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Refer To: EP2011-0162

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Subject: Submittal of the Phase II Investigation Work Plan for Threemile Canyon Aggregate Area

Dear Mr. Kieling:

Enclosed please find two hard copies with electronic files of the Phase II Investigation Work Plan for Threemile Canyon Aggregate Area.

If you have any questions, please contact Becky Coel-Roback at (505) 665-5011 (becky_cr@lanl.gov) or Woody Woodworth at (505) 665-5820 (lwoodworth@doeal.gov).

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Phase II Investigation Work Plan for Threemile Canyon Aggregate Area

Prepared by the Environmental Programs Directorate

Los Alamos National Laboratory, operated by Los Alamos National Security, LLC, for the U.S. Department of Energy under Contract No. DE-AC52-06NA25396, has prepared this document pursuant to the Compliance Order on Consent, signed March 1, 2005. The Compliance Order on Consent contains requirements for the investigation and cleanup, including corrective action, of contamination at Los Alamos National Laboratory. The U.S. government has rights to use, reproduce, and distribute this document. The public may copy and use this document without charge, provided that this notice and any statement of authorship are reproduced on all copies.

EP2011-0162

Phase II Investigation Work Plan for Threemile Canyon Aggregate Area

June 2011

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EXECUTIVE SUMMARY

The Threemile Canyon Aggregate Area is located in Technical Area 14 (TA-14), TA-15, TA-36, and former TA-12 (currently within the boundaries of TA-67 and TA-15) of Los Alamos National Laboratory and includes a total of 40 solid waste management units (SWMUs) and areas of concern (AOCs). Twenty-six of the sites were investigated in 2009–2010 and the results reported in the investigation report for the Threemile Canyon Aggregate Area. All 26 sites require additional sampling to define the extent of contamination; however, AOC 15-004(d) is located within the boundary of SWMU 15-004(a), which is deferred per Table IV-2 of the Compliance Order on Consent. Therefore, AOC 15-004(d) will not be sampled during the Phase II investigation. This investigation work plan presents the proposed sampling and analyses needed to define the vertical and/or lateral extent of one or more contaminants at each of the remaining 25 sites. The results of the Phase II investigation activities will be reported in a Phase II investigation report.

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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) and managed by Los Alamos National Security, LLC. The Laboratory 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 fingerlike 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 above mean sea level.

The Laboratory is participating in a national effort by DOE to clean up sites and facilities formerly involved in weapons research and development. The goal of the Laboratory's efforts is to ensure past operations do not threaten human or environmental health and safety in and around Los Alamos County, New Mexico. To achieve this goal, the Laboratory is currently investigating sites potentially contaminated by past Laboratory operations. These sites are designated as either solid waste management units (SWMUs) or areas of concern (AOCs).

The SWMUs and AOCs addressed in this Phase II 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, regulates cleanup of hazardous wastes and hazardous constituents. DOE regulates cleanup of radioactive contamination, pursuant to DOE Order 5400.5, Radiation Protection of the Public and the Environment; DOE Order 435.1, Radioactive Waste Management; and DOE Order 458.1, Administrative Change 1, Radiation Protection of the Public and the Environment. 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.

1.1 Work Plan Overview

The Threemile Canyon Aggregate Area is located in Technical Area 14 (TA-14), TA-15, TA-36, and former TA-12 (currently within the boundaries of TA-67 and TA-15 at the Laboratory) and consists of 40 SWMUs and AOCs (Figure 1.1-1 and Plate 1). Twenty-six of the sites were investigated in 2009–2010; the results were reported in the approved investigation report (LANL 2010, 111324; NMED 2010, 111458). All 26 sites require additional sampling to define the extent of contamination; however, AOC 15-004(d) is located within the boundary of SWMU 15-004(a), which is deferred per Table IV-2 of Compliance Order on Consent (the Consent Order). Therefore, AOC 15-004(d) will not be sampled during the Phase II investigation. This Phase II investigation work plan presents the proposed sampling and analyses needed to define the vertical and/or lateral extent of one or more contaminants at each of the remaining 25 sites. Contaminants to be investigated include selected target analyte list (TAL) metals, cyanide, nitrate, perchlorate; selected volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs); and selected radionuclides. A brief description of and additional sampling requirements for the 25 sites are presented in Table 1.1-1.

Section 2 presents the background and conceptual site model of the Threemile Canyon Aggregate Area. Section 3 presents site conditions, and section 4 summarizes previous investigations and data collected and presents the scope of proposed activities for each site. Section 5 describes investigation methods for proposed field activities. Ongoing monitoring and sampling programs within the aggregate area are summarized in section 6. Section 7 is an overview of the anticipated schedule of the investigation and reporting activities. The references cited in this Phase II work plan and the map data sources are provided in section 8. Appendix A of this work plan includes a list of acronyms and abbreviations, a metric

conversion table, and a data qualifier definitions table. Appendix B describes the management of investigation-derived waste (IDW).

1.2 Work Plan Objectives

The objective of the Phase II investigation work plan is to complete the activities recommended in the approved investigation report (LANL 2010, 111324.14; NMED 2010, 111458) for 25 sites requiring additional sampling to define the extent of contamination.

To accomplish this objective, the Phase II work plan

- presents historical and background information and data from the investigation report for each site,
- describes the rationale for proposed data collection activities,
- identifies and presents appropriate methods for achieving the investigation objectives and managing IDW, and
- presents a schedule for conducting the investigation activities and reporting the investigation results.

2.0 BACKGROUND

2.1 General Site Information

Former TA-12, also known as L-Site, was constructed during World War II and used as an explosives testing facility. An open area was used as the firing site where a number of shots were detonated, including one 70-kg charge (LANL 1996, 054086, p. 1-1). Former TA-12 is located on the Pajarito Mesa between Starmer's Gulch/Upper Pajarito Canyon to the north and Threemile Canyon to the south (Plate 1).

TA-14 was established during World War II and used by X Division to test explosives beginning in 1944 (LANL 1996, 054086, p. 1-1). This site was used primarily for close-observation work on small explosives charges. Tests were conducted in open and closed firing chambers (LANL 1996, 054086, p. 1-1). Some of these tests used radioactive materials (LANL 1994, 034755). TA-14 is located on the mesa between Threemile Canyon to the north and Cañon de Valle to the south (Plate 1). TA-14 remains active with scheduled tests at the firing area and bullet test facility (LANL 1994, 034755, p. 1-11).

TA-15 was established in 1945 as a firing site area. Current activities at TA-15 consist of high explosives (HE) research, development, and testing, mainly through hydrodynamic testing and dynamic experimentation. Many large explosive tests have taken place with the concurrent scattering of large amounts of natural uranium or depleted uranium (DU) and, to a lesser extent, beryllium and lead (LANL 1994, 040595). TA-15, also known as R-Site, occupies portions of Threemile Mesa on the Pajarito Plateau near the southwestern boundary of the Laboratory in a roughly rectangular area approximately 1.3 mi wide by 1.5 mi long. TA-15 occupies approximately 1200 acres and is bounded by TA-66 and TA-67 to the north, TA-14, TA-16, TA-37, and TA-49 to the west and south, and TA-36 to the east (Plate 1).

TA-36 is located east of TA-15 and south of Pajarito Road (Plate 1). TA-36 contains four active firing sites (Eenie, Meenie, Minie, and Lower Slobovia) that support explosives testing. The firing sites and associated buildings are used for a wide variety of nonnuclear ordinance tests for the U.S. Department of

Defense. Activities include shipping, receiving, transporting, and testing HE; developing diagnostic techniques; testing armor/antiarmor systems; and testing weapons components and guns (LANL 1993, 015313, p. 2-5). TA-36 operations associated with the Threemile Canyon Aggregate Area include a laboratory and an experiment facility located on a mesa top south of Threemile Canyon and west of TA-18.

2.2 Operational History

Former TA-12 was constructed in 1944 as a testing site for X Division and ceased operation in 1946. In 1950, the Biomedical Group used TA-12 and constructed a bermed radiation test bunker for conducting an experiment using a 1000-Ci radioactive lanthanum-140 source. Because of these radiation experiments, a section of the perimeter became contaminated. In 1951, the Dynamic Experimentation Group began using the area, reportedly firing 600 shots per month (LANL 1994, 034755). By 1953, the entire site was vacated. In 1960, the structures were decontaminated, decommissioned, and intentionally burned (LANL 1996, 054086, p. 1-1). A Laboratory group used part of the site during the Vietnam War for "Mortar Locator" experiments, which involved using an acetylene gas gun.

TA-14, also constructed for X Division, was used for close observation work on small explosive charges and included both open and closed firing chambers. TA-14 has always been a dedicated site for developing and testing explosives, including tests involving radioactive materials. TA-14 remains an active site with scheduled tests at both the firing area and bullet test facility (LANL 1994, 034755, p. 1-11).

TA-15 has been used from 1944 to the present for explosives experiments. Test explosions ranging from a few kilograms of HE to as much as 1800 kg have been detonated. In most cases, the tests are carried out aboveground, resulting in the test materials being scattered over areas as large as hundreds of square meters (LANL 1993, 020946, p. 1-10). Sites located within the Threemile Canyon Aggregate Area include Firing Sites C, R-44, R-45, and Ector and related support structures.

Operations at TA-36 started in 1950. Structures at TA-36 consist of the group office and sanitary facilities, four active firing sites, and a storage magazine. In 1983, the boundary was changed to incorporate the I-J Firing Site (formerly part of TA-15). Activities at TA-36 include the storage and assembly of prefabricated metal and explosives components, detonators, cables, and instrumentation for shots; and the detonation of these shots (LANL 1993, 015313, p. 2-5). Sites located within the Threemile Canyon Aggregate Area are associated with building 36-1, which houses laboratory activities and photoprocessing operations. None of the TA-36 sites within Threemile Canyon Aggregate Area are associated with firing-site activities.

2.3 Conceptual Site Model

The sampling proposed in this Phase II work plan uses a conceptual site model to predict areas of potential contamination and to 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 within the Threemile Canyon Aggregate Area may have occurred as a result of firing site activities, potential leaks from septic systems and sumps and associated drainlines, discharges from outfalls, and surface disposal areas. Previous sampling results indicate contamination from HE, inorganic

chemicals, organic chemicals, and radionuclides (LANL 2010, 111324.14). Additional sampling is needed to define the extent of contamination at 25 sites.

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.

Laboratory and construction workers could potentially be exposed to contaminants in soil, tuff, and sediment by direct contact, ingestion, or inhalation. Ecological receptors may also be exposed to contaminants in soil and sediment.

2.3.4 Cleanup Levels

NMED soil screening levels (SSLs) for inorganic and organic chemicals (NMED 2009, 108070) or Laboratory screening action levels for radionuclides (LANL 2009, 107655) will be used as soil cleanup levels unless they are determined to be impractical (Section VIII.B.1 of the Consent Order) or unless values do not exist for the current and reasonably foreseeable future land use scenarios. If NMED SSLs do not exist, U.S. Environmental Protection Agency (EPA) regional screening values (adjusted to 10^{-5} risk for carcinogens) will be used (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

2.4 Data Overview

This investigation work plan summarizes the available decision-level data used to evaluate whether the nature and extent of contamination are defined for each site. In addition, this work plan proposes sampling and analyses for sites where the extent of contamination has not been defined. The data collected during this investigation, along with existing decision-level data, will be used to define nature and extent and perform risk-screening assessments. To ensure extent is defined, the deepest sample collected at every location shall be from undisturbed soil or unweathered tuff; sample collection depths will be adjusted accordingly in the field and recorded in sample collection logs (SCLs).

Isotopic Uranium Data

Total uranium was included in the analytical suite of historical Resource Conservation and Recovery Act facility investigations (RFIs) and was subsequently included in the analytical suite for the 2009–2010 Threemile Canyon Aggregate Area investigation. Samples from most of these sites were also analyzed for isotopic uranium. Isotopic uranium results can be used to define extent for total uranium as well as uranium isotopes. Therefore, at sampling locations where the vertical and/or lateral extent of total uranium was not defined in previously collected samples, samples collected during the Phase II investigation will be analyzed only for isotopic uranium to define extent.

3.0 SITE CONDITIONS

Surface and subsurface features and geologic characteristics of the Threemile Canyon Aggregate Area are described in detail in the approved investigation report (LANL 2010, 111324.14; NMED 2010, 111458). Conditions at the sites included in this Phase II investigation work plan are predominantly influenced by

- a semiarid climate with low precipitation and a high evapotranspiration rate that limits the extent of subsurface moisture percolation and, therefore, the amount of moisture available to transport radionuclides or hazardous waste constituents in the subsurface, and
- a thick, relatively dry, unsaturated (vadose) zone that greatly restricts or prevents downward migration of contaminants to the regional aquifer.

These and other elements of the environmental setting in the Threemile Canyon Aggregate Area are considered when the investigation data are evaluated with respect to the fate and transport of contaminants.

4.0 SITE DESCRIPTIONS AND PROPOSED INVESTIGATION ACTIVITIES

4.1 Former TA-12

Former TA-12, also known as L-Site, was constructed during World War II and used as an explosives testing facility. An open area was used as the firing site where a number of shots were detonated, including one 70-kg charge (LANL 1996, 054086, p. 1-1).

In 1989 the Laboratory redefined TA boundaries. Most of former TA-12 is now within the boundary of TA-67 and the remaining area is within the boundary of TA-15. Two former TA-12 sites in this investigation [AOCs 12-004(a) and 12-004(b)] are located in the northeast corner of TA-15. The other eight former TA-12 sites are located in the western portion of TA-67 (Figure 4.1-1).

4.1.1 Consolidated Unit 12-001(a)-99, Firing Site

Consolidated Unit 12-001(a)-99 consists of SWMUs 12-001(a), 12-001(b), and 12-002 and AOC C-12-005.

4.1.1.1 Site Description and Operational History

SWMU 12-001(a), Steel-Lined Firing Pit

SWMU 12-001(a) is a decommissioned belowground steel-lined firing pit and steel cover (structure 12-4) located on the north side of Redondo Road at former TA-12 (Plate 2). The firing pit is hexagonal and measures 10.5 ft on each side × 11 ft deep. A steel cover that measures 20 ft long × 22 ft wide × 5 ft high overlays the pit. The steel cover has a 5-ft-diameter opening in its center through which explosives were lowered into the pit. The firing pit began operation in 1944 (LANL 1994, 034755, p. 5-1-1) and was used to conduct recovery shots involving uranium until the pit was decommissioned in 1953. In 1996, a voluntary corrective action removed approximately 10.5 ft^3 of noncontaminated soil that had blown into the bottom of the pit; the pit remains in place (LANL 1996, 055073, p. 1).

SWMU 12-001(b), Former Firing Pit

SWMU 12-001(b) is a decommissioned firing pit located on the north side of Redondo Road at former TA-12 (Plate 2). The pit is 5 ft × 5 ft × 3 ft deep and was used for calorimetric experiments in 1945. Following World War II, the pit was used to fire HE shots involving lead and uranium. Although operations at this site ceased in the 1950s, the pit remains in place.

SWMU 12-002, Potential Soil Contamination

SWMU 12-002 is an area of potential soil contamination at former TA-12 where a small quantity of scrap HE was burned on one occasion (Plate 2). In 1962, a can containing approximately 0.5 lb of HE was discovered during a property survey and was subsequently burned in a small area (approximately 3 ft^2) to destroy the HE (Anderson 1962, 004860; LANL 1994, 034755, p. 6-3). The location of SWMU 12-002 now lies beneath the asphalt pavement of Redondo Road.

AOC C-12-005, Former Junction Box

AOC C-12-005 is the location of a former junction box (structure 12-6) at former TA-12 (Plate 2). The junction box was used to support experiments conducted at the firing pits, SWMUs 12-001(a) and 12-001(b). Constructed in 1945, the junction box was 3 ft long × 3 ft wide × 4 ft high and surrounded on three sides by a soil berm. The junction box served as a relay between former control building 12-2 and the two firing pits and housed diagnostic equipment, signal cables, and electrical power equipment. Approximately 750 ft of detonation wire connected the junction box to building 12-2. The junction box was not used after 1953 and was intentionally burned in place in 1960 (LANL 1994, 034755, p. 5-1-5).

4.1.1.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14; NMED 2010, 111458) concluded that the nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at Consolidated Unit 12-001(a)-99, except for the following:

- Lateral extent of antimony west of location 12-610656
- Lateral extent of barium and cobalt west of location 12-610694
- Lateral extent of nickel east of location 12-610787
- Vertical extent of aluminum at locations 12-610670, 12-610671, 12-610701, and 12-610787

- Vertical extent of antimony at location 12-610694
- Vertical extent of barium at locations 12-610670, 12-610671, 12-610701, and 12-610787
- Vertical extent of calcium at locations 12-610654, 12-610671, 12-610701, and 12-610787
- Vertical extent of chromium at locations 12-610676, 12-610694, 12-610697, and 12-610787
- Vertical extent of cobalt at locations 12-610647, 12-610671, 12-610694, 12-610696, 12-610701, and 12-610787
- Vertical extent of copper at location 12-610787
- Vertical extent of cyanide at location 12-610672
- Vertical extent of iron at locations 12-610650, 12-610670, 12-610675, and 12-610787
- Vertical extent of manganese at locations 12-610647 and 12-610694
- Vertical extent of nickel at locations 12-610701 and 12-610787
- Vertical extent of vanadium at locations 12-610671 and 12-610787
- Vertical extent of zinc at location 12-610675
- Vertical extent of HMX (1,3,5,7-tetranitro-1,3,5,7-tetrazocine) and RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine) at locations 12-610640 and 12-610642
- Vertical extent of cesium-137 at locations 12-610639, 12-610676, 12-610679, and 12-610680
- Vertical extent of plutonium-239/240 at location 12-610639
- Vertical extent of uranium-238 at location 12-610676

The investigation report indicated the lateral extent of antimony was not defined west of sampling location 12-610656, but antimony was not detected at location 12-610659, west of 12-610656. Therefore, the lateral extent of antimony is defined.

Similarly, the investigation report indicated the lateral extent of barium was not defined to the west because of increasing concentrations. Although barium concentrations increased to the west at location 12-610694, the highest concentration at this location (407 mg/kg at 3.0–3.4 ft below ground surface [bgs]) was below the maximum background concentration for soil (410 mg/kg). Therefore, the lateral extent of barium is defined.

The investigation report also indicated the lateral extent of chromium was defined. However, chromium concentrations increased to the west at location 12-610694, and lateral extent is not defined at this location. Similarly, the investigation report indicated the lateral extent of vanadium was defined. Vanadium concentrations increased to the east at location 12-610787, however, and lateral extent is not defined at this location.

The investigation report indicated the vertical extent of cyanide was not defined at location 12-610672. The detected concentration of cyanide at this location (0.502 mg/kg), however, was equivalent to the background value (BV) (0.5 mg/kg). Therefore, the vertical extent of cyanide is defined.

The investigation report indicated the vertical extent of iron was not defined at locations 12-610650 and 12-610675. The detected concentrations of iron above BVs at these locations (14,600 mg/kg in Qbt 3 and 22,100 mg/kg in soil, respectively) were below the maximum background concentrations for Qbt 3 and soil (19,500 mg/kg and 36,000 mg/kg, respectively). Therefore, the vertical extent of iron is defined at these locations.

The investigation report indicated the vertical extent of cesium-137 was not defined at locations 12-610676 and 12-610679. At each of these locations, cesium-137 was detected below the fallout value (FV) in a shallow soil or sediment sample, and the detected activities in the shallow samples (0.514 pCi/g and 0.15 pCi/g, respectively) were higher than the activities in the deeper samples (0.227 pCi/g and 0.0779 pCi/g, respectively). Therefore, the vertical extent of cesium-137 is defined at both locations.

The sampling locations and results for inorganic chemicals detected above BVs are shown on Plate 3, organic chemicals detected are shown on Plate 4, and radionuclides detected or detected above BVs/FVs are shown on Plate 5 for Consolidated Unit 12-001(a)-99.

4.1.1.3 Proposed Activities at Consolidated Unit 12-001(a)-99

Subsurface samples will be collected at 15 previously sampled locations, extending the depths at each sampling location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 9.0–10.0 ft bgs and will be analyzed as follows.

- Samples collected at location 12-610639 will be analyzed for cesium-137 and isotopic plutonium.
- Samples collected at locations 12-610640 and 12-610642 will be analyzed for HMX and RDX.
- Samples collected at location 12-610647 will be analyzed for cobalt and manganese.
- Samples collected at location 12-610654 will be analyzed for calcium.
- Samples collected at location 12-610670 will be analyzed for aluminum, barium, and iron.
- Samples collected at location 12-610671 will be analyzed for aluminum, barium, calcium, cobalt, and vanadium.
- Samples collected at location 12-610675 will be analyzed for zinc.
- Samples collected at location 12-610676 will be analyzed for chromium and isotopic uranium.
- Samples collected at location 12-610680 will be analyzed for cesium-137.
- Samples collected at location 12-610694 will be analyzed for antimony, chromium, cobalt, and manganese.
- Samples collected at location 12-610696 will be analyzed for cobalt.
- Samples collected at location 12-610697 will be analyzed for chromium.
- Samples collected at location 12-610701 will be analyzed for aluminum, barium, calcium, cobalt, and nickel.
- Samples collected at location 12-610787 will be analyzed for aluminum, barium, calcium, chromium, cobalt, copper, iron, nickel, and vanadium.

Two new boreholes (1a-1 and 1a-2) will be drilled west of existing sampling location 12-610694 to define the lateral extent of chromium and cobalt. Samples will be collected from depth intervals of 0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and will be analyzed for chromium and cobalt.

Two new boreholes (1a-3 and 1a-4) will be drilled east of existing sampling location 12-610787 to define the lateral extent of nickel and vanadium. Samples will be collected from depth intervals of 0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and will be analyzed for nickel and vanadium.

Proposed sampling locations at Consolidated Unit 12-001(a)-99 are shown on Plate 6. Table 4.1-1 summarizes the proposed sampling locations, depths, and analytical suites.

4.1.2 AOC 12-004(a), Radiation Test Site

4.1.2.1 Site Description and Operational History

AOC 12-004(a) is the site of a lanthanum radiation experiment conducted at former TA-12 (Figure 4.1-2). The site originally consisted of a 6-ft × 6-ft × 6-ft soil-bermed radiation shelter (structure 12-8) and three vertical poles. The shelter and poles were constructed in a line parallel to a drainage channel that flows southwest from Redondo Road into Threemile Canyon. The northernmost pole has been removed and was located in a drainage 30 ft south of Redondo Road; the middle pole is located 58 ft south of the first pole location; and the radiation shelter and the third pole are located 40 ft south of the second pole (LANL 1996, 054086, pp. 5-18–5-24).

The site was constructed in March 1950, and experiments were conducted over a 3-wk period in the same year. Operations at the site consisted of deploying a lanthanum source from the radiation shelter by raising it with a wire strung over the three poles. The radiation source was stored in a lead container at the base of the first pole and could be deployed at various heights by raising it inside a guide tube attached to the pole. At an unspecified date between 1962 and 1966, the lead container and the plastic guide tube were removed (Blackwell 1962, 005011). The northernmost pole was removed in 1966 (Blackwell 1966, 005012). The shelter and two poles remain in place.

4.1.2.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 27–30) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at AOC 12-004(a), except for the following:

- Lateral extent of barium, calcium, nickel, and vanadium at locations 12-610528 and 12-610529
- Lateral extent of chromium at locations 12-610540, 12-610542, and 12-610543
- Lateral extent of cobalt at location 12-610527
- Lateral extent of uranium, uranium-234, uranium-235/236, and uranium-238 at location 12-610550
- Vertical extent of cobalt and lead at location 12-610527
- Vertical extent of aluminum, barium, and calcium at location 12-610528
- Vertical extent of aluminum, barium, and calcium, chromium, nickel, and vanadium at location 12-610529
- Vertical extent of cobalt at location 12-610530
- Vertical extent of chromium at locations 12-610539, 12-610540, and 12-610549
- Vertical extent of uranium at location 12-610540
- Vertical extent of antimony, calcium, chromium, and nickel at location 12-610543
- Vertical extent of cesium-137 at locations 12-610540, 12-610543, 12-610547, and 12-610549
- Vertical extent of uranium-234 at location 12-610550 and uranium-235/236 at locations 12-610545, 12-610549, and 12-610550
- Vertical extent of uranium-238 at locations 12-610548 and 12-610550

The investigation report indicated the vertical extent of aluminum was not defined at location 12-610528. At this location, aluminum was detected below the BV in a shallow soil sample, and the detected concentration in the shallow sample (18,300 mg/kg) was higher than the concentration in the deeper tuff sample (10,600 mg/kg). Therefore, the vertical extent of aluminum is defined at this location.

The investigation report indicated the vertical extent of uranium was not defined at location 12-610540 because its concentrations increased with depth. The isotopic uranium data for this location, however, showed uranium-234 and uranium-235/236 activities to be below BVs in both samples and uranium-238 activities to be below BV in the deeper sample. Based on the isotopic uranium data, the vertical extent of uranium is defined at this location.

The investigation report indicated the vertical extent of cesium-137 was not defined at locations 12-610540, 12-610543, 12-610547, and 12-610549. At each of these locations, cesium-137 was detected below the FV in a shallow soil sample, and the detected activities in the shallow samples (0.438 pCi/g, 0.971 pCi/g, 0.483 pCi/g, and 0.35 pCi/g, respectively) were higher than the activities in the deeper tuff samples (0.113 pCi/g, 0.123 pCi/g, 0.126 pCi/g, and 0.124 pCi/g, respectively). Therefore, the vertical extent of cesium-137 is defined at these locations.

Sampling locations and results for inorganic chemicals detected above BVs are shown in Figure 4.1-3, and radionuclides detected or detected above BVs/FVs are shown in Figure 4.1-4 for AOC 12-004(a).

4.1.2.3 Proposed Activities at AOC 12-004(a)

Subsurface samples will be collected at 10 previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 9.0–10.0 ft bgs and analyzed as follows:

- Samples collected at location 12-610527 will be analyzed for cobalt and lead.
- Samples collected at location 12-610528 will be analyzed for barium and calcium.
- Samples collected at location 12-610529 will be analyzed for aluminum, barium, calcium, chromium, nickel, and vanadium.
- Samples collected at location 12-610530 will be analyzed for cobalt.
- Samples collected at location 12-610540 will be analyzed for chromium and will be used to define the vertical extent of chromium at adjacent location 12-610539.
- Samples collected at location 12-610543 will be analyzed for antimony, calcium, chromium, and nickel.
- Samples collected at location 12-610545 will be analyzed for isotopic uranium.
- Samples collected at location 12-610548 will be analyzed for isotopic uranium.
- Samples collected at location 12-610549 will be analyzed for chromium and isotopic uranium.
- Samples collected at location 12-610550 will be analyzed for isotopic uranium.

Two new boreholes (4a-1 and 4a-2) will be drilled east of existing sampling locations 12-610528 and 12-610529 to define the lateral extent of barium, calcium, nickel, and vanadium. Samples will be collected from depth intervals of 0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and will be analyzed for barium, calcium, nickel, and vanadium.

Three new boreholes (4a-3, 4a-4, and 4a-5) will be drilled west of existing sampling locations 12-610540, 12-610542, and 12-610543, and one new borehole (4a-6) will be drilled east of existing sampling location 12-610543 to define the lateral extent of chromium. Samples will be collected from depth intervals of 0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and will be analyzed for chromium.

One new borehole (4a-7) will be drilled west of existing sampling location 12-610527 to define the lateral extent of cobalt. Samples will be collected from depth intervals of 0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and will be analyzed for cobalt.

Samples will be collected from sediment catchment areas at two new locations (4a-8 and 4a-9) in the drainage downgradient of existing sampling location 12-610550 to define the lateral extent of uranium, uranium-234, uranium-235/236, and uranium-238. The samples will be collected from depth intervals of 0–1.0 ft and 2.0–3.0 ft bgs and will be analyzed for isotopic uranium. The isotopic uranium results will also be used to define the extent of total uranium.

Proposed sampling locations at AOC 12-004(a) are shown in Figure 4.1-5. Table 4.1-2 summarizes the proposed sampling locations, depths, and analytical suites.

4.1.3 AOC 12-004(b), Pipe

4.1.3.1 Site Description and Operational History

AOC 12-004(b) consists of a former aluminum pipe located at former TA-12 at the edge of Redondo Road approximately 78 ft north of a radiation shelter (structure 12-8) (Figure 4.1-2). The pipe was set vertically in the ground and protruded 8 in. aboveground without a cover. The pipe was 7.5 in. thick in diameter and 3 ft long with an inner diameter of 18 in. The pipe was filled with soil. Remnant fragments of HE were observed at the site in 1959 (Blackwell 1959, 005773). The pipe was removed during the 2009–2010 investigation.

4.1.3.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 32–34) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at AOC 12-004(b), except for the following:

- Vertical extent for calcium, chromium, copper, magnesium, nickel, and selenium at location 12-611939
- Vertical extent for chromium at location 12-610553
- Vertical extent for chromium, copper, and selenium at location 12-611940

The investigation report indicated the vertical extent of chromium was not defined at location 12-611940. The detected concentrations of chromium above BV at this location (8.2 mg/kg and 8.7 mg/kg in Qbt 3) were below the maximum background concentration for Qbt 3 (13 mg/kg). Therefore, the vertical extent of chromium is defined at this location.

Sampling locations and results for inorganic chemicals detected above BVs are shown in Figure 4.1-3 for AOC 12-004(b).

4.1.3.3 Proposed Activities at AOC 12-004(b)

Subsurface samples will be collected at one previously sampled location, extending the depth to define the vertical extent of contamination. Samples will be collected from depth intervals of 6.0–7.0 ft and 9.0–10.0 ft bgs.

- Samples collected at location 12-611939 will be analyzed for calcium, chromium, copper, magnesium, nickel, and selenium.

Because of the close proximity of locations 12-610553, 12-611939, and 12-611940 (within 20 ft of each other), samples from location 12-611939 will be used to define vertical extent for all three locations.

The proposed sampling location at AOC 12-004(b) is shown in Figure 4.1-5. Table 4.1-3 summarizes the proposed sampling locations, depths, and analytical suites.

4.1.4 AOC C-12-001, Potential Soil Contamination Associated with Former Building 12-1

4.1.4.1 Site Description and Operational History

AOC C-12-001 is an area of potential soil contamination at former TA-12 associated with the former trim building (12-1) (Plate 7). The trim building was built in December 1944 and used to prepare HE for detonation experiments. The building was 16 ft long × 16 ft wide × 9 ft high and of wood-frame construction with a soil berm on three sides and on top. Activities at former TA-12 ceased in 1953, and building 12-1 was destroyed in 1960 by intentional burning. Concrete blocks and metal radiators were observed at the site in 1992 but have since been removed (LANL 1994, 034755).

4.1.4.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 36–38) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at AOC C-12-001, except for the following:

- Lateral extent of aluminum, barium, cobalt, nickel, Aroclor-1242, Aroclor-1254, and Aroclor-1260 at locations 12-610627 and 12-610628
- Vertical extent of chromium at location 12-610624
- Vertical extent of calcium, chromium, and nickel at location 12-610625
- Vertical extent of aluminum, barium, and calcium at location 12-610627
- Vertical extent of aluminum, barium, calcium, and nickel at location 12-610628

Sampling locations and results for inorganic chemicals detected above BVs are shown on Plate 8, and detected organic chemicals are shown on Plate 9 for AOC C-12-001.

4.1.4.3 Proposed Activities at AOC C-12-001

Subsurface samples will be collected at four previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 9.0–10.0 ft bgs and analyzed as follows.

- Samples collected at location 12-610624 will be analyzed for chromium.
- Samples collected at location 12-610625 will be analyzed for calcium, chromium, and nickel.
- Samples collected at location 12-610627 will be analyzed for aluminum, barium, and calcium.
- Samples collected at location 12-610628 will be analyzed for aluminum, barium, calcium, and nickel.

Samples will be collected from sediment catchment areas at four new locations (C1-1, C1-2, C1-3, and C1-4) in the drainage downgradient of existing sampling locations 12-610627 and 12-610628 to define the lateral extent of aluminum, barium, cobalt, nickel, Aroclor-1242, Aroclor-1254, and Aroclor-1260. Samples will be collected from depth intervals of 0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and will be analyzed for aluminum, barium, cobalt, nickel, and PCBs.

Proposed sampling locations at AOC C-12-001 are shown on Plate 10. Table 4.1-4 summarizes the proposed sampling locations, depths, and analytical suites.

4.1.5 AOC C-12-002, Potential Soil Contamination Associated with Former Building 12-2

4.1.5.1 Site Description and Operational History

AOC C-12-002 is an area of potential soil contamination at former TA-12 associated with former control building 12-2 (Plate 7). Built in 1945 of wood-frame construction, the building measured 8 ft long × 8 ft wide × 8 ft high, with a soil berm on three sides and on top. The structure was located south of Redondo Road. Activities at former TA-12 ceased in the early 1950s, and the control building was destroyed in 1960 by intentional burning.

4.1.5.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 40–41) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at AOC C-12-002, except for the following:

- Lateral extent of aluminum and barium at location 12-610631
- Lateral extent of aluminum, barium, copper, nickel, and vanadium at location 12-610632
- Vertical extent of aluminum and cobalt at location 12-610631
- Vertical extent of aluminum, barium, calcium, cobalt, copper, and nickel at location 12-610632

Sampling locations and results for inorganic chemicals detected above BVs are shown on Plate 8 for AOC C-12-002.

4.1.5.3 Proposed Activities at AOC C-12-002

Subsurface samples will be collected at two previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 9.0–10.0 ft bgs and analyzed as follows.

- Samples collected at location 12-610631 will be analyzed for aluminum and cobalt.
- Samples collected at location 12-610632 will be analyzed for aluminum, barium, calcium, cobalt, copper, and nickel.

Samples will be collected at two new step-out locations (C2-1 and C2-2) downgradient of existing sampling location 12-610631 to define the lateral extent of aluminum and barium. Samples will be collected from depth intervals of 0–1.0 ft and 2.0–3.0 ft bgs and will be analyzed for aluminum and barium.

Samples will be collected from two new step-out locations (C2-3 and C2-4) downgradient of existing sampling location 12-610632 to define the lateral extent of aluminum, barium, copper, nickel, and vanadium. Samples will be collected from depth intervals of 0–1.0 ft and 2.0–3.0 ft bgs and will be analyzed for aluminum, barium, copper, nickel, and vanadium.

Proposed sampling locations at AOC C-12-002 are shown on Plate 10. Table 4.1-5 summarizes the proposed sampling locations, depths, and analytical suites.

4.1.6 AOC C-12-003, Potential Soil Contamination Associated with Former Building 12-3

4.1.6.1 Site Description and Operational History

AOC C-12-003 is an area of potential soil contamination associated with a former HE-storage magazine (building 12-3) at former TA-12 (Plate 7). The magazine, built in 1944 of wood-frame construction, was 6 ft long × 6 ft wide × 7 ft high, with a soil berm on three sides and on top. The building was located north of Redondo Road. Activities at former TA-12 ceased in the early 1950s, and building 12-3 was destroyed by intentional burning in 1960.

4.1.6.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 43–44) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at AOC C-12-003, except for the following:

- Vertical extent of antimony at location 12-610634
- Vertical extent of chromium at locations 12-610637 and 12-610638

Sampling locations and results for inorganic chemicals detected above BVs are shown on Plate 8 for AOC C-12-003.

4.1.6.3 Proposed Activities at AOC C-12-003

Subsurface samples will be collected at three previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 9.0–10.0 ft bgs and analyzed as follows.

- Samples collected at location 12-610634 will be analyzed for antimony.
- Samples collected at locations 12-610637 and 12-610638 will be analyzed for chromium.

Proposed sampling locations at AOC C-12-003 are shown on Plate 10. Table 4.1-6 summarizes the proposed sampling locations, depths, and analytical suites.

4.1.7 AOC C-12-004, Potential Soil Contamination Associated with Former Building 12-5

4.1.7.1 Site Description and Operational History

AOC C-12-004 is an area of potential soil contamination at former TA-12 associated with former generator building 12-5 (Plate 7). The generator building was built of wood-frame construction of unknown dimensions. The building was originally located next to a former junction box (former structure 12-6). In 1952, the generator building was relocated 10 ft north of former control building 12-2. Activities at former TA-12 ceased in the early 1950s. Building 12-5 was destroyed by intentional burning in 1960 (LANL 1996, 054086, pp. 5-12–5-15).

4.1.7.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 45–47) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at AOC C-12-004, except for the following:

- Lateral extent of aluminum, calcium, cobalt, copper, and nickel at location 12-610573
- Lateral extent of lead at location 12-610572
- Vertical extent of aluminum, barium, and calcium at location 12-610571
- Vertical extent of aluminum and cobalt at locations 12-610570 and 12-610573
- Vertical extent of nickel at locations 12-610571 and 12-610573

The investigation report indicated the vertical extent of nickel was not defined at location 12-610571. The detected concentration of nickel above BV at this location (7.09 mg/kg in Qbt 3) was essentially the same (i.e., within 1%) as the maximum background concentration for Qbt 3 (7 mg/kg). Therefore, the vertical extent of nickel is defined at location 12-610571.

Sampling locations and results for inorganic chemicals detected above BVs are shown on Plate 8 for AOC C-12-004.

4.1.7.3 Proposed Activities at AOC C-12-004

Subsurface samples will be collected at three previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 9.0–10.0 ft bgs analyzed as follows.

- Samples collected at location 12-610570 will be analyzed for aluminum and cobalt.
- Samples collected at location 12-610571 will be analyzed for aluminum, barium, and calcium.
- Samples collected at location 12-610573 will be analyzed for aluminum, cobalt, and nickel.

Samples will be collected from two new step-out locations (C4-1 and C4-2) west of existing sampling location 12-610573 to define the lateral extent of aluminum, calcium, cobalt, copper, and nickel. Samples will be collected from depth intervals of 0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and analyzed for aluminum, calcium, cobalt, copper, and nickel.

Samples will be collected from two new step-out locations (C4-3 and C4-4) east of existing sampling location 12-610572 to define the lateral extent of lead. Samples will be collected from depth intervals of 0.0–1.0 ft and 2.0–3.0 ft bgs and analyzed for lead.

Proposed sampling locations at AOC C-12-004 are shown on Plate 10. Table 4.1-7 summarizes the proposed sampling locations, depths, and analytical suites.

4.2 TA-14

TA-14 is located south of R-Site Road and on the northeast side of Q-Site Road.

4.2.1 AOC C-14-006, Potential Soil Contamination Associated with Former Building 14-9

4.2.1.1 Site Description and Operational History

AOC C-14-006 is an area of potential soil contamination associated with an HE-storage magazine (former building 14-9) at TA-14 (Figure 4.2-1). The magazine, located 60 ft northwest of building 14-22, was constructed of wood and was 6 ft long × 6 ft wide × 6 ft high. A soil berm surrounded three sides, and soil covered the top of the structure. The magazine was built in 1945 and removed in 1952. The location of the former magazine is covered with several feet of loose fill (LANL 1996, 054086, pp. 5-61–5-64).

4.2.1.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 45–47) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at AOC C-12-006, except for the following:

- Lateral extent of triaminotrinitrobenzene (TATB) at location 14-610663

Sampling locations and results for detected organic chemicals are shown in Figure 4.2-2 for AOC C-14-006.

4.2.1.3 Proposed Activities at AOC C-14-006

Samples will be collected from three new step-out locations (C6-1, C6-2, and C6-3) downgradient of existing sampling location 14-610663 to define the lateral extent of TATB. Samples will be collected from depth intervals of 0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and analyzed for TATB.

Proposed sampling locations at AOC C-14-006 are shown in Figure 4.2-3. Table 4.2-1 summarizes the proposed sampling locations, depths, and analytical suites.

4.3 TA-15

TA-15 was established in 1945 as a firing site area. Current activities at TA-15 consist of HE research, development, and testing, mainly through hydrodynamic testing and dynamic experimentation (LANL 1994, 040595). Figure 4.3-1 shows the site features of the SWMUs and AOCs at TA-15.

4.3.1 AOC 15-005(c), Container Storage Area

4.3.1.1 Site Description and Operational History

AOC 15-005(c) is the location of a former container storage area at building 15-41 (R-41), located at TA-15 near Firing Site C (Figure 4.3-2). The area was used to store containers of scrap HE and chem-wipes contaminated with acetone, ethanol, and mineral oil. The ground surface on the northern, western, and eastern sides of building 15-41 is unpaved, and an asphalt road (Priscilla Road) runs along the south side of the building. The date the storage area began to be used is not known; however, it was deactivated in April 1996.

4.3.1.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 27–30) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at AOC 15-005(c), except for the following:

- Lateral extent of barium, chromium, cobalt, copper, iron, and vanadium at location 15-610555
- Vertical extent of barium at locations 15-610556 and 15-610557
- Vertical extent of chromium, cobalt, iron, and vanadium at location 15-610556
- Vertical extent of antimony at location 15-610562

Sampling locations and results for inorganic chemicals detected above BVs are shown in Figure 4.3-3 for AOC 15-005(c).

4.3.1.3 Proposed Activities at AOC 15-005(c)

Subsurface samples will be collected at three previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 8.0–9.0 ft bgs and analyzed as follows.

- Samples collected at location 15-610556 will be analyzed for barium, chromium, cobalt, iron, and vanadium.
- Samples collected at location 15-610557 will be analyzed for barium.
- Samples collected at location 15-610562 will be analyzed for antimony.

Samples will be collected from two new step-out locations (5c-1 and 5c-2) downgradient of existing sampling location 15-610555 to define the lateral extent of barium, chromium, cobalt, copper, iron, and vanadium. Samples will be collected from depth intervals of 0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 8.0–9.0 ft bgs and analyzed for of barium, chromium, cobalt, copper, iron, and vanadium.

Proposed sampling locations at AOC 15-005(c) are shown in Figure 4.3-4. Table 4.3-1 summarizes the proposed sampling locations, depths, and analytical suites.

4.3.2 Consolidated Unit 15-007(c)-00, Shaft

Consolidated Unit 15-007(c)-00 consists of SWMUs 15-007(c) and 15-007(d).

4.3.2.1 Site Description and Operational History

SWMU 15-007(c), Shaft

SWMU 15-007(c) is an underground shaft (structure 15-264) located at TA-15 approximately 300 ft east of building 15-263 and 100 ft north of underground shaft 15-265 [SWMU 15-007(d)] (Plate 11). The shaft, 6 ft in diameter by 120 ft deep, is situated within a 20- × 20-ft concrete pad and covered with a wooden lid. In 1972, the shaft was used to conduct a single underground test involving approximately 2 tons of HE, the only material used in the test (LANL 1993, 020946, p. 5-9). This test was designed to determine the ability of tuff to absorb the explosion. The explosion was confined to the bottom of the shaft by filling it with layers of magnetite, cement, sand grout, bentonite, sand, and gravel. Before 2010, 0.25-in.-diameter lead shot was scattered on the surface of the concrete pad and on the soil on three sides of the pad. The source of the lead shot was probably bags of lead shot used for instrument shielding during the experiment (LANL 1997, 056562, p. 1). In February 2010, the lead shot was removed from the concrete pad and from the surface of the surrounding soil.

SWMU 15-007(d), Shaft

SWMU 15-007(d) is an underground shaft (structure 15-265) located at TA-15 approximately 300 ft east of building 15-263 and 100 ft south of underground shaft 15-264 [SWMU 15-007(c)] (Plate 11). The shaft, 6 ft in diameter by 120 ft deep, is situated within a 20- × 20-ft concrete pad and covered with a wooden lid. The shaft was used in 1972 to conduct a single test involving beryllium, tritium, and approximately 500 lb of HE. This test was designed to determine the ability of tuff to absorb the explosion. The explosion was confined to the bottom of the shaft by filling it with layers of magnetite, cement, sand grout, bentonite, sand, and gravel (LANL 1993, 020946, p. 5-9).

Contrary to the site description provided for SWMU 15-007(d) in all previous documents, the site description for the SWMU 15-007(d) shaft in the investigation report (LANL 2010, 111324.14) stated that lead shot was scattered on the concrete pad at the surface of the shaft and in the surrounding soil at SWMU 15-007(d). The investigation report is incorrect: previous documentation substantiates that scattered lead shot has never been present at the SWMU 15-007(d) shaft. Site visits made to the shaft after the investigation report was written have confirmed no lead shot is present at the site.

4.3.2.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 27–30) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at Consolidated Unit 15-007(c)-00, except for the following:

- Lateral extent of tritium at locations 15-610519 and 15-610520
- Vertical extent of aluminum, barium, and nickel at locations 15-610798, 15-610807, and 15-610814
- Vertical extent of antimony at location 15-610813
- Vertical extent of calcium at locations 15-610794, 15-610807, 15-610809, and 15-610814
- Vertical extent of chromium at locations 15-610797, 15-610798, 15-610803, 15-610807, and 15-610814
- Vertical extent of cobalt at locations 15-610798, 15-610801, 15-610807, and 15-610814
- Vertical extent of copper at locations 15-610798, 15-610807, 15-610809, and 15-610814
- Vertical extent of lead at locations 15-610798, 15-610802, 15-610813, and 15-610814
- Vertical extent of magnesium at locations 15-610807 and 15-610814
- Vertical extent of manganese at locations 15-610817, 15-610818, and 15-610819
- Vertical extent of vanadium at locations 15-610798, 15-610801, 15-610807, 15-610808, 15-610814, and 15-610816

The investigation report indicated the vertical extent of lead was not defined at location 15-610798. The detected concentration of lead above BV at this location (12.1 mg/kg in Qbt 3) was below the maximum Qbt 3 background concentration (15.5 mg/kg). Therefore, the vertical extent of lead is defined at this location.

The investigation report indicated the vertical extent of manganese was not defined at locations 15-610817, 15-610818, and 15-610819. At each location, manganese was detected above the BV in only the bottom two samples, which were collected in unit Qbt 1g. Manganese was not detected above the BV in the 11 samples collected at each borehole in overlying units Qbt 2 and Qbt 3. The distribution of concentrations above BV appears to represent the natural variability of manganese in tuff rather than a release, and the vertical extent of manganese is defined at these locations.

