at Consolidated Unit 42-001(a)-99

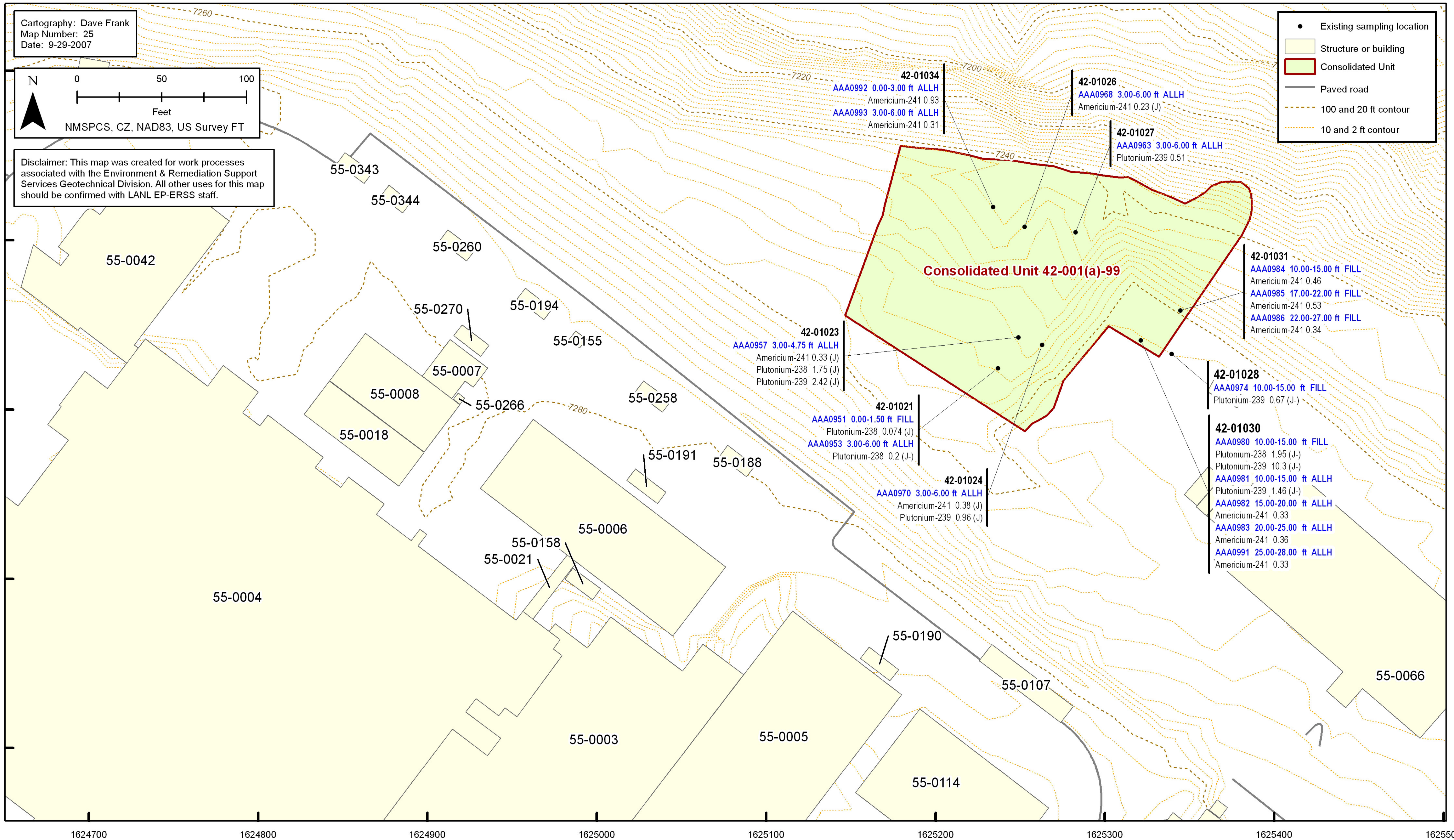

Figure 4.2-2 Radionuclides detected or detected above BV/FV at Consolidated Unit 42-001(a)-99

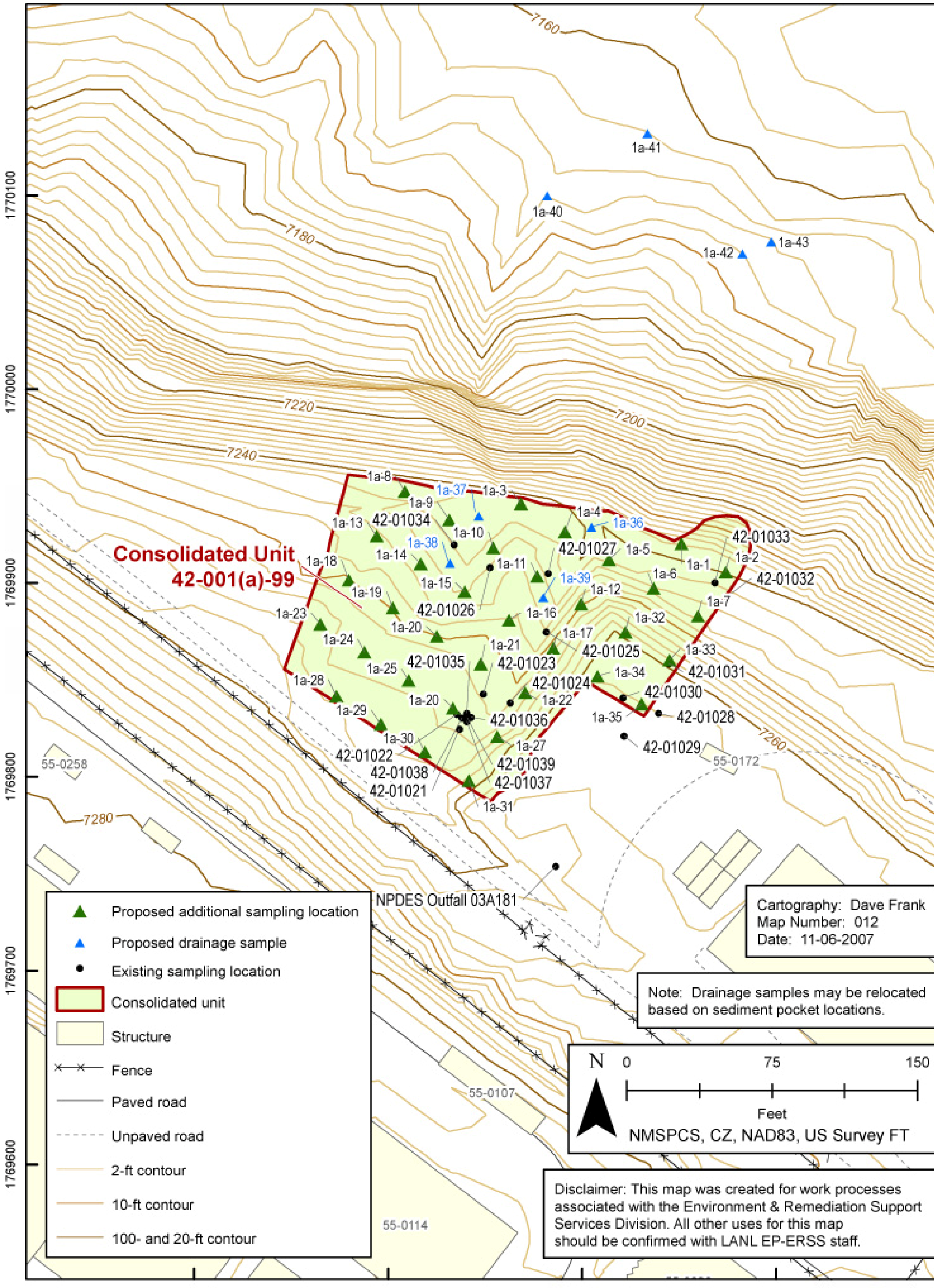

Figure 4.2-3 Proposed sampling locations at Consolidated Unit 42-001(a)-99

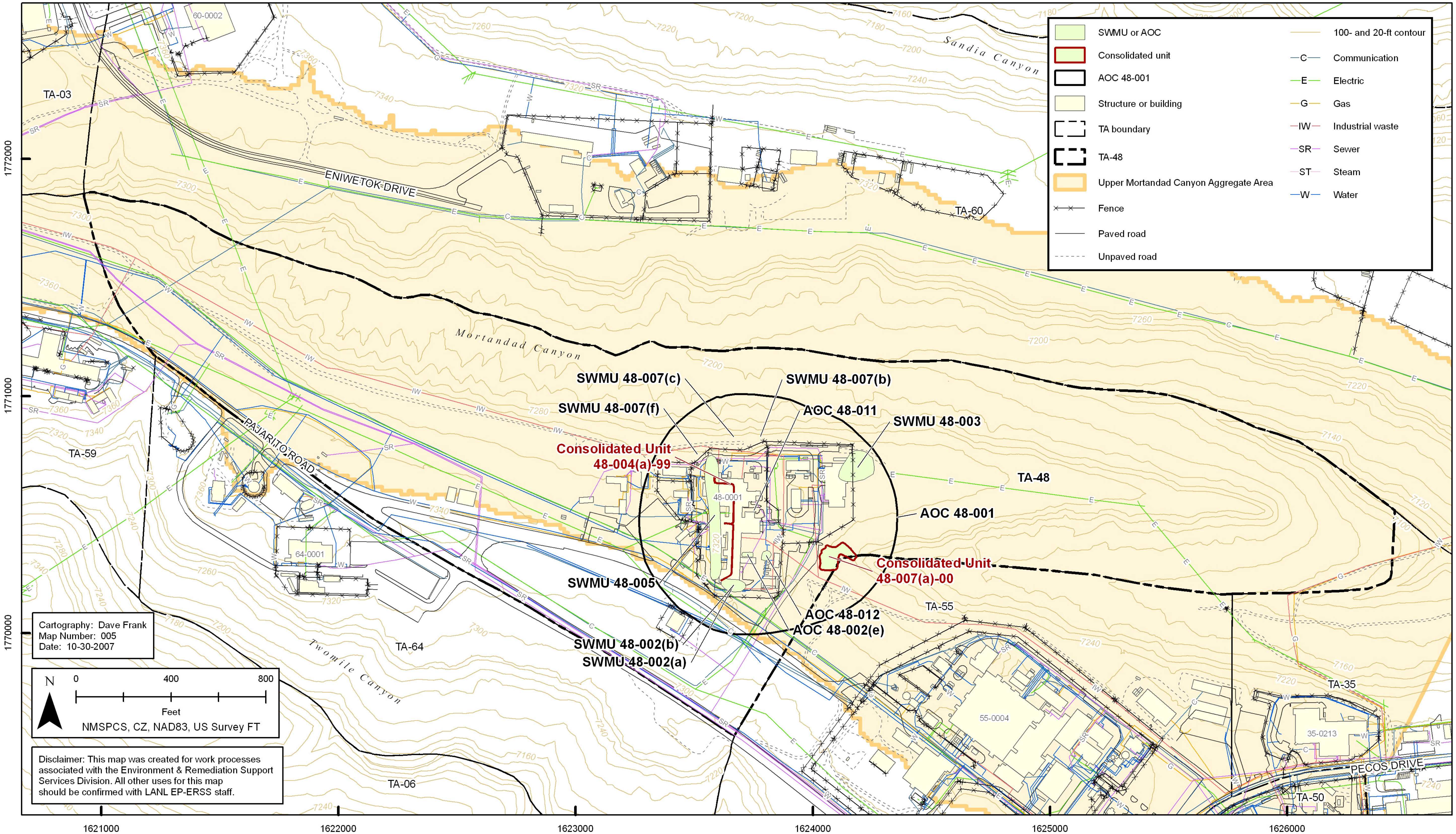

Figure 5.1-1 Site features for TA-48 SWMUs, AOCs, and consolidated units

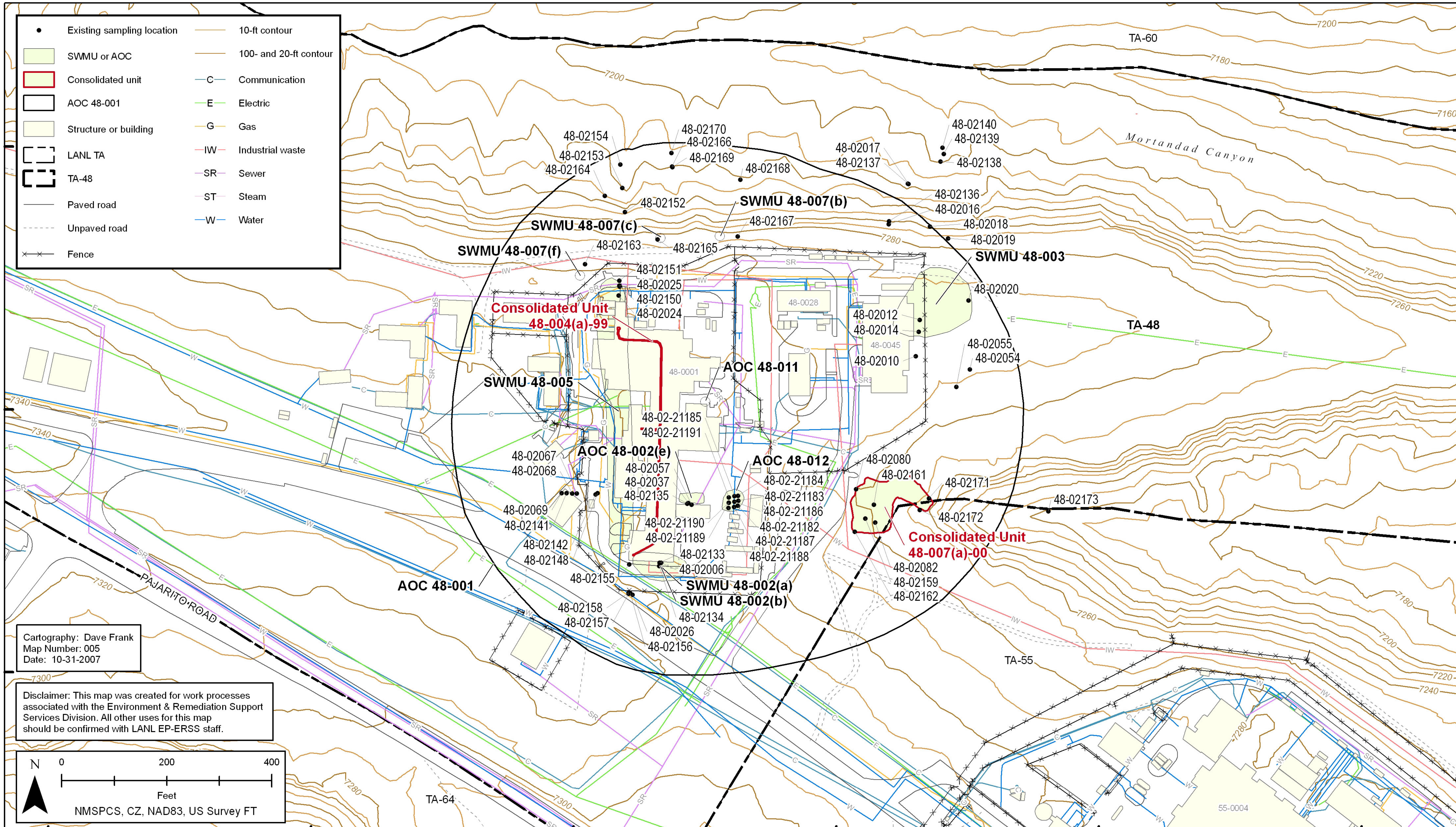

Figure 5.2-1 Site features and previous sampling locations for TA-48 SWMUs, AOCs, and consolidated units

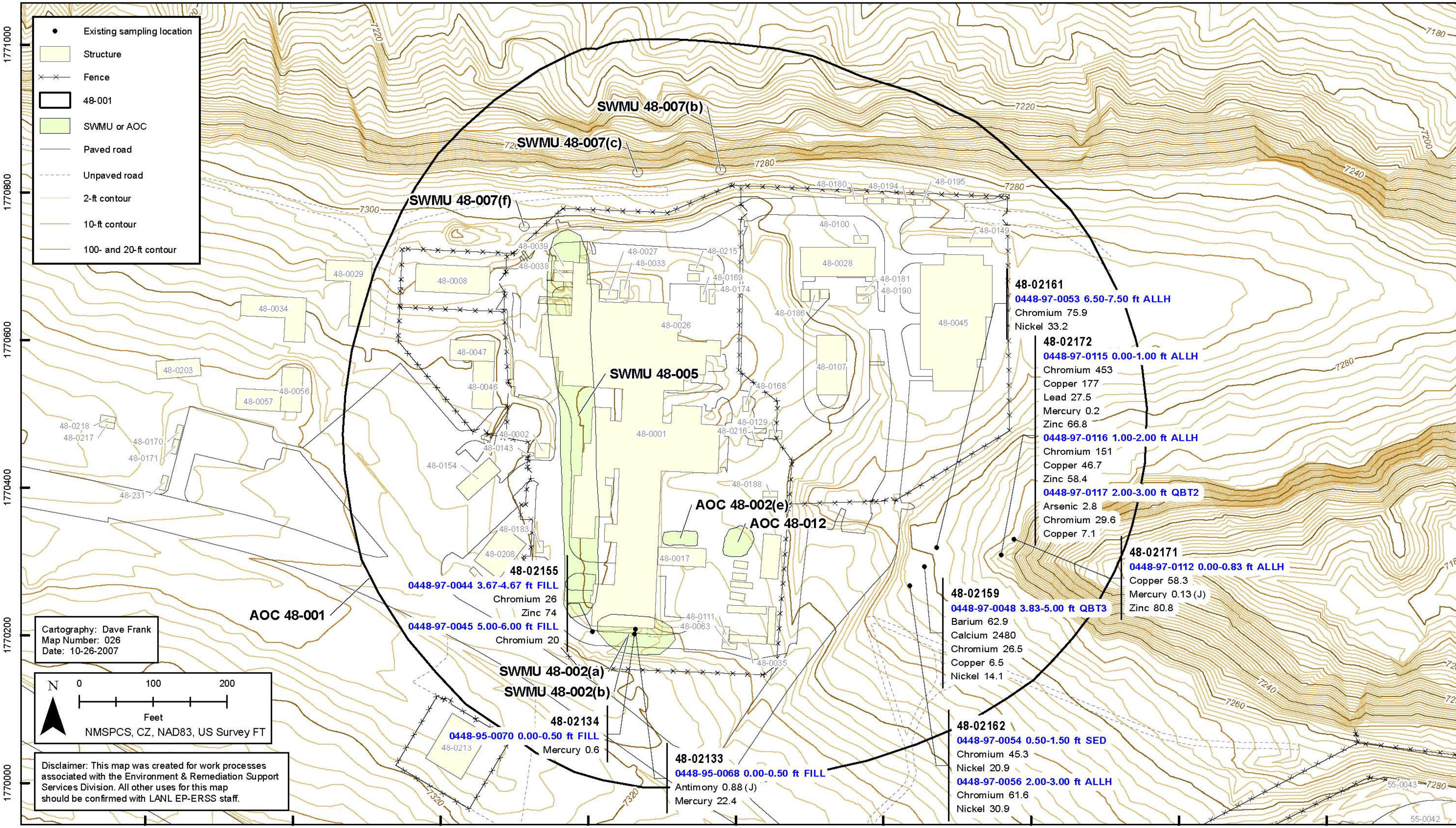

Figure 5.2-2 Inorganic chemicals detected above BVs at AOC 48-001 and SWMUs 48-002(a), 48-002(b), and 48-005

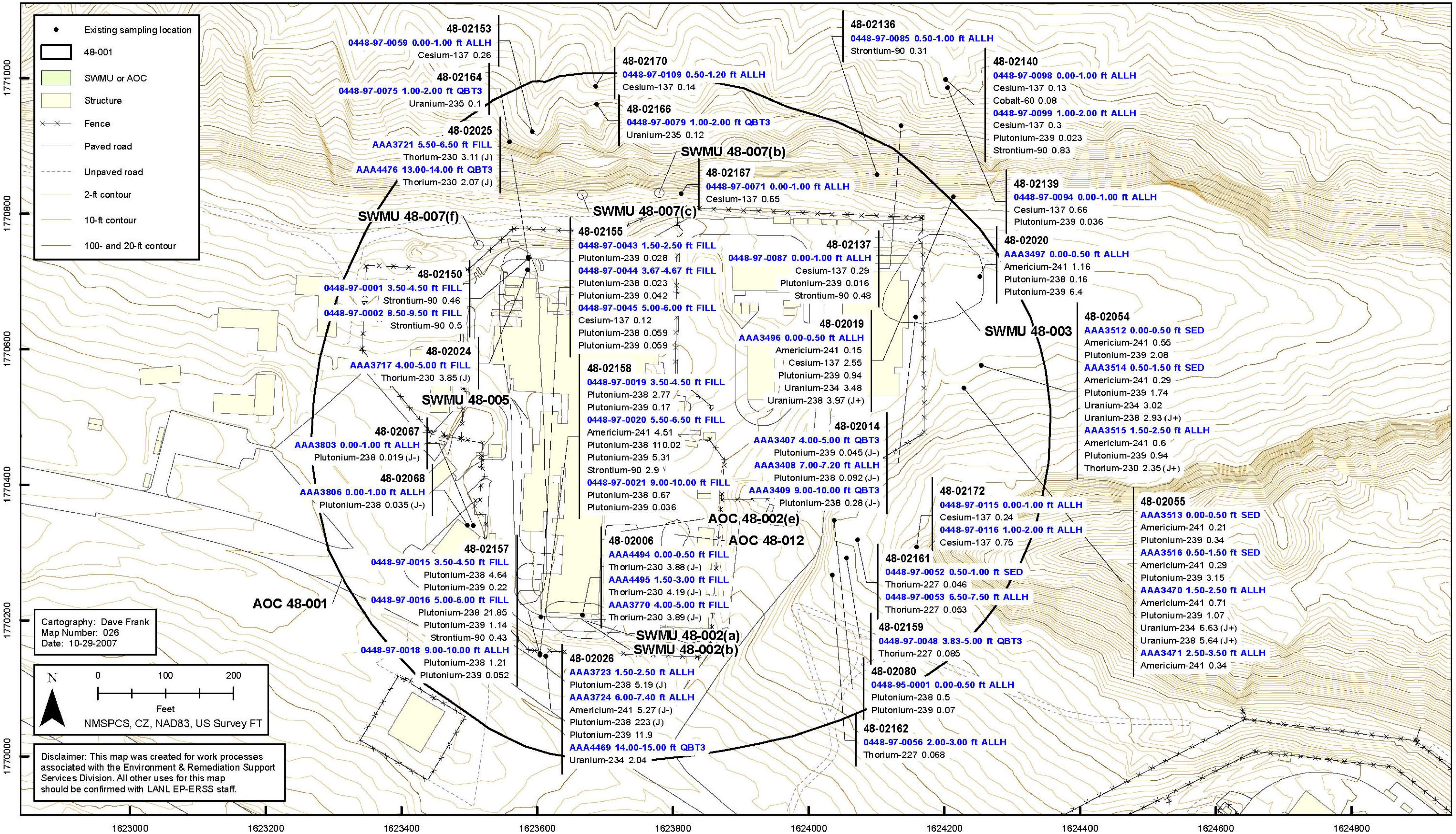

Figure 5.2-3 Radionuclides detected or detected above BV/FV at AOC 48-001 and SWMUs 48-002(a), 48-002(b), 48-003, 48-005, 48-007(b), 48-007(c), and 48-007(f)

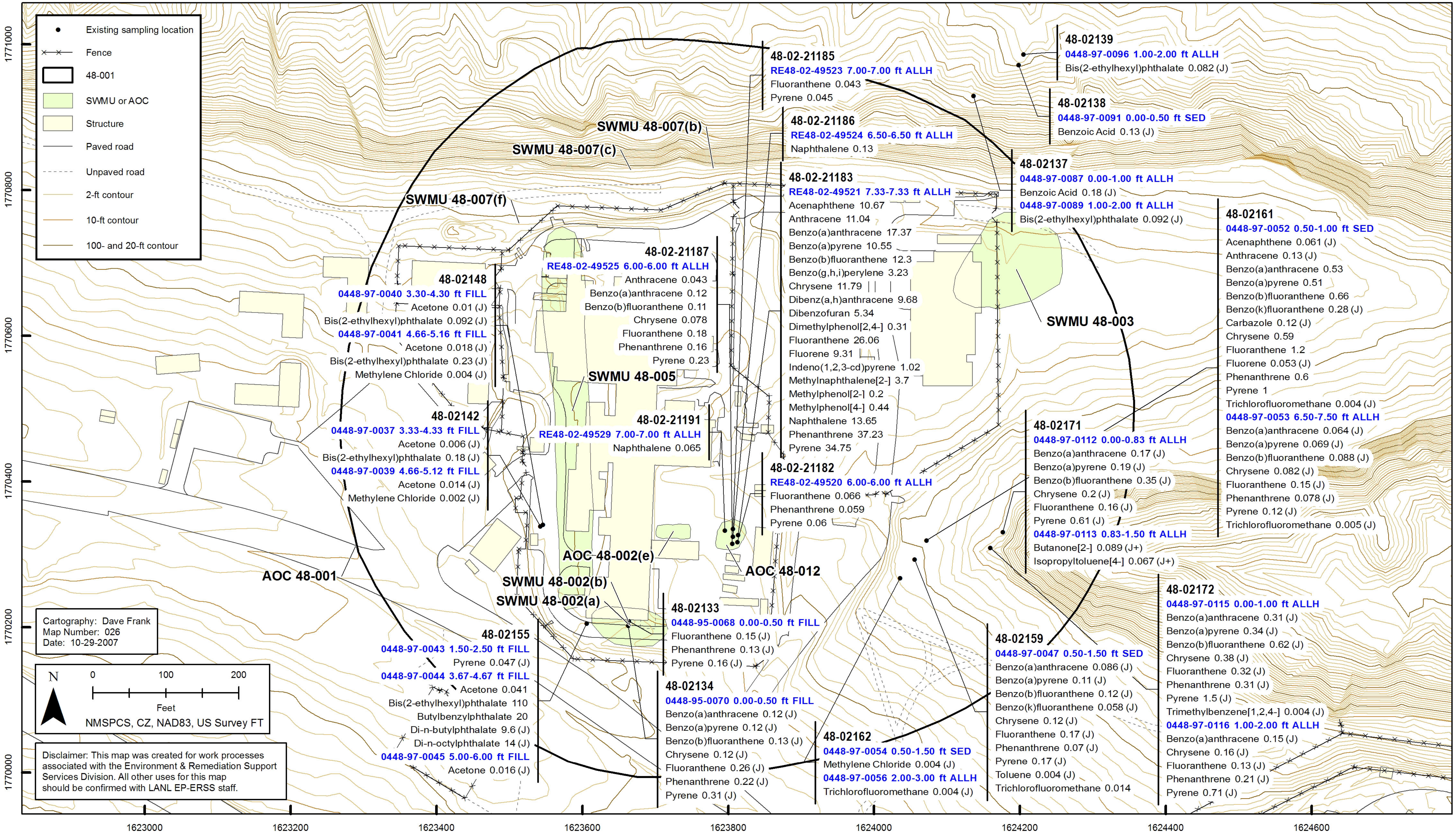

Figure 5.2-4 Organic chemicals detected at AOC 48-001, SWMUs 48-002(a), 48-002(b), 48-003, and 48-005, and AOC 48-012

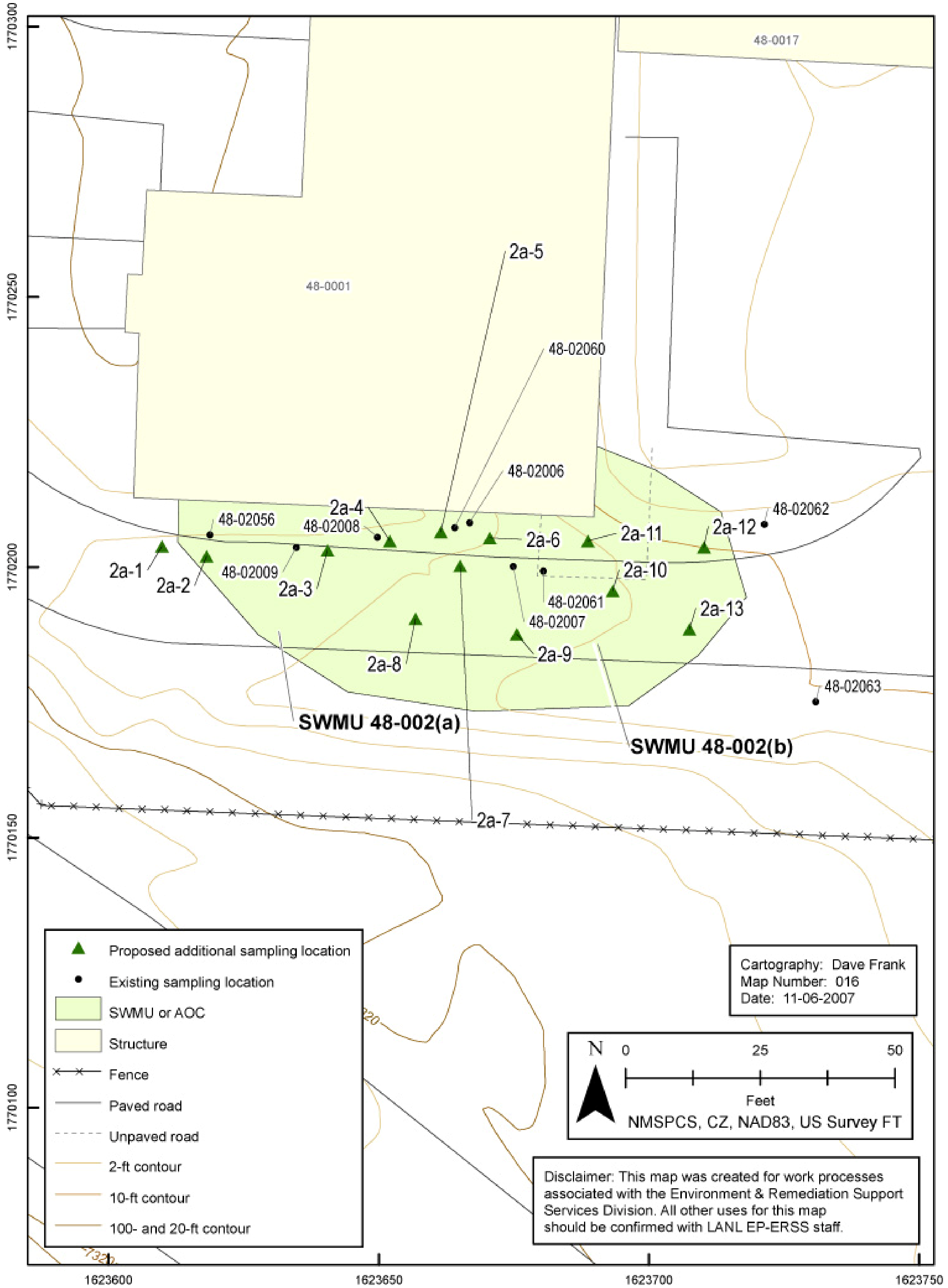

Figure 5.3-1 Proposed sampling locations at SWMUs 48-002(a) and 48-002(b)

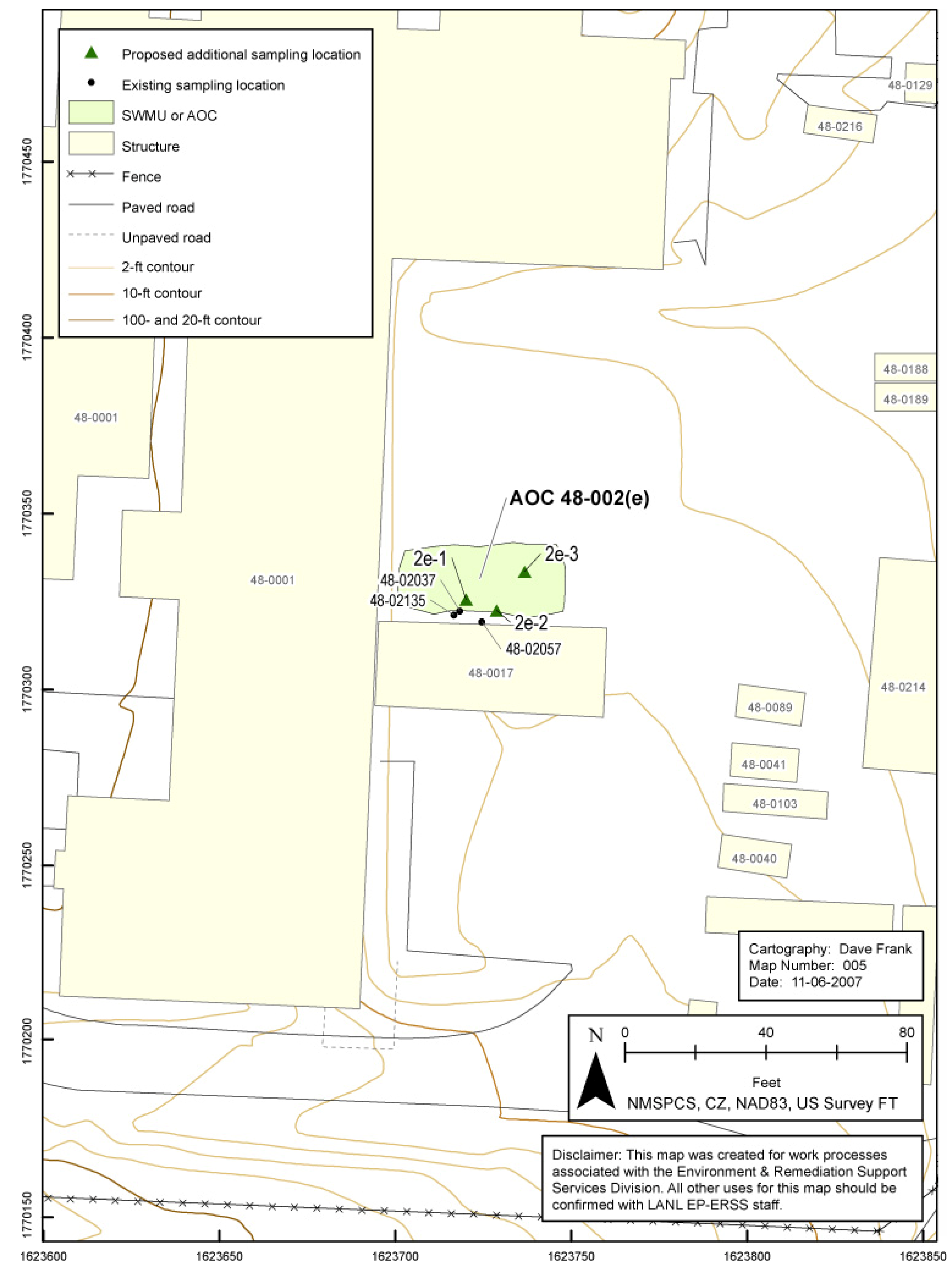

Figure 5.5-1 Proposed sampling locations at AOC 48-002(e)

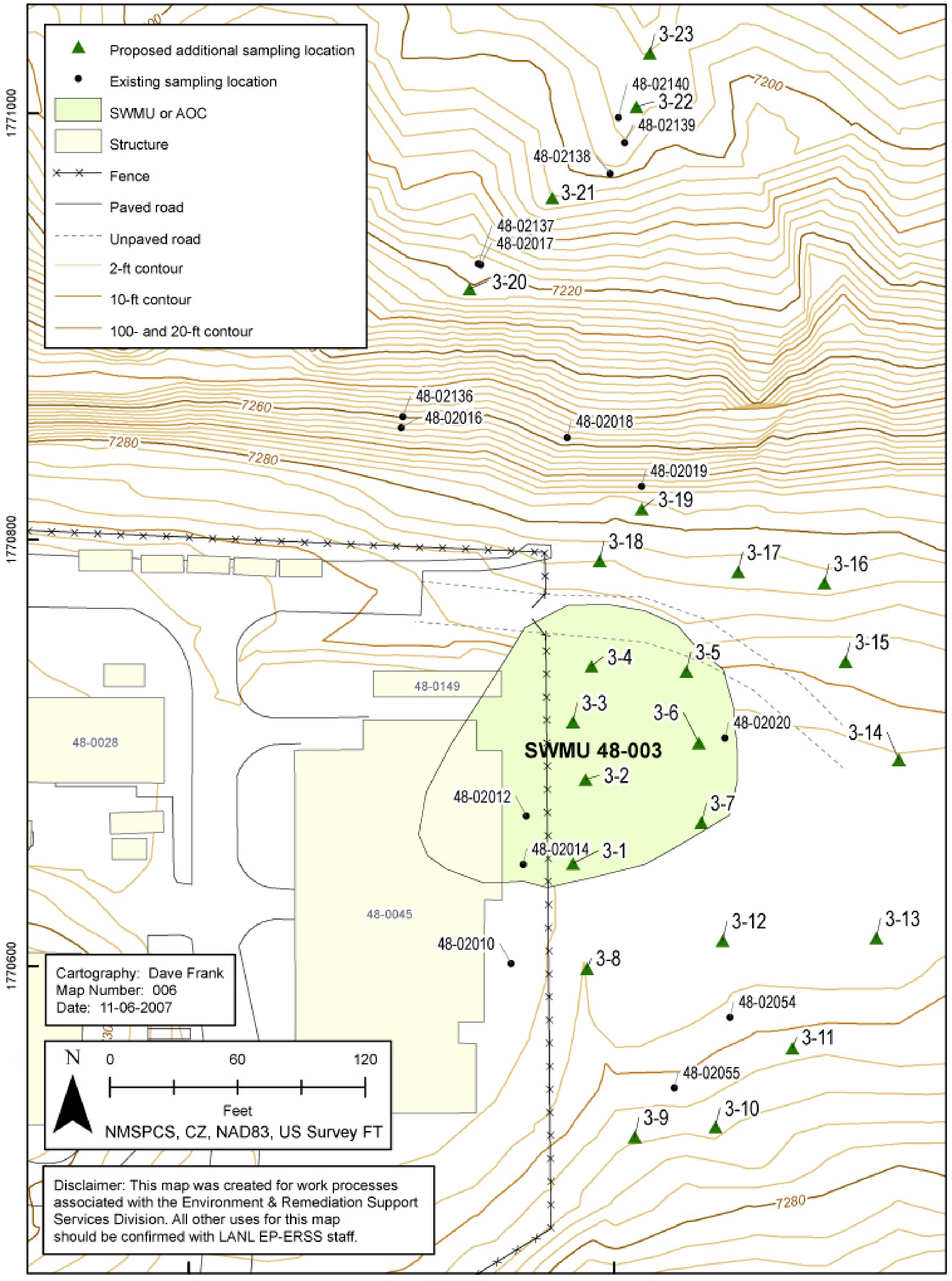

Figure 5.6-1 Proposed sampling locations at SWMU 48-003

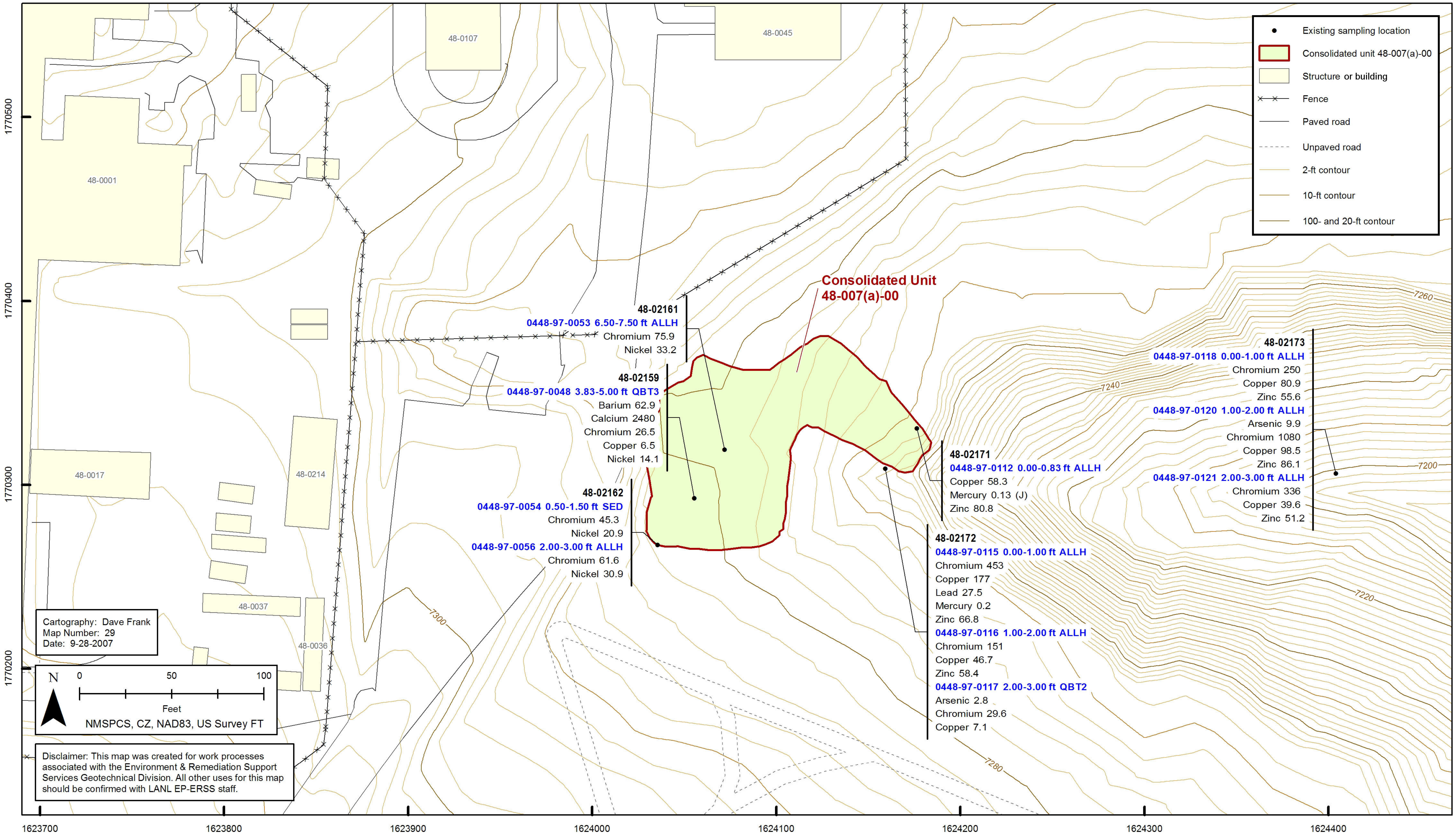

Figure 5.9-1 Inorganic chemicals detected above BVs at Consolidated Unit 48-007(a)-00

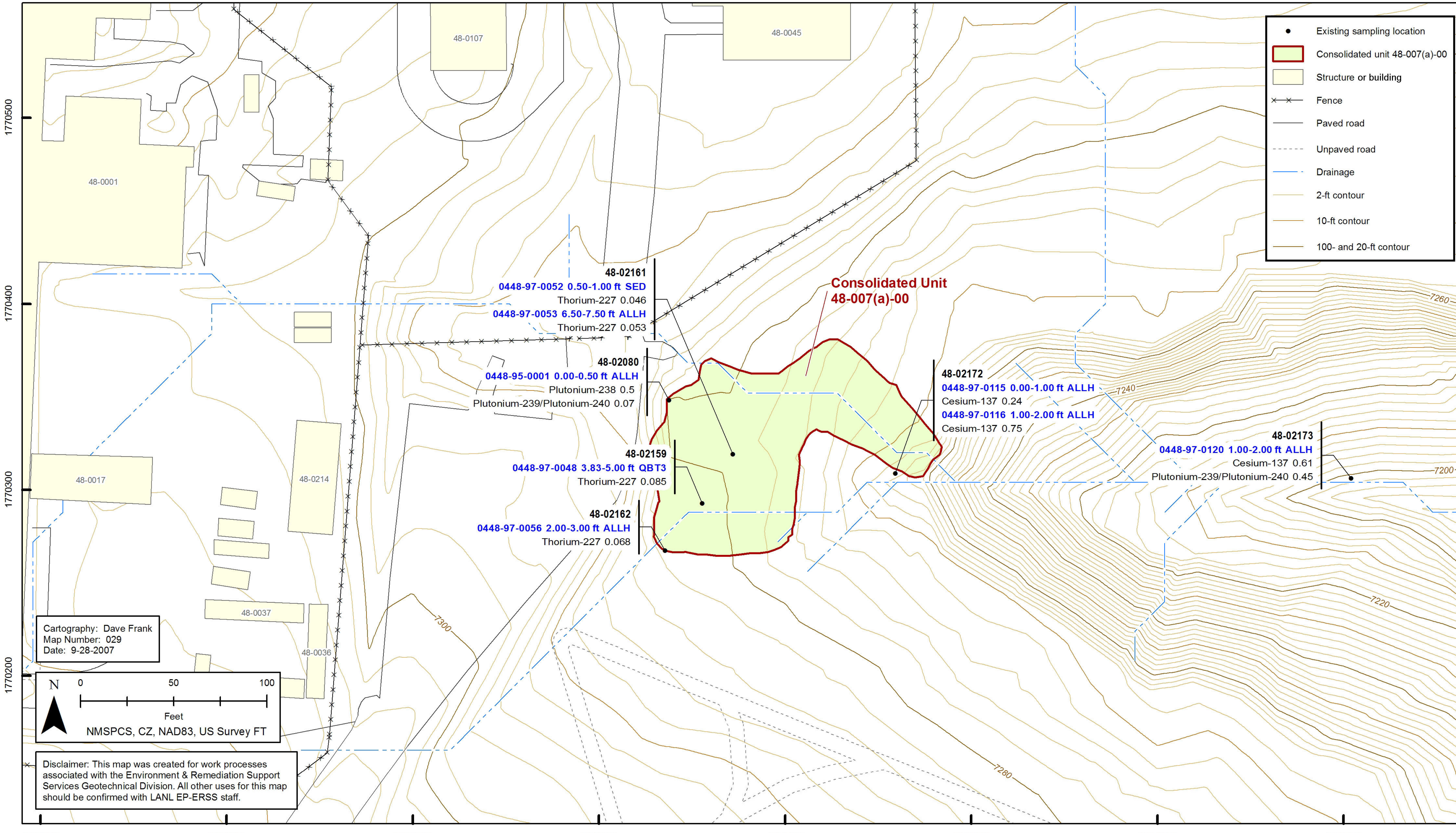

Figure 5.9-2 Radionuclides detected or detected above BV/FV at Consolidated Unit 48-007(a)-00

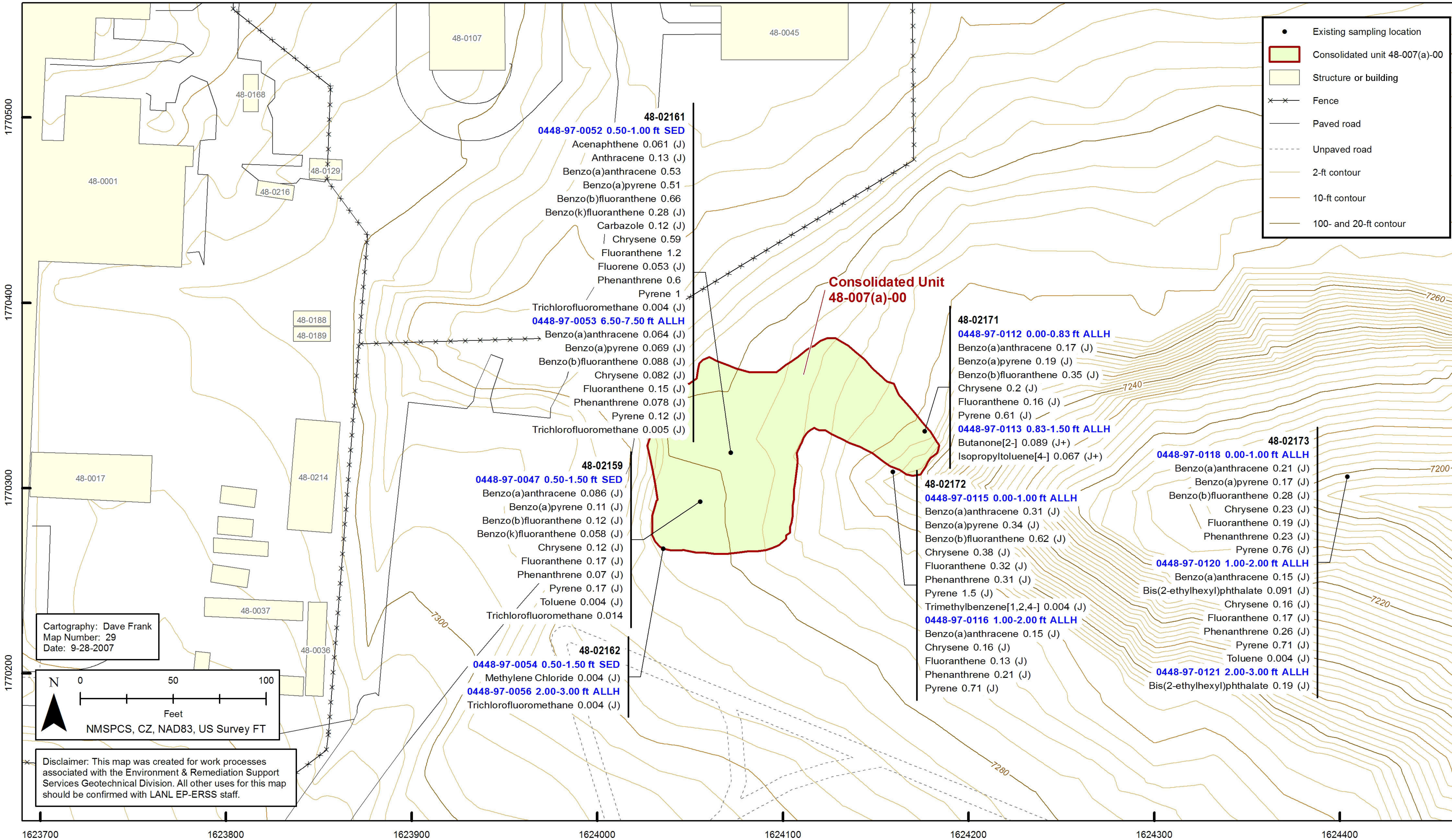

Figure 5.9-3 Organic chemicals detected at Consolidated Unit 48-007(a)-00

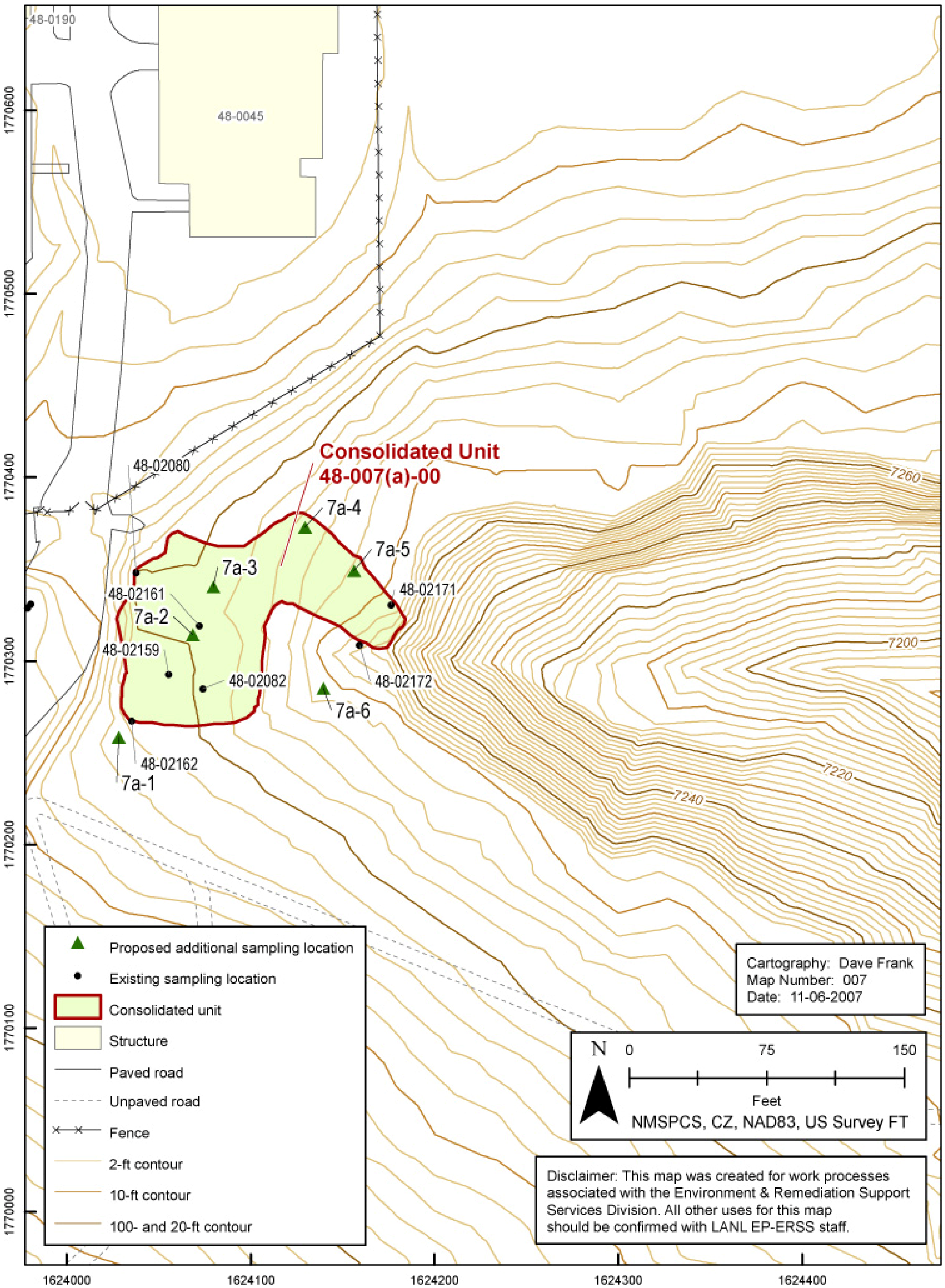

Figure 5.9-4 Proposed sampling locations at Consolidated Unit 48-007(a)-00

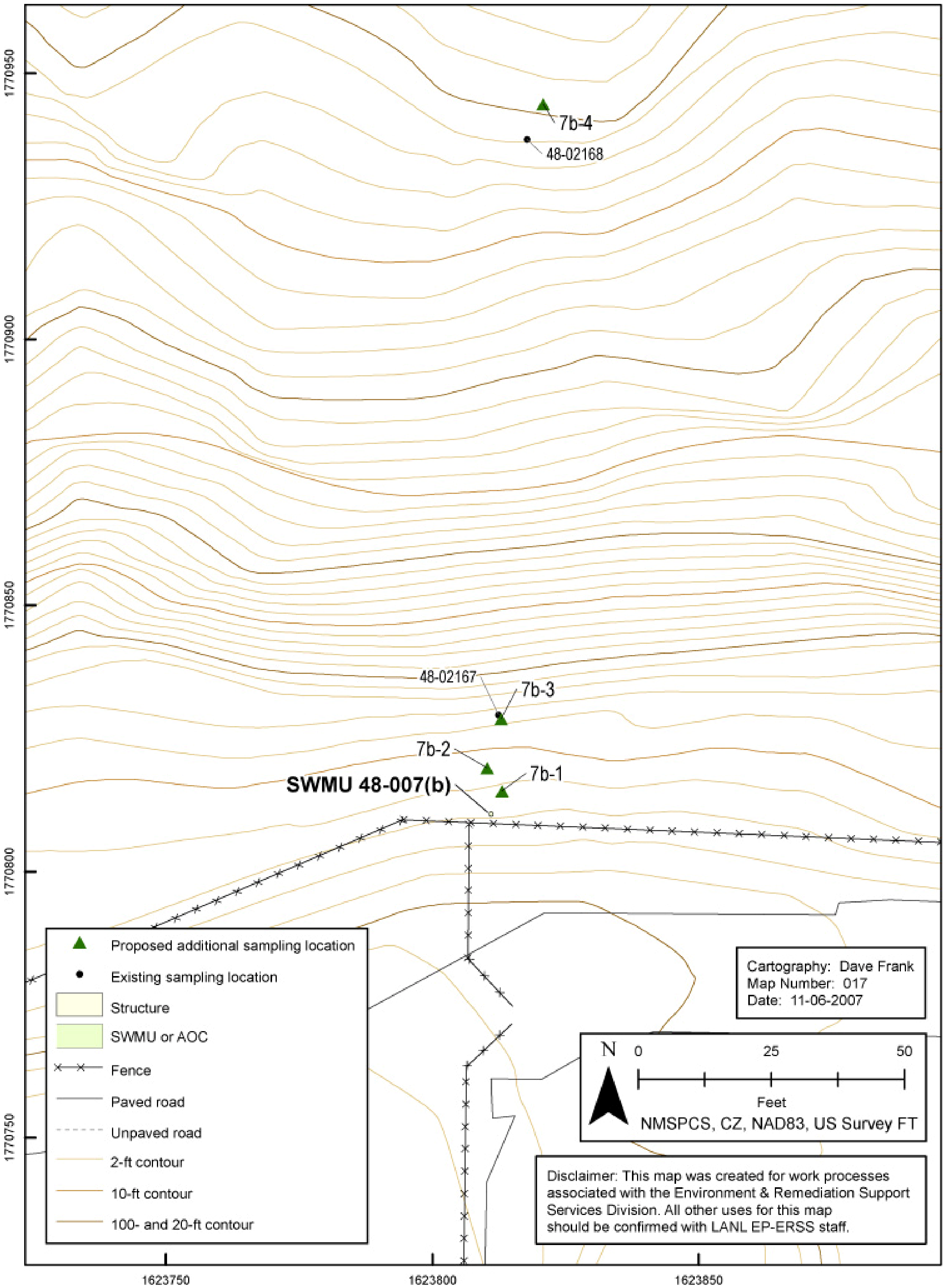

Figure 5.10-1 Proposed sampling locations at SWMU 48-007(b)

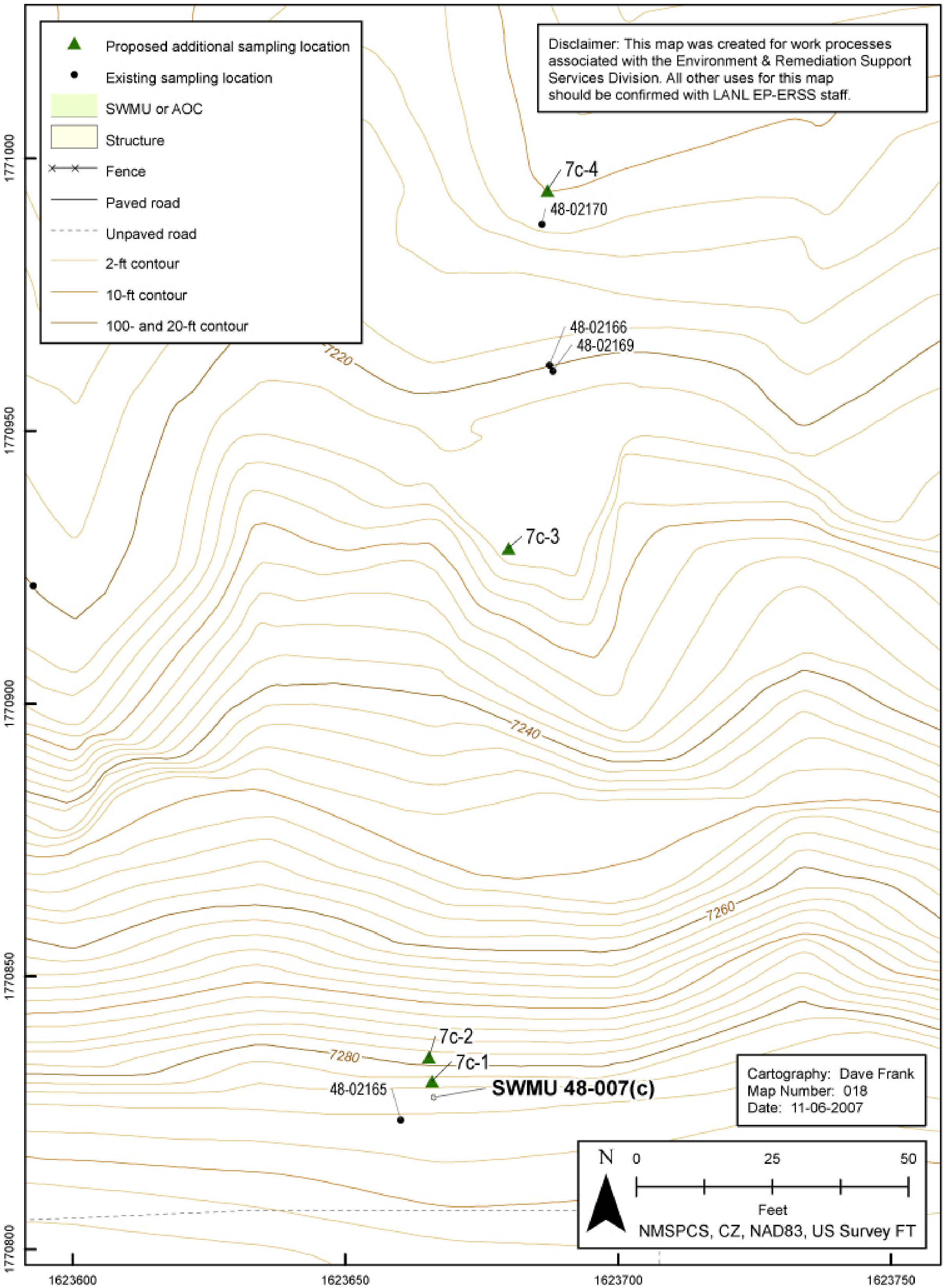

Figure 5.11-1 Proposed sampling locations at SWMU 48-007(c)

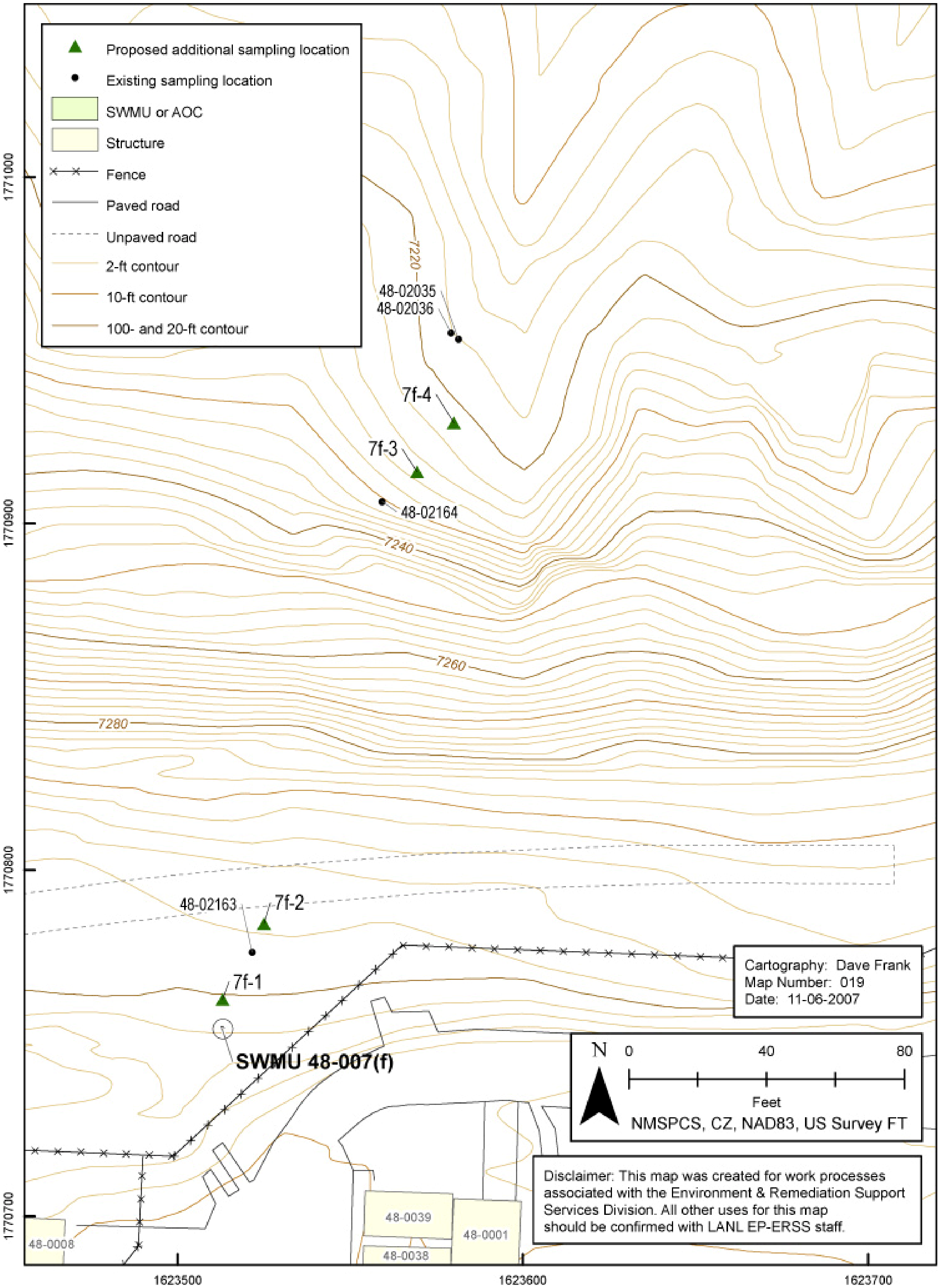

Figure 5.12-1 Proposed sampling locations at SWMU 48-007(f)

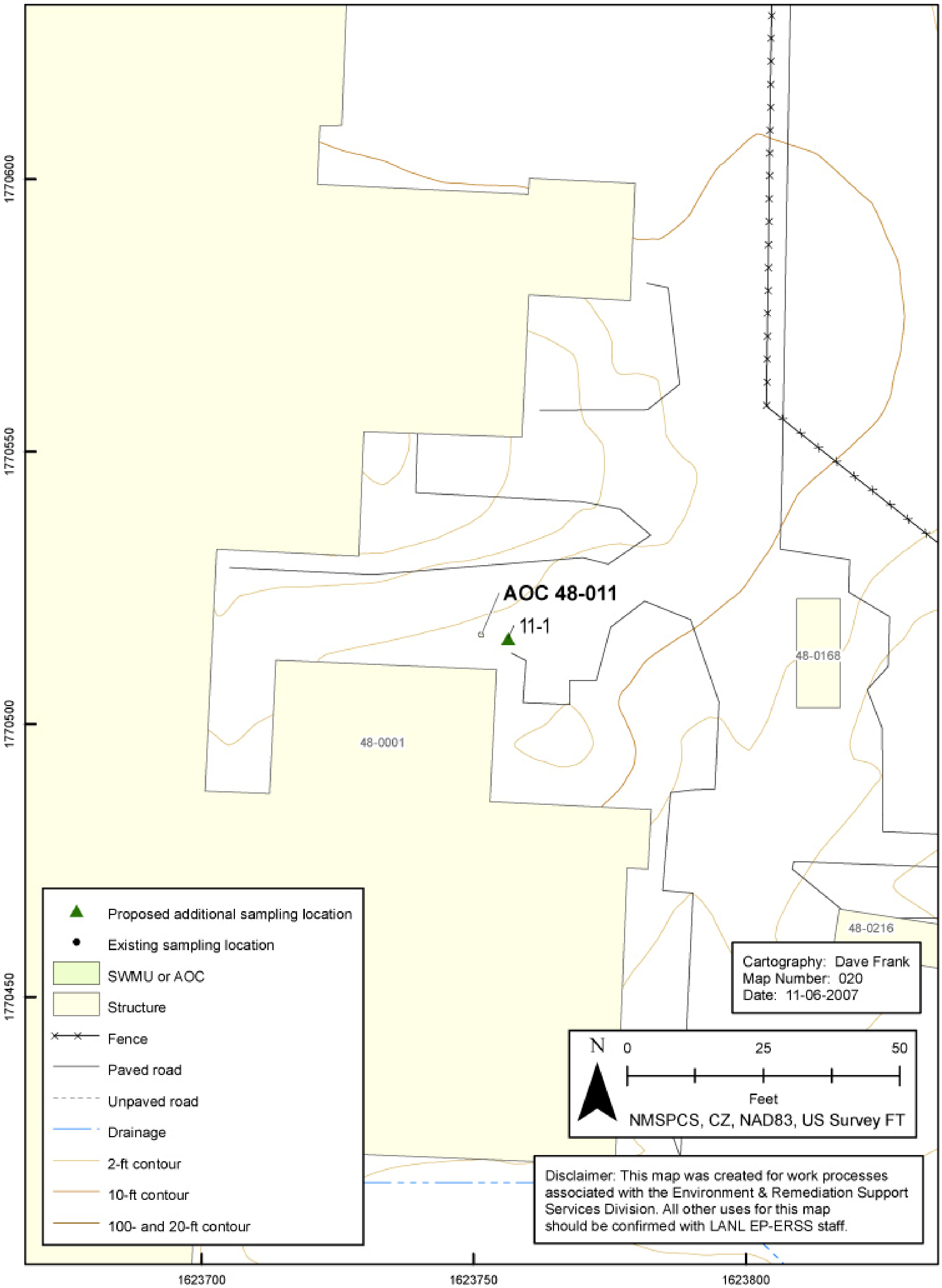

Figure 5.13-1 Proposed sampling locations at AOC 48-011

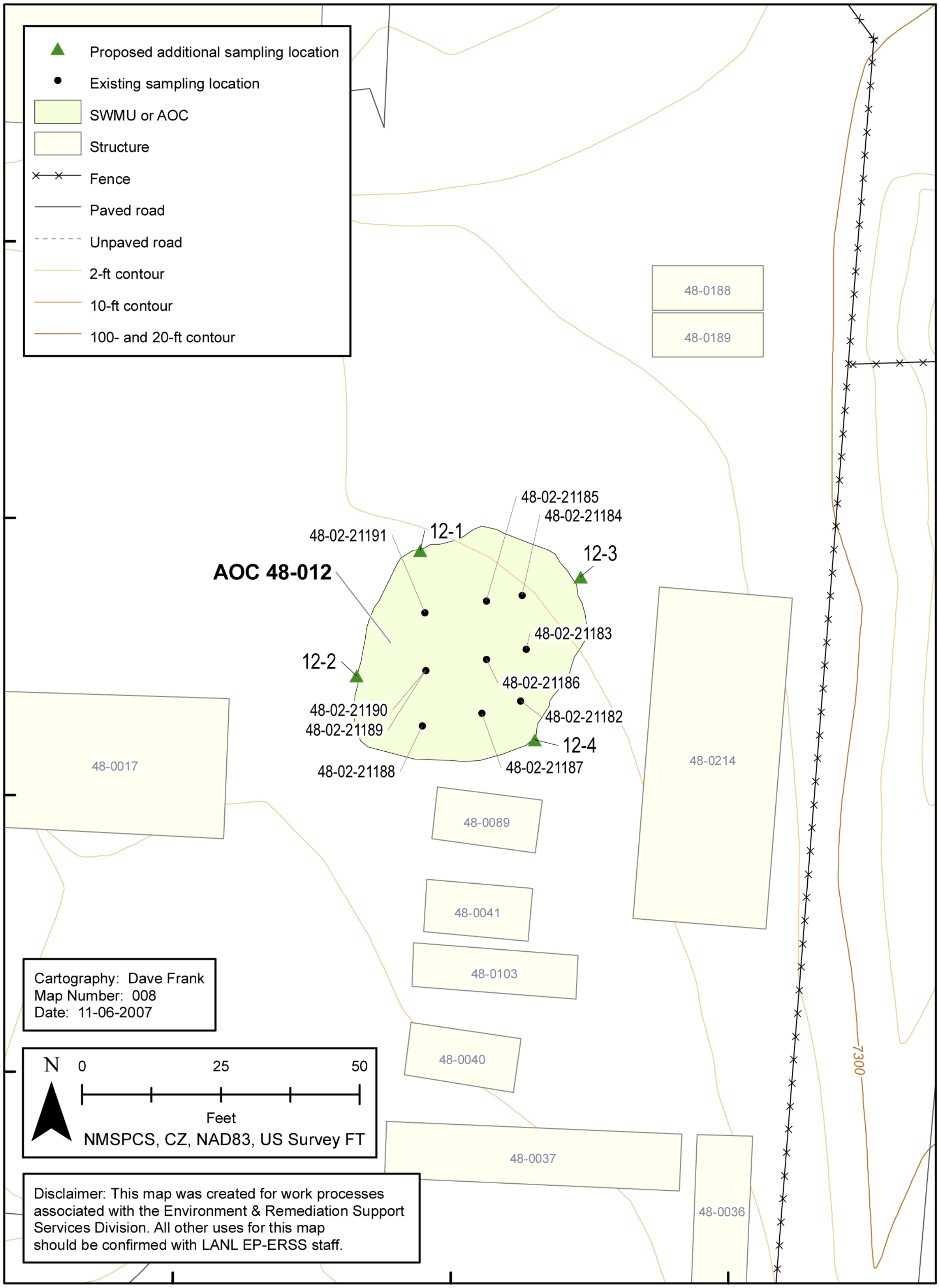

Figure 5.14-1 Proposed sampling locations at AOC 48-012

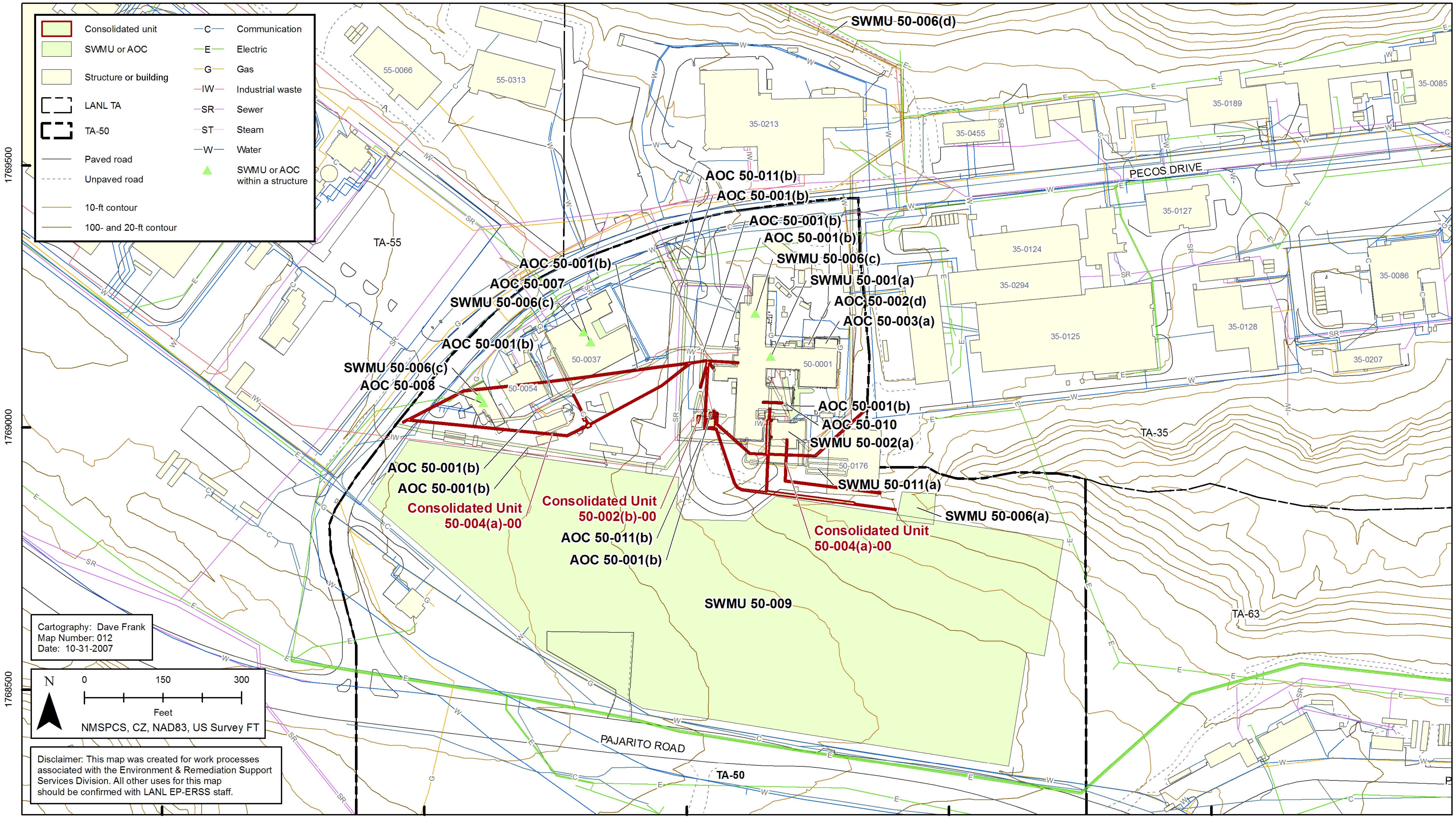

Figure 6.1-1 Site features for TA-50 SWMUs, AOCs, and consolidated units

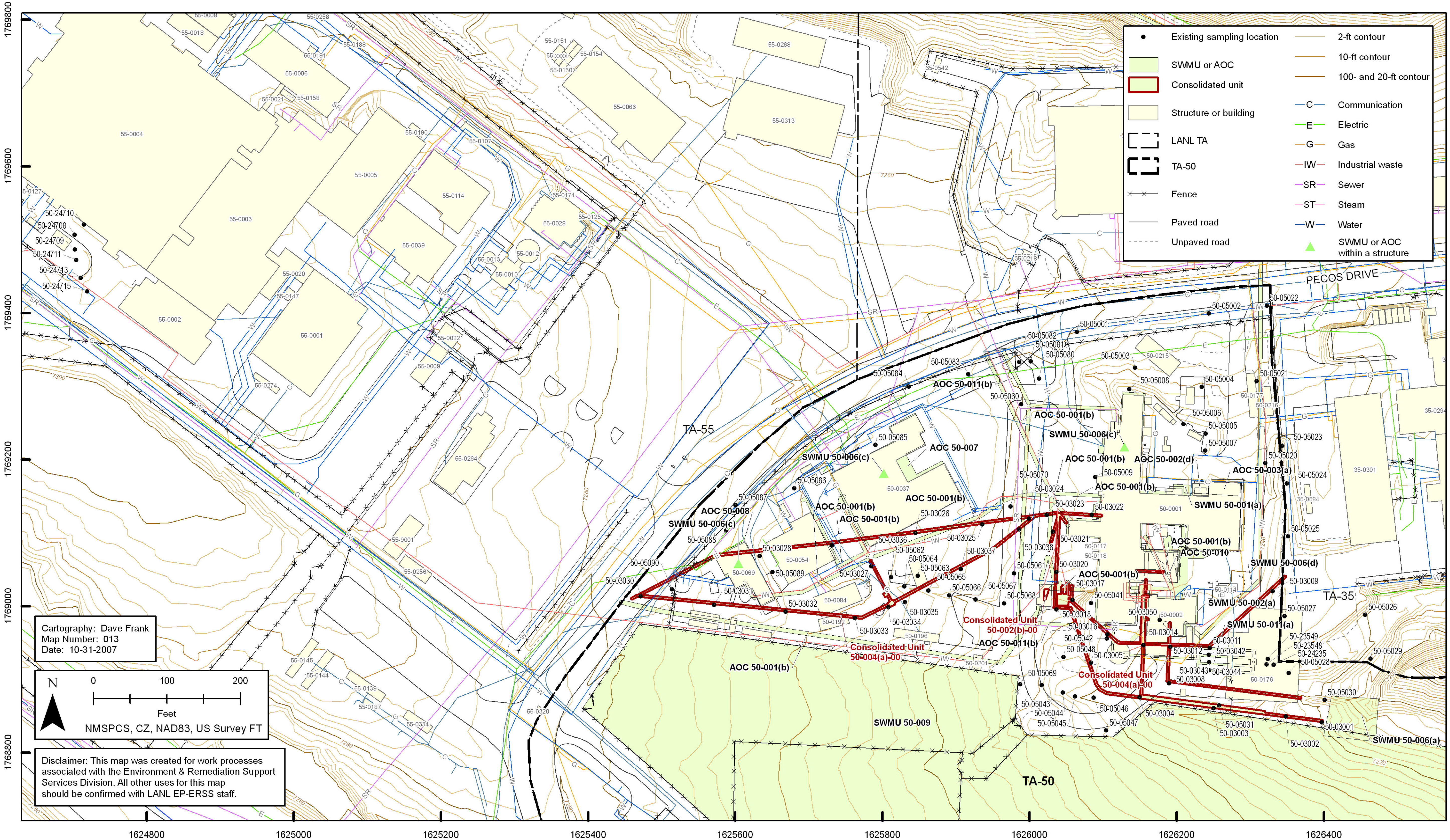

Figure 6.2-1 Site features and previous sampling locations for TA-50 SWMUs, AOCs, and consolidated units, except sampling locations at SWMUs 50-006(a) and 50-006(d)

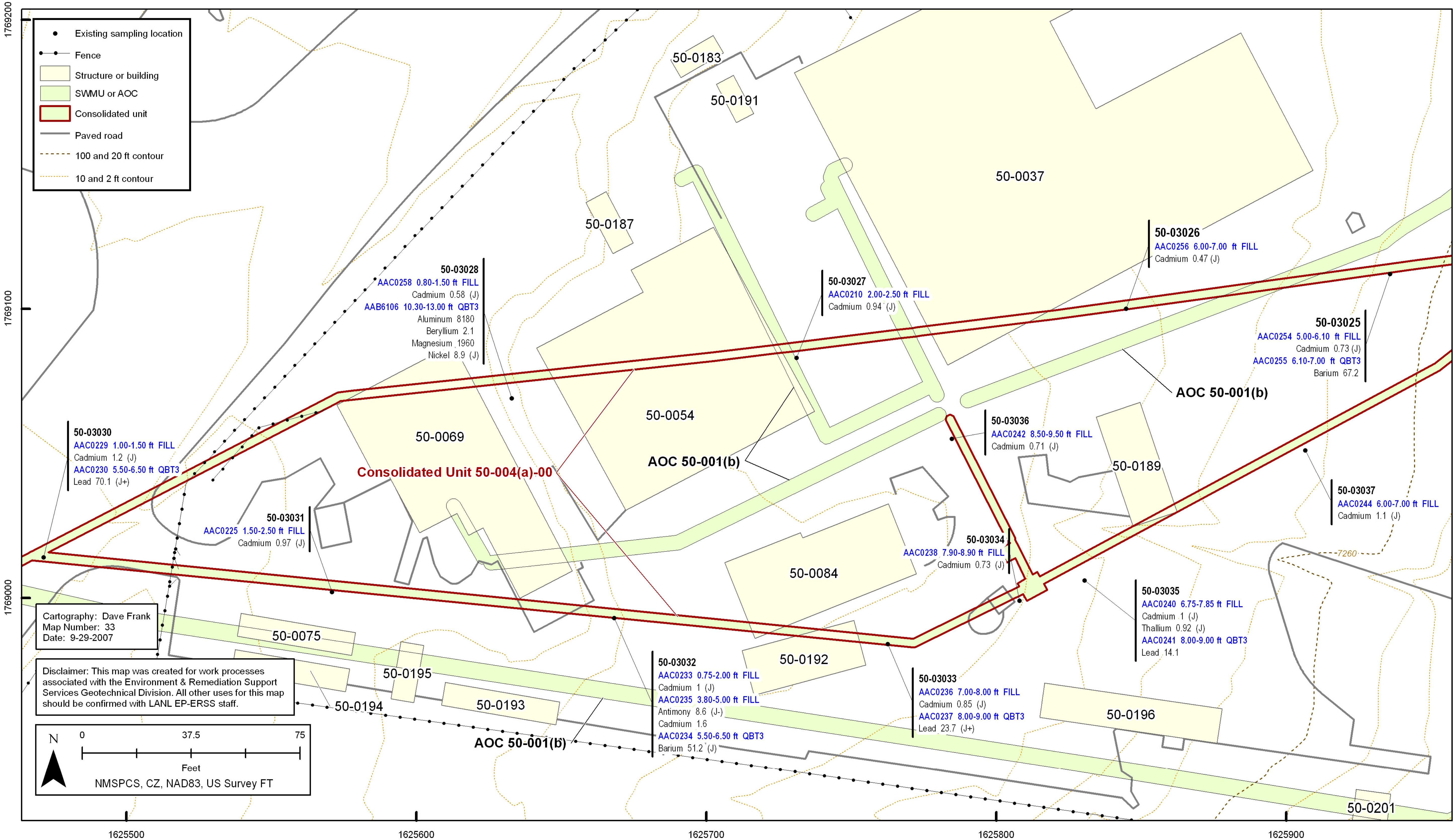

Figure 6.3-1 Inorganic chemicals detected above BVs at the western portions of AOC 50-001(b) and Consolidated Unit 50-004(a)-00, part 1 of 2

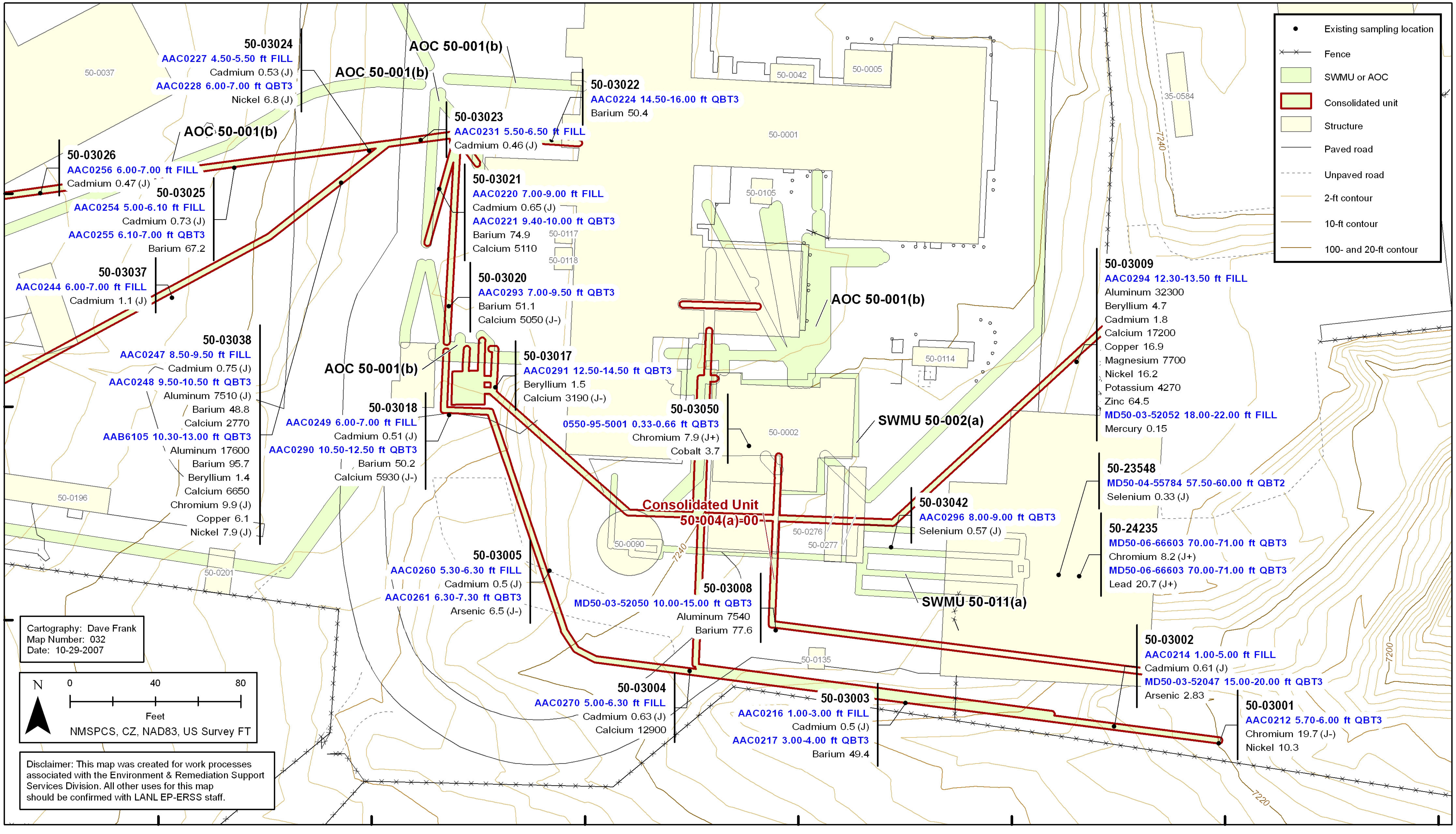

Figure 6.3-2 Inorganic chemicals detected above BVs at the eastern portions of AOC 50-001(b) and Consolidated Unit 50-004(a)-00 and at SWMUs 50-002(a) and 50-011(a), part 2 of 2

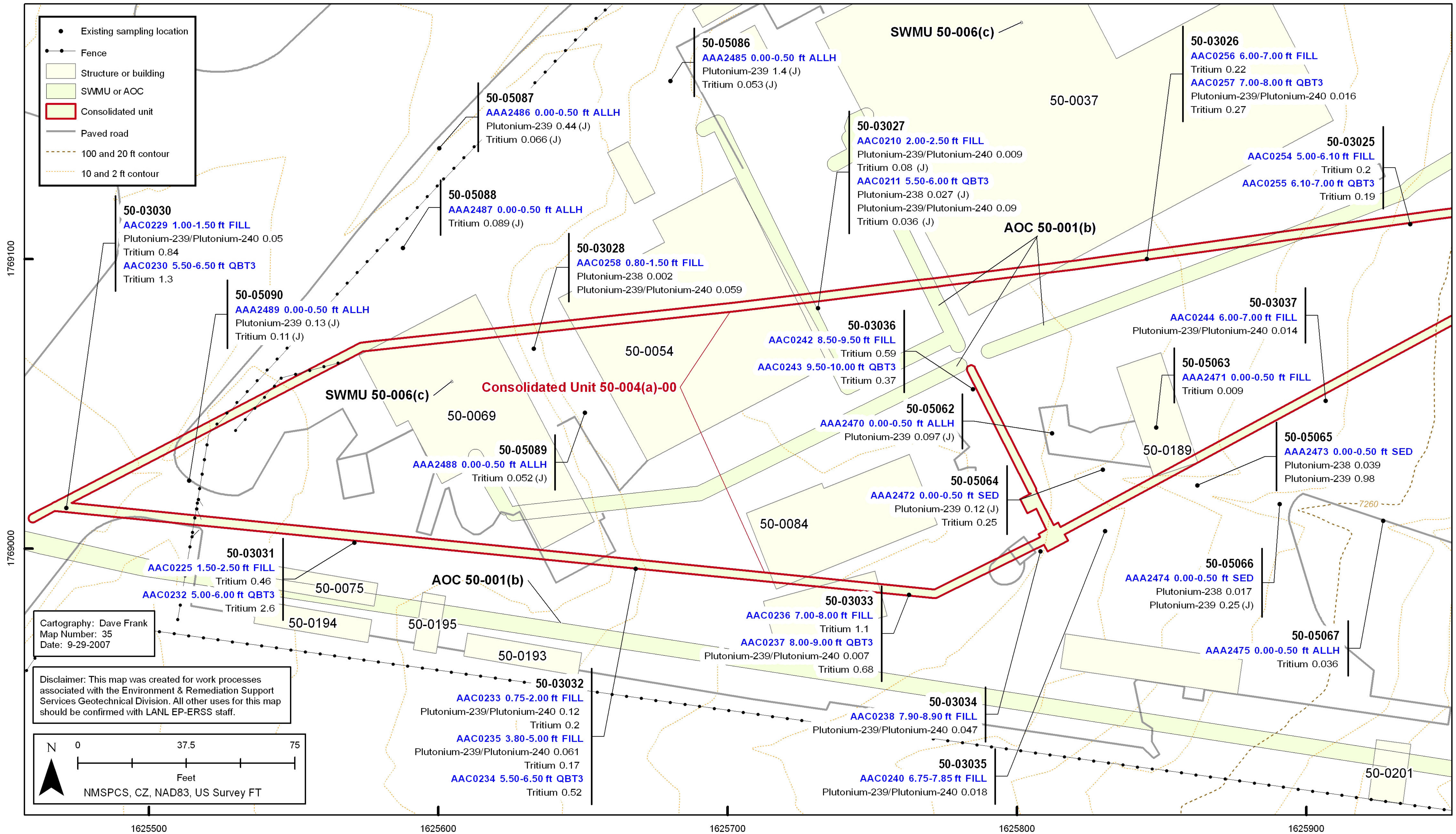

Figure 6.3-3 Radionuclides detected or detected above BV/FV at AOC 50-001(b) and at the western portions of SWMU 50-006(c) and Consolidated Unit 50-004(a)-00

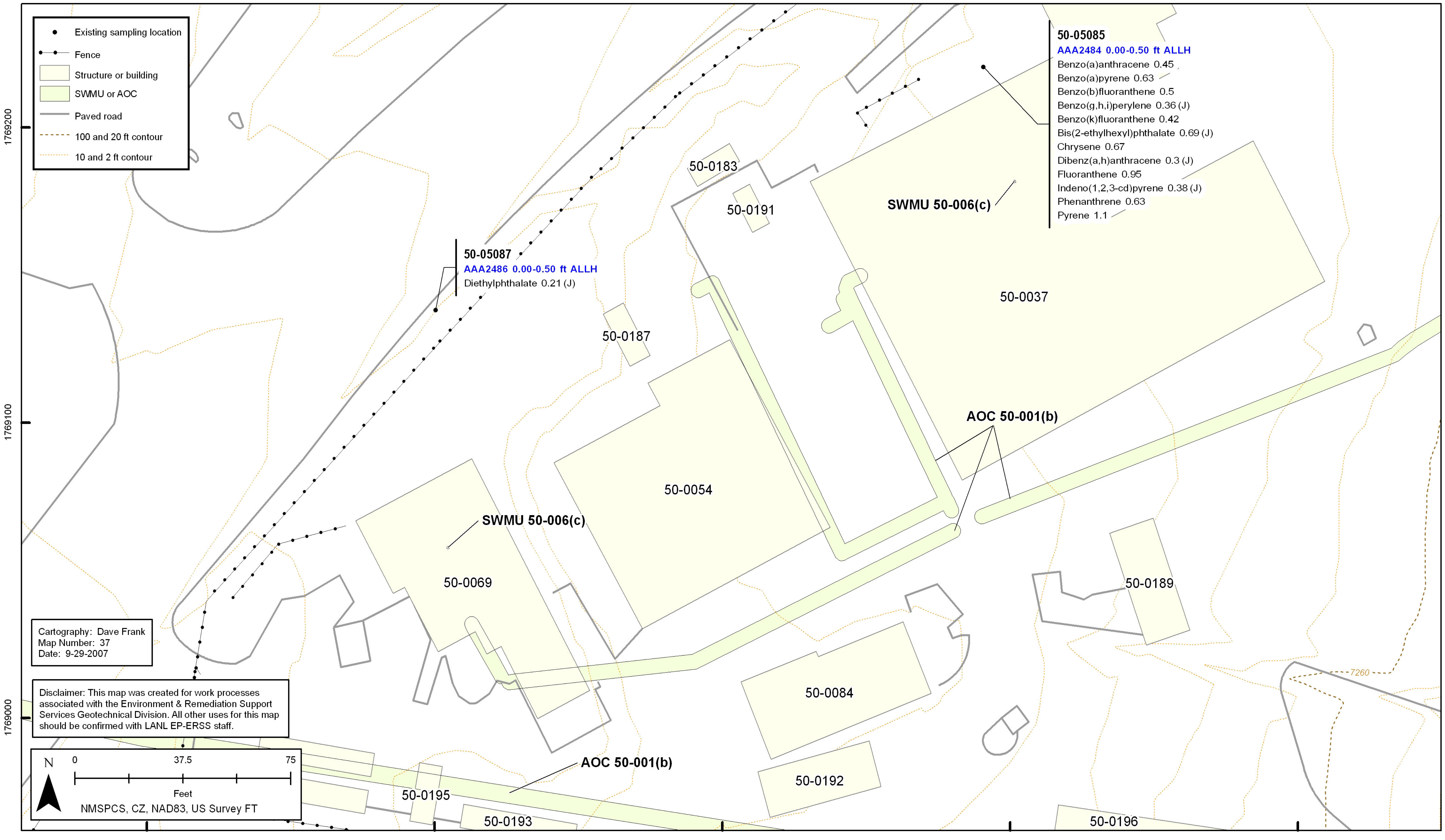

Figure 6.3-4 Organic chemicals detected at AOC 50-001(b) and at the western portion of SWMU 50-006(c)

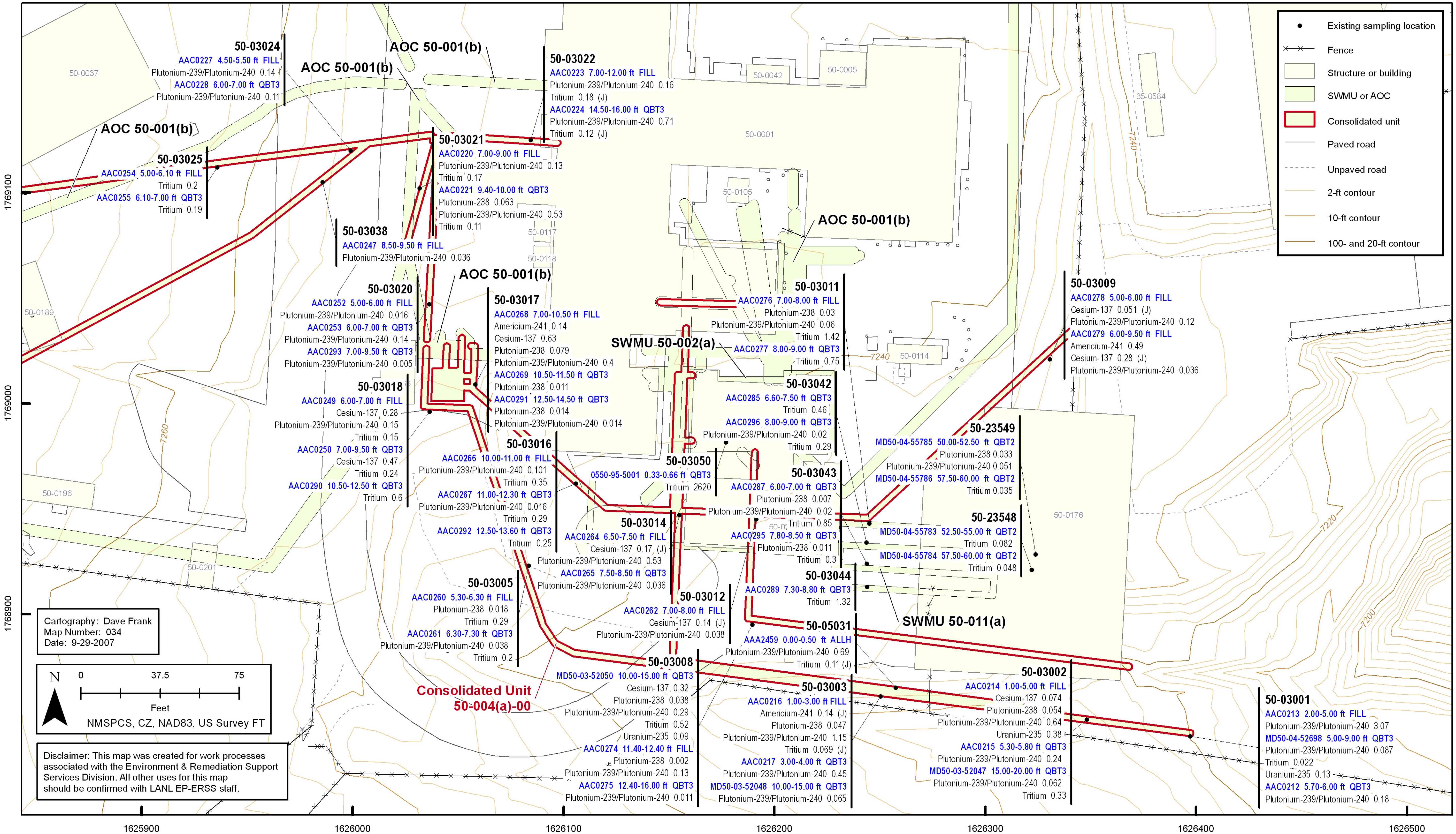

Figure 6.4-1 Radionuclides detected or detected above BV/FV at SWMU 50-002(a), at the eastern portions of SWMU 50-006(c) and Consolidated Unit 50-004(a)-00, and at SWMU 50-011(a)

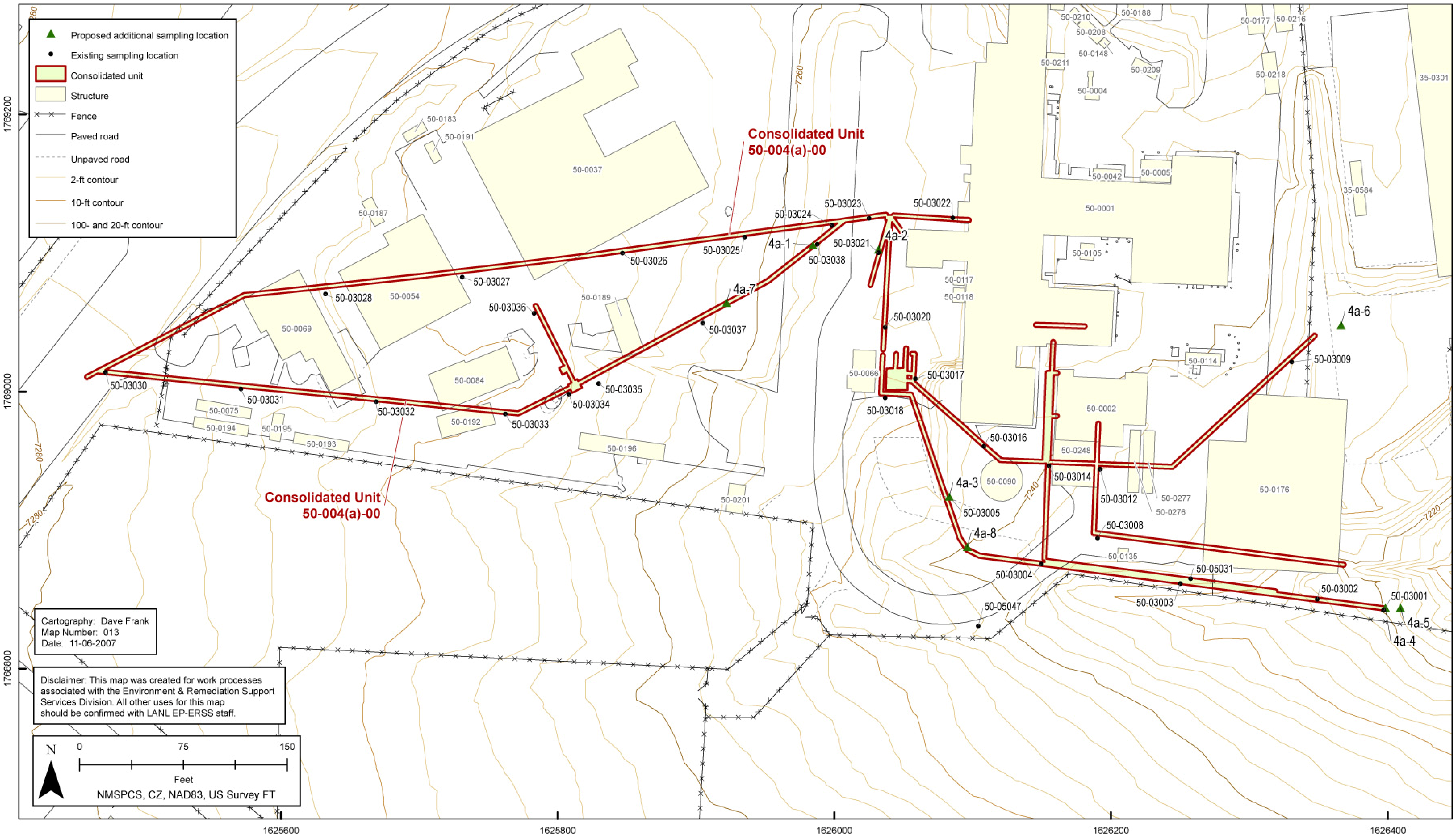

Figure 6.8-1 Proposed sampling locations at Consolidated Unit 50-004(a)-00

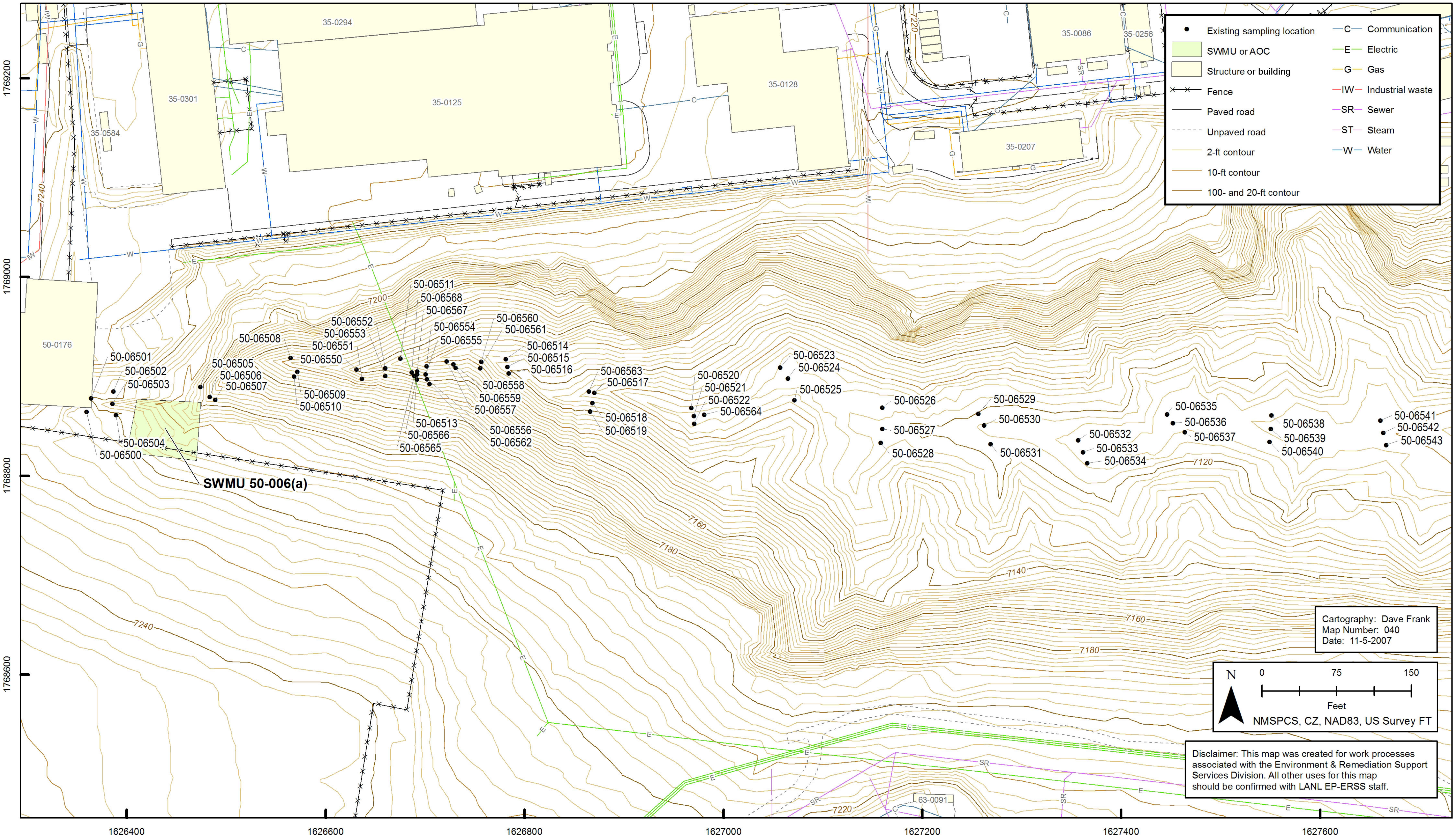

Figure 6.9-1 Site features and previous sampling locations at SWMU 50-006(a)

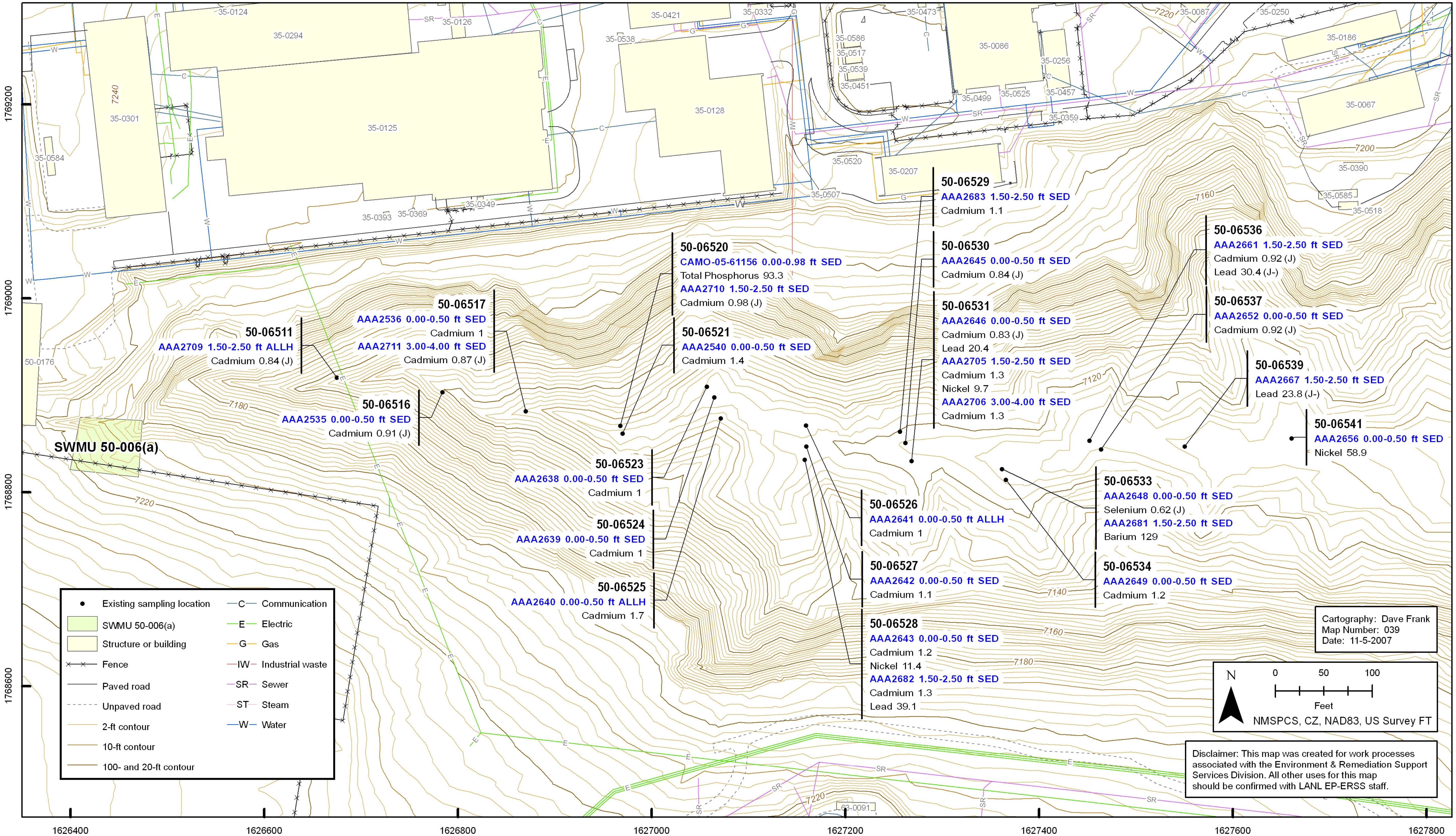

Figure 6.9-2 Inorganic chemicals detected above BVs at SWMU 50-006(a)

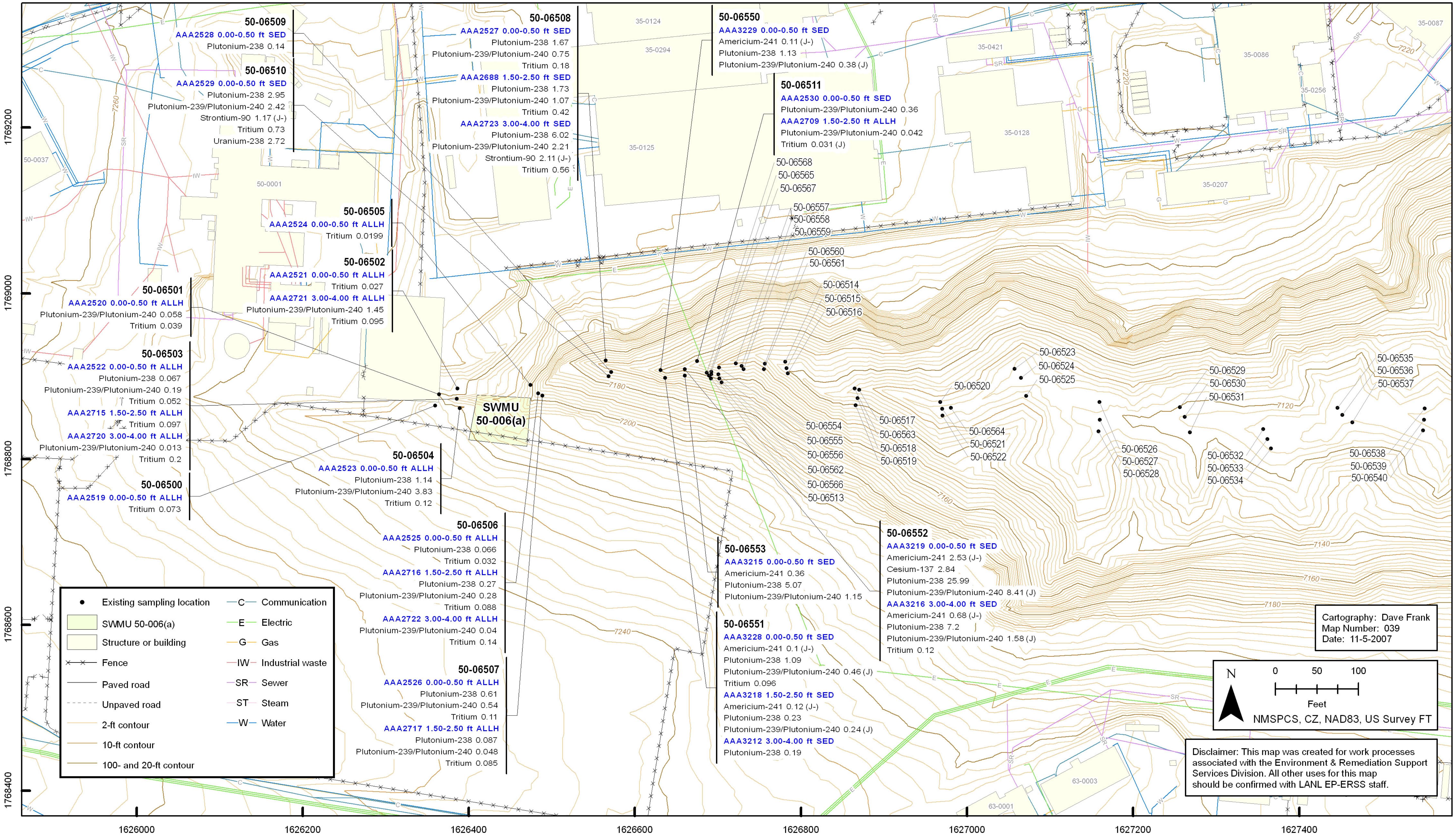

Figure 6.9-3 Radionuclides detected or detected above BV/FV at SWMU 50-006(a), part 1 of 4