Similarly, the investigation report indicated the vertical extent of vanadium was not defined at location 15-610816. As with manganese, vanadium was detected above BV only in the two deepest samples from unit Qbt 1g and was not detected above BV in 11 samples from overlying units Qbt 2 and Qbt 3. Therefore, the vertical extent of vanadium is defined at location 15-610816.

Sampling locations and results for inorganic chemicals detected above BVs are shown on Plate 12, and for radionuclides detected or detected above BVs/FVs are shown on Plate 13 for Consolidated Unit 15-007(c)-00.

4.3.2.3 Proposed Activities at Consolidated Unit 15-007(c)-00

Subsurface samples will be collected at 11 previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 9.0–10.0 ft bgs and analyzed as follows.

- Samples collected at location 15-610794 will be analyzed for calcium.
- Samples collected at locations 15-610797 and 15-610803 will be analyzed for chromium.
- Samples collected at location 15-610798 will be analyzed for aluminum, barium, chromium, cobalt, copper, nickel, and vanadium.
- Samples collected at location 15-610801 will be analyzed for cobalt and vanadium.
- Samples collected at location 15-610802 will be analyzed for lead.
- Samples collected at location 15-610803 will be analyzed for chromium.
- Samples collected at location 15-610807 will be analyzed for aluminum, barium, calcium, chromium, cobalt, copper, magnesium, nickel, and vanadium.
- Samples collected at location 15-610808 will be analyzed for vanadium.
- Samples collected at location 15-610809 will be analyzed for calcium and copper.
- Samples collected at location 15-610813 will be analyzed for antimony and lead.
- Samples collected at location 15-610814 will be analyzed for aluminum, barium, calcium, chromium, cobalt, copper, magnesium, nickel, and vanadium.

The results of the previous sampling at location 15-610814 showed lead to be present at 63,700 mg/kg in the sample from 0.0–0.5 ft bgs and 90.6 mg/kg in the sample from 1.0–2.0 ft bgs. Based on the decrease in concentrations with depth, vertical extent is defined at this location. However, lead was detected above the 800-mg/kg industrial SSL in the surface soil and the top 1 ft of soil will be removed from a 5-ft radius around location 15-610814. Results from nearby locations 15-610796, 15-610802, and 15-610807 were all below the industrial SSL and will be used to confirm cleanup to the north, south, and west. Additional confirmation samples will be collected to the east of the excavation (location 7c-1) at depths of 0.0–1.0 ft and 2.0–3.0 ft bgs and analyzed for lead.

The source of tritium detected in the subsurface is the shaft, SWMU 15-007(d). One new borehole will be advanced next to the shaft (location 7d-1) to characterize tritium activities near the shaft. Thirteen samples will be collected at 15-ft intervals from 4.0–5.0 ft to 184–185 ft bgs. Lateral extent will be defined if activities decrease outward from this sampling location to locations 15-610819 and 15-610820.

The proposed sampling locations at Consolidated Unit 15-007(c)-00 are shown on Plate 14. Table 4.3-2 summarizes the proposed sampling locations, depths, and analytical suites.

4.3.3 SWMU 15-008(b), Surface Disposal Area

4.3.3.1 Site Description and Operational History

SWMU 15-008(b) is a surface disposal area located at TA-15, north of Firing Site R-44 [SWMU 15-006(c)] and extending along the edge of the mesa and downslope into Threemile Canyon (Plate 15). The surface disposal area covers approximately 8.5 acres. Soil and debris generated from activities at the R-44 firing site were disposed of at SWMU 15-008(b). Activities at the firing site began in 1951. The firing site was

used extensively until 1978 and sporadically until 1992 when firing site activities ceased (LANL 1993, 020946, p. 6-8; LANL 1995, 050294, p. 4-73).

4.3.3.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 27–30) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at SWMU 15-008(b), except for the following:

- Lateral extent of cyanide and cesium-137 west of location 15-610762
- Lateral extent of iron north and downgradient of location 15-610719
- Lateral extent of cobalt east of location 15-610742
- Lateral extent of arsenic west of location 15-610723
- Vertical extent of aluminum at locations 15-610713, 15-610730, 15-610736, 15-610751, and 15-610760
- Vertical extent of antimony at locations 15-610723 and 15-610724
- Vertical extent of arsenic at locations 15-610718, 15-610723, 15-610747, and 15-610760
- Vertical extent of barium at locations 15-610705, 15-610713, 15-610714, 15-610726, 15-610728, 15-610730, 15-610736, 15-610741, 15-610750, 15-610751, and 15-610760
- Vertical extent of beryllium at locations 15-610705, 15-610718, and 15-610747
- Vertical extent of calcium at locations 15-610713, 15-610725, 15-610728, 15-610736, 15-610739, 15-610747, and 15-610760
- Vertical extent of chromium at locations 15-610708, 15-610710, 15-610714, 15-610715, 15-610718, 15-610719, 15-610728, 15-610732, 15-610734, 15-610736,15-610738, 15-610739, 15-610741, 15-610742, 15-610743, 15-610745, 15-610746, 15-610751, 15-610753, and 15-610781
- Vertical extent of cobalt at locations 15-610704, 15-610706, 15-610707, 15-610708, 15-610709, 15-610710, 15-610712, 15-610713, 15-610714, 15-610723, 15-610724, 15-610726, 15-610730, 15-610731, 15-610732, 15-610735, 15-610736, 15-610740, 15-610741, 15-610742, 15-610749, 610750, 15-610751, 15-610752, 15-610755, 15-610757,15-610758, and 15-610763
- Vertical extent of copper at locations 15-02502, 15-610719, 15-610726, 15-610730, 15-610741, 15-610752, and 15-610781
- Vertical extent of iron at locations 15-610718, 15-610730, and 15-610734
- Vertical extent of lead at locations 15-610705, 15-610723, 15-610746, 15-610748, 15-610749
- Vertical extent of mercury at location 15-02502
- Vertical extent of nickel at locations 15-610713, 15-610718, 15-610719, 15-610728, 15-610730, 15-610736, 15-610741, 15-610747, 15-610751, 15-610760, 15-610763, 15-610764, and 15-610765
- Vertical extent of selenium at locations 15-610713, 15-610714, and 15-610747
- Vertical extent of uranium at locations 15-610705, 15-610723, 15-610748, 15-610778, and 15-610784

- Vertical extent of vanadium at location 15-610718
- Vertical extent of americium-241 at locations 15-610749 and 15-610762
- Vertical extent of cesium-137 at locations 15-610730, 15-610748, and 15-610784
- Vertical extent of plutonium-239/240 at locations 15-610749 and 15-610762
- Vertical extent of tritium at locations 15-610709, 15-610710, 15-610713, 15-610728, 15-610736, 15-610739, 15-610741, 15-610748, 15-610749, 15-610762, 15-610765, and 15-610784
- Vertical extent of uranium-234 at locations 15-610723, 15-610747, 15-610762, and 15-610784
- Vertical extent of uranium-235/236 at locations 15-610723 and 15-610762
- Vertical extent of uranium-238 at locations 15-610723, 15-610726, 15-610747, 15-610762, and 15-610784

The investigation report indicated the vertical extent of aluminum was not defined at location 15-610713. The detected concentration of aluminum above BV at this location (7810 mg/kg in Qbt 3) was below the maximum background concentration for Qbt 3 (8370 mg/kg). Therefore, vertical extent of aluminum is defined at this location.

The investigation report indicated the lateral extent of cyanide was not defined to the west of sampling location 15-610762. The detected concentration of cyanide above BV at this location (0.555 mg/kg in soil) was essentially the same as the BV for soil (0.5 mg/kg). Therefore, lateral extent of cyanide is defined at this location.

Sampling locations and results for inorganic chemicals detected above BVs are shown on Plate 16 and radionuclides detected or detected above BVs/FVs are shown on Plate 17 for SWMU 15-008(b).

4.3.3.3 Proposed Activities at SWMU 15-008(b)

Subsurface samples will be collected at 51 previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft bgs and 9.0–10.0 ft bgs and analyzed as follows.

- Samples collected at location 15-02502 will be analyzed for copper and mercury.
- Samples collected at locations 15-610704, 15-610706, 15-610707, 15-610712, 15-610731, 15-610735, 15-610740, 15-610755, 15-610757, and 15-610758 will be analyzed for cobalt.
- Samples collected at location 15-610705 will be analyzed for barium, beryllium, lead, and isotopic uranium.
- Samples collected at locations 15-610708, 15-610732, and 15-610742 will be analyzed for chromium and cobalt.
- Samples collected at location 15-610709 will be analyzed for cobalt and tritium.
- Samples collected at location 15-610710 will be analyzed for chromium, cobalt, and tritium.
- Samples collected at location 15-610713 will be analyzed for barium, calcium, cobalt, nickel, selenium, and tritium.
- Samples collected at location 15-610714 will be analyzed for barium, chromium, cobalt, and selenium.

- Samples collected at locations 15-610715, 15-610738, 15-610743, 15-610745, 15-610746, and 15-610753 will be analyzed for chromium.
- Samples collected at location 15-610718 will be analyzed for arsenic, beryllium, chromium, iron, nickel, and vanadium.
- Samples collected at location 15-610719 will be analyzed for chromium, copper, and nickel.
- Samples collected at location 15-610723 will be analyzed for antimony, arsenic, cobalt, lead, isotopic uranium.
- Samples collected at location 15-610724 will be analyzed for antimony and cobalt.
- Samples collected at location 15-610725 will be analyzed for calcium.
- Samples collected at location 15-610726 will be analyzed for barium, cobalt, copper, and isotopic uranium.
- Samples collected at location 15-610728 will be analyzed for barium, calcium, chromium, nickel, and tritium.
- Samples collected at location 15-610730 will be analyzed for aluminum, barium, cobalt, copper, iron, nickel, and cesium-137.
- Samples collected at location 15-610734 will be analyzed for chromium and iron.
- Samples collected at location 15-610736 will be analyzed for aluminum, barium, calcium, chromium, cobalt, nickel, and tritium.
- Samples collected at location 15-610739 will be analyzed for calcium, chromium, and tritium.
- Samples collected at location 15-610741 will be analyzed for barium, chromium, cobalt, copper, nickel, and tritium.
- Samples collected at location 15-610747 will be analyzed for arsenic, beryllium, calcium, nickel, selenium, and isotopic uranium.
- Samples collected at location 15-610748 will be analyzed for lead, isotopic uranium, cesium-137, and tritium.
- Samples collected at location 15-610749 will be analyzed for cobalt, lead, americium-241, isotopic plutonium, and tritium.
- Samples collected at location 15-610750 will be analyzed for barium and cobalt.
- Samples collected at location 15-610751 will be analyzed for aluminum, barium, chromium, cobalt, and nickel.
- Samples collected at location 15-610752 will be analyzed for cobalt and copper.
- Samples collected at location 15-610760 will be analyzed for aluminum, arsenic, barium, calcium, and nickel.
- Samples collected at location 15-610762 will be analyzed for americium-241, isotopic plutonium, tritium, and isotopic uranium.
- Samples collected at location 15-610763 will be analyzed for cobalt and nickel.
- Samples collected at location 15-610764 will be analyzed for nickel.
- Samples collected at location 15-610765 will be analyzed for nickel and tritium.

- Samples collected at location 15-610778 will be analyzed for isotopic uranium.
- Samples collected at location 15-610781 will be analyzed for chromium and copper.
- Samples collected at location 15-610784 will be analyzed for cesium-137, tritium, and isotopic uranium.

Surface and subsurface samples will be collected at two new sampling locations (8b-1 and 8b-2) to define the lateral extent of cesium-137 west and downgradient of previously sampled location 15-610762. Samples from the new sampling locations will be collected from depth intervals of 0.0–1.0 ft, 2.0–3.0, 5.0–6.0 ft, and 9.0–10.0 ft bgs and analyzed for cesium-137.

Surface and subsurface samples will be collected at one new sampling location (8b-3) to define the lateral extent of arsenic west and downgradient of previously sampled location 15-610723. Samples from the new sampling location will be collected from depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and analyzed for arsenic.

Surface and subsurface samples will be collected at two new sampling locations (8b-4 and 8b-5) to define the lateral extent of cobalt east and downgradient of previously sampled location 15-610742. Samples from the new sampling locations will be collected from depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and analyzed for cobalt.

Surface and subsurface samples will be collected at two new sampling locations (8b-6 and 8b-7) to define the lateral extent of iron north and downgradient of previously sampled location 15-610719. Samples from the new sampling locations will be collected from depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and analyzed for iron.

The results of the previous sampling at location 15-610746 showed lead to be present at 138,000 mg/kg in the sample from 0.0–0.8 ft and 578 mg/kg in the sample from 3.0–3.4 ft bgs. At adjacent sampling location 15-02503, lead was detected at 1250 mg/kg at 0.0–0.5 ft and was below the soil BV at 1.5–2.0 ft bgs. Based on the decrease in concentrations with depth at these locations, vertical extent is defined. Lead is present above the 800-mg/kg industrial SSL in the surface soil, however, and the top 3 ft of soil will be removed from a 35-ft × 40-ft area around locations 15-610746 and 15-02503. Results from nearby locations 15-02500, 15-02501, 15-02502, 15-610732, 15-610747, and 15-610748 are all below the industrial SSL and will be used to confirm cleanup to the north, west, and southeast. Additional confirmation samples will be collected to the south and east of the excavation (locations 8b-8 and 8b-9) at depths of 0.0–1.0 ft and 2.0–3.0 ft bgs and analyzed for lead.

The results of the previous sampling at location 15-610709 showed lead to be present at 977 mg/kg in the sample from 0.0–0.5 ft and 34.4 mg/kg in the sample from 2.8–3.6 ft bgs. Based on the decrease in concentrations with depth, vertical extent is defined. Lead is present above the 800-mg/kg industrial SSL in the surface soil, however, and the top 3 ft of soil will be removed a 30-ft × 35-ft area around location 15-610709. Confirmation samples will be collected to the north, east, south, and west of the excavation (locations 8b-10, 8b-11, 8b-12, and 8b-13) at depths of 0.0–1.0 ft and 2.0–3.0 ft bgs and analyzed for lead.

The proposed sampling and analyses at SWMU 15-008(b) are presented in Table 4.3-3, and the proposed sampling locations are shown on Plate 18.

4.3.4 AOC 15-008(g), Surface Disposal Associated with Firing Site R-45

4.3.4.1 Site Description and Operational History

AOC 15-008(g) is the former location of a pile of broken sandbags located in TA-15 at Firing Site R-45 [SWMU 15-006(d)] (Figure 4.3-5). The sandbags were used as shielding for the explosives tests carried out at the firing site (LANL 1996, 054977, p. 5-103). Firing Site R-45 was constructed in 1951 and was used until 1992 for experiments involving small amounts of explosives. The sandbags have been removed from the site.

4.3.4.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 27–30) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at AOC 15-008(g), except for the following:

- Lateral extent of antimony, cobalt, lead, and TATB at location 15-610568
- Lateral extent of uranium and TATB at location 15-610565
- Vertical extent of antimony at location 15-610566
- Vertical extent of uranium at locations 15-610565, 15-610566, and 15-610568
- Vertical extent of TATB at locations 15-610566, 15-610567, and 15-610568
- Vertical extent of tritium at locations 15-610566 and 15-610568
- Vertical extent of uranium-238 at location 15-610565

The investigation report indicated the vertical extent of uranium was not defined at locations 15-610566 and 15-610568 because concentrations increased with depth. The isotopic uranium data for these locations however, showed uranium-234 and uranium-235/236 activities to be below BV in all samples and uranium-238 activities to be below BV in the deeper samples at both locations. Based on the isotopic uranium data, the vertical extent of uranium is defined at these locations.

Barium and 4-nitrotoluene data for samples collected at locations 15-610565, 15-610566, 15-610567, and 15-610568 were rejected during data validation, so the nature and extent of barium and 4-nitrotoluene could not be evaluated.

Sampling locations and results for inorganic chemicals detected above BVs are shown in Figure 4.3-6, organic chemicals detected are shown in Figure 4.3-7, and radionuclides detected or detected above BVs/FVs are shown in Figure 4.3-8 for AOC 15-008(g).

4.3.4.3 Proposed Activities at AOC 15-008(g)

Subsurface samples will be collected at four previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 9.0–10.0 ft bgs and analyzed as follows.

- Samples collected at location 15-610565 will be analyzed for isotopic uranium.
- Samples collected at location 15-610566 will be analyzed for antimony, TATB, and tritium.

- Samples collected at location 15-610567 will be analyzed for TATB.
- Samples collected at location 15-610568 will be analyzed for TATB and tritium.

One new sampling location (8g-1) will be placed downgradient of existing location 15-610568 to define the lateral extent of antimony, cobalt, lead, and TATB. Two new sampling locations (8g-2 and 8g-3) will be placed downgradient of existing locations 15-610565 and 15-610567 to define the lateral extent of uranium and TATB. One new sampling location (8g-4) will be placed downgradient of the site to define the lateral extent of uranium and TATB. Samples will be collected from depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs. Samples collected at location 8g-1 will be analyzed for antimony, cobalt, lead, and TATB, and samples collected from locations 8g-2, 8g-3, and 8g-4 will be analyzed for isotopic uranium and TATB.

Sampling locations 15-610565, 15-610566, 15-610567, and 15-610568 will be resampled to replace rejected barium and 4-nitrotoluene data. Samples will be collected from depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and will be analyzed for barium and 4-nitrotoluene.

The proposed sampling and analyses at AOC 15-008(g) are presented in Table 4.3-4, and the proposed sampling locations are shown in Figure 4.3-9.

4.3.5 SWMU 15-009(b), Septic System

4.3.5.1 Site Description and Operational History

SWMU 15-009(b) is a septic system located at Firing Site R-45 at TA-15. The septic system consists of a former septic tank (structure 15-61), a seepage pit, associated drainlines, and a former outfall (Figure 4.3-10). The septic tank was constructed in 1951 of reinforced concrete with a 540-gal. capacity. This septic system served restroom facilities in the firing site control building 15-45. The septic tank originally discharged to an outfall located approximately 20 ft southeast of the septic tank. In the 1970s, a seepage pit measuring approximately 4 ft in diameter × 50 ft deep, was constructed to receive discharges from the septic tank. A 2003 engineering drawing shows the outfall pipe has been plugged (LANL 2003, 102118). The septic tank (structure 15-61) was removed in 2010, but the drainlines and seepage pit remain in place.

4.3.5.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 27–30) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at SWMU 15-009(b), except for the following:

- Lateral extent of barium, copper, total cyanide, lead, uranium, cesium-137, plutonium-239/240, uranium-234, uranium-235/236, and uranium-238 at location 15-610831
- Vertical extent of barium and chromium at location 15-610833
- Vertical extent of chromium and uranium at location 15-610829
- Vertical extent of uranium at location 15-610835
- Vertical extent of benzo(b)fluoranthene and fluoranthene at location 15-610836
- Vertical extent of uranium-234, uranium-235/236, uranium-238 at location 15-610831

The investigation report indicated the vertical extent of chromium and uranium was not defined at location 15-610829. The detected concentrations of chromium and uranium above BV at this location (8.69 mg/kg and 2.62 mg/kg in Qbt 3, respectively) were below the maximum Qbt 3 background concentrations (13 mg/kg and 5 mg/kg, respectively). Therefore, the vertical extent of chromium and uranium is defined at this location. The investigation report indicated the vertical extent of uranium was not defined at location 15-610835 because concentrations increased with depth. The isotopic uranium data for this location, however, showed uranium-234, uranium-235/236, and uranium-238 activities to be below BVs in all samples. Based on the isotopic uranium data, the vertical extent of uranium is defined at this location.

Sampling locations and results for inorganic chemicals detected above BVs are shown in Figure 4.3-11, organic chemicals detected are shown in Figure 4.3-12, and radionuclides detected or detected above BVs/FVs are shown in Figure 4.3-13 for SWMU 15-009(b).

4.3.5.3 Proposed Activities at SWMU 15-009(b)

Subsurface samples will be collected at three previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 9.0–10.0 ft bgs at locations 15-610831 and 15-610833 and 15.0–16.0 ft and 19.0–20.0 ft bgs at location 15-610836 and analyzed as follows.

- Samples collected at location 15-610831 will be analyzed for isotopic uranium.
- Samples collected at location 15-610833 will be analyzed for barium and chromium.
- Samples collected at location 15-610836 will be analyzed for benzo(b)fluoranthene and fluoranthene.

Surface and subsurface samples will be collected at two new sampling locations (9b-1 and 9b-2) to define the lateral extent of barium, copper, total cyanide, lead, uranium, cesium-137, plutonium-239/240, uranium-234, uranium-235/236, and uranium-238 south and downgradient of previously sampled location 15-610831. Samples from the new sampling locations will be collected from depth intervals of 0.0–1.0 ft, 4.0– 5.0 ft and 9.0–10.0 ft bgs and analyzed for barium, copper, total cyanide, lead, cesium-137, isotopic plutonium, and isotopic uranium.

The proposed sampling and analyses at SWMU 15-009(b) are presented in Table 4.3-5, and the proposed sampling locations are shown in Figure 4.3-14.

4.3.6 SWMU 15-009(c), Septic System

4.3.6.1 Site Description and Operational History

SWMU 15-009(c) is a septic system located at Firing Site R-44 at TA-15. The septic system consists of a former septic tank (structure 15-62), associated drainlines, and a former outfall (Plate 19). The septic tank was constructed in 1951 of reinforced concrete with a 540-gal. capacity. The septic system served restroom facilities in the firing site control building 15-44. The drainlines were constructed of cast iron and discharged to an outfall into the south fork of Threemile Canyon. The outfall, located approximately 25 ft downgradient of the tank, has been plugged (LANL 2003, 102119). The septic tank (structure 15-62) was removed in 2010, but the drainlines remain in place.

4.3.6.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 27–30) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at SWMU 15-009(c), except for the following:

- Vertical extent of chromium at locations 15-610838, 15-610845, and 15-610852
- Vertical extent of uranium at locations 15-610850 and 15-610854
- Vertical extent of acetone at locations 15-610839 and 15-610840
- Vertical extent of uranium-234 at locations 15-610846 and 15-610850
- Vertical extent of uranium-235/236 at locations 15-610846 and 15-610850
- Vertical extent of uranium-238 at locations 15-610839, 15-610846, 15-610850, and 15-610854

The investigation report indicated the vertical extent of acetone was not defined at location 15-610840 because acetone was detected in the deeper sample at this location but not in the surface sample. The detected concentration of acetone in the deeper sample (0.00574 mg/kg) is equivalent to the estimated quantitation limit (0.0052 mg/kg), and vertical extent is defined at this location.

Sampling locations and results for inorganic chemicals detected above BVs are shown on Plate 20, detected organic chemicals are shown on Plate 21, and radionuclides detected or detected above BVs/FVs are shown on Plate 22 for SWMU 15-009(c).

4.3.6.3 Proposed Activities at SWMU 15-009(c)

Subsurface samples will be collected at seven previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 3.0–4.0 ft and 5.0–6.0 ft bgs and analyzed as follows.

- Samples collected at locations 15-610838, 15-610845, and 15-610852 will be analyzed for chromium.
- Samples collected at location 15-610839 will be analyzed for acetone and isotopic uranium.
- Samples collected at locations 15-610846, 15-610850, and 15-610854 will be analyzed for isotopic uranium.

The proposed sampling and analyses at SWMU 15-009(c) are presented in Table 4.3-6, and the proposed sampling locations are shown on Plate 23.

4.3.7 SWMU 15-009(h), Septic System

4.3.7.1 Site Description and Operational History

SWMU 15-009(h) is a septic system located at the Ector firing site on the eastern side of TA-15. The septic system consists of a 6-ft × 4-ft × 5-ft septic tank (structure 15-282), associated drainlines, and a drain field (Figure 4.3-15). The septic tank was constructed in the late 1970s of reinforced concrete with a 905-gal. capacity and flowed to a drain field. The septic system served restroom facilities in the Ector firing site control building 15-280. In the 1990s, the sanitary waste drainlines that served this septic system were rerouted to the Sanitary Wastewater Systems Consolidation (SWSC) plant at TA-46 and are

currently active (LANL 2003, 102117). Although the investigation work plan proposed removing the septic tank, the tank could not be removed because it is next to active utility lines (LANL 2010, 111324.14).

4.3.7.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 27–30) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at SWMU 15-009(h), except for the following:

- Vertical extent of barium at location 15-610855
- Vertical extent of calcium at location 15-610860
- Vertical extent of chromium at locations 15-610855, 15-610858, and 15-610859
- Vertical extent of uranium at location 15-610860
- Vertical extent of zinc at location 15-610857
- Vertical extent of plutonium-239/240 at location 15-610861
- Vertical extent of uranium-238 at location 15-610860

Sampling locations and results for inorganic chemicals detected above BVs are shown in Figure 4.3-16, and radionuclides detected or detected above BVs/FVs are shown in Figure 4.3-17 for SWMU 15-009(h).

4.3.7.3 Proposed Activities at SWMU 15-009(h)

Subsurface samples will be collected at six previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 15.0–16.0 ft and 19.0–20.0 ft bgs and will be analyzed as follows.

- Samples collected at location 15-610855 will be analyzed for barium and chromium.
- Samples collected at location 15-610857 will be analyzed for zinc.
- Samples collected at locations 15-610858 and 15-610859 will be analyzed for chromium.
- Samples collected at location 15-610860 will be analyzed for calcium and isotopic uranium.
- Samples collected at location 15-610861 will be analyzed for isotopic plutonium.

The septic tank will be inspected to ensure it is empty. If liquid or sludge is in the tank, it will be pumped out, characterized, and disposed of appropriately (Appendix B). The septic tank will then be filled with concrete.

The proposed sampling and analyses at SWMU 15-009(h) are presented in Table 4.3-7; proposed sampling locations are shown in Figure 4.3-18.

4.3.8 SWMU 15-010(b), Settling Tank

4.3.8.1 Site Description and Operational History

SWMU 15-010(b) is a settling tank (structure 15-147) located in the northwest corner of TA-15 near former shop building 15-8 (Figure 4.3-19). The tank, constructed in 1947 of concrete, measures 5 ft × 5 ft × 5.5 ft with an approximate capacity of 900 gal. The tank was originally designed to be a septic tank;

however, subsequent engineering records confirm the tank was used as an HE settling tank. The settling tank served former building 15-8, which housed HE-machining operations during the 1950s, and discharged to an outfall at the edge of Threemile Canyon (LANL 1993, 020946, p. 10-25). The tank is no longer in operation; however, the date it ceased to be used is not known.

The investigation work plan proposed removing the tank. However, facility restrictions on the handling of HE prevented removing the tank, which was found to contain liquid, until the contents were characterized. The liquid contents were sampled for waste characterization purposes and found to be nonhazardous and nonradioactive and were removed. The facility has requested the tank be closed in place and filled with concrete (LANL 2010, 111324.14).

4.3.8.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 27–30) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at SWMU 15-010(b), except for the following:

- Lateral extent of iron and vanadium at location 15-610866
- Vertical extent of chromium at locations 15-610863 and 15-610872
- Vertical extent of iron at locations 15-610866, 15-610867, and 15-610868
- Vertical extent of mercury and uranium at location 15-610864
- Vertical extent of vanadium and zinc at locations 15-610866 and 15-610868
- Vertical extent of acetone and toluene at location 15-610863
- Vertical extent of acetone, Aroclor-1254, and toluene at location 15-610864
- Vertical extent of toluene at location 15-610871
- Vertical extent of uranium-238 at location 15-610864

The investigation report indicated the vertical extent of chromium was not defined at location 15-610872. The detected concentration of chromium above BV at this location (11.6 mg/kg in Qbt 3) was below the maximum Qbt 3 background concentration (13 mg/kg). Therefore, the vertical extent of chromium is defined at this location.

The investigation report indicated the lateral extent of chromium, acetone, and toluene was defined. These chemicals were detected at location 16-610863, however, and there is no sampling location downgradient of this location. Therefore, the lateral extent of chromium, acetone, and toluene is not defined at location 15-610863.

Sampling locations and results for inorganic chemicals detected above BVs are shown in Figure 4.3-20, detected organic chemicals are shown in Figure 4.3-21, and radionuclides detected or detected above BVs/FVs are shown in Figure 4.3-22 for SWMU 15-010(b).

4.3.8.3 Proposed Activities at SWMU 15-010(b)

Subsurface samples will be collected at six previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 3.0–4.0 ft and 5.0–6.0 ft bgs and analyzed as follows.

- Samples collected at location 15-610863 will be analyzed for chromium, acetone, and toluene.
- Samples collected at location 15-610864 will be analyzed for mercury, acetone, PCBs, toluene, and isotopic uranium.
- Samples collected at locations 15-610866 and 15-610868 will be analyzed for iron, vanadium, and zinc.
- Samples collected at location 15-610867 will be analyzed for iron.
- Samples collected at location 15-610871 will be analyzed for toluene.

Surface and subsurface samples will be collected at two new sampling locations (10b-1 and 10b-2), downgradient of previously sampled location 15-610866, to define the lateral extent of iron and vanadium. Samples from locations 10b-1 and 10b-2 will be collected from depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, and 5.0–6.0 ft bgs and analyzed for iron and vanadium.

Surface and subsurface samples will be collected at two new sampling locations (10b-3 and 10b-4), downgradient of previously sampled location 15-610863, to define the lateral extent of chromium, acetone, and toluene. Samples from locations 10b-3 and 10b-4 will be collected from depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, and 5.0–6.0 ft bgs and analyzed for chromium, acetone, and toluene.

The settling tank will be inspected to ensure it is empty. If liquid or sludge is in the tank, it will be pumped out, characterized, and disposed of appropriately (Appendix B). The tank will then be filled with concrete.

The proposed sampling and analyses at SWMU 15-010(b) are presented in Table 4.3-8, and the proposed sampling locations are shown in Figure 4.3-23.

4.3.9 AOC 15-014(h), Outfalls from Building 15-40

4.3.9.1 Site Description and Operational History

AOC 15-014(h) consists of three outfalls located in the northwest corner of TA-15 (Plate 24). The outfalls served a former laboratory and office (former building 15-40). All three outfalls discharge north of former building 15-40 into Threemile Canyon.

The westernmost outfall is a former National Pollutant Discharge Elimination System– (NPDES-) permitted outfall (EPA04A102) that received industrial effluent, including wastewater from a photographic laboratory in former building 15-40. This outfall consists of an 8-in.-diameter vitrified-clay pipe (VCP) that discharged approximately 75 ft north of the northwest corner of former building 15-40 (LANL 1990, 007512; LANL 1993, 020946, p. 10-22). The outfall was removed from the NPDES permit in 1994 (Dale 1998, 057524) and currently receives only stormwater.

The middle outfall is a former NPDES-permitted outfall (EPA04A103) that received noncontact cooling water, roof runoff, and floor-drain effluent from former building 15-40. The floor drains received water from drain valves in a potable water system. This outfall consists of an 8-in.-diameter VCP that discharged approximately 100 ft north of the northeast corner of former building 15-40 (LANL 1990, 007512;

LANL 1993, 020946, p. 10-22). The outfall was removed from the NPDES permit in 1990 (EPA 1990, 012454) and currently receives only stormwater.

The easternmost outfall receives stormwater from yard drains and is located north and east of former building 15-40. This outfall consists of a 12-in.-diameter corrugated metal pipe that discharges approximately 75 ft northeast of the northeast corner of former building 15-40 (LANL 1990, 007512; LANL 1993, 020946, p. 10-22). From the outfall, an approximately 60-ft-long ditch connects to a 30-ft-long, 12-in.-diameter corrugated metal pipe that accommodates drainage beneath a security fence.

4.3.9.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 27–30) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at AOC 15-014(h), except for the following:

- Vertical extent of aluminum at location 15-610505
- Vertical extent of barium at locations 15-610510 and 15-610525
- Vertical extent of chromium at locations 15-610501, 15-610502, 15-610508, 15-610510, 15-610511, 15-610512, 15-610517, 15-610519, 15-610520, 15-610523, 15-610524, 15-610525, and 15-610526
- Vertical extent of cobalt at locations 15-610504, 15-610505, 15-610508, and 15-610525
- Vertical extent of copper and total cyanide at location 15-610523
- Vertical extent of iron at locations 15-610504 and 15-610525
- Vertical extent of lead and mercury at locations 15-610510 and 15-610523
- Vertical extent of nickel at locations 15-610501, 15-610502, and 15-610525
- Vertical extent of perchlorate at location 15-610508
- Vertical extent of silver at locations 15-610514, 15-610517, 15-610520, 15-610523, and 15-610525
- Vertical extent of uranium at locations 15-610510, 15-610514, and 15-610523
- Vertical extent of vanadium at locations 15-610501, 15-610504, 15-610505, 15-610517, and 15-610525
- Vertical extent of acenaphthene at location 15-610525
- Vertical extent of acetone at location 15-610508
- Vertical extent of toluene at location 15-610523
- Vertical extent of cesium-137 at locations 15-610514 and 15-610523
- Vertical extent of plutonium-239/240 at locations 15-610509 and 15-610523
- Vertical extent of tritium at locations 15-610520, 15-610521, 15-610523, 15-610524, and 15-610526
- Vertical extent of uranium-234, uranium-235, and uranium-238 at location 15-610523
- Vertical extent of uranium-238 at location 15-610510

The investigation report indicated the vertical extent of barium was not defined at location 15-610510 because concentrations did not change substantially with depth. The detected concentration of barium in the deeper sample at this location (139 mg/kg) was below the soil BV (295 mg/kg). Therefore, the vertical extent of barium is defined at this location.

The investigation report indicated the vertical extent of chromium was not defined at locations 15-610510, 15-610511, 15-610520, 15-610524 and 15-610526 because concentrations increased with depth. At locations 15-610510, 15-610511, and 15-610520, the detected concentrations of chromium above BV in the deeper samples (23.2 mg/kg, 21.6 mg/kg, and 21.4 mg/kg, respectively) were below the maximum soil background concentration (36.5 mg/kg). At locations 15-610524 and 15-610526, the detected concentrations of chromium above BV in the deeper samples (10.3 mg/kg and 12.4 mg/kg, respectively) were below the maximum Qbt 3 background concentration for (13 mg/kg). Therefore, the vertical extent of chromium is defined at these locations.

The investigation report indicated the vertical extent of lead was not defined at location 15-610510 because concentrations did not change substantially with depth. The detected concentration of lead above BV in the deeper sample at this location (22.8 mg/kg) was below the maximum soil background concentration (26 mg/kg). Therefore, the vertical extent of lead is defined at this location.

The investigation report indicated the vertical extent of silver was not defined at location 15-610520 because its concentrations increased with depth. The detected concentration of silver above BV in the deeper sample at this location (1.02 mg/kg) was equivalent to the BV (1 mg/kg). Therefore, the vertical extent of silver is defined at this location.

The investigation report indicated the vertical extent of uranium was not defined at location 15-610514 because concentrations increased with depth. The detected concentration of uranium above BV in the deeper sample at this location (3.2 mg/kg) was below the maximum soil background concentration of uranium (3.6 mg/kg). Therefore, the vertical extent of uranium is defined at this location.

Sampling locations and results for inorganic chemicals detected above BVs are shown on Plate 25, detected organic chemical are shown on Plate 26, and radionuclides detected or detected above BVs/FVs are shown on Plate 27 for AOC 15-014(h).

4.3.9.3 Proposed Activities at SWMU 15-014(h)

Subsurface samples will be collected at 17 previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 9.0–10.0 ft bgs at all locations, except at location 15-610526, and from 9.0–10.0 ft and 13.0–14.0 ft bgs at location 15-610526. Samples will be analyzed as follows.

- Samples collected at location 15-610501 will be analyzed for chromium, nickel, and vanadium.
- Samples collected at location 15-610502 will be analyzed for chromium and nickel.
- Samples collected at location 15-610504 will be analyzed for cobalt, iron, and vanadium.
- Samples collected at location 15-610505 will be analyzed for aluminum, cobalt, and vanadium.
- Samples collected at location 15-610508 will be analyzed for chromium, cobalt, perchlorate, and acetone.
- Samples collected at location 15-610509 will be analyzed for isotopic plutonium.
- Samples collected at location 15-610510 will be analyzed for mercury, and isotopic uranium.

- Samples collected at locations 15-610512 and 15-610519 will be analyzed for chromium.
- Samples collected at location 15-610514 will be analyzed for silver and cesium-137.
- Samples collected at location 15-610517 will be analyzed for chromium, silver, and vanadium.
- Samples collected at locations 15-610520, 15-610521, 15-610524, and 15-610526 will be analyzed for tritium.
- Samples collected at location 15-610523 will be analyzed for chromium, copper, total cyanide, lead, mercury, silver, toluene, cesium-137, isotopic plutonium, tritium, and isotopic uranium.
- Samples collected at location 15-610525 will be analyzed for barium, chromium, cobalt, iron, nickel, silver, vanadium, and acenaphthene.

The proposed sampling and analyses at SWMU 15-014(h) are presented in Table 4.3-9, and the proposed sampling location is shown on Plate 28.

4.4 TA-36

TA-36 is located east of TA-15 and south of Pajarito Road (Figure 4.4-1). TA-36 contains four active firing sites (Eenie, Meenie, Minie, and Lower Slobovia) that support explosives testing. The firing sites and associated buildings are used for a wide variety of nonnuclear ordinance tests for the U.S. Department of Defense. Activities include shipping, receiving, transporting, and testing HE; developing diagnostic techniques; testing armor/antiarmor systems; and testing weapons components and guns (LANL 1993, 015313, p. 2-5). TA-36 operations associated with the Threemile Canyon Aggregate Area include a laboratory and an experiment facility located on a mesa top south of Threemile Canyon and west of TA-18.

4.4.1 SWMU 36-002, Former Sump

4.4.1.1 Site Description and Operational History

SWMU 36-002 is a former sump (structure 36-49) that was located at TA-36, near the edge of Threemile Canyon and approximately 40 ft northwest of building 36-48 (Figure 4.4-2). The 4-ft-diameter × 8-ft-deep sump was constructed in 1965 by excavating directly into native tuff. A 4-ft-diameter corrugated metal pipe was placed vertically into the excavation. The interior of the pipe was filled with 3-in.-diameter gravel to a depth of 2 ft bgs. The sump had a metal cover. From 1965 to 1993, the sump received effluent from two sinks in building 36-48 via a 4-in.-diameter VCP that connected to the sump 2 ft bgs. Building 36-48 was used for shot assembly and controlled-temperature experiments as well as cutting, lapping, and polishing DU. One of the sinks connected to the sump had a chemical-resistant coating. The sinks were disconnected from the sump in 1993, and the sump was removed during the 1994 RFI (LANL 1995, 062839).

4.4.1.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 110–112) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at SWMU 36-002, except for the following:

- Lateral extent of barium, copper, magnesium, and nickel at location 36-610877
- Vertical extent of perchlorate and tritium at location 36-610878

Sampling locations and results for inorganic chemicals detected above BVs are shown in Figure 4.4-3, and radionuclides detected or detected above BVs/FVs are shown in Figure 4.4-4 for SWMU 36-002.

4.4.1.3 Proposed Activities at SWMU 36-002

Subsurface samples will be collected at one previously sampled location, extending the depth to define the vertical extent of contamination. Samples will be collected from depth intervals of 12.0–13.0 ft and 16.0–17.0 ft bgs.

- Samples collected at location 36-610878 will be analyzed for perchlorate and tritium.

Subsurface samples will be collected at two new sampling locations (2-1 and 2-2) to define the lateral extent of barium, copper, magnesium, and nickel. Locations 2-1 and 2-2 will be sited to the northeast and downgradient of previously sampled location 36-610877, and samples will be collected from depth intervals of 4.0–5.0 ft, 9.0–10.0 ft, 12.0–13.0 ft, and 16.0–17.0 ft bgs and analyzed for barium, copper, magnesium, and nickel.

The proposed sampling and analyses at SWMU 36-002 are presented in Table 4.4-1, and the proposed sampling locations are shown in Figure 4.4-5.

4.4.2 SWMU 36-003(a), Septic System

4.4.2.1 Site Description and Operational History

SWMU 36-003(a) is a septic system located at TA-36 approximately 115 ft east of building 36-1 (Figure 4.4-6). The septic system consists of a septic tank (structure 36-17), a manhole (structure 36-38), a distribution box, a drain field, a seepage pit, and all associated drainlines. The septic tank was constructed in 1949 of reinforced concrete with a 1360-gal. capacity. The drain field is northeast of the septic tank and consists of four 200-ft-long perforated tile pipes spaced 10 ft apart. The drain field was replaced with the seepage pit in late 1973 or early 1974.

The septic system served the restroom facilities in building 36-1. In addition to sanitary wastes, spent photoprocessing chemicals from x-ray developing activities in building 36-1 may have been discharged to the septic system. In 1951, a guard station (building 36-22) was added to the SWMU 36-003(a) septic system. The guard station was disconnected from the septic system in 1988 and rerouted to an adjacent septic system [AOC 36-003(d)]. The septic system was deactivated in 1992 when the sanitary waste drainlines that served building 36-1 were rerouted to the Sanitary Wastewater Systems Consolidation (SWSC) plant. In 1995, the septic tank was decontaminated by steam cleaning and filled with concrete (LANL 1996, 054484).

4.4.2.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 114–115) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at SWMU 36-003(a), except for the following:

- Vertical extent of beryllium at location 36-610889
- Vertical extent of chromium at locations 36-610882, 36-610884, 36-610885, and 36-610889
- Vertical extent of cobalt at locations 36-610880 and 36-610882

- Vertical extent of nickel at location 36-610889
- Vertical extent of acenaphthene at location 36-610887
- Vertical extent of 4-isopropyltoluene at location 36-610882

The investigation report indicated the vertical extent of chromium was not defined at locations 36-610884 and 36-610885. The detected concentrations of chromium above BV at locations 36-610884 and 36-610885 (13.4 mg/kg and 13.3 mg/kg in Qbt 2, respectively) were equivalent to the maximum Qbt 2, 3, 4 background concentration (13 mg/kg). Therefore, the vertical extent of chromium is defined at these locations.

Sampling locations and results for inorganic chemicals detected above BVs are shown in Figure 4.4-7 and detected organic chemicals are shown in Figure 4.4-8 for SWMU 36-003(a).

4.4.2.3 Proposed Activities at SWMU 36-003(a)

Subsurface samples will be collected at six previously sampled locations, extending the depth at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 9.0–10.0 ft and 13.0–14.0 ft bgs. Samples will be analyzed as follows.

- Samples collected at location 36-610880 will be analyzed for cobalt.
- Samples collected at location 36-610882 will be analyzed for chromium, cobalt, and 4-isopropyltoluene.
- Samples collected at location 36-610887 will be analyzed for acenaphthene.
- Samples collected at location 36-610889 will be analyzed for beryllium, chromium, and nickel.

The proposed sampling and analyses at SWMU 36-003(a) are presented in Table 4.4-2, and the proposed sampling locations are shown in Figure 4.4-9.

4.4.3 SWMU 36-008, Surface Disposal Area Located Near Building 36-1

4.4.3.1 Site Description and Operational History

SWMU 36-008 is a surface disposal area located at TA-36 north of building 36-1, an office and laboratory (Plate 29). The disposal area is on the south rim of Threemile Canyon and extends down the steeply sloping edge of the mesa. The approximately 1-acre disposal area was discovered in June 2000 after the Cerro Grande fire burned through the area. The dates the site was used for disposal are not known. The materials strewn over the site seemed to be associated with building activities, and it is possible the disposal area may have been used as early as 1949, when building 36-1 was constructed. Surface debris included laboratory glassware, metal cans, metal pipe, and miscellaneous metal fragments. As part of Cerro Grande fire response efforts, visible debris was removed from the surface disposal area. Approximately 5 yd^3 of debris was collected from the site, segregated, and staged for disposal; in addition, stormwater best management practices were implemented to prevent erosion (LANL 2000, 068656).

4.4.3.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 117–123) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at SWMU 36-008, except for the following:

- Lateral extent of cesium-137 downgradient of location 36-610584
- Lateral extent of plutonium-239/240 downgradient of locations 36-610584, 36-610586, and 36-610622
- Vertical extent of aluminum, barium, nickel, and vanadium at location 36-610584
- Vertical extent of beryllium at location 36-610602
- Vertical extent of calcium at locations 36-610584 and 36-610609
- Vertical extent of chromium at locations 36-610584, 36-610591, 36-610594, 36-610598, 36-610599, 36-610600, 36-610602, 36-610609, 36-610613, and 36-610615
- Vertical extent of cobalt at locations 36-610584 and 36-610594
- Vertical extent of copper at locations 36-610603, 36-610605, and 36-610609
- Vertical extent of total cyanide at locations 36-610576, 36-610595, and 36-610598
- Vertical extent of lead at location 36-610603
- Vertical extent of mercury at locations 36-610576, 36-610595, 36-610605, 36-610606, and 36-610609
- Vertical extent of nitrate at locations 36-610574, 36-610576, 36-610581, 36-610584, 36-610587, 36-610595, 36-610609, 36-610611, 36-610618, and 36-610620
- Vertical extent of perchlorate at locations 36-610574, 36-610576, 36-610582, 36-610587, 36-610588, 36-610595, 36-610609, 36-610614, and 36-610615
- Vertical extent of uranium at location 36-610615
- Vertical extent of zinc at locations 36-610587, 36-610595, and 36-610603
- Vertical extent of polycyclic aromatic hydrocarbons (PAHs) at locations 36-610607 and 36-610615
- Vertical extent of phenanthrene and pyrene at locations 36-610586 and 36-610587
- Vertical extent of Aroclor-1254 at location 36-610579
- Vertical extent of Aroclor-1260 at location 36-610574
- Vertical extent of acetone at location 36-610623
- Vertical extent of 4-isopropyltoluene at locations 36-610580, 36-610581, 36-610584, 36-610585, 36-610590, 36-610591, 36-610592, 36-610598, 36-610599, 36-610601, 36-610606, 36-610613, 36-610616, and 36-610623
- Vertical extent of toluene at locations 36-610592, 36-610598, 36-610617, and 36-610623
- Vertical extent of cesium-137 at locations 36-610598, 36-610603, and 36-610609
- Vertical extent of plutonium-239/240 at locations 36-610598 and 36-610615

- Vertical extent of tritium at location 36-610607
- Vertical extent of uranium-238 at location 36-610605

The investigation report indicated the vertical extent of chromium was not defined at locations 36-610584, 36-610591, 36-610598, 36-610599, 36-610600, and 36-610615 because concentrations increased with depth. At locations 36-610584 and 36-610600, the detected concentrations of chromium above BV in the deeper samples (12.2 mg/kg in Qbt 3 and 13.5 mg/kg in Qbt 2, respectively) were equivalent to the maximum Qbt 2, 3, 4 background concentration (13 mg/kg). At locations 36-610591, 36-610599, and 15-610615, the detected concentrations of chromium above BV in the deeper samples (12.2 mg/kg in Qbt 3, 11.7 mg/kg in Qbt 2, and 20.6 mg/kg in soil, respectively) were below the maximum Qbt 2, 3, 4 background concentration (13 mg/kg) and soil concentration (36.5 mg/kg). At location 36-610598, both detected concentrations of chromium above the BV in soil (21.5 mg/kg at 0.0–0.5 ft bgs and 23.2 mg/kg at 2.0–3.0 ft bgs) were below the maximum soil background concentration (36.5 mg/kg). Therefore, the vertical extent of chromium is defined at these locations.