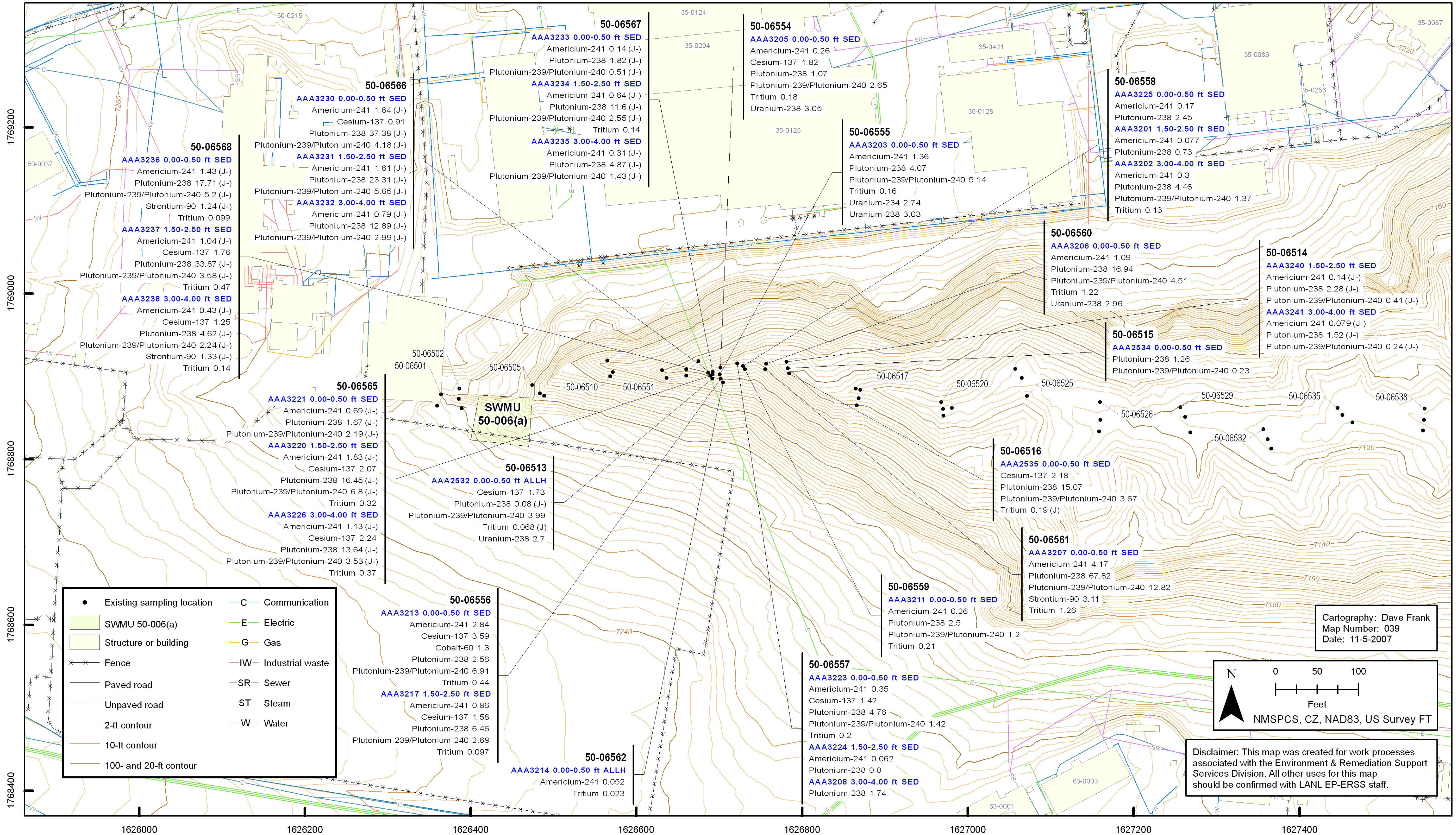

Figure 6.9-4 Radionuclides detected or detected above BV/FV at SWMU 50-006(a), part 2 of 4

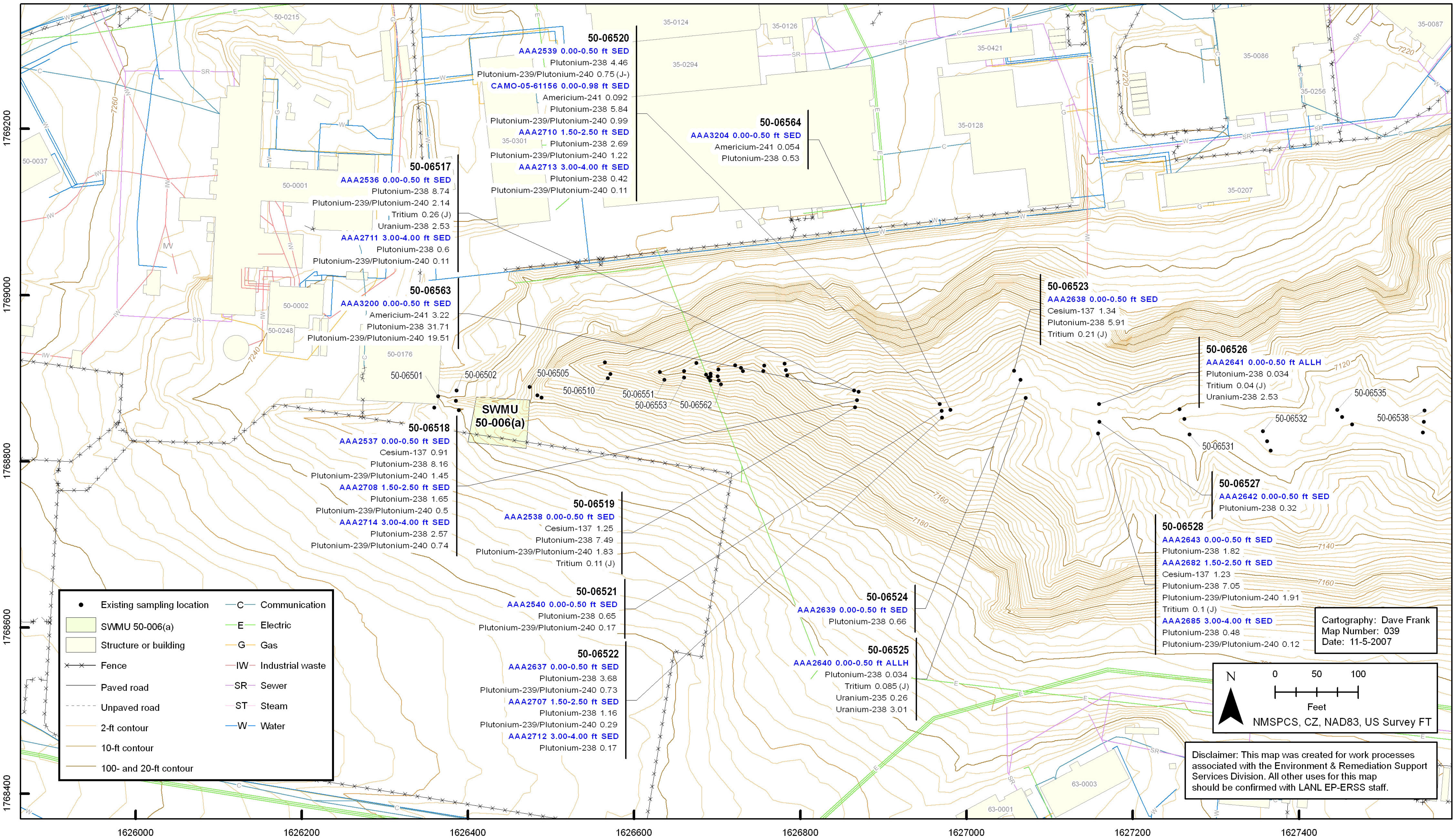

Figure 6.9-5 Radionuclides detected or detected above BV/FV at SWMU 50-006(a), part 3 of 4

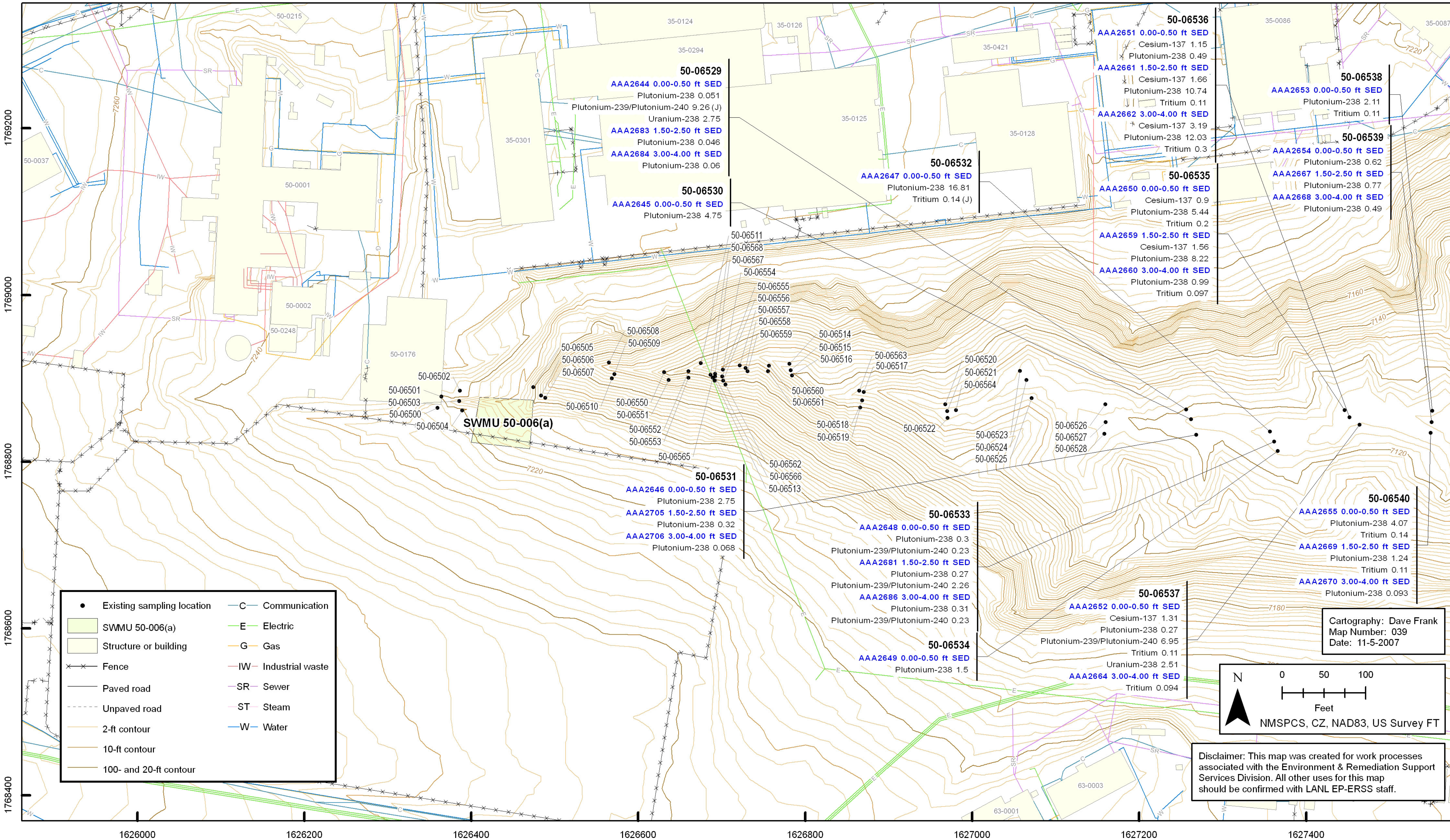

Figure 6.9-6 Radionuclides detected or detected above BV/FV at SWMU 50-006(a), part 4 of 4

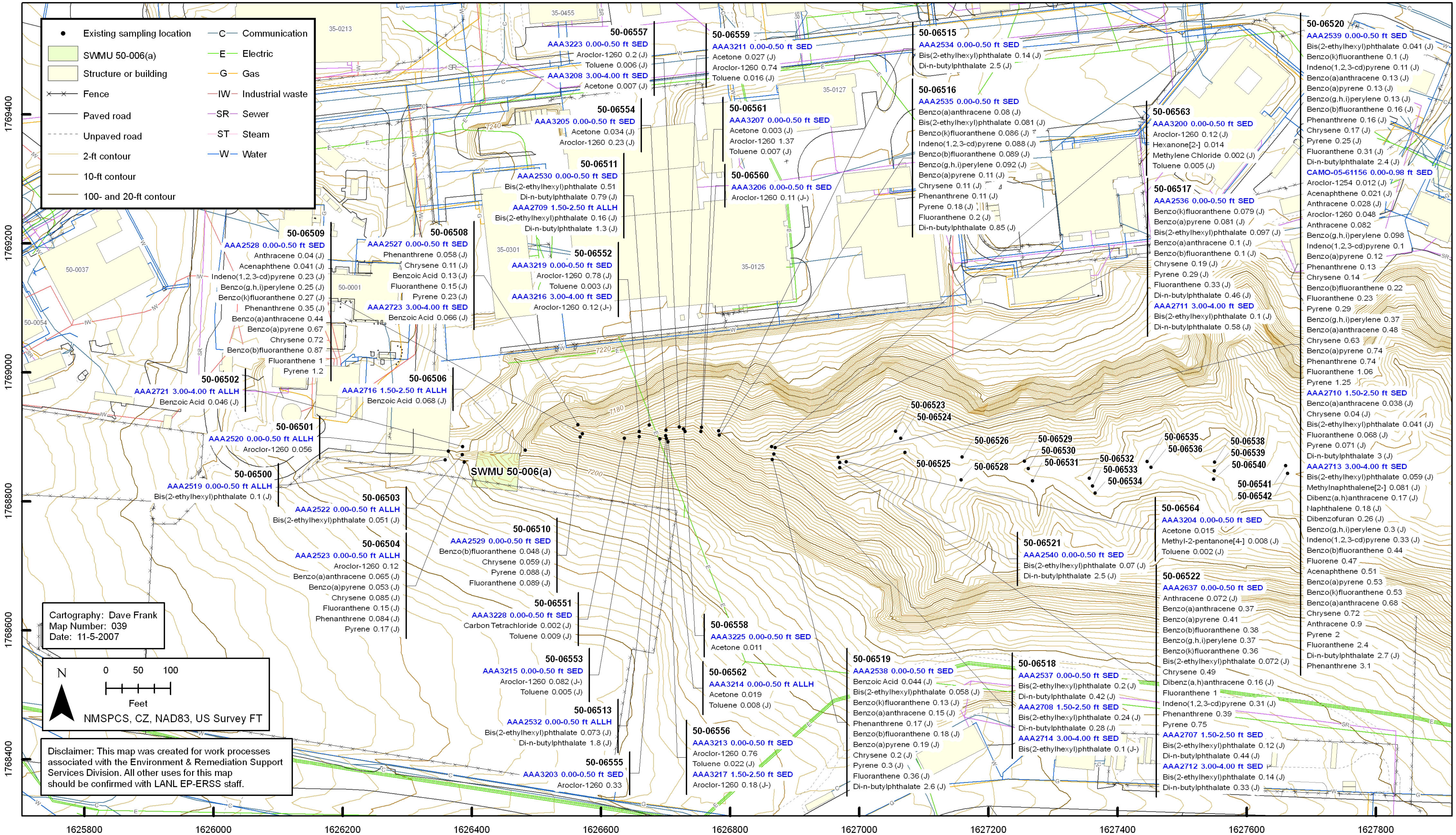

Figure 6.9-7 Organic chemicals detected at SWMU 50-006(a), western portion

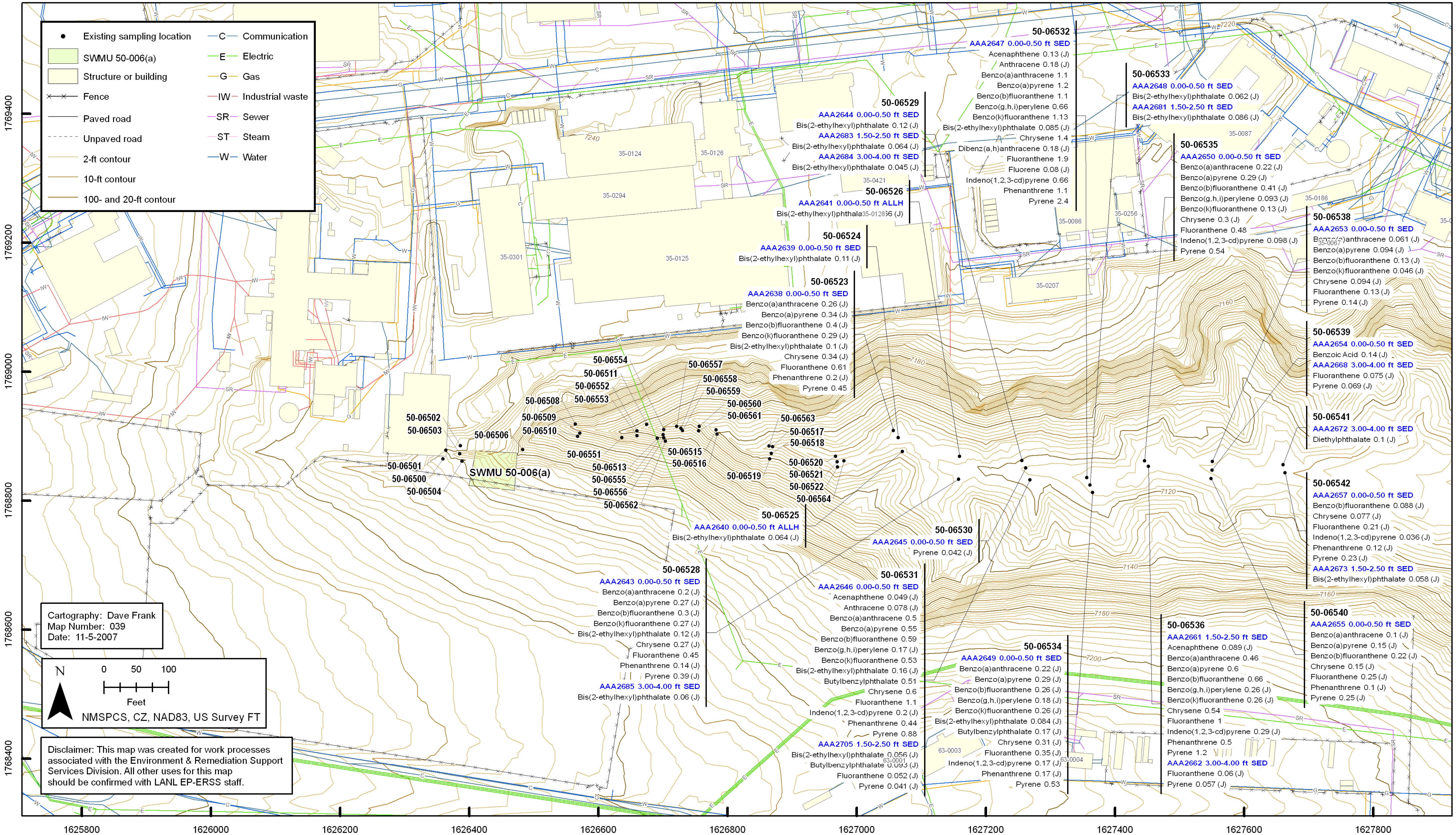

Figure 6.9-8 Organic chemicals detected at SWMU 50-006(a), western portion

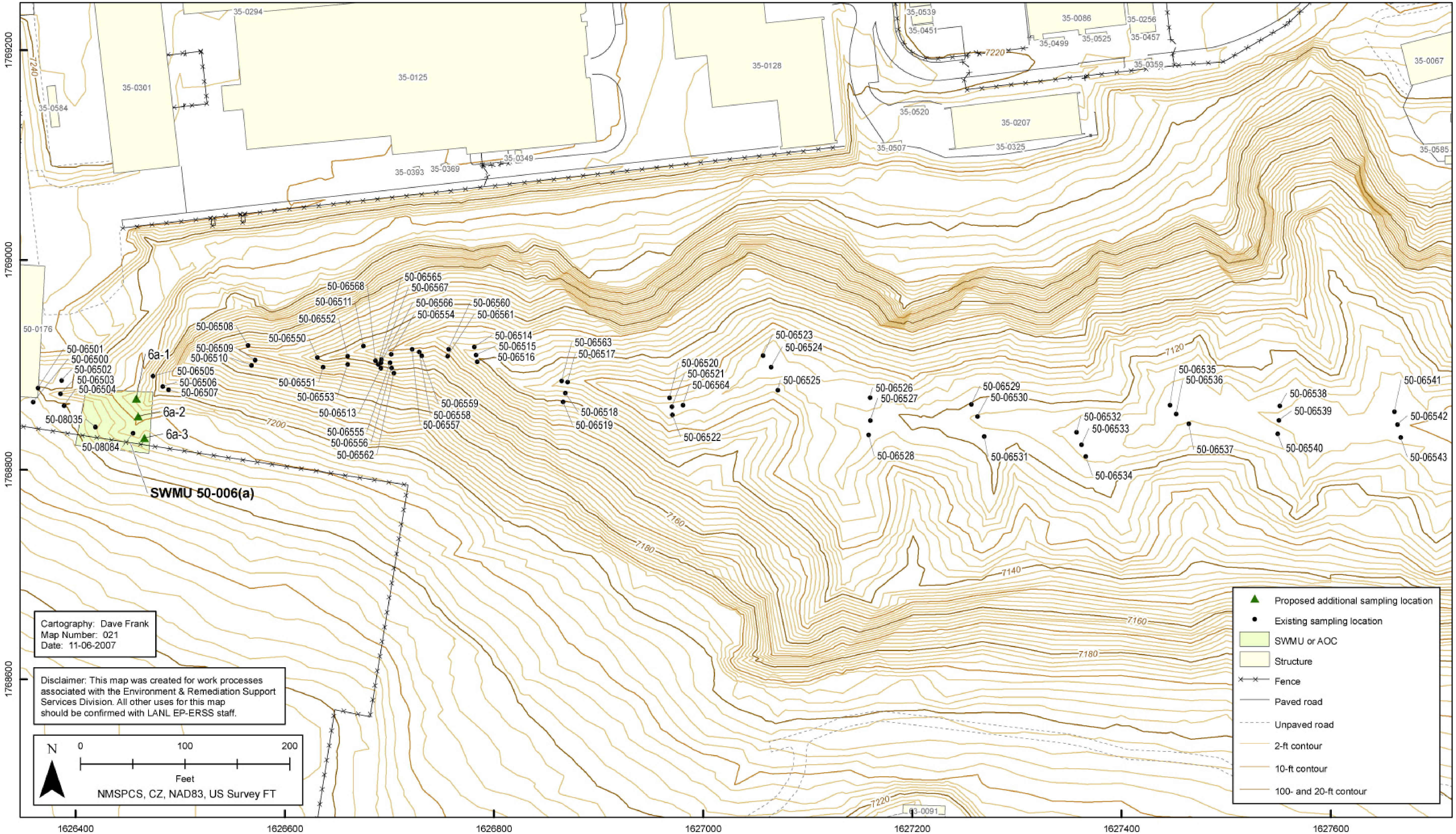

Figure 6.9-9 Proposed sampling locations at SWMU 50-006(a)

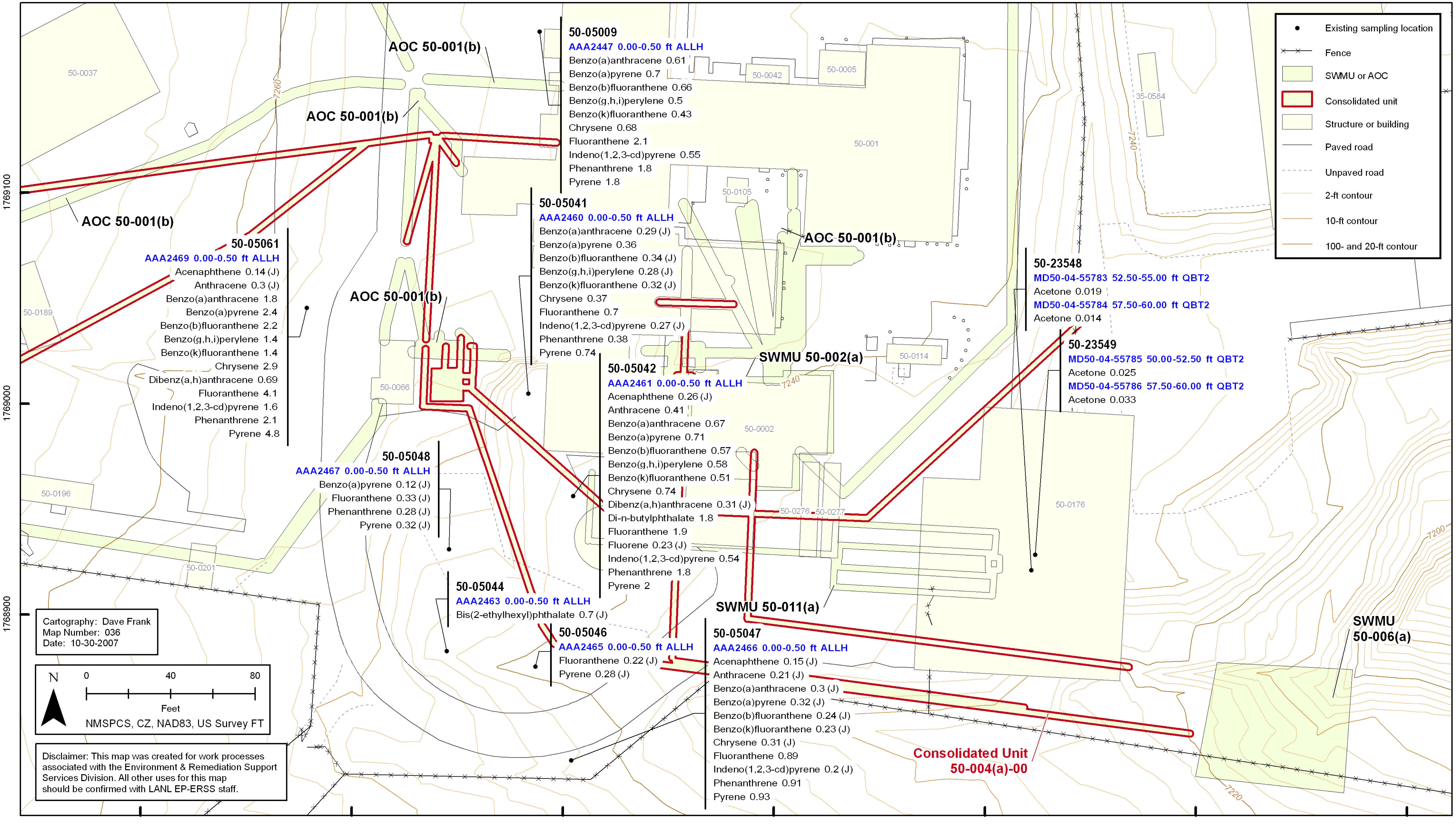

Figure 6.10-1 Organic chemicals detected at the eastern portion of SWMU 50-006(c) and at SWMU 50-011(a)

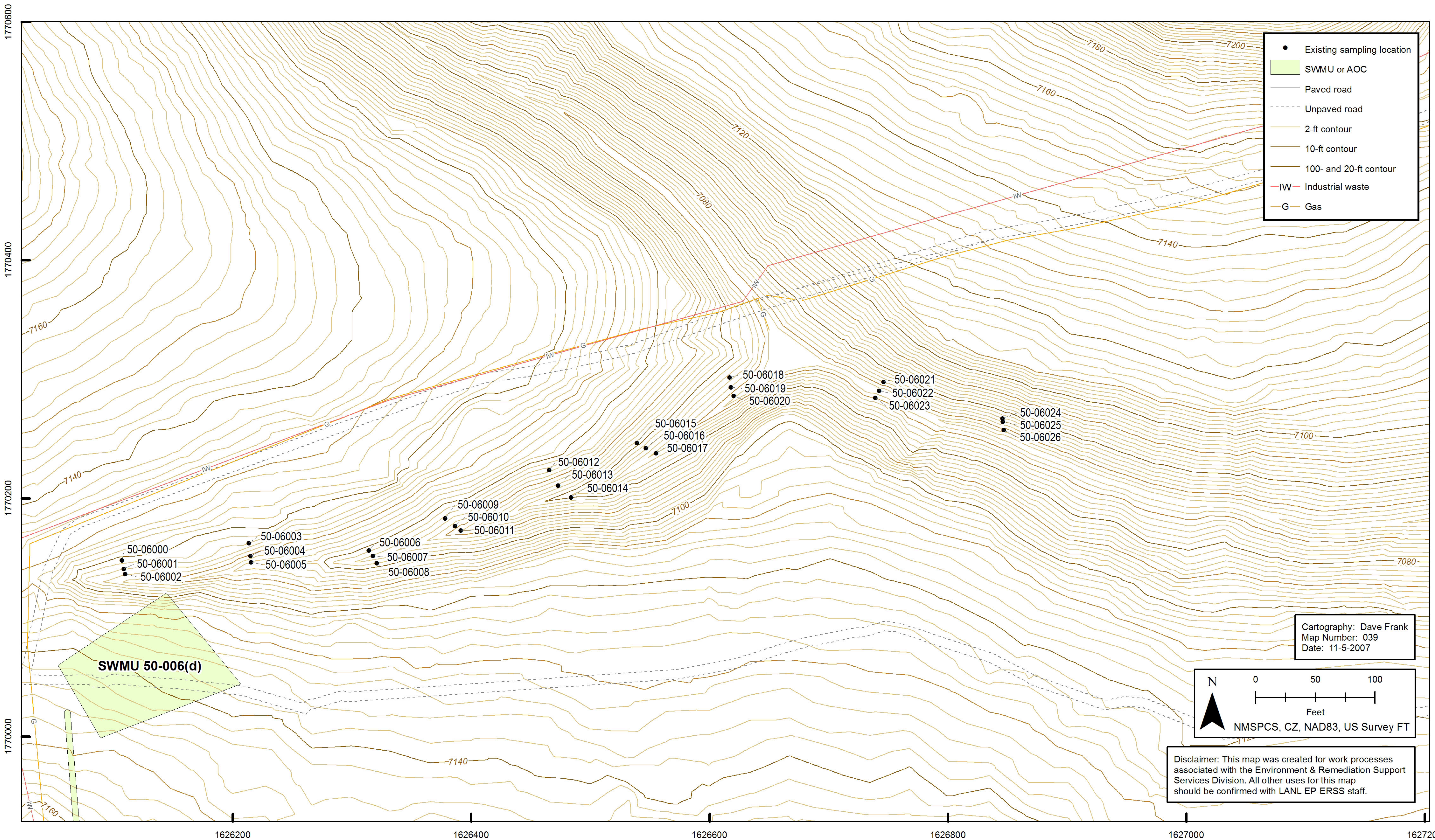

Figure 6.11-1 Site features and previous sampling locations at SWMU 50-006(d)

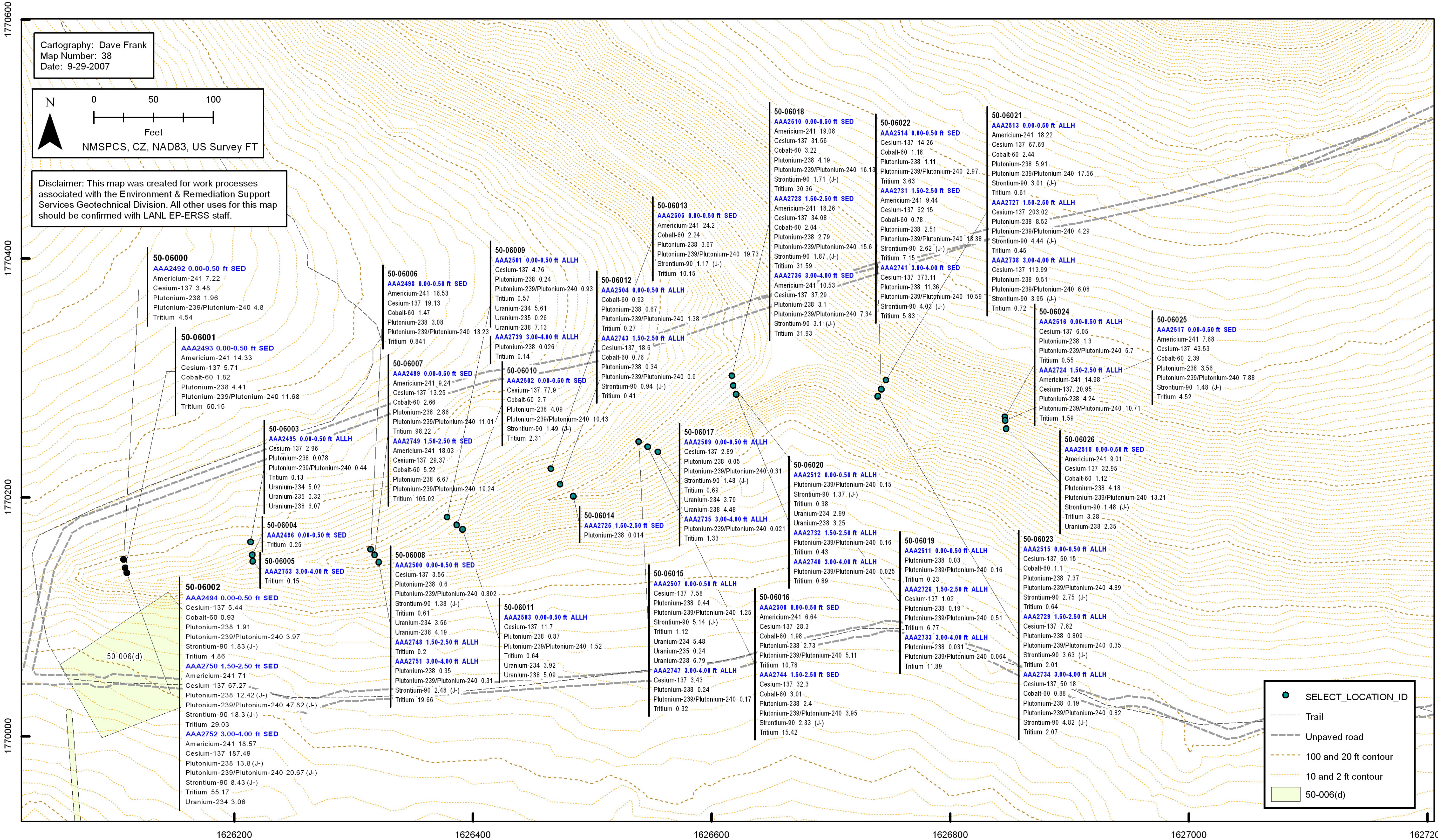

Figure 6.11-2 Radionuclides detected or detected above BV/FV at SWMU 50-006(d)

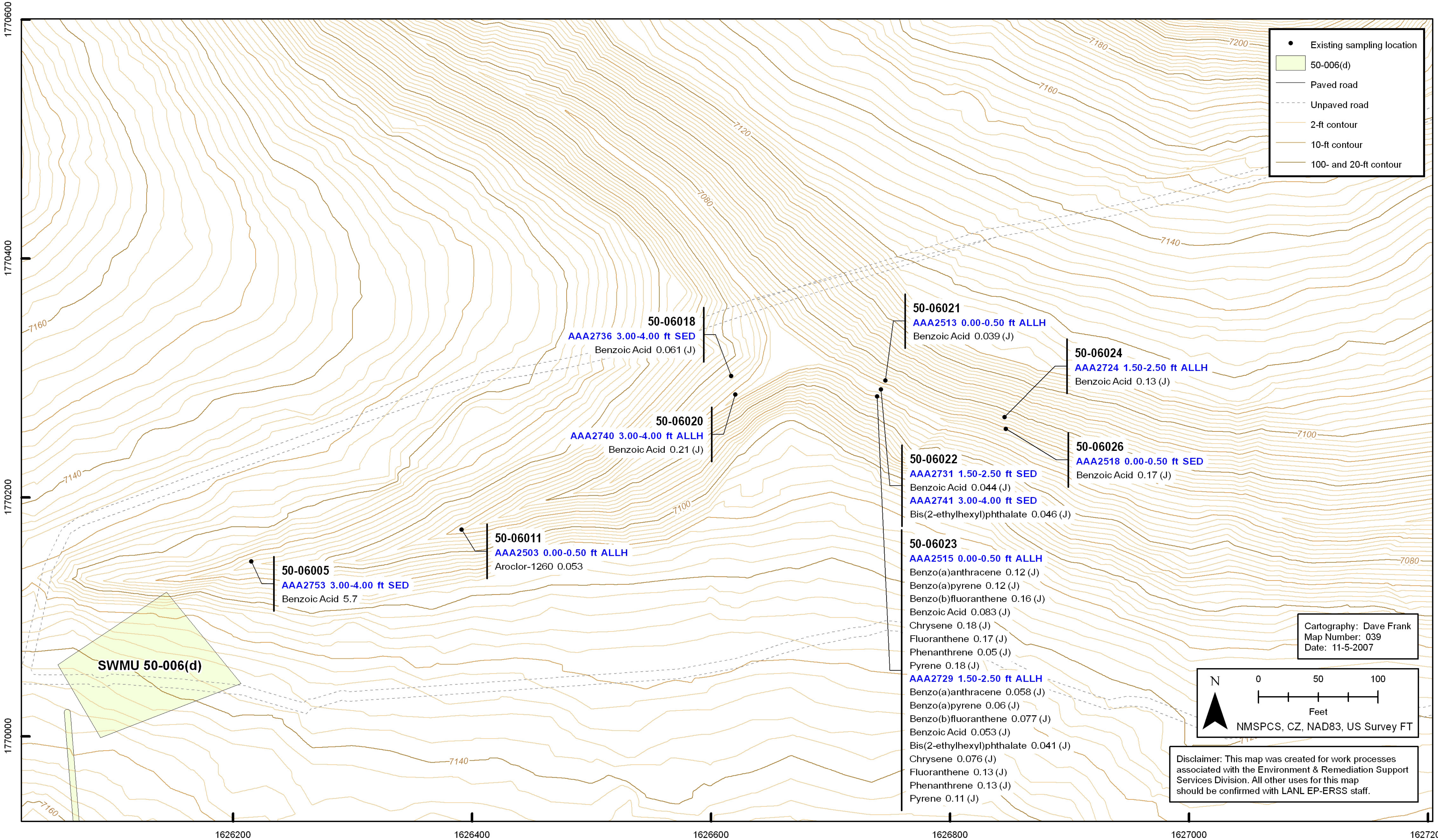

Figure 6.11-3 Organic chemicals detected at SWMU 50-006(d)

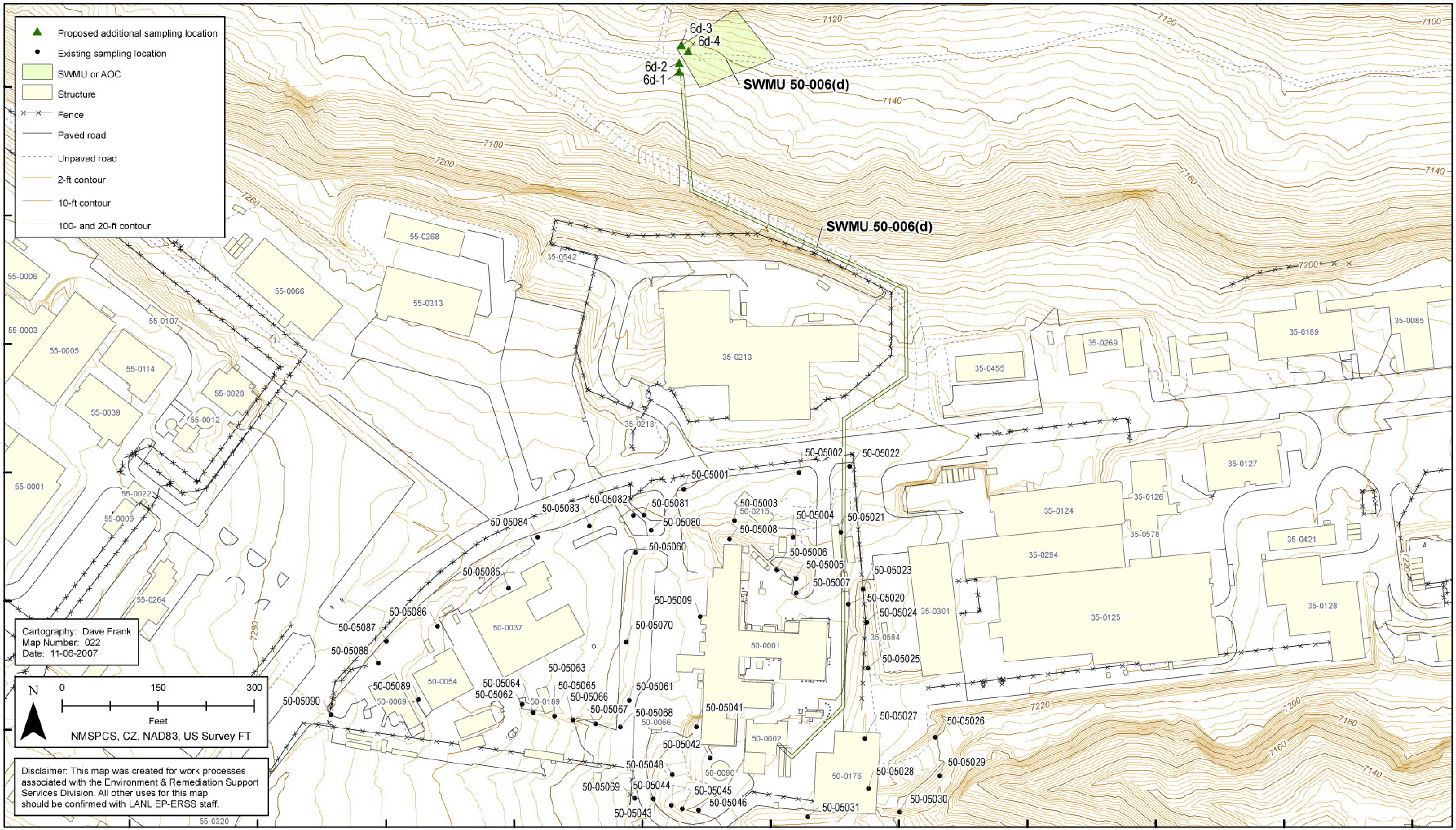

Figure 6.11-4 Proposed sampling locations at SWMU 50-006(d)

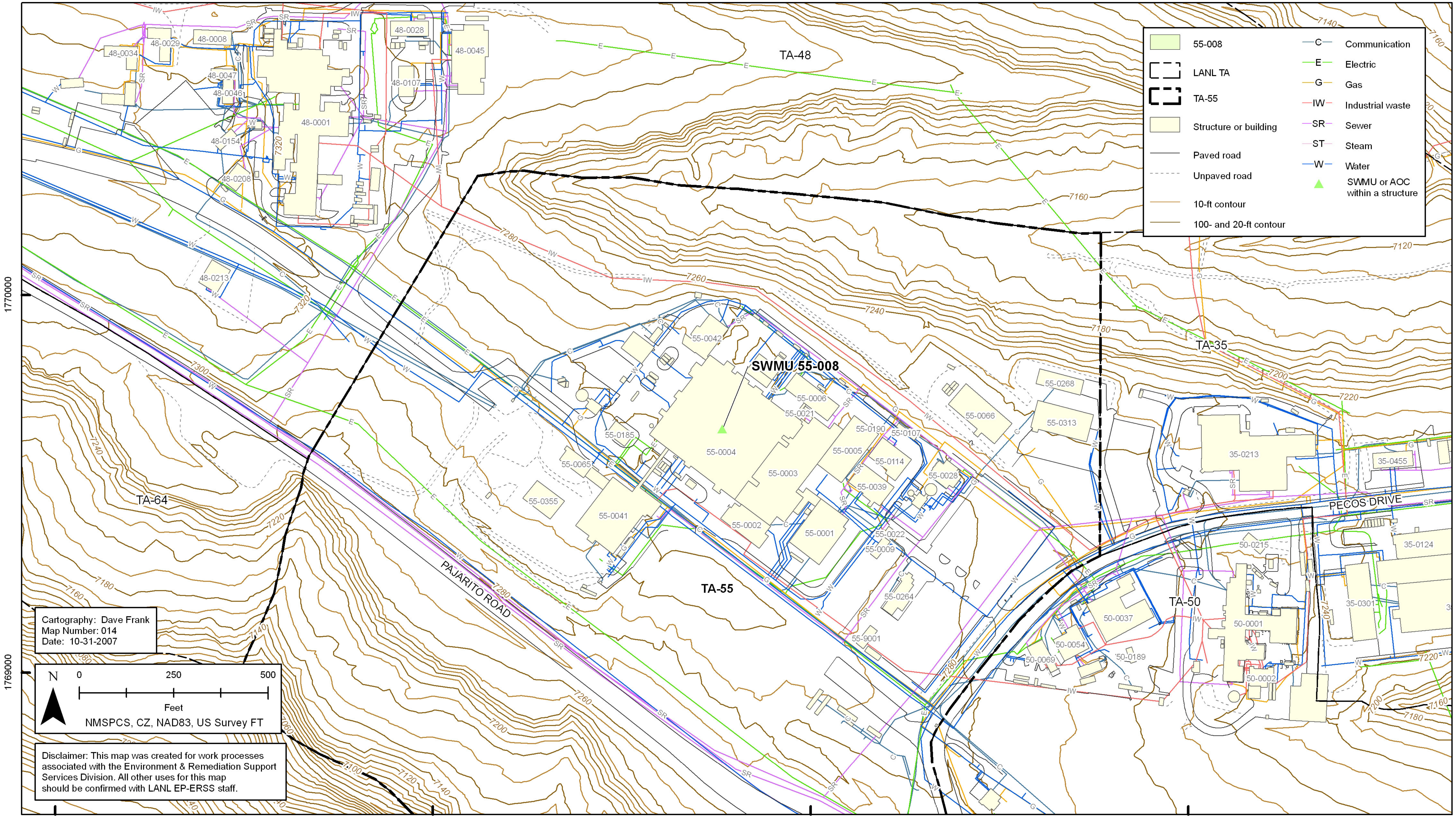

Figure 7.1-1 Site features for TA-55 SWMU

Table 1.1-1
Upper Mortandad Canyon Aggregate Area Sites and Their Regulatory Status

Site ID	Subunit	Brief Description	Site Status	Reference	Proposed Action
TA-03					
AOC 03-001(h)		Satellite accumulation area in the Sigma Building (03-66)	NFA approved	EPA 2005, 088464	None
AOC 03-001(j)		Satellite accumulation area at the south loading dock of Building 03-34	NFA approved	EPA 2005, 088464	None
AOC 03-001(y)		Satellite accumulation area in the CMR Building (03-29)	NFA approved	EPA 2005, 088464	None
AOC 03-003(e)		Storage area (transformers)—PCB only site in the basement of the CMR Building (03-29)	Under investigation	Work plan section 3.2	Delay characterization
AOC 03-003(i)		Storage area (transformer)—PCB only site in a vault beneath the Cryogenics Building (03-32)	Under investigation	Work plan section 3.3	Delay characterization
AOC 03-004(a)		Container storage area, former temporary drum storage area outside Room 4041 of the CMR Building (03-29)	NFA approved	EPA 2005, 088464	None
AOC 03-004(b)		Container storage area, former drum storage area on a concrete pad in Room 2005 of the CMR Building (03-29)	NFA approved	EPA 2005, 088464	None
AOC 03-004(c)		Storage area at the main loading dock of the CMR Building (03-29)	Under investigation	Work plan section 3.4	Collect samples
AOC 03-004(d)		Storage area, former location of a dumpster at the west end of Wing 9 of the CMR Building (03-29)	Under investigation	Work plan section 3.5	Collect samples
AOC 03-004(e)		Storage area, a 55-gal. storage drum in Wing 4 of the CMR Building (03-29)	NFA approved	EPA 2005, 088464	None
AOC 03-004(f)		Storage area, a 55-gal. drum that contains a calcium fluoride slag in paint can in Room 4064 in the basement of the CMR Building (03-29)	NFA approved	EPA 2005, 088464	None
AOC 03-007		Decommissioned firing site located southwest of the Beryllium Technology Facility (03-141)	Under investigation	Work plan section 3.6	Collect samples
SWMU 03-009(c)		Construction debris area, formerly located south of the Sigma Building (03-66)	Removed from Module VIII, HWFP*	Lewis 2001, 070010	None

Table 1.1-1 (continued)

Site ID	Subunit	Brief Description	Site Status	Reference	Proposed Action
SWMU 03-009(e)		Surface disposal area, revealed to be construction fill area located at the head of Mortandad Canyon	Removed from Module VIII, HWFP*	Kelley 1998, 063042	None
SWMU 03-009(h)		Surface disposal area located on Sigma Mesa, re-identified and assigned as SWMU 60-002	Removed from Module VIII, HWFP*	Kelley 1998, 063042	None
AOC 03-010(b)		Operational release, site of a former vacuum pump located on the north side of Wing 5 of the CMR Building (03-29)	NFA approved	EPA 2005, 088464	None
SWMU 03-012(a)		Controlled operational release, site of a controlled operational pipe cleaning procedure, located on the north slope of Mortandad Canyon	Removed from Module VIII, HWFP*	Kelley 1998, 063042	None
AOC 03-014(w)		Floor drain in the CMR Building (03-29)	Under investigation	Work plan section 3.7	Delay characterization
AOC 03-014(x)		Floor drain in the Sigma Building (03-66)	Under investigation	Work plan section 3.8	Delay characterization
SWMU 03-025(a)		Reputed oil trap sump, site does not exist	Removed from Module VIII, HWFP*	Lewis 2001, 070010	None
AOC 03-026(a)		Sump located in the southeast corner of an open pump pit directly adjacent to and west of the SWMU 03-037 holding tanks	Under investigation	Work plan section 3.9	Delay characterization
SWMU 03-026(c)		Aboveground holding tanks for returning chilled water in the basement of the CMR Building (03-29)	Under investigation	Work plan section 3.10	Delay characterization
AOC 03-030		Surface impoundment, duplicate of SWMU 03-012(a)	NFA approved	EPA 2005, 088464	None
SWMU 03-031		Radioactive liquid waste system in the CMR Building (03-29)	Under investigation	Work plan section 3.11	Delay characterization
SWMU 03-034(a)		Pumphouse (structure 03-154) and associated radioactive liquid waste tanks	Under investigation	Work plan section 3.12	Collect samples
SWMU 03-034(b)		Active industrial waste sump and tank located on the west side of the Beryllium Technology Facility (03-141)	Under investigation	Work plan section 3.13	Delay characterization
AOC 03-041		Unloading station (structure 03-1264) designed as a holding tank for industrial low-level radioactive wastewater, located approximately 140 ft southwest of the Sigma Building (03-66)	Under investigation	Work plan section 3.14	Collect samples

Table 1.1-1 (continued)

Site ID	Subunit	Brief Description	Site Status	Reference	Proposed Action
Consolidated Unit 03-045(h)-00	SWMU 03-045(h)	Former NPDES-permitted outfall at the north perimeter of the Sigma Complex security fence, approximately 50 ft north of a cooling tower (03-187); ultimately drains into Sandia Canyon	Under investigation	Work plan section 3.15	Collect samples to the south; additional samples will be collected for the Upper Sandia Canyon Work Plan
	SWMU 03-049(a)	NPDES-permitted outfall south of the Sigma Building (03-66) that discharges treated cooling water from a cooling tower (03-127) and roof-drain runoff to Mortandad Canyon		Work plan section 3.15	Collect samples
AOC 03-048		Satellite accumulation areas within the CMR Building (03-29)	NFA approved	EPA 2005, 088464	None
Consolidated Unit 03-049(b)-00	SWMU 03-049(b)	Discharge area from a former vacuum pump at the south wall of the Press Building (03-35)	Under investigation	Work plan section 3.16	Collect samples
	AOC C-03-014	Equipment storage area located southwest of the Press Building (03-35)			
SWMU 03-049(d)		Active outfall of the condensate system for the Sigma Building (03-66)	Removed from Module VIII, HWFP*	Lewis 2001, 070010	None
SWMU 03-049(e)		Outfall from a single pipe that connects three roof drains, located south of the Sigma Building (03-66)	Under investigation	Work plan section 3.17	Collect samples
AOC 03-050(b)		Exhaust emissions, off-gas scrubber of HEPA filter system at the Cryogenics Building (03-34)	NFA approved	EPA 2005, 088464	None
SWMU 03-054(e)		Outfall located in upper Mortandad Canyon, receives roof drains and stormwater runoff at the CMR Building (03-29); received an unintentional one-time release from an industrial waste manhole (AOC C-03-006) in 1974	Under investigation	Work plan section 3.18	Collect samples
AOC 03-056(e)		Satellite accumulation area, duplicate of both SWMU 03-001(j) and SWMU 03-001(n)	NFA approved	EPA 2005, 088464	None
AOC 03-058		Container storage areas within the CMR Building (03-29)	NFA approved	EPA 2005, 088464	None

Table 1.1-1 (continued)

Site ID	Subunit	Brief Description	Site Status	Reference	Proposed Action
AOC C-03-006		Unintentional overflow at an industrial waste line manhole in 1974 that discharged to the outfall [SWMU 03-054(e)]	Under investigation	Work plan section 3.19	Collect samples, associated with SWMU 03-054(e)
AOC C-03-007		Storage areas for radioactive materials in Building 03-35	NFA approved	EPA 2005, 088464	None
AOC C-03-012		Satellite accumulation area, a former storage cabinet located outdoors at the southeast entrance to the filter tower for Wing 3 of the CMR Building (03-29)	NFA approved	EPA 2005, 088464	None
TA-42					
Consolidated Unit 42-001(a)-99	SWMU 42-001(a)	Former location for Building 42-1 that housed the incinerator	Under investigation	Work plan section 4.2	Collect samples
	SWMU 42-001(b)	Former location of one of the two ash storage tanks associated with the incinerator			
	SWMU 42-001(c)	Former location of the other ash storage tank			
	AOC 42-002(a)	Former location of an indoor storage and decontamination area (Building 42-1)			
	SWMU 42-002(b)	Former location of the outdoor decontamination area (driveway west and north of Building 42-1)			
	SWMU 42-003	Former location of a septic system that served Building 42-1			
AOC 42-004		Canyon disposal located over the canyon edge north of former TA-42	NFA approved	EPA 2005, 088464	None
TA-48					
AOC 48-001		Air exhaust system of Building 48-1	Under investigation	Work plan section 5.2	Delay characterization
SWMU 48-002(a)		Former container storage area located at the southwest corner of Building 48-1	Under investigation	Work plan section 5.3	Collect samples
SWMU 48-002(b)		Former container storage area located at a loading dock on the south side of Building 48-1	Under investigation	Work plan section 5.4	Collect samples, associated with SWMU 48-002(a)
AOC 48-002(c)		Former container storage area located on an asphalt pad east of Building 48-1	NFA Approved	EPA 2005, 088464	None

Table 1.1-1 (continued)

Site ID	Subunit	Brief Description	Site Status	Reference	Proposed Action
AOC 48-002(d)		Container storage area located inside Building 48-1	NFA Approved	EPA 2005, 088464	None
AOC 48-002(e)		Former container storage area located on the east side of Building 48-1	Under investigation	Work plan section 5.5	Collect samples
SWMU 48-003		Former septic system that served TA-48 from 1957 to 1986	Under investigation	Work plan section 5.6	Collect samples
Consolidated Unit 48-004(a)-99	SWMU 48-004(a)	Two sumps located below the floor of the shop (Room 50) of Building 48-1	Under investigation	Work plan section 5.7	Delay characterization
	SWMU 48-004(b)	Three sets of tanks located in the south basement of Building 48-1			
	SWMU 48-004(c)	Two tanks located in the north basement of Building 48-1			
AOC 48-004(d)		Tank installed below the hot cell in the basement of Building 48-1; has never been used	NFA approved	EPA 2005, 088464	None
SWMU 48-005		Segments of inactive radioactive liquid waste lines at TA-48 and an associated outfall	Under investigation	Work Plan section 5.8	Delay characterization
AOC 48-006		Septic system installed in early 1980s and only served office buildings at TA-48	NFA approved	EPA 2005, 088464	None
Consolidated Unit 48-007(a)-00	SWMU 48-007(a)	Former NPDES-permitted outfall located east of Building 48-1; currently discharges stormwater to SWMU 48-010	Under investigation	Work plan section 5.9	Collect samples
	SWMU 48-007(d)	Former NPDES-permitted outfall located east of Building 48-1; currently discharges stormwater to SWMU 48-010			
	SWMU 48-010	Surface impoundment located approximately 300 ft east of Building 48-1 and 150 ft south of Building 48-45; discharges into a tributary to Mortandad Canyon			
SWMU 48-007(b)		Former NPDES-permitted outfall located north of Building 48-1; currently discharges stormwater into Mortandad Canyon	Under investigation	Work plan section 5.10	Collect samples
SWMU 48-007(c)		Former NPDES-permitted outfall located north of Building 48-1; currently discharges stormwater into Mortandad Canyon	Under investigation	Work plan section 5.11	Collect samples

Table 1.1-1 (continued)

Site ID	Subunit	Brief Description	Site Status	Reference	Proposed Action
AOC 48-007(e)		Outfall of once-through noncontact cooling water used to cool an electromagnet in the northwest corner of Building 48-8	NFA approved	EPA 2005, 088464	None
SWMU 48-007(f)		Former NPDES-permitted outfall located north of Building 48-1 that received discharges from two sink drains in Building 48-46 and discharged into Mortandad Canyon	Under investigation	Work plan section 5.12	Collect samples
AOC 48-008		Former transformer leak—PCB only site in the basement of Building 48-1	NFA approved	EPA 2005, 088464	None
AOC 48-009		Soil contamination from two air compressors located on the loading dock east of Building 48-1	NFA approved	EPA 2005, 088464	None
AOC 48-011		A 3-ft diameter by 65-ft deep shaft that was drilled into tuff on the east side of Building 48-1; inside the shaft is a 2-ft diameter by 3-ft long stainless-steel cylinder that contains a sodium-iodide radiation detector	Under investigation	Work plan section 5.13	Collect samples
AOC 48-012		Soil contamination discovered in August 2002 during trenching east of Building 48-1	Under investigation	Work plan section 5.14	Collect samples
TA-50					
SWMU 50-001(a)		TA-50 radioactive liquid waste treatment facility (RLWTF, Building 50-1)	Under investigation	Work plan Section 6.2	Delay characterization
AOC 50-001(b)		Active underground drain line system transferring liquid waste to the RLWTF	Under investigation	Work plan section 6.3	Delay characterization
SWMU 50-002(a)		Underground reinforced-concrete vault (Building 50-2) that houses equipments, tanks, and transfer lines, all of which are associated with the RLWTF	Under investigation	Work plan section 6.4	Delay characterization
Consolidated Unit 50-002(b)-00	SWMU 50-002(b)	Waste tank (structure 50-67) and associated inlet and outlet lines housed in an underground reinforced-concrete vault (structure 50-66) at the RLWTF	Under investigation	Work plan section 6.5	Delay characterization

Table 1.1-1 (continued)

Site ID	Subunit	Brief Description	Site Status	Reference	Proposed Action
	SWMU 50-002(c)	Waste tank (structure 50-68) and associated inlet and outlet lines housed in an underground reinforced-concrete vault (structure 50-66) at the RLWTF			
AOC 50-002(d)		Decommissioned aboveground 5000-gal. stainless-steel tank (structure 50-5) at the RLWTF	Under investigation	Work plan section 6.6	Delay characterization
AOC 50-003(a)		Former RCRA interim status unit located in Room 59 of Building 50-1 to store containers of solid, cemented mixed-TRU sludge resulting from waste treatment activities	Under investigation	Work plan section 6.7	Delay characterization
AOC 50-003(b)		Storage area, a storage cabinet in Room 130 of Building 50-1 that contains bottles of mixed wastes	NFA approved	EPA 2005, 088464	None
AOC 50-003(c)		Two temporary storage areas, one located on asphalt paving immediately south of the tank farm at TA-50; the other located on concrete between the north wall of the Vehicle Decontamination Facility and the south wall of east wing of Building 50-1	NFA approved	EPA 2005, 088464	None
AOC 50-003(d)		Two greater-than-90-day storage structures for chemical waste, one is a 12’x14’ canvas building located on asphalt pavement, against the south wall of the east wing of Building 50-1 and adjacent to the storage area of AOC 50-003(c); the other is a 9’x24’ steel shed set on a concrete pad, located about 25 ft east of the northeast corner of the tank farm	NFA approved	EPA 2005, 088464	None
AOC 50-003(e)		Reputed storage area, site does not exist	NFA approved	EPA 2005, 088464	None
Consolidated Unit 50-004(a)-00	SWMU 50-004(a)	Locations of former underground radioactive liquid waste and industrial waste lines	Under investigation	Work plan section 6.8	Collect samples
	SWMU 50-004(b)	Location of a former underground vault (structure 50-3) that housed three stainless-steel-lined concrete storage tanks			

Table 1.1-1 (continued)

Site ID	Subunit	Brief Description	Site Status	Reference	Proposed Action
	SWMU 50-004(c)	Thirteen industrial waste lines and three associated manholes that discharged to the underground tank vault [SWMU 50-004(b)]			
AOC 50-005		Former waste treatment facility for treating nonradioactive liquid waste in Building 50-1	NFA approved	EPA 2005, 088464	None
SWMU 50-006(a)		Two accidental operational releases from sump	Under investigation	Work plan section 6.9	Collect samples
AOC 50-006(b)		Operational release from a radiator located on a concrete foundation about 15 ft west of Building 50-37	NFA approved	EPA 2005, 088464	None
SWMU 50-006(c)		Surface soil contamination at TA-50 resulting from the deposition of radioactive contaminants from historical stack emissions at TA-50	Under investigation	Work plan section 6.10	Delay characterization
SWMU 50-006(d)		A TA-50 drain line (structure 50-64) and associated NPDES-permitted outfall (051) in Mortandad Canyon for treated wastewater from the RLWTF	Under investigation	Work plan section 6.11	Collect samples
AOC 50-006(e)		Aboveground diesel fuel tank located on the southwest side of Building 50-37	NFA approved	EPA 2005, 088464	None
AOC 50-007		Former incinerator complex in Building 50-37	Closed Under RCRA	Work plan section 6.12	None
AOC 50-008		Formerly volume reduction facility, currently the waste characterization, reduction, and repackaging facility (WCRRF), in Building 50-69	Under investigation	Work plan section 6.13	Delay characterization
SWMU 50-009		Material disposal area (MDA C)	Under investigation	Work plan section 6.14	Sampling is being conducted per LANL 2007, 098425
AOC 50-010		Former vehicle decontamination bay located in Room 34B of the RLWTF	Under investigation	Work plan section 6.15	Delay characterization
SWMU 50-011(a)		Former septic system at the south end of the RLWTF	Under investigation	Work plan section 6.16	Delay characterization
AOC 50-011(b)		Two sanitary wastewater lift stations (structures 50-91 and 50-92) and associated piping	Under investigation	Work plan section 6.17	Delay characterization

Table 1.1-1 (continued)

Site ID	Subunit	Brief Description	Site Status	Reference	Proposed Action
TA-55					
AOC 55-001		Cement plant in Room 401 in the Plutonium Building (55-4), a RCRA unit	NFA approved	EPA 2005, 088464	None
AOC 55-002(a)		Radioactive waste storage area located inside the Plutonium Building (55-4)	NFA approved	EPA 2005, 088464	None
AOC 55-002(b)		Temporary radioactive waste storage area outside the Plutonium Building (55-4)	NFA approved	EPA 2005, 088464	None
AOC 55-002(c)		Interim container storage area located on asphalt pad on the west side of the Plutonium Building (55-4)	NFA approved	EPA 2005, 088464	None
AOC 55-003		Containment area, an aboveground storage tank (structure 55-127) located on the south side of the Plutonium Building (55-4) that holds pure nitric acid, which is product, not waste	NFA approved	EPA 2005, 088464	None
AOC 55-004		Evaporator located adjacent to the cementing process (AOC 55-001) in the Plutonium Building (55-4)	NFA approved	EPA 2005, 088464	None
AOC 55-005		Filtration unit associated with the evaporator (AOC 55-004) and the cementing process (AOC 55-001) in the Plutonium Building (55-4)	NFA approved	EPA 2005, 088464	None
AOC 55-006		Glass breaker located in a glovebox in Room 133 of the Plutonium Building (55-4)	NFA approved	EPA 2005, 088464	None
AOC 55-007		Two thermal combustion units located in Room 420 of the Plutonium Building (55-4)	NFA approved	EPA 2005, 088464	None
SWMU 55-008		Sumps, tanks, and pumps in the basement of the Plutonium Building (55-4)	Under investigation	Work plan section 7.2	Delay characterization
SWMU 55-009		Former sanitary sewer monitoring station in TA-55 plutonium complex	Removed from Module VIII, HWFP*	NMED 2007, 095495	None
AOC 55-010		One time spill of solvent located at the southwest side of the Plutonium Building (55-4)	NFA approved	EPA 2005, 088464	None

Table 1.1-1 (continued)

Site ID	Subunit	Brief Description	Site Status	Reference	Proposed Action
AOC 55-011(a)		Active NPDES-permitted storm-drainage system located northwest of the Plutonium Building (55-4) and discharges to the north of Building 55-4 at the rim of Mortandad Canyon	NFA approved	EPA 2005, 088464	None
AOC 55-011(b)		Active NPDES-permitted storm-drainage system located northeast of the Plutonium Building (55-4) and discharges to the northeast of Building 55-4 at the rim of Mortandad Canyon	NFA approved	EPA 2005, 088464	None
AOC 55-011(c)		Active NPDES-permitted storm-drainage system located northeast of the Plutonium Building (55-4) and discharges to the northeast of Building 55-4 at the rim of Mortandad Canyon	NFA approved	EPA 2005, 088464	None
AOC 55-011(d)		Active NPDES-permitted storm-drainage system located southwest of the Plutonium Building (55-4) and discharges to the south of Building 55-4 to Two Mile Canyon	NFA approved	EPA 2005, 088464	None
AOC 55-011(e)		Active NPDES-permitted storm-drainage system located northeast of the Plutonium Building (55-4) and discharges to the northeast of Building 55-4 at the rim of Mortandad Canyon	NFA approved	EPA 2005, 088464	None
AOC 55-012		Former container storage area for a bottle of waste acid containing heavy metals in Room 503 in the Plutonium Building (55-4)	NFA approved	EPA 2005, 088464	None
AOC 55-013(a)		A satellite storage area under a fume hood in Room 186 of Building 55-3	NFA approved	EPA 2005, 088464	None
AOC 55-013(b)		A satellite storage area under a fume hood in Room 208 of Building 55-4	NFA approved	EPA 2005, 088464	None
TA-60					
AOC C-60-002		A 4000-gal. decommissioned diesel fuel UST (structure 03-318) located on Sigma Mesa near the decommissioned communications bunker (structure 03-219)	NFA approved	EPA 2005, 088464	None

Note: Shading denotes sites that have been approved for NFA.
*HWFP=The Laboratory's Hazardous Waste Facility Permit.

Table 2.3-1
Soil Screening Levels for Inorganic and Organic Chemicals

COPC	Industrial Soil Screening Value[a]	Construction Worker Soil Screening Value[a]
Inorganics		
Aluminum	1.00E+05	1.44E+04
Antimony	454	124
Arsenic	17.7	85.2
Barium	1.00E+05	6.02E+04
Beryllium	2250	56.2
Cadmium	564	154
Calcium	na[b]	na
Chromium	450[c]	500[c]
Cobalt	2.05E+04	61
Copper	4.54E+04	1.24E+04
Cyanide (total)	1.37E+04	4760
Iron	1.00E+05	9.29E+04
Lead	800	800
Magnesium	na	na
Manganese	4.84E+04	150
Mercury	1.00E+05	927
Nickel	2.27E+04	6190
Nitrate	1.00E+05	1.00E+05
Total Phosphorus	na	na
Potassium	na	na
Selenium	5680	1550
Silver	5680	1550
Thallium	74.9	20.4
Vanadium	1140	310
Zinc	1.00E+05	9.29E+04
Organic Chemicals		
Acenaphthene	3.35E+04	1.41E+04
Acetone	1.00E+05	9.85E+04
Anthracene	1.00E+05	8.60E+04
Aroclor-1254	8.26	4.28
Aroclor-1260	8.26	4.28
Benzo(a)anthracene	23.4	212
Benzo(a)pyrene	2.34	21.2
Benzo(b)fluoranthene	23.4	212
Benzo(g,h,i)perylene	3.09E+04	9010
Benzo(k)fluoranthene	234	2120

Table 2.3-1 (continued)

COPC	Industrial Soil Screening Value[a]	Construction Worker Soil Screening Value[a]
Benzoic Acid	1.00E+05	1.00E+05
Bis(2-ethylhexl)phthalate	1370	4660
Butanone[2-]	4.87E+04	4.87E+04
Butylbenzlphthalate	240[c]	240 [c]
Carbazole	2900[c]	960[c]
Carbon Tetrachloride	8.64	180
Chrysene	2310	2.12E+04
Dibenz(a,h)anthracene	2.34	2.12E+01
Dibenzofuran	1620	5.52E+02
Diethylphthalate	1.00E+05	1.00E+05
Dimethylphenol[2,4-]	1.37E+04	4.66E+03
Di-n-butlyphthalate	6.84E+04	2.33E+04
Di-n-octlyphthalate	2.50E+04[d]	na
Fluoranthene	2.44E+04	8730
Fluorene	2.65E+04	1.02E+04
Hexanone[2-][e]	4.87E+04	4.87E+04
Indeno(1,2,3-cd)pyrene	23.4	212
Isopropyltoluene[4-][f]	389	389
Methylene Chloride	490	2630
Methylnaphthalene[2-][g]	300	262
Methyl-2-pentanone[4-]	7010	7010
Methylphenol[2-][h]	885	586
Methylphenol[4-] [h]	885	586
Naphthalene	300	262
Phenanthrene	2.05E+04	6990
Pyrene	3.09E+04	9010
Toluene	252	252
TPH-DRO	na	na
Trichlorofluoromethane	9.83E+02	983
Trimethylbenzene[1,2,4-]	6.92E+01	69.2

[a] Values from NMED 2006, 092513.

[b] na = Not available.

[c] Values from EPA Region 6 (EPA 2007, 095866).

[d] Values from EPA Region 9 (http://www.epa.gov/region09/waste/sfund/prg/index.html).

[e] 2-Butanone used as a surrogate.

[f] Isopropylbenzene used as a surrogate.

[g] Naphthalene used as a surrogate.

[h] 2-Chlorophenol used as a surrogate.

Table 2.3-2
Soil Screening Levels for Radionuclides

COPCs	Industrial Screening Action Level*	Construction Worker Screening Action Level*
Americium-241	180	34
Cesium-137	23	18
Cobalt-60	5.1	4.1
Europium-152	11	9.1
Plutonium-238	240	40
Plutonium-239/Plutonium-240	210	36
Sodium-22	6.5	5.2
Strontium-90	1900	800
Thorium-228	9.0	6.8
Thorium-230	5	5
Thorium-232	5	5
Tritium	4.40E+05	3.20E+05
Uranium-234	1500	220
Uranium-235	87	43
Uranium-238	430	160

* Values from LANL 2005, 088493.

Table 3.4-1
Samples Collected at AOC 03-004(c)

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	VOCs
0103-97-0275	03-03301	1.25–1.5	Soil	3415R[a]	3414R	—[b]
0103-97-0279	03-03302	1.17–1.5	Soil	3415R	3414R	—
0103-97-0280	03-03303	1.17–1.5	Soil	3415R	3414R	—
0103-97-0278	03-03304	0.33–1.42	Soil	3415R	3414R	—
0103-97-0277	03-03305	1.17–1.42	Soil	3415R	3414R	3414R

[a] Analytical request number.
[b] — =Analysis not requested.

Table 3.4-2
Inorganic Chemicals above BVs at AOC 03-004(c)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Silver
Soil Background Value[a]				**0.83**	**0.4**	**6120**	**1**
0103-97-0275	03-03301	1.25–1.50	Soil	6.6 (UJ)	0.55 (U)	—[b]	1.9 (U)
0103-97-0279	03-03302	1.17–1.50	Soil	5.7 (UJ)	0.47 (U)	—	1.7 (U)
0103-97-0280	03-03303	1.17–1.50	Soil	7.1 (UJ)	0.59 (U)	13900	2.1 (U)
0103-97-0278	03-03304	0.33–1.42	Soil	6.9 (UJ)	0.57 (U)	—	2 (U)
0103-97-0277	03-03305	1.17–1.42	Soil	6.6 (UJ)	0.55 (U)	—	1.9 (U)

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.4-3
Organic Chemicals Detected at AOC 03-004(c)

Sample ID	Location ID	Depth (ft)	Media	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Fluoranthene	Phenanthrene	Pyrene
0103-97-0280	03-03303	1.17–1.50	Soil	0.09 (J)	0.09 (J)	0.1 (J)	0.083 (J)	0.12 (J)

Note: All values in mg/kg.

Table 3.4-1
Proposed Sampling at AOC 03-004(c)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and extent of potential contamination	4c-1	North of AOC 03-004(c)	Under asphalt	X	X	X	X	X	X	X	X	—*	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	4c-2	West of active dumpster	Under asphalt	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of potential contamination	4c-3	South of AOC 03-004(c)	Under asphalt	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	4c-4	Northwest of AOC 03-004(c)	Under asphalt	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	4c-5	West of AOC 03-004(c)	Under asphalt	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	4c-6	Southwest of AOC 03-004(c)	Under asphalt	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	4c-7	West of AOC near storm drain	Under asphalt	X	X	X	X	X	X	X	X		X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.5-1
Samples Collected at AOC 03-004(d)

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium
0103-97-0261	03-03294	0–1	Fill	3413R[a]	3412R	—[b]	—	—	—
0103-97-0351	03-03294	0–1	Fill	—	—	—	3731R	3731R	3731R
0103-97-0262	03-03294	3–4	Fill	3413R	3412R	3412R	—	—	—
0103-97-0263	03-03295	0.25–1.25	Fill	3413R	3412R	—	—	—	—
0103-97-0352	03-03295	0.25–1.25	Fill	—	—	—	3731R	3731R	3731R
0103-97-0264	03-03296	0–1	Fill	3413R	3412R	—	—	—	—
0103-97-0353	03-03296	0–1	Fill	—	—	—	3731R	3731R	3731R
0103-97-0265	03-03296	3–4	Fill	3413R	3412R	—	—	—	—
0103-97-0268	03-03297	0.25–0.5	Soil	3413R	3412R	—	—	—	—
0103-97-0356	03-03297	0.25–0.5	Soil	—	—	—	3731R	3731R	3731R
0103-97-0266	03-03298	0–0.83	Fill	3413R	3412R	—	—	—	—
0103-97-0354	03-03298	0–0.83	Fill	—	—	—	3731R	3731R	3731R
0103-97-0267	03-03299	0–0.5	Soil	3413R	3412R	—	—	—	—
0103-97-0355	03-03299	0–0.5	Soil	—	—	—	3731R	3731R	3731R
0103-97-0357	03-03300	0–0.83	Soil	—	—	—	3731R	3731R	3731R

[a] Analytical request number.

[b] — =Analysis not requested.

Table 3.5-2
Inorganic Chemicals above BVs at AOC 03-004(d)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Lead	Silver	Thallium	Zinc
Soil Background Value[a]				**0.83**	**0.4**	**6120**	**19.3**	**22.3**	**1**	**0.73**	**48.8**
0103-97-0261	03-03294	0.00–1.00	Fill	7.7 (U)	0.74 (J)	7840	33	56.6	1.3 (J)	—[b]	211 (J-)
0103-97-0262	03-03294	3.00–4.00	Fill	8.2 (U)	0.92 (J)	—	—	—	—	—	—
0103-97-0263	03-03295	0.25–1.25	Fill	8.1 (U)	0.7 (U)	—	—	—	—	2 (U)	—
0103-97-0264	03-03296	0.00–1.00	Fill	7.5 (U)	0.65 (U)	—	—	—	—	—	51.2 (J-)
0103-97-0265	03-03296	3.00–4.00	Fill	8.2 (U)	0.71 (U)	—	—	—	—	—	—
0103-97-0268	03-03297	0.25–0.50	Soil	8.1 (U)	0.7 (U)	—	—	—	—	2.1 (U)	—
0103-97-0266	03-03298	0.00–0.83	Fill	7.1 (U)	0.61 (U)	—	—	—	—	1.9 (U)	—
0103-97-0267	03-03299	0.00–0.50	Soil	7.8 (U)	0.67 (U)	—	—	—	—	1.8 (U)	—

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.5-3
Radionuclides Detected at AOC 03-004(d)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/Plutonium-240
Soil Fallout Value[a,b]				**1.65**	**0.023**	**0.054**
0103-97-0351	03-03294	0.00–1.00	Fill	0.1673	0.077	0.072
0103-97-0352	03-03295	0.25–1.25	Fill	—[c]	—	0.089
0103-97-0353	03-03296	0.00–1.00	Fill	—	0.039	0.084
0103-97-0354	03-03298	0.00–0.83	Fill	0.4739	0.035	0.058
0103-97-0357	03-03300	0.00–0.83	Soil	0.2244	—	0.04

Note: All values in pCi/g.

[a] Fallout values are from LANL 1998, 059730.

[b] Fallout value applies to samples collected from 0–0.5 ft only.

[c] — = Analyte not detected.

Table 3.5-4
Organic Chemicals Detected at AOC 03-004(d)

Sample ID	Location ID	Depth (ft)	Media	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carbazole	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
0103-97-0264	03-03296	0.00–1.00	Fill	0.051 (J)	0.21 (J)	0.18 (J)	0.23 (J)	0.095 (J)	0.1 (J)	0.055 (J)	0.23 (J)	0.51	0.11 (J)	0.27 (J)	0.4
0103-97-0266	03-03298	0.00–0.83	Fill	—*	—	—	—	—	—	—	—	—	—	—	0.046 (J)
0103-97-0267	03-03299	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	0.044 (J)

Note: All values in mg/kg.

* — = Analyte not detected.

Table 3.5-5
Proposed Sampling at AOC 03-004(d)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and vertical extent of potential contamination	4d-1	North section of AOC, center	Under asphalt Soil/tuff interface 5.0 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	—* X X	X X X	X X X	— — —
Determine nature and vertical extent of potential contamination	4d-2	Middle of AOC 03-004(d)	Under asphalt Soil/tuff interface 5.0 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	X X X
Determine nature and vertical extent of potential contamination	4d-3	South section of AOC, center	Under asphalt Soil/tuff interface 5.0 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	— — —
Determine nature and lateral extent of potential contamination	4d-4	Downslope of AOC, west	Under asphalt Soil/tuff interface 5.0 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	— — —
Determine nature and lateral extent of potential contamination	4d-5	Downslope of AOC, southwest	Under asphalt Soil/tuff interface 5.0 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	— — —
Determine nature and lateral extent of potential contamination	4d-6	Downslope of previous location	Under asphalt Soil/tuff interface 5.0 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	— — —
Determine nature and lateral extent of potential contamination	4d-7	Downslope of previous location	Under asphalt Soil/tuff interface 5.0 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	 X X	X X X	X X X	X X X

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.6-1
Samples Collected at AOC 03-007

Sample ID	Location ID	Depth (ft)	Media	Metals	High-Explosive	SVOCs	VOCs	Gamma Spectroscopy	Isotopic Thorium
0103-97-0221	03-03311	0–1	Fill	3410R[a]	3409R	3408R	3408R	—[b]	3411R
0103-97-0222	03-03312	0–1	Fill	3410R	3409R	3408R	—	—	3411R
0103-97-0223	03-03313	0–1	Fill	3410R	3409R	3408R	—	3426R	3411R
0103-97-0224	03-03314	0–1	Fill	3410R	3409R	3408R	3408R	—	3411R

[a] Analytical request number.
[b] — =Analysis not requested.

Table 3.6-2
Inorganic Chemicals above BVs at AOC 03-007

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Silver
Soil Background Value*				**0.83**	**0.4**	**1**
0103-97-0221	03-03311	0.00–1.00	Fill	5.5 (UJ)	0.46 (U)	1.6 (U)
0103-97-0222	03-03312	0.00–1.00	Fill	6.2 (UJ)	0.51 (U)	1.8 (U)
0103-97-0223	03-03313	0.00–1.00	Fill	6.1 (UJ)	0.88 (J)	1.8 (U)
0103-97-0224	03-03314	0.00–1.00	Fill	6.3 (UJ)	0.53 (U)	1.8 (U)

Note: All values in mg/kg.
* Background values are from LANL 1998, 059730.

Table 3.6-3
Radionuclides Detected at AOC 03-007

Sample ID	Location ID	Depth (ft)	Media	Cesium-137
Soil Fallout Value[a,b]				**1.65**
0103-97-0223	03-03313	0.00–1.00	Fill	0.08

Note: All values in pCi/g.
[a] Fallout values are from LANL 1998, 059730.
[b] Fallout value applies to samples collected from 0–0.5 ft only.

Table 3.6-4
Organic Chemicals Detected at AOC 03-007

Sample ID	Location ID	Depth (ft)	Media	Benzoic acid
0103-97-0223	03-03313	0.00–1.00	Fill	0.71 (J)

Note: All values in mg/kg.

Table 3.6-5
Proposed Sampling at AOC 03-007

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Isotopic Thorium	Tritium	SVOCs	VOCs	Explosive Compounds	Dioxins/furans	Cyanide	pH
Determine nature and vertical extent of potential contamination	7-1	Within AOC boundaries	Surface	X	X	X	X	X	X	X	X	X	—*	X	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and vertical extent of potential contamination	7-2	Within AOC boundaries	Surface	X	X	X	X	X	X	X	X	X	—	X	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and vertical extent of potential contamination	7-3	Within AOC boundaries	Surface	X	X	X	X	X	X	X	X	X	—	X	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and vertical extent of potential contamination	7-4	Within AOC boundaries	Surface	X	X	X	X	X	X	X	X	X	—	X	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and vertical extent of potential contamination	7-5	Within AOC boundaries	Surface	X	X	X	X	X	X	X	X	X	—	X	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and lateral extent of potential contamination	7-6	Downslope of AOC, east	Surface	X	X	X	X	X	X	X	X	X	—	X	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and lateral extent of potential contamination	7-7	Downslope of AOC, east	Surface	X	X	X	X	X	X	X	X	X	—	X	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and lateral extent of potential contamination	7-8	Downslope of AOC, southeast	Surface	X	X	X	X	X	X	X	X	X	—	X	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and lateral extent of potential contamination	7-9	Downslope of AOC, south	Surface	X	X	X	X	X	X	X	X	X	—	X	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5.0 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 3.6-5 (continued)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Isotopic Thorium	Tritium	SVOCs	VOCs	Explosive Compounds	Dioxins/furans	Cyanide	pH
Determine if contamination is present within drainage	7-10	Within drainage	Surface sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X	X X	X X
Determine if contamination is present within drainage	7-11	Within drainage	Surface sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X	X X	X X

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.12-1
Samples Collected at SWMU 03-034(a)

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium
0103-97-0266	03-03298	0–0.83	Fill	3413R[a]	3412R	—[b]	—	—
0103-97-0354	03-03298	0–0.83	Fill	—	—	3731R	3731R	3731R
0103-97-0267	03-03299	0–0.5	Soil	3413R	3412R	—	—	—
0103-97-0355	03-03299	0–0.5	Soil	—	—	3731R	3731R	3731R
0103-97-0357	03-03300	0–0.83	Soil	—	—	3731R	3731R	3731R

[a] Analytical request number.
[b] — =Analysis not requested.

Table 3.12-2
Inorganic Chemicals above BVs at SWMU 03-034(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Thallium
Soil Background Value*				**0.83**	**0.4**	**0.73**
0103-97-0266	03-03298	0.00–0.83	Fill	7.1 (U)	0.61 (U)	1.9 (U)
0103-97-0267	03-03299	0.00–0.50	Soil	7.8 (U)	0.67 (U)	1.8 (U)

Note: All values in mg/kg.
* Background values are from LANL 1998, 059730.

Table 3.12-3
Radionuclides Detected at SWMU 03-034(a)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/Plutonium-240
Soil Fallout Value[a,b]				**1.65**	**0.023**	**0.054**
0103-97-0354	03-03298	0.00–0.83	Fill	0.4739	0.035	0.058
0103-97-0357	03-03300	0.00–0.83	Soil	0.2244	—[c]	0.04

Note: All values in pCi/g.
[a] Fallout values are from LANL 1998, 059730.
[b] Fallout value applies to samples collected from 0–0.5 ft only.
[c] — = Analyte not detected.

Table 3.12-4
Organic Chemicals Detected at SWMU 03-034(a)

Sample ID	Location ID	Depth (ft)	Media	Pyrene
0103-97-0266	03-03298	0.00–0.83	Fill	0.046 (J)
0103-97-0267	03-03299	0.00–0.50	Soil	0.044 (J)

Note: All values in mg/kg.

Table 3.12-5
Proposed Sampling at SWMU 03-034(a)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine if the tank has leaked	34a-1	North of Building 03-0154	Bottom of tank	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below tank	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below tank	X	X	X	X	X	X	X	X	X	X	X	X

Table 3.14-1
Proposed Sampling at AOC 03-041

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine if the tank has leaked	41-1	South of Building 03-1264	Surface	X	X	X	X	X	X	X	X	—*	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
Determine if the tank has leaked	41-2	East of Building 03-1264	Surface	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
Determine if the tank has leaked	41-3	North of Building 03-1264	Surface	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.15-1
Samples Collected at SWMU 03-049(a)

Sample ID	Location ID	Depth (ft)	Media	Hexavalent Chromium	Metals	Total Cyanide	VOCs	Isotopic Uranium
0103-97-0061	03-03231	0–0.33	Sediment	3363R[a]	3363R	3363R	3362R	3364R
0103-97-0062	03-03233	0–0.33	Sediment	3363R	3363R	3363R	3362R	3364R
0103-97-0063	03-03234	0–0.33	Sediment	3363R	3363R	3363R	—[b]	3364R
0103-97-0064	03-03236	0–0.33	Sediment	3363R	3363R	3363R	—	3364R
0103-97-0065	03-03237	0–0.33	Sediment	3363R	3363R	3363R	—	3364R
0103-97-0066	03-03238	0–0.33	Sediment	3363R	3363R	3363R	—	3364R
0103-97-0067	03-03239	0–0.33	Sediment	3363R	3363R	3363R	—	3364R

[a] Analytical request number.

[b] — =Analysis not requested.

Table 3.15-2
Inorganic Chemicals above BVs at SWMU 03-049(e)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Sediment Background Value[a]				**0.83**	**3.98**	**127**	**4420**	**10.5**	**4.73**	**11.2**	**13800**	**19.7**	**543**	**9.38**	**0.3**	**1**	**0.73**	**19.7**	**60.2**
0103-97-0061	03-03231	0.00-0.33	Sediment	1.1 (U)	—[b]	—	—	68.2 (J-)	—	446	—	25.1	—	29.9	0.84 (U)	—	1.8 (J)	—	422
0103-97-0062	03-03233	0.00-0.33	Sediment	2.3 (U)	—	—	5590	152 (J-)	—	663	17400	53.9	—	29.5	1.8 (U)	1.1 (J)	1.5 (U)	24.7 (J)	421
0103-97-0063	03-03234	0.00-0.33	Sediment	1.2 (U)	—	—	—	274 (J-)	—	68.2	14900	25.2	—	12.8 (J)	0.99 (U)	—	0.81 (U)	—	356
0103-97-0064	03-03236	0.00-0.33	Sediment	1.2 (U)	—	—	—	264 (J-)	—	80.7	—	51.2	—	22.3	0.92 (U)	—	0.75 (U)	—	222
0103-97-0065	03-03237	0.00-0.33	Sediment	3.3 (U)	6 (J)	171 (J)	4990	198 (J-)	14.7 (J)	310	19200	92.6	1110 (J-)	55.7	2.6 (U)	1.2 (U)	2.1 (U)	34.8 (J)	564
0103-97-0066	03-03238	0.00-0.33	Sediment	0.95 (U)	—	—	—	—	—	17.6	—	—	—	—	0.75 (U)	—	—	—	—
0103-97-0067	03-03239	0.00-0.33	Sediment	2.3 (U)	—	—	—	86.3 (J-)	—	161	—	29.7	—	16.2 (J)	1.8 (U)	—	1.5 (U)	—	270

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.15-3
Radionuclide Detected above the BV at SWMU 03-049(a)

Sample ID	Location ID	Depth (ft)	Media	Uranium-238
Sediment Background Value*				**2.29**
0103-97-0062	03-03233	0.00–0.33	Sediment	2.3592
0103-97-0065	03-03237	0.00–0.33	Sediment	3.364

Note: All values in pCi/g.
* Background values are from LANL 1998, 059730.

Table 3.15-4
Organic Chemicals Detected at SWMU 03-049(a)

Sample ID	Location ID	Depth (ft)	Media	Butanone[2-]	Methylene chloride
0103-97-0061	03-03231	0.00–0.33	Sediment	0.013 (J)	0.011 (J)
0103-97-0062	03-03233	0.00–0.33	Sediment	—*	0.012

Note: All values in mg/kg.
* — = Analyte not detected.

Table 3.15-5
Proposed Sampling at Consolidated Unit 03-045(h)-00

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Hexavalent Chromium	Cyanide	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Uranium	Tritium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
SWMU 03-045(h)																
Determine if contamination associated with potential overflow drained south	45h-1 through 45h-4	Sediment Pocket	Sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	X X	—* X	X X	X X	X X
SWMU 03-049(a)																
Determine nature and extent of potential contamination	49a-1	Sediment Pocket	Sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X	X X
Determine nature and extent of potential contamination	49a-2	Sediment Pocket	Sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X	— —
Determine nature and extent of potential contamination	49a-3	Sediment Pocket	Sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X	— —
Determine nature and extent of potential contamination	49a-4	Sediment Pocket	Sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X	— —
Determine nature and extent of potential contamination	49a-5	Sediment Pocket	Sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X	— —
Determine nature and extent of potential contamination	49a-6	Sediment Pocket	Sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X	X X

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.16-1
Samples Collected at Consolidated Unit 03-049(b)-00

Sample ID	Location ID	Depth (ft)	Media	Metals	PCBs	TPH-DRO	VOCs	Isotopic Uranium
0103-97-0101	03-03251	0–0.83	Soil	3369R[a]	3368R	3368R	—[b]	—
0103-97-0102	03-03252	0–0.83	Soil	3369R	3368R	3368R	3368R	—
0103-97-0103	03-03253	0–0.92	Soil	3369R	3368R	3368R	—	—
0103-97-0104	03-03254	0–0.83	Fill	3369R	3368R	3368R	—	3370R
0103-97-0105	03-03255	0–0.83	Fill	3369R	3368R	3368R	—	3370R
0103-97-0106	03-03256	0–0.83	Fill	3369R	3368R	3368R	—	3370R
0103-97-0107	03-03257	0–1	Soil	3369R	3368R	3368R	—	—
0103-97-0108	03-03258	0–1	Soil	3369R	3368R	3368R	3368R	—
0103-97-0109	03-03259	0–1	Soil	3369R	3368R	3368R	—	—
0103-97-0110	03-03260	0–1	Fill	3369R	3368R	3368R	3368R	3370R
0103-97-0111	03-03261	0–1	Fill	3369R	3368R	3368R	—	—
0103-97-0112	03-03262	0–1	Fill	3369R	3368R	3368R	—	—
0103-97-0113	03-03263	0–1	Fill	3369R	3368R	3368R	—	—

[a] Analytical request number.

[b] — =Analysis not requested.

Table 3.16-2
Inorganic Chemicals above BVs at Consolidated Unit 03-049(b)-00

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Cobalt	Copper	Lead	Manganese	Zinc
Soil Background Value[a]				**0.83**	**0.4**	**8.64**	**14.7**	**22.3**	**671**	**48.8**
0103-97-0101	03-03251	0.00–0.83	Soil	4.64 (U)	0.464 (U)	—[b]	244	102	—	109
0103-97-0102	03-03252	0.00–0.83	Soil	5.06 (U)	0.506 (U)	—	151	72.2	—	85.2
0103-97-0103	03-03253	0.00–0.92	Soil	3.97 (U)	—	—	19.6	—	—	—
0103-97-0104	03-03254	0.00–0.83	Fill	5.77 (U)	0.577 (U)	—	—	—	—	—
0103-97-0105	03-03255	0.00–0.83	Fill	4.98 (U)	0.498 (U)	9.47	—	—	1090	—
0103-97-0106	03-03256	0.00–0.83	Fill	4.13 (U)	0.413 (U)	—	—	—	—	—
0103-97-0107	03-03257	0.00–1.00	Soil	4.79 (U)	0.479 (U)	—	—	—	—	—
0103-97-0108	03-03258	0.00–1.00	Soil	4.84 (U)	0.484 (U)	—	—	—	—	—
0103-97-0109	03-03259	0.00–1.00	Soil	4.77 (U)	0.477 (U)	—	—	—	—	—
0103-97-0110	03-03260	0.00–1.00	Fill	5.16 (U)	0.516 (U)	—	—	—	—	—

Table 3.16-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Cobalt	Copper	Lead	Manganese	Zinc
Soil Background Value[a]				**0.83**	**0.4**	**8.64**	**14.7**	**22.3**	**671**	**48.8**
0103-97-0111	03-03261	0.00–1.00	Fill	4.35 (U)	0.435 (U)	—	—	—	—	—
0103-97-0112	03-03262	0.00–1.00	Fill	4.46 (U)	0.446 (U)	—	—	—	—	—
0103-97-0113	03-03263	0.00–1.00	Fill	4.8 (U)	0.48 (U)	—	—	—	—	—

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.16-3
Organic Chemicals Detected at Consolidated Unit 03-049(b)-00

Sample ID	Location ID	Depth (ft)	Media	Aroclor 1254	Isopropyltoluene[4-]	Toluene	TPH-DRO
0103-97-0101	03-03251	0.00–0.83	Soil	12	—*	—	130
0103-97-0102	03-03252	0.00–0.83	Soil	7.3	0.002 (J)	0.004 (J)	190
0103-97-0103	03-03253	0.00–0.92	Soil	3.9	—	—	130
0103-97-0104	03-03254	0.00–0.83	Fill	—	—	—	9.5
0103-97-0105	03-03255	0.00–0.83	Fill	—	—	—	13
0103-97-0106	03-03256	0.00–0.83	Fill	—	—	—	98
0103-97-0107	03-03257	0.00–1.00	Soil	—	—	—	7.5
0103-97-0108	03-03258	0.00–1.00	Soil	—	—	—	3400 (J+)
0103-97-0109	03-03259	0.00–1.00	Soil	—	—	—	1100
0103-97-0110	03-03260	0.00–1.00	Fill	—	—	—	16
0103-97-0111	03-03261	0.00–1.00	Fill	0.38	—	—	38
0103-97-0112	03-03262	0.00–1.00	Fill	0.052	—	—	70
0103-97-0113	03-03263	0.00–1.00	Fill	0.078	—	—	17

Note: All values in mg/kg.

* — = Analyte not detected.

Table 3.16-4
Proposed Sampling at Consolidated Unit 03-049(b)-00

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Uranium	TPH-DRO	PCBs/	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and extent of potential contamination	49b-1	Beneath discharge outlet	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	—* X X	X X X	X X X	X X X
Determine nature and extent of potential contamination	49b-2	Beneath discharge outlet	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	— — —
Determine nature and extent of potential contamination	49b-3	Beneath discharge outlet	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	— — —
Determine nature and extent of potential contamination	49b-4	Downgradient (south) discharge outlet	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	— — —
Determine nature and extent of potential contamination	49b-5	Downgradient (west) discharge outlet	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	— — —
Determine nature and extent of potential contamination	49b-6	Downgradient (southwest) discharge outlet	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	— — —
Determine nature and extent of potential contamination	49b-7	Downgradient (southwest) discharge outlet	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	— — —
Determine nature and extent of potential contamination	49b-8	Equipment storage area	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	X X X

Table 3.16-4 (continued)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Uranium	TPH-DRO	PCBs/	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and extent of potential contamination	49b-9	Equipment storage area	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	X X X
Determine nature and extent of potential contamination	49b-10	Equipment storage area	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	X X X

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.17-1
Samples Collected at SWMU 03-049(e)

Sample ID	Location ID	Depth (ft)	Media	Anions	Metals
RC03-01-0024	03-14466	0–0.5	Fill	9417R*	9417R
RC03-01-0025	03-14467	0–0.5	Fill	9417R	9417R
RC03-01-0026	03-14468	0–0.5	Fill	9417R	9417R
RC03-01-0027	03-14469	0–0.5	Fill	9417R	9417R

* Analytical request number.

Table 3.17-2
Inorganic Chemicals Detected above BVs at SWMU 03-049(e)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Zinc
Soil Background Value[a]				**0.83**	**8.17**	**0.4**	**19.3**	**8.64**	**14.7**	**21500**	**22.3**	**671**	**15.4**	**48.8**
RC03-01-0024	03-14466	0.00–0.50	Fill	1.6	82.3	2	69.8	8.9	177	113000	72.5	740	30.1	631
RC03-01-0025	03-14467	0.00–0.50	Fill	—[b]	27.3	—	19.6	—	40.8	—	34.3	—	—	194
RC03-01-0026	03-14468	0.00–0.50	Fill	—	20.1	0.47	22.1	—	35.9	—	24.3	—	—	258
RC03-01-0027	03-14469	0.00–0.50	Fill	—	—	—	—	—	—	—	—	—	—	88.8

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.17-3
Proposed Sampling at SWMU 03-049(e)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Hexavalent Chromium	Nitrate	Perchlorate	Gamma Spectroscopy	Tritium	Dioxins/furans	SVOCs	VOCs	Cyanide	pH
Determine nature and extent of potential contamination	49e-1	Sediment Pocket	Surface sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	—* X	X X	X X
Determine nature and extent of potential contamination	49e-2	Sediment Pocket	Surface sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X
Determine nature and extent of potential contamination	49e-3	Sediment Pocket	Surface sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X
Determine nature and extent of potential contamination	49e-4	Sediment Pocket	Surface sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X
Determine nature and extent of potential contamination	49e-5	Sediment Pocket	Surface sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X
Determine nature and extent of potential contamination	49e-6	Sediment Pocket	Surface sediment Soil/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.18-1
Samples Collected at SWMU 03-054(e)

Sample ID	Location ID	Depth (ft)	Media	Metals	Total Cyanide	PCBs	SVOCs	VOCs	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium
0103-95-0001	03-02715	0–1	Soil	31[a]	31	11	11	11	35	35	35	35
0103-95-0002	03-02715	1.67–2.33	Soil	31	31	11	11	11	35	35	35	35
0103-95-0003	03-02716	0–0.67	Soil	31	31	11	11	—[b]	35	35	35	35
0103-95-0005	03-02717	0–0.5	Soil	31	31	11	11	—	35	35	35	35
0103-95-0008	03-02718	0–1	Soil	31	31	11	11	11	35	35	35	35
0103-95-0007	03-02718	1.17–1.83	Soil	31	31	11	11	11	35	35	35	35
0103-95-0009	03-02719	0–0.5	Soil	31	31	11	11	—	35	35	35	35
0103-95-0011	03-02720	0–0.5	Soil	31	31	11	11	—	35	35	35	35

[a] Analytical request number.

[b] — =Analysis not requested.

Table 3.18-2
Inorganic Chemicals above BVs at SWMU 03-054(e)

Sample ID	Location ID	Depth (ft)	Media	Cyanide (Total)	Mercury	Thallium	Zinc
Soil Background Value[a]				**0.5**	**0.1**	**0.73**	**48.8**
0103-95-0001	03-02715	0.00–1.00	Soil	1.2 (U)	0.12 (U)	1.1 (U)	58.2
0103-95-0002	03-02715	1.67–2.33	Soil	1.21 (U)	0.11 (U)	1.1 (U)	64
0103-95-0003	03-02716	0.00–0.67	Soil	1.23 (U)	0.12 (U)	1.2 (U)	112
0103-95-0005	03-02717	0.00–0.50	Soil	1.11 (U)	0.11 (U)	1 (U)	65.4
0103-95-0008	03-02718	0.00–1.00	Soil	1.35 (U)	0.12 (U)	1.3 (U)	56.3
0103-95-0007	03-02718	1.17–1.83	Soil	1.27 (U)	0.11 (U)	1.2 (U)	59.2
0103-95-0009	03-02719	0.00–0.50	Soil	1.19 (U)	0.12 (U)	1.1 (U)	56.2
0103-95-0011	03-02720	0.00–0.50	Soil	1.18 (U)	0.11 (U)	1.1 (U)	—[b]

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 3.18-3
Radionuclides Detected or Detected above the FVs at SWMU 03-054(e)

Sample ID	Location ID	Depth (ft)	Media	Europium-152	Plutonium-238	Plutonium-239/ Plutonium-240	Sodium-22
Soil Fallout Value[a,b]				**na[c]**	**0.023**	**0.054**	**na**
0103-95-0001	03-02715	0.00–1.00	Soil	—[d]	0.016	0.011	—
0103-95-0002	03-02715	1.67–2.33	Soil	—	0.027	—	—
0103-95-0003	03-02716	0.00–0.67	Soil	—	0.002	0.005	—
0103-95-0005	03-02717	0.00–0.50	Soil	—	0.032	—	—
0103-95-0008	03-02718	0.00–1.00	Soil	—	0.02	0.009	—
0103-95-0007	03-02718	1.17–1.83	Soil	—	0.025	0.011	—
0103-95-0009	03-02719	0.00–0.50	Soil	0.211	0.043	—	—
0103-95-0011	03-02720	0.00–0.50	Soil	—	—	—	0.0681

Note: All values in pCi/g.

[a] Fallout values are from LANL 1998, 059730.

[b] Fallout value applies to samples collected from 0–0.5 ft only.

[c] na = Not available

[d] — = Analyte not reported (detect or nondetect) above FV or not detected.

Table 3.18-4
Organic Chemicals Detected at SWMU 03-054(e)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1260	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Diethylphthalate	Fluoranthene	Pyrene
0103-95-0002	03-02715	1.67–2.33	Soil	0.0553	—*	—	—	—	—	—
0103-95-0003	03-02716	0.00–0.67	Soil	0.0536	—	—	—	—	—	—
0103-95-0005	03-02717	0.00–0.50	Soil	0.0562	0.1 (J)	0.13 (J)	0.16 (J)	0.69	0.32 (J)	0.22 (J)
0103-95-0009	03-02719	0.00–0.50	Soil	0.0596	—	—	—	—	—	—

Note: All values in mg/kg.

* — = Analyte not detected.

Table 3.18-5
Proposed Sampling at SWMU 03-054(e) and AOC C-03-006

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Cyanide	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	PCBs	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and extent of potential contamination	54e-1	Sediment Pocket	Sediment	X	X	X	X	X	X	X	X	X	X	—*	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of potential contamination	54e-2	Sediment Pocket	Sediment	X	X	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	54e-3	Sediment Pocket	Sediment	X	X	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	54e-4	Sediment Pocket	Sediment	X	X	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 4.2-1
Samples Collected at Consolidated Unit 42-001(a)-99

Sample ID	Location ID	Depth (ft)	Media	Metals	Americium-241	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium
AAA0951	42-01021	0–1.5	Fill	13188[a]	13189	13189	—[b]	—
AAA0953	42-01021	3–6	Soil	13188	13189	13189	—	—
AAA0954	42-01022	0–2.6	Fill	13188	13189	13189	—	—
AAA0955	42-01022	3–6	Soil	13188	13189	13189	—	—
AAA0956	42-01023	0–3	Soil	13188	13189	13189	—	—
AAA0957	42-01023	3–4.75	Soil	13188	13189	13189	—	—
AAA0969	42-01024	0–3	Fill	—	13189	13189	—	—
AAA0970	42-01024	3–6	Soil	—	13189	13189	—	—
AAA0960	42-01025	0–2.2	Fill	—	13189	13189	—	—
AAA0961	42-01025	3–6	Soil	—	13189	13189	—	—
AAA0967	42-01026	0–3	Soil	—	13189	13189	13189	13189
AAA0968	42-01026	3–6	Soil	—	13189	13189	—	—
AAA0962	42-01027	0–3	Fill	—	13189	13189	—	—
AAA0963	42-01027	3–6	Soil	—	13189	13189	13189	13189
AAA0973	42-01028	10–15	Fill	—	13189	13189	—	—
AAA0974	42-01028	10–15	Fill	—	13189	13189	—	—
AAA0975	42-01028	15–20	Fill	—	13189	13189	—	—
AAA0976	42-01028	20–25	Fill	—	13189	13189	—	—
AAA0990	42-01028	25–28	Soil	—	13189	13189	—	—
AAA0977	42-01029	10–15	Fill	—	13189	13189	—	—
AAA0978	42-01029	15–20	Fill	—	13189	13189	—	—
AAA0979	42-01029	20–25	Fill	—	13189	13189	—	—
AAA0980	42-01030	10–15	Fill	—	13189	13189	—	—
AAA0981	42-01030	10–15	Soil	—	13189	13189	—	—
AAA0982	42-01030	15–20	Soil	—	13189	13189	—	—
AAA0983	42-01030	20–25	Soil	—	13189	13189	—	—
AAA0991	42-01030	25–28	Soil	—	13189	13189	—	—
AAA0984	42-01031	10–15	Fill	—	13189	13189	—	—
AAA0985	42-01031	17–22	Fill	—	13189	13189	—	—
AAA0986	42-01031	22–27	Fill	—	13189	13189	—	—
AAA0964	42-01032	0–5	Fill	—	13189	13189	—	—
AAA0965	42-01032	5–10	Soil	—	13189	13189	—	—
AAA0966	42-01032	7–11	Soil	—	13189	13189	—	—

Table 4.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	Americium-241	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium
AAA0989	42-01033	0–3.5	Soil	—	13189	13189	—	—
AAA0992	42-01034	0–3	Soil	—	13189	13189	13189	—
AAA0993	42-01034	3–6	Soil	—	13189	13189	13189	—
AAA1691	42-01037	1–2	Soil	13641	—	—	—	—
AAA1692	42-01039	0–1	Soil	13641	—	—	—	—
AAA1693	42-01039	1–2	Soil	13641	—	—	—	—
AAA1695	42-01039	2–3	Soil	13641	—	—	—	—

[a] Analytical request number.

[b] — =Analysis not requested.

Table 4.2-2
Inorganic Chemical Detected above the BV at
Consolidated Unit 42-001(a)-99

Sample ID	Location ID	Depth (ft)	Media	Lead
Soil Background Value*				**22.3**
AAA0957	42-01023	3.00–4.75	Soil	28.1 (J-)

Note: All values in mg/kg.

* Background value is from LANL 1998, 059730.

Table 4.2-3
Radionuclides Detected at Consolidated Unit 42-001(a)-99

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Plutonium-238	Plutonium-239/ Plutonium-240
Soil Fallout Value[a,b]				**0.013**	**0.023**	**0.054**
AAA0951	42-01021	0.00–1.50	Fill	—[c]	0.0739 (J)	—
AAA0953	42-01021	3.00–6.00	Soil	—	0.2 (J-)	—
AAA0957	42-01023	3.00–4.75	Soil	0.332 (J)	1.75 (J)	2.42 (J)
AAA0970	42-01024	3.00–6.00	Soil	0.38 (J)	—	0.963 (J)
AAA0968	42-01026	3.00–6.00	Soil	0.227 (J)	—	—
AAA0963	42-01027	3.00–6.00	Soil	—	—	0.511
AAA0974	42-01028	10.00–15.00	Fill	—	—	0.666 (J-)
AAA0980	42-01030	10.00–15.00	Fill	—	1.95 (J-)	10.3 (J-)
AAA0981	42-01030	10.00–15.00	Soil	—	—	1.46 (J-)
AAA0982	42-01030	15.00–20.00	Soil	0.327	—	—
AAA0983	42-01030	20.00–25.00	Soil	0.358	—	—
AAA0991	42-01030	25.00–28.00	Soil	0.332	—	—
AAA0984	42-01031	10.00–15.00	Fill	0.463	—	—
AAA0985	42-01031	17.00–22.00	Fill	0.529	—	—
AAA0986	42-01031	22.00–27.00	Fill	0.342	—	—
AAA0992	42-01034	0.00–3.00	Soil	0.933	—	—
AAA0993	42-01034	3.00–6.00	Soil	0.309	—	—

Note: All values in pCi/g.

[a] Fallout values are from LANL 1998, 059730.

[b] Fallout value applies to samples collected from 0–0.5 ft only.

[c] — = Analyte not detected.