The investigation report indicated the vertical extent of nitrate was not defined at locations 36-610574, 36-610581, 36-610584, 36-610611, 36-610618, and 36-610620 because concentrations increased with depth. The detected concentrations of nitrate at these locations (15.5 and 17.4 mg/kg, 1.34 and 1.47 mg/kg, 1.33 mg/kg, 2.23 mg/kg, 1.93 and 5.84 mg/kg, and 1.81 and 5.04 mg/kg, respectively) were consistent with naturally occurring levels of nitrate. Therefore, the vertical extent of nitrate is defined at these locations

The investigation report indicated the vertical extent of phenanthrene and pyrene was not defined at location 36-610586 because only one depth was sampled. In fact, two depths (0.0 ft–0.5 ft bgs and 2.0 ft–3.0 ft bgs) had been sampled at this location during the 2009-2010 investigation, and phenanthrene and pyrene were not detected in the deeper sample. Therefore, the vertical extent of phenanthrene and pyrene is defined at this location.

The investigation report indicated the vertical extent of Aroclor-1254 was not defined at location 36-610579 because concentrations increased with depth. The detected concentrations of Aroclor-1254 at location 36-610579 (0.191 mg/kg at 0.0–0.5 ft bgs and 0.0197 mg/kg at 2.0–3.0 ft bgs) decreased with depth. Therefore, the vertical extent of Aroclor-1254 is defined at this location.

The investigation report indicated the vertical extent of 4-isopropyltoluene was not defined at locations 36-610580, 36-610584, 36-610599, and 36-610616 because concentrations increased with depth. Isopropyltoluene(4-) was not detected in the deeper of two samples at each location. Therefore, the vertical extent of 4-isopropyltoluene is defined at these locations.

Sampling locations and results for inorganic chemicals detected above BVs are shown on Plate 30, detected organic chemicals are shown on Plate 31, and radionuclides detected or detected above BVs/FVs are shown on Plate 32 for SWMU 36-008.

4.4.3.3 Proposed Activities at SWMU 36-008

Shallow subsurface samples will be collected at 26 previously sampled locations, extending the depth at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 9.0–10.0 ft bgs and analyzed as follows:

- Samples collected at location 36-610574 will be analyzed for perchlorate and PCBs.
- Samples collected at location 36-610576 will be analyzed for total cyanide, mercury, nitrate, and perchlorate.

- Samples collected at locations 36-610581, 36-610585, 36-610590, 36-610591, and 36-610601 will be analyzed for 4-isopropyltoluene.
- Samples collected at locations 36-610582, 36-610588, and 36-610614 will be analyzed for perchlorate.
- Samples collected at location 36-610584 will be analyzed for aluminum, barium, calcium, cobalt, nickel, and vanadium.
- Samples collected at location 36-610587 will be analyzed for nitrate, perchlorate, zinc, phenanthrene, and pyrene.
- Samples collected at location 36-610592 will be analyzed for 4-isopropyltoluene and toluene.
- Samples collected at location 36-610594 will be analyzed for chromium and cobalt.
- Samples collected at location 36-610595 will be analyzed for total cyanide, mercury, nitrate, perchlorate, and zinc.
- Samples collected at location 36-610598 will be analyzed for total cyanide, 4-isopropyltoluene, toluene, cesium-137, and isotopic plutonium.
- Samples collected at location 36-610602 will be analyzed for beryllium and chromium.
- Samples collected at location 36-610603 will be analyzed for copper, lead, zinc, and cesium-137.
- Samples collected at location 36-610605 will be analyzed for copper, mercury, and isotopic uranium.
- Samples collected at location 36-610606 will be analyzed for mercury and 4-isopropyltoluene.
- Samples collected at location 36-610607 will be analyzed for PAHs and tritium.
- Samples collected at location 36-610609 will be analyzed for calcium, chromium, copper, mercury, nitrate, perchlorate, and cesium-137.
- Samples collected at location 36-610613 will be analyzed for chromium and 4-isopropyltoluene.
- Samples collected at location 36-610615 will be analyzed for perchlorate, isotopic uranium, PAHs, and isotopic plutonium.
- Samples collected at location 36-610617 will be analyzed for toluene.
- Samples collected at location 36-610623 will be analyzed for acetone, 4-isopropyltoluene, and toluene.

If the samples cannot be safely collected at these depths because of the steepness of the terrain, alternate locations will be established at downgradient locations as close as possible to the original location where samples can be collected safely.

Surface and subsurface samples will be collected at two new sampling locations (8-1 and 8-2) to define the lateral extent of cesium-137 and plutonium-239/240 downgradient of location 36-610584. Locations 8-1 and 8-2 will be sited in the same drainage to the north and downgradient of previously sampled location 36-610584. Samples from locations 8-1 and 8-2 will be collected from depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and will be analyzed for cesium-137 and isotopic plutonium.

Surface and subsurface samples will be collected at four new sampling locations (8-3, 8-4, 8-5, and 8-6) to define the lateral extent of plutonium-239/240 downgradient of locations 36-610586 and 36-610622.

Locations 8-3 and 8-4 will be sited in the same drainage to the north and downgradient of previously sampled location 36-610586, and locations 8-5 and 8-6 will be sited in the same drainage to the north and downgradient of previously sampled location 36-610622. The samples from 8-3, 8-4, 8-5, and 8-6 will be collected from depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs and will be analyzed for isotopic plutonium.

The results of previously sampled locations 36-610579, 36-610585, 36-610588, 36-610605, 36-610608, 36-610610, 36-610824, 36-610825, 36-610826, and 36-610827 showed PAHs to be present at concentrations above industrial SSLs. The top 3 ft of soil will be removed from an approximately 70-ft × 160-ft area around these locations. Results from nearby locations 36-610574, 36-610575, 36-610587, 36-610589, 36-610593, 36-610603, and 36-610607 are all below industrial SSLs and will be used to confirm cleanup to the east, north, and west. Two additional confirmation samples will be collected to the north (locations 8-7 and 8-8) at depths of 0.0–1.0 ft and 2.0–3.0 ft bgs and analyzed for PAHs. The excavation will be bounded to the south by a paved parking area and no samples will be collected in this area. Cleanup to industrial SSLs within the excavation will be confirmed by resampling locations 36-610579, 36-610585, 36-610588, 36-610605, 36-610608, 36-610610, 36-610824, 36-610825, 36-610826, and 36-610827. Samples will be collected from the bottom of the excavation at these locations from depths of 3.0–4.0 ft and 7.0–8.0 ft bgs and analyzed for PAHs.

The proposed sampling and analyses at SWMU 36-008 are presented in Table 4.4-3, and the proposed sampling locations are shown on Plate 33.

4.4.4 SWMU C-36-003, Outfall from Building 36-1

4.4.4.1 Site Description and Operational History

SWMU C-36-003 is a former NPDES-permitted outfall (EPA06A106) located at TA-36 on the south rim of Threemile Canyon, north of office and laboratory building 36-1 (Plate 29). The outfall became operational in the 1950s and served the sink and floor drains on the first floor of the building and the floor, sink, and equipment drains in the photoprocessing labs on the second floor of the building. In 1993 the floor and sink drains were rerouted to the SWSC plant. The outfall was removed from the NPDES permit in 2001 (EPA 2001, 082282).

4.4.4.2 Nature and Extent of Contamination

The approved investigation report (LANL 2010, 111324.14, pp. 27–30) concluded nature and extent had been defined for inorganic and organic chemicals and radionuclides detected at SWMU C-36-003, except for the following:

- Vertical extent of cadmium, copper, total cyanide, mercury, and uranium at location 36-610824
- Vertical extent of cadmium, copper, and silver at location 36-610827
- Vertical extent of chromium at location 36-610822
- Vertical extent of chromium, selenium, and silver at location 36-610825
- Vertical extent of perchlorate at location 36-610828
- Vertical extent of Aroclor-1254 and Aroclor 1260 at location 36-610824
- Vertical extent of toluene at locations 36-610823, 36-610824, and 36-610827
- Vertical extent of plutonium-238 at location 36-610822

- Vertical extent of tritium at locations 36-610825 and 36-610826
- Vertical extent of uranium-234 at location 36-610824

The investigation report indicated the vertical extent of cadmium was not defined at location 36-610824 because concentrations increased with depth. At location 36-610824, both detected concentrations in soil (0.542 mg/kg at 0.0–0.5 ft bgs and 1.09 mg/kg at 2.0 ft to 3.0 ft bgs) were below the maximum soil background concentration (2.6 mg/kg). Therefore, the vertical extent of cadmium is defined at this location.

The investigation report indicated the vertical extent of uranium was not defined at location 36-610824 because concentrations increased with depth. The isotopic uranium data for this location, however, showed activities of uranium-234 did not increase with depth, uranium-235/236 was below BV, and uranium-238 decreased with depth. Based on the isotopic uranium data, the vertical extent of uranium is defined at this location.

The investigation report indicated the vertical extent was defined for 4-isopropyltoluene. However, concentrations of 4-isopropyltoluene increased with depth at location 36-610326, and vertical extent is not defined at this location.

The investigation report indicated the vertical extent of uranium-234 was not defined at location 36-610824 because concentrations increased with depth. The detected activities of uranium-234 at this location (3.43 pCi/g at 0.0–0.5 ft bgs and 3.49 pCi/g at 2.0–3.0 ft bgs) were essentially the same and did not indicate an increase with depth. Therefore, the vertical extent of uranium-234 is defined at this location.

Sampling locations and results for inorganic chemicals detected above BVs are shown on Plate 30, detected organic chemicals are shown on Plate 31, and radionuclides detected or detected above BVs/FVs are shown on Plate 32 for SWMU C-36-003.

4.4.4.3 Proposed Activities at SWMU C-36-003

Shallow subsurface samples will be collected at seven previously sampled locations, extending the depths at each location to define the vertical extent of contamination. Samples will be collected from depth intervals of 5.0–6.0 ft and 9.0–10.0 ft bgs and analyzed as follows.

- Samples collected at location 36-610822 will be analyzed for chromium and isotopic plutonium.
- Samples collected at location 36-610623 will be analyzed for toluene.
- Samples collected at location 36-610824 will be analyzed for copper, total cyanide, mercury, PCBs, and toluene.
- Samples collected at location 36-610825 will be analyzed for chromium, selenium, silver, and tritium.
- Samples collected at location 36-610826 will be analyzed for 4-isopropyltoluene and tritium.
- Samples collected at location 36-610827 will be analyzed for cadmium, copper, silver, and toluene.
- Samples collected at location 36-610828 will be analyzed for perchlorate.

Excavation of soil at locations 36-610824, 36-610825, 36-610826, and 36-610827 and collection of confirmation samples at these locations are described in section 4.4.3.3.

The proposed sampling and analyses at SWMU C-36-003 are presented in Table 4.4-4, and the proposed sampling locations are shown on Plate 33.

5.0 INVESTIGATION METHODS

A summary of investigation methods to be implemented is presented in Table 5.0-1. The standard operating procedures (SOPs) used to implement these methods are available at http://www.lanl.gov/environment/all/qa/adep.shtml.

Descriptions 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 current analytical statement of work (LANL 2008, 109962). Accredited non-Laboratory contract analytical laboratories will use the most recent EPA- and industry-accepted extraction and analytical methods for the requested analyses.

5.1 Sampling Locations

Proposed sampling locations are identified for each site based on engineering drawings, surveyed locations of existing structures (from the geographic information system database), previous sampling locations, and topography or other features identified in the field (e.g., drainage channels and sediment accumulation areas). The coordinates of proposed new sampling locations will be obtained by georeferencing the points from the proposed sampling maps. Coordinates will be located and flagged or otherwise marked in the field using a differential global positioning system (GPS) unit. If any proposed sampling locations are moved because of field conditions, utilities, or other unexpected reasons, the new locations will be surveyed immediately following sample collection as described in section 5.2. Surveying and determining sampling locations will be conducted in accordance with the latest version of SOP-5028, Coordinating and Evaluating Geodetic Surveys.

5.2 Geodetic Surveys

Geodetic surveys will be conducted in accordance with 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 per the National Geodetic Vertical Datum of 1929. All GPS equipment used will meet the accuracy requirements specified in SOP-5028.

5.3 Surface and Shallow Subsurface Sampling

Soil and rock samples will be collected by the most efficient, 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 sampled, accessibility, and the level of disruption to Laboratory activities. Typically, samples will be collected using spade-and-scoop, hand-auger, or hollow-stem auger drilling methods. The deepest sample collected at every location shall be from undisturbed soil or unweathered tuff; sample collection depths will be adjusted accordingly in the field and recorded on SCLs.

5.3.1 Spade-and-Scoop Method

Surface and shallow subsurface samples will be collected in accordance with SOP-06.09, Spade and Scoop Method for the Collection of Soil Samples. Stainless-steel shovels, spades, scoops, and bowls will be used for ease of decontamination. If the surface location is at bedrock, an axe or hammer and chisel may be used to collect samples. Samples collected for analyses will be placed in the appropriate sample containers, depending upon the analytical method requirement.

5.3.2 Sediment Samples

Sediment samples will be collected from areas of sediment accumulation that include sediment judged to be representative of the historical period of Laboratory operations (i.e., post-1943). Sediment samples will be collected using either spade-and-scoop and/or hand-auger methods. Proposed sediment sampling locations have been identified and are shown in the figures in the previous sections. The actual sediment sampling locations will be selected in the field based on geomorphic relationships in areas likely to have been affected by discharges from Laboratory operations. Because sediment is dynamic and subject to redistribution by runoff events, some locations may need to be adjusted when this work plan is implemented. In the course of collecting sediment samples, it may be determined, based on field conditions, that the selected location is not appropriate (e.g., the sediment is much shallower than anticipated, the sediment is predominantly coarse grained, or the sediment shows evidence of being older than the target age). Sediment sampling locations will be adjusted as appropriate based on geomorphic verification to ensure sampling locations are in the drainage(s) downgradient of the site, any revised locations will be surveyed, and the updated coordinates will be submitted for inclusion in the appropriate database. The deepest sample collected at every location shall be from undisturbed soil or unweathered tuff; sample collection depths will be adjusted accordingly in the field and recorded on SCLs.

5.4 Subsurface Sampling

Subsurface sampling is proposed to include surface soil and fill, sediment, and tuff. Any adjustments will be noted in SCLs and recorded in the Phase II investigation report as deviations from this investigation work plan. Subsurface samples will be collected following the current version of SOP-06.24, Sample Collection from Split-Spoon Samplers and Shelby-Tube Samplers, and SOP-06.26, Core-Barrel Sampling for Subsurface Earth Materials. The deepest sample collected at every location shall be from undisturbed soil or unweathered tuff; sample collection depths will be adjusted accordingly in the field and recorded on SCLs.

5.4.1 Hollow-Stem Auger

A hollow-stem auger may be used to drill holes deeper than approximately 15 ft or to shallower depths where hand-auger refusal is encountered. 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 allows insertion of drill rods, split-spoon core barrels, Shelby tubes, and other samplers through the center of the auger so samples may be retrieved during drilling operations. The hollow stem 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 collapse of the borehole. A bottom plug or pilot bit can be fastened onto the bottom of the auger to keep out most of the soil and/or water that tends to clog the bottom of augers during drilling. Drilling without a center plug is acceptable if the soil plug, formed in the bottom of the auger, is removed before sampling or installing a well casing. The soil plug

can be removed by washing out the plug using a side-discharge rotary bit or auguring out the plug with a solid-stem auger bit sized to fit inside the hollow-stem auger.

During sampling, the auger will be advanced to just above the desired sampling interval. The sample will be collected by driving a split-spoon sampler into undisturbed soil-tuff to the desired depth. Samples will be collected in accordance with SOP-06.26, Core-Barrel Sampling for Subsurface Earth Materials.

5.4.2 Hand Auger

Hand augers may be used to drill 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. Hand-auger samples will be collected in accordance with SOP-06.10, Hand Auger and Thin-Wall Tube Sampler.

Because the chromium and nickel concentrations at some previously hand-augered sampling locations are suspected of being influenced by the use of stainless-steel auger buckets, carbon-steel auger buckets will be used to collect the proposed samples at locations not accessible to a drill rig that must be sampled by the hand-auger method.

5.4.3 Borehole Abandonment

All boreholes will be properly abandoned according to the current version of SOP-5.03, Monitoring Well and RFI Borehole Abandonment.

Shallow boreholes (less than approximately 20 ft deep or advanced by methods other than a drill rig) will be abandoned by filling the borehole with bentonite chips, which are subsequently hydrated, in 1- to 2-ft lifts. The borehole will be visually inspected while the bentonite chips are added to ensure bridging does not occur.

Deeper boreholes 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.

The use of backfill materials, such as bentonite and grout, will be documented in a field logbook with regard to volume (calculated and actual), intervals of placement, and additives used to enhance backfilling. All borehole abandonment information will be provided in the Phase II investigation report.

5.5 Cleanup Activities

SWMUs 15-007(c), 15-008(b), 15-009(h), 15-010(b), 36-008, and C-36-003 are proposed for remediation under this investigation work plan. Excavation of waste, contaminated media, waste disposition, and confirmation sampling will be completed at these sites. This section summarizes proposed remediation activities. The general sequence of activities for waste excavation, transportation, disposal, and confirmation sampling is summarized below. Specific details are provided for each site in section 4.

5.5.1 Removal of Surficial and Buried Waste, Inactive Units, and Contaminated Soil and Sediment

The general sequence of waste-removal activities is as follows.

- Mobilization
  - ❖ Assemble construction documents
  - ❖ Conduct construction readiness assessment
  - ❖ Conduct preconstruction meeting
  - ❖ Construct access roads
  - ❖ Construct staging area
  - ❖ Install temporary field trailers
  - ❖ Determine boundaries of waste. First, the original waste limit coordinates will be surveyed and staked, as determined in the approved investigation report. Next, excavation and potholing, with visual examination using methods described in section 5, will be used to establish or to confirm waste boundaries only where the original boundaries are inadequately defined to implement cleanup.
  - ❖ Mobilize heavy equipment to site
  - ❖ Identify underground utilities
- Site preparation
  - ❖ Install fencing
  - ❖ Install stormwater controls
  - ❖ Abandon monitoring wells
  - ❖ Abandon/relocate utilities
  - ❖ Conduct preexcavation survey
- Removal of waste
  - ❖ Excavate waste
  - ❖ Stockpile and load roll-off container
  - ❖ Characterize for dispositioning
  - ❖ Transport to off-site disposal facility
  - ❖ Survey boundaries of excavation
  - ❖ Confirmation sampling
  - ❖ Establish subgrade and conduct survey
- Backfill
  - ❖ Backfill and compact
  - ❖ Vegetate surface
  - ❖ Survey finished surface
- Demobilize

5.5.2 Waste Management and Disposal

Management of all investigation waste, including waste generated during cleanup, is described in Appendix B.

5.5.3 Confirmation Sampling

Confirmation sampling will be performed at all remediated sites (section 4).

5.6 Chain of Custody and Sample Collection Logs

The collection, screening, and transport of samples will be documented on standard forms generated by the Sample Management Office (SMO). These include sample container labels and combined SCL/chain-of-custody (COC) forms. Sample collection portions of the combined forms will be completed at the time of sample collection and signed by the sampler and a reviewer who will verify the logs for completeness and accuracy. The COC portions of the combined forms will be completed and signed to verify the samples are not left unattended. Corresponding labels will be initialed and applied to each sample container, and custody seals will be placed around container lids or openings. Documentation and handling of all samples will be conducted in accordance with WES-EDA-QP-219, Sample Control and Field Documentation, and with SOP-5057, Handling, Packaging, and Transporting Field Samples.

5.7 Field-Screening Methods

The primary field-screening methods to be used on samples include radiological screening and organic vapor screening using a photoionization detector (PID). Field screening will be used primarily for health and safety purposes and for determining transportability of samples from the field sites to the SMO and from the SMO to the analytical laboratories. Field-screening results may be used at the discretion of the field personnel to collect additional samples beyond those planned or to extend the depth of sampling as required. Field changes to sampling plans will be approved by the subcontractor technical representative and will be documented on field paperwork and in the Phase II investigation report.

5.7.1 Radiological Screening

Based on the results of past sampling, field screening for radioactivity will be conducted primarily to ensure worker health and safety rather than to direct sampling. Radiological screening will target gross-alpha, -beta, and -gamma radiation. Field screening for alpha, beta, and gamma radiation will be conducted within 6 in. of soil and core material using appropriate field instruments as determined by the Laboratory's Health Physics Operations Group. Instruments will be calibrated in accordance with the Health Physics Operations Group procedures or equivalent procedures. All instrument calibration activities will be documented daily in the field logbooks in accordance with SOP-5181, Notebook Documentation for Waste and Environmental Services Technical Field Activities.

5.7.2 Organic Vapor Field Screening

Based on 2009 investigation results, significant VOC contamination is not expected to be encountered, and screening will be conducted for health and safety purposes.

Screening will be conducted using a PID capable of measuring quantities as low as 1.0 ppm. Vapor screening of soil, sediment, and subsurface core will be conducted using a PID equipped with an

11.7 electronvolt lamp. All samples will be screened for organic vapors in headspace gas in accordance with SOP-06.33, Headspace Vapor Screening with a Photo Ionization Detector.

The PID will be calibrated daily to the manufacturer's standard for instrument operation, and the daily calibration results will be documented in the field logbooks. All instrument background checks, background ranges, and calibration procedures will be documented daily in the field logbooks in accordance with SOP-5181, Notebook and Logbook Documentation for Environmental Directorate Technical and Field Activities.

5.8 Quality Assurance/Quality Control Samples

Quality assurance (QA)/quality control samples will include field duplicate, equipment rinsate, and field trip blank samples. Field duplicate samples and field rinsate blanks will be collected at an overall frequency of at least 1 for every 10 regular samples or as directed by the current version of SOP-5059, Field Quality Control Samples. Field trip blanks will be collected at a rate of at least one per day on days when VOC samples are collected.

5.9 Laboratory Analytical Methods

The analytical suites for laboratory analyses and the specific analytical methods to be used are summarized in Table 5.9-1. Total uranium was included in the analytical suite of historical RFI and was subsequently included in the analytical suite for the 2009–2010 Threemile Canyon Aggregate Area investigation. Samples from most of these sites were also analyzed for isotopic uranium. Isotopic uranium results can be used to define extent for total uranium as well as for uranium isotopes. Therefore, at sampling locations where the vertical and/or lateral extent of total uranium was not defined in previous samples, samples collected during the Phase II investigation will be analyzed only for isotopic uranium to define extent.

All analytical methods are presented in the statement of work for analytical laboratories (LANL 2008, 109962). Sample collection and analysis will be coordinated with the SMO.

5.10 Health and Safety

The field investigations described in this Phase II investigation work plan will comply with all applicable requirements pertaining to worker health and safety. An integrated work document and a site-specific health and safety plan will be in place before fieldwork is conducted.

5.11 Equipment Decontamination

Equipment for drilling and sampling will be decontaminated before and after sampling activities to minimize the potential for cross-contamination. All equipment will be decontaminated using dry decontamination methods whenever possible to minimize generating liquid waste. All sampling equipment will be decontaminated using dry decontamination methods if possible, as described in SOP-5061, Field Decontamination of Equipment. If dry decontamination methods are not effective as determined by field screening of the equipment after dry decontamination, drilling/exploration equipment that may come in contact with the borehole will be decontaminated by steam-cleaning, hot-water pressure-washing, or another method before each new borehole is drilled. If wet decontamination is necessary, the equipment will be decontaminated on a high-density polyethylene liner on a temporary decontamination pad. Cleaning solutions and wash water will be collected and contained for proper disposal. Decontamination

solutions will be sampled and analyzed to determine the final disposition of the wastewater and the effectiveness of the decontamination procedures.

5.12 IDW

IDW generated during field-investigation activities may include, but is not limited to, drill cuttings; contaminated soil; contaminated personal protective equipment (PPE), sampling supplies, and plastic; fluids from the decontamination of PPE and sampling equipment; and all other waste that has potentially come into contact with contamination.

All IDW generated during field-investigation activities will be managed in accordance with applicable EPA and NMED regulations, DOE orders, and Laboratory requirements. Appendix B presents the IDW management plan.

6.0 MONITORING PROGRAMS

Groundwater, sediment, and surface-water monitoring conducted in the Threemile Canyon Aggregate Area as part of other environmental activities. This monitoring is summarized below.

6.1 Groundwater

Groundwater-monitoring activities in Threemile Canyon, located within the Pajarito Canyon watershed, are performed independent of this investigation and in accordance with the Laboratory's Interim Facility-Wide Groundwater Monitoring Plan, which is updated annually. This includes semiannual monitoring near or downstream from areas of past Laboratory activities. These monitoring locations include three alluvial groundwater observation wells (3MAO-1, 3MAO-2, and 18-BG-4).

6.2 Stormwater

SWMUs 15-008(b), 15-009(c), 15-010(b), 36-008, and C-36-003 are subject to the stormwater monitoring requirements of the Laboratory's National Pollution Discharge Elimination System individual permit (IP) for stormwater discharges from SWMUs and AOCs. Monitoring under the IP is performed using site-monitoring areas (SMAs) that monitor stormwater runoff from individual SWMUs and AOCs or groups of SWMUs and AOCs. The SMAs in the Threemile Canyon Aggregate Area monitored under the IP and the corresponding SWMUs are

- 3M-SMA-0.2: SWMU 15-010(b),
- 3M-SMA-0.5: SWMU 15-009(c),
- 3M-SMA-0.6: SWMU 15-008(b), and
- 3M-SMA-2.6: SWMUs 36-008 and C-36-003,

The monitoring results are reported to EPA annually.

7.0 SCHEDULE

The schedule for the Phase II investigation is affected by work constraints associated with the protection of threatened and endangered species. The sites to be investigated are located within core habitat for the

Mexican Spotted Owl, a federally protected threatened species. Breeding owls have historically been identified within the Threemile Canyon Aggregate Area. Work restrictions will prevent investigation activities from taking place from March 1 to August 31. Therefore, field investigation activities are proposed to begin on September 1, 2012. Field activities will take approximately 3 mo to complete. A submittal date of no later than August 31, 2013, is proposed for the Phase II investigation report.

8.0 REFERENCES AND MAP DATA SOURCES

8.1 References

The following list includes all documents cited in this plan. Parenthetical information following each reference provides the author(s), publication date, and ER ID. This information is also included in text citations. ER IDs 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 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.

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8.2 Map Data Sources

Data sources used in original figures and/or plates created for this report are described below and identified by legend title.

Legend Item	Data Source
LANL Technical Areas	Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; September 2007; as published 04 December 2008.
Paved roads	Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Paved parking	Paved Parking; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Dirt roads	Dirt Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
LANL structures	Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
LANL fence lines	Security and Industrial Fences and Gates; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Legend Item	Data Source
LANL communications lines	Communication Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 08 August 2002; as published 28 May 2009.
LANL electric lines	Primary Electric Grid; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
LANL gas lines	Primary Gas Distribution Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
LANL sewer lines	Sewer Line System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
LANL steam lines	Steam Line Distribution System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 15 January 2009.
LANL water lines	Water Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
LANL industrial waste lines	Primary Industrial Waste Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 15 October 2008.
LANL historical sampling locations	Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Waste and Environmental Services Division, 5 June 2010.
LANL PRS boundaries	Potential Release Sites; Los Alamos National Laboratory, Waste and Environmental Services Division, Environmental Data and Analysis Group, EP2009-0137; 1:2,500 Scale Data; 25 January 2010.
Contours	Hypsography, 2, 10, 20, and 100 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.

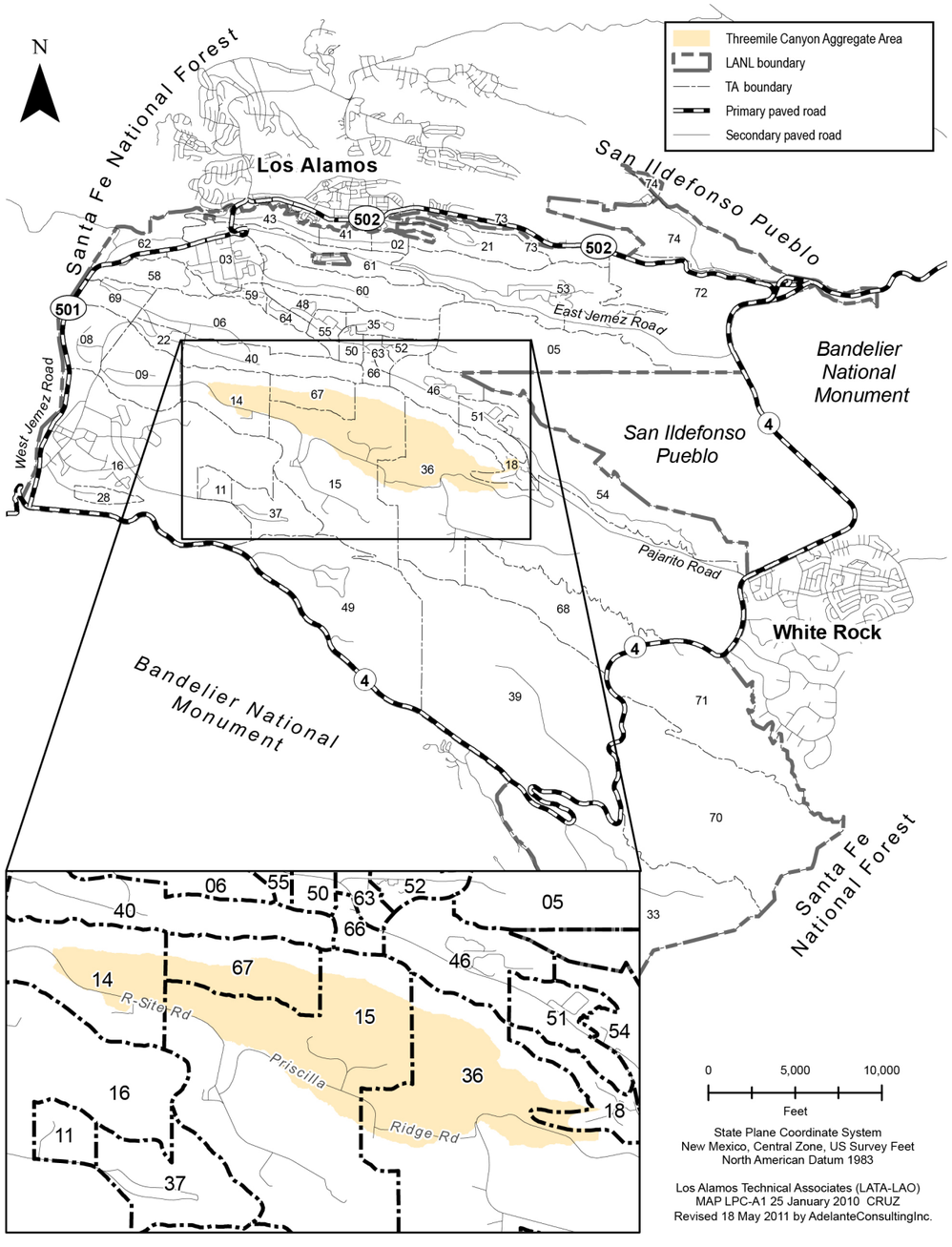


Figure 1.1-1 Location of Threemile Canyon Aggregate Area with respect to Laboratory technical areas

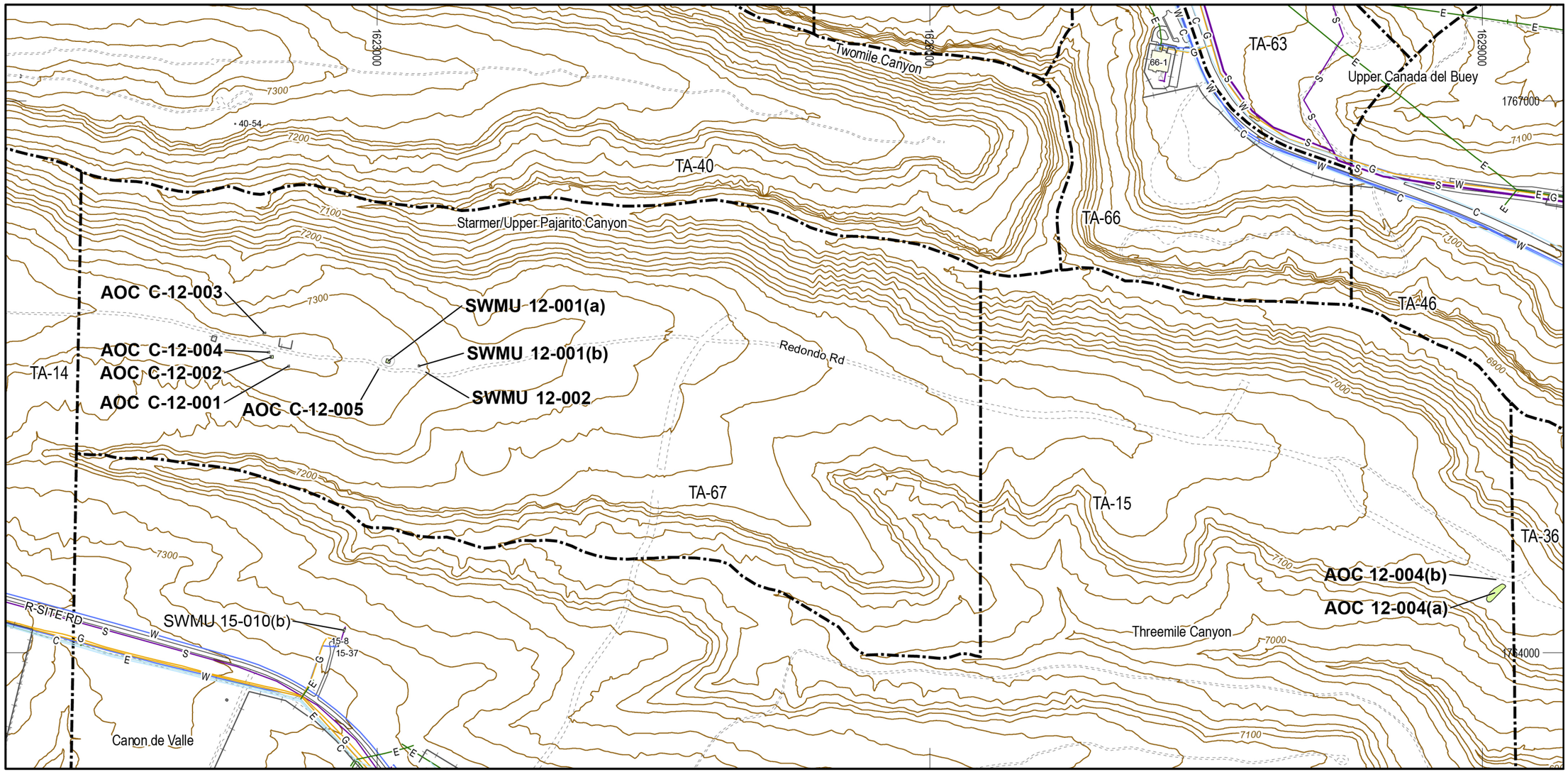


Figure 4.1-1 Site map of former TA-12

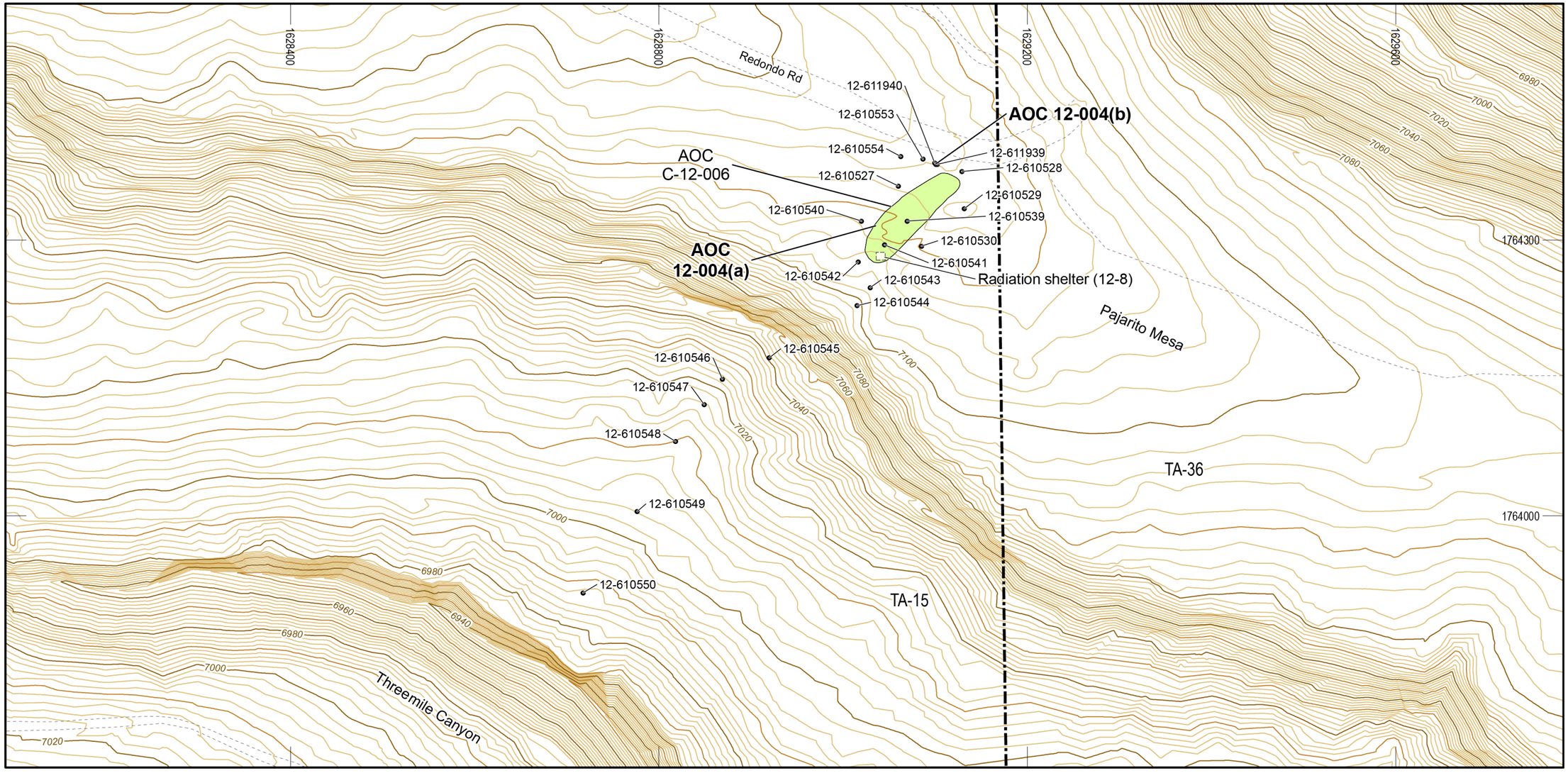


Figure 4.1-2 Site map and sampling locations at AOCs 12-004(a) and 12-004(b)

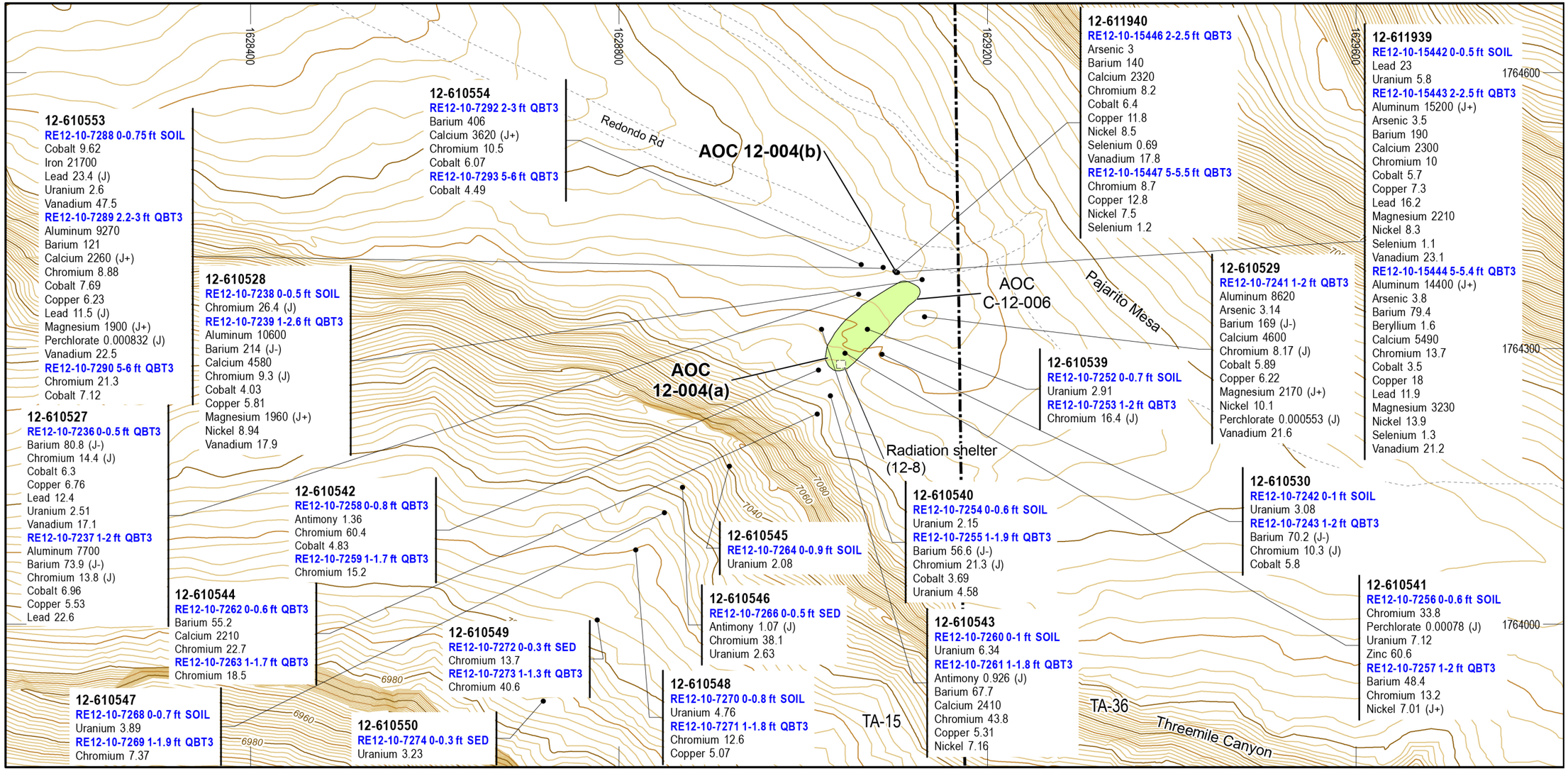


Figure 4.1-3 Inorganic chemicals detected or detected above BVs at AOCs 12-004(a) and 12-004(b)

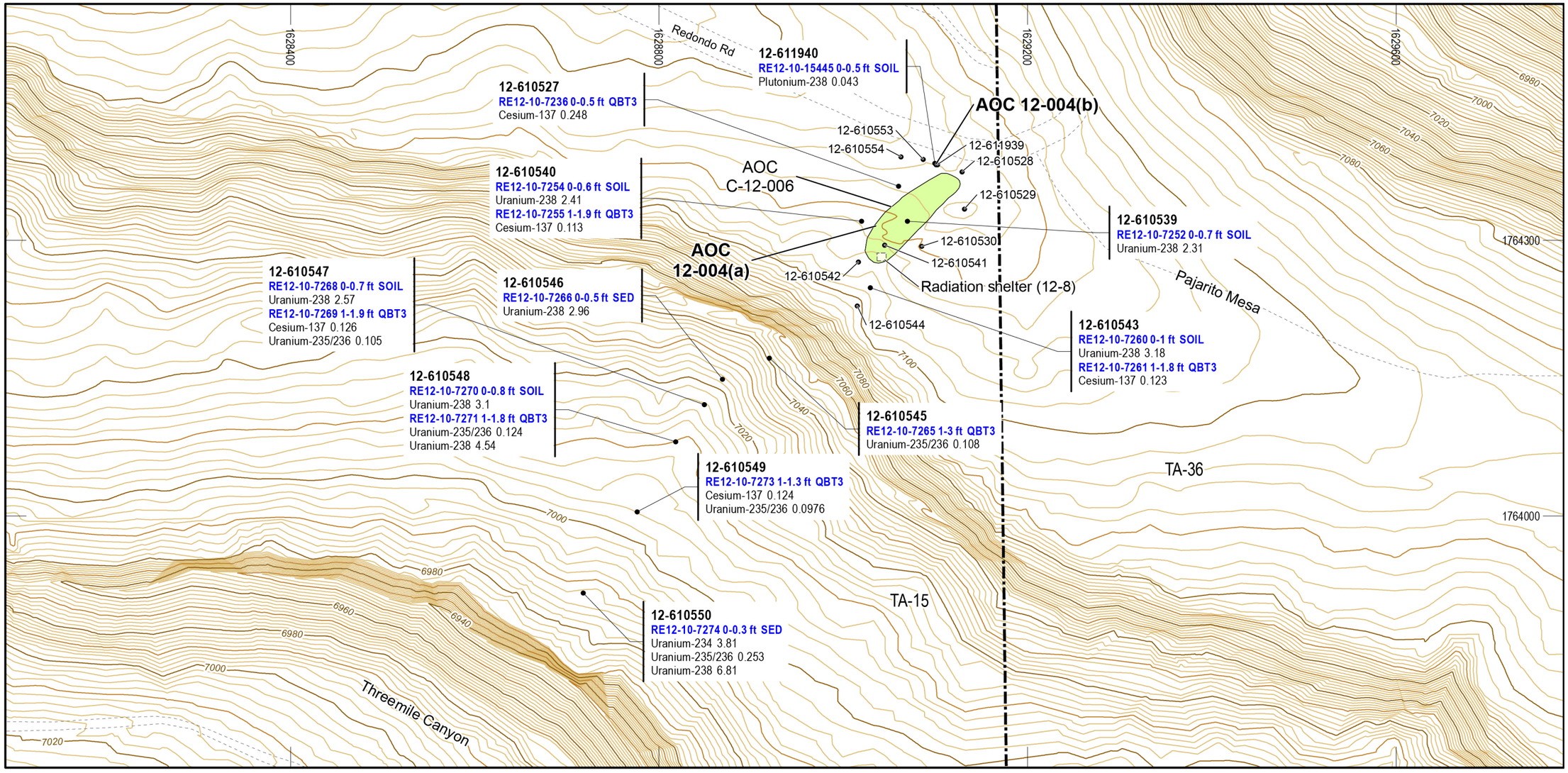


Figure 4.1-4 Radionuclides detected or detected above BVs/FVs at AOCs 12-004(a) and 12-004(b)

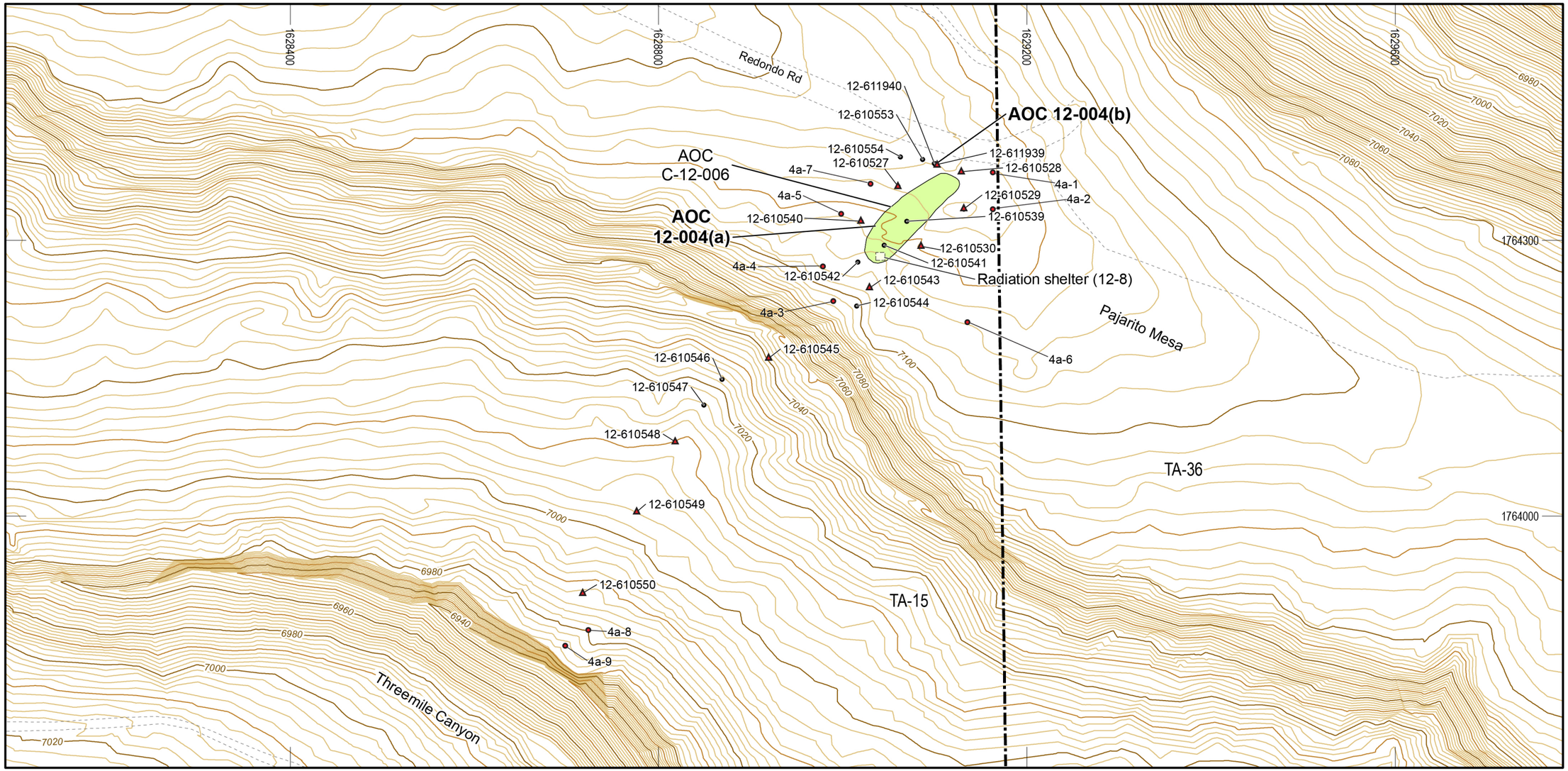


Figure 4.1-5 Proposed sampling locations at AOCs 12-004(a) and 12-004(b)

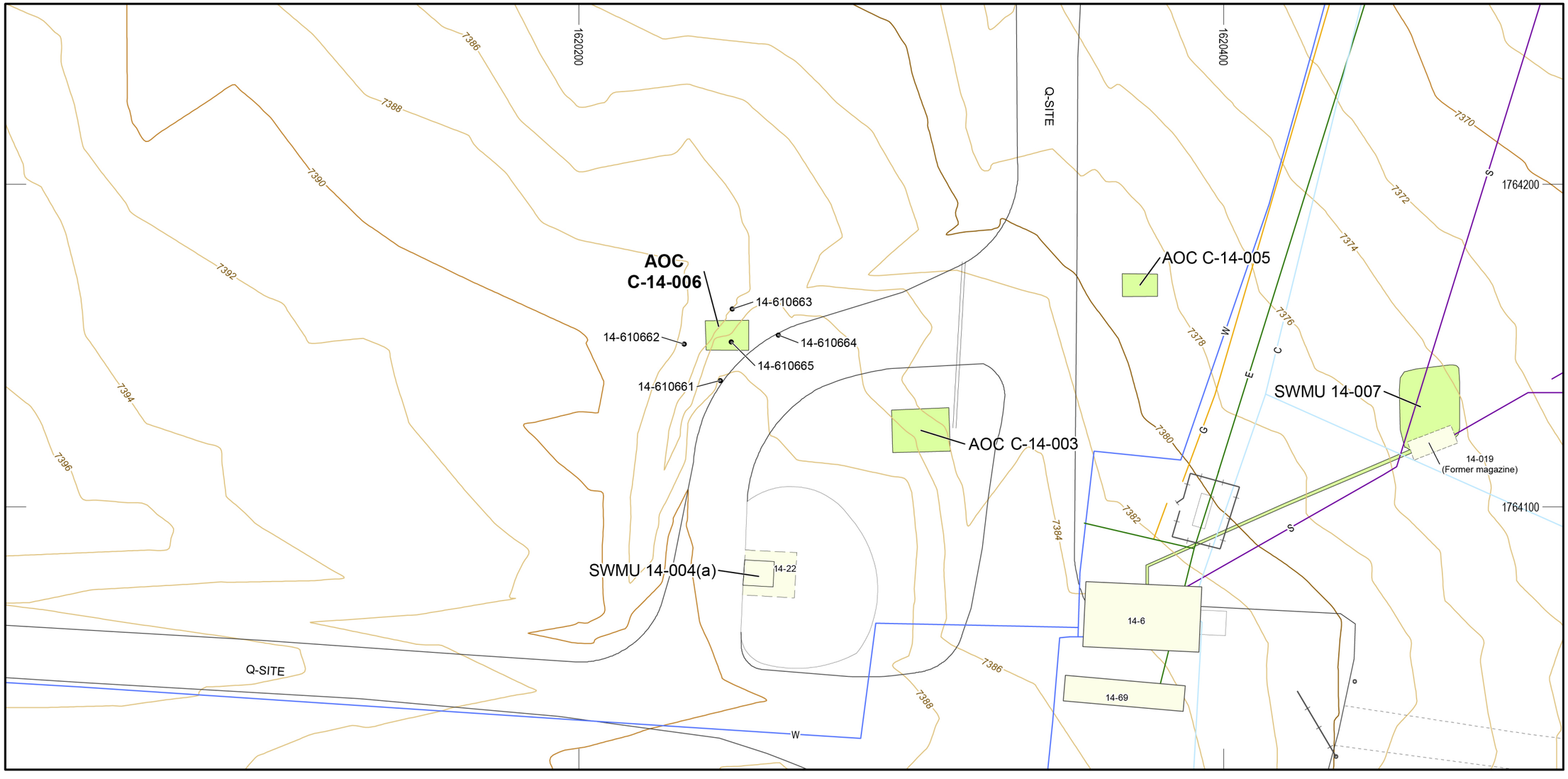


Figure 4.2-1 Site map and sampling locations at AOC C-14-006

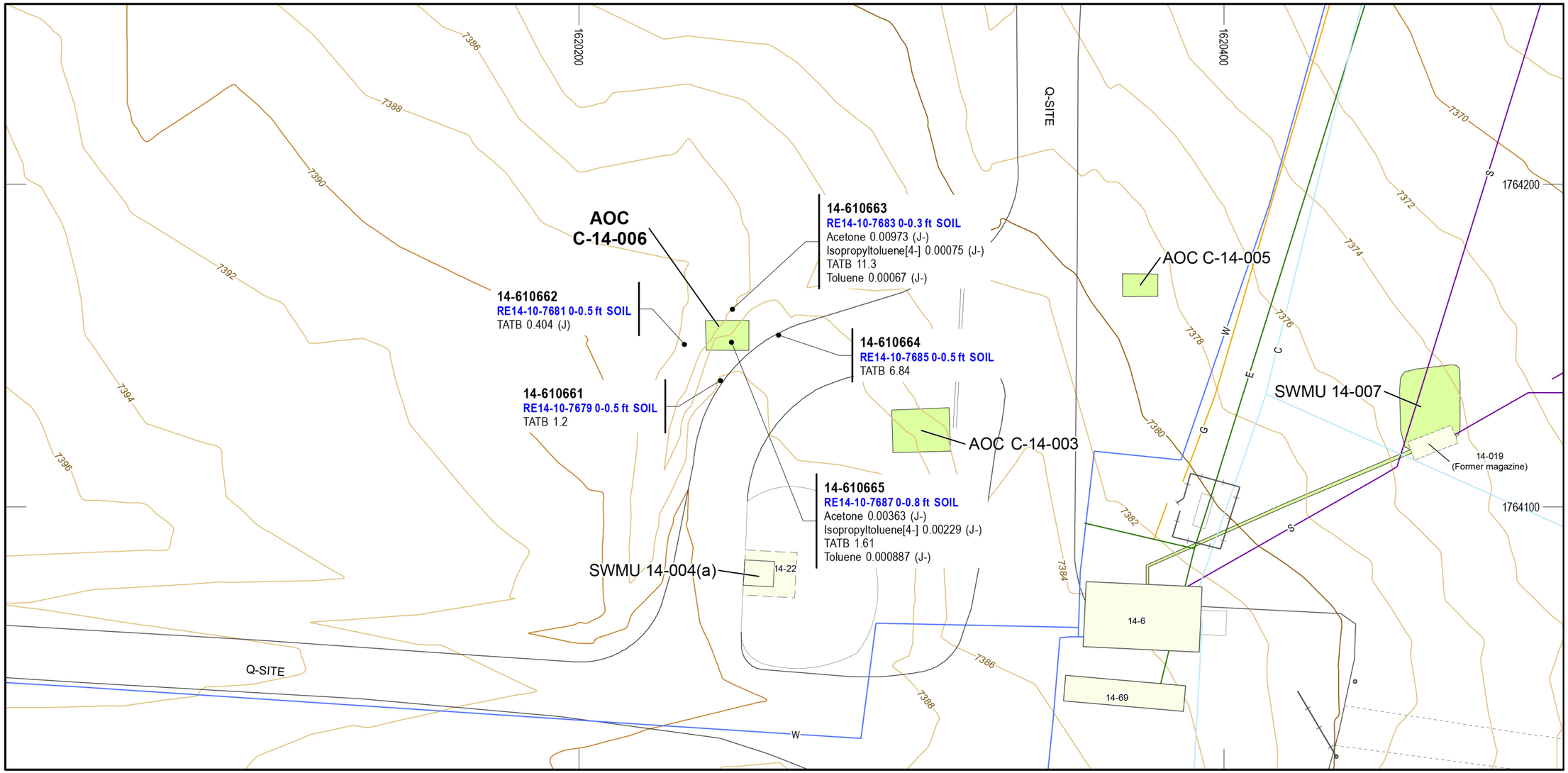


Figure 4.2-2 Organic chemicals detected at AOC C-14-006

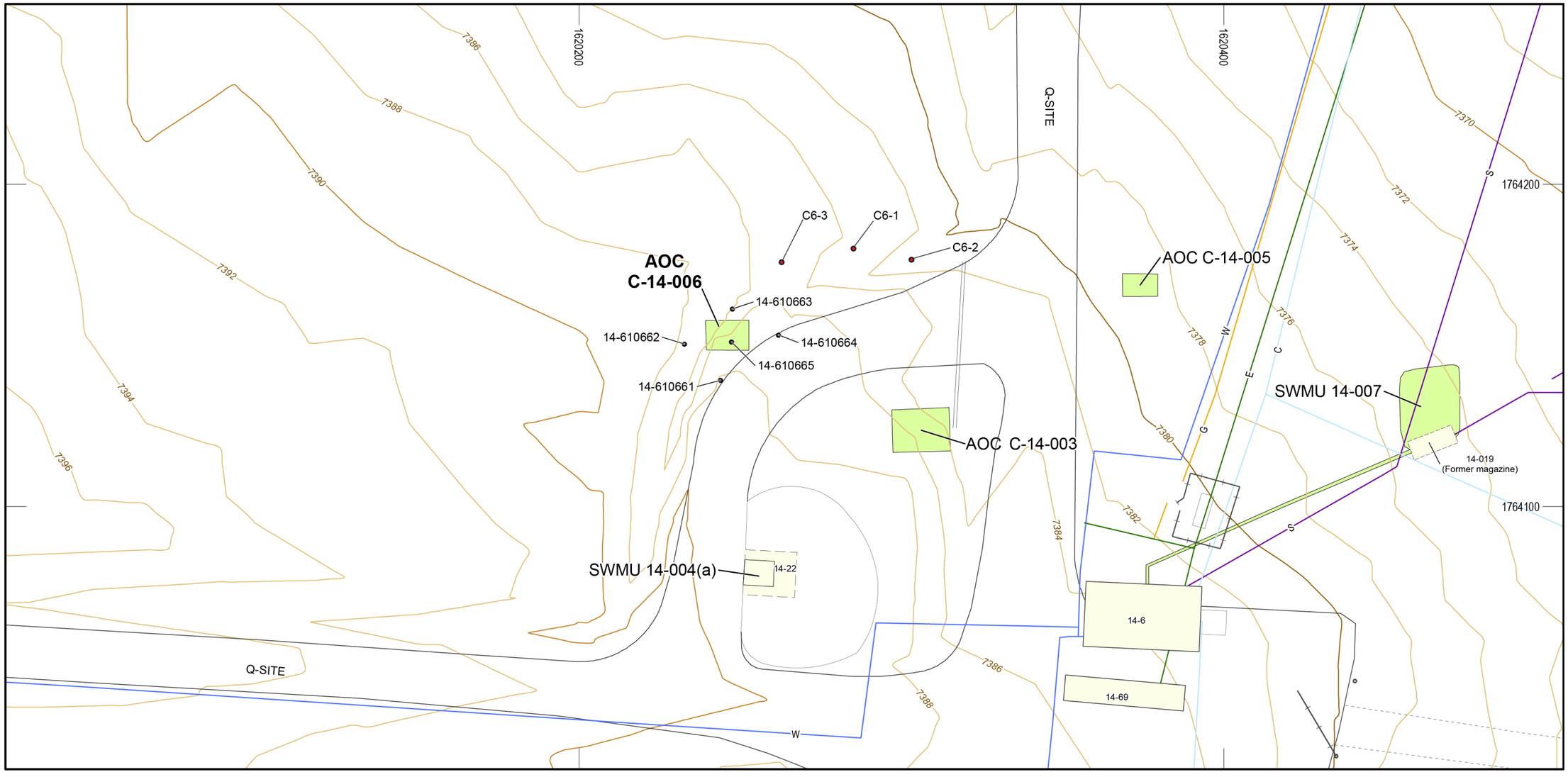


Figure 4.2-3 Proposed sampling locations at AOC C-14-006

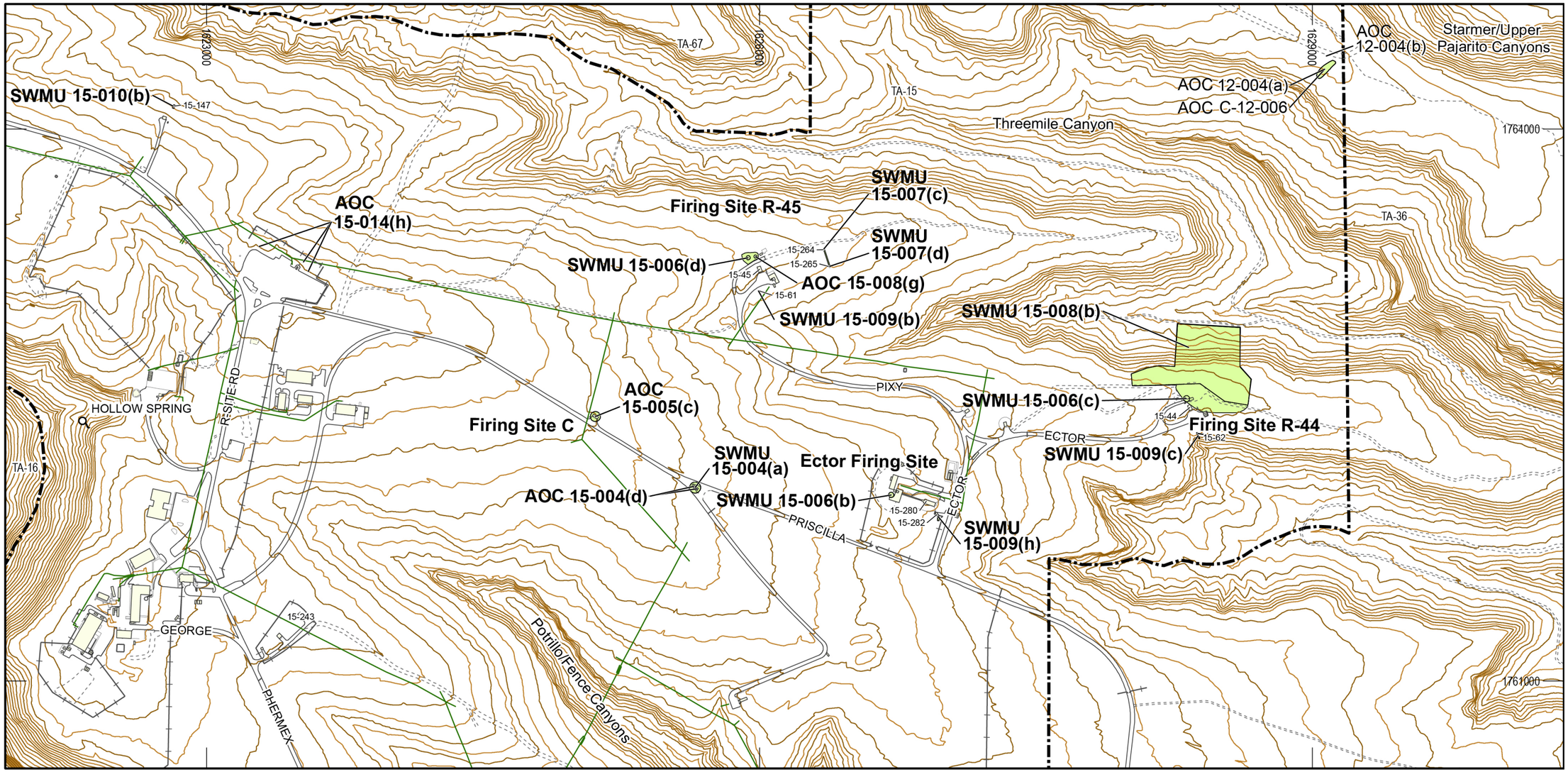


Figure 4.3-1 Site map of TA-15

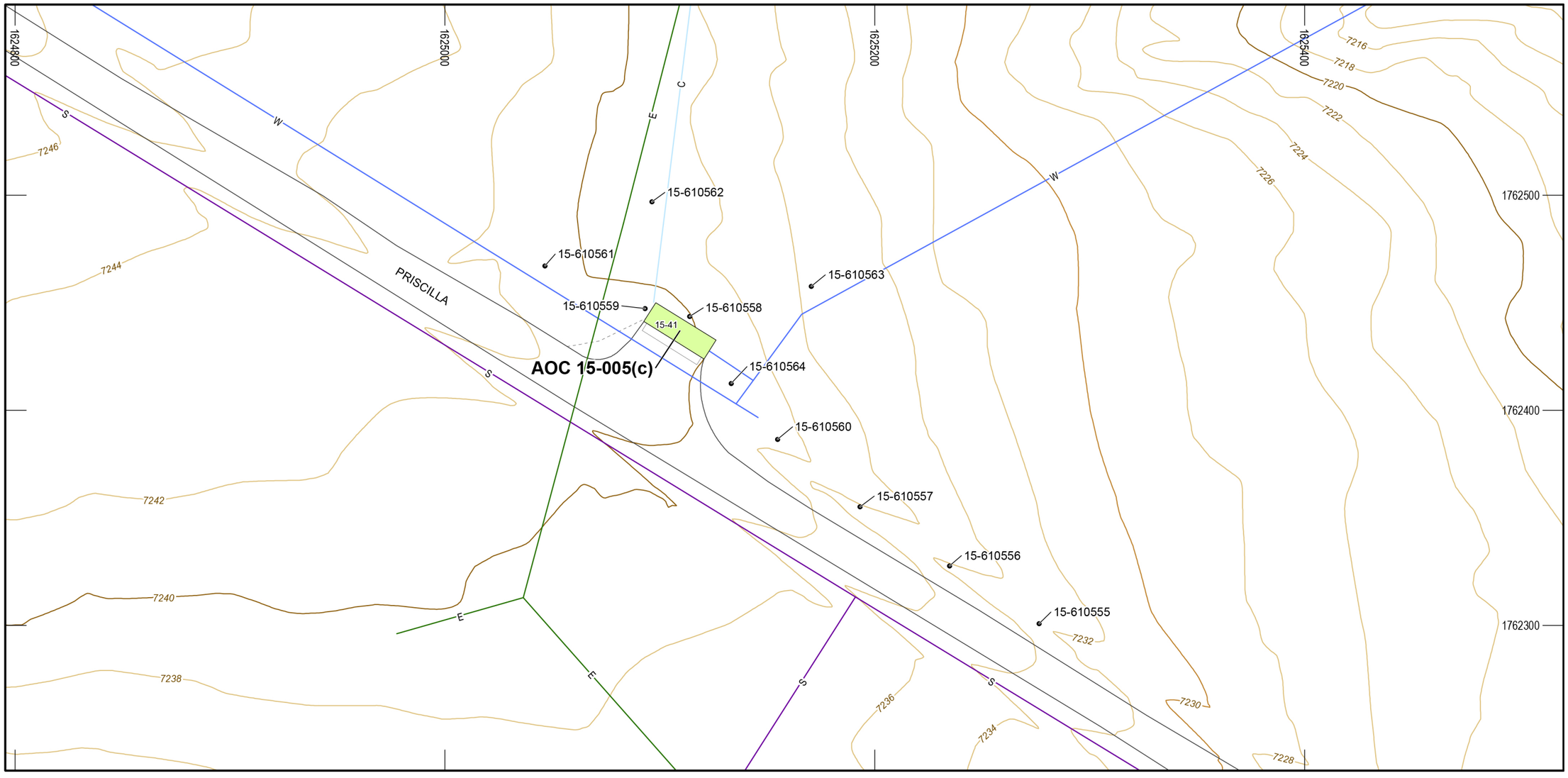


Figure 4.3-2 Site map and sampling locations at AOC 15-005(c)

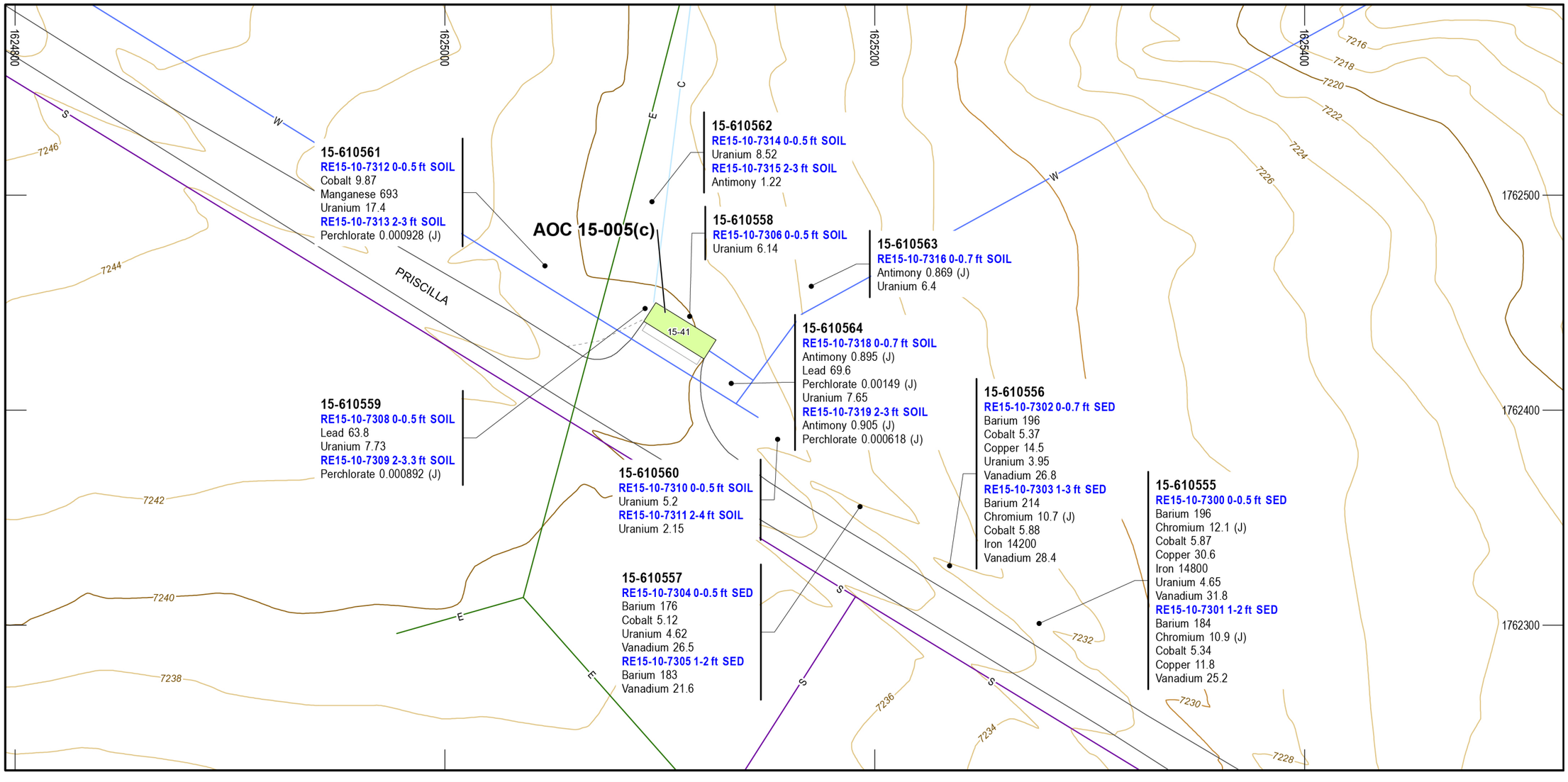


Figure 4.3-3 Inorganic chemicals detected or detected above BVs at AOC 15-005(c)

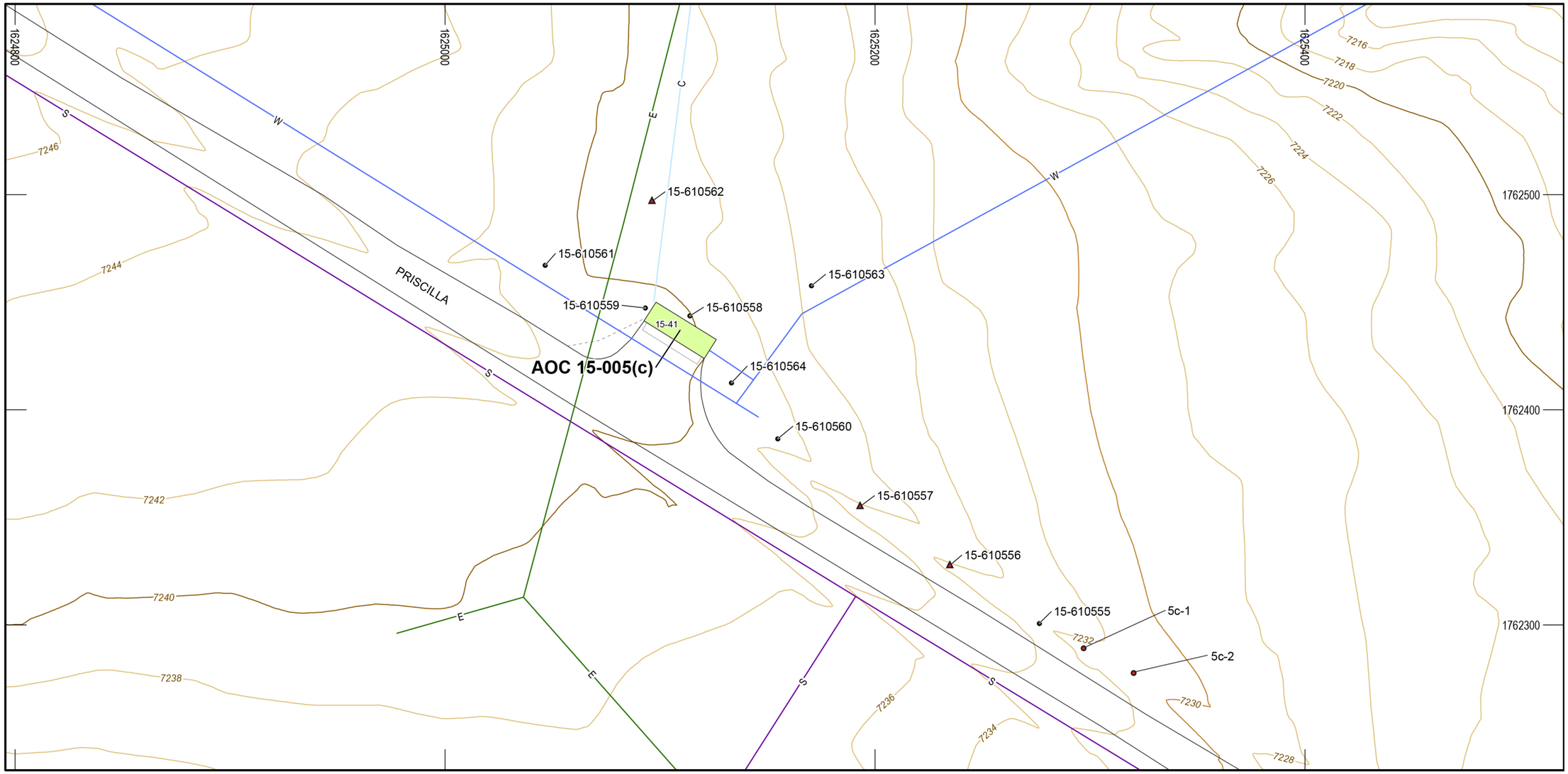


Figure 4.3-4 Proposed sampling locations at AOC 15-005(c)

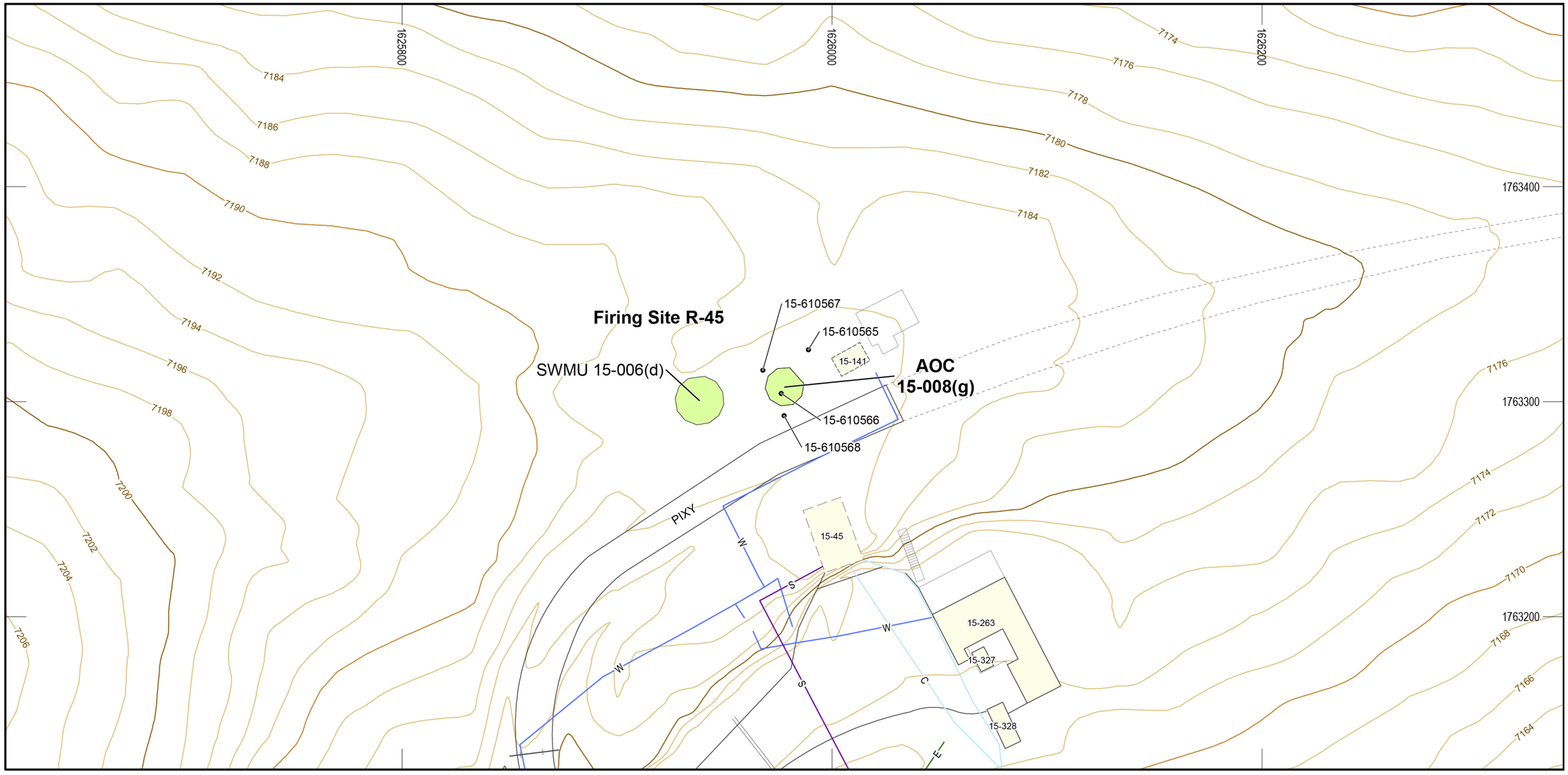


Figure 4.3-5 Site map and proposed sampling locations at AOC 15-008(g)

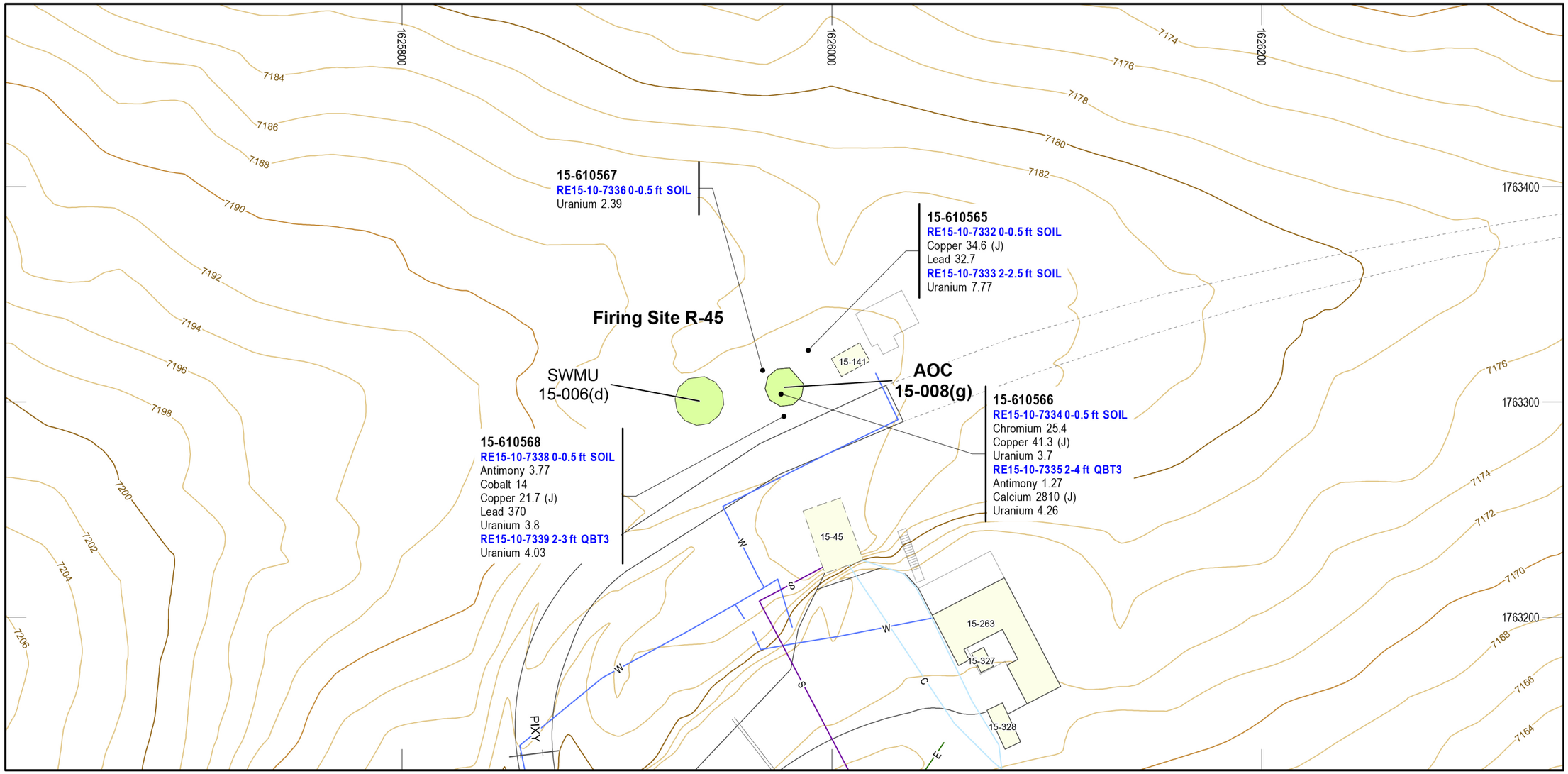


Figure 4.3-6 Inorganic chemicals detected or detected above BVs at AOC 15-008(g)

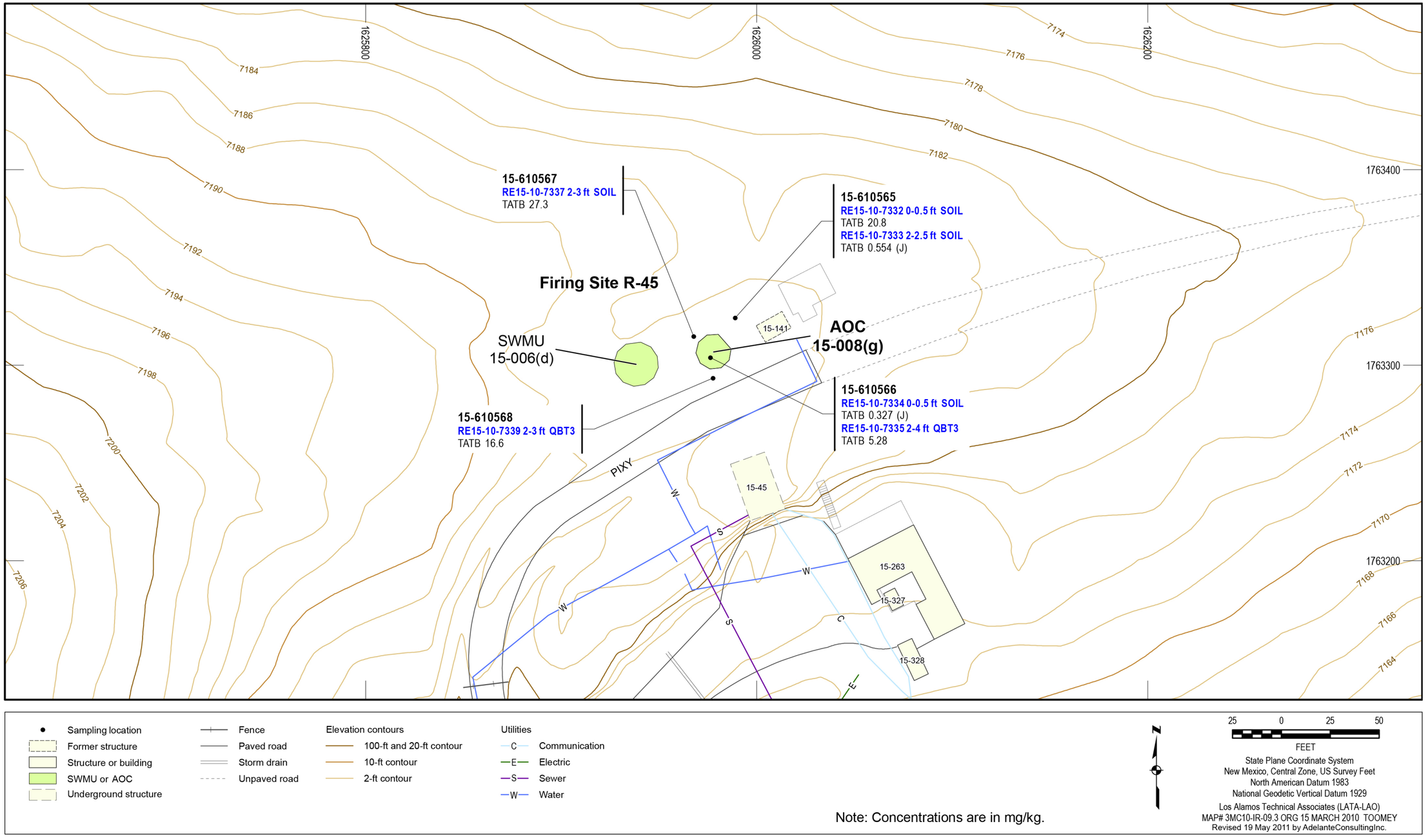


Figure 4.3-7 Organic chemicals detected at AOC 15-008(g)