Table 4.2-4
Proposed Sampling at Consolidated Unit 42-001(a)-99

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	PCBs	SVOCs	VOCs	Explosive Compounds	Dioxins/furans	Cyanide	pH
Determine nature and vertical extent of potential contamination	1a-1 through 1a-31	Grid within Consolidated Unit	Surface Soil/tuff interface 5.0 ft below soil/tuff 10 ft below soil/tuff 20 ft below soil/tuff 30 ft below soil/tuff	X X X X X X	X X X X X X	X X X X X X	X X X X X X	X X X X X X	X X X X X X	X X X X X X	X X X X X X	X X X X X X	—* X X X X X	X X X X X X	X X X X X X	X X X X X X	X X X X X X
Determine nature and vertical extent of potential contamination	1a-32 through 1a-35	Grid within Consolidated Unit on fill area	Soil/tuff interface 10 ft below soil/tuff 20 ft below soil/tuff 30 ft below soil/tuff	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X
Determine nature and vertical extent of potential contamination	1a-36 through 1a-43	Drainage	Surface sediment Soil/tuff	X X	X X	X X	X X	X X	X X	X X	X X	X X	— X	X X	X X	X X	X X

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.2-1
Samples Collected at AOC 48-001

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Strontium-90
AAA4494	48-02006	0–0.5	Fill	—[a]	—	—	—	15290[b]	15290	15290	15290	—
AAA4493	48-02006	0.5–1.5	Fill	—	—	—	—	15290	15290	15290	15290	—
AAA4495	48-02006	1.5–3	Fill	—	—	—	—	15290	15290	15290	15290	—
AAA3769	48-02006	3–4	Fill	—	—	—	—	15290	15290	15290	15290	—
AAA3770	48-02006	4–5	Fill	—	—	—	—	15290	15290	15290	15290	—
AAA3771	48-02006	5–6	Fill	—	—	—	—	15290	15290	15290	15290	—
AAA3772	48-02006	6–7	Fill	—	—	—	—	15290	15290	15290	15290	—
AAA3773	48-02006	7–8	Fill	—	—	—	—	15290	15290	15290	15290	—
AAA3401	48-02010	4–5	Qbt 3	—	—	—	—	15162	15162	15162	15162	—
AAA3402	48-02010	8.5–9.5	Qbt 3	—	—	—	—	15162	15162	15162	15162	—
AAA3403	48-02010	14–15	Qbt 3	—	—	—	—	15162	15162	15162	15162	—
AAA3404	48-02012	4–5	Qbt 3	—	—	—	—	15162	15162	15162	15162	—
AAA3405	48-02012	9–10	Qbt 3	—	—	—	—	15162	15162	15162	15162	—
AAA3406	48-02012	14–15	Qbt 3	—	—	—	—	15162	15162	15162	15162	—
AAA3407	48-02014	4–5	Qbt 3	—	—	—	—	15162	15162	15162	15162	—
AAA3408	48-02014	7–7.2	Soil	—	—	—	—	15162	15162	15162	15162	—
AAA3409	48-02014	9–10	Qbt 3	—	—	—	—	15162	15162	15162	15162	—
AAA4473	48-02014	14–15	Qbt 3	—	—	—	—	15162	15162	15162	15162	—
AAA3493	48-02016	0–0.5	Soil	—	—	—	15128	15128	15128	15128	15128	—
AAA3495	48-02018	0–0.5	Soil	—	—	—	15128	15128	15128	15128	15128	—
AAA3497	48-02020	0–0.5	Soil	—	—	—	15128	15128	15128	15128	15128	—

Table 5.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Strontium-90
AAA3717	48-02024	4–5	Fill	—	—	—	15213	—	15213	15213	15213	—
AAA3718	48-02024	8–9	Fill	—	—	—	15213	15213	15213	15213	15213	—
AAA3719	48-02024	14–15	Qbt 3	—	—	—	15213	—	15213	15213	15213	—
AAA3720	48-02025	4–5	Fill	—	—	—	15213	—	15213	15213	15213	—
AAA3721	48-02025	5.5–6.5	Fill	—	—	—	15213	15213	15213	15213	15213	—
AAA3722	48-02025	7.5–8.5	Fill	—	—	—	15213	—	15213	15213	15213	—
AAA4475	48-02025	9–10	Qbt 4	—	—	—	15213	—	15213	15213	15213	—
AAA4476	48-02025	13–14	Qbt 3	—	—	—	15213	—	15213	15213	15213	—
AAA3723	48-02026	1.5–2.5	Soil	—	—	—	15213	—	15213	15213	15213	—
AAA3724	48-02026	6–7.4	Soil	—	—	—	15213	—	15213	15213	15213	—
AAA4469	48-02026	14–15	Qbt 3	—	—	—	15213	—	15213	15213	15213	—
AAA3545	48-02037	0–0.5	Fill	—	—	—	15333	15333	15333	15333	15333	—
AAA3546	48-02037	0.5–1.5	Fill	—	—	—	15333	—	15333	15333	15333	—
AAA3547	48-02037	1.5–3	Soil	—	—	—	15333	—	15333	15333	15333	—
AAA3512	48-02054	0–0.5	Sediment	—	—	—	15128	15128	15128	15128	15128	—
AAA3514	48-02054	0.5–1.5	Sediment	—	—	—	15128	—	15128	15128	15128	—
AAA3515	48-02054	1.5–2.5	Soil	—	—	—	15128	—	15128	15128	15128	—
AAA3513	48-02055	0–0.5	Sediment	—	—	—	15128	15128	15128	15128	15128	—
AAA3516	48-02055	0.5–1.5	Sediment	—	—	—	15128	—	15128	15128	15128	—
AAA3470	48-02055	1.5–2.5	Soil	—	—	—	15128	—	15128	15128	15128	—
AAA3471	48-02055	2.5–3.5	Soil	—	—	—	15128	—	15128	15128	15128	—
AAA3782	48-02057	0–0.5	Soil	—	—	—	15333	—	15333	15333	15333	—

Table 5.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Strontium-90
AAA3803	48-02067	0–1	Soil	—	16178	—	16193	—	16193	16193	16193	—
AAA3804	48-02067	1–2	Soil	—	16178	—	16193	—	16193	16193	16193	—
AAA3806	48-02068	0–1	Soil	—	16178	—	16193	—	16193	16193	16193	—
AAA3810	48-02069	0–1	Soil	—	16178	—	16193	16193	16193	16193	16193	—
AAA3811	48-02069	1–2	Qbt 4	—	16178	—	16193	—	16193	16193	16193	—
0448-95-0001	48-02080	0–0.5	Soil	224	—	—	—	—	225	—	225	—
0448-95-0005	48-02082	0–0.5	Soil	224	—	—	—	—	—	—	—	—
0448-95-0068	48-02133	0–0.5	Fill	1050	1049	—	—	—	—	—	—	—
0448-95-0070	48-02134	0–0.5	Fill	1050	1049	—	—	—	—	—	—	—
0448-97-0032	48-02135	0–1	Fill	—	—	—	—	2920	—	—	—	—
0448-97-0033	48-02135	1–2	Fill	—	—	—	—	2920	—	—	—	—
0448-97-0034	48-02135	2–3.25	Fill	—	—	—	—	2920	—	—	—	—
0448-97-0084	48-02136	0–0.5	Soil	2996	2995	—	—	2997	2997	2997	2997	2997
0448-97-0085	48-02136	0.5–1	Soil	2996	2995	—	—	2997	2997	2997	2997	2997
0448-97-0009	48-02141	11.5–12.5	Fill	—	—	—	—	2906	—	—	—	—
0448-97-0011	48-02141	12.5–13.5	Qbt 4	—	—	—	—	2906	—	—	—	—
0448-97-0037	48-02142	3.33–4.33	Fill	2980	2979	2979	—	2981	2981	2981	2981	2981
0448-97-0039	48-02142	4.66–5.12	Fill	2980	2979	2979	—	2981	2981	2981	2981	2981
0448-97-0040	48-02148	3.3–4.3	Fill	2980	2979	2979	—	2981	2981	2981	2981	2981
0448-97-0041	48-02148	4.66–5.16	Fill	2980	2979	2979	—	2981	2981	2981	2981	2981
0448-97-0001	48-02150	3.5–4.5	Fill	—	—	—	—	2906	—	2906	2906	2906
0448-97-0002	48-02150	8.5–9.5	Fill	—	—	—	—	2906	—	2906	2906	2906

Table 5.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Strontium-90
0448-97-0003	48-02150	14–15	Qbt 4	—	—	—	—	2906	—	2906	2906	2906
0448-97-0004	48-02151	6–7	Fill	—	—	—	—	2906	—	2906	2906	2906
0448-97-0006	48-02151	13.5–14.5	Fill	—	—	—	—	2906	—	2906	2906	2906
0448-97-0007	48-02151	15.5–16.5	Fill	—	—	—	—	2906	—	2906	2906	2906
0448-97-0057	48-02152	0–1	Soil	—	—	—	—	2977	—	2977	2977	2977
0448-97-0058	48-02152	1–2	Soil	—	—	—	—	2977	—	2977	2977	2977
0448-97-0059	48-02153	0–1	Soil	—	—	—	—	2977	—	2977	2977	2977
0448-97-0060	48-02153	1–2	Soil	—	—	—	—	2977	—	2977	2977	2977
0448-97-0062	48-02154	0–0.83	Sediment	—	—	—	—	2977	—	2977	2977	2977
0448-97-0061	48-02154	0.83–1.67	Soil	—	—	—	—	2977	—	2977	2977	2977
0448-97-0043	48-02155	1.5–2.5	Fill	2918	2917	2917	—	2919	2919	2919	2919	2919
0448-97-0044	48-02155	3.67–4.67	Fill	2918	2917	2917	—	2919	2919	2919	2919	2919
0448-97-0045	48-02155	5–6	Fill	2918	2917	2917	—	2919	2919	2919	2919	2919
0448-97-0012	48-02156	17.5–18.5	Fill	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0013	48-02156	21–22	Fill	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0014	48-02156	24–25	Qbt 3	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0015	48-02157	3.5–4.5	Fill	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0016	48-02157	5–6	Fill	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0018	48-02157	9–10	Soil	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0019	48-02158	3.5–4.5	Fill	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0020	48-02158	5.5–6.5	Fill	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0021	48-02158	9–10	Fill	—	—	—	—	2906	2906	2906	2906	2906

Table 5.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Strontium-90
0448-97-0047	48-02159	0.5–1.5	Sediment	2944	2943	2943	—	2945	2945	2945	2945	2945
0448-97-0048	48-02159	3.83–5	Qbt 3	2944	2943	2943	—	2945	2945	2945	2945	2945
0448-97-0052	48-02161	0.5–1	Sediment	2944	2943	2943	—	2945	2945	2945	2945	2945
0448-97-0053	48-02161	6.5–7.5	Soil	2944	2943	2943	—	2945	2945	2945	2945	2945
0448-97-0054	48-02162	0.5–1.5	Sediment	2944	2943	2943	—	2945	2945	2945	2945	2945
0448-97-0056	48-02162	2–3	Soil	2944	2943	2943	—	2945	2945	2945	2945	2945
0448-97-0064	48-02163	0–1	Soil	—	—	—	—	2955	—	—	—	—
0448-97-0065	48-02163	1–2	Soil	—	—	—	—	2955	—	—	—	—
0448-97-0074	48-02164	0–1	Sediment	—	—	—	—	2977	—	—	—	—
0448-97-0075	48-02164	1–2	Qbt 3	—	—	—	—	2977	—	—	—	—
0448-97-0067	48-02165	0–1	Sediment	—	—	—	—	2955	—	—	—	—
0448-97-0068	48-02165	1–2	Soil	—	—	—	—	2955	—	—	—	—
0448-97-0070	48-02165	2–2.83	Soil	—	—	—	—	2955	—	—	—	—
0448-97-0078	48-02166	0–1	Sediment	—	—	—	—	2977	—	—	—	—
0448-97-0079	48-02166	1–2	Qbt 3	—	—	—	—	2977	—	—	—	—
0448-97-0071	48-02167	0–1	Soil	—	—	—	—	2955	—	—	—	—
0448-97-0072	48-02167	1–2	Soil	—	—	—	—	2955	—	—	—	—
0448-97-0081	48-02168	0–0.83	Sediment	—	—	—	—	2977	—	—	—	—
0448-97-0082	48-02168	0.83–1.67	Soil	—	—	—	—	2977	—	—	—	—
0448-97-0105	48-02169	0–1	Sediment	—	—	—	—	3220R	—	—	—	—
0448-97-0107	48-02169	1–2	Soil	—	—	—	—	3220R	—	—	—	—
0448-97-0108	48-02170	0–0.5	Sediment	—	—	—	—	3220R	—	—	—	—

Table 5.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Strontium-90
0448-97-0109	48-02170	0.5–1.2	Soil	—	—	—	—	3220R	—	—	—	—
0448-97-0112	48-02171	0–0.83	Soil	3258R	3257R	3257R	—	3259R	3259R	3259R	3259R	3259R
0448-97-0113	48-02171	0.83–1.5	Soil	3258R	3257R	3257R	—	3259R	3259R	3259R	3259R	3259R
0448-97-0115	48-02172	0–1	Soil	3258R	3257R	3257R	—	3259R	3259R	3259R	3259R	3259R
0448-97-0116	48-02172	1–2	Soil	3258R	3257R	3257R	—	3259R	3259R	3259R	3259R	3259R
0448-97-0117	48-02172	2–3	Qbt 2	3258R	3257R	3257R	—	3259R	3259R	3259R	3259R	3259R

[a] — =Analysis not requested.

[b] Analytical request number.

Table 5.2-2
Inorganic Chemicals above BVs at AOC 48-001

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Soil Background Value[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**4.66**	**11.2**	**0.1**	**6.58**	**0.3**	**1**	**1.10**	**63.5**
Sediment Background Value[a]				**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**11.2**	**19.7**	**0.1**	**9.38**	**0.3**	**1**	**0.73**	**60.2**
0448-95-0068	48-02133	0.00–0.50	Fill	0.88 (J)	—[b]	—	—	—	—	—	—	22.4	—	—	—	—	—
0448-95-0070	48-02134	0.00–0.50	Fill	—	—	—	—	—	—	—	—	0.6	—	—	—	—	—
0448-97-0084	48-02136	0.00–0.50	Soil	5.8 (U)	—	—	0.58 (U)	—	—	—	—	—	—	—	—	—	—
0448-97-0085	48-02136	0.50–1.00	Soil	5.49 (U)	—	—	0.549 (U)	—	—	—	—	—	—	—	—	—	—
0448-97-0037	48-02142	3.33–4.33	Fill	5.4 (U)	—	—	0.54 (U)	—	—	—	—	—	—	—	—	—	—
0448-97-0039	48-02142	4.66–5.12	Fill	5.54 (U)	—	—	0.554 (U)	—	—	—	—	—	—	—	—	—	—
0448-97-0040	48-02148	3.30–4.30	Fill	5.69 (U)	—	—	0.569 (U)	—	—	—	—	—	—	—	—	—	—
0448-97-0041	48-02148	4.66–5.16	Fill	5.79 (U)	—	—	0.579 (U)	—	—	—	—	—	—	—	—	—	—
0448-97-0043	48-02155	1.50–2.50	Fill	12 (UJ)	—	—	0.6 (U)	—	—	—	—	0.12 (U)	—	—	2.4 (U)	—	—
0448-97-0044	48-02155	3.67–4.67	Fill	12 (UJ)	—	—	0.59 (U)	—	26	—	—	0.12 (U)	—	—	2.4 (U)	—	74
0448-97-0045	48-02155	5.00–6.00	Fill	12 (UJ)	—	—	0.59 (U)	—	20	—	—	0.12 (U)	—	—	2.4 (U)	—	—
0448-97-0047	48-02159	0.50–1.50	Sediment	7.2 (U)	—	—	0.72 (U)	—	—	—	—	—	—	0.36 (UJ)	—	—	—
0448-97-0048	48-02159	3.83–5.00	Qbt 3	6.4 (U)	—	62.9	—	2480	26.5	6.5	—	—	14.1	0.32 (UJ)	—	—	—
0448-97-0052	48-02161	0.50–1.00	Sediment	7.3 (U)	—	—	0.73 (U)	—	—	—	—	—	—	0.37 (UJ)	—	—	—
0448-97-0053	48-02161	6.50–7.50	Soil	6.1 (U)	—	—	0.61 (U)	—	75.9	—	—	—	33.2	—	—	—	—
0448-97-0054	48-02162	0.50–1.50	Sediment	5.9 (U)	—	—	0.59 (U)	—	45.3	—	—	—	20.9	—	—	—	—
0448-97-0056	48-02162	2.00–3.00	Soil	6.2 (U)	—	—	0.62 (U)	—	61.6	—	—	—	30.9	—	—	—	—
0448-97-0112	48-02171	0.00–0.83	Soil	3.7 (UJ)	—	—	—	—	—	58.3	—	0.13 (J)	—	—	—	1.3 (U)	80.8
0448-97-0113	48-02171	0.83–1.50	Soil	3 (UJ)	—	—	—	—	—	—	—	—	—	—	—	1.1 (U)	—
0448-97-0115	48-02172	0.00–1.00	Soil	2.7 (UJ)	—	—	—	—	453	177	27.5	0.2	—	—	—	0.96 (U)	66.8
0448-97-0116	48-02172	1.00–2.00	Soil	2.8 (UJ)	—	—	—	—	151	46.7	—	—	—	—	—	1 (U)	58.4
0448-97-0117	48-02172	2.00–3.00	Qbt 2	2.4 (UJ)	2.8	—	—	—	29.6	7.1	—	—	—	0.56 (U)	—	—	—

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.2-3
Radionuclides Detected or Detected above BVs/FVs at AOC 48-001

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Thorium-227	Thorium-230	Uranium-234	Uranium-235	Uranium-238
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**0.023**	**0.054**	**1.31**	**na[c]**	**2.29**	**2.59**	**0.20**	**2.29**
Qbt 2,3,4 Background/Fallout Value[a,b]				**na**	**na**	**na**	**na**	**na**	**na**	**1.98**	**1.98**	**0.09**	**1.93**
Sediment Background/Fallout Value[a,b]				**0.04**	**0.90**	**0.006**	**0.068**	**1.04**	**na**	**2.28**	**2.59**	**0.20**	**2.29**
AAA4494	48-02006	0.00–0.50	Fill	—[d]	—	—	—	—	—	3.88 (J-)	—	—	—
AAA4495	48-02006	1.50–3.00	Fill	—	—	—	—	—	—	4.19 (J-)	—	—	—
AAA3770	48-02006	4.00–5.00	Fill	—	—	—	—	—	—	3.89 (J-)	—	—	—
AAA3407	48-02014	4.00–5.00	Qbt 3	—	—	—	0.045 (J-)	—	—	—	—	—	—
AAA3408	48-02014	7.00–7.20	Soil	—	—	0.092 (J-)	—	—	—	—	—	—	—
AAA3409	48-02014	9.00–10.00	Qbt 3	—	—	0.277 (J-)	—	—	—	—	—	—	—
AAA3497	48-02020	0.00–0.50	Soil	1.16	—	0.162	6.4	—	—	—	—	—	—
AAA3717	48-02024	4.00–5.00	Fill	—	—	—	—	—	—	3.85 (J)	—	—	—
AAA3721	48-02025	5.50–6.50	Fill	—	—	—	—	—	—	3.11 (J)	—	—	—
AAA4476	48-02025	13.00–14.00	Qbt 3	—	—	—	—	—	—	2.07 (J)	—	—	—
AAA3723	48-02026	1.50–2.50	Soil	—	—	5.19 (J)	—	—	—	—	—	—	—
AAA3724	48-02026	6.00–7.40	Soil	5.27 (J-)	—	223 (J)	11.9	—	—	—	—	—	—
AAA4469	48-02026	14.00–15.00	Qbt 3	—	—	—	—	—	—	—	2.04	—	—
AAA3512	48-02054	0.00–0.50	Sediment	0.545	—	—	2.08	—	—	—	—	—	—
AAA3514	48-02054	0.50–1.50	Sediment	0.292	—	—	1.74	—	—	—	3.02	—	2.93 (J+)
AAA3515	48-02054	1.50–2.50	Soil	0.601	—	—	0.935	—	—	2.35 (J+)	—	—	—
AAA3513	48-02055	0.00–0.50	Sediment	0.213	—	—	0.339	—	—	—	—	—	—
AAA3516	48-02055	0.50–1.50	Sediment	0.291	—	—	3.15	—	—	—	—	—	—
AAA3470	48-02055	1.50–2.50	Soil	0.713	—	—	1.07	—	—	—	6.63 (J+)	—	5.64 (J+)

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Thorium-227	Thorium-230	Uranium-234	Uranium-235	Uranium-238
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**0.023**	**0.054**	**1.31**	**na[c]**	**2.29**	**2.59**	**0.20**	**2.29**
Qbt 2,3,4 Background/Fallout Value[a,b]				**na**	**na**	**na**	**na**	**na**	**na**	**1.98**	**1.98**	**0.09**	**1.93**
Sediment Background/Fallout Value[a,b]				**0.04**	**0.90**	**0.006**	**0.068**	**1.04**	**na**	**2.28**	**2.59**	**0.20**	**2.29**
AAA3471	48-02055	2.50–3.50	Soil	0.337	—	—	—	—	—	—	—	—	—
AAA3803	48-02067	0.00–1.00	Soil	—	—	0.0186 (J-)	—	—	—	—	—	—	—
AAA3806	48-02068	0.00–1.00	Soil	—	—	0.0348 (J-)	—	—	—	—	—	—	—
0448-95-0001	48-02080	0.00–0.50	Soil	—	—	0.5	0.07	—	—	—	—	—	—
0448-97-0085	48-02136	0.50–1.00	Soil	—	—	—	—	0.308	—	—	—	—	—
0448-97-0001	48-02150	3.50–4.50	Fill	—	—	—	—	0.46	—	—	—	—	—
0448-97-0002	48-02150	8.50–9.50	Fill	—	—	—	—	0.5	—	—	—	—	—
0448-97-0059	48-02153	0.00–1.00	Soil	—	0.258	—	—	—	—	—	—	—	—
0448-97-0043	48-02155	1.50–2.50	Fill	—	—	—	0.028	—	—	—	—	—	—
0448-97-0044	48-02155	3.67–4.67	Fill	—	—	0.023	0.042	—	—	—	—	—	—
0448-97-0045	48-02155	5.00–6.00	Fill	—	0.118	0.059	0.059	—	—	—	—	—	—
0448-97-0015	48-02157	3.50–4.50	Fill	—	—	4.64	0.218	—	—	—	—	—	—
0448-97-0016	48-02157	5.00–6.00	Fill	—	—	21.847	1.135	0.43	—	—	—	—	—
0448-97-0018	48-02157	9.00–10.00	Soil	—	—	1.205	0.052	—	—	—	—	—	—
0448-97-0019	48-02158	3.50–4.50	Fill	—	—	2.766	0.171	—	—	—	—	—	—
0448-97-0020	48-02158	5.50–6.50	Fill	4.511	—	110.02	5.311	2.9	—	—	—	—	—
0448-97-0021	48-02158	9.00–10.00	Fill	—	—	0.671	0.036	—	—	—	—	—	—
0448-97-0048	48-02159	3.83–5.00	Qbt 3	—	—	—	—	—	0.085	—	—	—	—
0448-97-0052	48-02161	0.50–1.00	Sediment	—	—	—	—	—	0.046	—	—	—	—
0448-97-0053	48-02161	6.50–7.50	Soil	—	—	—	—	—	0.053	—	—	—	—
0448-97-0056	48-02162	2.00–3.00	Soil	—	—	—	—	—	0.068	—	—	—	—

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Thorium-227	Thorium-230	Uranium-234	Uranium-235	Uranium-238
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**0.023**	**0.054**	**1.31**	**na[c]**	**2.29**	**2.59**	**0.20**	**2.29**
Qbt 2,3,4 Background/Fallout Value[a,b]				**na**	**na**	**na**	**na**	**na**	**na**	**1.98**	**1.98**	**0.09**	**1.93**
Sediment Background/Fallout Value[a,b]				**0.04**	**0.90**	**0.006**	**0.068**	**1.04**	**na**	**2.28**	**2.59**	**0.20**	**2.29**
0448-97-0075	48-02164	1.00–2.00	Qbt 3	—	—	—	—	—	—	—	—	0.1033	—
0448-97-0079	48-02166	1.00–2.00	Qbt 3	—	—	—	—	—	—	—	—	0.119	—
0448-97-0071	48-02167	0.00–1.00	Soil	—	0.65	—	—	—	—	—	—	—	—
0448-97-0109	48-02170	0.50–1.20	Soil	—	0.144	—	—	—	—	—	—	—	—
0448-97-0115	48-02172	0.00–1.00	Soil	—	0.244	—	—	—	—	—	—	—	—
0448-97-0116	48-02172	1.00–2.00	Soil	—	0.754	—	—	—	—	—	—	—	—

Note: All values in pCi/g.

[a] Background/fallout values are from LANL 1998, 059730.

[b] Fallout value applies to soil and tuff samples collected from 0–0.5 ft only and applies to sediment samples of all depth.

[c] na = Not available.

[d] — = Analyte not reported (detect or nondetect) above BV/FV or not detected.

Table 5.2-4
Organic Chemicals Detected at AOC 48-001

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzylphthalate	Carbazole	Chrysene	Di-n-butylphthalate	Di-n-octylphthalate	Fluoranthene	Fluorene	Isopropyltoluene[4-]	Methylene Chloride	Phenanthrene	Pyrene	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
0448-95-0068	48-02133	0.00–0.50	Fill	—*	—	—	—	—	—	—	—	—	—	—	—	—	—	0.15 (J)	—	—	—	0.13 (J)	0.16 (J)	—	—	—
0448-95-0070	48-02134	0.00–0.50	Fill	—	—	—	0.12 (J)	0.12 (J)	0.13 (J)	—	—	—	—	—	0.12 (J)	—	—	0.26 (J)	—	—	—	0.22 (J)	0.31 (J)	—	—	—
0448-97-0037	48-02142	3.33–4.33	Fill	—	0.006 (J)	—	—	—	—	—	0.18 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0039	48-02142	4.66–5.12	Fill	—	0.014 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.002 (J)	—	—	—	—	—
0448-97-0040	48-02148	3.30–4.30	Fill	—	0.01 (J)	—	—	—	—	—	0.092 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0041	48-02148	4.66–5.16	Fill	—	0.018 (J)	—	—	—	—	—	0.23 (J)	—	—	—	—	—	—	—	—	—	0.004 (J)	—	—	—	—	—
0448-97-0043	48-02155	1.50–2.50	Fill	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.047 (J)	—	—	—
0448-97-0044	48-02155	3.67–4.67	Fill	—	0.041	—	—	—	—	—	110	—	20	—	—	9.6 (J)	14 (J)	—	—	—	—	—	—	—	—	—
0448-97-0045	48-02155	5.00–6.00	Fill	—	0.016 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0047	48-02159	0.50–1.50	Sediment	—	—	—	0.086 (J)	0.11 (J)	0.12 (J)	0.058 (J)	—	—	—	—	0.12 (J)	—	—	0.17 (J)	—	—	—	0.07 (J)	0.17 (J)	0.004 (J)	0.014	—
0448-97-0052	48-02161	0.50–1.00	Sediment	0.061 (J)	—	0.13 (J)	0.53	0.51	0.66	0.28 (J)	—	—	—	0.12 (J)	0.59	—	—	1.2	0.053 (J)	—	—	0.6	1	—	0.004 (J)	—
0448-97-0053	48-02161	6.50–7.50	Soil	—	—	—	0.064 (J)	0.069 (J)	0.088 (J)	—	—	—	—	—	0.082 (J)	—	—	0.15 (J)	—	—	—	0.078 (J)	0.12 (J)	—	0.005 (J)	—
0448-97-0054	48-02162	0.50–1.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.004 (J)	—	—	—	—	—
0448-97-0056	48-02162	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.004 (J)	—
0448-97-0112	48-02171	0.00–0.83	Soil	—	—	—	0.17 (J)	0.19 (J)	0.35 (J)	—	—	—	—	—	0.2 (J)	—	—	0.16 (J)	—	—	—	—	0.61 (J)	—	—	—
0448-97-0113	48-02171	0.83–1.50	Soil	—	—	—	—	—	—	—	—	0.089 (J+)	—	—	—	—	—	—	—	0.067 (J+)	—	—	—	—	—	—
0448-97-0115	48-02172	0.00–1.00	Soil	—	—	—	0.31 (J)	0.34 (J)	0.62 (J)	—	—	—	—	—	0.38 (J)	—	—	0.32 (J)	—	—	—	0.31 (J)	1.5 (J)	—	—	0.004 (J)
0448-97-0116	48-02172	1.00–2.00	Soil	—	—	—	0.15 (J)	—	—	—	—	—	—	—	0.16 (J)	—	—	0.13 (J)	—	—	—	0.21 (J)	0.71 (J)	—	—	—

Note: All values in mg/kg.
* — = Analyte not detected.

Table 5.3-1
Samples Collected at SWMU 48-002(a)

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium
AAA4494	48-02006	0–0.5	Fill	—[a]	—	15290[b]	15290	15290	15290
AAA4493	48-02006	0.5–1.5	Fill	—	—	15290	15290	15290	15290
AAA4495	48-02006	1.5–3	Fill	—	—	15290	15290	15290	15290
AAA3769	48-02006	3–4	Fill	—	—	15290	15290	15290	15290
AAA3770	48-02006	4–5	Fill	—	—	15290	15290	15290	15290
AAA3771	48-02006	5–6	Fill	—	—	15290	15290	15290	15290
AAA3772	48-02006	6–7	Fill	—	—	15290	15290	15290	15290
AAA3773	48-02006	7–8	Fill	—	—	15290	15290	15290	15290
0448-95-0068	48-02133	0–0.5	Fill	1050	1049	—	—	—	—
0448-95-0070	48-02134	0–0.5	Fill	1050	1049	—	—	—	—

[a] — =Analysis not requested.

[b] Analytical request number.

Table 5.3-2
Inorganic Chemicals above BVs at SWMU 48-002(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Mercury
Soil Background Value[a]				**0.83**	**0.1**
0448-95-0068	48-02133	0.00–0.50	Fill	0.88 (J)	22.4
0448-95-0070	48-02134	0.00–0.50	Fill	—[b]	0.6

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.3-3
Radionuclide Detected above the BV at SWMU 48-002(a)

Sample ID	Location ID	Depth (ft)	Media	Thorium-230
Soil Background Value*				**2.29**
AAA4494	48-02006	0.00–0.50	Fill	3.88 (J-)
AAA4495	48-02006	1.50–3.00	Fill	4.19 (J-)
AAA3770	48-02006	4.00–5.00	Fill	3.89 (J-)

Note: All values in pCi/g.

* Background value is from LANL 1998, 059730.

Table 5.3-4
Organic Chemicals Detected at SWMU 48-002(a)

Sample ID	Location ID	Depth (ft)	Media	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Fluoranthene	Phenanthrene	Pyrene
0448-95-0068	48-02133	0.00–0.50	Fill	—*	—	—	—	0.15 (J)	0.13 (J)	0.16 (J)
0448-95-0070	48-02134	0.00–0.50	Fill	0.12 (J)	0.12 (J)	0.13 (J)	0.12 (J)	0.26 (J)	0.22 (J)	0.31 (J)

Note: All values in mg/kg.

* — = Analyte not detected.

Table 5.3-5
Proposed Sampling at SWMU 48-002(a) and SWMU 48-002(b)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and extent of potential contamination	2a-1	Former storage areas	Surface	X	X	X	X	X	X	X	X	—*	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of potential contamination	2a-2	Former storage areas	Surface	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	2a-3	Former storage areas	Surface	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	2a-4	Former storage areas	Surface	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of potential contamination	2a-5	Former storage areas	Surface	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	2a-6	Former storage areas	Surface	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	2a-7	Former storage areas	Surface	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—

Table 5.3-5 (continued)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and extent of potential contamination	2a-8	Downgradient of former storage areas	Surface	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	2a-9	Downgradient of former storage areas	Surface	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	2a-10	Downgradient of former storage areas	Surface	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	2a-11	Downgradient of former storage areas	Surface	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	2a-12	Downgradient of former storage areas	Surface	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	2a-13	Downgradient of former storage areas	Surface	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.5-1
Samples Collected at AOC 48-002(e)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium
AAA3545	48-02037	0–0.5	Fill	15333[a]	15333	15333	15333	15333
AAA3546	48-02037	0.5–1.5	Fill	15333	—[b]	15333	15333	15333
AAA3547	48-02037	1.5–3	Soil	15333	—	15333	15333	15333
AAA3782	48-02057	0–0.5	Soil	15333	—	15333	15333	15333
0448-97-0032	48-02135	0–1	Fill	—	2920	—	—	—
0448-97-0033	48-02135	1–2	Fill	—	2920	—	—	—
0448-97-0034	48-02135	2–3.25	Fill	—	2920	—	—	—

[a] Analytical request number.

[b] — =Analysis not requested.

Table 5.5-2
Proposed Sampling at AOC 48-002(e)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	Americium-241	Isotopic Thorium	Cyanide	pH	Dioxins/furans
Determine nature and extent of potential contamination	2e-1	Former waste accumulation area	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
Determine nature and extent of potential contamination	2e-2	Former waste accumulation area	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
Determine nature and extent of potential contamination	2e-3	Downgradient of former waste accumulation area	Surface Soil/tuff interface 5 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X

Table 5.6-1
Samples Collected at SWMU 48-003

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	Americium-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Strontium-90
AAA3401	48-02010	4–5	Qbt 3	—[a]	—	—	15162[b]	15162	15162	15162	—
AAA3402	48-02010	8.5–9.5	Qbt 3	—	—	—	15162	15162	15162	15162	—
AAA3403	48-02010	14–15	Qbt 3	—	—	—	15162	15162	15162	15162	—
AAA3404	48-02012	4–5	Qbt 3	—	—	—	15162	15162	15162	15162	—
AAA3405	48-02012	9–10	Qbt 3	—	—	—	15162	15162	15162	15162	—
AAA3406	48-02012	14–15	Qbt 3	—	—	—	15162	15162	15162	15162	—
AAA3407	48-02014	4–5	Qbt 3	—	—	—	15162	15162	15162	15162	—
AAA3408	48-02014	7–7.2	Soil	—	—	—	15162	15162	15162	15162	—
AAA3409	48-02014	9–10	Qbt 3	—	—	—	15162	15162	15162	15162	—
AAA4473	48-02014	14–15	Qbt 3	—	—	—	15162	15162	15162	15162	—
AAA3493	48-02016	0–0.5	Soil	—	—	15128	15128	15128	15128	15128	—
AAA3494	48-02017	0–0.5	Soil	—	—	15128	15128	15128	15128	15128	—
AAA3495	48-02018	0–0.5	Soil	—	—	15128	15128	15128	15128	15128	—
AAA3496	48-02019	0–0.5	Soil	—	—	15128	15128	15128	15128	15128	—
AAA3497	48-02020	0–0.5	Soil	—	—	15128	15128	15128	15128	15128	—
AAA3512	48-02054	0–0.5	Sediment	—	—	15128	15128	15128	15128	15128	—
AAA3514	48-02054	0.5–1.5	Sediment	—	—	15128	—	15128	15128	15128	—
AAA3515	48-02054	1.5–2.5	Soil	—	—	15128	—	15128	15128	15128	—
AAA3513	48-02055	0–0.5	Sediment	—	—	15128	15128	15128	15128	15128	—
AAA3516	48-02055	0.5–1.5	Sediment	—	—	15128	—	15128	15128	15128	—
AAA3470	48-02055	1.5–2.5	Soil	—	—	15128	—	15128	15128	15128	—
AAA3471	48-02055	2.5–3.5	Soil	—	—	15128	—	15128	15128	15128	—
0448-97-0084	48-02136	0–0.5	Soil	2996	2995	—	2997	2997	2997	2997	2997
0448-97-0085	48-02136	0.5–1	Soil	2996	2995	—	2997	2997	2997	2997	2997
0448-97-0087	48-02137	0–1	Soil	2996	2995	—	2997	2997	2997	2997	2997
0448-97-0089	48-02137	1–2	Soil	2996	2995	—	2997	2997	2997	2997	2997
0448-97-0091	48-02138	0–0.5	Sediment	2996	2995	—	2997	2997	2997	2997	2997
0448-97-0092	48-02138	0.5–1	Soil	2996	2995	—	2997	2997	2997	2997	2997
0448-97-0094	48-02139	0–1	Soil	2996	2995	—	2997	2997	2997	2997	2997
0448-97-0096	48-02139	1–2	Soil	2996	2995	—	2997	2997	2997	2997	2997
0448-97-0098	48-02140	0–1	Soil	2996	2995	—	2997	2997	2997	2997	2997
0448-97-0099	48-02140	1–2	Soil	2996	2995	—	2997	2997	2997	2997	2997

[a] — =Analysis not requested.

[b] Analytical request number.

Table 5.6-2
Inorganic Chemicals above BVs at SWMU 48-003

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium
Soil Background Value*				**0.83**	**0.4**
Sediment Background Value*				**0.83**	**0.4**
0448-97-0084	48-02136	0.00–0.50	Soil	5.8 (U)	0.58 (U)
0448-97-0085	48-02136	0.50–1.00	Soil	5.49 (U)	0.549 (U)
0448-97-0087	48-02137	0.00–1.00	Soil	6.17 (U)	0.617 (U)
0448-97-0089	48-02137	1.00–2.00	Soil	5.51 (U)	0.551 (U)
0448-97-0091	48-02138	0.00–0.50	Sediment	6.67 (U)	0.667 (U)
0448-97-0092	48-02138	0.50–1.00	Soil	6.04 (U)	0.604 (U)
0448-97-0094	48-02139	0.00–1.00	Soil	5.9 (U)	0.59 (U)
0448-97-0096	48-02139	1.00–2.00	Soil	5.5 (U)	0.55 (U)
0448-97-0098	48-02140	0.00–1.00	Soil	5.39 (U)	0.539 (U)
0448-97-0099	48-02140	1.00–2.00	Soil	5.7 (U)	0.57 (U)

Note: All values in mg/kg.

* Background values are from LANL 1998, 059730.

Table 5.6-3
Radionuclides Detected or Detected above BVs at SWMU 48-003

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Thorium-230	Uranium-234	Uranium-238
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**na[c]**	**0.023**	**0.054**	**1.31**	**2.29**	**2.59**	**2.29**
Qbt 2,3,4 Background/Fallout Value[a,b]				**na**	**na**	**na**	**na**	**na**	**na**	**1.98**	**1.98**	**1.93**
Sediment Background/Fallout Value[a,b]				**0.04**	**0.90**	**na**	**0.006**	**0.068**	**1.04**	**2.29**	**2.59**	**2.29**
AAA3407	48-02014	4.00–5.00	Qbt 3	—[d]	—	—	—	0.045 (J-)	—	—	—	—
AAA3408	48-02014	7.00–7.20	Soil	—	—	—	0.092 (J-)	—	—	—	—	—
AAA3409	48-02014	9.00–10.00	Qbt 3	—	—	—	0.277 (J-)	—	—	—	—	—
AAA3496	48-02019	0.00–0.50	Soil	0.153	2.549	—	—	0.941	—	—	3.48	3.97 (J+)
AAA3497	48-02020	0.00–0.50	Soil	1.16	—	—	0.162	6.4	—	—	—	—
AAA3512	48-02054	0.00–0.50	Sediment	0.545	—	—	—	2.08	—	—	—	—
AAA3514	48-02054	0.50–1.50	Sediment	0.292	—	—	—	1.74	—	—	3.02	2.93 (J+)
AAA3515	48-02054	1.50–2.50	Soil	0.601	—	—	—	0.935	—	2.35 (J+)	—	—
AAA3513	48-02055	0.00–0.50	Sediment	0.213	—	—	—	0.339	—	—	—	—
AAA3516	48-02055	0.50–1.50	Sediment	0.291	—	—	—	3.15	—	—	—	—
AAA3470	48-02055	1.50–2.50	Soil	0.713	—	—	—	1.07	—	—	6.63 (J+)	5.64 (J+)
AAA3471	48-02055	2.50–3.50	Soil	0.337	—	—	—	—	—	—	—	—
0448-97-0085	48-02136	0.50–1.00	Soil	—	—	—	—	—	0.308	—	—	—
0448-97-0087	48-02137	0.00–1.00	Soil	—	0.2932	—	—	0.0158	0.476	—	—	—
0448-97-0094	48-02139	0.00–1.00	Soil	—	0.6592	—	—	0.036	—	—	—	—

Table 5.6-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Thorium-230	Uranium-234	Uranium-238
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**na[c]**	**0.023**	**0.054**	**1.31**	**2.29**	**2.59**	**2.29**
Qbt 2,3,4 Background/Fallout Value[a,b]				**na**	**na**	**na**	**na**	**na**	**na**	**1.98**	**1.98**	**1.93**
Sediment Background/Fallout Value[a,b]				**0.04**	**0.90**	**na**	**0.006**	**0.068**	**1.04**	**2.29**	**2.59**	**2.29**
0448-97-0098	48-02140	0.00–1.00	Soil	—	0.1322	0.0795	—	—	—	—	—	—
0448-97-0099	48-02140	1.00–2.00	Soil	—	0.3036	—	—	0.0225	0.834	—	—	—

Note: All values in pCi/g.

[a] Background/fallout values are from LANL 1998, 059730.

[b] Fallout value applies to soil and tuff samples collected from 0–0.5 ft only and applies to sediment samples of all depth.

[c] na = Not available.

[d] — = Analyte not reported (detect or nondetect) above BV/FV or not detected.

Table 5.6-4
Organic Chemicals Detected at SWMU 48-003

Sample ID	Location ID	Depth (ft)	Media	Benzoic Acid	Bis(2-ethylhexyl)phthalate
0448-97-0087	48-02137	0.00–1.00	Soil	0.18 (J)	—*
0448-97-0089	48-02137	1.00–2.00	Soil	—	0.092 (J)
0448-97-0091	48-02138	0.00–0.50	Sediment	0.13 (J)	—
0448-97-0096	48-02139	1.00–2.00	Soil	—	0.082 (J)

Note: All values in mg/kg.

* — = Analyte not detected.

Table 5.6-4
Proposed Sampling at SWMU 48-003

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Hexavalent Chromium	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	Americium-241	Strontium-90	Isotopic Thorium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and extent of potential contamination	3-1 through 3-4	Former leachfield	Surface	X	X	X	X	X	X	X	X	X	X	X	X	—*	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of potential contamination	3-5 through 3-13	Downgradient of former leachfield	Surface	X	X	X	X	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	3-14	Downgradient of former leachfield	Surface	X	X	X	X	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of potential contamination	3-15 through 3-7	Downgradient of former leachfield	Surface	X	X	X	X	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	3-18	Downgradient of former leachfield	Surface	X	X	X	X	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine if septic system discharged to the drainage.	3-19 through 3-3	Sediment Pocket	Sediment	X	X	X	X	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.8-1
Samples Collected at SWMU 48-005

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Strontium-90
AAA3717	48-02024	4–5	Fill	—[a]	—	—	15213[b]	—	15213	15213	15213	—
AAA3718	48-02024	8–9	Fill	—	—	—	15213	15213	15213	15213	15213	—
AAA3719	48-02024	14–15	Qbt 3	—	—	—	15213	—	15213	15213	15213	—
AAA3720	48-02025	4–5	Fill	—	—	—	15213	—	15213	15213	15213	—
AAA3721	48-02025	5.5–6.5	Fill	—	—	—	15213	15213	15213	15213	15213	—
AAA3722	48-02025	7.5–8.5	Fill	—	—	—	15213	—	15213	15213	15213	—
AAA4475	48-02025	9–10	Qbt 4	—	—	—	15213	—	15213	15213	15213	—
AAA4476	48-02025	13–14	Qbt 3	—	—	—	15213	—	15213	15213	15213	—
AAA3723	48-02026	1.5–2.5	Soil	—	—	—	15213	—	15213	15213	15213	—
AAA3724	48-02026	6–7.4	Soil	—	—	—	15213	—	15213	15213	15213	—
AAA4469	48-02026	14–15	Qbt 3	—	—	—	15213	—	15213	15213	15213	—
AAA3803	48-02067	0–1	Soil	—	16178	—	16193	—	16193	16193	16193	—
AAA3804	48-02067	1–2	Soil	—	16178	—	16193	—	16193	16193	16193	—
AAA3806	48-02068	0–1	Soil	—	16178	—	16193	—	16193	16193	16193	—
AAA3810	48-02069	0–1	Soil	—	16178	—	16193	16193	16193	16193	16193	—
AAA3811	48-02069	1–2	Qbt 4	—	16178	—	16193	—	16193	16193	16193	—
0448-97-0009	48-02141	11.5–12.5	Fill	—	—	—	—	2906	—	—	—	—
0448-97-0011	48-02141	12.5–13.5	Qbt 4	—	—	—	—	2906	—	—	—	—
0448-97-0037	48-02142	3.33–4.33	Fill	2980	2979	2979	—	2981	2981	2981	2981	2981
0448-97-0039	48-02142	4.66–5.12	Fill	2980	2979	2979	—	2981	2981	2981	2981	2981
0448-97-0040	48-02148	3.3–4.3	Fill	2980	2979	2979	—	2981	2981	2981	2981	2981

Table 5.8-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Strontium-90
0448-97-0041	48-02148	4.66–5.16	Fill	2980	2979	2979	—	2981	2981	2981	2981	2981
0448-97-0001	48-02150	3.5–4.5	Fill	—	—	—	—	2906	—	2906	2906	2906
0448-97-0002	48-02150	8.5–9.5	Fill	—	—	—	—	2906	—	2906	2906	2906
0448-97-0003	48-02150	14–15	Qbt 4	—	—	—	—	2906	—	2906	2906	2906
0448-97-0004	48-02151	6–7	Fill	—	—	—	—	2906	—	2906	2906	2906
0448-97-0006	48-02151	13.5–14.5	Fill	—	—	—	—	2906	—	2906	2906	2906
0448-97-0007	48-02151	15.5–16.5	Fill	—	—	—	—	2906	—	2906	2906	2906
0448-97-0057	48-02152	0–1	Soil	—	—	—	—	2977	—	2977	2977	2977
0448-97-0058	48-02152	1–2	Soil	—	—	—	—	2977	—	2977	2977	2977
0448-97-0059	48-02153	0–1	Soil	—	—	—	—	2977	—	2977	2977	2977
0448-97-0060	48-02153	1–2	Soil	—	—	—	—	2977	—	2977	2977	2977
0448-97-0062	48-02154	0–0.83	Sediment	—	—	—	—	2977	—	2977	2977	2977
0448-97-0061	48-02154	0.83–1.67	Soil	—	—	—	—	2977	—	2977	2977	2977
0448-97-0043	48-02155	1.5–2.5	Fill	2918	2917	2917	—	2919	2919	2919	2919	2919
0448-97-0044	48-02155	3.67–4.67	Fill	2918	2917	2917	—	2919	2919	2919	2919	2919
0448-97-0045	48-02155	5–6	Fill	2918	2917	2917	—	2919	2919	2919	2919	2919
0448-97-0012	48-02156	17.5–18.5	Fill	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0013	48-02156	21–22	Fill	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0014	48-02156	24–25	Qbt 3	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0015	48-02157	3.5–4.5	Fill	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0016	48-02157	5–6	Fill	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0018	48-02157	9–10	Soil	—	—	—	—	2906	2906	2906	2906	2906

Table 5.8-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Strontium-90
0448-97-0019	48-02158	3.5–4.5	Fill	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0020	48-02158	5.5–6.5	Fill	—	—	—	—	2906	2906	2906	2906	2906
0448-97-0021	48-02158	9–10	Fill	—	—	—	—	2906	2906	2906	2906	2906

[a] — =Analysis not requested.

[b] Analytical request number.

Table 5.8-2
Inorganic Chemicals above BVs at SWMU 48-005

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Mercury	Silver	Zinc
Soil Background Value[a]				**0.83**	**0.4**	**19.3**	**0.1**	**1**	**48.8**
0448-97-0037	48-02142	3.33–4.33	Fill	5.4 (U)	0.54 (U)	—[b]	—	—	—
0448-97-0039	48-02142	4.66–5.12	Fill	5.54 (U)	0.554 (U)	—	—	—	—
0448-97-0040	48-02148	3.30–4.30	Fill	5.69 (U)	0.569 (U)	—	—	—	—
0448-97-0041	48-02148	4.66–5.16	Fill	5.79 (U)	0.579 (U)	—	—	—	—
0448-97-0043	48-02155	1.50–2.50	Fill	12 (UJ)	0.6 (U)	—	0.12 (U)	2.4 (U)	—
0448-97-0044	48-02155	3.67–4.67	Fill	12 (UJ)	0.59 (U)	26	0.12 (U)	2.4 (U)	74
0448-97-0045	48-02155	5.00–6.00	Fill	12 (UJ)	0.59 (U)	20	0.12 (U)	2.4 (U)	—

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.8-3
Radionuclides Detected or Detected above the BVs at SWMU 48-005

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Thorium-230	Uranium-234
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**0.023**	**0.054**	**1.31**	**2.29**	**2.59**
Qbt 2,3,4 Background/Fallout Value[a,b]				**na[c]**	**na**	**na**	**na**	**na**	**1.98**	**1.98**
AAA3717	48-02024	4.00–5.00	Fill	—[d]	—	—	—	—	3.85 (J)	—
AAA3721	48-02025	5.50–6.50	Fill	—	—	—	—	—	3.11 (J)	—
AAA4476	48-02025	13.00–14.00	Qbt 3	—	—	—	—	—	2.07 (J)	—
AAA3723	48-02026	1.50–2.50	Soil	—	—	5.19 (J)	—	—	—	—
AAA3724	48-02026	6.00–7.40	Soil	5.27 (J-)	—	223 (J)	11.9	—	—	—
AAA4469	48-02026	14.00–15.00	Qbt 3	—	—	—	—	—	—	2.04
AAA3803	48-02067	0.00–1.00	Soil	—	—	0.0186 (J-)	—	—	—	—
AAA3806	48-02068	0.00–1.00	Soil	—	—	0.0348 (J-)	—	—	—	—
0448-97-0001	48-02150	3.50–4.50	Fill	—	—	—	—	0.46	—	—
0448-97-0002	48-02150	8.50–9.50	Fill	—	—	—	—	0.5	—	—
0448-97-0059	48-02153	0.00–1.00	Soil	—	0.258	—	—	—	—	—
0448-97-0043	48-02155	1.50–2.50	Fill	—	—	—	0.028	—	—	—
0448-97-0044	48-02155	3.67–4.67	Fill	—	—	0.023	0.042	—	—	—
0448-97-0045	48-02155	5.00–6.00	Fill	—	0.118	0.059	0.059	—	—	—
0448-97-0015	48-02157	3.50–4.50	Fill	—	—	4.64	0.218	—	—	—

Table 5.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Thorium-230	Uranium-234
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**0.023**	**0.054**	**1.31**	**2.29**	**2.59**
Qbt 2,3,4 Background/Fallout Value[a,b]				**na[c]**	**na**	**na**	**na**	**na**	**1.98**	**1.98**
0448-97-0016	48-02157	5.00–6.00	Fill	—	—	21.847	1.135	0.43	—	—
0448-97-0018	48-02157	9.00–10.00	Soil	—	—	1.205	0.052	—	—	—
0448-97-0019	48-02158	3.50–4.50	Fill	—	—	2.766	0.171	—	—	—
0448-97-0020	48-02158	5.50–6.50	Fill	4.511	—	110.02	5.311	2.9	—	—
0448-97-0021	48-02158	9.00–10.00	Fill	—	—	0.671	0.036	—	—	—

Note: All values in pCi/g.

[a] Background/fallout values are from LANL 1998, 059730.

[b] Fallout value applies to samples collected from 0–0.5 ft only.

[c] na = Not available.

[d] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.8-4
Organic Chemicals Detected at SWMU 48-005

Sample ID	Location ID	Depth (ft)	Media	Acetone	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Di-n-butylphthalate	Di-n-octylphthalate	Methylene Chloride	Pyrene
0448-97-0037	48-02142	3.33–4.33	Fill	0.006 (J)	0.18 (J)	—*	—	—	—	—
0448-97-0039	48-02142	4.66–5.12	Fill	0.014 (J)	—	—	—	—	0.002 (J)	—
0448-97-0040	48-02148	3.30–4.30	Fill	0.01 (J)	0.092 (J)	—	—	—	—	—
0448-97-0041	48-02148	4.66–5.16	Fill	0.018 (J)	0.23 (J)	—	—	—	0.004 (J)	—
0448-97-0043	48-02155	1.50–2.50	Fill	—	—	—	—	—	—	0.047 (J)
0448-97-0044	48-02155	3.67–4.67	Fill	0.041	110	20	9.6 (J)	14 (J)	—	—
0448-97-0045	48-02155	5.00–6.00	Fill	0.016 (J)	—	—	—	—	—	—

Note: All values in mg/kg.

* — = Analyte not detected.

Table 5.9-1
Samples Collected at Consolidated Unit 48-007(a)-00

Sample ID	Location ID	Depth (ft)	Media	Metals	SVOCs	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Strontium-90
0448-95-0001	48-02080	0–0.5	Soil	224[a]	—[b]	—	—	225	—	225	—
0448-95-0005	48-02082	0–0.5	Soil	224	—	—	—	—	—	—	—
0448-97-0047	48-02159	0.5–1.5	Sediment	2944	2943	2943	2945	2945	2945	2945	2945
0448-97-0048	48-02159	3.83–5	Qbt 3	2944	2943	2943	2945	2945	2945	2945	2945
0448-97-0052	48-02161	0.5–1	Sediment	2944	2943	2943	2945	2945	2945	2945	2945
0448-97-0053	48-02161	6.5–7.5	Soil	2944	2943	2943	2945	2945	2945	2945	2945
0448-97-0054	48-02162	0.5–1.5	Sediment	2944	2943	2943	2945	2945	2945	2945	2945
0448-97-0056	48-02162	2–3	Soil	2944	2943	2943	2945	2945	2945	2945	2945
0448-97-0112	48-02171	0–0.83	Soil	3258R	3257R	3257R	3259R	3259R	3259R	3259R	3259R
0448-97-0113	48-02171	0.83–1.5	Soil	3258R	3257R	3257R	3259R	3259R	3259R	3259R	3259R
0448-97-0115	48-02172	0–1	Soil	3258R	3257R	3257R	3259R	3259R	3259R	3259R	3259R
0448-97-0116	48-02172	1–2	Soil	3258R	3257R	3257R	3259R	3259R	3259R	3259R	3259R
0448-97-0117	48-02172	2–3	Qbt 2	3258R	3257R	3257R	3259R	3259R	3259R	3259R	3259R
0448-97-0118	48-02173	0–1	Soil	3258R	3257R	3257R	3259R	3259R	3259R	3259R	3259R
0448-97-0120	48-02173	1–2	Soil	3258R	3257R	3257R	3259R	3259R	3259R	3259R	3259R
0448-97-0121	48-02173	2–3	Soil	3258R	3257R	3257R	3259R	3259R	3259R	3259R	3259R

[a] Analytical request number.

[b] — =Analysis not requested.

Table 5.9-2
Inorganic Chemicals above BVs at Consolidated Unit 48-007(a)-00

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Thallium	Zinc
Soil Background Value[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**0.1**	**15.4**	**1.52**	**0.73**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**4.66**	**11.2**	**0.1**	**6.58**	**0.3**	**1.1**	**63.5**
Sediment Background Value[a]				**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**11.2**	**19.7**	**0.1**	**9.38**	**0.3**	**0.73**	**60.2**
0448-97-0047	48-02159	0.50–1.50	Sediment	7.2 (U)	—[b]	—	0.72 (U)	—	—	—	—	—	—	0.36 (UJ)	—	—
0448-97-0048	48-02159	3.83–5.00	Qbt 3	6.4 (U)	—	62.9	—	2480	26.5	6.5	—	—	14.1	0.32 (UJ)	—	—
0448-97-0052	48-02161	0.50–1.00	Sediment	7.3 (U)	—	—	0.73 (U)	—	—	—	—	—	—	0.37 (UJ)	—	—
0448-97-0053	48-02161	6.50–7.50	Soil	6.1 (U)	—	—	0.61 (U)	—	75.9	—	—	—	33.2	—	—	—
0448-97-0054	48-02162	0.50–1.50	Sediment	5.9 (U)	—	—	0.59 (U)	—	45.3	—	—	—	20.9	—	—	—
0448-97-0056	48-02162	2.00–3.00	Soil	6.2 (U)	—	—	0.62 (U)	—	61.6	—	—	—	30.9	—	—	—
0448-97-0112	48-02171	0.00–0.83	Soil	3.7 (UJ)	—	—	—	—	—	58.3	—	0.13 (J)	—	—	1.3 (U)	80.8
0448-97-0113	48-02171	0.83–1.50	Soil	3 (UJ)	—	—	—	—	—	—	—	—	—	—	1.1 (U)	—
0448-97-0115	48-02172	0.00–1.00	Soil	2.7 (UJ)	—	—	—	—	453	177	27.5	0.2	—	—	0.96 (U)	66.8
0448-97-0116	48-02172	1.00–2.00	Soil	2.8 (UJ)	—	—	—	—	151	46.7	—	—	—	—	1 (U)	58.4
0448-97-0117	48-02172	2.00–3.00	Qbt 2	2.4 (UJ)	2.8	—	—	—	29.6	7.1	—	—	—	0.56 (U)	—	—
0448-97-0118	48-02173	0.00–1.00	Soil	2.5 (UJ)	—	—	—	—	250	80.9	—	—	—	—	0.88 (U)	55.6
0448-97-0120	48-02173	1.00–2.00	Soil	2.7 (UJ)	9.9	—	—	—	1080	98.5	—	—	—	—	0.97 (U)	86.1
0448-97-0121	48-02173	2.00–3.00	Soil	2.5 (UJ)	—	—	—	—	336	39.6	—	—	—	—	0.91 (U)	51.2

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.9-3
Radionuclides Detected or Detected above the FVs at Consolidated Unit 48-007(a)-00

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/Plutonium-240	Thorium-227
Soil Background/Fallout Value[a,b]				**1.65**	**0.023**	**0.054**	**na[c]**
Qbt 2,3,4 Background/Fallout Value[a,b]				**na**	**na**	**na**	**na**
Sediment Background/Fallout Value[a,b]				**0.9**	**0.006**	**0.068**	**na**
0448-95-0001	48-02080	0.00–0.50	Soil	—[d]	0.5	0.07	—
0448-97-0048	48-02159	3.83–5.00	Qbt 3	—	—	—	0.085
0448-97-0052	48-02161	0.50–1.00	Sediment	—	—	—	0.046
0448-97-0053	48-02161	6.50–7.50	Soil	—	—	—	0.053
0448-97-0056	48-02162	2.00–3.00	Soil	—	—	—	0.068
0448-97-0115	48-02172	0.00–1.00	Soil	0.244	—	—	—
0448-97-0116	48-02172	1.00–2.00	Soil	0.754	—	—	—
0448-97-0120	48-02173	1.00–2.00	Soil	0.614	—	0.448	—

Note: All values in pCi/g.

[a] Background/fallout values are from LANL 1998, 059730.

[b] Fallout value applies to soil and tuff samples collected from 0–0.5 ft only and applies to sediment samples of all depth.

[c] na = Not available.

[d] — = Analyte not reported (detect or nondetect) above BV/FV or not detected.

Table 5.9-4
Organic Chemicals Detected at Consolidated Unit 48-007(a)-00

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Carbazole	Chrysene	Fluoranthene	Fluorene	Isopropyltoluene[4-]	Methylene Chloride	Phenanthrene	Pyrene	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
0448-97-0047	48-02159	0.50–1.50	Sediment	—*	—	0.086 (J)	0.11 (J)	0.12 (J)	0.058 (J)	—	—	—	0.12 (J)	0.17 (J)	—	—	—	0.07 (J)	0.17 (J)	0.004 (J)	0.014	—
0448-97-0052	48-02161	0.50–1.00	Sediment	0.061 (J)	0.13 (J)	0.53	0.51	0.66	0.28 (J)	—	—	0.12 (J)	0.59	1.2	0.053 (J)	—	—	0.6	1	—	0.004 (J)	—
0448-97-0053	48-02161	6.50–7.50	Soil	—	—	0.064 (J)	0.069 (J)	0.088 (J)	—	—	—	—	0.082 (J)	0.15 (J)	—	—	—	0.078 (J)	0.12 (J)	—	0.005 (J)	—
0448-97-0054	48-02162	0.50–1.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	0.004 (J)	—	—	—	—	—
0448-97-0056	48-02162	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.004 (J)	—
0448-97-0112	48-02171	0.00–0.83	Soil	—	—	0.17 (J)	0.19 (J)	0.35 (J)	—	—	—	—	0.2 (J)	0.16 (J)	—	—	—	—	0.61 (J)	—	—	—
0448-97-0113	48-02171	0.83–1.50	Soil	—	—	—	—	—	—	—	0.089 (J+)	—	—	—	—	0.067 (J+)	—	—	—	—	—	—
0448-97-0115	48-02172	0.00–1.00	Soil	—	—	0.31 (J)	0.34 (J)	0.62 (J)	—	—	—	—	0.38 (J)	0.32 (J)	—	—	—	0.31 (J)	1.5 (J)	—	—	0.004 (J)
0448-97-0116	48-02172	1.00–2.00	Soil	—	—	0.15 (J)	—	—	—	—	—	—	0.16 (J)	0.13 (J)	—	—	—	0.21 (J)	0.71 (J)	—	—	—
0448-97-0118	48-02173	0.00–1.00	Soil	—	—	0.21 (J)	0.17 (J)	0.28 (J)	—	—	—	—	0.23 (J)	0.19 (J)	—	—	—	0.23 (J)	0.76 (J)	—	—	—
0448-97-0120	48-02173	1.00–2.00	Soil	—	—	0.15 (J)	—	—	—	0.091 (J)	—	—	0.16 (J)	0.17 (J)	—	—	—	0.26 (J)	0.71 (J)	0.004 (J)	—	—
0448-97-0121	48-02173	2.00–3.00	Soil	—	—	—	—	—	—	0.19 (J)	—	—	—	—	—	—	—	—	—	—	—	—

Note: All values in mg/kg.

*— = Analyte not detected.