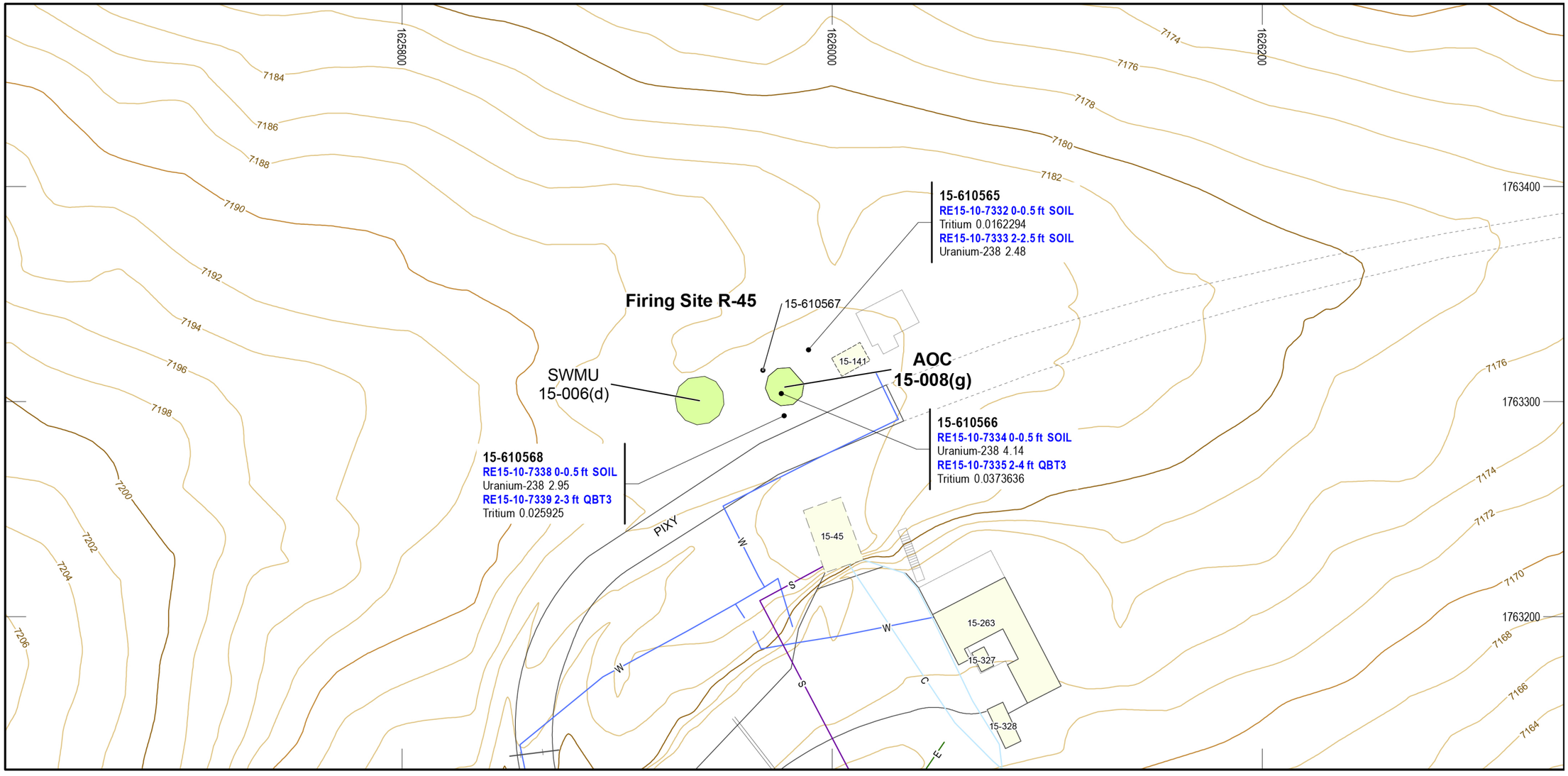


Figure 4.3-8 Radionuclides detected or detected above BVs/FVs at AOC 15-008(g)

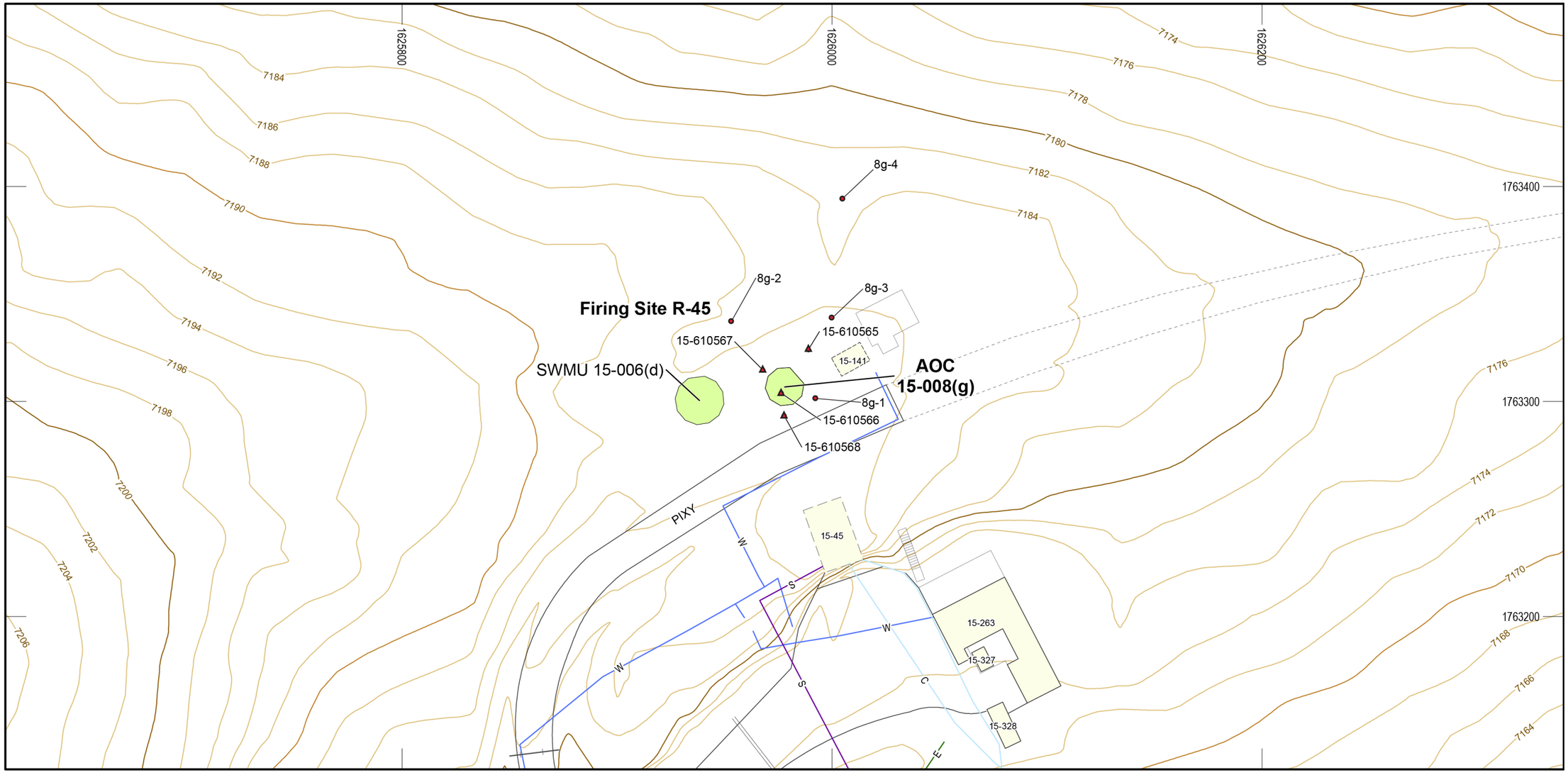


Figure 4.3-9 Proposed sampling locations at AOC 15-008(g)

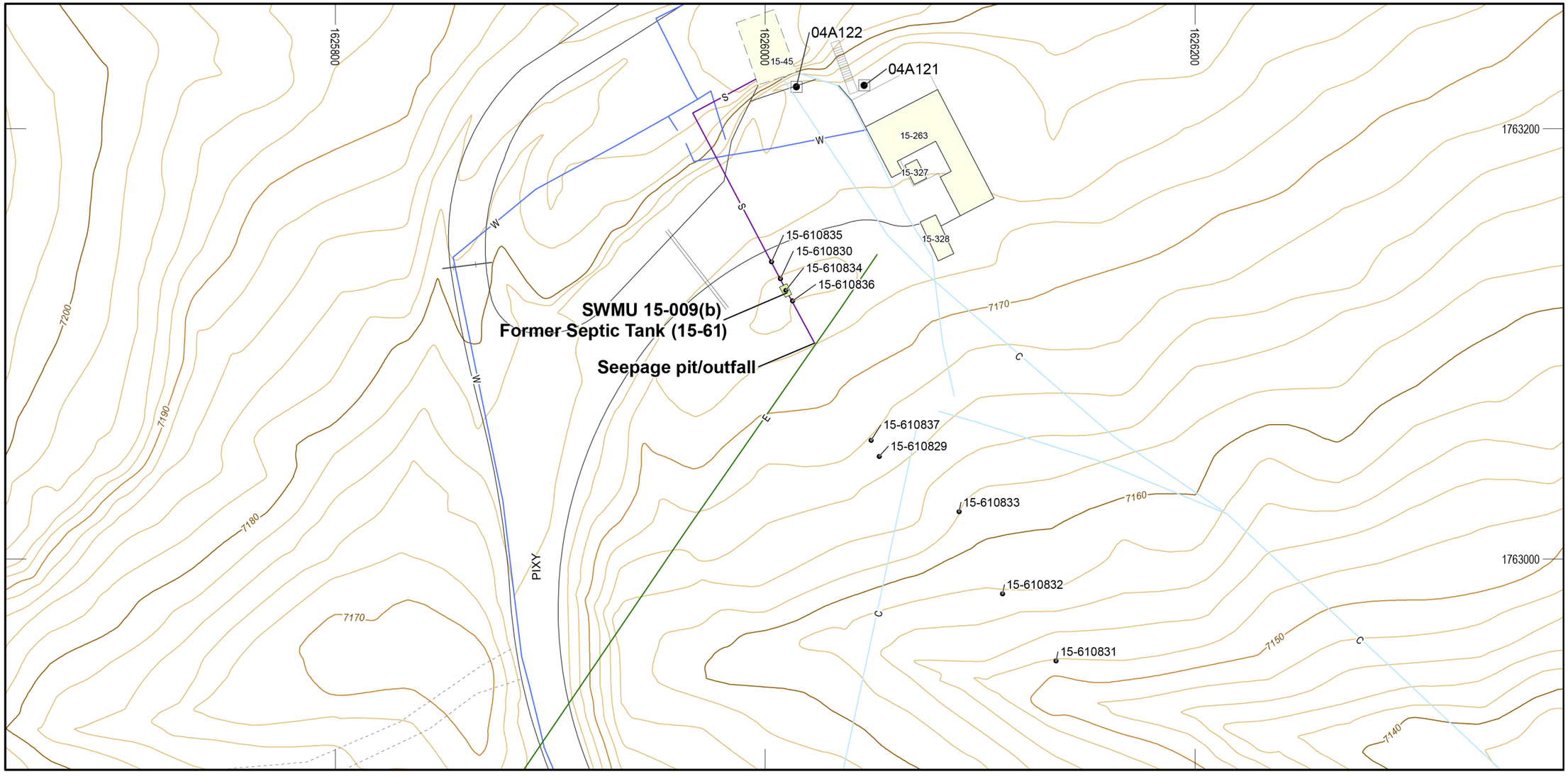


Figure 4.3-10 Site map and sampling locations at SWMU 15-009(b)

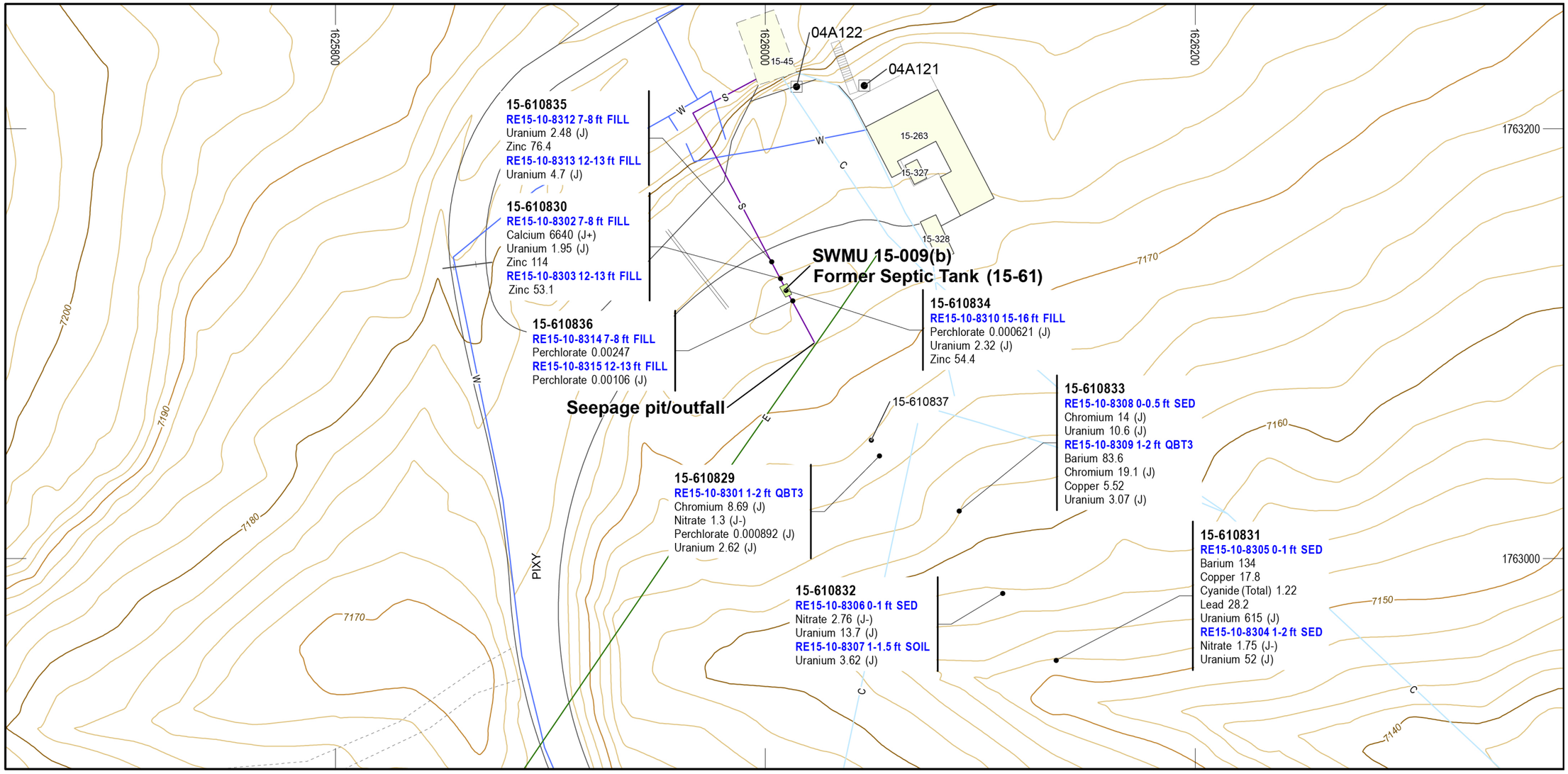


Figure 4.3-11 Inorganic chemicals detected or detected above BVs at SWMU 15-009(b)

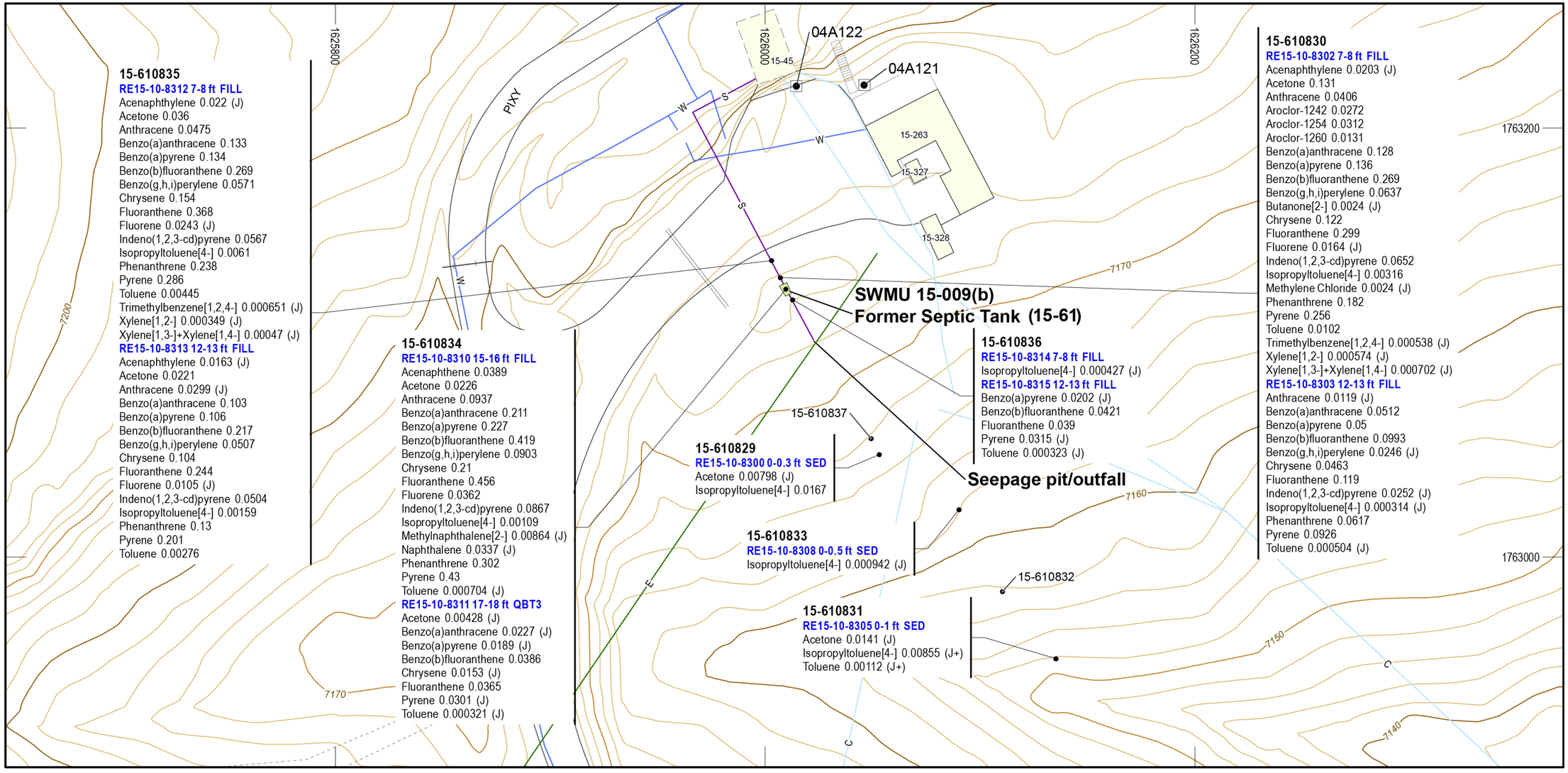


Figure 4.3-12 Organic chemicals detected at SWMU 15-009(b)

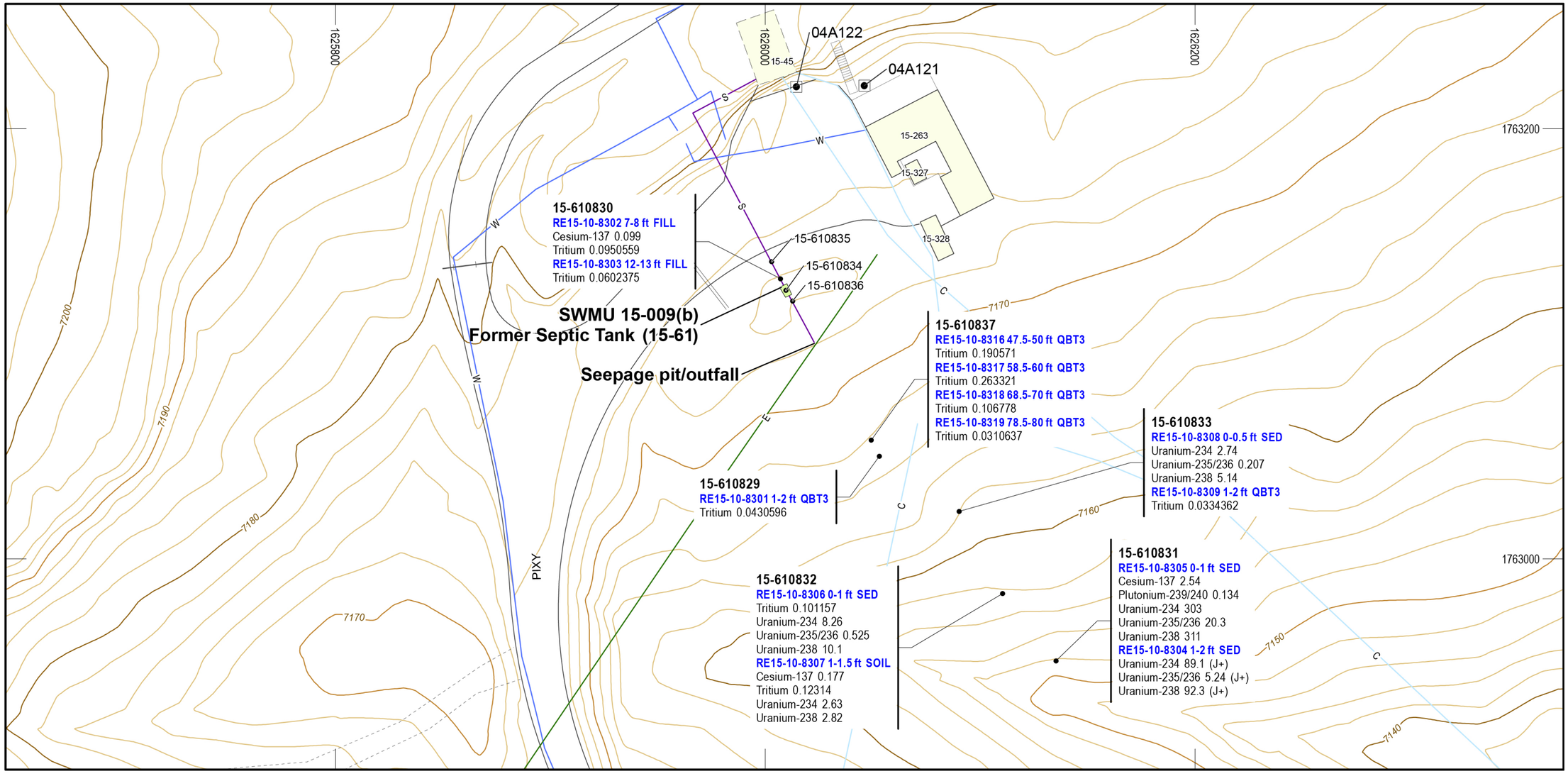


Figure 4.3-13 Radionuclides detected or detected above BVs/FVs at SWMU 15-009(b)

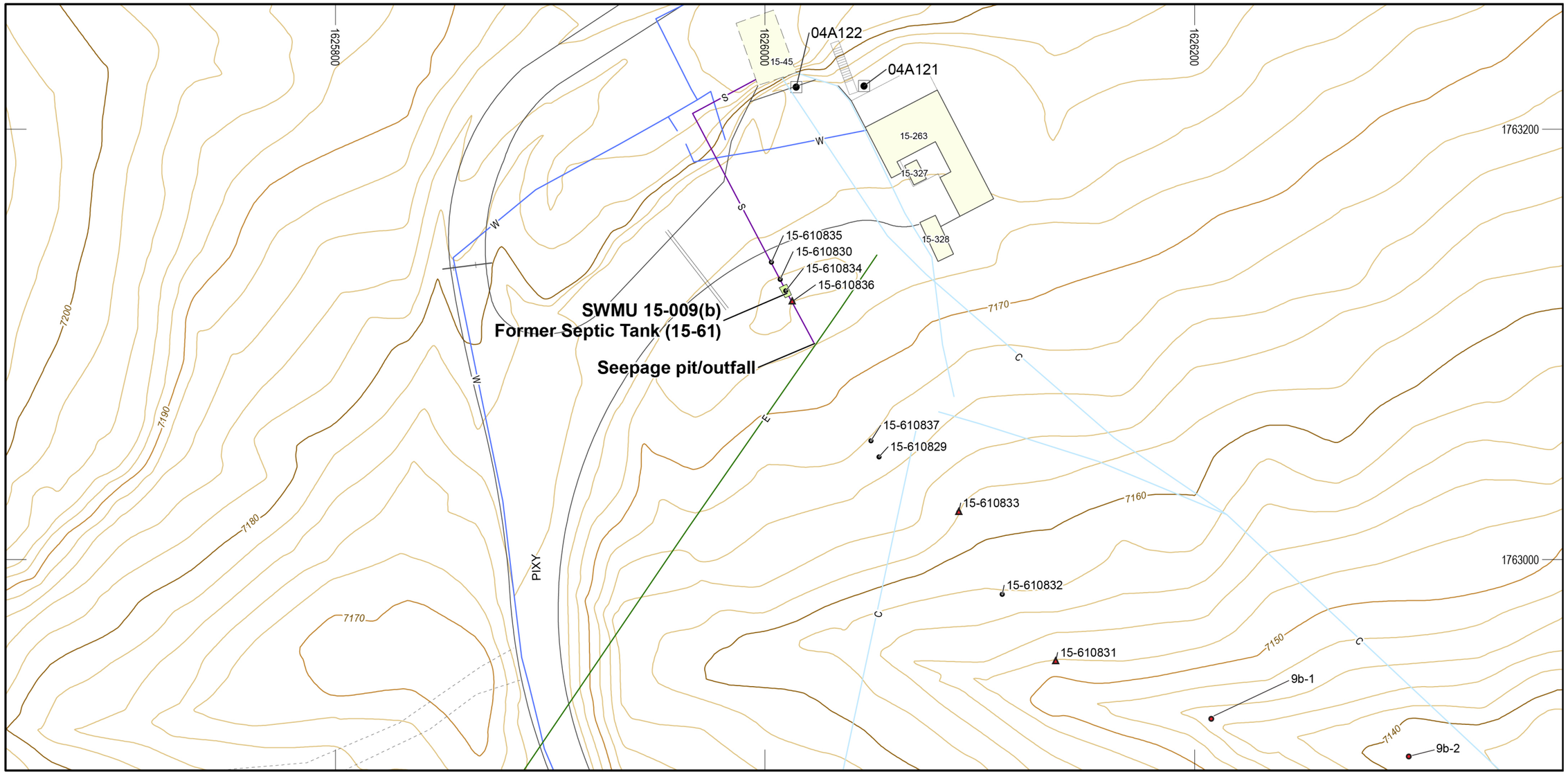


Figure 4.3-14 Proposed sampling locations at SWMU 15-009(b)

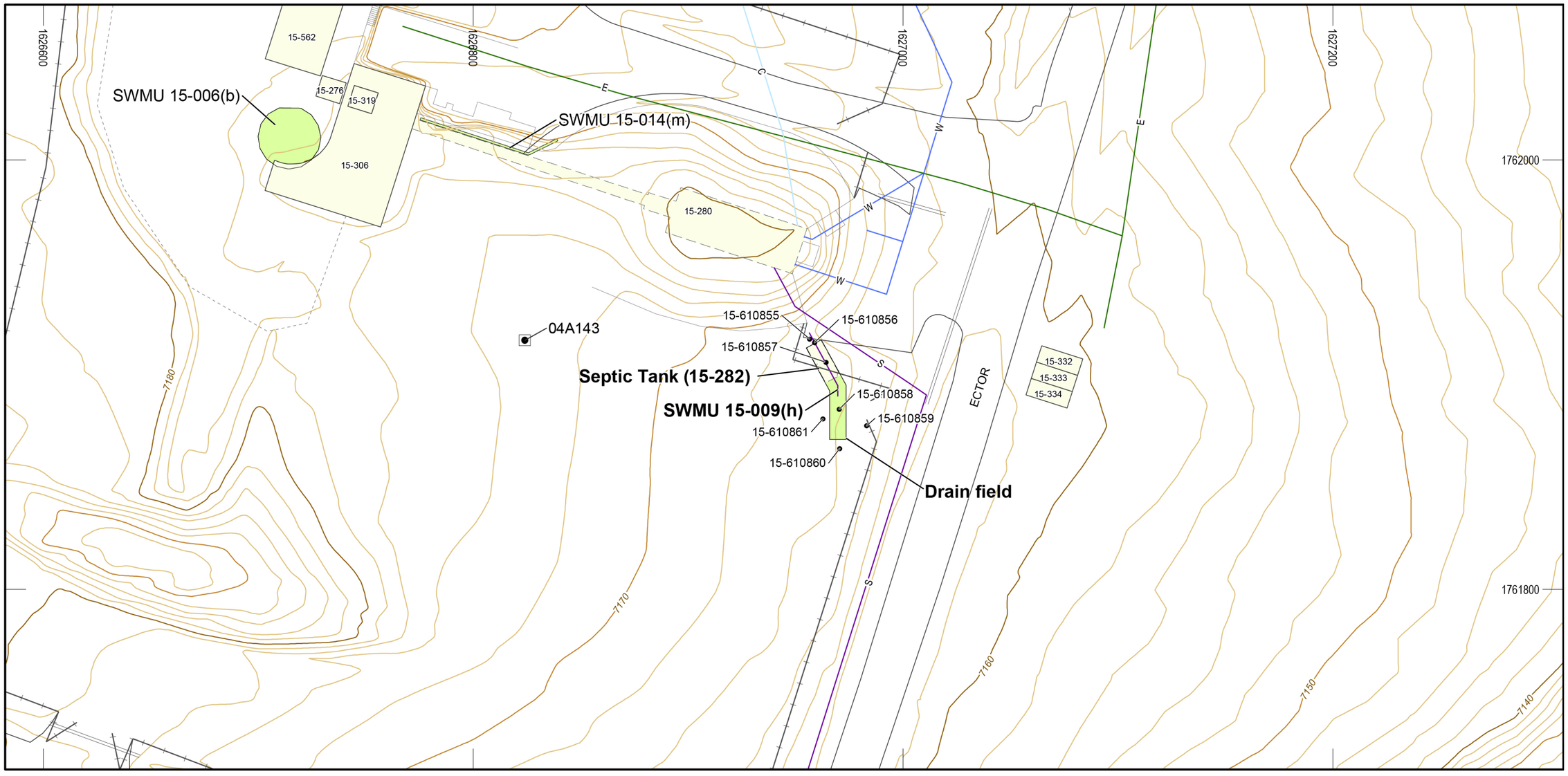


Figure 4.3-15 Site map and sampling locations at SWMU 15-009(h)

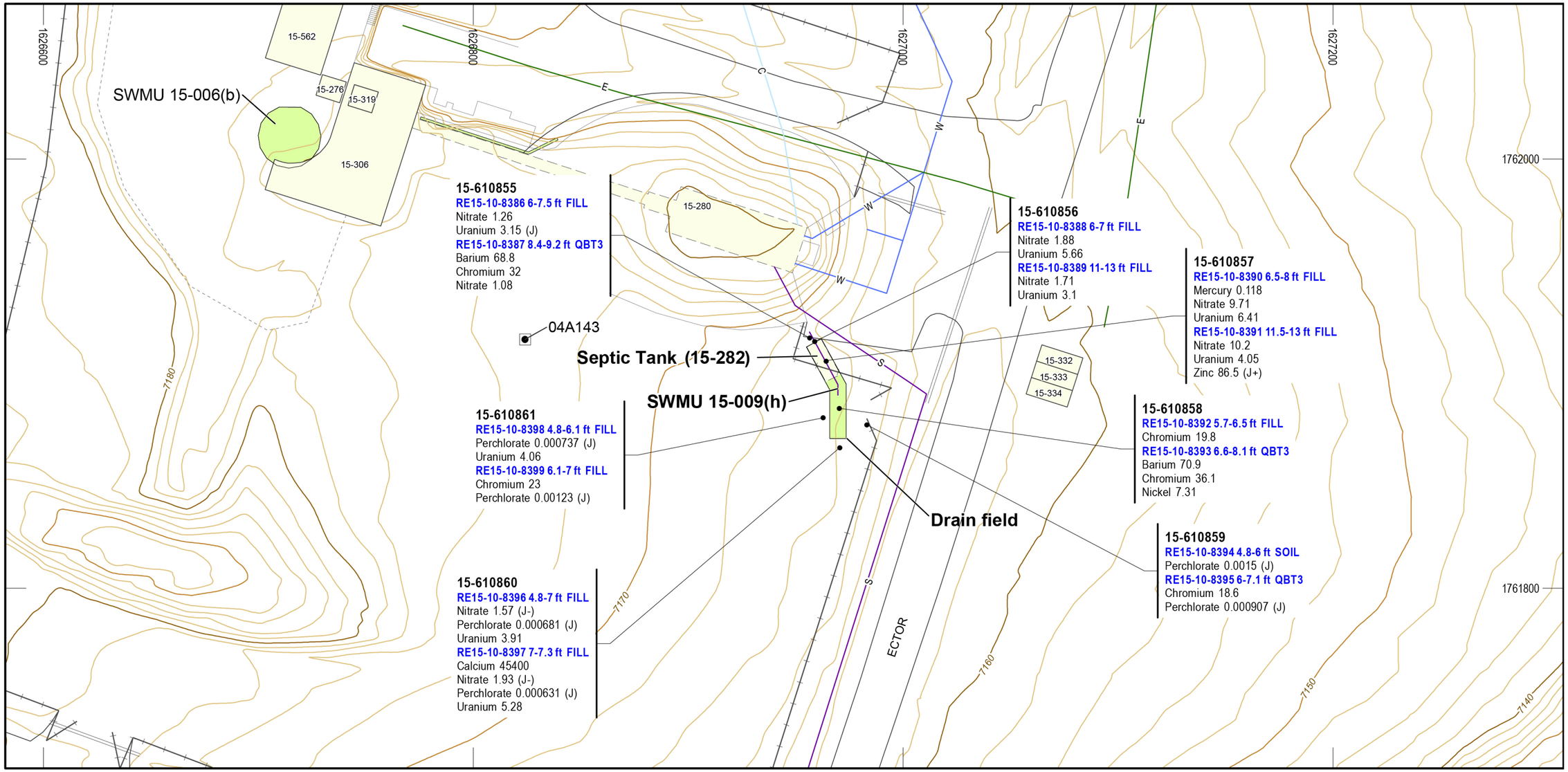


Figure 4.3-16 Inorganic chemicals detected or detected above BVs at SWMU 15-009(h)

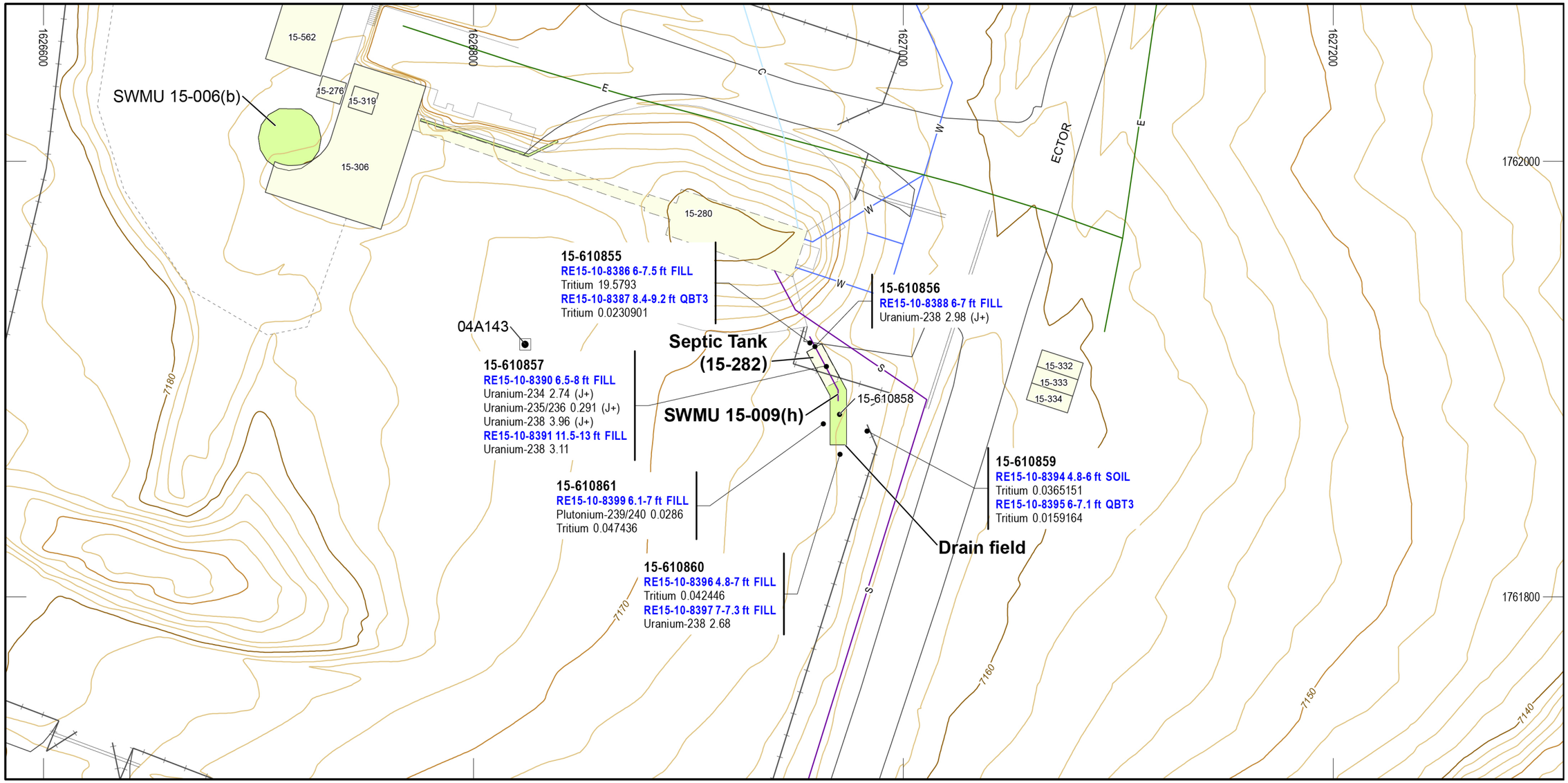


Figure 4.3-17 Radionuclides detected or detected above BVs/FVs at SWMU 15-009(h)

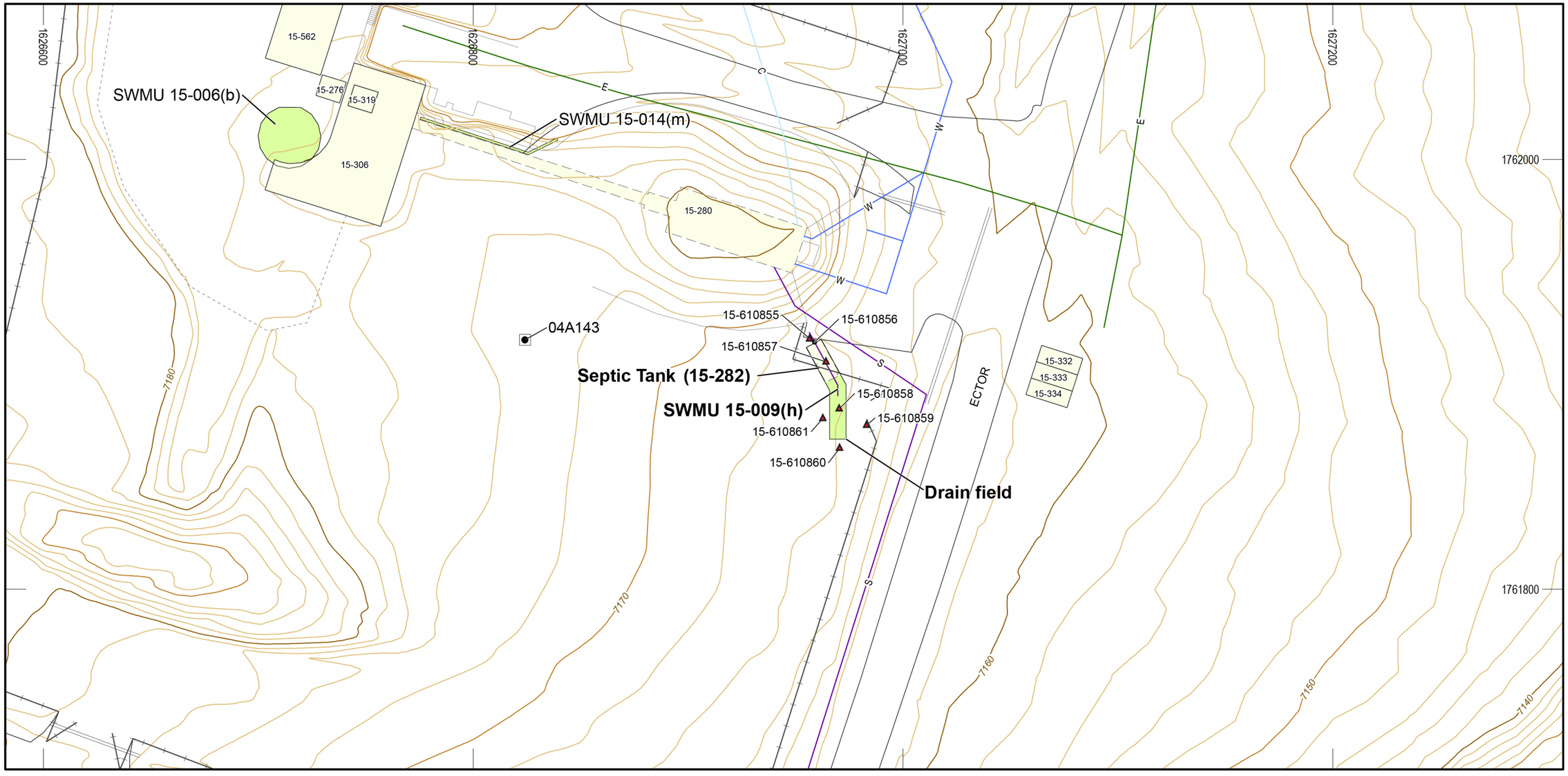


Figure 4.3-18 Proposed sampling locations at SWMU 15-009(h)

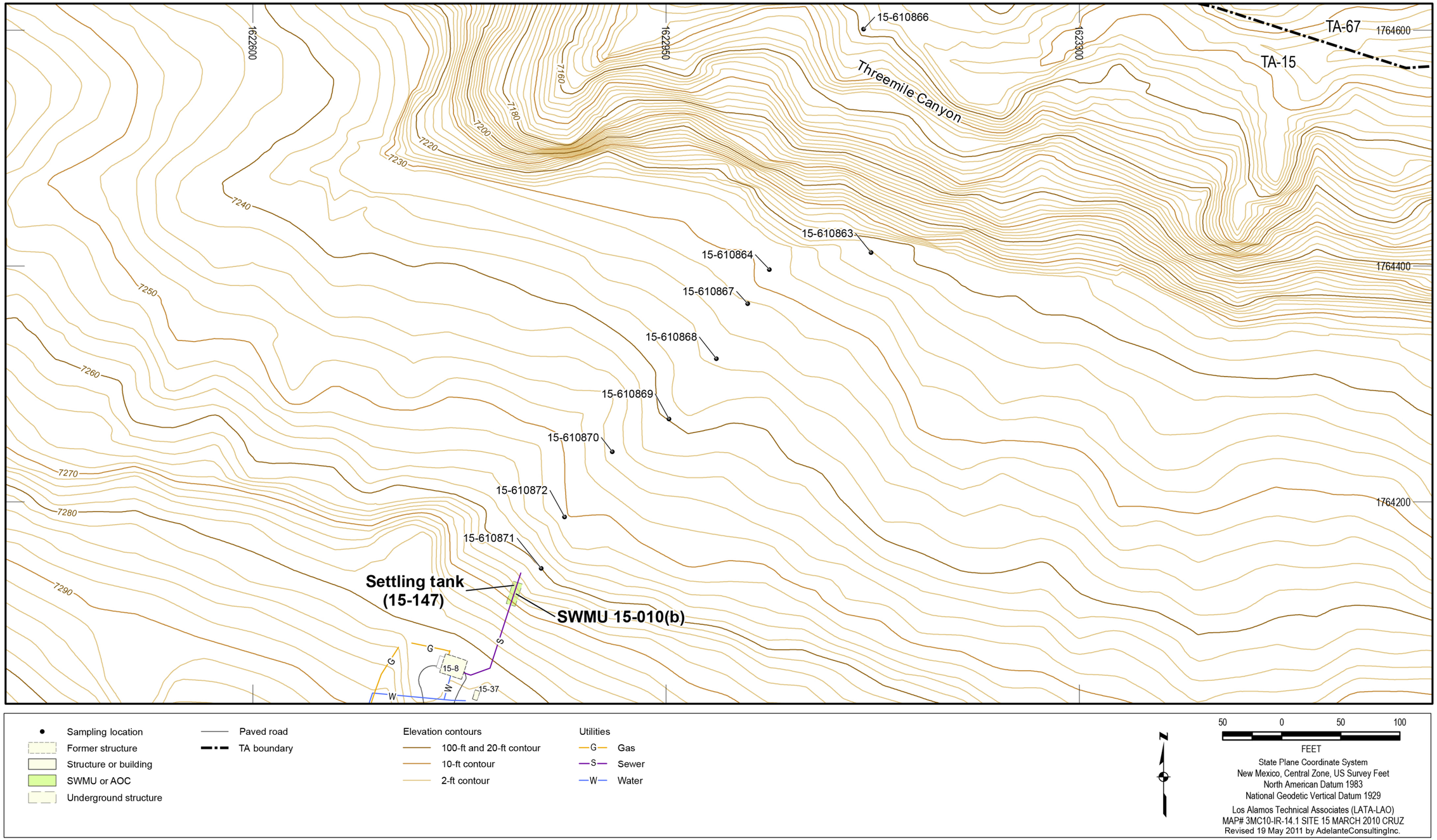


Figure 4.3-19 Site map and sampling locations at SWMU 15-010(b)

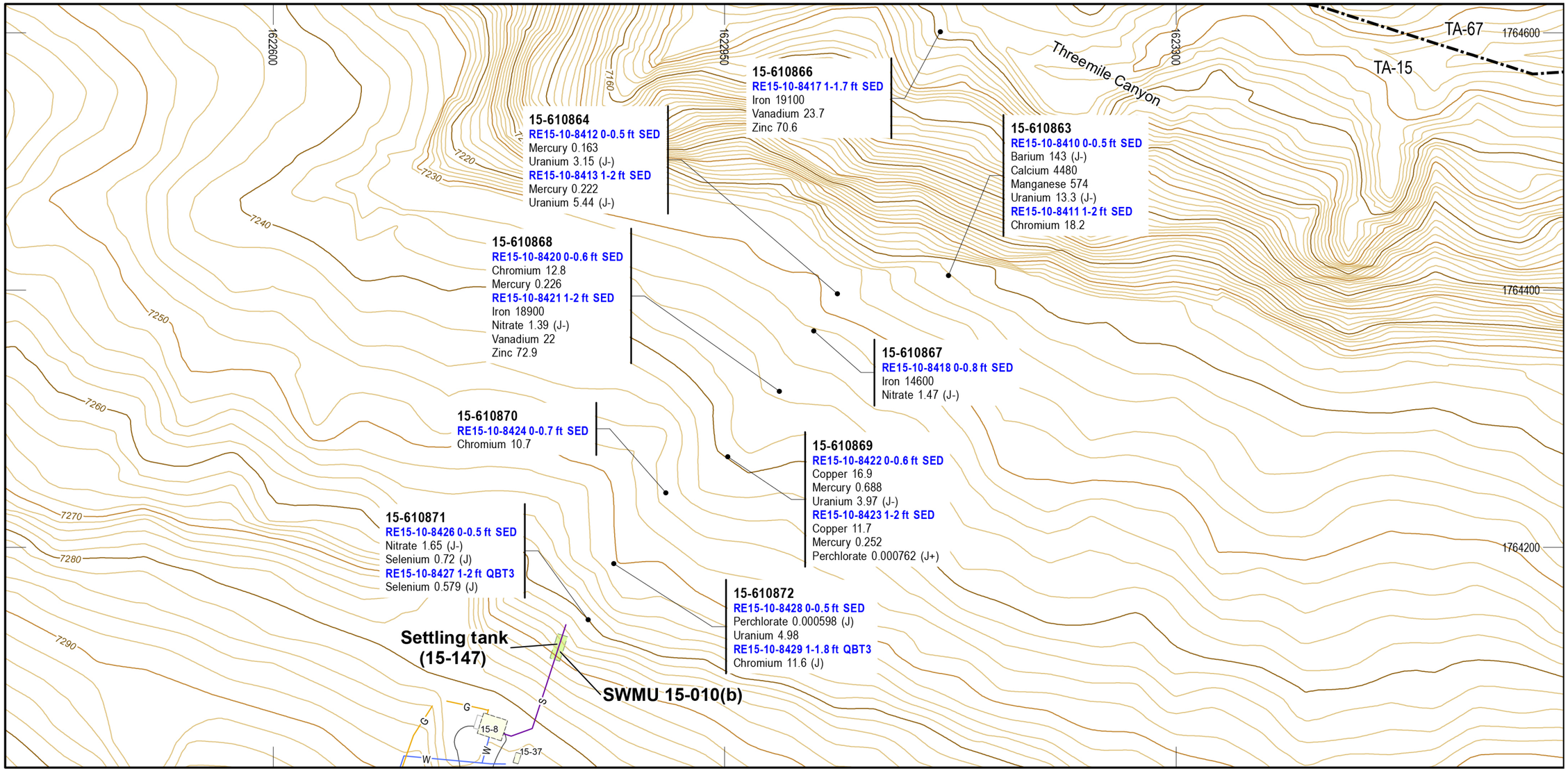
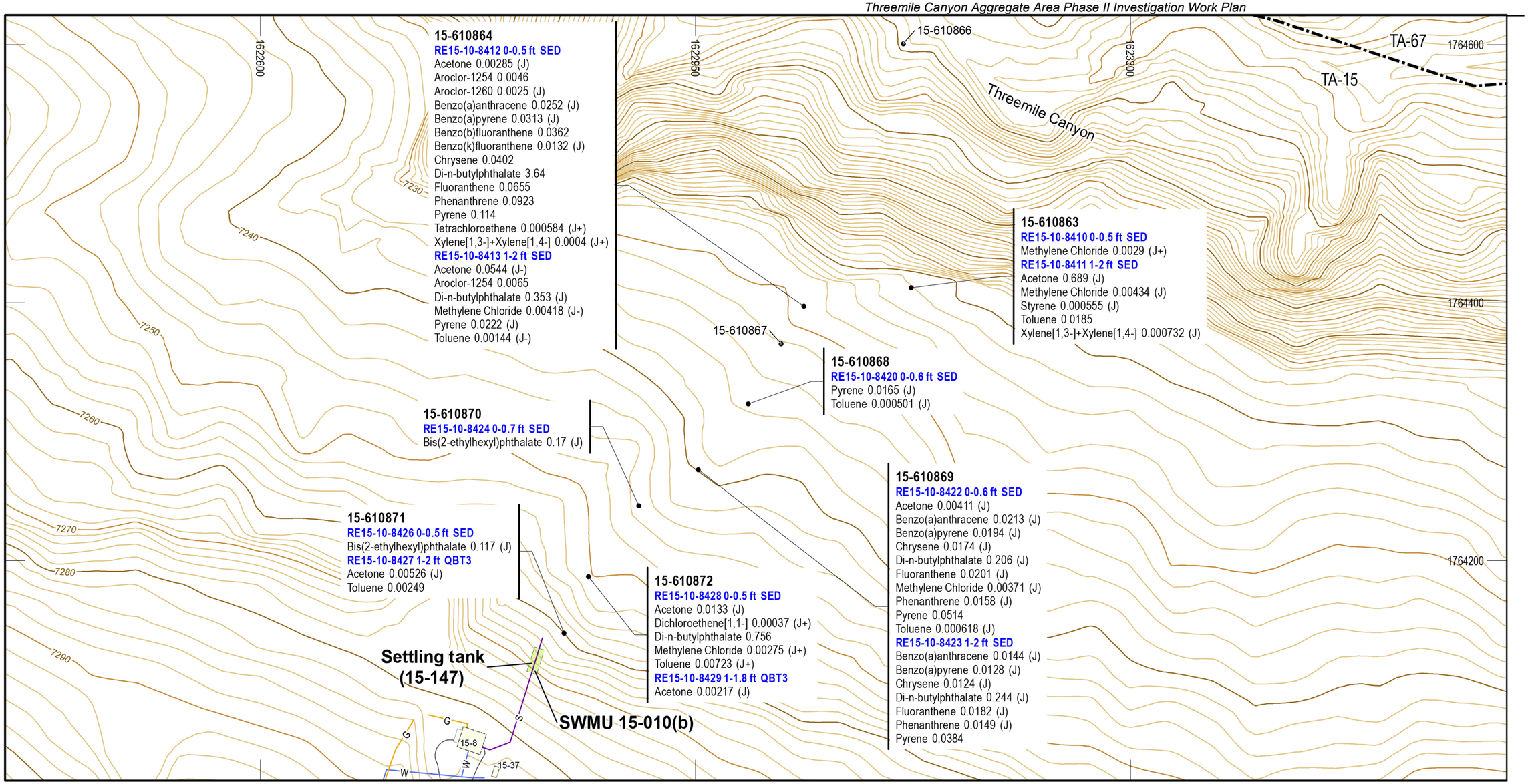


Figure 4.3-20 Inorganic chemicals detected or detected above BVs at SWMU 15-010(b)



Note: Concentrations are in mg/kg.

Figure 4.3-21 Organic chemicals detected at SWMU 15-010(b)

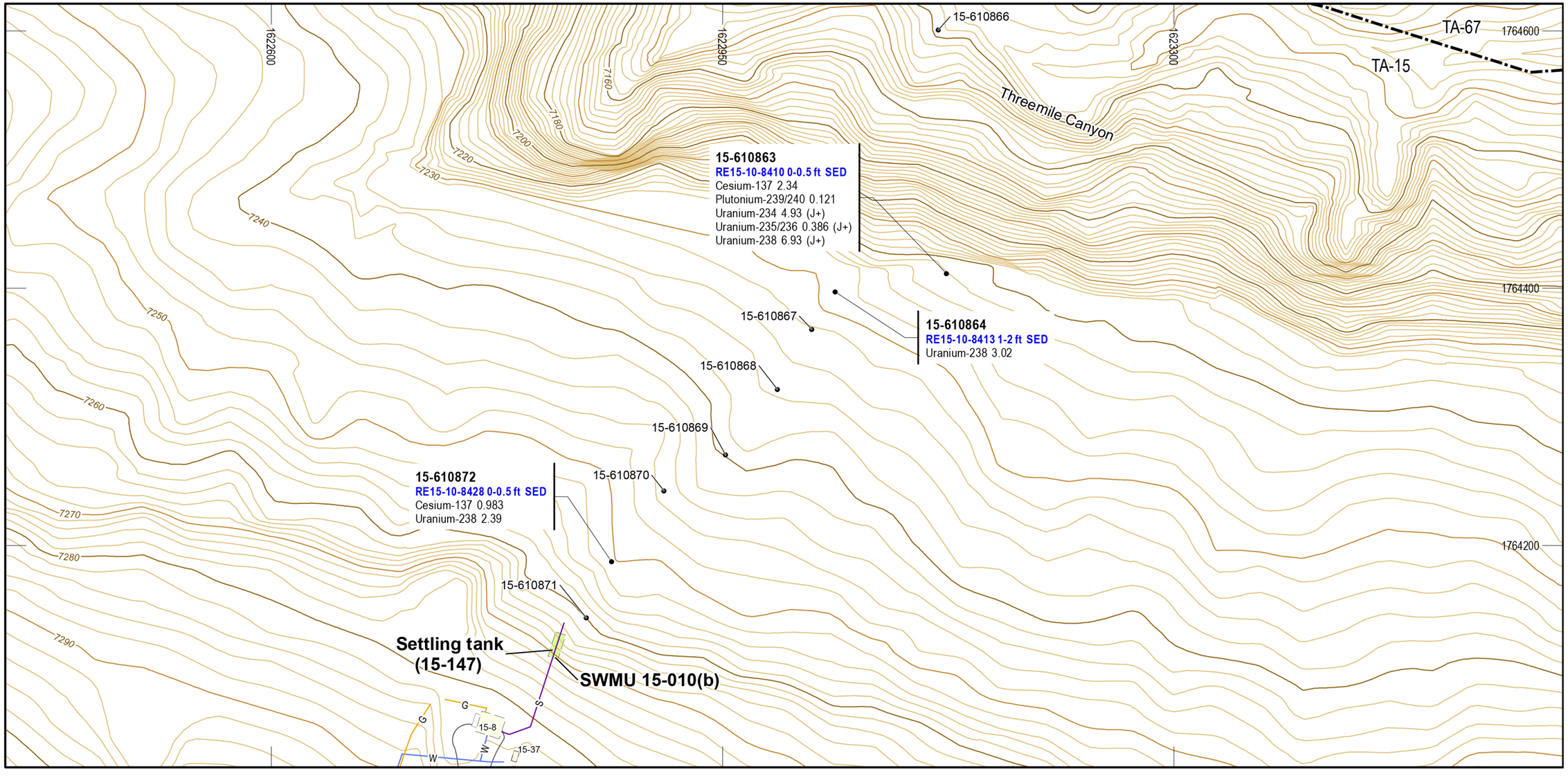


Figure 4.3-22 Radionuclides detected or detected above BVs/FVs at SWMU 15-010(b)

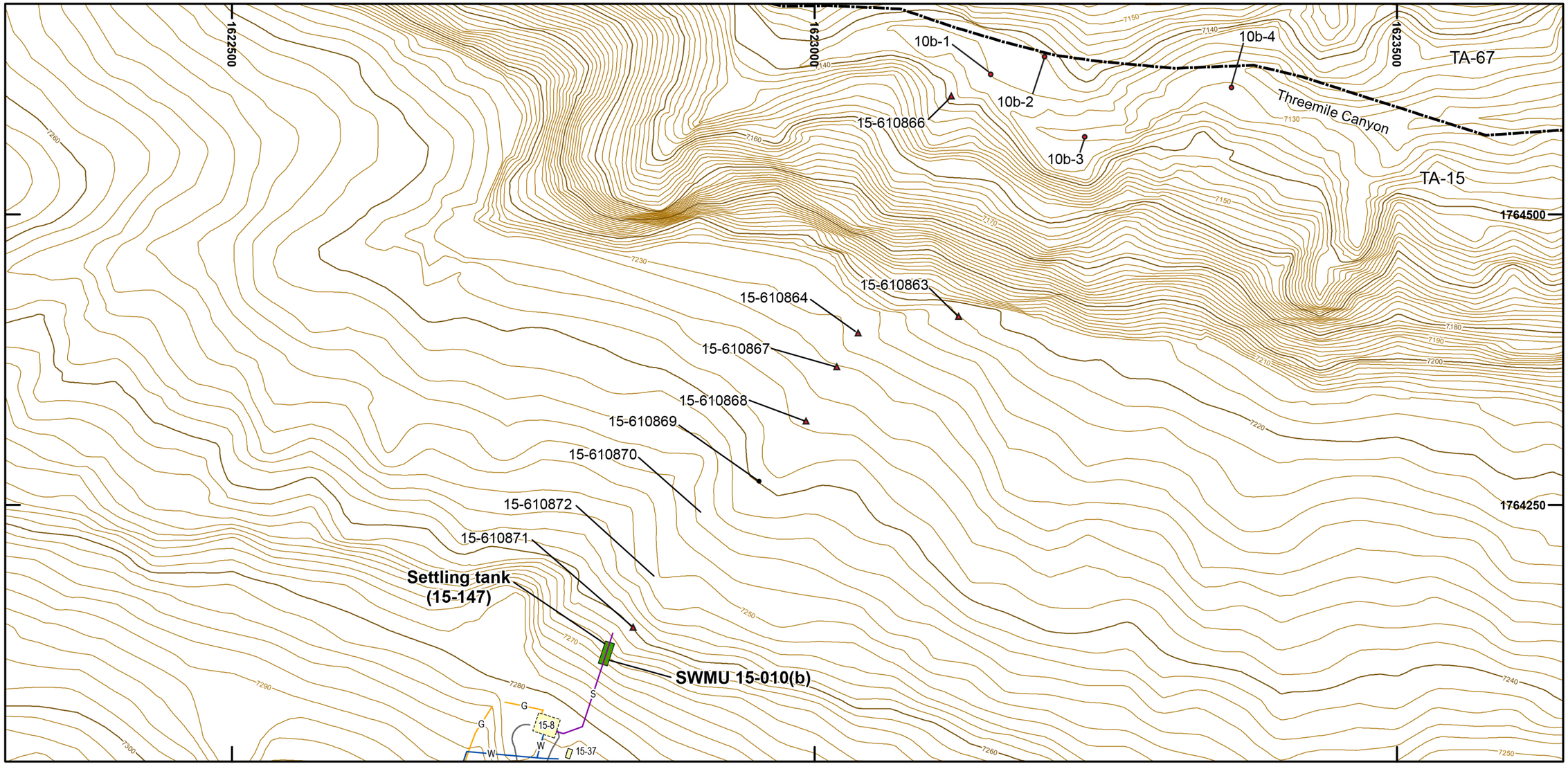
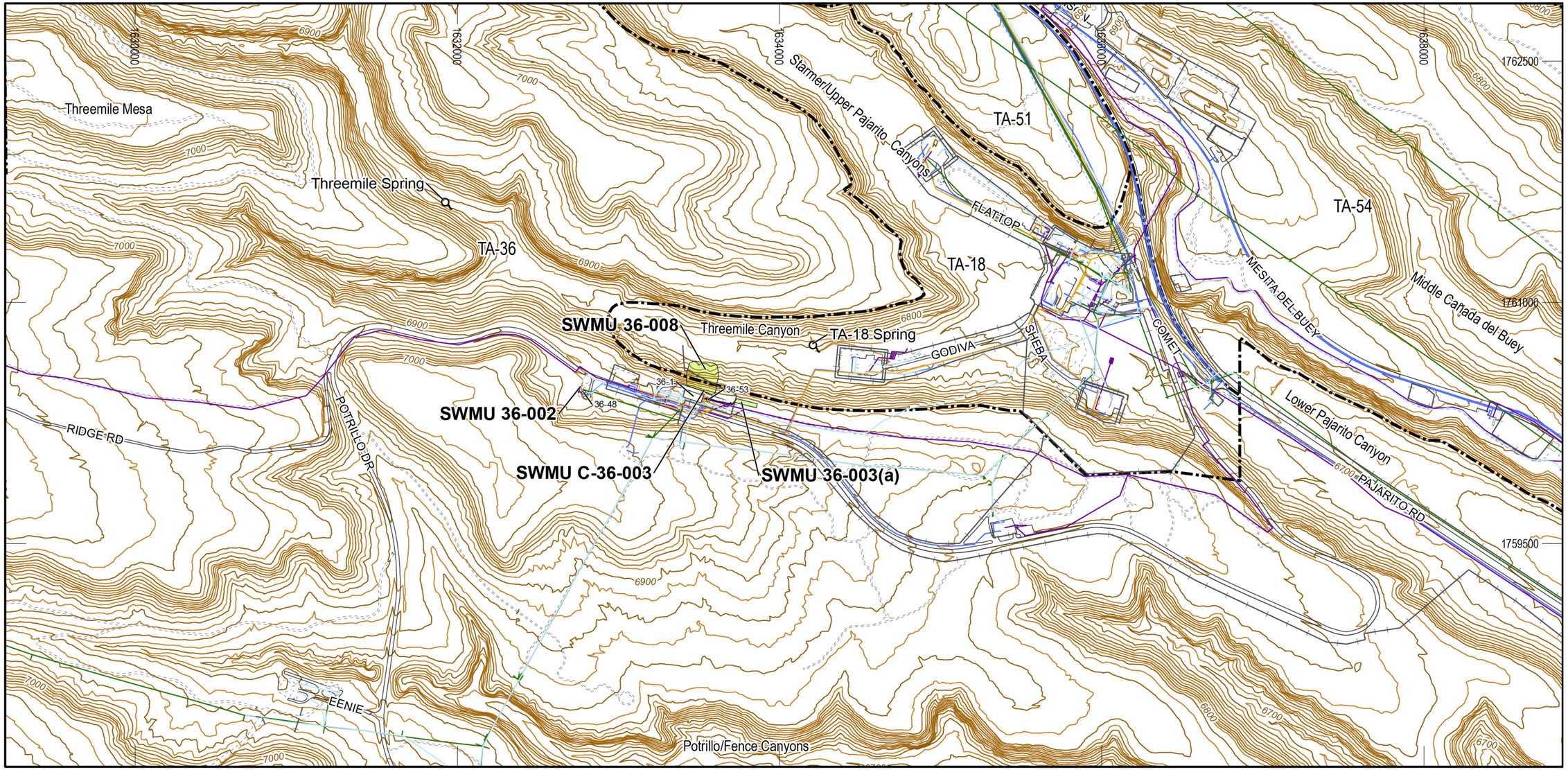


Figure 4.3-23 Proposed sampling locations at SWMU 15-010(b)



Spring
Former structure
Structure or building
SWMU or AOC
Fence
Paved road
TA boundary
Unpaved road
Elevation contours
100- and 20-ft contour
10-ft contour
Utilities
C Communication
E Electric
G Gas
S Sewer
W Water

N

250 0 250 500
FEET

State Plane Coordinate System
New Mexico, Central Zone, US Survey Feet
North American Datum 1983
National Geodetic Vertical Datum 1929

Los Alamos Technical Associates (LATA-LAO)
MAP# 3MC10-IR-58.0 SITE 15 MARCH 2010 CRUZ
Revised 19 May 2011 by AdelanteConsultingInc.

Figure 4.4-1 Site map of TA-36

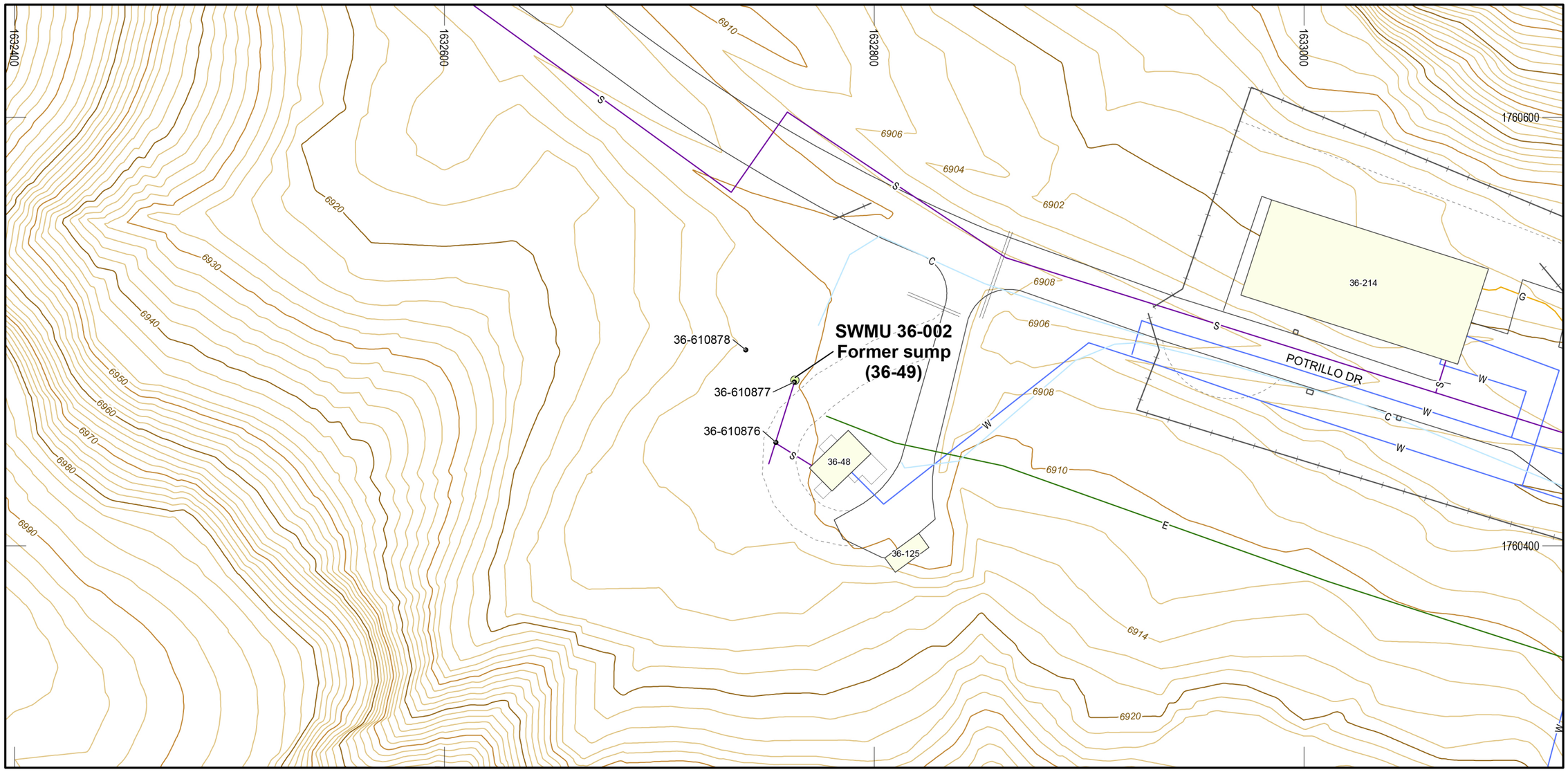


Figure 4.4-2 Site map and sampling locations at SWMU 36-002

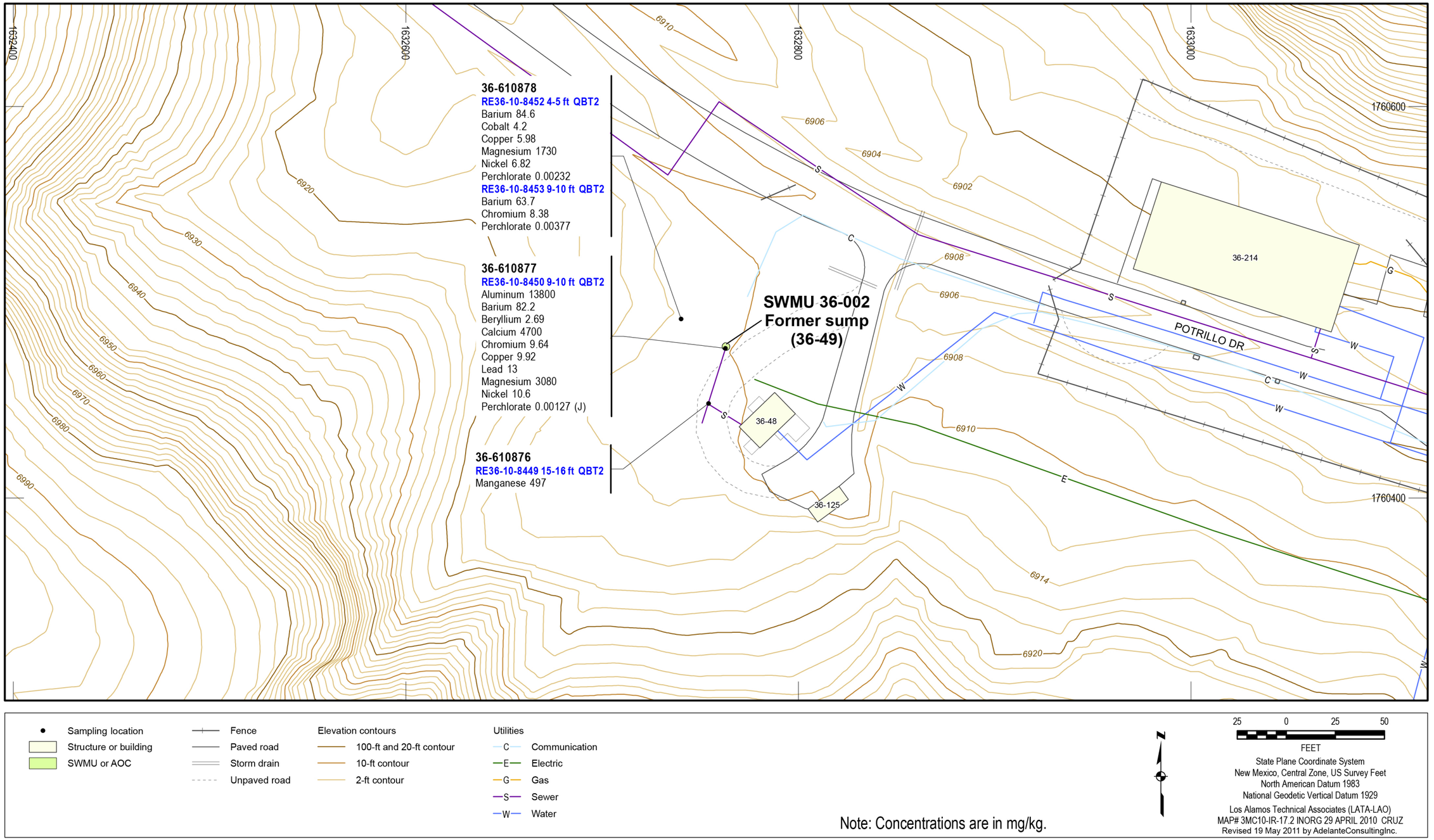


Figure 4.4-3 Inorganic chemicals detected or detected above BVs at SWMU 36-002

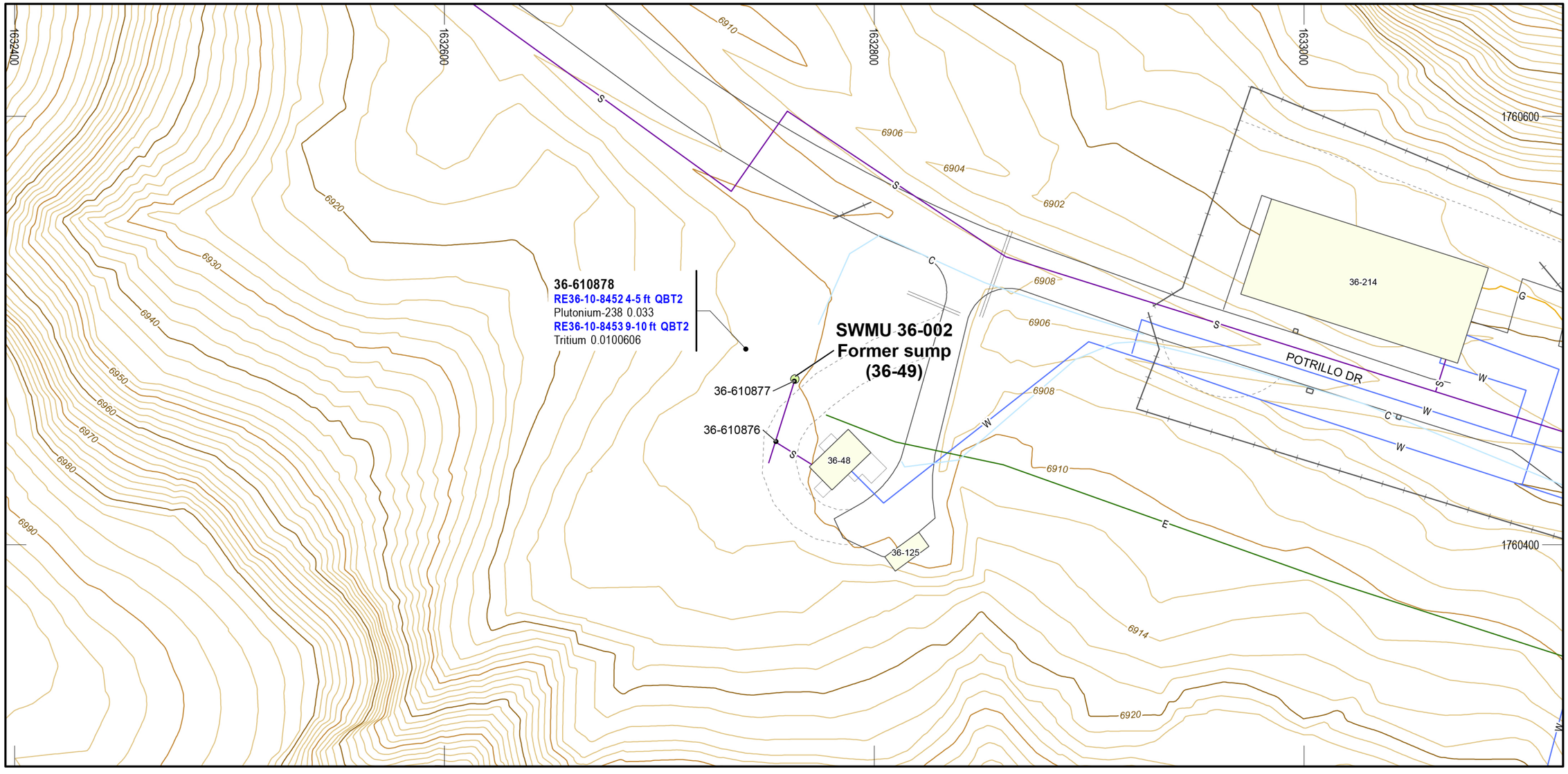


Figure 4.4-4 Radionuclides detected or detected above BVs/FVs at SWMU 36-002

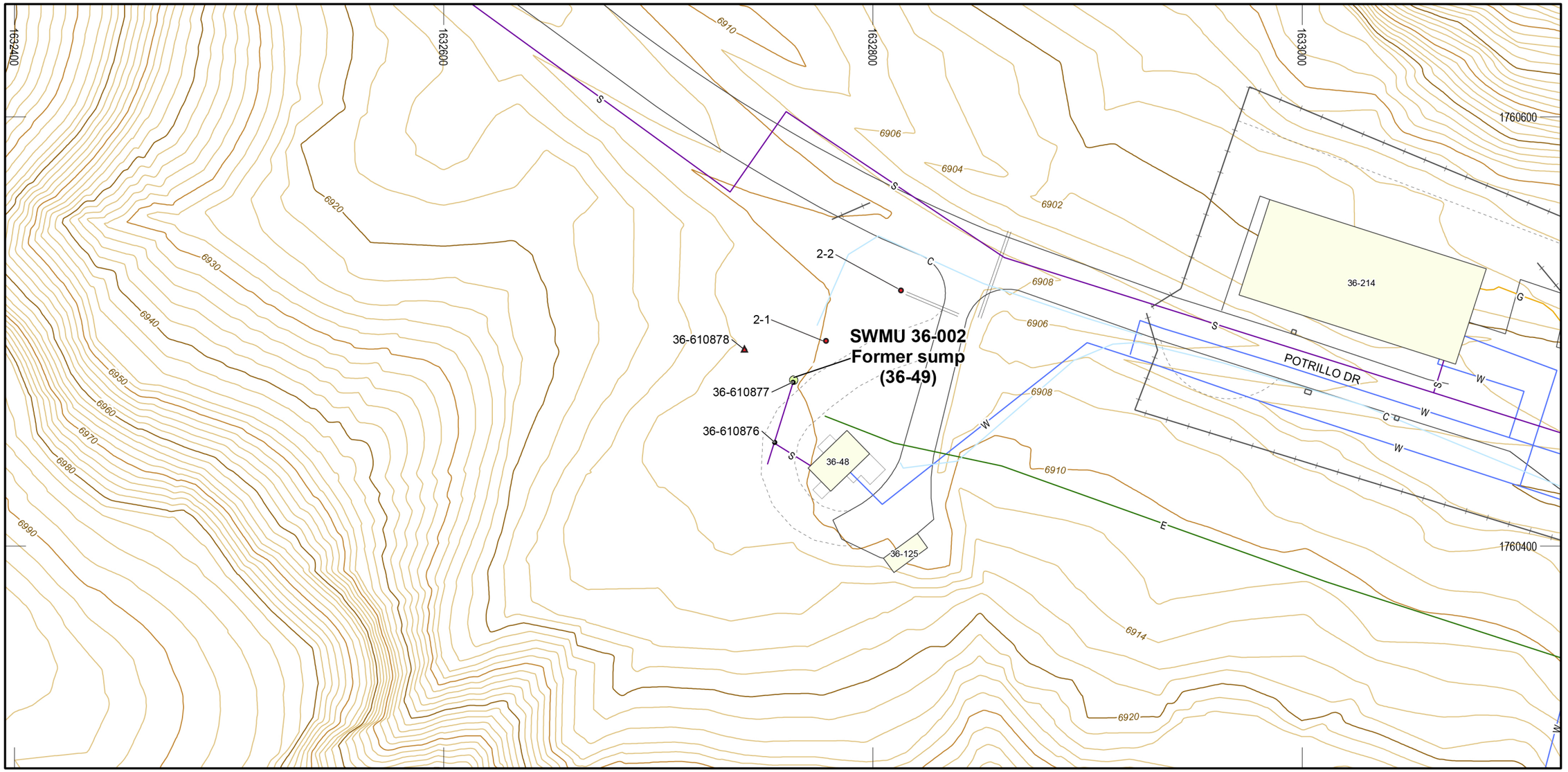


Figure 4.4-5 Proposed sampling locations at SWMU 36-002

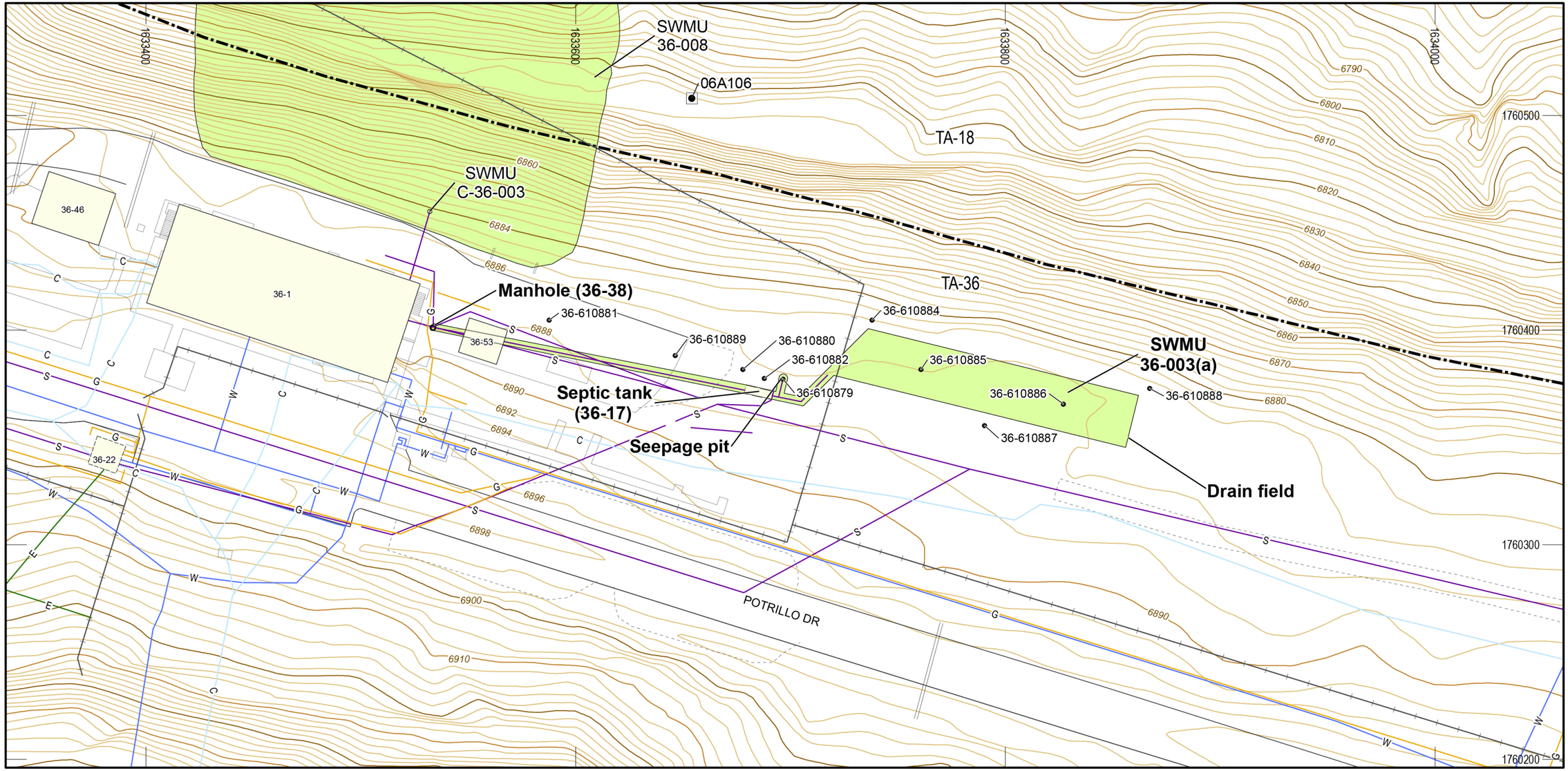


Figure 4.4-6 Site map and sampling locations at SWMU 36-003(a)

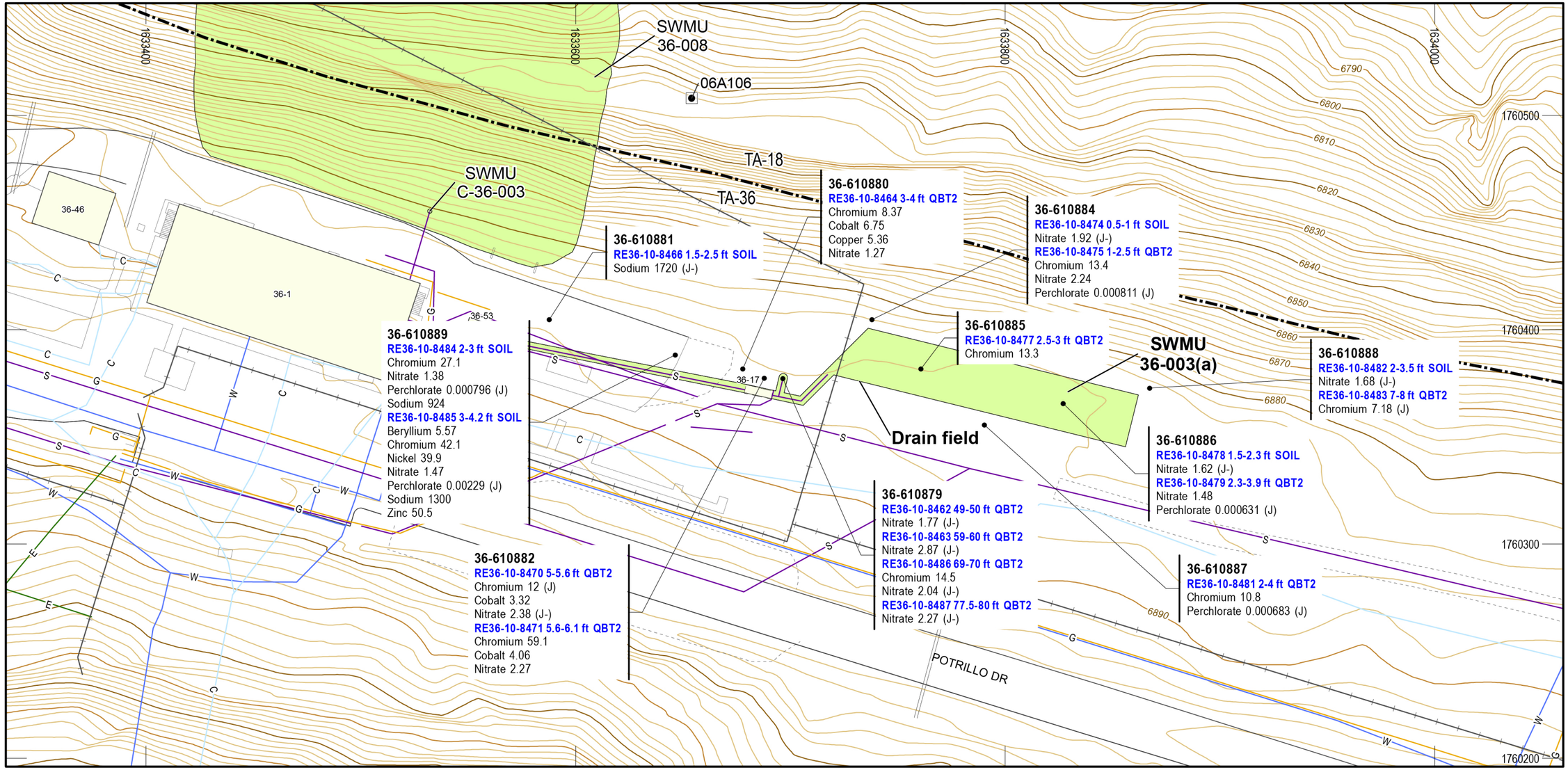


Figure 4.4-7 Inorganic chemicals detected or detected above BVs at SWMU 36-003(a)

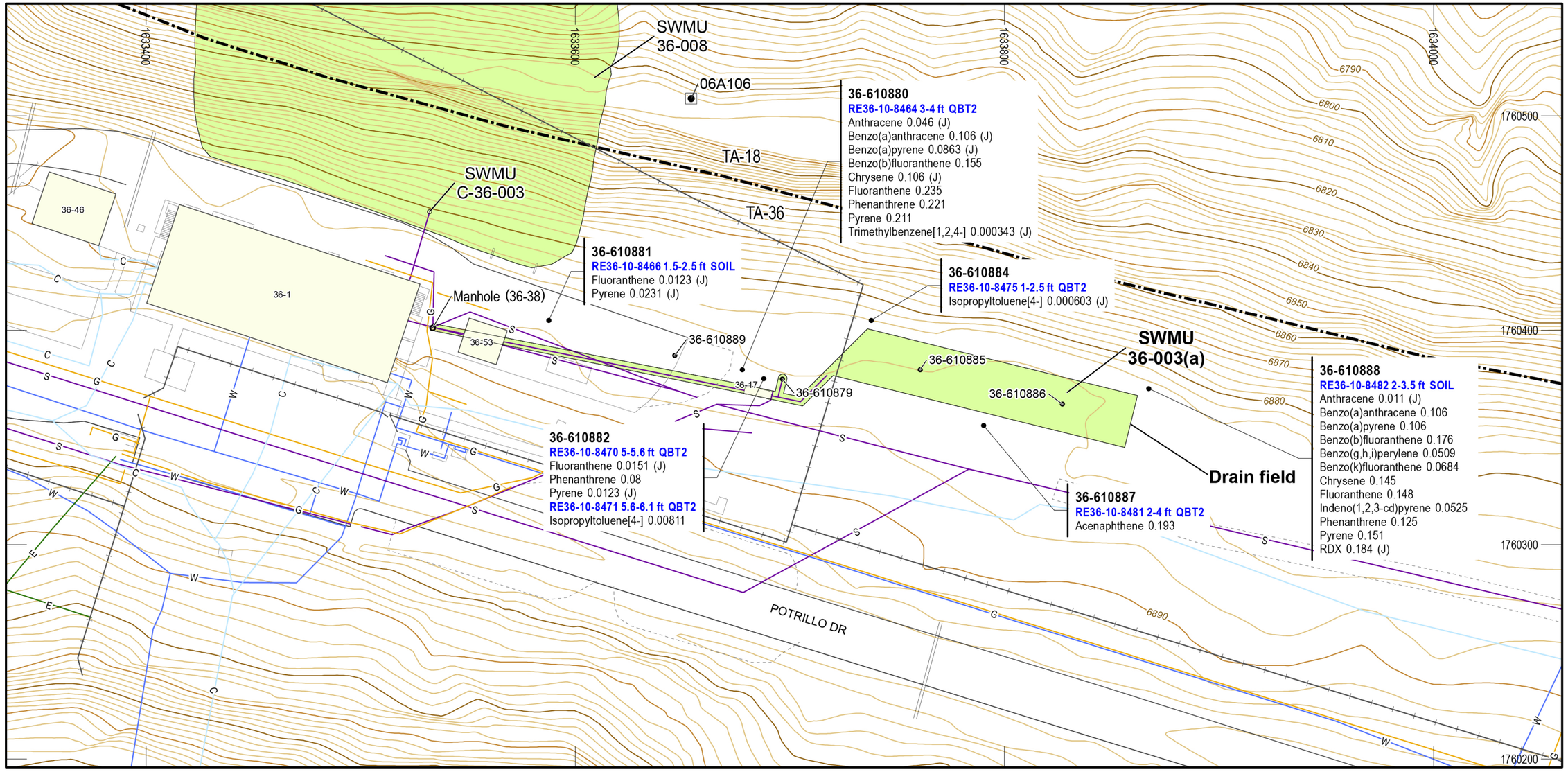


Figure 4.4-8 Organic chemicals detected at SWMU 36-003(a)