Table 5.9-5
Proposed Sampling at Consolidated Unit 48-007(a)-00

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Hexavalent Chromium	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	Isotopic Thorium	Strontium-90	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and extent of potential contamination	7a-1	Near location 48-02162	Surface	X	X	X	X	X	X	X	X	X	X	X	—*	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	7a-2	West side of surface impoundment	Surface	X	X	X	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of potential contamination	7a-3	West side of surface impoundment	Surface	X	X	X	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	7a-4	Downgradient of surface impoundment	Surface	X	X	X	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	7a-5	Downgradient of surface impoundment	Surface	X	X	X	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of potential contamination	7a-6	Downgradient of surface impoundment	Surface	X	X	X	X	X	X	X	X	X	X	X		X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.10-1
Samples Collected at SWMU 48-007(b)

Sample ID	Location ID	Depth (ft)	Media	Gamma Spectroscopy
0448-97-0071	48-02167	0–1	Soil	2955*
0448-97-0072	48-02167	1–2	Soil	2955
0448-97-0081	48-02168	0–0.83	Sediment	2977
0448-97-0082	48-02168	0.83–1.67	Soil	2977

* Analytical request number.

Table 5.10-2
Radionuclides Detected at SWMU 48-007(b)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137
Soil Fallout Value[a,b]				**1.65**
0448-97-0071	48-02167	0.00–1.00	Soil	0.65

Note: All values in pCi/g.

[a] Fallout values are from LANL 1998, 059730.

[b] Fallout value applies to samples collected from 0–0.5 ft only.

Table 5.10-3
Proposed Sampling at SWMU 48-007(b)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Hexavalent Chromium	Nitrate	Perchlorate	Gamma Spectroscopy	Tritium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and extent of potential contamination	7b-1	Downgradient of outfall	Surface	X	X	X	X	X	X	X	—*	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X
			2 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of potential contamination	7b-2	Downgradient of outfall	Surface	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	—
			2 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	7b-3	Downgradient of outfall	Surface	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X
			2 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of potential contamination	7b-4	Downgradient of outfall	Surface	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	—
			2 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	—

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.11-1
Samples Collected at SWMU 48-007(c)

Sample ID	Location ID	Depth (ft)	Media	Gamma Spectroscopy
0448-97-0067	48-02165	0–1	Sediment	2955*
0448-97-0068	48-02165	1–2	Soil	2955
0448-97-0070	48-02165	2–2.83	Soil	2955
0448-97-0078	48-02166	0–1	Sediment	2977
0448-97-0079	48-02166	1–2	Qbt 3	2977
0448-97-0105	48-02169	0–1	Sediment	3220R
0448-97-0107	48-02169	1–2	Soil	3220R
0448-97-0108	48-02170	0–0.5	Sediment	3220R
0448-97-0109	48-02170	0.5–1.2	Soil	3220R

* Analytical request number.

Table 5.11-2
Radionuclides Detected or Detected above the BV at SWMU 48-007(c)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Uranium-235
Soil Background/Fallout Value[a,b]				**1.65**	**0.2**
Qbt 2,3,4 Background/Fallout Value[a,b]				**na[c]**	**0.09**
0448-97-0079	48-02166	1.00–2.00	Qbt 3	—[d]	0.119
0448-97-0109	48-02170	0.50–1.20	Soil	0.144	—

Note: All values in pCi/g.

[a] Background/fallout values are from LANL 1998, 059730.

[b] Fallout value applies to samples collected from 0–0.5 ft only.

[c] na = Not available.

[d] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.11-3
Proposed Sampling at SWMU 48-007(c)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Hexavalent Chromium	Nitrate	Perchlorate	Gamma Spectroscopy	Tritium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and extent of potential contamination	7c-1	Downgradient of outfall	Surface	X	X	X	X	X	X	X	—*	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X
			2 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of potential contamination	7c-2	Downgradient of outfall	Surface	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	—
			2 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of potential contamination	7c-3	Downgradient of outfall	Surface	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X
			2 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of potential contamination	7c-4	Downgradient of outfall	Surface	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	—
			2 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	—

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.12-1
Samples Collected at SWMU 48-007(f)

Sample ID	Location ID	Depth (ft)	Media	Gamma Spectroscopy
0448-97-0064	48-02163	0–1	Soil	2955*
0448-97-0065	48-02163	1–2	Soil	2955
0448-97-0074	48-02164	0–1	Sediment	2977
0448-97-0075	48-02164	1–2	Qbt 3	2977

* Analytical request number.

Table 5.12-2
Radionuclide Detected above the BV at SWMU 48-007(f)

Sample ID	Location ID	Depth (ft)	Media	Uranium-235
Qbt 2,3,4 Background Value*				**0.09**
0448-97-0075	48-02164	1.00-2.00	Qbt 3	0.1033

Note: All values in pCi/g.
* Background value is from LANL 1998, 059730.

Table 5.12-3
Proposed Sampling at SWMU 48-007(f)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Tritium	Isotopic Uranium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and extent of potential contamination	7f-1	Downgradient of outfall	Surface Soil/tuff interface 2 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	—* X X	X X X	X X X	X X X
Determine nature and extent of potential contamination	7f-2	Downgradient of outfall	Surface Soil/tuff interface 2 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	— — —
Determine nature and extent of potential contamination	7f-3	Downgradient of outfall	Surface Soil/tuff interface 2 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	X X X
Determine nature and extent of potential contamination	7f-4	Downgradient of outfall	Surface Soil/tuff interface 2 ft below soil/tuff	X X X	X X X	X X X	X X X	X X X	X X X	X X X	— X X	X X X	X X X	— — —

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 5.13-1
Proposed Sampling at AOC 48-011

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Tritium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine if a release has occurred	11-1	Downgradient of shaft	65 ft bgs 75 ft bgs 85 ft bgs	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X

Table 5.14-1
Samples Collected at AOC 48-012

Sample ID	Location ID	Depth (ft)	Media	SVOCs	VOCs
RE48-02-49520	48-02-21182	6–6	Soil	1243S*	1243S
RE48-02-49521	48-02-21183	7.33–7.33	Soil	1244S	1243S
RE48-02-49522	48-02-21184	7–7	Soil	1243S	1243S
RE48-02-49523	48-02-21185	7–7	Soil	1243S	1243S
RE48-02-49524	48-02-21186	6.5–6.5	Soil	1243S	1243S
RE48-02-49525	48-02-21187	6–6	Soil	1243S	1243S
RE48-02-49526	48-02-21188	6–6	Soil	1243S	1243S
RE48-02-49527	48-02-21189	7–7	Soil	1243S	1243S
RE48-02-49528	48-02-21190	7–7	Soil	1243S	1243S
RE48-02-49529	48-02-21191	7–7	Soil	1243S	1243S

* Analytical request number.

Table 5.14-2
Organic Chemicals Detected at AOC 48-012

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Dimethylphenol[2,4-]	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Methylphenol[2-]	Methylphenol[4-]	Naphthalene	Phenanthrene	Pyrene
RE48-02-49520	48-02-21182	6.00–6.00	Soil	—*	—	—	—	—	—	—	—	—	—	0.06580494	—	—	—	—	—	—	0.05875441	0.05992949
RE48-02-49521	48-02-21183	7.33–7.33	Soil	10.67183	11.0441	17.37275	10.54774	12.3	3.226367	11.78865	9.679101	5.335915	0.3102276	26.05912	9.306828	1.017546	3.7	0.1985456	0.442	13.65001	37.22731	34.74549
RE48-02-49523	48-02-21185	7.00–7.00	Soil	—	—	—	—	—	—	—	—	—	—	0.04347826	—	—	—	—	—	—	—	0.04459309
RE48-02-49524	48-02-21186	6.50–6.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.1345291	—	—
RE48-02-49525	48-02-21187	6.00–6.00	Soil	—	0.0433735	0.1180723	—	0.113	—	0.07831325	—	—	—	0.1807229	—	—	—	—	—	—	0.1566265	0.2289157
RE48-02-49529	48-02-21191	7.00–7.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06455266	—	—

Note: All values in mg/kg.

* — = Analyte not detected.

Table 5.14-3
Proposed Sampling at AOC 48-012

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TPH-DRO	SVOCs	VOCs
Determine nature and extent of potential contamination	12-1 through 12-4	Perimeter of former excavation	Soil/tuff interface 10 ft below soil/tuff 15 ft below soil/tuff	X X X	X X X	X X X

Table 6.3-1
Samples Collected at AOC 50-001(b)

Sample ID	Location ID	Depth (ft)	Media	Anions	Metals	Perchlorate	Total Cyanide	PCBs	Pesticides	SVOCs	TPH-DRO	VOCs	Americium-241	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
MD50-06-66603	50-24235	70–71	Qbt 3	—[a]	4475S[b]	—	—	4475S	4475S	4475S	4475S	—	—	4475S	—	4475S	4475S	4475S
MD50-06-66604	50-24235	90–91.5	Qbt 3	—	4475S	—	—	4475S	4475S	4475S	4475S	—	—	4475S	—	4475S	4475S	4475S
MD50-05-60733	50-24708	0–0.5	Soil	3402S	3402S	3402S	3402S	—	—	—	—	3401S	3403S	3403S	3403S	3403S	3403S	3403S
MD50-05-60734	50-24709	0–0.5	Soil	3402S	3402S	3402S	3402S	—	—	—	—	3401S	3403S	3403S	3403S	3403S	3403S	3403S
MD50-05-60732	50-24710	0–0.5	Soil	3402S	3402S	3402S	3402S	—	—	—	—	3401S	3403S	3403S	3403S	3403S	3403S	3403S
MD50-05-60736	50-24711	0–0.5	Soil	3402S	3402S	3402S	3402S	—	—	—	—	3401S	3403S	3403S	3403S	3403S	3403S	3403S
MD50-05-60738	50-24713	0–0.5	Soil	3470S	3470S	3470S	3470S	—	—	—	—	3469S	3471S	3471S	3471S	3471S	3471S	3471S
MD50-05-60740	50-24715	0–0.5	Soil	3470S	3470S	3470S	3470S	—	—	—	—	3469S	3471S	3471S	3471S	3471S	3471S	3471S

[a] — =Analysis not requested.

[b] Analytical request number.

Table 6.3-2
Inorganic Chemicals above BVs or Detected without BV at AOC 50-001(b)

Sample ID	Location ID	Depth (ft)	Media	Arsenic	Chromium	Total Cyanide	Lead	Nitrate	Selenium	Zinc
Soil Background Value[a]				**8.17**	**19.3**	**0.5**	**22.3**	**na[b]**	**1.52**	**48.8**
Qbt 2,3,4 Background Value[a]				**2.79**	**7.14**	**0.5**	**11.2**	**na**	**0.3**	**63.5**
MD50-06-66603	50-24235	70.00–71.00	Qbt 3	3 (U)	8.2 (J+)	—[c]	20.7 (J+)	—	2.5 (U)	—
MD50-06-66604	50-24235	90.00–91.50	Qbt 3	3 (U)	—	—	—	—	2.5 (U)	—
MD50-05-60733	50-24708	0.00–0.50	Soil	—	—	0.53 (U)	—	0.31	—	—
MD50-05-60734	50-24709	0.00–0.50	Soil	—	—	0.56 (U)	—	4.2	—	—
MD50-05-60732	50-24710	0.00–0.50	Soil	—	—	0.6 (U)	—	0.3	—	—
MD50-05-60736	50-24711	0.00–0.50	Soil	—	—	0.51 (U)	—	2.1	—	—
MD50-05-60738	50-24713	0.00–0.50	Soil	—	—	0.56 (U)	—	1.3	—	82.2 (J+)
MD50-05-60740	50-24715	0.00–0.50	Soil	—	—	0.52 (U)	—	2.9	—	—

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 6.3-3
Radionuclides Detected at AOC 50-001(b)

Sample ID	Location ID	Depth (ft)	Media	Tritium
Soil Fallout Value[a,b]				**na[c]**
Qbt 2,3,4 Fallout Value[a,b]				**na**
MD50-05-60733	50-24708	0.00–0.50	Soil	0.0144
MD50-05-60734	50-24709	0.00–0.50	Soil	0.0816
MD50-05-60736	50-24711	0.00–0.50	Soil	0.0648
MD50-05-60738	50-24713	0.00–0.50	Soil	0.0153
MD50-05-60740	50-24715	0.00–0.50	Soil	0.0242

Note: All values in pCi/g.

[a] Fallout values are from LANL 1998, 059730.

[b] Fallout value applies to samples collected from 0–0.5 ft only.

[c] na = Not available.

Table 6.3-4
Organic Chemicals Detected at AOC 50-001(b)

Sample ID	Location ID	Depth (ft)	Media	Methylene Chloride
MD50-05-60732	50-24710	0.00–0.50	Soil	0.0035 (J)

Note: Value in mg/kg.

Table 6.4-1
Samples Collected at SWMU 50-002(a)

Sample ID	Location ID	Depth (ft)	Media	Metals	Uranium	Pesticides/PCBs	SVOCs	VOCs	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
0550-95-5001	50-03050	0.33–0.66	Qbt 3	1292*	1293	1291	1291	1291	1293	1293	1293	1293	1293

* Analytical request number.

Table 6.4-2
Inorganic Chemicals above BVs at SWMU 50-002(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Chromium	Cobalt	Selenium
Qbt 2,3,4 Background Value*				**0.5**	**7.14**	**3.14**	**0.3**
0550-95-5001	50-03050	0.33-0.66	Qbt 3	0.54 (U)	7.9 (J+)	3.7	0.49 (U)

Note: All values in mg/kg.
* Background values are from LANL 1998, 059730.

Table 6.4-3
Radionuclides Detected at SWMU 50-002(a)

Sample ID	Location ID	Depth (ft)	Media	Tritium
Qbt 2,3,4 Fallout Value[a,b]				**na[c]**
0550-95-5001	50-03050	0.33-0.66	Qbt 3	2620

Note: Value in pCi/g.
[a] Fallout values are from LANL 1998, 059730.
[b] Fallout value applies to samples collected from 0–0.5 ft only.
[c] na = Not available.

Table 6.8-1
Samples Collected at Consolidated Unit 50-004(a)-00

Sample ID	Location ID	Depth (ft)	Media	Metals	Perchlorate	SVOCs	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
AAC0213	50-03001	2–5	Fill	19677[a]	—[b]	—	19658	19658	19658	19658	—
MD50-04-52698	50-03001	5–9	Qbt 3	1941S	1941S	—	1942S	1942S	1942S	1942S	—
AAC0212	50-03001	5.7–6	Qbt 3	19677	—	—	19658	19658	19658	19658	—
AAC0214	50-03002	1–5	Fill	19677	—	—	19658	19658	19658	19658	—
AAC0215	50-03002	5.3–5.8	Qbt 3	19677	—	—	19658	19658	19658	19658	—
MD50-03-52047	50-03002	15–20	Qbt 3	1901S	1901S	—	1902S	1902S	1902S	1902S	—
AAC0216	50-03003	1–3	Fill	19677	—	—	19658	19658	19658	19658	—
AAC0217	50-03003	3–4	Qbt 3	19677	—	—	19658	19658	19658	19658	—
MD50-03-52048	50-03003	10–15	Qbt 3	1901S	1901S	—	1902S	1902S	1902S	1902S	—
AAC0270	50-03004	5–6.3	Fill	20190	—	—	20195	20195	—	20195	—
AAC0271	50-03004	6.3–7.3	Qbt 3	20190	—	—	20195	20195	—	20195	—
AAC0260	50-03005	5.3–6.3	Fill	19774	—	—	19776	19776	19776	19776	—
AAC0261	50-03005	6.3–7.3	Qbt 3	19774	—	—	19776	19776	19776	19776	—
MD50-03-52050	50-03008	10–15	Qbt 3	1901S	1901S	—	1902S	1902S	1902S	1902S	—
AAC0274	50-03008	11.4–12.4	Fill	19910	—	—	19915	19915	19915	19915	—
AAC0275	50-03008	12.4–16	Qbt 3	19910	—	—	19915	19915	19915	19915	—
AAC0278	50-03009	5–6	Fill	19910	—	—	19915	19915	19915	19915	—
AAC0279	50-03009	6–9.5	Fill	19910	—	—	19915	19915	19915	19915	—
AAC0294	50-03009	12.3–13.5	Fill	19910	—	—	19915	19915	19915	19915	—
MD50-03-52052	50-03009	18–22	Fill	1792S	1792S	—	1793S	1793S	1793S	1793S	—
MD50-03-52051	50-03009	26–28	Qbt 3	1792S	1792S	—	1793S	1793S	1793S	1793S	—
AAC0262	50-03012	7–8	Fill	19910	—	—	19915	19915	19915	19915	—
AAC0263	50-03012	8–11	Qbt 3	19910	—	—	19915	19915	19915	19915	—
AAC0264	50-03014	6.5–7.5	Fill	19910	—	—	19915	19915	19915	19915	—
AAC0265	50-03014	7.5–8.5	Qbt 3	19910	—	—	19915	19915	19915	19915	—
AAC0266	50-03016	10–11	Fill	19774	—	—	19776	19776	19776	19776	—
AAC0267	50-03016	11–12.3	Qbt 3	19774	—	—	19776	19776	19776	19776	—
AAC0292	50-03016	12.5–13.6	Qbt 3	19774	—	—	19776	19776	19776	19776	—
AAC0268	50-03017	7–10.5	Fill	19774	—	—	19776	19776	19776	19776	—
AAC0269	50-03017	10.5–11.5	Qbt 3	19774	—	—	19776	19776	19776	19776	—
AAC0291	50-03017	12.5–14.5	Qbt 3	19774	—	—	19776	19776	19776	19776	—
AAC0249	50-03018	6–7	Fill	19774	—	—	19776	19776	19776	19776	—
AAC0250	50-03018	7–9.5	Qbt 3	19774	—	—	19776	19776	19776	19776	—

Table 6.8-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	Perchlorate	SVOCs	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
AAC0290	50-03018	10.5–12.5	Qbt 3	19774	—	—	19776	19776	19776	19776	—
AAC0252	50-03020	5–6	Fill	19774	—	—	19776	19776	19776	19776	—
AAC0253	50-03020	6–7	Qbt 3	19774	—	—	19776	19776	19776	19776	—
AAC0293	50-03020	7–9.5	Qbt 3	19774	—	—	19776	19776	19776	19776	—
AAC0220	50-03021	7–9	Fill	19679	—	—	19657	19657	19657	19657	—
AAC0221	50-03021	9.4–10	Qbt 3	19679	—	—	19657	19657	19657	19657	—
AAC0223	50-03022	7–12	Fill	19677	—	—	19658	19658	19658	19658	—
AAC0224	50-03022	14.5–16	Qbt 3	19677	—	—	19658	19658	19658	19658	—
AAC0231	50-03023	5.5–6.5	Fill	19678	—	—	19671	19671	19671	19671	—
AAC0227	50-03024	4.5–5.5	Fill	19678	—	—	19671	19671	19671	19671	—
AAC0228	50-03024	6–7	Qbt 3	19678	—	—	19671	19671	19671	19671	—
AAC0254	50-03025	5–6.1	Fill	19720	—	—	19722	19722	19722	19722	—
AAC0255	50-03025	6.1–7	Qbt 3	19720	—	—	19722	19722	19722	19722	—
AAC0256	50-03026	6–7	Fill	19720	—	—	19722	19722	19722	19722	—
AAC0257	50-03026	7–8	Qbt 3	19720	—	—	19722	19722	19722	19722	—
AAC0210	50-03027	2–2.5	Fill	19506	—	—	19670	19670	19670	19670	—
AAC0211	50-03027	5.5–6	Qbt 3	19506	—	—	19670	19670	19670	19670	—
AAC0258	50-03028	0.8–1.5	Fill	19720	—	—	19722	19722	19722	19722	—
AAC0259	50-03028	1.5–3	Qbt 3	19720	—	—	19722	19722	19722	19722	—
AAB6106	50-03028	10.3–13	Qbt 3	19720	—	—	19722	19722	19722	19722	—
AAC0229	50-03030	1–1.5	Fill	19679	—	—	19657	19657	19657	19657	—
AAC0230	50-03030	5.5–6.5	Qbt 3	19679	—	—	19657	19657	19657	19657	—
AAC0225	50-03031	1.5–2.5	Fill	19679	—	—	19657	19657	19657	19657	—
AAC0232	50-03031	5–6	Qbt 3	19679	—	—	19657	19657	19657	19657	—
AAC0233	50-03032	0.75–2	Fill	19679	—	—	19657	19657	19657	19657	—
AAC0235	50-03032	3.8–5	Fill	19679	—	—	19657	19657	19657	19657	—
AAC0234	50-03032	5.5–6.5	Qbt 3	19679	—	—	19657	19657	19657	19657	—
AAC0236	50-03033	7–8	Fill	19679	—	—	19657	19657	19657	19657	—
AAC0237	50-03033	8–9	Qbt 3	19679	—	—	19657	19657	19657	19657	—
AAC0238	50-03034	7.9–8.9	Fill	19678	—	—	19671	19671	19671	19671	—
AAC0239	50-03034	9–10	Qbt 3	19678	—	—	19671	19671	19671	19671	—
AAC0240	50-03035	6.75–7.85	Fill	19678	—	—	19671	19671	19671	19671	—
AAC0241	50-03035	8–9	Qbt 3	19678	—	—	19671	19671	19671	19671	—
AAC0242	50-03036	8.5–9.5	Fill	19679	—	—	19657	19657	19657	19657	—

Table 6.8-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Metals	Perchlorate	SVOCs	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
AAC0243	50-03036	9.5–10	Qbt 3	19679	—	—	19657	19657	19657	19657	—
AAC0244	50-03037	6–7	Fill	19678	—	—	19671	19671	19671	19671	—
AAC0245	50-03037	7–8.5	Qbt 3	19678	—	—	19671	19671	19671	19671	—
AAC0247	50-03038	8.5–9.5	Fill	19678	—	—	19671	19671	19671	19671	—
AAC0248	50-03038	9.5–10.5	Qbt 3	19678	—	—	19671	19671	19671	19671	—
AAB6105	50-03038	10.3–13	Qbt 3	19678	—	—	19671	19671	19671	19671	—
AAA2459	50-05031	0–0.5	Soil	—	—	14633	14634	14634	14634	14634	14634

[a] Analytical request number.

[b] — =Analysis not requested.

Table 6.8-2
Inorganic Chemicals above BVs at Consolidated Unit 50-004(a)-00

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Copper	Lead	Magnesium	Mercury	Nickel	Potassium	Selenium	Silver	Thallium	Zinc
Qbt 2,3,4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**4.66**	**11.2**	**1690**	**0.1**	**6.58**	**3500**	**0.3**	**1**	**1.1**	**63.5**
Soil Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**4610**	**0.1**	**15.4**	**3460**	**1.52**	**1**	**0.73**	**48.8**
AAC0213	50-03001	2.00–5.00	Fill	—[b]	4.5 (U)	—	—	—	—	—	—	—	—	—	0.12 (U)	—	—	—	—	—	—
MD50-04-52698	50-03001	5.00–9.00	Qbt 3	—	1.03 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	0.518 (U)	—	—	—
AAC0212	50-03001	5.70–6.00	Qbt 3	—	4.5 (U)	—	—	—	—	—	19.7 (J-)	—	—	—	0.12 (U)	10.3	—	0.53 (U)	—	—	—
AAC0214	50-03002	1.00–5.00	Fill	—	4.8 (U)	—	—	—	0.61 (J)	—	—	—	—	—	0.16 (U)	—	—	—	—	—	—
AAC0215	50-03002	5.30–5.80	Qbt 3	—	4.8 (U)	—	—	—	—	—	—	—	—	—	0.14 (U)	—	—	0.57 (U)	—	—	—
MD50-03-52047	50-03002	15.00–20.00	Qbt 3	—	—	2.83	—	—	—	—	—	—	—	—	—	—	—	0.528 (U)	—	—	—
AAC0216	50-03003	1.00–3.00	Fill	—	4.6 (U)	—	—	—	0.5 (J)	—	—	—	—	—	0.25 (U)	—	—	—	—	—	—
AAC0217	50-03003	3.00–4.00	Qbt 3	—	4.6 (U)	—	49.4	—	—	—	—	—	—	—	0.14 (U)	—	—	0.55 (U)	—	—	—
MD50-03-52048	50-03003	10.00–15.00	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.545 (U)	—	—	—
AAC0270	50-03004	5.00–6.30	Fill	—	4.6 (U)	—	—	—	0.63 (J)	12900	—	—	—	—	—	—	—	—	—	—	—
AAC0271	50-03004	6.30–7.30	Qbt 3	—	4.8 (U)	—	—	—	—	—	—	—	—	—	—	—	—	0.57 (U)	—	—	—
AAC0260	50-03005	5.30–6.30	Fill	—	4.9 (UJ)	—	—	—	0.5 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0261	50-03005	6.30–7.30	Qbt 3	—	4.7 (UJ)	6.5 (J-)	—	—	—	—	—	—	—	—	—	—	—	0.55 (U)	—	—	—
MD50-03-52050	50-03008	10.00–15.00	Qbt 3	7540	—	—	77.6	—	—	—	—	—	—	—	—	—	—	0.554 (U)	—	—	—
AAC0274	50-03008	11.40–12.40	Fill	—	5 (U)	—	—	—	0.41 (U)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0275	50-03008	12.40–16.00	Qbt 3	—	4.7 (U)	—	—	—	—	—	—	—	—	—	—	—	—	0.55 (U)	—	—	—
AAC0278	50-03009	5.00–6.00	Fill	—	4.7 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAC0279	50-03009	6.00–9.50	Fill	—	4.6 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAC0294	50-03009	12.30–13.50	Fill	32300	6.7 (U)	—	—	4.7	1.8	17200	—	16.9	—	7700	—	16.2	4270	—	1.2 (U)	—	64.5
MD50-03-52052	50-03009	18.00–22.00	Fill	—	—	—	—	—	0.552 (U)	—	—	—	—	—	0.146	—	—	—	—	—	—
AAC0262	50-03012	7.00–8.00	Fill	—	4.6 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAC0263	50-03012	8.00–11.00	Qbt 3	—	4.6 (U)	—	—	—	—	—	—	—	—	—	—	—	—	0.55 (U)	—	—	—
AAC0264	50-03014	6.50–7.50	Fill	—	4.6 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAC0265	50-03014	7.50–8.50	Qbt 3	—	4.6 (U)	—	—	—	—	—	—	—	—	—	—	—	—	0.7 (U)	—	—	—
AAC0266	50-03016	10.00–11.00	Fill	—	4.7 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAC0267	50-03016	11.00–12.30	Qbt 3	—	4.7 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	0.56 (U)	—	—	—
AAC0292	50-03016	12.50–13.60	Qbt 3	—	4.7 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	0.56 (U)	—	—	—
AAC0268	50-03017	7.00–10.50	Fill	—	4.7 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAC0269	50-03017	10.50–11.50	Qbt 3	—	4.7 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	0.56 (U)	—	—	—
AAC0291	50-03017	12.50–14.50	Qbt 3	—	4.8 (UJ)	—	—	1.5	—	3190 (J-)	—	—	—	—	—	—	—	0.57 (U)	—	—	—
AAC0249	50-03018	6.00–7.00	Fill	—	4.8 (UJ)	—	—	—	0.51 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0250	50-03018	7.00–9.50	Qbt 3	—	4.8 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	0.58 (U)	—	—	—
AAC0290	50-03018	10.50–12.50	Qbt 3	—	4.9 (UJ)	—	50.2	—	—	5930 (J-)	—	—	—	—	—	—	—	0.58 (U)	—	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Copper	Lead	Magnesium	Mercury	Nickel	Potassium	Selenium	Silver	Thallium	Zinc
Qbt 2,3,4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**4.66**	**11.2**	**1690**	**0.1**	**6.58**	**3500**	**0.3**	**1**	**1.1**	**63.5**
Soil Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**4610**	**0.1**	**15.4**	**3460**	**1.52**	**1**	**0.73**	**48.8**
AAC0252	50-03020	5.00–6.00	Fill	—	4.9 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAC0253	50-03020	6.00–7.00	Qbt 3	—	4.9 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	0.58 (U)	—	—	—
AAC0293	50-03020	7.00–9.50	Qbt 3	—	4.8 (UJ)	—	51.1	—	—	5050 (J-)	—	—	—	—	—	—	—	0.57 (U)	—	—	—
AAC0220	50-03021	7.00–9.00	Fill	—	4.7 (UJ)	—	—	—	0.65 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0221	50-03021	9.40–10.00	Qbt 3	—	4.6 (UJ)	—	74.9	—	—	5110	—	—	—	—	—	—	—	0.55 (U)	—	—	—
AAC0223	50-03022	7.00–12.00	Fill	—	4.8 (U)	—	—	—	—	—	—	—	—	—	0.14 (U)	—	—	—	—	—	—
AAC0224	50-03022	14.50–16.00	Qbt 3	—	4.7 (U)	—	50.4	—	—	—	—	—	—	—	0.19 (U)	—	—	0.56 (U)	—	—	—
AAC0231	50-03023	5.50–6.50	Fill	—	4.6 (U)	—	—	—	0.46 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0227	50-03024	4.50–5.50	Fill	—	4.5 (U)	—	—	—	0.53 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0228	50-03024	6.00–7.00	Qbt 3	—	4.8 (U)	—	—	—	—	—	—	—	—	—	—	6.8 (J)	—	0.58 (U)	—	—	—
AAC0254	50-03025	5.00–6.10	Fill	—	4.8 (UJ)	—	—	—	0.73 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0255	50-03025	6.10–7.00	Qbt 3	—	4.6 (UJ)	—	67.2	—	—	—	—	—	—	—	—	—	—	0.55 (UJ)	—	—	—
AAC0256	50-03026	6.00–7.00	Fill	—	5 (UJ)	—	—	—	0.47 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0257	50-03026	7.00–8.00	Qbt 3	—	5 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	0.59 (UJ)	—	—	—
AAC0210	50-03027	2.00–2.50	Fill	—	4.8 (U)	—	—	—	0.94 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0211	50-03027	5.50–6.00	Qbt 3	—	4.6 (U)	—	—	—	—	—	—	—	—	—	—	—	—	0.55 (U)	—	—	—
AAC0258	50-03028	0.80–1.50	Fill	—	5.3 (UJ)	—	—	—	0.58 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0259	50-03028	1.50–3.00	Qbt 3	—	6 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	0.71 (UJ)	1.1 (UJ)	—	—
AAB6106	50-03028	10.30–13.00	Qbt 3	8180	5 (UJ)	—	—	2.1	—	—	—	—	—	1960	—	8.9 (J)	—	0.59 (UJ)	—	—	—
AAC0229	50-03030	1.00–1.50	Fill	—	5.1 (UJ)	—	—	—	1.2 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0230	50-03030	5.50–6.50	Qbt 3	—	5 (UJ)	—	—	—	—	—	—	—	70.1 (J+)	—	—	—	—	0.6 (U)	—	—	—
AAC0225	50-03031	1.50–2.50	Fill	—	5.1 (UJ)	—	—	—	0.97 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0232	50-03031	5.00–6.00	Qbt 3	—	5.8 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	0.69 (U)	—	—	—
AAC0233	50-03032	0.75–2.00	Fill	—	5.1 (UJ)	—	—	—	1 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0235	50-03032	3.80–5.00	Fill	—	8.6 (J-)	—	—	—	1.6	—	—	—	—	—	—	—	—	—	—	—	—
AAC0234	50-03032	5.50–6.50	Qbt 3	—	5.4 (UJ)	—	51.2 (J)	—	—	—	—	—	—	—	—	—	—	0.64 (U)	—	—	—
AAC0236	50-03033	7.00–8.00	Fill	—	4.7 (UJ)	—	—	—	0.85 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0237	50-03033	8.00–9.00	Qbt 3	—	4.5 (UJ)	—	—	—	—	—	—	—	23.7 (J+)	—	—	—	—	0.54 (U)	—	—	—
AAC0238	50-03034	7.90–8.90	Fill	—	4.9 (U)	—	—	—	0.73 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0239	50-03034	9.00–10.00	Qbt 3	—	4.5 (U)	—	—	—	—	—	—	—	—	—	—	—	—	0.53 (U)	—	—	—
AAC0240	50-03035	6.75–7.85	Fill	—	4.9 (U)	—	—	—	1 (J)	—	—	—	—	—	—	—	—	—	—	0.92 (J)	—
AAC0241	50-03035	8.00–9.00	Qbt 3	—	4.8 (U)	—	—	—	—	—	—	—	14.1	—	—	—	—	0.57 (U)	—	—	—
AAC0242	50-03036	8.50–9.50	Fill	—	5 (UJ)	—	—	—	0.71 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0243	50-03036	9.50–10.00	Qbt 3	—	4.9 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	0.58 (U)	—	—	—
AAC0244	50-03037	6.00–7.00	Fill	—	4.7 (U)	—	—	—	1.1 (J)	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Copper	Lead	Magnesium	Mercury	Nickel	Potassium	Selenium	Silver	Thallium	Zinc
Qbt 2,3,4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**4.66**	**11.2**	**1690**	**0.1**	**6.58**	**3500**	**0.3**	**1**	**1.1**	**63.5**
Soil Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**4610**	**0.1**	**15.4**	**3460**	**1.52**	**1**	**0.73**	**48.8**
AAC0245	50-03037	7.00–8.50	Qbt 3	—	4.7 (U)	—	—	—	—	—	—	—	—	—	—	—	—	0.56 (U)	—	—	—
AAC0247	50-03038	8.50–9.50	Fill	—	4.6 (U)	—	—	—	0.75 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAC0248	50-03038	9.50–10.50	Qbt 3	7510 (J)	4.8 (U)	—	48.8	—	—	2770	—	—	—	—	—	—	—	0.57 (U)	—	—	—
AAB6105	50-03038	10.30–13.00	Qbt 3	17600	5.1 (U)	—	95.7	1.4	—	6650	9.9 (J)	6.1	—	2670 (U)	—	7.9 (J)	—	0.61 (U)	—	—	—

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 6.8-3
Radionuclides Detected or Detected above BVs/FVs at Consolidated Unit 50-004(a)-00

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/ Plutonium-240	Tritium	Uranium-235
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**0.023**	**0.054**	**na[c]**	**0.2**
Qbt 2,3,4 Background/Fallout Value[a,b]				**na**	**na**	**na**	**na**	**na**	**0.09**
AAC0213	50-03001	2.00–5.00	Fill	—[d]	—	—	3.074	—	—
MD50-04-52698	50-03001	5.00–9.00	Qbt 3	—	—	—	0.0869	0.0215	0.132
AAC0212	50-03001	5.70–6.00	Qbt 3	—	—	—	0.178	—	—
AAC0214	50-03002	1.00–5.00	Fill	—	0.074	0.054	0.64	—	0.38
AAC0215	50-03002	5.30–5.80	Qbt 3	—	—	—	0.241	—	—
MD50-03-52047	50-03002	15.00–20.00	Qbt 3	—	—	—	0.0618	0.327	—
AAC0216	50-03003	1.00–3.00	Fill	0.142 (J)	—	0.047	1.149	0.0690 (J)	—
AAC0217	50-03003	3.00–4.00	Qbt 3	—	—	—	0.448	—	—
MD50-03-52048	50-03003	10.00–15.00	Qbt 3	—	—	—	0.0648	—	—
AAC0260	50-03005	5.30–6.30	Fill	—	—	0.018	—	0.2929989	—
AAC0261	50-03005	6.30–7.30	Qbt 3	—	—	—	0.038	0.1987262	—
MD50-03-52050	50-03008	10.00–15.00	Qbt 3	—	0.318	0.0384	0.294	0.523	0.0902
AAC0274	50-03008	11.40–12.40	Fill	—	—	0.002	0.131	—	—
AAC0275	50-03008	12.40–16.00	Qbt 3	—	—	—	0.011	—	—
AAC0278	50-03009	5.00–6.00	Fill	—	0.051 (J)	—	0.122	—	—
AAC0279	50-03009	6.00–9.50	Fill	0.488	0.28 (J)	—	0.036	—	—
AAC0262	50-03012	7.00–8.00	Fill	—	0.139 (J)	—	0.038	—	—
AAC0264	50-03014	6.50–7.50	Fill	—	0.165 (J)	—	0.525	—	—
AAC0265	50-03014	7.50–8.50	Qbt 3	—	—	—	0.036	—	—
AAC0266	50-03016	10.00–11.00	Fill	—	—	—	0.101	0.3495513	—
AAC0267	50-03016	11.00–12.30	Qbt 3	—	—	—	0.016	0.2897765	—
AAC0292	50-03016	12.50–13.60	Qbt 3	—	—	—	—	0.2546068	—
AAC0268	50-03017	7.00–10.50	Fill	0.135	0.625	0.079	0.403	—	—
AAC0269	50-03017	10.50–11.50	Qbt 3	—	—	0.011	—	—	—
AAC0291	50-03017	12.50–14.50	Qbt 3	—	—	0.014	0.014	—	—
AAC0249	50-03018	6.00–7.00	Fill	—	0.275	—	0.146	0.1527491	—
AAC0250	50-03018	7.00–9.50	Qbt 3	—	0.472	—	—	0.2382164	—
AAC0290	50-03018	10.50–12.50	Qbt 3	—	—	—	—	0.5958139	—
AAC0252	50-03020	5.00–6.00	Fill	—	—	—	0.016	—	—
AAC0253	50-03020	6.00–7.00	Qbt 3	—	—	—	0.14	—	—
AAC0293	50-03020	7.00–9.50	Qbt 3	—	—	—	0.005	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/ Plutonium-240	Tritium	Uranium-235
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**0.023**	**0.054**	**na[c]**	**0.2**
Qbt 2,3,4 Background/Fallout Value[a,b]				**na**	**na**	**na**	**na**	**na**	**0.09**
AAC0220	50-03021	7.00–9.00	Fill	—	—	—	0.126	0.16567	—
AAC0221	50-03021	9.40–10.00	Qbt 3	—	—	0.063	0.527	0.1060026	—
AAC0223	50-03022	7.00–12.00	Fill	—	—	—	0.164	0.1814286 (J)	—
AAC0224	50-03022	14.50–16.00	Qbt 3	—	—	—	0.705	0.117836 (J)	—
AAC0227	50-03024	4.50–5.50	Fill	—	—	—	0.135	—	—
AAC0228	50-03024	6.00–7.00	Qbt 3	—	—	—	0.108	—	—
AAC0254	50-03025	5.00–6.10	Fill	—	—	—	—	0.1968487	—
AAC0255	50-03025	6.10–7.00	Qbt 3	—	—	—	—	0.1943905	—
AAC0256	50-03026	6.00–7.00	Fill	—	—	—	—	0.2216251	—
AAC0257	50-03026	7.00–8.00	Qbt 3	—	—	—	0.016	0.2696491	—
AAC0210	50-03027	2.00–2.50	Fill	—	—	—	0.009	0.0803 (J)	—
AAC0211	50-03027	5.50–6.00	Qbt 3	—	—	0.027 (J)	0.09	0.0360 (J)	—
AAC0258	50-03028	0.80–1.50	Fill	—	—	0.002	0.059	—	—
AAC0229	50-03030	1.00–1.50	Fill	—	—	—	0.05	0.8399521	—
AAC0230	50-03030	5.50–6.50	Qbt 3	—	—	—	—	1.300737	—
AAC0225	50-03031	1.50–2.50	Fill	—	—	—	—	0.4570025	—
AAC0232	50-03031	5.00–6.00	Qbt 3	—	—	—	—	2.596487	—
AAC0233	50-03032	0.75–2.00	Fill	—	—	—	0.117	0.1986747	—
AAC0235	50-03032	3.80–5.00	Fill	—	—	—	0.061	0.168	—
AAC0234	50-03032	5.50–6.50	Qbt 3	—	—	—	—	0.5246193	—
AAC0236	50-03033	7.00–8.00	Fill	—	—	—	—	1.097514	—
AAC0237	50-03033	8.00–9.00	Qbt 3	—	—	—	0.007	0.6798884	—
AAC0238	50-03034	7.90–8.90	Fill	—	—	—	0.047	—	—
AAC0240	50-03035	6.75–7.85	Fill	—	—	—	0.018	—	—
AAC0242	50-03036	8.50–9.50	Fill	—	—	—	—	0.5898795	—
AAC0243	50-03036	9.50–10.00	Qbt 3	—	—	—	—	0.3725806	—
AAC0244	50-03037	6.00–7.00	Fill	—	—	—	0.014	—	—
AAC0247	50-03038	8.50–9.50	Fill	—	—	—	0.036	—	—
AAA2459	50-05031	0.00–0.50	Soil	—	—	—	0.691	0.1127894 (J)	—

Note: All values in pCi/g.

[a] Background/fallout values are from LANL 1998, 059730.

[b] Fallout value applies to samples collected from 0–0.5 ft only.

[c] na = Not available.

[d] — = Analyte not reported (detect or nondetect) above BV/FV or not detected.

Table 6.8-4
Proposed Sampling at Consolidated Unit 50-004(a)-00

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine vertical extent of contamination	4a-1	Location 50-03038	15 ft bgs	X	X	X	X	X	X	X	X	X	X	X	X
			20 ft bgs	X	X	X	X	X	X	X	X	X	X	X	X
Determine vertical extent of contamination	4a-2	Location 50-03021	15 ft bgs	X	X	X	X	X	X	X	X	X	X	X	X
			20 ft bgs	X	X	X	X	X	X	X	X	X	X	X	X
Determine vertical extent of contamination	4a-3	Location 50-03005	10 ft bgs	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft bgs	X	X	X	X	X	X	X	X	X	X	X	X
			20 ft bgs	X	X	X	X	X	X	X	X	X	X	X	—*
Determine vertical extent of contamination	4a-4	Location 50-03001	10 ft bgs	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft bgs	X	X	X	X	X	X	X	X	X	X	X	X
			20 ft bgs	X	X	X	X	X	X	X	X	X	X	X	—
Determine lateral extent of potential contamination	4a-5	Downgradient of 50-03001	Surface	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
Determine lateral extent of potential contamination	4a-6	Downgradient of 50-03009	Surface	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
Determine lateral extent of potential contamination	4a-7	Downgradient of 50-03038	Surface	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
Determine extent of potential contamination	4a-8	Bend in former pipe	Surface	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			10 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X
			15 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 6.9-1
Samples Collected at SWMU 50-006(a)

Sample ID	Location ID	Depth (ft)	Media	Anions	Metals	Perchlorate	Phosphorus	PAH	PCBs	Pesticides	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
AAA2519	50-06500	0–0.5	Soil	—[a]	—	—	—	—	—	—	14749[b]	—	—	14750	14750	14750	14750	14750
AAA2520	50-06501	0–0.5	Soil	—	—	—	—	—	14749	—	14749	—	—	14750	14750	14750	14750	14750
AAA2521	50-06502	0–0.5	Soil	—	—	—	—	—	—	—	14749	—	—	14750	14750	14750	14750	14750
AAA2721	50-06502	3–4	Soil	—	—	—	—	—	—	—	14749	—	—	14750	14750	14750	14750	14750
AAA2522	50-06503	0–0.5	Soil	—	—	—	—	—	—	—	14749	—	—	14750	14750	14750	14750	14750
AAA2715	50-06503	1.5–2.5	Soil	—	—	—	—	—	—	—	14749	—	—	14750	14750	14750	14750	14750
AAA2720	50-06503	3–4	Soil	—	—	—	—	—	—	—	14749	—	—	14750	14750	14750	14750	14750
AAA2523	50-06504	0–0.5	Soil	—	—	—	—	—	14749	—	14749	—	—	14750	14750	14750	14750	14750
AAA2524	50-06505	0–0.5	Soil	—	—	—	—	—	14749	—	14749	—	—	14750	14750	14750	14750	14750
AAA2525	50-06506	0–0.5	Soil	—	—	—	—	—	14749	—	14749	—	—	14750	14750	14750	14750	14750
AAA2716	50-06506	1.5–2.5	Soil	—	—	—	—	—	14749	—	14749	—	—	14750	14750	14750	14750	14750
AAA2722	50-06506	3–4	Soil	—	—	—	—	—	14749	—	14749	—	—	14750	14750	14750	14750	14750
AAA2526	50-06507	0–0.5	Soil	—	—	—	—	—	14749	—	14749	—	—	14750	14750	14750	14750	14750
AAA2717	50-06507	1.5–2.5	Soil	—	—	—	—	—	14749	—	14749	—	—	14750	14750	14750	14750	14750
AAA2527	50-06508	0–0.5	Sediment	—	—	—	—	—	—	—	14749	—	—	14750	14750	14750	14750	14750
AAA2688	50-06508	1.5–2.5	Sediment	—	—	—	—	—	—	—	14749	—	—	14750	14750	14750	14750	14750
AAA2723	50-06508	3–4	Sediment	—	—	—	—	—	—	—	14749	—	—	14750	14750	14750	14750	14750
AAA2528	50-06509	0–0.5	Sediment	—	—	—	—	—	—	—	14749	—	—	14750	14750	14750	14750	14750
AAA2529	50-06510	0–0.5	Sediment	—	—	—	—	—	—	—	14749	—	—	14750	14750	14750	14750	14750
AAA2530	50-06511	0–0.5	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2709	50-06511	1.5–2.5	Soil	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2532	50-06513	0–0.5	Soil	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA3240	50-06514	1.5–2.5	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA3241	50-06514	3–4	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA2534	50-06515	0–0.5	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2535	50-06516	0–0.5	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2536	50-06517	0–0.5	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2711	50-06517	3–4	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2537	50-06518	0–0.5	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2708	50-06518	1.5–2.5	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2714	50-06518	3–4	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2538	50-06519	0–0.5	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2539	50-06520	0–0.5	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717

Table 6.9-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Metals	Perchlorate	Phosphorus	PAH	PCBs	Pesticides	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
CAMO-05-61156	50-06520	0–0.98	Sediment	3449S	3449S	3448S	3449S	3448S	3448S	3448S	3448S	—	—	3449S	—	3449S	—	3449S
AAA2710	50-06520	1.5–2.5	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2713	50-06520	3–4	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2540	50-06521	0–0.5	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2637	50-06522	0–0.5	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2707	50-06522	1.5–2.5	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2712	50-06522	3–4	Sediment	—	14715	—	—	—	—	—	14716	—	—	14717	14717	14717	14717	14717
AAA2638	50-06523	0–0.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2639	50-06524	0–0.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2640	50-06525	0–0.5	Soil	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2641	50-06526	0–0.5	Soil	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2642	50-06527	0–0.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2643	50-06528	0–0.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2682	50-06528	1.5–2.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2685	50-06528	3–4	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2644	50-06529	0–0.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2683	50-06529	1.5–2.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2684	50-06529	3–4	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2645	50-06530	0–0.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2646	50-06531	0–0.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2705	50-06531	1.5–2.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2706	50-06531	3–4	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2647	50-06532	0–0.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2648	50-06533	0–0.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2681	50-06533	1.5–2.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2686	50-06533	3–4	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2649	50-06534	0–0.5	Sediment	—	14702	—	—	—	—	—	14703	—	—	14704	14704	14704	14704	14704
AAA2650	50-06535	0–0.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2659	50-06535	1.5–2.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2660	50-06535	3–4	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2651	50-06536	0–0.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2661	50-06536	1.5–2.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2662	50-06536	3–4	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2652	50-06537	0–0.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673

Table 6.9-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Metals	Perchlorate	Phosphorus	PAH	PCBs	Pesticides	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
AAA2663	50-06537	1.5–2.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2664	50-06537	3–4	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2653	50-06538	0–0.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2665	50-06538	1.5–2.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2666	50-06538	3–4	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2654	50-06539	0–0.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2667	50-06539	1.5–2.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2668	50-06539	3–4	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2655	50-06540	0–0.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2669	50-06540	1.5–2.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2670	50-06540	3–4	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2656	50-06541	0–0.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2671	50-06541	1.5–2.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2672	50-06541	3–4	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2657	50-06542	0–0.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2673	50-06542	1.5–2.5	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2674	50-06542	3–4	Sediment	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2658	50-06543	0–0.5	Soil	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2675	50-06543	1.5–2.5	Soil	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA2676	50-06543	3–4	Soil	—	14671	—	—	—	—	—	14672	—	—	14673	14673	14673	14673	14673
AAA3229	50-06550	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3228	50-06551	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3218	50-06551	1.5–2.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3212	50-06551	3–4	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3219	50-06552	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3216	50-06552	3–4	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3215	50-06553	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3205	50-06554	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3210	50-06554	1.5–2.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3209	50-06554	3–4	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3203	50-06555	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3213	50-06556	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3217	50-06556	1.5–2.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3223	50-06557	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981

Table 6.9-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Metals	Perchlorate	Phosphorus	PAH	PCBs	Pesticides	SVOCs	VOCs	Americium-241	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
AAA3224	50-06557	1.5–2.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3208	50-06557	3–4	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3225	50-06558	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3201	50-06558	1.5–2.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3202	50-06558	3–4	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3211	50-06559	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3206	50-06560	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3207	50-06561	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3214	50-06562	0–0.5	Soil	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3200	50-06563	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3204	50-06564	0–0.5	Sediment	—	—	—	—	—	14979	—	14979	14979	14981	14981	14981	14981	14981	14981
AAA3221	50-06565	0–0.5	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA3220	50-06565	1.5–2.5	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA3226	50-06565	3–4	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA3230	50-06566	0–0.5	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA3231	50-06566	1.5–2.5	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA3232	50-06566	3–4	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA3233	50-06567	0–0.5	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA3234	50-06567	1.5–2.5	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA3235	50-06567	3–4	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA3236	50-06568	0–0.5	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA3237	50-06568	1.5–2.5	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114
AAA3238	50-06568	3–4	Sediment	—	—	—	—	—	—	—	—	—	15114	15114	15114	15114	15114	15114

[a] — =Analysis not requested.

[b] Analytical request number.

Table 6.9-2
Inorganic Chemicals above BVs or Detected without BV at SWMU 50-006(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Lead	Nickel	Selenium	Silver	Thallium	Total Phosphorus
Soil Background Value[a]				**0.83**	**295**	**0.4**	**22.3**	**15.4**	**1.52**	**1**	**0.73**	**na[b]**
Sediment Background Value[a]				**0.83**	**127**	**0.4**	**19.7**	**9.38**	**0.3**	**1**	**0.73**	**na**
AAA2530	50-06511	0.00–0.50	Sediment	11.2 (UJ)	—[c]	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2709	50-06511	1.50–2.50	Soil	11.2 (UJ)	—	0.84 (J)	—	—	—	1.4 (U)	1 (U)	—
AAA2532	50-06513	0.00–0.50	Soil	11.2 (UJ)	—	0.8 (U)	—	—	—	1.4 (U)	1 (U)	—
AAA2534	50-06515	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2535	50-06516	0.00–0.50	Sediment	11.2 (UJ)	—	0.91 (J)	—	—	0.6 (U)	1.4 (U)	1 (UJ)	—
AAA2536	50-06517	0.00–0.50	Sediment	11.2 (U)	—	1	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2711	50-06517	3.00–4.00	Sediment	11.2 (UJ)	—	0.87 (J)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2537	50-06518	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2708	50-06518	1.50–2.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2714	50-06518	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2538	50-06519	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2539	50-06520	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
CAMO-05-61156	50-06520	0.00–0.98	Sediment	—	—	0.496 (U)	—	—	1.49 (U)	—	—	93.3
AAA2710	50-06520	1.50–2.50	Sediment	11.2 (UJ)	—	0.98 (J)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2713	50-06520	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2540	50-06521	0.00–0.50	Sediment	11.2 (UJ)	—	1.4	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2637	50-06522	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2707	50-06522	1.50–2.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2712	50-06522	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2638	50-06523	0.00–0.50	Sediment	11.2 (UJ)	—	1	—	—	0.6 (U)	1.4 (U)	1 (U)	—

Table 6.9-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Lead	Nickel	Selenium	Silver	Thallium	Total Phosphorus
Soil Background Value[a]				**0.83**	**295**	**0.4**	**22.3**	**15.4**	**1.52**	**1**	**0.73**	**na[b]**
Sediment Background Value[a]				**0.83**	**127**	**0.4**	**19.7**	**9.38**	**0.3**	**1**	**0.73**	**na**
AAA2639	50-06524	0.00–0.50	Sediment	11.2 (UJ)	—	1	—	—	3 (U)	1.4 (U)	1 (U)	—
AAA2640	50-06525	0.00–0.50	Soil	11.2 (UJ)	—	1.7	—	—	3 (U)	1.4 (U)	1 (U)	—
AAA2641	50-06526	0.00–0.50	Soil	11.2 (UJ)	—	1	—	—	—	1.4 (U)	1 (U)	—
AAA2642	50-06527	0.00–0.50	Sediment	11.2 (UJ)	—	1.1	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2643	50-06528	0.00–0.50	Sediment	11.2 (UJ)	—	1.2	—	11.4	0.6 (U)	1.4 (U)	1 (U)	—
AAA2682	50-06528	1.50–2.50	Sediment	11.2 (UJ)	—	1.3	39.1	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2685	50-06528	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2644	50-06529	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2683	50-06529	1.50–2.50	Sediment	11.2 (UJ)	—	1.1	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2684	50-06529	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2645	50-06530	0.00–0.50	Sediment	11.2 (UJ)	—	0.84 (J)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2646	50-06531	0.00–0.50	Sediment	11.2 (UJ)	—	0.83 (J)	20.4	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2705	50-06531	1.50–2.50	Sediment	11.2 (UJ)	—	1.3	—	9.7	0.6 (U)	1.4 (U)	1 (U)	—
AAA2706	50-06531	3.00–4.00	Sediment	11.2 (UJ)	—	1.3	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2647	50-06532	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2648	50-06533	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.62 (J)	1.4 (U)	1 (U)	—
AAA2681	50-06533	1.50–2.50	Sediment	11.2 (UJ)	129	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2686	50-06533	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2649	50-06534	0.00–0.50	Sediment	11.2 (UJ)	—	1.2	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2650	50-06535	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2659	50-06535	1.50–2.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—

Table 6.9-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Lead	Nickel	Selenium	Silver	Thallium	Total Phosphorus
Soil Background Value[a]				**0.83**	**295**	**0.4**	**22.3**	**15.4**	**1.52**	**1**	**0.73**	**na[b]**
Sediment Background Value[a]				**0.83**	**127**	**0.4**	**19.7**	**9.38**	**0.3**	**1**	**0.73**	**na**
AAA2660	50-06535	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2651	50-06536	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2661	50-06536	1.50–2.50	Sediment	11.2 (UJ)	—	0.92 (J)	30.4 (J-)	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2662	50-06536	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2652	50-06537	0.00–0.50	Sediment	11.2 (UJ)	—	0.92 (J)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2663	50-06537	1.50–2.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2664	50-06537	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2653	50-06538	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2665	50-06538	1.50–2.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2666	50-06538	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	3 (U)	1.4 (U)	1 (U)	—
AAA2654	50-06539	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2667	50-06539	1.50–2.50	Sediment	11.2 (UJ)	—	0.8 (U)	23.8 (J-)	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2668	50-06539	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2655	50-06540	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2669	50-06540	1.50–2.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2670	50-06540	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2656	50-06541	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	58.9	0.6 (U)	1.4 (U)	1 (U)	—
AAA2671	50-06541	1.50–2.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2672	50-06541	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2657	50-06542	0.00–0.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2673	50-06542	1.50–2.50	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—

Table 6.9-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Lead	Nickel	Selenium	Silver	Thallium	Total Phosphorus
Soil Background Value[a]				**0.83**	**295**	**0.4**	**22.3**	**15.4**	**1.52**	**1**	**0.73**	**na[b]**
Sediment Background Value[a]				**0.83**	**127**	**0.4**	**19.7**	**9.38**	**0.3**	**1**	**0.73**	**na**
AAA2674	50-06542	3.00–4.00	Sediment	11.2 (UJ)	—	0.8 (U)	—	—	0.6 (U)	1.4 (U)	1 (U)	—
AAA2658	50-06543	0.00–0.50	Soil	11.2 (UJ)	—	0.8 (U)	—	—	—	1.4 (U)	1 (U)	—
AAA2675	50-06543	1.50–2.50	Soil	11.2 (UJ)	—	0.8 (U)	—	—	—	1.4 (U)	1 (U)	—
AAA2676	50-06543	3.00–4.00	Soil	11.2 (UJ)	—	0.8 (U)	—	—	—	1.4 (U)	1 (U)	—

Note: All values in mg/kg.

[a] Background values are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 6.9-3
Radionuclides Detected above the BVs/FVs at SWMU 50-006(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**na[c]**	**0.023**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Sediment Background/Fallout Value[a,b]				**0.04**	**0.9**	**na**	**0.006**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
AAA2519	50-06500	0.00–0.50	Soil	—[d]	—	—	—	—	—	0.0726	—	—	—
AAA2520	50-06501	0.00–0.50	Soil	—	—	—	—	0.058	—	0.0390	—	—	—
AAA2521	50-06502	0.00–0.50	Soil	—	—	—	—	—	—	0.0269	—	—	—
AAA2721	50-06502	3.00–4.00	Soil	—	—	—	—	1.445	—	0.0953	—	—	—
AAA2522	50-06503	0.00–0.50	Soil	—	—	—	0.067	0.19	—	0.0519	—	—	—
AAA2715	50-06503	1.50–2.50	Soil	—	—	—	—	—	—	0.0969	—	—	—
AAA2720	50-06503	3.00–4.00	Soil	—	—	—	—	0.013	—	0.1985879	—	—	—
AAA2523	50-06504	0.00–0.50	Soil	—	—	—	1.144	3.83	—	0.1170034	—	—	—
AAA2524	50-06505	0.00–0.50	Soil	—	—	—	—	—	—	0.0198783	—	—	—
AAA2525	50-06506	0.00–0.50	Soil	—	—	—	0.066	—	—	0.0322	—	—	—
AAA2716	50-06506	1.50–2.50	Soil	—	—	—	0.272	0.281	—	0.0878	—	—	—
AAA2722	50-06506	3.00–4.00	Soil	—	—	—	—	0.04	—	0.1406806	—	—	—
AAA2526	50-06507	0.00–0.50	Soil	—	—	—	0.611	0.536	—	0.1099773	—	—	—
AAA2717	50-06507	1.50–2.50	Soil	—	—	—	0.087	0.048	—	0.0848	—	—	—
AAA2527	50-06508	0.00–0.50	Sediment	—	—	—	1.674	0.746	—	0.1765435	—	—	—
AAA2688	50-06508	1.50–2.50	Sediment	—	—	—	1.734	1.067	—	0.4193302	—	—	—
AAA2723	50-06508	3.00–4.00	Sediment	—	—	—	6.018	2.207	2.11 (J-)	0.5551674	—	—	—
AAA2528	50-06509	0.00–0.50	Sediment	—	—	—	0.14	—	—	—	—	—	—
AAA2529	50-06510	0.00–0.50	Sediment	—	—	—	2.953	2.419	1.17 (J-)	0.7323288	—	—	2.72
AAA2530	50-06511	0.00–0.50	Sediment	—	—	—	—	0.356	—	—	—	—	—
AAA2709	50-06511	1.50–2.50	Soil	—	—	—	—	0.042	—	0.0307 (J)	—	—	—
AAA2532	50-06513	0.00–0.50	Soil	—	1.7296	—	0.08 (J-)	3.99	—	0.0678 (J)	—	—	2.703
AAA3240	50-06514	1.50–2.50	Sediment	0.142 (J-)	—	—	2.276 (J-)	0.408 (J-)	—	—	—	—	—
AAA3241	50-06514	3.00–4.00	Sediment	0.079 (J-)	—	—	1.522 (J-)	0.244 (J-)	—	—	—	—	—
AAA2534	50-06515	0.00–0.50	Sediment	—	—	—	1.257	0.231	—	—	—	—	—
AAA2535	50-06516	0.00–0.50	Sediment	—	2.1782	—	15.068	3.674	—	0.1877228 (J)	—	—	—
AAA2536	50-06517	0.00–0.50	Sediment	—	—	—	8.741	2.144	—	0.2615691 (J)	—	—	2.53
AAA2711	50-06517	3.00–4.00	Sediment	—	—	—	0.602	0.111	—	—	—	—	—
AAA2537	50-06518	0.00–0.50	Sediment	—	0.9085	—	8.163	1.453	—	—	—	—	—
AAA2708	50-06518	1.50–2.50	Sediment	—	—	—	1.651	0.496	—	—	—	—	—
AAA2714	50-06518	3.00–4.00	Sediment	—	—	—	2.574	0.742	—	—	—	—	—
AAA2538	50-06519	0.00–0.50	Sediment	—	1.2458	—	7.486	1.825	—	0.1077898 (J)	—	—	—

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**na[c]**	**0.023**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Sediment Background/Fallout Value[a,b]				**0.04**	**0.9**	**na**	**0.006**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
AAA2539	50-06520	0.00–0.50	Sediment	—	—	—	4.462	0.746 (J-)	—	—	—	—	—
CAMO-05-61156	50-06520	0.00–0.98	Sediment	0.0918	—	—	5.84	0.991	—	—	—	—	—
AAA2710	50-06520	1.50–2.50	Sediment	—	—	—	2.687	1.215	—	—	—	—	—
AAA2713	50-06520	3.00–4.00	Sediment	—	—	—	0.421	0.109	—	—	—	—	—
AAA2540	50-06521	0.00–0.50	Sediment	—	—	—	0.654	0.165	—	—	—	—	—
AAA2637	50-06522	0.00–0.50	Sediment	—	—	—	3.679	0.734	—	—	—	—	—
AAA2707	50-06522	1.50–2.50	Sediment	—	—	—	1.163	0.286	—	—	—	—	—
AAA2712	50-06522	3.00–4.00	Sediment	—	—	—	0.171	—	—	—	—	—	—
AAA2638	50-06523	0.00–0.50	Sediment	—	1.3383	—	5.913	—	—	0.2066667 (J)	—	—	—
AAA2639	50-06524	0.00–0.50	Sediment	—	—	—	0.658	—	—	—	—	—	—
AAA2640	50-06525	0.00–0.50	Soil	—	—	—	0.034	—	—	0.0853 (J)	—	0.255	3.006
AAA2641	50-06526	0.00–0.50	Soil	—	—	—	0.034	—	—	0.0397 (J)	—	—	2.525
AAA2642	50-06527	0.00–0.50	Sediment	—	—	—	0.315	—	—	—	—	—	—
AAA2643	50-06528	0.00–0.50	Sediment	—	—	—	1.822	—	—	—	—	—	—
AAA2682	50-06528	1.50–2.50	Sediment	—	1.2311	—	7.051	1.91	—	0.1011839 (J)	—	—	—
AAA2685	50-06528	3.00–4.00	Sediment	—	—	—	0.481	0.116	—	—	—	—	—
AAA2644	50-06529	0.00–0.50	Sediment	—	—	—	0.051	9.258 (J)	—	—	—	—	2.747
AAA2683	50-06529	1.50–2.50	Sediment	—	—	—	0.046	—	—	—	—	—	—
AAA2684	50-06529	3.00–4.00	Sediment	—	—	—	0.06	—	—	—	—	—	—
AAA2645	50-06530	0.00–0.50	Sediment	—	—	—	4.746	—	—	—	—	—	—
AAA2646	50-06531	0.00–0.50	Sediment	—	—	—	2.746	—	—	—	—	—	—
AAA2705	50-06531	1.50–2.50	Sediment	—	—	—	0.316	—	—	—	—	—	—
AAA2706	50-06531	3.00–4.00	Sediment	—	—	—	0.068	—	—	—	—	—	—
AAA2647	50-06532	0.00–0.50	Sediment	—	—	—	16.811	—	—	0.1384778 (J)	—	—	—
AAA2648	50-06533	0.00–0.50	Sediment	—	—	—	0.304	0.225	—	—	—	—	—
AAA2681	50-06533	1.50–2.50	Sediment	—	—	—	0.265	2.263	—	—	—	—	—
AAA2686	50-06533	3.00–4.00	Sediment	—	—	—	0.314	0.233	—	—	—	—	—
AAA2649	50-06534	0.00–0.50	Sediment	—	—	—	1.495	—	—	—	—	—	—
AAA2650	50-06535	0.00–0.50	Sediment	—	0.9021	—	5.441	—	—	0.1978581	—	—	—
AAA2659	50-06535	1.50–2.50	Sediment	—	1.5605	—	8.22	—	—	—	—	—	—
AAA2660	50-06535	3.00–4.00	Sediment	—	—	—	0.993	—	—	0.0972	—	—	—
AAA2651	50-06536	0.00–0.50	Sediment	—	1.145	—	0.494	—	—	—	—	—	—
AAA2661	50-06536	1.50–2.50	Sediment	—	1.6626	—	10.739	—	—	0.1103311	—	—	—
AAA2662	50-06536	3.00–4.00	Sediment	—	3.1869	—	12.033	—	—	0.3034217	—	—	—

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**na[c]**	**0.023**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Sediment Background/Fallout Value[a,b]				**0.04**	**0.9**	**na**	**0.006**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
AAA2652	50-06537	0.00–0.50	Sediment	—	1.3146	—	0.269	6.947	—	0.1057521	—	—	2.506
AAA2664	50-06537	3.00–4.00	Sediment	—	—	—	—	—	—	0.0935	—	—	—
AAA2653	50-06538	0.00–0.50	Sediment	—	—	—	2.114	—	—	0.112951	—	—	—
AAA2654	50-06539	0.00–0.50	Sediment	—	—	—	0.622	—	—	—	—	—	—
AAA2667	50-06539	1.50–2.50	Sediment	—	—	—	0.765	—	—	—	—	—	—
AAA2668	50-06539	3.00–4.00	Sediment	—	—	—	0.494	—	—	—	—	—	—
AAA2655	50-06540	0.00–0.50	Sediment	—	—	—	4.066	—	—	0.1389583	—	—	—
AAA2669	50-06540	1.50–2.50	Sediment	—	—	—	1.236	—	—	0.1111937	—	—	—
AAA2670	50-06540	3.00–4.00	Sediment	—	—	—	0.093	—	—	—	—	—	—
AAA2656	50-06541	0.00–0.50	Sediment	—	—	—	0.314	—	—	—	—	—	—
AAA2671	50-06541	1.50–2.50	Sediment	—	—	—	0.035	—	—	—	—	—	—
AAA2672	50-06541	3.00–4.00	Sediment	—	—	—	0.065	0.069	—	—	—	—	—
AAA2657	50-06542	0.00–0.50	Sediment	—	—	—	0.465	0.219	—	—	—	—	—
AAA2673	50-06542	1.50–2.50	Sediment	—	—	—	1.066	0.313	—	—	—	—	—
AAA2674	50-06542	3.00–4.00	Sediment	—	—	—	0.259	0.122	—	—	—	—	—
AAA2658	50-06543	0.00–0.50	Soil	—	—	—	—	0.436	—	0.0762	—	—	2.692
AAA2675	50-06543	1.50–2.50	Soil	—	—	—	—	0.04	—	0.0629	—	—	—
AAA2676	50-06543	3.00–4.00	Soil	—	—	—	—	—	—	0.1021286	—	—	—
AAA3229	50-06550	0.00–0.50	Sediment	0.1134 (J-)	—	—	1.125	0.376 (J)	—	—	—	—	—
AAA3228	50-06551	0.00–0.50	Sediment	0.102 (J-)	—	—	1.09	0.463 (J)	—	0.0955794	—	—	—
AAA3218	50-06551	1.50–2.50	Sediment	0.123 (J-)	—	—	0.232	0.242 (J)	—	—	—	—	—
AAA3212	50-06551	3.00–4.00	Sediment	—	—	—	0.191	—	—	—	—	—	—
AAA3219	50-06552	0.00–0.50	Sediment	2.526 (J-)	2.8439	—	25.988	8.414 (J)	—	—	—	—	—
AAA3216	50-06552	3.00–4.00	Sediment	0.679 (J-)	—	—	7.198	1.579 (J)	—	0.1245503	—	—	—
AAA3215	50-06553	0.00–0.50	Sediment	0.358	—	—	5.069	1.152	—	—	—	—	—
AAA3205	50-06554	0.00–0.50	Sediment	0.261	1.8215	—	1.065	2.653	—	0.1835391	—	—	3.049
AAA3203	50-06555	0.00–0.50	Sediment	1.36	—	—	4.066	5.142	—	0.1604218	2.735	—	3.028
AAA3213	50-06556	0.00–0.50	Sediment	2.844	3.585	1.2991	2.561	6.909	—	0.435891	—	—	—
AAA3217	50-06556	1.50–2.50	Sediment	0.863	1.5807	—	6.464	2.694	—	0.0966	—	—	—
AAA3223	50-06557	0.00–0.50	Sediment	0.347	1.4207	—	4.76	1.424	—	0.2015011	—	—	—
AAA3224	50-06557	1.50–2.50	Sediment	0.062	—	—	0.797	—	—	—	—	—	—
AAA3208	50-06557	3.00–4.00	Sediment	—	—	—	1.741	—	—	—	—	—	—
AAA3225	50-06558	0.00–0.50	Sediment	0.168	—	—	2.446	—	—	—	—	—	—
AAA3201	50-06558	1.50–2.50	Sediment	0.077	—	—	0.729	—	—	—	—	—	—

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**na[c]**	**0.023**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Sediment Background/Fallout Value[a,b]				**0.04**	**0.9**	**na**	**0.006**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
AAA3202	50-06558	3.00–4.00	Sediment	0.302	—	—	4.461	1.367	—	0.128379	—	—	—
AAA3211	50-06559	0.00–0.50	Sediment	0.258	—	—	2.502	1.198	—	0.2117759	—	—	—
AAA3206	50-06560	0.00–0.50	Sediment	1.086	—	—	16.94	4.512	—	1.222941	—	—	2.96
AAA3207	50-06561	0.00–0.50	Sediment	4.172	—	—	67.817	12.815	3.11	1.264033	—	—	—
AAA3214	50-06562	0.00–0.50	Soil	0.052	—	—	—	—	—	0.0234	—	—	—
AAA3200	50-06563	0.00–0.50	Sediment	3.219	—	—	31.711	19.51	—	—	—	—	—
AAA3204	50-06564	0.00–0.50	Sediment	0.054	—	—	0.533	—	—	—	—	—	—
AAA3221	50-06565	0.00–0.50	Sediment	0.685 (J-)	—	—	1.669 (J-)	2.194 (J-)	—	—	—	—	—
AAA3220	50-06565	1.50–2.50	Sediment	1.834 (J-)	2.07	—	16.447 (J-)	6.798 (J-)	—	0.3231511	—	—	—
AAA3226	50-06565	3.00–4.00	Sediment	1.128 (J-)	2.2445	—	13.638 (J-)	3.533 (J-)	—	0.3742328	—	—	—
AAA3230	50-06566	0.00–0.50	Sediment	1.644 (J-)	0.9107	—	37.383 (J-)	4.176 (J-)	—	—	—	—	—
AAA3231	50-06566	1.50–2.50	Sediment	1.607 (J-)	—	—	23.306 (J-)	5.649 (J-)	—	—	—	—	—
AAA3232	50-06566	3.00–4.00	Sediment	0.786 (J-)	—	—	12.894 (J-)	2.986 (J-)	—	—	—	—	—
AAA3233	50-06567	0.00–0.50	Sediment	0.135 (J-)	—	—	1.822 (J-)	0.514 (J-)	—	—	—	—	—
AAA3234	50-06567	1.50–2.50	Sediment	0.641 (J-)	—	—	11.603 (J-)	2.546 (J-)	—	0.1369249	—	—	—
AAA3235	50-06567	3.00–4.00	Sediment	0.307 (J-)	—	—	4.868 (J-)	1.428 (J-)	—	—	—	—	—
AAA3236	50-06568	0.00–0.50	Sediment	1.432 (J-)	—	—	17.71 (J-)	5.195 (J-)	1.24 (J-)	0.099319	—	—	—
AAA3237	50-06568	1.50–2.50	Sediment	1.043 (J-)	1.7569	—	33.873 (J-)	3.577 (J-)	—	0.4681765	—	—	—
AAA3238	50-06568	3.00–4.00	Sediment	0.425 (J-)	1.2493	—	4.618 (J-)	2.235 (J-)	1.33 (J-)	0.1430864	—	—	—

Note: All values in pCi/g.

[a] Background/fallout values are from LANL 1998, 059730.

[b] Fallout value applies to soil samples collected from 0–0.5 ft only and applies to sediment samples of all depth.

[c] na = Not available.

[d] — = Analyte not reported (detect or nondetect) above BV/FV or not detected.

Table 6.9-4
Organic Chemicals Detected at SWMU 50-006(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbon Tetrachloride	Chrysene
AAA2519	50-06500	0.00–0.50	Soil	—*	—	—	—	—	—	—	—	—	—	—	0.1 (J)	—	—	—
AAA2520	50-06501	0.00–0.50	Soil	—	—	—	—	0.056	—	—	—	—	—	—	—	—	—	—
AAA2721	50-06502	3.00–4.00	Soil	—	—	—	—	—	—	—	—	—	—	0.046 (J)	—	—	—	—
AAA2522	50-06503	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	0.051 (J)	—	—	—
AAA2523	50-06504	0.00–0.50	Soil	—	—	—	—	0.12	0.065 (J)	0.053 (J)	—	—	—	—	—	—	—	0.085 (J)
AAA2716	50-06506	1.50–2.50	Soil	—	—	—	—	—	—	—	—	—	—	0.068 (J)	—	—	—	—
AAA2527	50-06508	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	0.13 (J)	—	—	—	0.11 (J)
AAA2723	50-06508	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	0.066 (J)	—	—	—	—
AAA2528	50-06509	0.00–0.50	Sediment	0.041 (J)	—	0.04 (J)	—	—	0.44	0.67	0.87	0.25 (J)	0.27 (J)	—	—	—	—	0.72
AAA2529	50-06510	0.00–0.50	Sediment	—	—	—	—	—	—	—	0.048 (J)	—	—	—	—	—	—	0.059 (J)
AAA2530	50-06511	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.51	—	—	—
AAA2709	50-06511	1.50–2.50	Soil	—	—	—	—	—	—	—	—	—	—	—	0.16 (J)	—	—	—
AAA2532	50-06513	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	0.073 (J)	—	—	—
AAA2534	50-06515	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.14 (J)	—	—	—
AAA2535	50-06516	0.00–0.50	Sediment	—	—	—	—	—	0.08 (J)	0.11 (J)	0.089 (J)	0.092 (J)	0.086 (J)	—	0.081 (J)	—	—	0.11 (J)
AAA2536	50-06517	0.00–0.50	Sediment	—	—	—	—	—	0.1 (J)	0.081 (J)	0.1 (J)	—	0.079 (J)	—	0.097 (J)	—	—	0.19 (J)
AAA2711	50-06517	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.1 (J)	—	—	—
AAA2537	50-06518	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.2 (J)	—	—	—
AAA2708	50-06518	1.50–2.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.24 (J)	—	—	—
AAA2714	50-06518	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.1 (J-)	—	—	—
AAA2538	50-06519	0.00–0.50	Sediment	—	—	—	—	—	0.15 (J)	0.19 (J)	0.18 (J)	—	0.13 (J)	0.044 (J)	0.058 (J)	—	—	0.2 (J)
AAA2539	50-06520	0.00–0.50	Sediment	—	—	—	—	—	0.13 (J)	0.13 (J)	0.16 (J)	0.13 (J)	0.1 (J)	—	0.041 (J)	—	—	0.17 (J)
CAMO-05-61156	50-06520	0.00–0.98	Sediment	0.0213 (J)	—	0.0816	0.0124 (J)	0.0479	0.482	0.735	0.224	0.374	—	—	—	—	—	0.629
AAA2710	50-06520	1.50–2.50	Sediment	—	—	—	—	—	0.038 (J)	—	—	—	—	—	0.041 (J)	—	—	0.04 (J)
AAA2713	50-06520	3.00–4.00	Sediment	0.51	—	0.9	—	—	0.68	0.53	0.44	0.3 (J)	0.53	—	0.059 (J)	—	—	0.72
AAA2540	50-06521	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.07 (J)	—	—	—
AAA2637	50-06522	0.00–0.50	Sediment	—	—	0.072 (J)	—	—	0.37	0.41	0.38	0.37	0.36	—	0.072 (J)	—	—	0.49
AAA2707	50-06522	1.50–2.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.12 (J)	—	—	—
AAA2712	50-06522	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.14 (J)	—	—	—
AAA2638	50-06523	0.00–0.50	Sediment	—	—	—	—	—	0.26 (J)	0.34 (J)	0.4 (J)	—	0.29 (J)	—	0.1 (J)	—	—	0.34 (J)
AAA2639	50-06524	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.11 (J)	—	—	—

Table 6.9-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbon Tetrachloride	Chrysene
AAA2640	50-06525	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	0.064 (J)	—	—	—
AAA2641	50-06526	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	0.066 (J)	—	—	—
AAA2643	50-06528	0.00–0.50	Sediment	—	—	—	—	—	0.2 (J)	0.27 (J)	0.3 (J)	—	0.27 (J)	—	0.12 (J)	—	—	0.27 (J)
AAA2685	50-06528	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.06 (J)	—	—	—
AAA2644	50-06529	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.12 (J)	—	—	—
AAA2683	50-06529	1.50–2.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.064 (J)	—	—	—
AAA2684	50-06529	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.045 (J)	—	—	—
AAA2645	50-06530	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2646	50-06531	0.00–0.50	Sediment	0.049 (J)	—	0.078 (J)	—	—	0.5	0.55	0.59	0.17 (J)	0.53	—	0.16 (J)	0.51	—	0.6
AAA2705	50-06531	1.50–2.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.056 (J)	0.093 (J)	—	—
AAA2647	50-06532	0.00–0.50	Sediment	0.13 (J)	—	0.18 (J)	—	—	1.1	1.2	1.1	0.66	1.13	—	0.085 (J)	—	—	1.4
AAA2648	50-06533	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.062 (J)	—	—	—
AAA2681	50-06533	1.50–2.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.086 (J)	—	—	—
AAA2649	50-06534	0.00–0.50	Sediment	—	—	—	—	—	0.22 (J)	0.29 (J)	0.26 (J)	0.18 (J)	0.26 (J)	—	0.084 (J)	0.17 (J)	—	0.31 (J)
AAA2650	50-06535	0.00–0.50	Sediment	—	—	—	—	—	0.22 (J)	0.29 (J)	0.41 (J)	0.093 (J)	0.13 (J)	—	—	—	—	0.3 (J)
AAA2661	50-06536	1.50–2.50	Sediment	0.089 (J)	—	—	—	—	0.46	0.6	0.66	0.26 (J)	0.26 (J)	—	—	—	—	0.54
AAA2662	50-06536	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2653	50-06538	0.00–0.50	Sediment	—	—	—	—	—	0.061 (J)	0.094 (J)	0.13 (J)	—	0.046 (J)	—	—	—	—	0.094 (J)
AAA2654	50-06539	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	0.14 (J)	—	—	—	—
AAA2668	50-06539	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2655	50-06540	0.00–0.50	Sediment	—	—	—	—	—	0.1 (J)	0.15 (J)	0.22 (J)	—	—	—	—	—	—	0.15 (J)
AAA2672	50-06541	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2657	50-06542	0.00–0.50	Sediment	—	—	—	—	—	—	—	0.088 (J)	—	—	—	—	—	—	0.077 (J)
AAA2673	50-06542	1.50–2.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	0.058 (J)	—	—	—
AAA3228	50-06551	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	0.002 (J)	—
AAA3219	50-06552	0.00–0.50	Sediment	—	—	—	—	0.78 (J)	—	—	—	—	—	—	—	—	—	—
AAA3216	50-06552	3.00–4.00	Sediment	—	—	—	—	0.12 (J-)	—	—	—	—	—	—	—	—	—	—
AAA3215	50-06553	0.00–0.50	Sediment	—	—	—	—	0.082 (J-)	—	—	—	—	—	—	—	—	—	—
AAA3205	50-06554	0.00–0.50	Sediment	—	0.034 (J)	—	—	0.23 (J)	—	—	—	—	—	—	—	—	—	—
AAA3203	50-06555	0.00–0.50	Sediment	—	—	—	—	0.33	—	—	—	—	—	—	—	—	—	—
AAA3213	50-06556	0.00–0.50	Sediment	—	—	—	—	0.76	—	—	—	—	—	—	—	—	—	—
AAA3217	50-06556	1.50–2.50	Sediment	—	—	—	—	0.182 (J-)	—	—	—	—	—	—	—	—	—	—

Table 6.9-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbon Tetrachloride	Chrysene
AAA3223	50-06557	0.00–0.50	Sediment	—	—	—	—	0.2 (J)	—	—	—	—	—	—	—	—	—	—
AAA3208	50-06557	3.00–4.00	Sediment	—	0.007 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA3225	50-06558	0.00–0.50	Sediment	—	0.011	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA3211	50-06559	0.00–0.50	Sediment	—	0.027 (J)	—	—	0.74	—	—	—	—	—	—	—	—	—	—
AAA3206	50-06560	0.00–0.50	Sediment	—	—	—	—	0.11 (J-)	—	—	—	—	—	—	—	—	—	—
AAA3207	50-06561	0.00–0.50	Sediment	—	0.003 (J)	—	—	1.37	—	—	—	—	—	—	—	—	—	—
AAA3214	50-06562	0.00–0.50	Soil	—	0.019	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA3200	50-06563	0.00–0.50	Sediment	—	—	—	—	0.12 (J)	—	—	—	—	—	—	—	—	—	—
AAA3204	50-06564	0.00–0.50	Sediment	—	0.015	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.9-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenz(a,h)anthracene	Dibenzofuran	Diethylphthalate	Di-n-butylphthalate	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methyl-2-pentanone[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene
AAA2519	50-06500	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2520	50-06501	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2721	50-06502	3.00–4.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2522	50-06503	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2523	50-06504	0.00–0.50	Soil	—	—	—	—	0.15 (J)	—	—	—	—	—	—	—	0.084 (J)	0.17 (J)	—
AAA2716	50-06506	1.50–2.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2527	50-06508	0.00–0.50	Sediment	—	—	—	—	0.15 (J)	—	—	—	—	—	—	—	0.058 (J)	0.23 (J)	—
AAA2723	50-06508	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2528	50-06509	0.00–0.50	Sediment	—	—	—	—	1	—	—	0.23 (J)	—	—	—	—	0.35 (J)	1.2	—
AAA2529	50-06510	0.00–0.50	Sediment	—	—	—	—	0.089 (J)	—	—	—	—	—	—	—	—	0.088 (J)	—
AAA2530	50-06511	0.00–0.50	Sediment	—	—	—	0.79 (J)	—	—	—	—	—	—	—	—	—	—	—
AAA2709	50-06511	1.50–2.50	Soil	—	—	—	1.3 (J)	—	—	—	—	—	—	—	—	—	—	—
AAA2532	50-06513	0.00–0.50	Soil	—	—	—	1.8 (J)	—	—	—	—	—	—	—	—	—	—	—
AAA2534	50-06515	0.00–0.50	Sediment	—	—	—	2.5 (J)	—	—	—	—	—	—	—	—	—	—	—
AAA2535	50-06516	0.00–0.50	Sediment	—	—	—	0.85 (J)	0.2 (J)	—	—	0.088 (J)	—	—	—	—	0.11 (J)	0.18 (J)	—
AAA2536	50-06517	0.00–0.50	Sediment	—	—	—	0.46 (J)	0.33 (J)	—	—	—	—	—	—	—	—	0.29 (J)	—
AAA2711	50-06517	3.00–4.00	Sediment	—	—	—	0.58 (J)	—	—	—	—	—	—	—	—	—	—	—
AAA2537	50-06518	0.00–0.50	Sediment	—	—	—	0.42 (J)	—	—	—	—	—	—	—	—	—	—	—
AAA2708	50-06518	1.50–2.50	Sediment	—	—	—	0.28 (J)	—	—	—	—	—	—	—	—	—	—	—
AAA2714	50-06518	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2538	50-06519	0.00–0.50	Sediment	—	—	—	2.6 (J)	0.36 (J)	—	—	—	—	—	—	—	0.17 (J)	0.3 (J)	—
AAA2539	50-06520	0.00–0.50	Sediment	—	—	—	2.4 (J)	0.31 (J)	—	—	0.11 (J)	—	—	—	—	0.16 (J)	0.25 (J)	—
CAMO-05-61156	50-06520	0.00–0.98	Sediment	—	—	—	—	1.06	—	—	0.101	—	—	—	—	0.735	1.25	—
AAA2710	50-06520	1.50–2.50	Sediment	—	—	—	3 (J)	0.068 (J)	—	—	—	—	—	—	—	—	0.071 (J)	—
AAA2713	50-06520	3.00–4.00	Sediment	0.17 (J)	0.26 (J)	—	2.7 (J)	2.4	0.47	—	0.33 (J)	—	—	0.081 (J)	0.18 (J)	3.1	2	—
AAA2540	50-06521	0.00–0.50	Sediment	—	—	—	2.5 (J)	—	—	—	—	—	—	—	—	—	—	—
AAA2637	50-06522	0.00–0.50	Sediment	0.16 (J)	—	—	—	1	—	—	0.31 (J)	—	—	—	—	0.39	0.75	—
AAA2707	50-06522	1.50–2.50	Sediment	—	—	—	0.44 (J)	—	—	—	—	—	—	—	—	—	—	—
AAA2712	50-06522	3.00–4.00	Sediment	—	—	—	0.33 (J)	—	—	—	—	—	—	—	—	—	—	—
AAA2638	50-06523	0.00–0.50	Sediment	—	—	—	—	0.61	—	—	—	—	—	—	—	0.2 (J)	0.45	—
AAA2639	50-06524	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2640	50-06525	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2641	50-06526	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2643	50-06528	0.00–0.50	Sediment	—	—	—	—	0.45	—	—	—	—	—	—	—	0.14 (J)	0.39 (J)	—

Table 6.9-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenz(a,h)anthracene	Dibenzofuran	Diethylphthalate	Di-n-butylphthalate	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methyl-2-pentanone[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene
AAA2685	50-06528	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2644	50-06529	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2683	50-06529	1.50–2.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2684	50-06529	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2645	50-06530	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	0.042 (J)	—
AAA2646	50-06531	0.00–0.50	Sediment	—	—	—	—	1.1	—	—	0.2 (J)	—	—	—	—	0.44	0.88	—
AAA2705	50-06531	1.50–2.50	Sediment	—	—	—	—	0.052 (J)	—	—	—	—	—	—	—	—	0.041 (J)	—
AAA2647	50-06532	0.00–0.50	Sediment	0.18 (J)	—	—	—	1.9	0.08 (J)	—	0.66	—	—	—	—	1.1	2.4	—
AAA2648	50-06533	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2681	50-06533	1.50–2.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2649	50-06534	0.00–0.50	Sediment	—	—	—	—	0.35 (J)	—	—	0.17 (J)	—	—	—	—	0.17 (J)	0.53	—
AAA2650	50-06535	0.00–0.50	Sediment	—	—	—	—	0.48	—	—	0.098 (J)	—	—	—	—	—	0.54	—
AAA2661	50-06536	1.50–2.50	Sediment	—	—	—	—	1	—	—	0.29 (J)	—	—	—	—	0.5	1.2	—
AAA2662	50-06536	3.00–4.00	Sediment	—	—	—	—	0.06 (J)	—	—	—	—	—	—	—	—	0.057 (J)	—
AAA2653	50-06538	0.00–0.50	Sediment	—	—	—	—	0.13 (J)	—	—	—	—	—	—	—	—	0.14 (J)	—
AAA2654	50-06539	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA2668	50-06539	3.00–4.00	Sediment	—	—	—	—	0.075 (J)	—	—	—	—	—	—	—	—	0.069 (J)	—
AAA2655	50-06540	0.00–0.50	Sediment	—	—	—	—	0.25 (J)	—	—	—	—	—	—	—	0.1 (J)	0.25 (J)	—
AAA2672	50-06541	3.00–4.00	Sediment	—	—	0.1 (J)	—	—	—	—	—	—	—	—	—	—	—	—
AAA2657	50-06542	0.00–0.50	Sediment	—	—	—	—	0.21 (J)	—	—	0.036 (J)	—	—	—	—	0.12 (J)	0.23 (J)	—
AAA2673	50-06542	1.50–2.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA3228	50-06551	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.009 (J)
AAA3219	50-06552	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.003 (J)
AAA3216	50-06552	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA3215	50-06553	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.005 (J)
AAA3205	50-06554	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA3203	50-06555	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA3213	50-06556	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.022 (J)
AAA3217	50-06556	1.50–2.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA3223	50-06557	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.006 (J)
AAA3208	50-06557	3.00–4.00	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA3225	50-06558	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA3211	50-06559	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.016 (J)
AAA3206	50-06560	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.9-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenz(a,h)anthracene	Dibenzofuran	Diethylphthalate	Di-n-butylphthalate	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methyl-2-pentanone[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene
AAA3207	50-06561	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.007 (J)
AAA3214	50-06562	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.008 (J)
AAA3200	50-06563	0.00–0.50	Sediment	—	—	—	—	—	—	0.014	—	—	0.002 (J)	—	—	—	—	0.005 (J)
AAA3204	50-06564	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	0.008 (J)	—	—	—	—	—	0.002 (J)

Note: All values in mg/kg.

* — = Analyte not detected.

Table 6.9-5
Proposed Sampling at SWMU 50-006(a)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Anions	Perchlorate	Phosphorous	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	Americium-241	Strontium-90	PCBs	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine vertical and lateral extent of contamination	6a-1 through 6a-3	Drainage	Surface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 6.10-1
Samples Collected at SWMU 50-006(c)

Sample ID	Location ID	Depth (ft)	Media	SVOCs	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
AAA2439	50-05001	0–0.5	Soil	14633[a]	14634	14634	14634	14634	14634
AAA2440	50-05002	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2441	50-05003	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2442	50-05004	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2443	50-05005	0–0.5	Sediment	14633	14634	14634	14634	14634	14634
AAA2444	50-05006	0–0.5	Sediment	14633	14634	14634	14634	14634	14634
AAA2445	50-05007	0–0.5	Sediment	14633	14634	14634	14634	14634	14634
AAA2446	50-05008	0–0.5	Sediment	14633	14634	14634	14634	14634	14634
AAA2447	50-05009	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2448	50-05020	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2449	50-05021	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2450	50-05022	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2451	50-05023	0–0.5	Sediment	14633	14634	14634	14634	14634	14634
AAA2452	50-05024	0–0.5	Sediment	14633	14634	14634	14634	14634	14634
AAA2453	50-05025	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2454	50-05026	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2455	50-05027	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2456	50-05028	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2457	50-05029	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2458	50-05030	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2459	50-05031	0–0.5	Soil	14633	14634	14634	14634	14634	14634
AAA2460	50-05041	0–0.5	Soil	14643	14644	14644	14644	14644	—[b]
AAA2461	50-05042	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2462	50-05043	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2463	50-05044	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2464	50-05045	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2465	50-05046	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2466	50-05047	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2467	50-05048	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2468	50-05060	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2469	50-05061	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2470	50-05062	0–0.5	Soil	—	14600	14600	14600	14600	—
AAA2471	50-05063	0–0.5	Fill	—	14600	14600	14600	14600	—

Table 6.10-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	SVOCs	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
AAA2472	50-05064	0–0.5	Sediment	—	14600	14600	14600	14600	—
AAA2473	50-05065	0–0.5	Sediment	—	14600	14600	14600	14600	—
AAA2474	50-05066	0–0.5	Sediment	—	14600	14600	14600	14600	—
AAA2475	50-05067	0–0.5	Soil	—	14600	14600	14600	14600	—
AAA2476	50-05068	0–0.5	Soil	—	14600	14600	14600	14600	—
AAA2477	50-05069	0–0.5	Soil	—	14600	14600	14600	14600	—
AAA2478	50-05070	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2479	50-05080	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2480	50-05081	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2481	50-05082	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2482	50-05083	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2483	50-05084	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2484	50-05085	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2485	50-05086	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2486	50-05087	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2487	50-05088	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2488	50-05089	0–0.5	Soil	14643	14644	14644	14644	14644	—
AAA2489	50-05090	0–0.5	Soil	14643	14644	14644	14644	14644	—

[a] Analytical request number.

[b] — =Analysis not requested.

Table 6.10-2
Radionuclides Detected or Detected above FVs/BVs at SWMU 50-006(c)

Sample ID	Location ID	Depth (ft)	Media	Cobalt-60	Plutonium-238	Plutonium-239/ Plutonium-240	Thorium-232	Tritium
Soil Background/Fallout Value[a,b]				**na[c]**	**0.023**	**0.054**	**2.33**	**na**
Sediment Background/Fallout Value[a,b]				**na**	**0.006**	**0.068**	**2.33**	**0.093**
AAA2439	50-05001	0.00–0.50	Soil	—[d]	—	—	—	0.0348
AAA2440	50-05002	0.00–0.50	Soil	—	—	—	—	0.0226
AAA2441	50-05003	0.00–0.50	Soil	—	—	0.072	—	0.1574661
AAA2442	50-05004	0.00–0.50	Soil	—	—	0.069	—	0.0682
AAA2443	50-05005	0.00–0.50	Sediment	—	0.013	0.07	—	—
AAA2444	50-05006	0.00–0.50	Sediment	—	0.016	—	—	—
AAA2445	50-05007	0.00–0.50	Sediment	—	0.023	0.086	—	—
AAA2447	50-05009	0.00–0.50	Soil	—	0.09	0.206	—	0.3234597
AAA2448	50-05020	0.00–0.50	Soil	—	0.089	0.171	—	0.0596
AAA2449	50-05021	0.00–0.50	Soil	—	—	—	—	0.0472
AAA2450	50-05022	0.00–0.50	Soil	—	—	—	—	0.0316
AAA2452	50-05024	0.00–0.50	Sediment	1.5192	0.021	—	—	—
AAA2453	50-05025	0.00–0.50	Soil	—	—	—	—	0.0420304
AAA2454	50-05026	0.00–0.50	Soil	—	—	—	—	0.0297
AAA2455	50-05027	0.00–0.50	Soil	—	—	—	4.0285	0.0319
AAA2456	50-05028	0.00–0.50	Soil	—	—	—	—	0.0489
AAA2457	50-05029	0.00–0.50	Soil	—	—	—	—	0.056875
AAA2458	50-05030	0.00–0.50	Soil	—	—	0.066	—	0.0364
AAA2459	50-05031	0.00–0.50	Soil	—	—	0.691	—	0.1127894
AAA2460	50-05041	0.00–0.50	Soil	—	0.025	0.055	—	0.0403 (J)
AAA2461	50-05042	0.00–0.50	Soil	—	—	0.456	—	0.0774 (J)
AAA2462	50-05043	0.00–0.50	Soil	—	0.033	0.121	—	0.0395 (J)
AAA2463	50-05044	0.00–0.50	Soil	—	—	0.094	—	0.0260 (J)
AAA2464	50-05045	0.00–0.50	Soil	—	0.033	0.791	—	0.0232 (J)
AAA2465	50-05046	0.00–0.50	Soil	—	—	—	—	0.0290 (J)
AAA2466	50-05047	0.00–0.50	Soil	—	—	0.285	—	0.0423 (J)
AAA2467	50-05048	0.00–0.50	Soil	—	0.127	0.744	—	—
AAA2468	50-05060	0.00–0.50	Soil	—	—	—	—	0.0260 (J)
AAA2469	50-05061	0.00–0.50	Soil	—	0.052	1.606	—	0.0547 (J)
AAA2470	50-05062	0.00–0.50	Soil	—	—	0.097 (J)	—	—
AAA2471	50-05063	0.00–0.50	Fill	—	—	—	—	0.00877
AAA2472	50-05064	0.00–0.50	Sediment	—	—	0.124 (J)	—	0.2496534

Table 6.10-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cobalt-60	Plutonium-238	Plutonium-239/ Plutonium-240	Thorium-232	Tritium
Soil Background/Fallout Value[a,b]				**na[c]**	**0.023**	**0.054**	**2.33**	**na**
Sediment Background/Fallout Value[a,b]				**na**	**0.006**	**0.068**	**2.33**	**0.093**
AAA2473	50-05065	0.00–0.50	Sediment	—	0.039	0.979	—	—
AAA2474	50-05066	0.00–0.50	Sediment	—	0.017	0.251 (J)	—	—
AAA2475	50-05067	0.00–0.50	Soil	—	—	—	—	0.0359
AAA2476	50-05068	0.00–0.50	Soil	—	0.028	0.763	—	0.0290
AAA2477	50-05069	0.00–0.50	Soil	—	—	0.13 (J)	—	0.0391
AAA2478	50-05070	0.00–0.50	Soil	—	—	0.316 (J)	—	0.0471 (J)
AAA2479	50-05080	0.00–0.50	Soil	—	—	—	—	0.0532 (J)
AAA2480	50-05081	0.00–0.50	Soil	—	—	—	—	0.0357 (J)
AAA2481	50-05082	0.00–0.50	Soil	—	—	0.162 (J)	—	0.0750 (J)
AAA2482	50-05083	0.00–0.50	Soil	—	—	0.187 (J)	—	0.0498 (J)
AAA2483	50-05084	0.00–0.50	Soil	—	—	0.076 (J)	—	0.0627 (J)
AAA2484	50-05085	0.00–0.50	Soil	—	—	—	—	0.112065 (J)
AAA2485	50-05086	0.00–0.50	Soil	—	—	1.395 (J)	—	0.0533 (J)
AAA2486	50-05087	0.00–0.50	Soil	—	—	0.435 (J)	—	0.0662 (J)
AAA2487	50-05088	0.00–0.50	Soil	—	—	—	—	0.0889 (J)
AAA2488	50-05089	0.00–0.50	Soil	—	—	—	—	0.0519774 (J)
AAA2489	50-05090	0.00–0.50	Soil	—	—	0.126 (J)	—	0.1098693 (J)

Note: All values in pCi/g.

[a] Background/fallout values are from LANL 1998, 059730.

[b] Fallout value applies to soil samples collected from 0–0.5 ft only and applies to sediment samples of all depth.

[c] na = Not available.

[d] — = Analyte not reported (detect or nondetect) above BV/FV or not detected.

Table 6.10-3
Organic Chemicals Detected at SWMU 50-006(c)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Dibenz(a,h)anthracene	Diethylphthalate	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
AAA2440	50-05002	0.00–0.50	Soil	—*	—	0.79	0.98	0.93	1	0.53	—	0.91	—	—	—	1.5	—	0.76	0.67	2.1
AAA2441	50-05003	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	0.75	—	—	0.64	0.74
AAA2445	50-05007	0.00–0.50	Sediment	—	—	1.2	1.3	1.4	1.2	1	—	1.5	0.55	—	—	2.8	—	1.1	1	2.1
AAA2447	50-05009	0.00–0.50	Soil	—	—	0.61	0.7	0.66	0.5	0.43	—	0.68	—	—	—	2.1	—	0.55	1.8	1.8
AAA2460	50-05041	0.00–0.50	Soil	—	—	0.29 (J)	0.36	0.34 (J)	0.28 (J)	0.32 (J)	—	0.37	—	—	—	0.7	—	0.27 (J)	0.38	0.74
AAA2461	50-05042	0.00–0.50	Soil	0.26 (J)	0.41	0.67	0.71	0.57	0.58	0.51	—	0.74	0.31 (J)	—	1.8	1.9	0.23 (J)	0.54	1.8	2
AAA2463	50-05044	0.00–0.50	Soil	—	—	—	—	—	—	—	0.7 (J)	—	—	—	—	—	—	—	—	—
AAA2465	50-05046	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	0.22 (J)	—	—	—	0.28 (J)
AAA2466	50-05047	0.00–0.50	Soil	0.15 (J)	0.21 (J)	0.3 (J)	0.32 (J)	0.24 (J)	—	0.23 (J)	—	0.31 (J)	—	—	—	0.89	—	0.2 (J)	0.91	0.93
AAA2467	50-05048	0.00–0.50	Soil	—	—	—	0.12 (J)	—	—	—	—	—	—	—	—	0.33 (J)	—	—	0.28 (J)	0.32 (J)
AAA2469	50-05061	0.00–0.50	Soil	0.14 (J)	0.3 (J)	1.8	2.4	2.2	1.4	1.4	—	2.9	0.69	—	—	4.1	—	1.6	2.1	4.8
AAA2484	50-05085	0.00–0.50	Soil	—	—	0.45	0.63	0.5	0.36 (J)	0.42	0.69 (J)	0.67	0.3 (J)	—	—	0.95	—	0.38 (J)	0.63	1.1
AAA2486	50-05087	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	0.21 (J)	—	—	—	—	—	—

Note: All values in mg/kg.

* — = Analyte not detected.

Table 6.11-1
Samples Collected at SWMU 50-006(d)

Sample ID	Location ID	Depth (ft)	Media	PCBs	SVOCs	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
AAA2492	50-06000	0–0.5	Sediment	—[a]	14813[b]	14818	14818	14818	14818	14818
AAA2493	50-06001	0–0.5	Sediment	14813	14813	14818	14818	14818	14818	14818
AAA2494	50-06002	0–0.5	Sediment	—	—	14818	14818	14818	14818	14818
AAA2750	50-06002	1.5–2.5	Sediment	—	14813	14818	14818	14818	14818	14818
AAA2752	50-06002	3–4	Sediment	—	14813	14818	14818	14818	14818	14818
AAA2495	50-06003	0–0.5	Soil	—	14813	14818	14818	14818	14818	14818
AAA2496	50-06004	0–0.5	Sediment	—	14813	14818	14818	14818	14818	14818
AAA2497	50-06005	0–0.5	Sediment	—	14813	14818	14818	14818	14818	14818
AAA2753	50-06005	3–4	Sediment	—	14813	14818	14818	14818	14818	14818
AAA2498	50-06006	0–0.5	Sediment	14813	—	14818	14818	14818	14818	14818
AAA2499	50-06007	0–0.5	Sediment	14813	14813	14818	14818	14818	14818	14818
AAA2749	50-06007	1.5–2.5	Sediment	14813	14813	14818	14818	14818	14818	14818
AAA2500	50-06008	0–0.5	Sediment	—	14813	14818	14818	14818	14818	14818
AAA2748	50-06008	1.5–2.5	Soil	—	14813	14818	14818	14818	14818	14818
AAA2751	50-06008	3–4	Soil	—	14813	14818	14818	14818	14818	14818
AAA2501	50-06009	0–0.5	Soil	—	14788	14797	14797	14797	14797	14797
AAA2739	50-06009	3–4	Soil	—	14788	14797	14797	14797	14797	14797
AAA2502	50-06010	0–0.5	Sediment	—	14788	14797	14797	14797	14797	14797
AAA2503	50-06011	0–0.5	Soil	14788	14788	14797	14797	14797	14797	14797
AAA2504	50-06012	0–0.5	Soil	—	14788	14797	14797	14797	14797	14797
AAA2743	50-06012	1.5–2.5	Soil	14788	14788	14797	14797	14797	14797	14797
AAA2505	50-06013	0–0.5	Sediment	—	14788	14797	14797	14797	14797	14797
AAA2506	50-06014	0–0.5	Sediment	—	14788	14797	14797	14797	14797	14797
AAA2725	50-06014	1.5–2.5	Sediment	—	14788	14797	14797	14797	14797	14797
AAA2507	50-06015	0–0.5	Soil	—	14788	14797	14797	14797	14797	14797
AAA2747	50-06015	3–4	Soil	—	14788	14797	14797	14797	14797	14797
AAA2508	50-06016	0–0.5	Sediment	14788	14788	14797	14797	14797	14797	14797
AAA2744	50-06016	1.5–2.5	Sediment	14788	14788	14797	14797	14797	14797	14797
AAA2509	50-06017	0–0.5	Soil	14788	14788	14797	14797	14797	14797	14797
AAA2735	50-06017	3–4	Soil	14788	14788	14797	14797	14797	14797	14797
AAA2510	50-06018	0–0.5	Sediment	14762	14762	14763	14763	14763	14763	14763
AAA2728	50-06018	1.5–2.5	Sediment	14762	14762	14763	14763	14763	14763	14763
AAA2736	50-06018	3–4	Sediment	14762	14762	14763	14763	14763	14763	14763

Table 6.11-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	PCBs	SVOCs	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
AAA2511	50-06019	0–0.5	Soil	—	14762	14763	14763	14763	14763	14763
AAA2726	50-06019	1.5–2.5	Soil	—	14762	14763	14763	14763	14763	14763
AAA2733	50-06019	3–4	Soil	—	14762	14763	14763	14763	14763	14763
AAA2512	50-06020	0–0.5	Soil	—	14762	14763	14763	14763	14763	14763
AAA2732	50-06020	1.5–2.5	Soil	—	14762	14763	14763	14763	14763	14763
AAA2740	50-06020	3–4	Soil	—	14762	14763	14763	14763	14763	14763
AAA2513	50-06021	0–0.5	Soil	—	14762	14763	14763	14763	14763	14763
AAA2727	50-06021	1.5–2.5	Soil	—	14762	14763	14763	14763	14763	14763
AAA2738	50-06021	3–4	Soil	—	14762	14763	14763	14763	14763	14763
AAA2514	50-06022	0–0.5	Sediment	—	14762	14763	14763	14763	14763	14763
AAA2731	50-06022	1.5–2.5	Sediment	—	14762	14763	14763	14763	14763	14763
AAA2741	50-06022	3–4	Sediment	—	14762	14763	14763	14763	14763	14763
AAA2515	50-06023	0–0.5	Soil	14762	14762	14763	14763	14763	14763	14763
AAA2729	50-06023	1.5–2.5	Soil	—	14762	14763	14763	14763	14763	14763
AAA2734	50-06023	3–4	Soil	—	14762	14763	14763	14763	14763	14763
AAA2516	50-06024	0–0.5	Soil	—	14762	14763	14763	14763	14763	14763
AAA2724	50-06024	1.5–2.5	Soil	—	14762	14763	14763	14763	14763	14763
AAA2517	50-06025	0–0.5	Sediment	14762	14762	14763	14763	14763	14763	14763
AAA2518	50-06026	0–0.5	Sediment	—	14762	14763	14763	14763	14763	14763

[a] — =Analysis not requested.

[b] Analytical request number.

Table 6.11-2
Radionuclides Detected or Detected above BVs/FVs at SWMU 50-006(d)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**na[c]**	**0.023**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Sediment Background/Fallout Value[a,b]				**0.04**	**0.9**	**na**	**0.006**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
AAA2492	50-06000	0.00–0.50	Sediment	7.22	3.48	—[d]	1.96	4.803	—	4.544124	—	—	—
AAA2493	50-06001	0.00–0.50	Sediment	14.33	5.71	1.82	4.414	11.681	—	60.14518	—	—	—
AAA2494	50-06002	0.00–0.50	Sediment	—	5.44	0.93	1.913	3.971	1.83 (J-)	4.860529	—	—	—
AAA2750	50-06002	1.50–2.50	Sediment	71.003	67.27	—	12.421 (J-)	47.816 (J-)	18.3 (J-)	29.02662	—	—	—
AAA2752	50-06002	3.00–4.00	Sediment	18.57	187.49	—	13.804 (J-)	20.667 (J-)	8.43 (J-)	55.16522	3.056	—	—
AAA2495	50-06003	0.00–0.50	Soil	—	2.96	—	0.078	0.444	—	0.1307317	5.022	0.315	6.068
AAA2496	50-06004	0.00–0.50	Sediment	—	—	—	—	—	—	0.2487805	—	—	—
AAA2753	50-06005	3.00–4.00	Sediment	—	—	—	—	—	—	0.1504501	—	—	—
AAA2498	50-06006	0.00–0.50	Sediment	16.53	19.13	1.47	3.084	13.231	—	0.8413963	—	—	—
AAA2499	50-06007	0.00–0.50	Sediment	9.24	13.25	2.66	2.855	11.014	—	98.21634	—	—	—
AAA2749	50-06007	1.50–2.50	Sediment	18.03	29.37	5.22	6.666	19.235	—	105.0239	—	—	—
AAA2500	50-06008	0.00–0.50	Sediment	—	3.56	—	0.597	0.802	1.38 (J-)	0.6144407	3.556	—	4.189
AAA2748	50-06008	1.50–2.50	Soil	—	—	—	—	—	—	0.1957895	—	—	—
AAA2751	50-06008	3.00–4.00	Soil	—	—	—	0.354	0.308	2.48 (J-)	19.66192	—	—	—
AAA2501	50-06009	0.00–0.50	Soil	—	4.76	—	0.24	0.927	—	0.5675	5.608	0.258	7.125
AAA2739	50-06009	3.00–4.00	Soil	—	—	—	0.026	—	—	0.1394487	—	—	—
AAA2502	50-06010	0.00–0.50	Sediment	—	77.9	2.7	4.093	10.43	1.49 (J-)	2.309425	—	—	—
AAA2503	50-06011	0.00–0.50	Soil	—	11.7	—	0.865	1.519	—	0.6387982	3.918	—	5.086
AAA2504	50-06012	0.00–0.50	Soil	—	—	0.93	0.668	1.375	—	0.2741414	—	—	—
AAA2743	50-06012	1.50–2.50	Soil	—	18.6	0.76	0.337	0.904	0.94 (J-)	0.4056553	—	—	—

Table 6.11-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**na[c]**	**0.023**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Sediment Background/Fallout Value[a,b]				**0.04**	**0.9**	**na**	**0.006**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
AAA2505	50-06013	0.00–0.50	Sediment	24.2	—	2.24	3.669	19.732	1.17 (J-)	10.15438	—	—	—
AAA2725	50-06014	1.50–2.50	Sediment	—	—	—	0.014	—	—	—	—	—	—
AAA2507	50-06015	0.00–0.50	Soil	—	7.58	—	0.439	1.252	5.14 (J-)	1.120617	5.48	0.243	6.785
AAA2747	50-06015	3.00–4.00	Soil	—	3.43	—	0.236	0.166	—	0.3225316	—	—	—
AAA2508	50-06016	0.00–0.50	Sediment	6.64	28.3	1.98	2.727	5.106	—	10.78075	—	—	—
AAA2744	50-06016	1.50–2.50	Sediment	—	32.3	3.01	2.401	3.947	2.33 (J-)	15.4203	—	—	—
AAA2509	50-06017	0.00–0.50	Soil	—	2.89	—	0.05	0.311	1.48 (J-)	0.6859471	3.79	—	4.48
AAA2735	50-06017	3.00–4.00	Soil	—	—	—	—	0.021	—	1.325789	—	—	—
AAA2510	50-06018	0.00–0.50	Sediment	19.081	31.563	3.2158	4.186	16.134	1.71 (J-)	30.36303	—	—	—
AAA2728	50-06018	1.50–2.50	Sediment	18.257	34.082	2.0415	2.793	15.596	1.87 (J-)	31.58693	—	—	—
AAA2736	50-06018	3.00–4.00	Sediment	10.531	37.286	—	3.096	7.339	3.1 (J-)	31.93234	—	—	—
AAA2511	50-06019	0.00–0.50	Soil	—	—	—	0.03	0.155	—	0.2264021	—	—	—
AAA2726	50-06019	1.50–2.50	Soil	—	1.0177	—	0.185	0.512	—	6.769277	—	—	—
AAA2733	50-06019	3.00–4.00	Soil	—	—	—	0.031	0.064	—	11.88753	—	—	—
AAA2512	50-06020	0.00–0.50	Soil	—	—	—	—	0.154	1.37 (J-)	0.3833333	2.991	—	3.254
AAA2732	50-06020	1.50–2.50	Soil	—	—	—	—	0.157	—	0.4263084	—	—	—
AAA2740	50-06020	3.00–4.00	Soil	—	—	—	—	0.025	—	0.8909643	—	—	—
AAA2513	50-06021	0.00–0.50	Soil	18.221	67.685	2.4397	5.909	17.555	3.01 (J-)	0.6089937	—	—	—
AAA2727	50-06021	1.50–2.50	Soil	—	203.02	—	8.522	4.294	4.44 (J-)	0.451745	—	—	—
AAA2738	50-06021	3.00–4.00	Soil	—	113.99	—	9.513	6.075	3.95 (J-)	0.7163303	—	—	—
AAA2514	50-06022	0.00–0.50	Sediment	—	14.258	1.1791	1.107	2.965	—	3.632461	—	—	—
AAA2731	50-06022	1.50–2.50	Sediment	9.4383	62.148	0.7825	2.508	13.376	2.62 (J-)	7.153747	—	—	—

Table 6.11-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/ Plutonium-240	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background/Fallout Value[a,b]				**0.013**	**1.65**	**na[c]**	**0.023**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Sediment Background/Fallout Value[a,b]				**0.04**	**0.9**	**na**	**0.006**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
AAA2741	50-06022	3.00–4.00	Sediment	—	373.1099	—	11.358	10.59	4.03 (J-)	5.831671	—	—	—
AAA2515	50-06023	0.00–0.50	Soil	—	50.146	1.1045	7.372	4.889	2.75 (J-)	0.6421755	—	—	—
AAA2729	50-06023	1.50–2.50	Soil	—	7.6197	—	0.809	0.351	3.63 (J-)	2.00912	—	—	—
AAA2734	50-06023	3.00–4.00	Soil	—	50.176	0.8782	0.189	0.824	4.82 (J-)	2.065197	—	—	—
AAA2516	50-06024	0.00–0.50	Soil	—	6.0491	—	1.295	5.702	—	0.554994	—	—	—
AAA2724	50-06024	1.50–2.50	Soil	14.979	20.945	—	4.235	10.71	—	1.593491	—	—	—
AAA2517	50-06025	0.00–0.50	Sediment	7.6766	43.533	2.39	3.556	7.881	1.48 (J-)	4.521383	—	—	—
AAA2518	50-06026	0.00–0.50	Sediment	9.014	32.945	1.1217	4.18	13.214	1.48 (J-)	3.275669	—	—	2.349

Note: All values in pCi/g.

[a] Background/fallout values are from LANL 1998, 059730.

[b] Fallout value applies to soil samples collected from 0–0.5 ft only and applies to sediment samples of all depth.

[c] na = Not available.

[d] — = Analyte not reported (detect or nondetect) above BV/FV or not detected.

Table 6.11-3
Organic Chemicals Detected at SWMU 50-006(d)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene	Phenanthrene	Pyrene
AAA2753	50-06005	3.00–4.00	Sediment	—*	—	—	—	5.7	—	—	—	—	—
AAA2503	50-06011	0.00–0.50	Soil	0.053	—	—	—	—	—	—	—	—	—
AAA2736	50-06018	3.00–4.00	Sediment	—	—	—	—	0.061 (J)	—	—	—	—	—
AAA2740	50-06020	3.00–4.00	Soil	—	—	—	—	0.21 (J)	—	—	—	—	—
AAA2513	50-06021	0.00–0.50	Soil	—	—	—	—	0.039 (J)	—	—	—	—	—
AAA2731	50-06022	1.50–2.50	Sediment	—	—	—	—	0.044 (J)	—	—	—	—	—
AAA2741	50-06022	3.00–4.00	Sediment	—	—	—	—	—	0.046 (J)	—	—	—	—
AAA2515	50-06023	0.00–0.50	Soil	—	0.12 (J)	0.12 (J)	0.16 (J)	0.083 (J)	—	0.18 (J)	0.17 (J)	0.05 (J)	0.18 (J)
AAA2729	50-06023	1.50–2.50	Soil	—	0.058 (J)	0.06 (J)	0.077 (J)	0.053 (J)	0.041 (J)	0.076 (J)	0.13 (J)	0.13 (J)	0.11 (J)
AAA2724	50-06024	1.50–2.50	Soil	—	—	—	—	0.13 (J)	—	—	—	—	—
AAA2518	50-06026	0.00–0.50	Sediment	—	—	—	—	0.17 (J)	—	—	—	—	—

Note: All values in mg/kg.

* — = Analyte not detected.