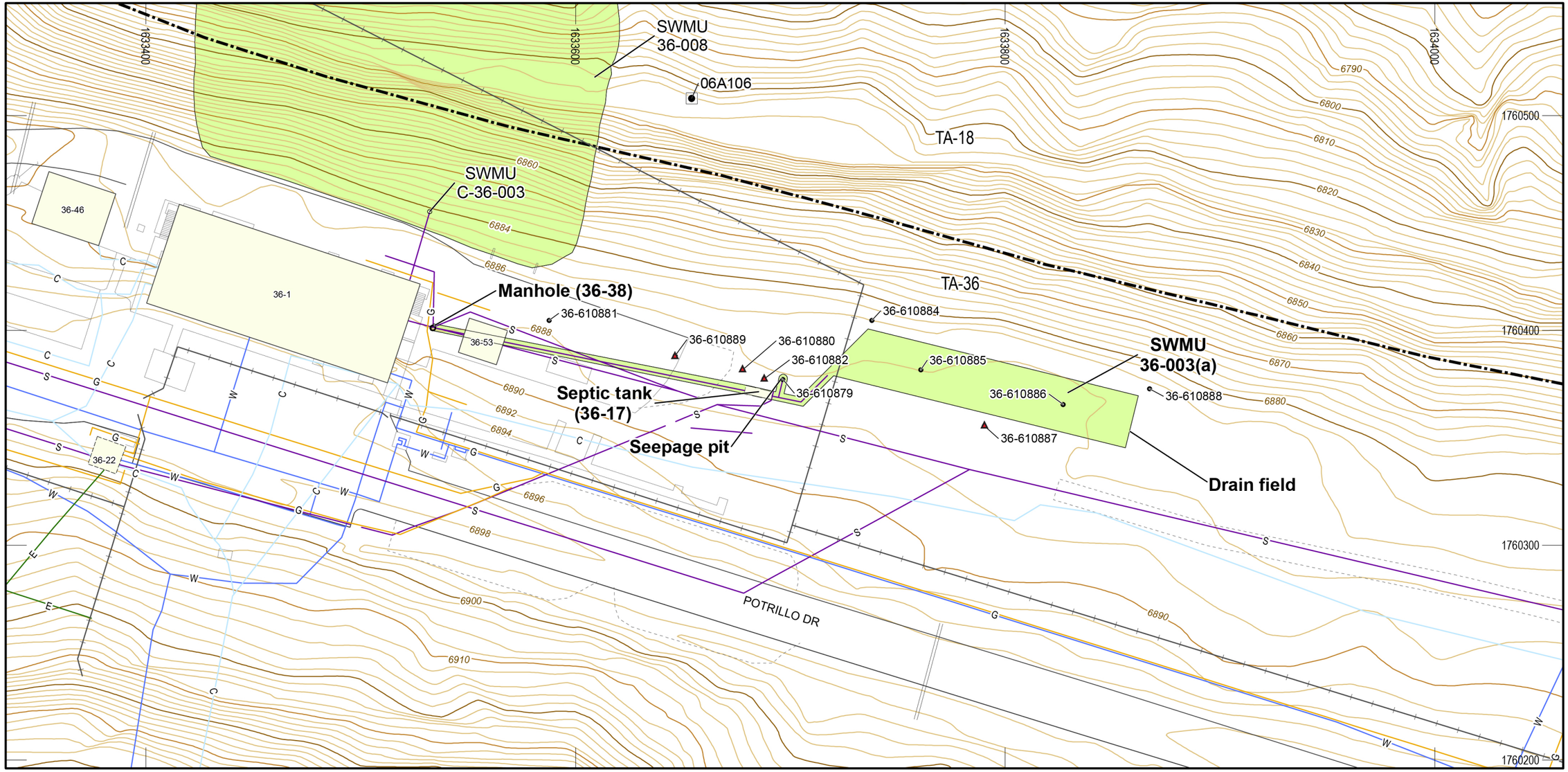


Figure 4.4-9 Proposed sampling locations at SWMU 36-003(a)

Table 1.1-1
Sites under Phase II Investigation in the Threemile Canyon Aggregate Area

Consolidated Unit	SWMU/AOC	Site Description	2009–2010 Investigation Results	Proposed Activities
Former TA-12				
12-001(a)-99	SWMU 12-001(a)	Steel-lined firing pit	Extent not defined: vertical extent of aluminum, antimony, barium, calcium, chromium, cobalt, copper, cyanide, iron, manganese, nickel, vanadium, zinc, HMX, RDX, cesium-137, plutonium-239/240, and uranium-238; lateral extent of antimony, barium cobalt, and nickel.	Additional sampling to define extent
	SWMU 12-001(b)	Former firing pit		
	SWMU 12-002	Potential soil contamination		
	AOC C-12-005	Former junction box		
	AOC 12-004(a)	Radiation test site	Extent not defined: vertical extent of antimony, aluminum, barium, calcium, chromium, cobalt, lead, nickel, vanadium, uranium, cesium-137, uranium-234, uranium-235/236, and uranium-238; lateral extent of barium, calcium, chromium, cobalt, nickel, vanadium, uranium, uranium-234, uranium-235/236, and uranium-238	Additional sampling to define extent
	AOC 12-004(b)	Pipe	Extent not defined: vertical extent of calcium, chromium, copper, magnesium, nickel, and selenium	Additional sampling to define extent
	AOC C-12-001	Potential soil contamination associated with former building 12-1	Extent not defined: vertical extent of aluminum, barium, calcium, chromium, and nickel; lateral extent of aluminum, barium, cobalt, nickel, Aroclor-1242, Aroclor-1254, and Aroclor-1260	Additional sampling to define extent
	AOC C-12-002	Potential soil contamination associated with former building 12-2	Extent not defined: vertical extent of aluminum, barium, calcium, cobalt, copper, and nickel; lateral extent of aluminum, barium, copper, nickel, and vanadium	Additional sampling to define extent
	AOC C-12-003	Potential soil contamination associated with former building 12-3	Extent not defined: vertical extent of antimony and chromium	Additional sampling to define extent
	AOC C-12-004	Potential soil contamination associated with former building 12-5	Extent not defined: vertical extent of aluminum, barium, calcium, cobalt, and nickel; lateral extent of aluminum, calcium, cobalt, copper, lead, and nickel	Additional sampling to define extent

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Site Description	2009–2010 Investigation Results	Proposed Activities
TA-14				
	AOC C-14-006	Potential soil contamination associated with former building 14-9	Extent not defined: lateral extent of TATB	Additional sampling to define extent
TA-15				
	AOC 15-005(c)	Container storage area (R-41)	Extent not defined: vertical extent of antimony, barium, chromium, cobalt, iron, and vanadium; lateral extent of barium, chromium, cobalt, copper, iron, and vanadium	Additional sampling to define extent
15-007(c)-00	SWMU 15-007(c)	Shaft	Extent not defined: vertical extent of aluminum, antimony, barium, calcium, chromium, cobalt, copper, lead, magnesium, manganese, nickel, and vanadium. Extent not defined: lateral extent of tritium. Cleanup levels for lead exceeded at location 15-610814	Additional sampling to define extent; soil removal and confirmation sampling
	SWMU 15-007(d)	Shaft		
	SWMU 15-008(b)	Surface disposal area (north of Firing Site R-44)	Extent not defined: vertical extent of aluminum, antimony, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, mercury, nickel, selenium, uranium, vanadium, americium-241, cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238; lateral extent of arsenic, cobalt, cyanide, iron, and cesium-137. Cleanup levels for lead exceeded at locations 15-02503, 15-610746, and 15-610709.	Additional sampling to define extent; soil removal and confirmation sampling
	AOC 15-008(g)	Surface disposal area (at Firing Site R-45)	Extent not defined: vertical extent of antimony, uranium, TATB, tritium, and uranium-238; lateral extent of antimony, cobalt, lead, uranium, and TATB. Replace rejected barium and 4-nitrotoluene data.	Additional sampling to define extent and to replace barium and 4-nitrotoluene data
	SWMU 15-009(b)	Septic system	Extent not defined: vertical extent of barium, chromium, uranium, benzo(b)fluoranthene, fluoranthene, uranium-234, uranium-235/236, and uranium-238; lateral extent of barium, copper, total cyanide, lead, uranium, cesium-137, plutonium-239/240, uranium-234, uranium-235/236, and uranium-238	Additional sampling to define extent
	SWMU 15-009(c)	Septic system	Extent not defined: vertical extent of chromium, uranium, acetone, uranium-234, uranium-235/236, and uranium-238	Additional sampling to define extent

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Site Description	2009–2010 Investigation Results	Proposed Activities
	SWMU 15-009(h)	Septic system	Extent not defined: vertical extent of barium, calcium, chromium, uranium, zinc, plutonium-239/240, and uranium-238	Additional sampling to define extent; fill septic tank with concrete
	SWMU 15-010(b)	Settling tank	Extent not defined: vertical extent of chromium, iron, mercury, uranium, vanadium, zinc, acetone, Aroclor-1254, toluene, and uranium-238; lateral extent of iron and vanadium	Additional sampling to define extent; fill settling tank with concrete
	AOC 15-014(h)	Outfalls from building 15-40	Extent not defined: vertical extent of aluminum, barium, chromium, cobalt, copper, total cyanide, iron, lead, mercury, nickel, perchlorate, silver, uranium, vanadium, acenaphthene, acetone, toluene, cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238	Additional sampling to define extent
TA-36				
	SWMU 36-002	Former sump	Extent not defined: vertical extent of perchlorate and tritium; lateral extent of barium, copper, magnesium, and nickel	Additional sampling to define extent
	SWMU 36-003(a)	Septic system	Extent not defined: vertical extent of beryllium, chromium, cobalt, nickel, acenaphthene, and 4-isopropyltoluene	Additional sampling to define extent
	SWMU 36-008	Surface disposal area	Extent not defined: vertical extent of aluminum, barium, beryllium, calcium, chromium, cobalt, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, uranium, vanadium, zinc, acetone, 4-isopropyltoluene, toluene, Aroclor-1254, Aroclor-1260, PAHs, cesium-137, plutonium-239/240, tritium, and uranium-238; lateral extent of cesium-137 and plutonium-239/240. Cleanup levels for PAHs exceeded at 36-610579, 36-610585, 36-610588, 36-610605, 36-610608, 36-610610, 36-610824, 36-610825, 36-610826, and 36-610827.	Additional sampling to define extent; soil removal and confirmation sampling
	SWMU C-36-003	Outfall from building 36-01	Extent not defined: vertical extent of cadmium, chromium, copper, total cyanide, mercury, perchlorate, selenium, silver, uranium, Aroclor-1254, Aroclor-1260, toluene, plutonium-238, tritium, and uranium-234.	Additional sampling to define extent; soil removal and confirmation sampling

Table 4.1-1
Proposed Sampling and Analysis at Consolidated Unit 12-001(a)-99

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Explosive Compounds (EPA SW-846:8321A_MOD)	Cesium-137 (EPA 901.1M)	Isotopic Plutonium (HASL 300)	Isotopic Uranium (HASL-300)
Define vertical extent of aluminum, antimony, barium, calcium, chromium, cobalt, copper, iron, manganese, nickel, vanadium, zinc, HMX, RDX, cesium-137, plutonium-239/240, and uranium-238	12-610639	5–6, 9–10	—[b]	—	X[c]	X	—
	12-610640	5–6, 9–10	—	X[d]	—	—	—
	12-610642	5–6, 9–10	—	X[d]	—	—	—
	12-610647	5–6, 9–10	X[e]	—	—	—	—
	12-610654	5–6, 9–10	X[f]	—	—	—	—
	12-610670	5–6, 9–10	X[g]	—	—	—	—
	12-610671	5–6, 9–10	X[h]	—	—	—	—
	12-610675	5–6, 9–10	X[i]	—	—	—	—
	12-610676	5–6, 9–10	X[j]	—	—	—	X
	12-610680	5–6, 9–10	—	—	X	—	—
	12-610694	5–6, 9–10	X[k]	—	—	—	—
	12-610696	5–6, 9–10	X[l]	—	—	—	—
	12-610697	5–6, 9–10	X[j]	—	—	—	—
	12-610701	5–6, 9–10	X[m]	—	—	—	—
	12-610787	5–6, 9–10	X[n]	—	—	—	—
Define lateral extent of chromium and cobalt to the west of location 12-610694	1a-1	0–1, 2–3, 5–6, 9–10	X[o]	—	—	—	—
	1a-2		X[o]	—	—	—	—
Define lateral extent of nickel and vanadium to the east of location 12-610787	1a-3	0–1, 2–3, 5–6, 9–10	X[p]	—	—	—	—
	1a-4		X[p]	—	—	—	—

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] — = Analysis will not be performed.

[c] X = Analysis will be performed.

[d] HMX and RDX only.

[e] Cobalt and manganese only.

[f] Calcium only.

[g] Aluminum, barium, and iron only.

[h] Aluminum, barium, calcium, cobalt, and vanadium only.

[i] Zinc only.

[j] Chromium only.

[k] Antimony, chromium, cobalt, and manganese only.

[l] Cobalt only.

[m] Aluminum, barium, calcium, cobalt, and nickel only.

[n] Aluminum, barium, calcium, chromium, cobalt, copper, iron, nickel, and vanadium only.

[o] Chromium and cobalt only.

[p] Nickel and vanadium only.

Table 4.1-2
Proposed Sampling and Analysis at AOC 12-004(a)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Isotopic Uranium (HASL-300)
Define vertical extent of aluminum, antimony, barium, calcium, chromium, cobalt, lead, nickel, uranium, vanadium, uranium-234, uranium-235/236, and uranium-238	12-610527	5–6, 9–10	X[b,c]	—[d]
	12-610528	5–6, 9–10	X[e]	—
	12-610529	5–6, 9–10	X[f]	—
	12-610530	5–6, 9–10	X[g]	—
	12-610540	5–6, 9–10	X[h]	—
	12-610543	5–6, 9–10	X[i]	—
	12-610545	5–6, 9–10	—	X
	12-610548	5–6, 9–10	—	X
	12-610549	5–6, 9–10	X[h]	X
	12-610550	5–6, 9–10	—	X
Define lateral extent of barium, calcium, nickel, and vanadium east of existing sampling locations 12-610528 and 12-610529	4a-1 and 4a-2	0–1, 2–3, 5–6, 9–10	X[j]	—
Define lateral extent chromium west of existing sampling locations 12-610540, 12-610542, and 12-610543 and east of 12-610543	4a-3, 4a-4, 4a-5, and 4a-6	0–1, 2–3, 5–6, 9–10	X[h]	—
Define lateral extent of cobalt west of existing sampling location 12-610527	4a-7	0–1, 2–3, 5–6, 9–10	X[g]	—
Define lateral extent of uranium, uranium-234, uranium-235/236, and uranium-238 in the drainage downgradient of existing sampling location 12-610550	4a-8 and 4a-9	0–1, 2–3	—	X

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Cobalt and lead only.

[d] — = Analysis will not be performed.

[e] Barium and calcium only.

[f] Aluminum, barium, calcium, chromium, nickel, and vanadium only.

[g] Cobalt only.

[h] Chromium only.

[i] Antimony, calcium, chromium, and nickel only.

[j] Barium, calcium, nickel, and vanadium only.

Table 4.1-3
Proposed Sampling and Analysis at AOC 12-004(b)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)
Define vertical extent of calcium, chromium, copper magnesium, nickel, and selenium	12-611939	6–7, 9–10	X[b,c]

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Calcium, chromium, copper, magnesium, nickel, and selenium only.

Table 4.1-4
Proposed Sampling and Analysis at AOC C-12-001

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	PCBs (EPA SW-846:8082)
Define vertical extent of aluminum, barium, calcium, chromium, and nickel	12-610624 12-610625 12-610627 12-610628	5–6, 9–10 5–6, 9–10 5–6, 9–10 5–6, 9–10	X[b,c] X[e] X[f] X[g]	—[d] — — —
Define lateral extent of aluminum, barium, cobalt, nickel, Aroclor-1242, Aroclor-1254, and Aroclor-1260 in the drainage downgradient of existing sampling locations 12-610627 and 12-610628	C1-1, C1-2, C1-3, and C1-4	0–1, 2–3, 5–6, 9–10	X[h]	X

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Chromium only.

[d] — = Analysis will not be performed.

[e] Calcium, chromium, and nickel only.

[f] Aluminum, barium, and calcium only.

[g] Aluminum, barium, calcium, and nickel only.

[h] Aluminum, barium, cobalt, and nickel only.

Table 4.1-5
Proposed Sampling and Analysis at AOC C-12-002

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)
Define vertical extent of aluminum, barium, calcium, cobalt, copper, and nickel	12-610631 12-610632	5–6, 9–10 5–6, 9–10	X[b,c] X[d]
Define lateral extent of aluminum and barium downgradient of existing sampling location 12-610631	C2-1 and C2-2	0–1, 2–3	X[e]
Define lateral extent of aluminum, barium, copper, nickel, and vanadium downgradient of existing sampling location 12-610632	C2-3 and C2-4	0–1, 2–3	X[f]

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Aluminum and cobalt only.

[d] Aluminum, barium, calcium, cobalt, copper, and nickel only.

[e] Aluminum and barium only.

[f] Aluminum, barium, copper, nickel, and vanadium only.

Table 4.1-6
Proposed Sampling and Analysis at AOC C-12-003

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)
Define vertical extent of antimony and chromium	12-610634 12-610637 12-610638	5–6, 9–10 5–6, 9–10 5–6, 9–10	X[b,c] X[d] X[d]

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Antimony only.

[d] Chromium only.

Table 4.1-7
Proposed Sampling and Analysis at AOC C-12-004

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)
Define vertical extent of aluminum, barium, calcium, cobalt, and nickel	12-610570 12-610571 12-610573	5–6, 9–10 5–6, 9–10 5–6, 9–10	X[b,c] X[d] X[e]
Define lateral extent of aluminum, calcium, cobalt, copper, and nickel west of existing sampling location 12-610573	C4-1 and C4-2	0–1, 2–3, 5–6, 9–10	X[f]
Define lateral extent of lead east of existing sampling location 12-610572	C4-3 and C4-4	0–1, 2–3	X[g]

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Aluminum and cobalt only.

[d] Aluminum, barium, and calcium only.

[e] Aluminum, cobalt, and nickel only.

[f] Aluminum, calcium, cobalt, copper, and nickel only.

[g] Lead only.

Table 4.2-1
Proposed Sampling and Analysis at AOC C-14-006

Sampling Objective	Location Number	Depth[a] (ft)	Explosive Compounds (EPA SW-846:6010B/6020)
Define lateral extent of TATB downgradient of sampling location 14-610663	C6-1, C6-2, and C6-3	0–1, 2–3, 5–6, 9–10	X[b,c]

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] TATB only.

Table 4.3-1
Proposed Sampling and Analysis at AOC 15-005(c)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)
Define vertical extent of antimony, barium, chromium, cobalt, iron, and vanadium	12-610556 12-610557 12-610562	5–6, 8–9 5–6, 8–9 5–6, 8–9	X[b,c] X[d] X[e]
Define lateral extent of barium, chromium, cobalt, copper, iron, and vanadium downgradient of existing sampling location 15-610555	5c-1 and 5c-2	0–1, 2–3, 5–6, 8–9	X[f]

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Barium, chromium, cobalt, iron, and vanadium only.

[d] Barium only.

[e] Antimony only.

[f] Barium, chromium, cobalt, copper, iron, and vanadium only.

Table 4.3-2
Proposed Sampling and Analysis at Consolidated Unit 15-007(c)-00

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Tritium (EPA 906)
Define vertical extent of aluminum, antimony, barium, calcium, chromium, cobalt, copper, magnesium, lead, nickel, and vanadium	15-610794	5–6, 9–10	X[b,c]	—[d]
	15-610797	5–6, 9–10	X[e]	—
	15-610798	5–6, 9–10	X[f]	—
	15-610801	5–6, 9–10	X[g]	—
	15-610802	5–6, 9–10	X[h]	—
	15-610803	5–6, 9–10	X[e]	—
	15-610807	5–6, 9–10	X[i]	—
	15-610808	5–6, 9–10	X[j]	—
	15-610809	5–6, 9–10	X[k]	—
	15-610813	5–6, 9–10	X[l]	—
	15-610814	5–6, 9–10	X[i]	—
Confirm removal of lead to industrial SSL to the east of sampling location 15-610814	7c-1	0–1, 2–3	X[h]	—
Define lateral extent of tritium downgradient of SWMU 15-007(d) shaft to locations 15-610819 and 15-610820	7d-1	4–5, 19–20, 34–35, 49–50, 64–65, 79–80, 94–95, 109–110, 124–125, 139–140, 154–155, 169–170, 184–185	—	X

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Calcium only.

[d] — = Analysis will not be performed.

[e] Chromium only

[f] Aluminum, barium, chromium, cobalt, copper, nickel, and vanadium only.

[g] Cobalt and vanadium only.

[h] Lead only.

[i] Aluminum, barium, calcium, chromium, cobalt, copper, magnesium, nickel, and vanadium only.

[j] Vanadium only.

[k] Calcium and copper.

[l] Antimony and lead only.

Table 4.3-3
Proposed Sampling and Analysis at SWMU 15-008(b)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Americium-241 (HASL-300)	Cesium-137 (EPA 901.1M)	Isotopic Uranium (HASL-300)	Isotopic Plutonium (HASL-300)	Tritium (EPA 906)
Define vertical extent of aluminum, antimony, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, mercury, nickel, selenium, uranium, vanadium, americium-241, cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238	15-02502	5–6, 9–10	X[b,c]	—[d]	—	—	—	—
	15-610704	5–6, 9–10	X[e]	—	—	—	—	—
	15-610705	5–6, 9–10	X[f]	—	—	X	—	—
	15-610706	5–6, 9–10	X[e]	—	—	—	—	—
	15-610707	5–6, 9–10	X[e]	—	—	—	—	—
	15-610708	5–6, 9–10	X[g]	—	—	—	—	—
	15-610709	5–6, 9–10	X[e]	—	—	—	—	X
	15-610710	5–6, 9–10	X[g]	—	—	—	—	X
	15-610712	5–6, 9–10	X[e]	—	—	—	—	—
	15-610713	5–6, 9–10	X[h]	—	—	—	—	X
	15-610714	5–6, 9–10	X[i]	—	—	—	—	—
	15-610715	5–6, 9–10	X[j]	—	—	—	—	—
	15-610718	5–6, 9–10	X[k]	—	—	—	—	—
	15-610719	5–6, 9–10	X[l]	—	—	—	—	—
	15-610723	5–6, 9–10	X[m]	—	—	X	—	—
	15-610724	5–6, 9–10	X[n]	—	—	—	—	—
	15-610725	5–6, 9–10	X[o]	—	—	—	—	—
	15-610726	5–6, 9–10	X[p]	—	—	X	—	—
	15-610728	5–6, 9–10	X[q]	—	—	—	—	X
	15-610730	5–6, 9–10	X[r]	—	X	—	—	—
	15-610731	5–6, 9–10	X[e]	—	—	—	—	—
	15-610732	5–6, 9–10	X[g]	—	—	—	—	—
	15-610734	5–6, 9–10	X[s]	—	—	—	—	—
	15-610735	5–6, 9–10	X[e]	—	—	—	—	—
	15-610736	5–6, 9–10	X[t]	—	—	—	—	X
	15-610738	5–6, 9–10	X[j]	—	—	—	—	—
	15-610739	5–6, 9–10	X[u]	—	—	—	—	X
	15-610740	5–6, 9–10	X[e]	—	—	—	—	—
	15-610741	5–6, 9–10	X[v]	—	—	—	—	X
	15-610742	5–6, 9–10	X[g]	—	—	—	—	—
	15-610743	5–6, 9–10	X[j]	—	—	—	—	—
	15-610745	5–6, 9–10	X[j]	—	—	—	—	—
	15-610746	5–6, 9–10	X[j]	—	—	—	—	—
	15-610747	5–6, 9–10	X[w]	—	—	X	—	—
	15-610748	5–6, 9–10	X[x]	—	X	X	—	X
	15-610749	5–6, 9–10	X[y]	X	—	—	X	X
	15-610750	5–6, 9–10	X[z]	—	—	—	—	—
	15-610751	5–6, 9–10	X[aa]	—	—	—	—	—
	15-610752	5–6, 9–10	X[bb]	—	—	—	—	—
	15-610753	5–6, 9–10	X[j]	—	—	—	—	—
	15-610755	5–6, 9–10	X[e]	—	—	—	—	—
	15-610757	5–6, 9–10	X[e]	—	—	—	—	—
	15-610758	5–6, 9–10	X[e]	—	—	—	—	—

Table 4.3-3 (continued)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Americium-241 (HASL-300)	Cesium-137 (EPA 901.1M)	Isotopic Uranium (HASL-300)	Isotopic Plutonium (HASL-300)	Tritium (EPA 906)
Define vertical extent of aluminum, antimony, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, mercury, nickel, selenium, uranium, vanadium, americium-241, cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238	15-610760 15-610762 15-610763 15-610764 15-610765 15-610778 15-610781 15-610784	5–6, 9–10 5–6, 9–10 5–6, 9–10 5–6, 9–10 5–6, 9–10 5–6, 9–10 5–6, 9–10 5–6, 9–10	X[cc] — X[dd] X[ee] X[ee] — X[ff] —	— X — — — — — —	— — — — — — — X	— X — — — X — X	— X — — — — — —	— X — — X — — X
Define the lateral extent of cesium-137 west and downgradient of existing sampling location 15-610762	8b-1 and 8b-2	0–1, 2–3, 5–6, 9–10	—	—	X	—	—	—
Define the lateral extent of arsenic west and downgradient of existing sampling location 15-610723	8b-3	0–1, 2–3, 5–6, 9–10	X[gg]	—	—	—	—	—
Define the lateral extent of cobalt east and downgradient of existing sampling location 15-610742	8b-4 and 8b-5	0–1, 2–3, 5–6, 9–10	X[e]	—	—	—	—	—
Define the lateral extent of iron north and downgradient of existing sampling location 15-610719	8b-6 and 8b-7	0–1, 2–3, 5–6, 9–10	X[hh]	—	—	—	—	—
Confirm removal of lead to industrial SSL south and east of sampling locations 15-02503 and 15-610746	8b-8 and 8b-9	0–1, 2–3	X[ii]	—	—	—	—	—

Table 4.3-3 (continued)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Americium-241 (HASL-300)	Cesium-137 (EPA 901.1M)	Isotopic Uranium (HASL-300)	Isotopic Plutonium (HASL-300)	Tritium (EPA 906)
Confirm removal of lead to industrial SSL around sampling location 15-610709	8b-10, 8b-11, 8b-12 and 8b-13	0–1, 2–3	X[ii]	—	—	—	—	—

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.
[b] X = Analysis will be performed.
[c] Copper and mercury only.
[d] — = Analysis will not be performed.
[e] Cobalt only.
[f] Barium, beryllium, and lead only.
[g] Chromium and cobalt only.
[h] Barium, calcium, cobalt, nickel, and selenium only.
[i] Barium chromium, cobalt, and selenium only.
[j] Chromium only.
[k] Arsenic, beryllium, chromium, iron, nickel, and vanadium only.
[l] Chromium, copper, and nickel only.
[m] Antimony, arsenic, cobalt, and lead only.
[n] Antimony and cobalt only.
[o] Calcium only.
[p] Barium, cobalt, and copper only.
[q] Barium, calcium, chromium, and nickel only.
[r] Aluminum, barium, cobalt, copper, iron, and nickel only.
[s] Chromium and iron only.
[t] Aluminum, barium, calcium, chromium, cobalt, and nickel only.
[u] Calcium and chromium only.
[v] Barium, chromium, cobalt, copper, and nickel only.
[w] Arsenic, beryllium, calcium, nickel, and selenium only.
[x] Lead only.
[y] Cobalt and lead only.
[z] Barium and cobalt only.
[aa] Aluminum, barium, chromium, cobalt, and nickel only.
[bb] Cobalt and copper only.
[cc] Aluminum, arsenic, barium, calcium, and nickel only.
[dd] Cobalt and nickel only.
[ee] Nickel only.
[ff] Chromium and copper only.
[gg] Arsenic only.
[hh] Iron only.
[ii] Lead only.

Table 4.3-4
Proposed Sampling and Analysis at AOC 15-008(g)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	VOCs (EPA SW-846:8260B)	Explosive Compounds (EPA SW-846:8321A_MOD)	Isotopic Uranium (HASL-300)	Tritium (EPA 906)
Define vertical extent of antimony, uranium, TATB, tritium, and uranium-238	15-610565 15-610566 15-610567 15-610568	5–6, 9–10 5–6, 9–10 5–6, 9–10 5–6, 9–10	—[b] X[d] — —	— — — 	— X[e] X[e] X[e]	X[c] — — —	— X — X
Define lateral extent of antimony, cobalt, lead, and TATB downgradient of existing sampling location 15-610568	8g-1	0–1, 2–3, 5–6, 9–10	X[f]	—	X[e]	—	—
Define lateral extent of uranium and TATB downgradient of existing sampling locations 15-610565	8g-2, 8g-3 and 8g-4	0–1, 2–3, 5–6, 9–10	—	—	X[e]	X	—
Resample previous sampling locations to replace rejected data for barium and 4-nitrotoluene	15-610565, 15-610566, 15-610567, and 15-610568	0–1, 2–3, 5–6, 9–10	X[g]	X[h]	—	—	—

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] — = Analysis will not be performed.

[c] X = Analysis will be performed.

[d] Antimony only.

[e] TATB only.

[f] Antimony, cobalt, and lead only.

[g] Barium only.

[h] Nitrotoluene(4-) only.

Table 4.3-5
Proposed Sampling and Analysis at SWMU 15-009(b)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Total Cyanide (EPA SW-846:9012A)	SVOCs (EPA SW-846:8270C)	Cesium-137 (EPA 901.1M)	Isotopic Plutonium (HASL 300)	Isotopic Uranium (HASL-300)
Define vertical extent of barium, chromium, uranium-234, uranium-235/236, and uranium-238	15-610831 15-610833 15-610836	5–6, 9–10 5–6, 9–10 15–16, 19–20	—[b] X[d] —	— — —	— — X[e]	— — —	— — —	X[c] — —
Define lateral extent of barium, copper, total cyanide, lead, uranium, cesium-137, plutonium-239/240, uranium-234, uranium-235/236, and uranium-238 south and downgradient of existing sampling location 15-610831	9b-1 and 9b-2	0–1, 4–5, 9–10	X[f]	X	—	X	X	X

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] — = Analysis will not be performed.

[c] X = Analysis will be performed.

[d] Barium and chromium only.

[e] Benzo(b)fluoranthene and fluoranthene only.

[f] Barium, copper, and lead only.

Table 4.3-6
Proposed Sampling and Analysis at SWMU 15-009(c)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	VOCs (EPA SW-846: 8260B)	Isotopic Uranium (HASL-300)
Define vertical extent of chromium, uranium, acetone, uranium-234, uranium-235/236, and uranium-238	15-610838 15-610839 15-610845 15-610846 15-610850 15-610852 15-610854	3–4, 5–6 3–4, 5–6 3–4, 5–6 3–4, 5–6 3–4, 5–6 3–4, 5–6 3–4, 5–6	X[b,c] — X[c] — — X[c] —	—[d] X[e] — — — — —	— X — X X — X

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Chromium only.

[d] — = Analysis will not be performed.

[e] Acetone only.

Table 4.3-7
Proposed Sampling and Analysis at SWMU 15-009(h)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Isotopic Plutonium (HASL 300)	Isotopic Uranium (HASL-300)
Define vertical extent of barium, calcium, chromium, uranium, zinc, plutonium-239/240, and uranium-238	15-610855	15–16, 19–20	X[b,c]	—[d]	—
	15-610857	15–16, 19–20	X[e]	—	—
	15-610858	15–16, 19–20	X[f]	—	—
	15-610859	15–16, 19–20	X[f]	—	—
	15-610860	15–16, 19–20	X[g]	—	X
	15-610861	15–16, 19–20	—	X	—

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Barium and chromium only.

[d] — = Analysis will not be performed.

[e] Zinc only.

[f] Chromium only.

[g] Calcium only

Table 4.3-8
Proposed Sampling and Analysis at SWMU 15-010(b)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	VOCs (EPA SW-846: 8260B)	PCBs (EPA SW-846:8082)	Isotopic Uranium (HASL-300)
Define vertical extent of chromium, iron, mercury, uranium, vanadium, zinc, acetone, Aroclor-1254, toluene, and uranium-238	15-610863	3–4, 5–6	X[b,c]	X[d]	—[e]	—
	15-610864	3–4, 5–6	X[f]	X[d]	X	X
	15-610866	3–4, 5–6	X[g]	—	—	—
	15-610867	3–4, 5–6	X[h]	—	—	—
	15-610868	3–4, 5–6	X[g]	—	—	—
	15-610871	3–4, 5–6	—	X[i]	—	—
Define lateral extent of iron and vanadium downgradient of existing sampling location 15-610866	10b-1 and 10b-2	0–1, 2–3, 5–6	X[j]	—	—	—
Define lateral extent of chromium, acetone, and toluene downgradient of existing sampling location 15-610863	10b-3 and 10b-4	0–1, 2–3, 5–6	X[c]	X[d]	—	—

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Chromium only.

[d] Acetone and toluene only.

[e] — = Analysis will not be performed.

[f] Mercury only.

[g] Iron, vanadium, and zinc only.

[h] Iron only.

[i] Toluene only.

[j] Iron and vanadium only.

Table 4.3-9
Proposed Sampling and Analysis at SWMU 15-014(h)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/ 6020)	Total Cyanide (EPA SW-846:9012A)	Perchlorate (EPA SW-846:6850)	VOCs (EPA SW-846: 8260B)	SVOCs (EPA SW-846:8270C)	Cesium-137 (EPA 901.1M)	Isotopic Plutonium (HASL 300)	Isotopic Uranium (HASL-300)	Tritium
Define vertical extent of aluminum, barium, chromium, cobalt, copper, total cyanide, iron, lead, mercury, nickel, perchlorate, silver, uranium, vanadium, acetone, toluene, acenaphthene, cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235, and uranium-238	15-610501	5–6, 9–10	X[b,c]	—[d]	—	—	—	—	—	—	—
	15-610502	5–6, 9–10	X[e]	—	—	—	—	—	—	—	—
	15-610504	5–6, 9–10	X[f]	—	—	—	—	—	—	—	—
	15-610505	5–6, 9–10	X[g]	—	—	—	—	—	—	—	—
	15-610508	5–6, 9–10	X[h]	—	X	X[i]	—	—	—	—	—
	15-610509	5–6, 9–10	—	—	—	—	—	—	X	—	—
	15-610510	5–6, 9–10	X[j]	—	—	—	—	—	—	X	—
	15-610512	5–6, 9–10	X[k]	—	—	—	—	—	—	—	—
	15-610514	5–6, 9–10	X[l]	—	—	—	—	X	—	—	—
	15-610517	5–6, 9–10	X[m]	—	—	—	—	—	—	—	—
	15-610519	5–6, 9–10	X[k]	—	—	—	—	—	—	—	—
	15-610520	5–6, 9–10	—	—	—	—	—	—	—	—	X
	15-610521	5–6, 9–10	—	—	—	—	—	—	—	—	X
	15-610523	5–6, 9–10	X[n]	X	—	X[o]	—	X	X	X	X
	15-610524	5–6, 9–10	—	—	—	—	—	—	—	—	X
	15-610525	5–6, 9–10	X[p]	—	—	—	X[q]	—	—	—	—
	15-610526	9–10, 13–14	—	—	—	—	—	—	—	—	X

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Chromium, nickel and vanadium only.

[d] — = Analysis will not be performed.

[e] Chromium and nickel only.

[f] Cobalt, iron, and vanadium only.

[g] Aluminum, cobalt and vanadium only.

[h] Chromium and cobalt only.

[i] Acetone only.

[j] Mercury only.

[k] Chromium only.

[l] Silver only.

[m] Chromium, silver, and vanadium only.

[n] Chromium, copper, lead, mercury, and silver only.

[o] Toluene only.

[p] Barium, chromium, cobalt, iron, nickel, silver, and vanadium only.

[q] Acenaphthene only.

Table 4.4-1
Proposed Sampling and Analysis at SWMU 36-002

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Perchlorate (EPA SW-846:6850)	Tritium
Define vertical extent of perchlorate and tritium	36-610878	12–13, 16–17	—[b]	X[c]	X
Define lateral extent of barium, copper, magnesium, and nickel northeast and downgradient of existing sampling location 36-610877	2-1 and 2-2	4–5, 9–10, 12–13, 16–17	X[d]	—	—

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] — = Analysis will not be performed.

[c] X = Analysis will be performed.

[d] Barium, copper, magnesium, and nickel only.

Table 4.4-2
Proposed Sampling and Analysis at SWMU 36-003(a)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	VOCs (EPA SW-846: 8260B)	SVOCs (EPA SW-846:8270C)
Define vertical extent of beryllium, chromium, cobalt, nickel, 4-isopropyltoluene, and acenaphthene	36-610880	9–10, 13–14	X[b,c]	—[d]	—
	36-610882	9–10, 13–14	X[e]	X[f]	—
	36-610887	9–10, 13–14	—	—	X[g]
	36-610889	9–10, 13–14	X[h]	—	—

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Cobalt only.

[d] — = Analysis will not be performed.

[e] Chromium and cobalt only.

[f] Isopropyltoluene(4-) only.

[g] Acenaphthene only.

[h] Beryllium, chromium, and nickel only.

Table 4.4-3
Proposed Sampling and Analysis at SMWU 36-008

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Total Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	VOCs (EPA SW-846: 8260B)	SVOCs (EPA SW-846:8270C)	PCBs (EPA SW-846:8082)	Perchlorate (EPA SW-846:6850)	Cesium-137 (EPA 901.1M)	Isotopic plutonium (HASL-300)	Isotopic uranium (HASL-300)	Tritium, (EPA 906)
Define vertical extent of aluminum, barium, beryllium, calcium, chromium, cobalt, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, uranium, vanadium, zinc, acetone, Aroclor-1254, Aroclor-1260, 4-isopropyltoluene, PAHs, phenanthrene, pyrene, toluene, cesium-137, plutonium 239/240, tritium, and uranium-238	36-610574	5–6, 9–10	—[b]	—	—	—	—	X[c]	X	—	—	—	—
	36-610576	5–6, 9–10	X[d]	X	X	—	—	—	X	—	—	—	—
	36-610581	5–6, 9–10	—	—	—	X[e]	—	—	—	—	—	—	—
	36-610582	5–6, 9–10	—	—	—	—	—	—	X	—	—	—	—
	36-610584	5–6, 9–10	X[f]	—	—	—	—	—	—	—	—	—	—
	36-610585	5–6, 9–10	—	—	—	X[e]	—	—	—	—	—	—	—
	36-610587	5–6, 9–10	X[g]	—	X	—	X[h]	—	X	—	—	—	—
	36-610588	5–6, 9–10	—	—	—	—	—	—	X	—	—	—	—
	36-610590	5–6, 9–10	—	—	—	X[e]	—	—	—	—	—	—	—
	36-610591	5–6, 9–10	—	—	—	X[e]	—	—	—	—	—	—	—
	36-610592	5–6, 9–10	—	—	—	X[i]	—	—	—	—	—	—	—
	36-610594	5–6, 9–10	X[j]	—	—	—	—	—	—	—	—	—	—
	36-610595	5–6, 9–10	X[k]	X	X	—	—	—	X	—	—	—	—
	36-610598	5–6, 9–10	—	X	—	X[i]	—	—	—	X	X	—	—
	36-610601	5–6, 9–10	—	—	—	X[e]	—	—	—	—	—	—	—
	36-610602	5–6, 9–10	X[l]	—	—	—	—	—	—	—	—	—	—
	36-610603	5–6, 9–10	X[m]	—	—	—	—	—	—	X	—	—	—
	36-610605	5–6, 9–10	X[n]	—	—	—	—	—	—	—	—	X	—
	36-610606	5–6, 9–10	X[d]	—	—	X[e]	—	—	—	—	—	—	—
	36-610607	5–6, 9–10	—	—	—	—	X[o]	—	—	—	—	—	X
	36-610609	5–6, 9–10	X[p]	—	X	—	—	—	X	X	—	—	—
	36-610613	5–6, 9–10	X[q]	—	—	X[e]	—	—	—	—	—	—	—
	36-610614	5–6, 9–10	—	—	—	—	—	—	X	—	—	—	—
	36-610615	5–6, 9–10	—	—	—	—	X[o]	—	X	—	X	X	—
	36-610617	5–6, 9–10	—	—	—	X[r]	—	—	—	—	—	—	—
	36-610623	5–6, 9–10	—	—	—	X[s]	—	—	—	—	—	—	—

Table 4.4-3 (continued)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Total Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	VOCs (EPA SW-846: 8260B)	SVOCs (EPA SW-846:8270C)	PCBs (EPA SW-846:8082)	Perchlorate (EPA SW-846:6850)	Cesium-137 (EPA 901.1M)	Isotopic plutonium (HASL-300)	Isotopic uranium (HASL-300)	Tritium, (EPA 906)
Define lateral extent of cesium-137 and plutonium-239/240 north and downgradient of existing sampling location 36-610584	8-1 and 8-2	0–1, 2–3, 5–6, 9–10	—	—	—	—	—	—	—	X	X	—	—
Define lateral extent of plutonium-239/240 north and downgradient of existing sampling locations 36-610586 and 36-610622	8-3, 8-4, 8-5, and 8-6	0–1, 2–3, 5–6, 9–10	—	—	—	—	—	—	—	—	X	—	—
Confirm removal to industrial SSLs to north of excavation	8-7 and 8-8	0–1, 2–3	—	—	—	—	X[o]	—	—	—	—	—	—

Table 4.4-3 (continued)

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Total Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	VOCs (EPA SW-846: 8260B)	SVOCs (EPA SW-846:8270C)	PCBs (EPA SW-846:8082)	Perchlorate (EPA SW-846:6850)	Cesium-137 (EPA 901.1M)	Isotopic plutonium (HASL-300)	Isotopic uranium (HASL-300)	Tritium, (EPA 906)
Confirm removal to industrial SSLs within excavated area	36-610579, 36-610585, 36-610588, 36-610605, 36-610608, 36-610610, 36-610824, 36-610825, 36-610826, and 36-610827 (from bottom of excavation)	3–4	—	—	—	—	X[o]	—	—	—	—	—	—

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] — = Analysis will not be performed.

[c] X = Analysis will be performed.

[d] Mercury only

[e] 4-isopropyltoluene only.

[f] Aluminum, barium, calcium, cobalt, nickel, and vanadium only.

[g] Zinc only.

[h] Phenanthrene and pyrene only.

[i] Isopropyltoluene(4-) and toluene only.

[j] Chromium and cobalt only.

[k] Mercury and zinc only.

[l] Beryllium and chromium only.

[m] Copper, lead, and zinc only.

[n] Copper and mercury only.

[o] PAHs only.

[p] Calcium, chromium, copper, and mercury only.

[q] Chromium only.

[r] Toluene only.

[s] Acetone, 4-isopropyltoluene and toluene only.

Table 4.4-4
Proposed Sampling and Analysis for SWMU C-36-003

Sampling Objective	Location Number	Depth[a] (ft)	TAL Metals (EPA SW-846:6010B/6020)	Total Cyanide (EPA SW-846:9012A)	Nitrate (EPA 300)	VOCs (EPA SW-846: 8260B)	PCBs (EPA SW-846:8082)	Tritium, (EPA 906)	Isotopic plutonium (HASL-300)	Perchlorate (EPA SW-846:6850)
Define vertical extent of	36-610822	5–6, 9–10	X[b,c]	—[d]	X	—	—	—	X	—
cadmium, chromium, copper,	36-610823	5–6, 9–10	—	—	—	X[e]	—	—	—	—
total cyanide, mercury,	36-610824	5–6, 9–10	X[f]	X	—	X[e]	X	—	—	—
nitrate, silver, uranium,	36-610825	5–6, 9–10	X[g]	—	—	—	—	X	—	—
Aroclor-1254, Aroclor-1260,	36-610826	5–6, 9–10	—	—	—	X[h]	—	X	—	—
acetone, 4-isopropyltoluene,	36-610827	5–6, 9–10	X[i]	—	—	X[e]	—	—	—	—
toluene, and tritium	36-610828	5–6, 9–10	—	—	—	—	—	—	—	X

[a] Depths are estimated and may be adjusted in the field to ensure deepest sample is collected in native material.

[b] X = Analysis will be performed.

[c] Chromium only.

[d] — = Analysis will not be performed.

[e] Toluene only.

[f] Copper and mercury only.

[g] Chromium, selenium, and silver only.

[h] Isopropyltoluene(4-) only.

[i] Cadmium, copper, and silver only.

Table 5.0-1
Summary of Investigation Methods

Method	Summary
Spade-and-Scoop Collection of Soil Samples	This method is typically used to collect shallow (e.g., 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 nonwelded tuff. The method involves hand-turning a stainless-steel bucket auger (typically 3–4 in. inside diameter), creating a vertical hole that can be advanced to the desired sampling depth. When the desired depth is reached, the auger is decontaminated before the hole is advanced to the sampling depth. The sample material is transferred from the auger bucket to a stainless-steel sampling bowl before the various required sample containers are filled. Carbon-steel auger buckets may be used, particularly in cases where chromium and nickel are the primary constituents of interest and cross-contamination from stainless-steel equipment is a concern.
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 the samples either to the SMO or to an SMO-approved radiation screening laboratory under COC. The SMO arranges to ship samples to the 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 container labels and combined SCL/COC forms. Sample collection portions of the combined forms will be completed at the time of sample collection and signed by the sampler and a reviewer who will verify the logs for completeness and accuracy. The COC portions of the combined forms will be completed and signed to verify the samples are not left unattended. Corresponding labels will be initialed and applied to each sample container, and custody seals will be placed around container lids or openings. COC forms are completed and assigned to verify that the samples are not left unattended. Site attributes (e.g., former and proposed soil sampling locations, sediment sampling 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 Sample Management Database.
Field Quality-Control Samples	Field quality-control samples are collected as follows. *Field duplicate*: At a frequency of 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 are containers of certified clean sand that are opened and kept with the other sample containers during the sampling process.