Table 6.11-4
Proposed Sampling at SWMU 50-006(d)

Objective Addressed	Location Number	Location	Beginning Depth of Sample Interval	TAL Metals	Nitrate	Perchlorate	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Tritium	Strontium-90	PCBs	SVOCs	VOCs	Cyanide	pH	Dioxins/furans
Determine nature and extent of contamination	6d-1	Below pipe	Surface	X	X	X	X	X	X	X	X	X	X	—*	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Determine nature and extent of contamination	6d-2	Below pipe	Surface	X	X	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of contamination	6d-3	Below pipe	Surface	X	X	X	X	X	X	X	X	X	X	—	X	X	—
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	—
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	—
Determine nature and extent of contamination	6d-4	Below pipe	Surface	X	X	X	X	X	X	X	X	X	X	—	X	X	X
			Soil/tuff interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			5 ft below soil/tuff	X	X	X	X	X	X	X	X	X	X	X	X	X	X

* — = Analyte not reported (detect or nondetect) above BV or not detected.

Table 6.16-1
Samples Collected at SWMU 50-011(a)

Sample ID	Location ID	Depth (ft)	Media	Metals	Perchlorate	VOCs	Americium-241	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium
AAC0276	50-03011	7–8	Fill	20190[a]	—[b]	—	—	20195	20195	20195	20195
AAC0277	50-03011	8–9	Qbt 3	20190	—	—	—	20195	20195	20195	20195
AAC0285	50-03042	6.6–7.5	Qbt 3	20190	—	—	—	20195	20195	20195	20195
AAC0296	50-03042	8–9	Qbt 3	20190	—	—	—	20195	20195	20195	20195
AAC0287	50-03043	6–7	Qbt 3	20190	—	—	—	20195	20195	20195	20195
AAC0295	50-03043	7.8–8.5	Qbt 3	20190	—	—	—	20195	20195	20195	20195
AAC0289	50-03044	7.3–8.8	Qbt 3	20190	—	—	—	20195	20195	20195	20195
MD50-04-55783	50-23548	52.5–55	Qbt 2	2406S	2406S	2405S	2407S	2407S	2407S	2407S	2407S
MD50-04-55784	50-23548	57.5–60	Qbt 2	2406S	2406S	2405S	2407S	2407S	2407S	2407S	2407S
MD50-04-55785	50-23549	50–52.5	Qbt 2	2406S	2406S	2405S	2407S	2407S	2407S	2407S	2407S
MD50-04-55786	50-23549	57.5–60	Qbt 2	2406S	2406S	2405S	2407S	2407S	2407S	2407S	2407S

[a] Analytical request number.

[b] — =Analysis not requested.

Table 6.16-2
Inorganic Chemicals above BVs at SWMU 50-011(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Selenium
Qbt 2,3,4 Background Value[a]				**0.5**	**0.3**
Soil Background Value[a]				**0.83**	**1.52**
AAC0276	50-03011	7.00–8.00	Fill	4.6 (U)	—[b]
AAC0277	50-03011	8.00–9.00	Qbt 3	4.4 (U)	0.53 (U)
AAC0285	50-03042	6.60–7.50	Qbt 3	4.6 (U)	0.55 (U)
AAC0296	50-03042	8.00–9.00	Qbt 3	4.5 (U)	0.57 (J)
AAC0287	50-03043	6.00–7.00	Qbt 3	4.6 (U)	0.55 (U)
AAC0295	50-03043	7.80–8.50	Qbt 3	4.5 (U)	0.53 (U)
AAC0289	50-03044	7.30–8.80	Qbt 3	4.7 (U)	0.56 (U)
MD50-04-55783	50-23548	52.50–55.00	Qbt 2	—	0.551 (U)
MD50-04-55784	50-23548	57.50–60.00	Qbt 2	—	0.332 (J)
MD50-04-55786	50-23549	57.50–60.00	Qbt 2	—	0.533 (U)

Note: All values in mg/kg.
[a] Background values are from LANL 1998, 059730.
[b] = Analyte not reported (detect or nondetect) above BV or not detected.

Table 6.16-3
Radionuclides Detected at SWMU 50-011(a)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-238	Plutonium-239/ Plutonium-240	Tritium
Soil Fallout Value[a,b]				**0.023**	**0.054**	**na[c]**
Qbt 2,3,4 Fallout Value[a,b]				**na**	**na**	**na**
AAC0276	50-03011	7.00–8.00	Fill	0.03	0.06	1.415309
AAC0277	50-03011	8.00–9.00	Qbt 3	—[d]	—	0.7514852
AAC0285	50-03042	6.60–7.50	Qbt 3	—	—	0.4558577
AAC0296	50-03042	8.00–9.00	Qbt 3	—	0.02	0.2937838
AAC0287	50-03043	6.00–7.00	Qbt 3	0.007	0.02	0.8533741
AAC0295	50-03043	7.80–8.50	Qbt 3	0.011	—	0.2997122
AAC0289	50-03044	7.30–8.80	Qbt 3	—	—	1.315881
MD50-04-55783	50-23548	52.50–55.00	Qbt 2	—	—	0.0821
MD50-04-55784	50-23548	57.50–60.00	Qbt 2	—	—	0.048
MD50-04-55785	50-23549	50.00–52.50	Qbt 2	0.0326	0.0506	—
MD50-04-55786	50-23549	57.50–60.00	Qbt 2	—	—	0.0351

Note: All values in pCi/g.
[a] Fallout values are from LANL 1998, 059730.
[b] Fallout value applies to samples collected from 0–0.5 ft only.
[c] na = Not available.
[d] — = Analyte not detected.

Table 6.16-4
Organic Chemicals Detected at SWMU 50-011(a)

Sample ID	Location ID	Depth (ft)	Media	Acetone
MD50-04-55783	50-23548	52.50–55.00	Qbt 2	0.0191
MD50-04-55784	50-23548	57.50–60.00	Qbt 2	0.0143
MD50-04-55785	50-23549	50.00–52.50	Qbt 2	0.0252
MD50-04-55786	50-23549	57.50–60.00	Qbt 2	0.0332

Note: All values in mg/kg.

Table 8.0-1
Summary of Investigation Methods

Method	Summary
Spade and Scoop Collection of Soil Samples	This method is typically used for collection of shallow (i.e., approximately 0–12 in.) soil or sediment samples. The “spade-and-scoop” method involves digging a hole to the desired depth, as prescribed in the sampling and analysis plan, and collecting a discrete grab sample. The sample is typically placed in a clean stainless steel bowl for transfer into various sample containers.
Hand Auger Sampling	This method is typically used for sampling soil or sediment at depths of less than 10-15 ft, but may in some cases be used for collecting samples of weathered or non-welded tuff. The method involves hand-turning a stainless-steel bucket auger (typically 3–4 in. i.d.), creating a vertical hole which can be advanced to the desired sample depth. When the desired depth is reached, the auger is decontaminated before advancing the hole through the sample depth. The sample material is transferred from the auger bucket to a stainless-steel sampling bowl before filling the various required sample containers.
Split-Spoon Core-Barrel Sampling	In this method, a stainless steel core barrel (typically 4-in. inside-diameter, 2.5 ft long) is advanced using a powered drilling rig. The core barrel extracts a continuous length of soil and/or rock which can be examined as a unit. The split-spoon core barrel is a cylindrical barrel split length-wise so that the two halves can be separated to expose the core sample. Once extracted, the section of core is typically screened for radioactivity and organic vapors, photographed, and described in a geologic log. A portion of the core may then be collected as a discrete sample from the desired depth.
Headspace Vapor Screening	Individual soil, rock, or sediment samples may be field-screened for volatile organic compounds by placing a portion of the sample in a plastic sample bag or in a glass container with a foil-sealed cover. The container is sealed and gently shaken, and allowed to equilibrate for 5 minutes. The sample is then screened by inserting a PID probe into the container and measuring and recording any detected vapors. PIDs must use lamps with voltage of 10.6 eV or higher.

Table 8.0-1 (continued)

Method	Summary
Handling, Packaging, and Shipping of Samples	Field team members seal and label samples before packing, and ensure that the sample containers and the containers used for transport are free of external contamination. Field team members package all samples so as to minimize the possibility of breakage during transportation. After all environmental samples are collected, packaged, and preserved, a field team member transports them to either the Sample Management Office (SMO) or an SMO-approved radiation screening laboratory under chain-of-custody. The SMO arranges for shipping of samples to analytical laboratories. The field team member must inform the SMO and/or the radiation screening laboratory coordinator when levels of radioactivity are in the action-level or limited-quantity ranges.
Sample Control and Field Documentation	The collection, screening, and transport of samples are documented on standard forms generated by the SMO. These include sample collection logs, chain-of-custody forms, and sample container labels. Collection logs are completed at the time of sample collection, and are signed by the sampler and a reviewer who verifies the logs for completeness and accuracy. Corresponding labels are initialed and applied to each sample container, and custody seals are placed around container lids or openings. Chain-of-custody forms are completed and assigned to verify that the samples are not left unattended. Site attributes (e.g., former and proposed soil sample locations, sediment sample locations) are located by using a GPS. Horizontal locations will be measured to the nearest 0.5 ft. The survey results for this field event will be presented as part of the investigation report. Sample coordinates will be uploaded into the Environmental Restoration Database.
Field Quality Control Samples	Field quality control samples are collected as directed in the Order on Consent as follows: Field Duplicate: At a frequency 10%; collected at the same time as a regular sample and submitted for the same analyses. Equipment Rinsate Blank: At a frequency of 10%; collected by rinsing sampling equipment with deionized water, which is collected in a sample container and submitted for laboratory analysis. Trip Blanks: Required for all field events that include the collection of samples for VOC analysis. Trip blanks containers of certified clean sand that are opened and kept with the other sample containers during the sampling process.
Field Decontamination of Drilling and Sampling Equipment	Dry decontamination is the preferred method to minimize the generation of liquid waste. Dry decontamination may include the use of a wire brush or other tool for removal of soil or other material adhering to the sampling equipment, followed by use of a commercial cleaning agent (nonacid, waxless cleaners) and paper wipes. Dry decontamination may be followed by wet decontamination if necessary. Wet decontamination may include washing with a non-phosphate detergent and water, followed by a water rinse and a second rinse with deionized water. Alternatively, steam cleaning may be used.
Containers and Preservation of Samples	Specific requirements/processes for sample containers, preservation techniques, and holding times are based on EPA guidance for environmental sampling, preservation, and quality assurance. Specific requirements for each sample are printed on the sample collection logs provided by the SMO (size and type of container, i.e., glass, amber glass, polyethylene, preservative, etc.). All samples are preserved by placing in insulated containers with ice to maintain a temperature of 4°C. Other requirements such as nitric acid or other preservatives may apply to different media or analytical requests.

Table 8.0-1 (continued)

Method	Summary
Management, characterization, and storage of investigation-derived waste (IDW)	IDW is managed, characterized, and stored in accordance with an approved waste characterization strategy form (WCSF) that documents site history, field activities, and the characterization approach for each waste stream managed. Waste characterization shall be adequate to comply with onsite or off-site waste acceptance criteria. All stored IDW will be marked with appropriate signage and labels, as appropriate. Drummed IDW will be stored on pallets to prevent deterioration of containers. Generators are required to reduced in volume of waste generated by as much as is technically and economically feasible. Means to store, control, and transport each potential waste type and classification shall be determined prior to the start of field operations that generate waste. A waste storage area shall be established prior to generating waste. Waste storage areas located in controlled areas of the laboratory shall be controlled as needed to prevent inadvertent addition or management of wastes by unauthorized personnel. Each container o f waste generated shall be individually labeled as to waste classification, item identification number, and radioactivity (if applicable), immediately following containerization. All waste shall be segregated by classification and compatibility to prevent cross-contamination. See appendix B for additional information.

Appendix A

Acronyms and Abbreviations, Glossary,
Metric Conversion Table, and Data Qualifier Definitions

A-1.0 ACRONYMS AND ABBREVIATIONS

AOC	area of concern
bgs	below ground surface
BV	background value
CFR	Code of Federal Regulations [U.S.]
CMP	corrugated metal pipe
CMR	Chemistry and Metallurgy Research
Consent Order	Compliance Order on Consent
CST	Chemical Science and Technology [a LANL division]
D&D	decontamination and decommissioning
DGPS	differential global-positioning system
DOE	Department of Energy [U.S.]
DRO	diesel range organics
EC	expedited cleanup
EDTA	ethylenediaminetetraacetic acid
EP	Environmental Programs [Directorate]
EPA	Environmental Protection Agency [U.S.]
ER	environmental restoration
FV	fallout value
GIS	geographic information system
GPR	ground-penetrating radar
GPS	global-positioning system
GRO	gasoline range organic
HEPA	high-efficiency particulate air [filter]
HIR	historical investigation report
HSWA	Hazardous and Solid Waste Amendments of 1984
HWFP	Hazardous Waste Facility Permit
IA	interim action
IDW	investigation-derived waste
LANL	Los Alamos National Laboratory [Laboratory is preferred to LANL]
LIR	Laboratory implementation requirement
LLW	low-level waste
MDA	material disposal area
NFA	no further action
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department [before 1991: New Mexico Environmental Improvement (NMEID) Division]

NMSP	New Mexico state plane
NPDES	National Pollutant Discharge Elimination System
OU	operable unit
PAH	polycyclic aromatic hydrocarbon [interchangeable with polynuclear aromatic hydrocarbon]
PCB	polychlorinated biphenyl
PCS	petroleum-contaminated soil
pH	potential of hydrogen
PPE	personal protective equipment
ppm	part(s) per million
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
QP	quality procedure
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
RLW	radioactive liquid waste
RLWTF	Radioactive Liquid Waste Treatment Facility
RPF	Records Processing Facility
SAP	sampling and analysis plan
SCL	sample collection log
SMO	Sample Management Office
SOP	standard operating procedure
SVOC	semivolatile organic compound
SWMU	solid waste management unit
SWSC	Sanitary Wastewater Systems Consolidation
TA	technical area
TAL	target analyte list [EPA]
TCLP	toxicity characteristic leaching procedure
TPH	total petroleum hydrocarbons
TRU	transuranic
TSCA	Toxic Substances Control Act
UST	underground storage tank
VCP	vitrified clay pipe
VOC	volatile organic compound
WCSF	waste characterization strategy form
WIPP	Waste Isolation Pilot Plant
WWTP	wastewater treatment plant

A-2.0 GLOSSARY

accelerated corrective action—A cleanup process used to implement presumptive remedies at small-scale and relatively simple sites where groundwater contamination is not a component of the accelerated cleanup, where the remedy is considered to be the final remedy for the site, and where the fieldwork will be accomplished within 180 days of the start of field activities. Accelerated corrective actions may be implemented before the approval of the accelerated corrective action work plan by the New Mexico Environment Department.

administrative authority—For Los Alamos National Laboratory, one or more regulatory agencies, such as the New Mexico Environment Department, the U.S. Environmental Protection Agency, or the U.S. Department of Energy, as appropriate.

administrative order on consent—A legal agreement signed by the U.S. Environmental Protection Agency and an individual, business, or other entity through which a violator agrees to pay for the correction of violations, take the required corrective or cleanup actions, or refrain from an activity. It describes the actions to be taken, may be subject to a comment period, applies to civil actions, and can be enforced in court.

administrative record—All documents that the administrative authority considered, or relied on, when selecting the response action at a site, culminating in the record of decision for remedial action or an action memorandum for removal actions.

aggregate—At the Los Alamos National Laboratory, an area within a watershed containing solid waste management units (SWMUs) and/or areas of concern (AOCs), and the media affected or potentially affected by releases from those SWMUs and/or AOCs. Aggregates are designated to promote efficient and effective corrective action activities.

analysis—A critical evaluation, usually made by breaking a subject (either material or intellectual) down into its constituent parts, then describing the parts and their relationship to the whole. Analyses may include physical analysis, chemical analysis, toxicological analysis, and knowledge-of-process determinations.

analyte—The element, nuclide, or ion a chemical analysis seeks to identify and/or quantify; the chemical constituent of interest.

analytical method—A procedure or technique for systematically performing an activity.

Approved Supplier List—A roster of suppliers who are approved and qualified to provide items or services to the Environmental Remediation and Surveillance Program.

aquifer—An underground geological formation (or group of formations) containing water that is the source of groundwater for wells and springs.

area of concern—(1) A release that may warrant investigation or remediation and is not a solid waste management unit (SWMU). (2) An area at Los Alamos National Laboratory that may have had a release of a hazardous waste or a hazardous constituent but is not a SWMU.

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

as low as reasonably achievable (ALARA)—(1) An approach to radiation protection for controlling or managing exposure (both individual and collective) to the work force and the general public. (2) An approach for controlling or managing releases of radioactive material to the environment at levels as low as social, technical, economic, practical, and public-policy considerations permit. ALARA is not a dose limit.

assessment—(1) The act of reviewing, inspecting, testing, checking, conducting surveillance, auditing, or otherwise determining and documenting whether items, processes, or services meet specified requirements. (2) An evaluation process used to measure the performance or effectiveness of a system and its elements. In this glossary, assessment is an all-inclusive term used to denote any one of the following: audit, performance evaluation, management system review, peer review, inspection, or surveillance.

background concentration—Naturally occurring concentrations of an inorganic chemical or radionuclide in soil, sediment, or tuff.

background data—Data that represent naturally occurring concentrations of inorganic and radionuclide constituents in a geologic medium. Los Alamos National Laboratory's (the Laboratory's) background data are derived from samples collected at locations that are either within, or adjacent to, the Laboratory. These locations (1) are representative of geological media found within Laboratory boundaries, and (2) have not been affected by Laboratory operations.

background level—(1) The concentration of a substance in an environmental medium (air, water, or soil) that occurs naturally or is not the result of human activities. (2) In exposure assessment, the concentration of a substance in a defined control area over a fixed period of time before, during, or after a data-gathering operation.

background radiation—The amount of radioactivity naturally present in the environment, including cosmic rays from space and natural radiation from soils and rock.

background value (BV)—A statistically derived concentration (i.e., the upper tolerance limit [UTL]) of a chemical used to represent the background data set. If a UTL cannot be derived, either the detection limit or maximum reported value in the background data set is used.

baseline contaminant level—Anthropogenic soil concentrations of a given chemical associated with Los Alamos National Laboratory and/or with commercial activities or processes that may not be related to source material(s) or release(s) from within a solid waste management unit or area of concern.

baseline data—Data that result from samples not directly associated with, or attributed to, a site. Baseline data must be identified during planning as originating from baseline samples. They are not equivalent to Los Alamos National Laboratory background data, usually are specific to an industrial area (such as a technical area), and are not applicable to another site without approval by the administrative authority.

beta radiation—High-energy electrons emitted by certain types of radioactive nuclei, such as potassium-40. The beta particles emitted are a form of ionizing radiation also known as beta rays.

blank—A sample that is expected to have a negligible or unmeasurable amount of an analyte. Results of blank sample analyses indicate whether field samples might have been contaminated during the sample collection, transport, storage, preparation, or analysis processes.

borehole—(1) A hole drilled or bored into the ground, usually for exploratory or economic purposes. (2) A hole into which casing, screen, and other materials may be installed to construct a well.

caldera—A large crater formed by a volcanic explosion or by the collapse of a volcanic cone.

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

canyon—A stream-cut chasm or gorge, the sides of which are composed of cliffs or a series of cliffs rising from the chasm's bed. Canyons are characteristic of arid or semiarid regions where downcutting by streams greatly exceeds weathering.

catchment—(1) A structure, such as a basin or reservoir, used for collecting or draining water. (2) The amount of water collected in such a structure. (3) A catching or collecting of water, especially rainwater.

certificate of completion—A document to be issued by the New Mexico Environment Department (NMED) under the March 1, 2005, Compliance Order on Consent (Consent Order) once NMED determines that the requirements of the Consent Order have been satisfied for a particular solid waste management unit or area of concern.

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

chemical—Any naturally occurring or human-made substance characterized by a definite molecular composition.

chemical analysis—A process used to measure one or more attributes of a sample in a clearly defined, controlled, and systematic manner. Chemical analysis often requires treating a sample chemically or physically before measurement.

cleanup—A series of actions taken to deal with the release, or threat of a release, of a hazardous substance that could affect humans and/or the environment. The term cleanup is sometimes used interchangeably with the terms remedial action, removal action, or corrective action.

Code of Federal Regulations (CFR)—A document that codifies all rules of the executive departments and agencies of the federal government. The code is divided into 50 volumes, known as titles. Title 40 of the CFR (referenced as 40 CFR) covers environmental regulations.

colluvium—A loose deposit of rock debris accumulated through the action of gravity at the base of a cliff or slope.

Compliance Order on Consent (Consent Order)—For the Environmental Remediation and Surveillance Program, an enforcement document signed by the New Mexico Environment Department, the U.S. Department of Energy, and the Regents of the University of California on March 1, 2005, which prescribes the requirements for corrective action at Los Alamos National Laboratory. The purposes of the Consent Order are (1) to define the nature and extent of releases of contaminants at, or from, the facility; (2) to identify and evaluate, where needed, alternatives for corrective measures to clean up contaminants in the environment and prevent or mitigate the migration of contaminants at, or from, the facility; and (3) to implement such corrective measures. The Consent Order supersedes the corrective action requirements previously specified in Module VIII of the Laboratory's Hazardous Waste Facility Permit.

conceptual hydrogeologic model—An approximation of the occurrence, movement, and quality of groundwater in a given area and the relationship of that groundwater to the surface water, soil water, and geologic framework in that area.

conceptual model—See site conceptual model .

confluence—A place where two or more streams or canyons meet; the point where a tributary meets the main stream.

Consent Order—See Compliance Order on Consent.

consolidated unit—A group of solid waste management units (SWMUs), or SWMUs and areas of concern, which generally are geographically proximate and have been combined for the purposes of investigation, reporting, or remediation.

contaminant—(1) Chemicals and radionuclides present in environmental media or on debris above background levels. (2) According to the March 1, 2005, Compliance Order on Consent (Consent Order), any hazardous waste listed or identified as characteristic in 40 Code of Federal Regulations (CFR) 261 (incorporated by 20.4.1.200 New Mexico Administrative Code [NMAC]); any hazardous constituent listed in 40 CFR 261 Appendix VIII (incorporated by 20.4.1.200 NMAC) or 40 CFR 264 Appendix IX (incorporated by 20.4.1.500 NMAC); any groundwater contaminant listed in the Water Quality Control Commission (WQCC) Regulations at 20.6.3.3103 NMAC; any toxic pollutant listed in the WQCC Regulations at 20.6.2.7 NMAC; explosive compounds; nitrate; and perchlorate. (Note: Under the Consent Order, the term “contaminant” does not include radionuclides or the radioactive portion of mixed waste.)

contract analytical laboratory—An analytical laboratory under contract to the University of California to analyze samples from work performed at Los Alamos National Laboratory.

corrective action—(1) In the Resource Conservation and Recovery Act, an action taken to rectify conditions potentially adverse to human health or the environment. (2) In the quality assurance field, the process of rectifying and preventing nonconformances.

corrective measure—An action taken at a solid waste management unit or area of concern to protect human health or the environment in the event of a release of contaminants into the environment, or to prevent a release of contaminants into the environment.

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

data package—The hard copy deliverable for each sample delivery group produced by a contract analytical laboratory in accordance with the statement of work for analytical services.

data-quality objectives—Qualitative and quantitative statements of the overall level of uncertainty that a decision maker will accept regarding results or decisions based on environmental data. The objectives provide the statistical framework for planning and managing environmental data operations that will meet user needs.

data validation—A systematic process that applies a defined set of performance-based criteria to a body of data and that may result in the qualification of the data. The data-validation process is performed independently of the analytical laboratory that generates the data set and occurs before conclusions are drawn from the data. The process may include a standardized data review (routine data validation) and/or a problem-specific data review (focused data validation).

data verification—The process of evaluating the completeness, correctness, consistency, and compliance of a laboratory data package against a specified standard or contract.

- Completeness: All required information is present—in both hard copy and electronic forms.
- Correctness: The reported results are based on properly documented and correctly applied algorithms.
- Consistency: The values are the same when they appear in different reports or are transcribed from one report to another.
- Compliance: The data pass numerical quality-control tests based on parameters or limits specified in a contract or in an auxiliary document.

decision peer review—A technical (subject-matter-expert) review that occurs before document writing has begun. The focus of the decision peer review is on the appropriateness of the stated objectives for the identified problem, on the adequacy of the proposed approach to address the objectives, and on the identification of concerns and necessary contingencies. Any decision that is expected to lead to the writing of a peer-reviewed document is subject to a decision peer review and falls under Quality Procedure 3.5, Peer Review Process.

decommissioning—The permanent removal of facilities and their components from service after the discontinued use of structures or buildings that are deemed no longer useful. Decommissioning must take place in accordance with regulatory requirements and applicable environmental policies.

decontamination—The removal of unwanted material from the surface of, or from within, another material.

detect (detection)—An analytical result, as reported by an analytical laboratory, that denotes a chemical or radionuclide to be present in a sample at a given concentration.

detection limit—The minimum concentration that can be determined by a single measurement of an instrument. A detection limit implies a specified statistical confidence that the analytical concentration is greater than zero.

discharge—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 groundwaters.

document catalog number—A unique document identifier designed to track every document generated by the Environmental Remediation and Surveillance Program. (This number is automatically assigned when an online document signature form is obtained.)

document peer review—A technical, regulatory, and legal review of a final, professionally edited document. Before the peer review, the document should receive a Level 3 (full) edit as defined by Los Alamos National Laboratory's Communication Arts and Services (IM-1) Group. Because this review follows the decision peer review, the approach should already have been agreed upon. Thus, the primary focus of a document peer review is on content (and to a lesser extent on approach; the clarity of presentation; and a consistent, appropriate format). The document peer review may be either a panel review or a read review. Quality Procedure 4.9 (Document Development and Approval Process) lists the types of Environmental Remediation and Surveillance Program documents that require a formal peer review.

duplicate analysis—An analysis performed on one member of a pair of identically prepared subsamples taken from the same sample.

effluent—Wastewater (treated or untreated) that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

environmental assessment—An environmental analysis that is prepared, pursuant to the National Environmental Policy Act, to determine whether a particular federal action would significantly affect the environment and thus require a more detailed environmental impact statement.

environmental impact statement (EIS)—A document required of federal agencies by the National Environmental Policy Act when those agencies are considering major projects or legislative proposals that could significantly affect the environment. Designed as a decision-making tool, an EIS describes the positive and negative effects of an undertaking and cites alternative actions.

Environmental Restoration (ER) Project—A Los Alamos National Laboratory project established in 1989 as part of a U.S. Department of Energy nationwide program, and precursor of today's Environmental Remediation and Surveillance (ERS) Program. This program is designed (1) to investigate hazardous and/or radioactive materials that may be present in the environment as a result of past Laboratory operations, (2) to determine if the materials currently pose an unacceptable risk to human health or the environment, and (3) to remediate (clean up, stabilize, or restore) those sites where unacceptable risk is still present.

environmental samples—Air, soil, water, or other media samples that have been collected from streams, wells, and soils, or other locations, and that are not expected to exhibit properties classified as hazardous by the U.S. Department of Transportation.

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

ephemeral—Pertaining to a stream or spring that flows only during, and immediately after, periods of rainfall or snowmelt.

equipment blank (rinsate blank)—A sample used to rinse sample-collection equipment and expected to have negligible or unmeasurable amounts of analytes. The equipment blank is collected after the equipment decontamination is completed but before the collection of another field sample.

ER data—Data derived from samples that have been collected and paid for through Environmental Remediation and Surveillance Program funding.

ER database (ERDB)—A database housing analytical and other programmatic information for the Environmental Remediation and Surveillance Program. The ERDB currently contains about 3 million analyses in 300 tables.

ER identification (ER ID) number—A unique identifier assigned by the Environmental Remediation and Surveillance Program's Records Processing Facility to each document when it is submitted as a final record.

facility—All contiguous land (and structures, other appurtenances, and improvements on the land) used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units. For the purpose of implementing a corrective action, a facility is all the contiguous property that is under the control of the owner or operator seeking a permit under Subtitle C of the Resource Conservation and Recovery Act.

fallout radionuclides—Radionuclides that are present at globally elevated levels in the environment as a result of fallout from world-wide atomic weapons tests. The Los Alamos National Laboratory (the Laboratory) background data sets consist of environmental surveillance samples taken from marginal and regional locations for the following radionuclides associated with fallout: tritium, cesium-137, americium-241, plutonium-238, plutonium-239/240, and strontium-90. Samples were collected from regional and marginal locations in the Laboratory's vicinity that were (1) representative of geological media found within Laboratory boundaries, and (2) were not impacted by Laboratory operations.

fallout value—The concentration of fallout radionuclides in surface soil (0-6 in.) that represent deposition from atmospheric fallout (resulting from world-wide atomic weapons tests) and are unrelated to Laboratory activities .

Federal Register—The official daily publication for Rules, Proposed Rules, and Notices from federal agencies and organizations, as well as Executive Orders and other presidential documents.

field blank (field reagent blank)—A blank sample prepared in the field or carried to the sampling site, exposed to sampling conditions (e.g., by removing bottle caps), and returned to a laboratory to be analyzed in the same manner in which environmental samples are being analyzed. Field blanks are used to identify the presence of any contamination that may have been added during the sampling and analysis process.

field duplicate (replicate) samples—Two separate, independent samples taken from the same source, which are collected as collocated samples (i.e., equally representative of a sample matrix at a given location and time).

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

field sample—See sample.

flood plain—The flat, or nearly flat, land along a river or stream, or in a tidal area, that is covered by water during a flood.

gamma radiation—A form of electromagnetic, high-energy ionizing radiation emitted from a nucleus. Gamma rays are essentially the same as x-rays (though at higher energy) and require heavy shielding, such as concrete or steel, to be blocked.

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

ground cover—Natural or human-made materials (e.g., grasses, pine needles, asphalt, or concrete) which overlay soils.

groundwater—Interstitial water that occurs in saturated earth material and is capable of entering a well in sufficient amounts to be used as a water supply.

gully erosion—The erosion process whereby water accumulates in narrow channels and, over short periods, removes soil from these narrow areas to considerable depths (1 ft to 50 ft).

Hazardous and Solid Waste Amendments (HSWA)—Public Law No. 98-616, 98 Stat. 3221, enacted in 1984, which amended the Resource Conservation and Recovery Act of 1976 (42 United States Code § 6901 et seq).

hazardous constituent (hazardous waste constituent)—According to the March 1, 2005, Compliance Order of Consent (Consent Order), any constituent identified in Appendix VIII of Part 261, Title 40 Code of Federal Regulations (CFR) (incorporated by 20.4.1.200 New Mexico Administrative Code [NMAC]) or any constituent identified in 40 CFR 264, Appendix IX (incorporated by 20.4.1.500 NMAC).

hazardous samples—Samples of on-site air particulates, soil, or water and materials collected at waste sites that are known, or thought, to meet the definition of a hazard class per 49 Code of Federal Regulations 171.8. The term “hazardous samples” does not refer to Resource Conservation and Recovery Act hazardous wastes unless so stated.

hazardous waste—(1) Solid waste that is listed as a hazardous waste, or exhibits any of the characteristics of hazardous waste (i.e., ignitability, corrosivity, reactivity, or toxicity, as provided in 40 CFR 261, Subpart C). (2) According to the March 1, 2005, Compliance Order of Consent (Consent Order), any solid waste or combination of solid wastes that, because of its quantity, concentration, or physical, chemical, or infectious characteristics, meets the description set forth in New Mexico Statutes Annotated 1978, § 74-4-3(K) and is listed as a hazardous waste or exhibits a hazardous waste characteristic under 40 CFR 261 (incorporated by 20.4.1.200 New Mexico Administrative Code).

Hazardous Waste Bureau—The New Mexico Environment Department bureau charged with providing regulatory oversight and technical guidance to New Mexico hazardous waste generators and to treatment, storage, and disposal facilities, as required by the New Mexico Hazardous Waste Act.

Hazardous Waste Facility Permit —The authorization issued to Los Alamos National Laboratory (the Laboratory) by the New Mexico Environment Department that allows the Laboratory to operate as a hazardous waste treatment, storage, and disposal facility.

high-explosive wastes—Any waste-containing material having an amount of stored chemical energy that could start a violent reaction when initiated by impact, spark, or heat. This violent reaction would be accompanied by a strong shock wave and the potential for high-velocity particles to be propelled.

HSWA module—See Module VIII.

hydrogen-ion activity (pH)—The effective concentration (activity) of dissociated hydrogen ions (H+); a measure of the acidity or alkalinity of a solution that is numerically equal to 7 for neutral solutions, increases with alkalinity, and decreases as acidity increases.

“Hydrogeologic Workplan”—The document that describes the activities planned by Los Alamos National Laboratory (the Laboratory) to characterize the hydrologic setting beneath the Laboratory and to enhance the Laboratory’s groundwater monitoring program.

hydrogeology—The science dealing with the occurrence of surface water and groundwater, their uses, and their functions in modifying the earth, primarily by erosion and deposition.

infiltration—(1) The penetration of water through the ground surface into subsurface soil. (2) The technique of applying large volumes of wastewater to land to penetrate the surface and percolate through the underlying soil.

inspection—The critical examination or measurement of an item or activity to determine its conformance to applicable quality standards or specifications.

interflow—A runoff process that involves lateral subsurface flow within the soil zone.

interim measure—An action that can be implemented to minimize or prevent the migration of contaminants and to minimize or prevent actual or potential human or ecological exposure to contaminants, while long-term final corrective action remedies are evaluated and, if necessary, implemented.

intermittent stream—A stream that flows only in certain reaches as a result of the channel bed’s losing and gaining characteristics.

investigation-derived waste—Solid waste or hazardous waste that was generated as a result of corrective action investigation or remediation field activities. Investigation-derived waste may include drilling muds, cuttings, and purge water from the installation of test pits or wells; purge water, soil, and other materials from the collection of samples; residues from the testing of treatment technologies and pump-and-treat systems; contaminated personal protective equipment; and solutions (aqueous or otherwise) used to decontaminate nondisposable protective clothing and equipment.

laboratory qualifier (laboratory flag)—Codes applied to data by a contract analytical laboratory to indicate, on a gross scale, a verifiable or potential data deficiency. These flags are applied according to the U.S. Environmental Protection Agency contract-laboratory program guidelines.

LANL (Los Alamos National Laboratory) data validation qualifiers—The Los Alamos National Laboratory data qualifiers which are defined by, and used, in the Environmental Remediation and Surveillance (ERS) Program validation process. The qualifiers describe the general usability (or quality) of data. For a complete list of data qualifiers applicable to any particular analytical suite, consult the appropriate ERS standard operating procedure.

leaching—The process by which soluble constituents are dissolved and filtered through the soil by a percolating fluid.

log book—A notebook used to record tabulated data (e.g., the history of calibrations, sample tracking, numerical data, or other technical data).

long-term environmental stewardship—All the activities required to maintain an adequate level of protection for human health and the environment from risks posed by nuclear and/or chemical materials, waste, and contamination that remain after cleanup is complete.

Los Alamos unlimited release (LA-UR) number—A unique identification number required for all documents or presentations prepared for distribution outside Los Alamos National Laboratory (the Laboratory). LA-UR numbers are obtained by filling out a technical information release form (http://enterprise.lanl.gov/alpha.htm) and submitting the form together with 2 copies of the document to the Laboratory's Classification Group (S-7) for review.

material disposal area (MDA)—A subset of the solid waste management units at Los Alamos National Laboratory (the Laboratory) that include disposal units such as trenches, pits, and shafts. Historically, various disposal areas (but not all) were designated by the Laboratory as MDAs.

medium (environmental)—Any material capable of absorbing or transporting constituents. Examples of media include tuffs, soils and sediments derived from these tuffs, surface water, soil water, groundwater, air, structural surfaces, and debris.

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

migration—The movement of inorganic and organic chemical species through unsaturated or saturated materials.

migration pathway—A route (e.g., a stream or subsurface flow path) for the potential movement of contaminants to environmental receptors (plants, humans, or other animals).

mixed waste—Waste containing both hazardous and source, special nuclear, or byproduct materials subject to the Atomic Energy Act of 1954.

Module VIII—Module VIII of the Los Alamos National Laboratory (the Laboratory) Hazardous Waste Facility Permit. This permit allows the Laboratory to operate as a hazardous-waste treatment, storage, and disposal facility. From 1990 to 2005, Module VIII included requirements from the Hazardous and Solid Waste Amendments. These requirements have been superceded by the March 1, 2005, Compliance Order on Consent (Consent Order).

monitoring well—(1) A well used to obtain water-quality samples or to measure groundwater levels, (2) A well drilled at a hazardous waste management facility or Superfund site to collect groundwater samples for the purpose of physical, chemical, or biological analysis and to determine the amounts, types, and distribution of contaminants in the groundwater beneath the site.

National Pollutant Discharge Elimination System—The national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits to discharge wastewater or storm water, and for imposing and enforcing pretreatment requirements under the Clean Water Act.

neutralize—To render a toxic chemical agent harmless by chemical action.

New DOE nuclear facility. A DOE nuclear facility that begins operation on or after April 9, 2001. [10 CFR 830.3(a)]

no further action—Under the Resource Conservation and Recovery Act, a corrective-action determination whereby, based on evidence or risk, no further investigation or remediation is warranted.

nondetect—A result that is less than the method detection limit.

non-ER data—Data derived from samples collected by, and paid for by, sources other than the Environmental Remediation and Surveillance Program.

operable units (OUs)—At Los Alamos National Laboratory, 24 areas originally established for administering the Environmental Remediation and Surveillance Program. Set up as groups of potential release sites, the OUs were aggregated according to geographic proximity for the purposes of planning and conducting Resource Conservation and Recovery Act (RCRA) facility assessments and RCRA facility investigations. As the project matured, it became apparent that there were too many areas to allow efficient communication and to ensure consistency in approach. In 1994, the 24 OUs were reduced to 6 administrative field units.

outfall—A place where effluent is discharged into receiving waters.

peer review—See decision peer review and document peer review.

perched water—A zone of unpressurized water held above the water table by impermeable rock or sediment.

perennial stream—Water in a channel or bed that flows continuously throughout the year.

permit—An authorization, license, or equivalent control document issued by the U.S. Environmental Protection Agency or an approved state agency to implement the requirements of an environmental regulation.

permit modification—A change to a condition in a facility's permit, initiated by either a request from the permittee or by the administrative authority's action.

polychlorinated biphenyls (PCBs)—Any chemical substance limited to the biphenyl molecule that has been chlorinated to varying degrees, or any combination that contains such substances. PCBs are colorless, odorless compounds that are chemically, electrically, and thermally stable and have proven to be toxic to both humans and other animals.

porosity—The degree to which soil, gravel, sediment, or rock is permeated with pores or cavities through which water or air can move.

Precambrian—All geologic time before the beginning of the Cambrian period's Paleozoic Era which began about 600 million years ago.

quality assurance/quality control—A system of procedures, checks, audits, and corrective actions set up to ensure that all U.S. Environmental Protection Agency research design and performance, environmental monitoring and sampling, and other technical and reporting activities are of the highest achievable quality.

quality procedure—A document that describes the process, method, and responsibilities for performing, controlling, and documenting any quality-affecting activity governed by a quality management plan.

Quaternary—The second period of the Cenozoic Era, following the Tertiary, and including the last two to three million years of earth history.

radiation—A stream of particles or electromagnetic waves emitted by atoms and molecules of a radioactive substance as a result of nuclear decay. The particles or waves emitted can consist of neutrons, positrons, alpha particles, beta particles, or gamma radiation.

radioactive material—For purposes of complying with U.S. Department of Transportation regulations, any material having a specific activity (activity per unit mass of the material) greater than 2 nanocuries per gram (nCi/g) and in which the radioactivity is evenly distributed.

radioactive waste—Waste that, by either monitoring and analysis, or acceptable knowledge, or both, has been determined to contain added (or concentrated and naturally occurring) radioactive material or activation products, or that does not meet radiological release criteria.

radioactivity (radioactive decay; radioactive disintegration)—The spontaneous change in an atom by the emission of charged particles and/or gamma rays.

radionuclide—Radioactive particle (human-made or natural) with a distinct atomic weight number.

RCRA facility investigation (RFI)—A Resource Conservation and Recovery Act (RCRA) investigation that determines if a release has occurred and characterizes the nature and extent of contamination at a hazardous waste facility. The RFI is generally equivalent to the remedial investigation portion of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.

reach—A specific length of a canyon that is treated as a single unit for sampling and analysis. Reaches tend to be internally uniform with respect to geomorphic setting and land use.

recharge—The process by which water is added to a zone of saturation, usually by percolation from the soil surface (e.g., the recharge of an aquifer).

record—Any book, paper, map, photograph, machine-readable material, or other documentary material, regardless of physical form or characteristics.

reference set—A hard-copy compilation of reference items cited in Environmental Remediation and Surveillance Program documents.

regional aquifer—Geologic material(s) or unit(s) of regional extent whose saturated portion yields significant quantities of water to wells, contains the regional zone of saturation, and is characterized by the regional water table or potentiometric surface.

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 of hazardous waste or hazardous constituents into the environment.

remediation—(1) 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 and the environment. (2) The act of restoring a contaminated area to a usable condition based on specified standards.

remediation waste—All solid wastes and hazardous wastes, and all media (including groundwater, surface water, soils, and sediments) and debris, that are managed for implementing cleanup.

request number—An identifying number assigned by the Environmental Remediation and Surveillance Program to a group of samples submitted for analysis.

Resource Conservation and Recovery Act—The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (Public Law [PL] 94-580, as amended by PL 95-609 and PL 96-482, United States Code 6901 et seq.).

restricted area—Any area to which access is controlled by a licensee to protect individuals from exposure to radiation and radioactive materials. The "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.

rinsate blank—See equipment blank.

routine analysis—The analysis categories of inorganic compounds, organic compounds, metals, radiochemistry, and high explosives, as defined in a contract laboratory's statement of work.

routine data—Data generated using analytical methods that are identified as routine methods in the current Environmental Remediation and Surveillance Program statement of work for analytical services.

routine data validation—The process of reviewing analytical data relative to quantitative routine acceptance criteria. The objective of routine data validation is two-fold—

- to estimate the technical quality of the data relative to minimum national standards adopted by the Environmental Remediation and Surveillance Program, and
- to indicate to data users the technical data quality at a gross level by assigning laboratory qualifiers to environmental data whose quality indicators do not meet acceptance criteria.

runoff—The portion of the precipitation on a drainage area that is discharged from the area.

run-on—Surface water that flows onto an area as a result of runoff occurring higher up on a slope.

sample—A portion of a material (e.g., rock, soil, water, or air), which, alone or in combination with other portions, is expected to be representative of the material or area from which it is taken. Samples are typically either 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 that is exclusive of the analytes of interest. Together, the matrix and the analytes of interest form the sample.

screening action level (SAL)—A radionuclide's medium-specific concentration level; it is calculated by using conservative criteria below which it is generally assumed that no potential exists for a dose that is unacceptable to human health. The derivation of a SAL is based on conservative exposure and on land-use assumptions. However, if an applicable regulatory standard exists that is less than the value derived, it is used in place of the SAL.

screening risk assessment—A risk assessment that is performed with few data and many assumptions in order to identify exposures that should be evaluated more carefully for potential risk.

sediment—(1) A mass of fragmented inorganic solid that comes from the weathering of rock and is carried or dropped by air, water, gravity, or ice. (2) A mass that is accumulated by any other natural agent and that forms in layers on the earth's surface (e.g., sand, gravel, silt, mud, fill, or loess). (3) A solid material that is not in solution and is either distributed through the liquid or has settled out of the liquid.

site characterization—Defining the pathways and methods of migration of hazardous waste or constituents, including the media affected; the extent, direction and speed of the contaminants; complicating factors influencing movement; or concentration profiles.

site conceptual model—A qualitative or quantitative description of sources of contamination, environmental transport pathways for contamination, and receptors that may be impacted by contamination 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 contaminants by the receptors.

slope—A ratio of units of elevation change to units of horizontal change, usually expressed in degrees.

soil—(1) A material that overlies bedrock and has been subject to soil-forming processes. (2) A sample media group that includes naturally occurring and artificial fill materials.

soil moisture—The water contained in the pore space of the unsaturated zone.

solid waste—Any garbage, refuse, or sludge from a waste treatment plant, water-supply treatment plant, or air-pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. Solid waste does not include solid or dissolved materials in domestic sewage; solid or dissolved materials in irrigation return flows; industrial discharges that are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended; or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended.

solid waste management unit (SWMU)—(1) Any discernible site at which solid wastes have been placed at any time, whether or not the site use was intended to be the management of solid or hazardous waste. SWMUs include any site at a facility at which solid wastes have been routinely and systematically released. This definition includes regulated sites (i.e., landfills, surface impoundments, waste piles, and land treatment sites), but does not include passive leakage or one-time spills from production areas and sites in which wastes have not been managed (e.g., product storage areas). (2) According to the March 1, 2005, Compliance Order on Consent (Consent Order), any discernible site at which solid waste has been placed at any time, and from which the New Mexico Environment Department determines there may be a risk of a release of hazardous waste or hazardous waste constituents (hazardous constituents), whether or not the site use was intended to be the management of solid or hazardous waste. Such sites include any area in Los Alamos National Laboratory at which solid wastes have been routinely and systematically released; they do not include one-time spills.

spring—Groundwater seeping out of the earth where the water table intersects the ground surface.

standard operating procedure—A document that details the officially approved method(s) for an operation, analysis, or action, with thoroughly prescribed techniques and steps.

stratigraphy—The study of the formation, composition, and sequence of sediments, whether consolidated or not.

subsample—See aliquot.

Superfund—Another term for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The two terms are used interchangeably.

surface sample—A sample taken at a collection depth that is (or was) representative of the medium's surface during the period of investigative interest. A typical depth interval for a surface sample is 0 to

6 in. for mesa-top locations, but may be up to several feet in sediment-deposition areas within canyons.

surrogate (surrogate compound)—An organic compound used in the analyses of organic target analytes that is similar in composition and behavior to the 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 being recovered during extraction and analysis.

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

technical area (TA)—At Los Alamos National Laboratory, an administrative unit of operational organization (e.g., TA-21).

technical notebook—A record of the methodology, observations, and results of technical activity investigations.

topography—The physical or natural features of an object or entity and their structural relationships.

transmissivity—The ability of an aquifer to transmit water.

transport (transportation)—(1) The movement of a hazardous waste by air, rail, highway, or water. (2) The movement of a contaminant from a source through a medium to a receptor.

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, recover energy or material resources from the waste, or to render such waste nonhazardous or less hazardous; safer to transport, store, or dispose of; or amenable for recovery or storage; or reduced in volume.

treatment, storage, and disposal facility—An interim-status or permitted facility in which hazardous waste is treated, stored, or disposed.

trip blank—A sample of analyte-free medium taken from a sampling site and returned to an 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—Consolidated volcanic ash, composed largely of fragments produced by volcanic eruptions.

unconfined aquifer—An aquifer containing water that is not under pressure; the water level in a well is the same as the water table outside the well.

underground storage tank—A tank located at least partially underground and designed to hold gasoline or other petroleum products or chemicals.

unique identifier—A word or code that aids in the ability to trace the history, application, or location of an activity, item, datum, or sample using recorded documentation. For Environmental Remediation and Surveillance Program records, a unique identifier is an alphanumeric identifier assigned to a primary record.

unsaturated hydraulic conductivity—A coefficient that describes the rate at which a fluid can potentially move through a permeable, unsaturated medium.

unsaturated zone—The area above the water table where soil pores are not fully saturated, although some water may be present.

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

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

vadose zone—The zone between the land surface and the water table within which the moisture content is less than saturation (except in the capillary fringe) and pressure is less than atmospheric. Soil pore space also typically contains air or other gases. The capillary fringe is included in the vadose zone.

watercourse—Any river, creek, arroyo, canyon, draw, wash, or other channel that has definite banks and beds and provides visual evidence of the occasional flow of water.

watershed—A region or basin drained by, or contributing waters to, a river, stream, lake, or other body of water and separated from adjacent drainage areas by a divide, such as a mesa, ridge, or other geologic feature.

water table—The top of the regional saturated zone; the piezometric surface associated with an unconfined aquifer.

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

work plan—A document that specifies the activities to be performed when implementing an investigation or remedy. At a minimum, the work plan should identify the scope of the work to be performed, specify the procedures to be used to perform the work, and present a schedule for performing the work. The work plan may also present the technical basis for performing the work.

A-3.0 METRIC CONVERSION TABLE

Multiply SI (Metric) Unit	by	To Obtain US Customary Unit
kilometers (km)	0.622	miles (mi)
kilometers (km)	3281	feet (ft)
meters (m)	3.281	feet (ft)
meters (m)	39.37	inches (in.)
centimeters (cm)	0.03281	feet (ft)
centimeters (cm)	0.394	inches (in.)
millimeters (mm)	0.0394	inches (in.)
micrometers or microns (µm)	0.0000394	inches (in.)
square kilometers (km^2)	0.3861	square miles (mi^2)
hectares (ha)	2.5	acres
square meters (m^2)	10.764	square feet (ft^2)
cubic meters (m^3)	35.31	cubic feet (ft^3)
kilograms (kg)	2.2046	pounds (lb)
grams (g)	0.0353	ounces (oz)
grams per cubic centimeter (g/cm^3)	62.422	pounds per cubic foot (lb/ft^3)
milligrams per kilogram (mg/kg)	1	parts per million (ppm)
micrograms per gram (µg/g)	1	parts per million (ppm)
liters (L)	0.26	gallons (gal.)
milligrams per liter (mg/L)	1	parts per million (ppm)
degrees Celsius (°C)	9/5 + 32	degrees Fahrenheit (°F)

A-4.0 DATA QUALIFIER DEFINITIONS

Data Qualifier	Definition
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.
R	The data are rejected as a result of major problems with quality assurance/quality control (QA/QC) parameters.

Appendix B

Management Plan for Investigation-Derived Waste

This appendix describes how investigation-derived waste (IDW) generated during the investigation of Upper Mortandad Canyon Aggregate Area at Los Alamos National Laboratory (the Laboratory) will be managed. IDW is solid waste generated as a result of field-investigation activities and may include, but is not limited to, drill cuttings; contaminated personal protective equipment (PPE), sampling supplies, and plastic; fluids from the decontamination of PPE and sampling equipment; and all other wastes potentially coming into contact with contaminants.

IDW generated during the investigation will be managed to protect human health and the environment, comply with applicable regulatory requirements, and adhere to Laboratory waste-minimization goals. All IDW generated during field-investigation activities will be managed in accordance with applicable standard operating procedures (SOPs). These SOPs incorporate the requirements of all applicable U.S. Environmental Protection Agency (EPA) and New Mexico Environment Department (NMED) regulations, U.S. Department of Energy (DOE) orders, and Laboratory implementation requirements (LIRs). The SOPs applicable to the characterization and management of IDW are the following:

- EP-ERSS-SOP 5022
- EP-ERSS-SOP 5023

These SOPs are among those applicable to the investigation and are available at the following URL: http://int.lanl.gov/environment/all/qa.shtml.

Before the start of field investigation activities, a waste characterization strategy form (WCSF) will be prepared and approved per the requirements of EP-ERSS-SOP 5022. The WCSF will provide detailed information on IDW characterization, management, containerization, and possible volumes. IDW characterization will be completed by reviewing existing data and/or documentation, by direct sampling of the IDW, and/or by sampling the media being investigated (i.e., surface soil, subsurface soil, etc.). If direct waste-characterization sampling is necessary, it will be described in the WCSF.

The guidance described in the Laboratory's 2006 waste minimization report (LANL 2006, 096015) will be implemented during field investigations to minimize waste generation. The IDW waste streams associated with the investigation are identified in Table B-1 and are summarized below. Table B-1 also summarizes the waste type, estimated volume, method of on-site management, and expected disposition for each of these waste streams.

The selection of waste containers will be based on the appropriate U.S. Department of Transportation requirements, waste types, and estimated volumes of IDW to be generated. Immediately following containerization, each waste container will be individually labeled with a unique identification number and with information regarding waste classification, item(s), radioactivity (if applicable), and date generated. If wastes are pending analytical results to make a final characterization determination, the containers will be labeled as such until analytical results are available. The wastes will be contained in clearly marked and appropriately constructed hazardous waste accumulation areas. The accumulation area postings, regulated storage duration, and inspection requirements will be based on the type of IDW and its classification. Container and storage requirements will be detailed in the WCSF and approved before the waste is generated.

Drill cuttings. The drill cuttings waste stream will consist of cuttings from all boreholes drilled during field activities. Drill cuttings will be collected and containerized at the point of generation (i.e., at the drill rig). The drill cutting waste stream will be characterized with analytical results by direct sampling of the containerized waste. The maximum detected concentrations of radionuclides will be compared with background/fallout values. If the maximum concentrations are above background/fallout values, the waste cuttings will be designated as low-level radioactive waste (LLW). The total concentrations of toxicity characteristic leaching procedure (TCLP) constituents will be compared with 20 times the TCLP regulatory level. If the total concentrations are less than 20 times the TCLP regulatory level, the waste cuttings will be designated non-hazardous by characteristic. If total concentrations exceed 20 times the TCLP regulatory level, the waste cuttings may be sampled and analyzed using TCLP to determine if they are hazardous by characteristic. If potential EPA-listed hazardous waste constituents are detected, the Laboratory will conduct a review of historical records and data in an effort to determine whether the source of each constituent was a listed hazardous waste at its point of generation. If the source is determined to be a listed hazardous waste, the cuttings will be managed as hazardous or mixed waste (depending on the levels of radioactivity). Otherwise, the cuttings will be managed as non-hazardous solid waste or LLW (depending on the levels of radioactivity). These wastes will be stored within 20 yd^3 roll-off containers in secure, designated waste staging areas within the aggregate area boundary. Based on the results of previous investigations, the Laboratory expects these wastes to be designated as LLW to be disposed of at Technical Area (TA) 54 or at an off-site disposal facility.

Spent PPE. The spent PPE waste stream will consist of PPE that has potentially contacted contaminated environmental media (i.e., core and/or drill cuttings) and that cannot be decontaminated. The bulk of this waste stream will consist of protective clothing such as coveralls, gloves, and shoe covers. Spent PPE will be collected in containers at personnel decontamination stations. Characterization of this waste stream will be performed through acceptable knowledge of the waste materials, the methods of generation, and the analytical results from the sampling of the environmental media with which the materials were in contact. These wastes will be stored in secure, designated waste staging areas within the aggregate area boundary. The Laboratory expects these wastes to be designated as LLW that will be disposed of at TA-54 or at an off-site disposal facility.

Disposable sampling supplies. The disposable sampling supplies waste stream will consist of all equipment and materials necessary for collecting samples that come into direct contact with contaminated environmental media and that cannot be decontaminated. This waste stream will consist primarily of paper and plastic items collected in bags at the sampling location and transferred to accumulation drums. This waste stream also includes wastes associated with dry decontamination activities. Characterization of this waste stream will be performed through acceptable knowledge of the waste materials, the methods of generation, and the analytical results from the sampling of the environmental media with which the materials were in contact. These wastes will be stored in secure, designated waste staging areas within the aggregate area boundary. The Laboratory expects these wastes to be designated as LLW to be disposed of at TA-54 or at an off-site disposal facility.

Decontamination fluids. The decontamination fluids waste stream will consist of liquid wastes from decontamination activities (i.e., decontamination solutions and rinse waters). Consistent with waste minimization practices, the Laboratory employs dry decontamination methods to the extent possible. If dry decontamination cannot be performed, liquid decontamination wastes will be collected in containers at the point of generation and characterized with analytical results from direct sampling of the containerized waste. These wastes will be stored in secure, designated waste staging areas within the aggregate area boundary. The Laboratory expects these wastes to be designated as liquid LLW to be sent to the radioactive liquid waste treatment facility (RLWTF) at TA-50 for disposal.

Petroleum-contaminated soil (PCS) and absorbent material. This waste stream consists of PCS and absorbent material (pads, paper towels, or other material) from the release of commercial products such as hydraulic fluid, motor oil, or diesel fuel which would only be generated in the event of an accidental release. This waste will be stored in plastic lined drums. This waste will be designated as New Mexico Special Waste and disposed off at an authorized offsite disposal facility. It is anticipated that if this waste is generated the volume will be less than 0.5 yd^3.

REFERENCE

The following list includes all documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau; the U.S. Department of Energy–Los Alamos Site Office; the U.S. Environmental Protection Agency, Region 6; and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

LANL (Los Alamos National Laboratory), November 2006. "Los Alamos National Laboratory Hazardous Waste Minimization Report," Los Alamos National Laboratory document LA-UR-06-8175, Los Alamos, New Mexico. (LANL 2006, 096015)

Table B-1
Summary of Estimated IDW Generation and Management

Waste Stream	Waste Type	Estimated Volume	Characterization Method	On-Site Management	Expected Disposition
Drill cuttings	LLW	100 yd^3	Direct sampling	20 yd^3 roll-off containers	Disposal at TA-54 or off-site disposal facility
Spent PPE	LLW	1.0 yd^3	Acceptable knowledge (analytical results from sampling of environmental media)	55-gal. drums	Disposal at TA-54 or off-site disposal facility
Disposable sampling supplies	LLW	1.0 yd^3	Acceptable knowledge (analytical results from sampling of environmental media)	55-gal. drums	Disposal at TA-54 or off-site disposal facility
Decontamination fluids	LLW	<55 gal.*	Direct sampling	55-gal. drums	Disposal at TA-54 or off-site disposal facility
PCS and absorbent material	New Mexico Special Waste	0.5 yd^3	Acceptable knowledge	55-gal. drums	Disposal at an off-site disposal facility

* Dry decontamination methods will be used to the maximum extent possible, and only minimal amounts of decontamination fluids are expected to be generated.