Table 5.0-1 (continued)

Method	Summary
Field Decontamination of Drilling and Sampling Equipment	Dry decontamination is the preferred method to minimize generating liquid waste. Dry decontamination may include using a wire brush or other tool to remove soil or other material adhering to the sampling equipment, followed by using 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 nonphosphate 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 QA. Specific requirements for each sample are printed on the sample collection logs provided by the SMO (size and type of container [glass, amber glass, polyethylene, preservative, etc.]). All samples are preserved by placing them 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.
Management, Characterization, and Storage of IDW	IDW is managed, characterized, and stored in accordance with an approved waste characterization strategy form that documents site history, field activities, and the characterization approach for each waste stream managed. Waste characterization complies with on-site 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 the containers from deterioration. Generators are required to reduce the volume of waste generated as much as technically and economically feasible. Means to store, control, and transport each potential waste type and classification shall be determined before field operations that generate waste begin. A waste storage area will be established before waste is generated. Waste storage areas located in controlled areas of the Laboratory will be controlled as needed to prevent inadvertent addition or management of wastes by unauthorized personnel. Each container of waste generated will 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. Appendix B describes the management of IDW.
Geodetic Surveys	This method describes the procedure for coordinating and evaluating geodetic surveys and establishing QA and quality control for geodetic survey data. The procedure covers evaluating geodetic survey requirements, preparing to perform a geodetic survey, performing geodetic survey field activities, preparing geodetic survey data for QA review, performing QA review of geodetic survey data, and submitting geodetic survey data.
Hollow-Stem Auger Drilling Methods	In this method, hollow-stem augers (sections of seamless pipe with auger flights welded to the pipe) act as a screw conveyor to bring cuttings of sediment, soil, and/or rock to the surface. Auger sections are typically 5 ft in length and have outside diameters of 4.25 to 14 in. Drill rods, split-spoon core barrels, Shelby tubes, and other samplers can pass through the center of the hollow-stem auger sections for collection of discrete samples from desired depths. Hollow-stem augers are used as temporary casings when setting wells to prevent cave-ins of the borehole walls.

Table 5.9-1
Summary of Analytical Methods

Analyte	Analytical Method
TAL metals	SW-846:6010B; SW-846:6020; SW-846:7471A (Mercury)
Total cyanide	EPA SW-846:9012A
Perchlorate	SW-846:6850
Nitrate	EPA 300
PCBs	SW-846:8082
SVOCs	SW-846:8270C
VOCs	SW-846:8260B
Americium-241	HASL-300:AM-241
Gamma-emitting radionuclides	EPA:901.1
Isotopic plutonium	HASL-300:ISOPU
Isotopic uranium	HASL-300:ISOU
Tritium	Liquid Scintillation
pH	SW-846:9045C
Explosive compounds	SW-846:8321A Modified

Appendix A

Acronyms and Abbreviations,
Metric Conversion Table, and Data Qualifier Definitions

A-1.0 ACRONYMS AND ABBREVIATIONS

AOC	area of concern
bgs	below ground surface
BV	background value
COC	chain of custody
Consent Order	Compliance Order on Consent
DOE	Department of Energy (U.S.)
DU	depleted uranium
EPA	Environmental Protection Agency (U.S.)
FV	fallout value
GPS	global positioning system
HE	high explosives
HMX	1,3,5,7-tetranitro-1,3,5,7-tetrazocine
IDW	investigation-derived waste
IP	individual permit
LANL	Los Alamos National Laboratory
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photoionization detector
PPE	personal protective equipment
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RFI	RCRA facility investigation
SCL	sample collection log
SMA	site-monitoring area
SMO	Sample Management Office
SOP	standard operating procedure
SSL	soil screening level
SVOC	semivolatile organic compound
SWMU	solid waste management unit

SWSC	Sanitary Wastewater Systems Consolidation
TA	technical area
TAL	target analyte list
TATB	triaminotrinitrobenzene
VCP	vitrified-clay pipe
VOC	volatile organic compound
WCSF	waste characterization strategy form

A-2.0 METRIC CONVERSION TABLE

Multiply SI (Metric) Unit	by	To Obtain U.S. 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-3.0 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

B-1.0 INTRODUCTION

This appendix describes how investigation-derived waste (IDW) generated during the Threemile Canyon Aggregate Area Phase II investigation will be managed at Los Alamos National Laboratory (the Laboratory). IDW may include, but is not limited to, drill cuttings, excavated media, contact waste, decontamination fluids, and all other waste that has potentially come into contact with contaminants.

B-2.0 IDW

If required based on the estimated amount of material and size of excavation, area of contamination requests will be submitted for approval to New Mexico Environment Department (NMED) for remediation sites in which excavation is planned.

All IDW generated during 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 and NMED regulations, U.S. Department of Energy orders, and Laboratory requirements. The SOP applicable to the characterization and management of IDW is SOP-5238, Characterization and Management of Environmental Program Waste, (http://www.lanl.gov/environment/all/qa.shtml).

The most recent version of the Laboratory's Hazardous Waste Minimization Report will be implemented during the investigation to minimize waste generation. The report is updated annually as a requirement of the Laboratory's Hazardous Waste Facility Permit.

A waste characterization strategy form (WCSF) will be prepared and approved per requirements of SOP-5238, Characterization and Management of Environmental Program Waste. The WCSF will provide detailed information on IDW characterization methods, management, containerization, and potential volumes. IDW characterization is completed through review of sampling data and/or documentation or by direct sampling of the IDW or the media being investigated (e.g., surface soil, subsurface soil). Waste characterization may include a review of historical information and process knowledge to identify whether listed hazardous waste may be present (i.e., due diligence reviews). If low levels of listed hazardous waste are identified, a "contained in" determination may be submitted to NMED for approval.

Wastes will be containerized and placed in clearly marked, appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements will be based on the type of IDW and its classification. Container and storage requirements as well as transportation and disposal requirements will be detailed in the WCSF and approved before waste is generated. Table B-2.0-1 summarizes the estimated IDW waste streams, waste types, waste volumes, and other data.

The waste streams that are anticipated to be generated during work plan implementation are described below.

B-2.1 Drill Cuttings

This waste stream consists of soil and rock chips generated by the drilling of boreholes to collect samples. Drill cuttings include excess core sample not submitted for analysis, and any returned samples sent for analysis. Drill cuttings will be stored in accordance with the approved WCSF.

This waste stream will be characterized based either on direct sampling of the waste in each container or on the results from core samples collected during drilling. The WCSF will specify the sampling suites for direct sampling of the waste stream. Constituents may be analyzed as necessary to meet the waste acceptance criteria for a receiving facility or if visual observations indicate that additional contaminants may be present.

Cuttings will be land applied if they meet the criteria in the NMED-approved Notice of Intent Decision Tree for Land Application of Investigation Derived Waste Solids from Construction of Wells and Boreholes. The Laboratory expects that cuttings will be land applied or disposed of in accordance with the approved WCSF. Table B-2.0-1 presents the estimated volumes, characterization and management methods, and expected disposition of this waste stream.

B-2.2 Excavated Environmental Media

Excavated environmental media will consist of soil and rock removed to meet the proposed cleanup levels where cleanup is recommended. The excavated material will be field screened and examined for visible evidence of contamination during the excavation process. The excavated material will remain within the boundary of the site from which it was excavated or within the area of contamination, if one is established, and will be placed in appropriate containers in accordance with the approved WCSF.

A minimum of one direct sample will be collected from each 50 yd^3 or each container of material excavated and will be submitted for laboratory analyses for the analytical suites specified in the WCSF. The Laboratory expects most of the excavated environmental media to be designated as nonhazardous, hazardous, or low-level radioactive waste that will be disposed of in accordance with the approved WCSF. Table B-2.0-1 presents the estimated volumes, characterization and management methods, and expected disposition of this waste stream.

B-2.3 Contact Waste

The contact waste stream consists of potentially contaminated materials that came in contact with waste during sampling and excavation. This waste stream consists primarily of, but is not limited, to personal protective equipment such as gloves; decontamination wastes such as paper wipes; and disposable sampling supplies. Contact waste will be stored in containers and characterized in accordance with the approved WCSF.

Characterization of this waste stream will use acceptable knowledge based on data from the media with which it came into contact (e.g., drill cuttings, soil, sumps, etc.). The Laboratory expects most of the contact waste to be designated as nonhazardous, nonradioactive waste that will be disposed of in accordance with the approved WCSF. Table B-2.0-1 presents the estimated volumes, characterization and management methods, and expected disposition of this waste stream.

B-2.4 Decontamination Fluids

Decontamination fluids consist of liquid wastes generated from decontamination of excavation, sampling, and drilling equipment. For waste minimization, dry decontamination methods will be used to avoid the generation of liquid waste and to minimize the IDW. Dry decontamination uses disposable paper towels and over-the-counter cleaner, such as Fantastik or equivalent. All sampling and measuring equipment, including but not limited to, stainless-steel sampling tools and split-barrel or core samplers, will be decontaminated in accordance with SOP-01.08, Field Decontamination of Drilling and Sampling Equipment.

Dry decontamination may be followed by wet decontamination, if necessary. Wet decontamination may include washing with a nonphosphate detergent and water, followed by a water rinse and a second rinse with deionized water. Alternatively, steam cleaning may be used. The decontamination fluids will be characterized by direct sampling of the containerized waste for the suites specified in approved WCSF. The Laboratory expects most of these wastes to be nonhazardous liquid waste that will be sent to one of the Laboratory's wastewater treatment facilities in accordance with the approved WCSF. Table B-2.0-1 presents the estimated volumes, characterization and management methods, and expected disposition of this waste stream.

Table B-2.0-1
Summary of Estimated IDW Generation and Management

Waste Stream	Expected Waste Type	Estimated Volume	Characterization Method	On-Site Management	Expected Disposition
Drill cuttings	Industrial waste, nonhazardous, nonradioactive	20 yd^3	Analytical results from direct sampling of waste or core samples	Accumulation in 55-gal. drums, covered rolloff containers, or other appropriate containers	Land application, permitted off-site facility for which waste meets acceptance criteria, or Technical Area 54 (TA-54), Area G
Excavated environmental media	Industrial waste, nonhazardous, hazardous, low-level radioactive, nonradioactive	20 yd^3	Analytical results from direct sampling of waste	On ground within site boundary or accumulation in 55-gal. drums, covered rolloff containers, or other appropriate containers	Permitted off-site facility for which waste meets acceptance criteria, or TA-54, Area G
Contact waste	Industrial waste, nonhazardous, nonradioactive	0.5 yd^3	Acceptable knowledge	Accumulation in 55-gal. drums	Permitted off-site facility for which waste meets acceptance criteria, or TA-54, Area G
Decontamination fluids	Industrial waste, nonhazardous, nonradioactive	10 gal.	Acceptable knowledge; analytical results from direct sampling of waste	Accumulation in 30-gal. plastic drums	Treatment at an on-site facility for which waste meets acceptance criteria

Plate 1 Threemile Canyon Aggregate Area

- Paved road
- Unpaved road
- Fence
- TA boundary
- Elevation contour, 10 ft interval
- Monitoring well, alluvial
- Monitoring well, regional
- Supply well, regional
- Surface water sampling station
- SWMU or AOC
- Consolidated unit
- Structure or building
- Underground structure
- Former structure
- Canyon reach
- Threemile Canyon Aggregate Area
- Existing Threemile Canyon sampling location
- Spring

N

State Plane Coordinate System
New Mexico, Central Zone, US Foot
North American Datum 1983
National Geodetic Vertical Datum 1929

Feet
0 250 500 750
0 100 200
Meters

Starmer/Upper Pajarito Canyon
Threemile Mesa
Threemile Canyon
Potrillo/Fence Canyons

AOC C-12-003
AOC C-12-002
SWMU 12-001(b)
SWMU 12-002
AOC C-12-004
AOC C-12-001
Consolidated Unit 12-001(a)-99
SWMU 12-001(a)
AOC C-12-005
AOC C-14-006
SWMU 15-010(b)
AOC 12-004(a)
AOC 12-004(b)
AOC C-12-006
AOC 15-014(h)
Consolidated Unit 15-006(d)-99
AOC 15-008(g)
SWMU 15-007(c)
Consolidated Unit 15-007(c)-00
SWMU 15-006(d)
SWMU 15-007(d)
SWMU 15-009(b)
SWMU 15-008(b)
Consolidated Unit 15-006(c)-99
AOC 15-005(c)
AOC 15-004(d)
SWMU 15-006(c)
SWMU 15-009(c)
SWMU 15-006(b)
SWMU 15-004(a)
SWMU 15-009(h)
SWMU 36-008
SWMU 36-002
SWMU 36-003(a)
SWMU C-36-003

TA-06, TA-11, TA-14, TA-15, TA-16, TA-18, TA-35, TA-36, TA-37, TA-40, TA-46, TA-50, TA-51, TA-52, TA-54, TA-55, TA-63, TA-66, TA-67

R-18, R-17, R-19

TWSE-1W, TW-4W, TWSE-1E, TW-4E, PA-1E, PA-2W, PA-2E, PA-3W, TH-1W, TH-1C, TH-1E, THW-1, TH-2W, TH-2E, THM-1, THS-1W, THS-1E, CDV-2E, CDB-1W, CDB-2C, 18-BG-1, 18-MW-7, 18-MW-8, 3MAO-2

PJ-SMA-7, PJ-SMA-8, PJ-SMA-9, PJ-SMA-10, PJ-SMA-11(E), PJ-SMA-11(W), E244, E243, TMO-1, PCAO-5, PCAO-6, E245, E245.5, E201.5, TS-3, MCVB-6.6, M-3E, M-4W, MT-1, M-MCO-6, CDB-SMA-0.1, CDB-SMA-0.2, CDB-SMA-0.5, CDB-SMA-1.7, PM-4, CDV-SMA-3, CDV-SMA-4, CDV-SMA-5, CDV-SMA-6, E256.5, CDV-SMA-7, CDV-SMA-8, HOLLOW SPRING, CDV-0.8 SPRING, CDV-SMA-9, CdV-R-37-2, 3M-SMA-0.6, 3M-SMA-0.5, THREEMILE SPRING, TH-3, 18-BG-4, 3M-SMA-3, E246, TA-18 SPRING, 3M-SMA-2.6, MSC-16-06294, MSC-16-06295, W-SMA-11, W-SMA-10, PT-SMA-0.5, PT-SMA-1, PT-SMA-2, W-SMA-14, W-SMA-4, E252.8, E252.5, E262, WA-6.25 SPRING

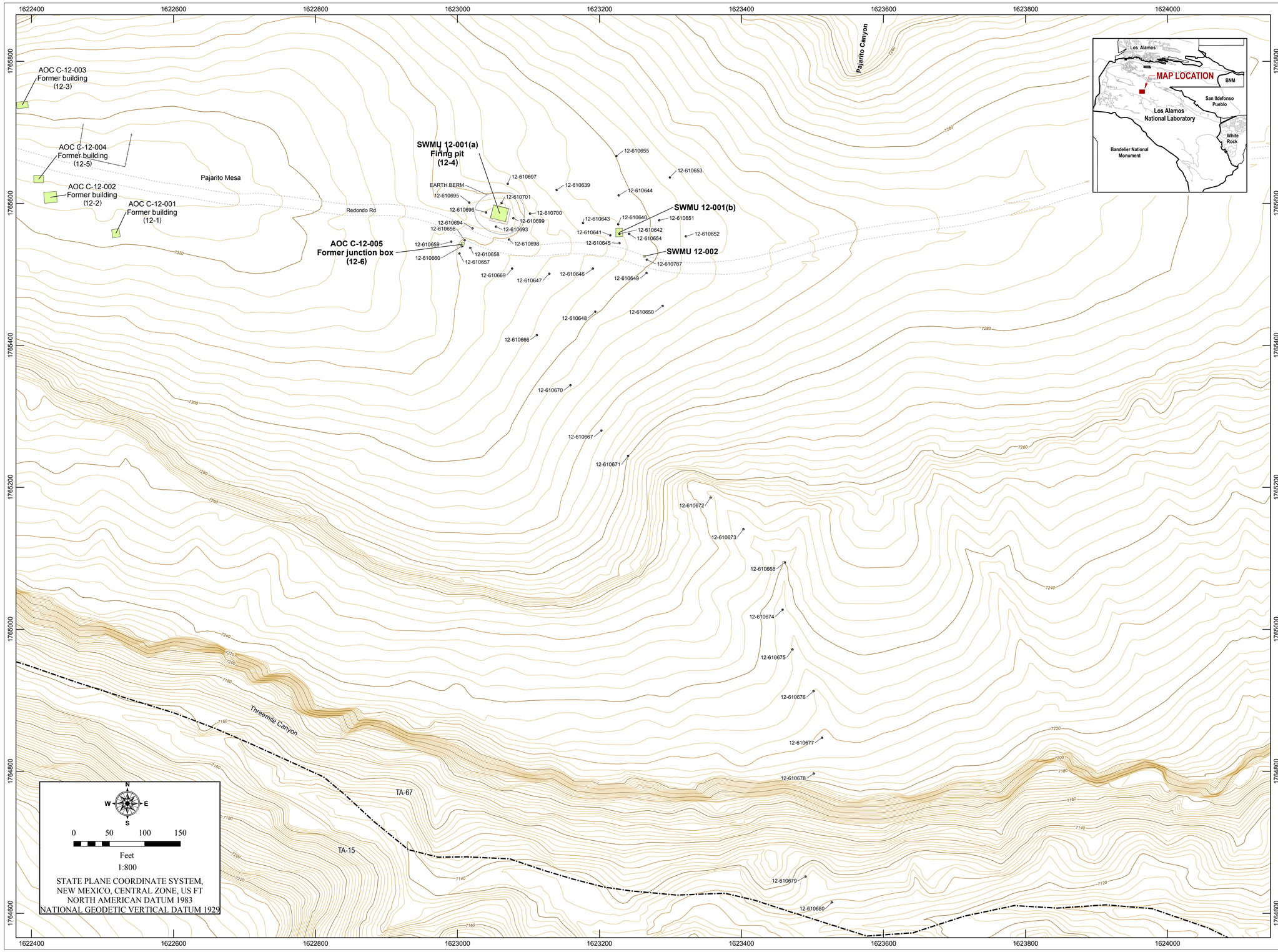
Redondo Road

Threemile Canyon Aggregate Area
Area of Detail
Los Alamos National Laboratory

John Toomey, Los Alamos Technical Associates
12 April 2010
Map 3MC-1.0-1-PLATE
Revised 23 May 2011 by AdelanteConsultinginc.

Disclaimer: This map was created for work processes associated with the LANL Environmental Programs Directorate, Corrective Actions Projects (EP-CAP). All other uses for this map should be confirmed with EP-CAP personnel.

1618000 1620000 1622000 1624000 1626000 1628000 1630000 1632000 1634000
1768000 1766000 1764000 1762000 1760000 1758000



- Sampling location
- SWMU or AOC
- Fence
- TA boundary
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

FEATURE DATA REFERENCES

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Potential Release Sites; Los Alamos National Laboratory, Waste and Environmental Services Division, Environmental Data and Analysis Group, EP2009-0633; 1:2,500 Scale Data; 25 January 2010
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Plate 2

Site map and sampling locations for Consolidated Unit 12-001(a)-99

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MCA10-IR-01.1 SITE 15 MARCH 2010 LYON
Los Alamos Technical Associates (LATA-LAO)
Revised 20 May 2011 by AdelanteConsultingInc.

This map was created for work processes associated with the Corrective Actions Projects (CAP) of the Los Alamos National Laboratory (LANL) Environmental Programs (EP) Directorate. All other uses for this map should be confirmed with LANL EP-CAP staff.

1622400 1622600 1622800 1623000 1623200 1623400 1623600 1623800 1624000

1765800 1765600 1765400 1765200 1765000 1764800 1764600

AOC C-12-003 (12-3)

AOC C-12-004 (12-5)

AOC C-12-002 (12-2)

AOC C-12-001 (12-1)

12-610694
RE12-10-7840 0-0.7 ft SOIL
Perchlorate 0.000656 (J)
Uranium 3.94
RE12-10-7841 3-3.4 ft SOIL
Antimony 1.15
Barium 407 (J)
Chromium 67.6
Cobalt 22.8 (J-)
Lead 22.5
Manganese 2150 (J)

12-610696
RE12-10-7844 0-0.75 ft SOIL
Chromium 27.1
Uranium 2.79
RE12-10-7845 2-2.6 ft SOIL
Cobalt 12.4 (J-)

12-610695
RE12-10-7842 0-1 ft SOIL
Chromium 24.5
Cobalt 17.3 (J-)
Manganese 802 (J)
Uranium 1.84
RE12-10-7843 2-2.4 ft SOIL
Chromium 20

12-610693
RE12-10-7838 0-0.5 ft SOIL
Uranium 2.05

12-610656
RE12-10-7663 0-0.5 ft SOIL
Antimony 3.89
Chromium 196
Lead 48.2

12-610659
RE12-10-7669 0-0.4 ft SOIL
Chromium 39
Perchlorate 0.00197 (J)
Uranium 2.16
RE12-10-7670 2-3 ft SOIL
Perchlorate 0.00124 (J)

AOC C-12-005
Former junction box
(12-6)

12-610701
RE12-10-7854 0-0.6 ft SOIL
Uranium 3.2
RE12-10-7855 2-3 ft QBT3
Aluminum 11400
Barium 243
Calcium 2400
Chromium 11.5
Cobalt 7.08
Copper 7.07
Lead 14.7
Magnesium 2040 (J+)
Nickel 8.43
Vanadium 28.8

SWMU 12-001(a) Firing pit (12-4)

12-610697
RE12-10-7847 1.4-1.8 ft SOIL
Chromium 36.8

12-610699
RE12-10-7850 0-0.5 ft SOIL
Chromium 43
Uranium 2.07

EARTH BERM

SWMU 12-001(b)

SWMU 12-002

12-610640

12-610653

12-610660

12-610657

12-610700
RE12-10-7852 0-0.6 ft SOIL
Chromium 31
Uranium 1.84
RE12-10-7853 2-3.5 ft SOIL
Perchlorate 0.000672 (J)

12-610639
RE12-10-7617 0-0.5 ft SOIL
Chromium 31.3
Perchlorate 0.000909 (J)
Uranium 2.59

12-610644
RE12-10-7627 0-0.5 ft SOIL
Chromium 21.4
Uranium 2.92

12-610651
RE12-10-7641 0-0.9 ft SOIL
Chromium 19.6
Uranium 7.42

12-610655
RE12-10-7649 0-0.7 ft SOIL
Uranium 1.92
RE12-10-7650 1.5-2.5 ft SOIL
Perchlorate 0.000645 (J)

12-610643
RE12-10-7625 0-0.6 ft SOIL
Chromium 27.2
Copper 18.5
RE12-10-7626 2-3 ft SOIL
Perchlorate 0.0006 (J)

12-610642
RE12-10-7623 0-0.5 ft SOIL
Barium 346
Chromium 20
Perchlorate 0.00117 (J)
Uranium 2.5
RE12-10-7624 2-2.6 ft SOIL
Perchlorate 0.000546 (J)

12-610652
RE12-10-7643 0-0.5 ft SOIL
Uranium 4.48

12-610654
RE12-10-7647 0-1 ft SOIL
Uranium 3.58
RE12-10-7648 2-3 ft QBT3
Barium 140 (J)
Calcium 3240
Chromium 7.26

12-610641
RE12-10-7621 0-1 ft SOIL
Barium 503
Copper 29

12-610658
RE12-10-7667 0-0.5 ft SOIL
Cadmium 0.502 (J)
Chromium 31
Uranium 2.77

12-610698
RE12-10-7848 0-0.75 ft SOIL
Lead 41

12-610646
RE12-10-7631 0-0.6 ft SOIL
Chromium 56.8
Uranium 1.92

12-610648
RE12-10-7635 0-0.7 ft SOIL
Uranium 2.15
RE12-10-7636 2-3 ft SOIL
Uranium 1.97

12-610647
RE12-10-7633 0-0.7 ft SOIL
Perchlorate 0.000809 (J)
Uranium 2.24 (J+)
RE12-10-7634 2-3 ft SOIL
Barium 334 (J)
Cobalt 15.2 (J-)
Manganese 1380 (J)
Silver 1.11

12-610649
RE12-10-7638 0-0.6 ft SOIL
Uranium 8.68 (J+)

12-610645
RE12-10-7629 0-0.4 ft SOIL
Chromium 74.3
Perchlorate 0.000738 (J)
Uranium 3.59

12-610787
RE12-10-8094 0.4-0.8 ft QBT3
Barium 74.3
Cobalt 13.4
Copper 7.83
RE12-10-8095 2-3.3 ft QBT3
Aluminum 14200
Barium 191
Calcium 2440
Chromium 13.5
Cobalt 14.2
Copper 11.1
Iron 18900
Lead 13
Magnesium 2220 (J+)
Nickel 9.28
Vanadium 27.1

12-610650
RE12-10-7639 0-0.7 ft SOIL
Uranium 1.9 (J+)
RE12-10-7640 2-3 ft QBT3
Aluminum 11700
Barium 130 (J)
Chromium 13.2
Cobalt 5.3 (J-)
Copper 5.81
Iron 14600
Magnesium 2080
Nickel 7.19
Vanadium 23.1

12-610669
RE12-10-7703 0-0.7 ft SOIL
Chromium 69.8

12-610666
RE12-10-7697 0-0.5 ft SOIL
Chromium 20
Uranium 1.84

12-610670
RE12-10-7706 1-2 ft QBT3
Aluminum 10800
Barium 102
Chromium 14.7
Cobalt 3.15
Copper 6.6
Iron 14600
Magnesium 2060 (J+)
Nickel 6.8
Vanadium 19.1

12-610667
RE12-10-7699 0-0.5 ft SOIL
Chromium 42.9
Perchlorate 0.00071 (J)
Uranium 3.59 (J)
RE12-10-7700 1-2 ft QBT3
Barium 49.2
Chromium 22.9

12-610671
RE12-10-7707 0-0.3 ft SOIL
Chromium 23.9
Uranium 5.55 (J)
RE12-10-7708 1-2 ft QBT3
Aluminum 10800
Barium 197
Calcium 2780
Chromium 12.4
Cobalt 5.7
Copper 6.77
Lead 15.4
Magnesium 1910 (J+)
Vanadium 27.8

12-610672
RE12-10-7709 0-0.8 ft SOIL
Uranium 19.1
RE12-10-7710 1-2.8 ft QBT3
Chromium 12.8
Cyanide (Total) 0.502

12-610673
RE12-10-7711 0-0.9 ft SOIL
Uranium 5.41
RE12-10-7712 1-1.9 ft QBT3
Chromium 11.1

12-610668
RE12-10-7701 0-1 ft SED
Uranium 4.92 (J)
RE12-10-7702 1-1.9 ft QBT3
Chromium 11.4

12-610674
RE12-10-7713 0-0.1 ft SOIL
Uranium 6.76
RE12-10-7714 1-2 ft SOIL
Perchlorate 0.000612 (J)

12-610675
RE12-10-7715 0-0.6 ft SOIL
Perchlorate 0.00209 (J)
Uranium 8.43 (J)
Zinc 55.8
RE12-10-7716 1-2 ft SOIL
Iron 22100
Zinc 85.6

12-610676
RE12-10-7718 1-1.5 ft QBT3
Chromium 32.1

12-610677
RE12-10-7719 0-0.7 ft SOIL
Perchlorate 0.000621 (J)
Uranium 3.18 (J)

12-610678

12-610679

12-610680

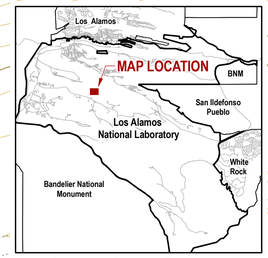
Redondo Road

Threemile Canyon

TA-67

TA-15

7360 7340 7320 7300 7280 7260 7240 7220 7200 7180 7160 7140 7120



- Sampling location
- SWMU or AOC
- Fence
- TA boundary
- Unpaved road

Elevation contours
- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Note: Concentrations are in mg/kg

FEATURE DATA REFERENCES

Hypsography; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Waste and Environmental Services Division, EP2010-0035; 21 January 2010.
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N W E S

0 50 100 150

Feet

1:800

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

Plate 3

Inorganic chemicals detected or detected above BVs at Consolidated Unit 12-001(a)-99

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MCA10-IR-01.2 INORG 01 APRIL 2010 LYON
Los Alamos Technical Associates (LATA-LAO)
Revised 20 May 2011 by AdelanteConsultingInc.

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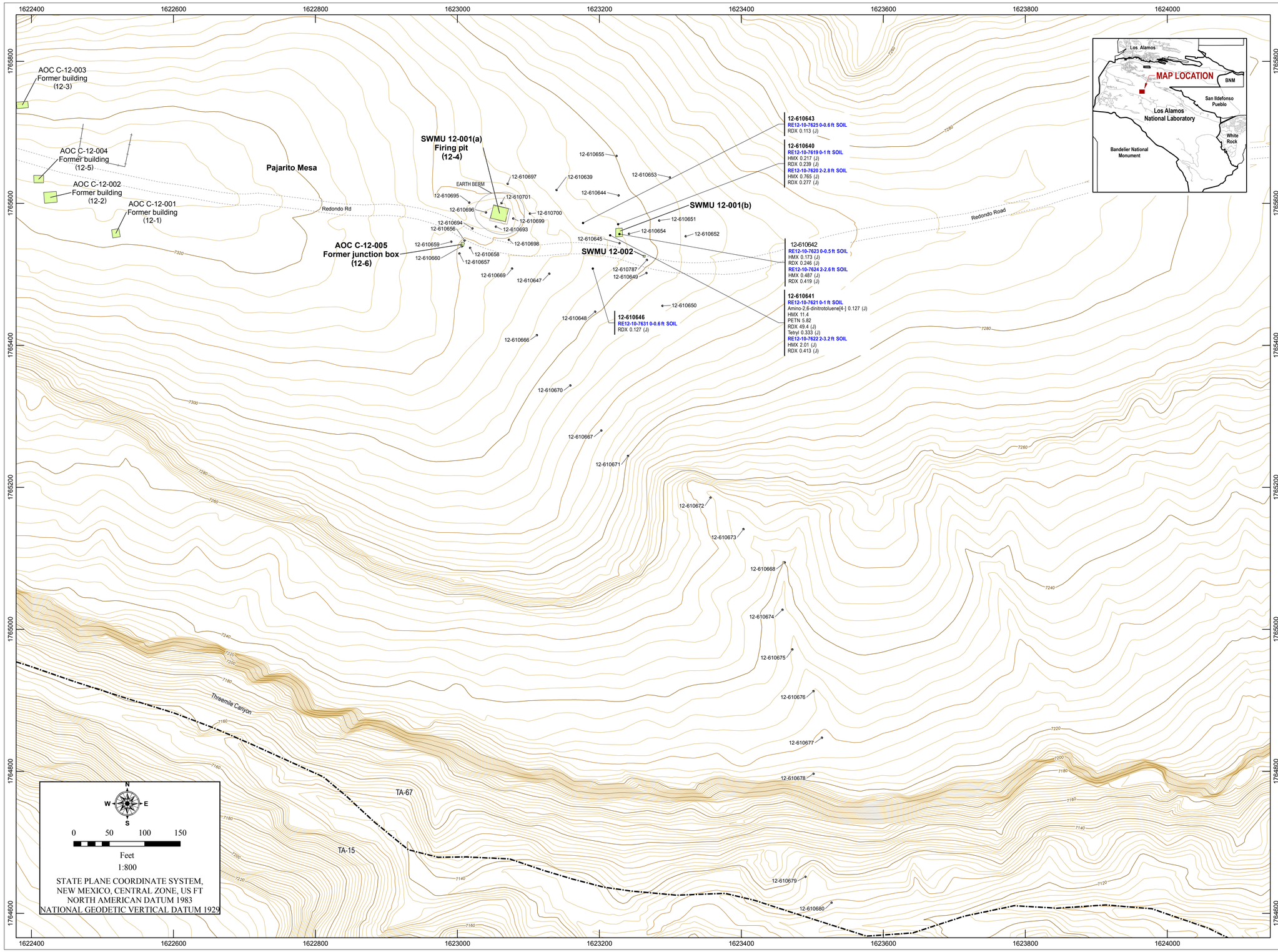

- Sampling location
- SWMU or AOC
- Fence
- TA boundary
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Note: Concentrations are in mg/kg

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Plate 4

Organic chemicals detected at Consolidated Unit 12-001(a)-99

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MCA10-IR-01.3 ORG 01 APRIL 2010 LYON
Los Alamos Technical Associates (LATA-LAO)
Revised 20 May 2011 by AdelanteConsultingInc.

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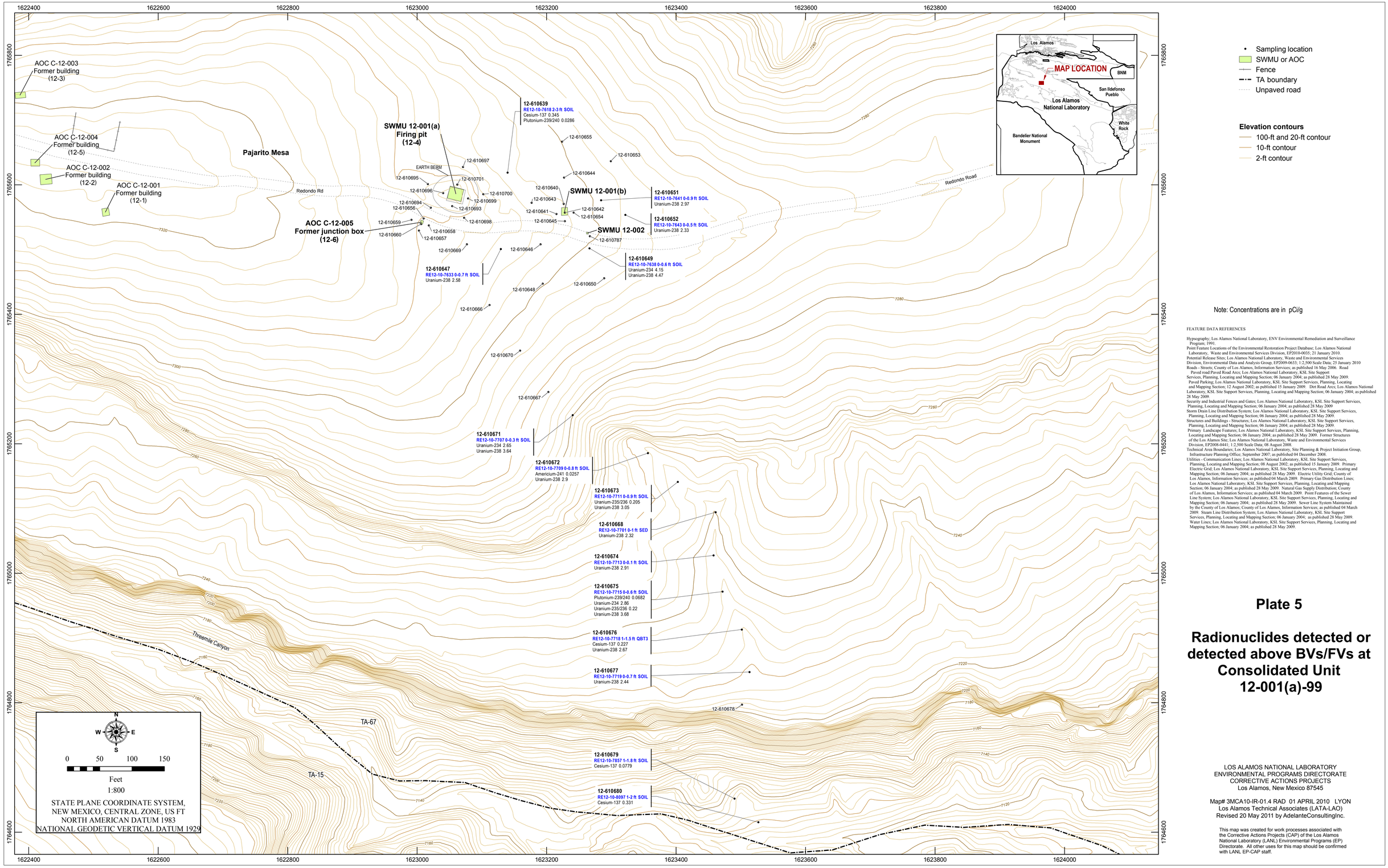

- Sampling location
- SWMU or AOC
- Fence
- TA boundary
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Note: Concentrations are in pCi/g

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Plate 5

Radionuclides detected or detected above BVs/FVs at Consolidated Unit 12-001(a)-99

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MCA10-IR-01.4 RAD 01 APRIL 2010 LYON
Los Alamos Technical Associates (LATA-LAO)
Revised 20 May 2011 by AdelanteConsultingInc.

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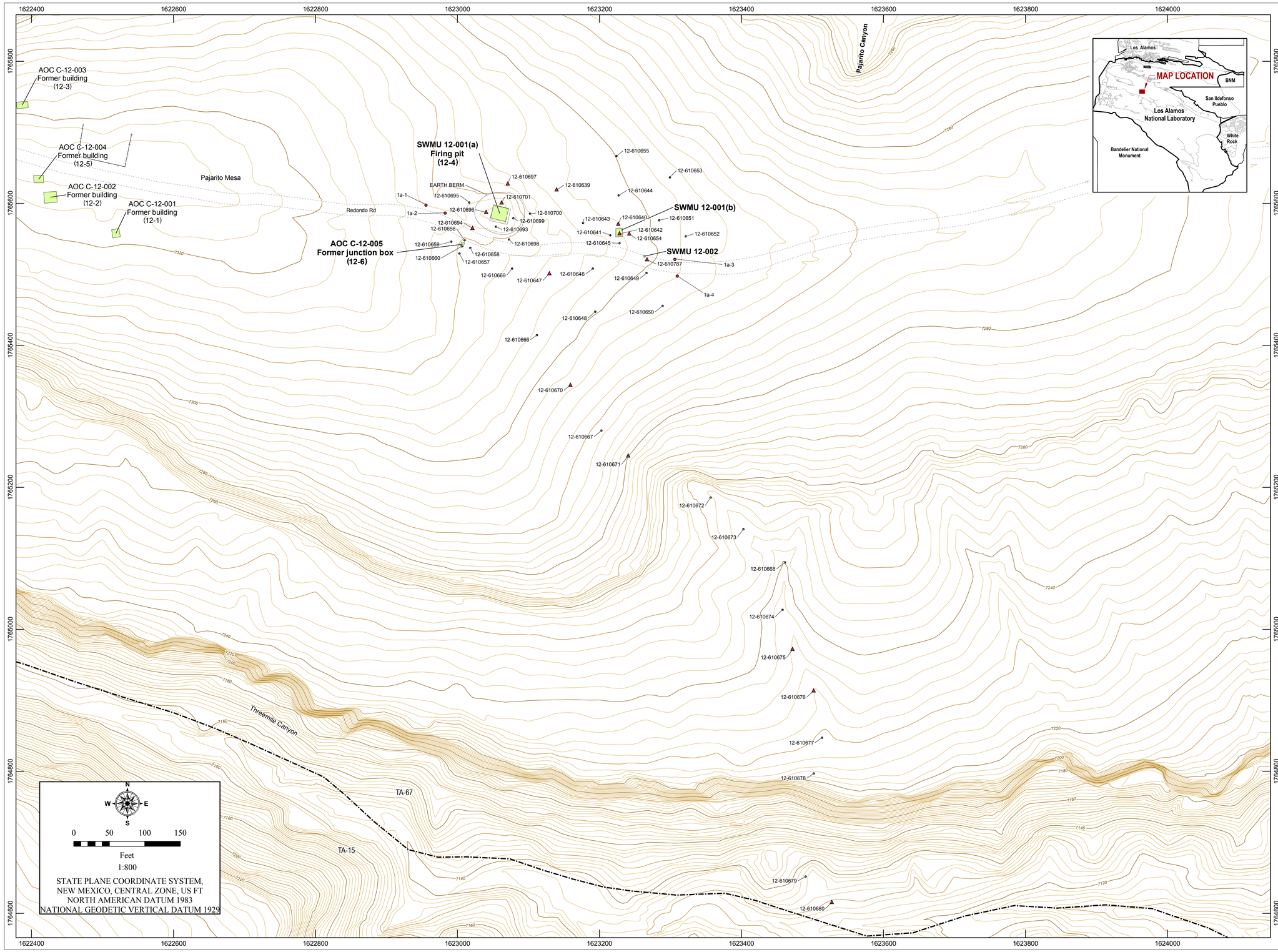

- Proposed location to resample
- Proposed new sampling location
- Sampling location
- SWMU or AOC
- Fence
- Unpaved road
- TA boundary

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

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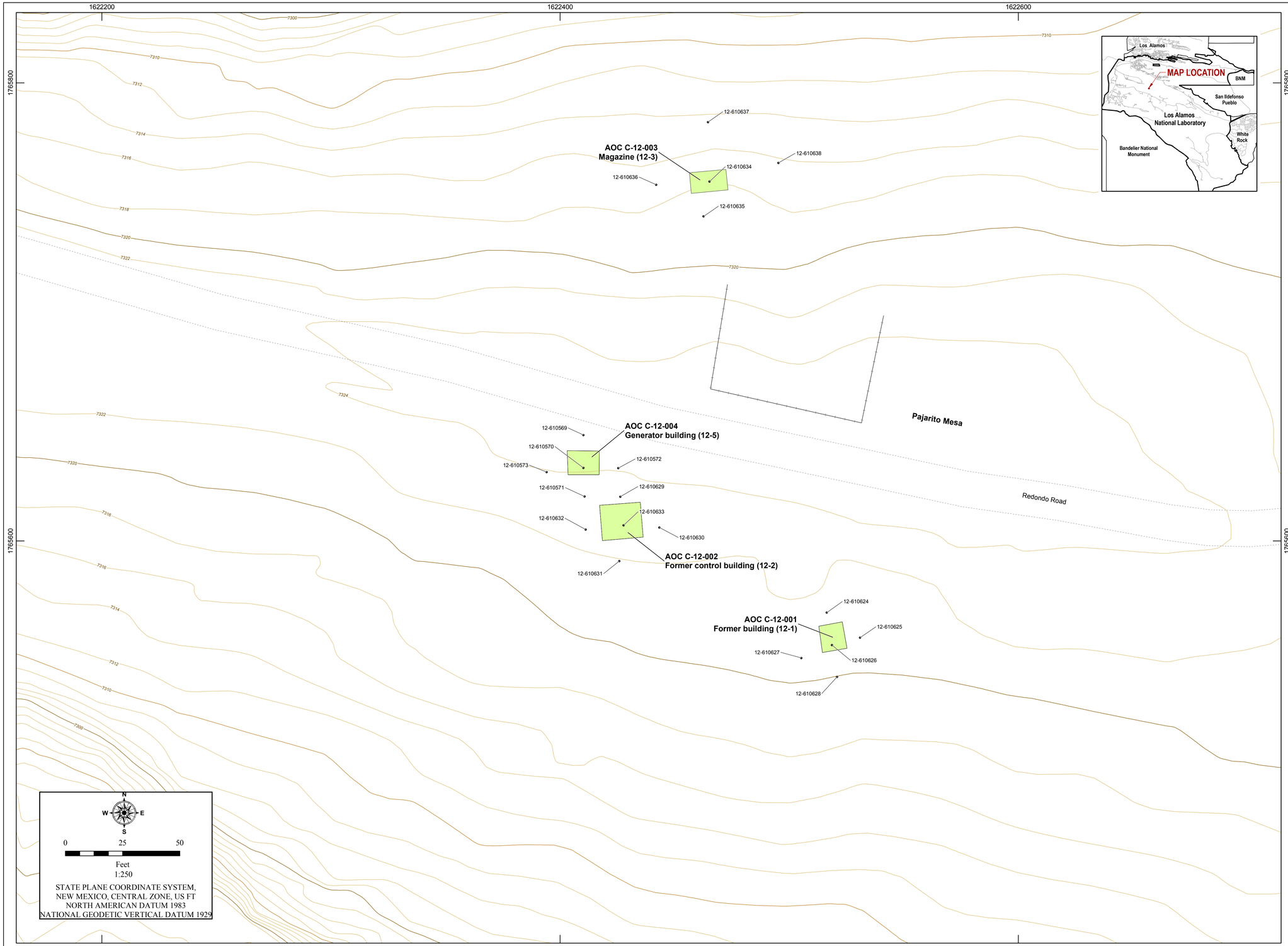
Plate 6

Proposed sampling locations at Consolidated Unit 12-001(a)-99

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MCA10-IR-01.1 SITE 15 MARCH 2010 LYON
Los Alamos Technical Associates (LATA-LAO)
Revised 25 May 2011 by AdelanteConsultingInc.

This map was created for work processes associated with the Corrective Actions Projects (CAP) of the Los Alamos National Laboratory (LANL) Environmental Programs (EP) Directorate. All other uses for this map should be confirmed with LANL EP-CAP staff.



- Sampling location
- SWMU or AOC
- Fence
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

FEATURE DATA REFERENCES

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Plate 7
Site map and sampling locations for AOCs C-12-001, C-12-002, C-12-003, and C-12-004

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-PLT-3.1 SITE 22 MARCH 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
Revised 17 May 2011 by AdelanteConsultingInc.

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1622200 1622400 1622600

1765800 1765600

AOC C-12-003
Magazine (12-3)

12-610636
RE12-10-7600 0-0.5 ft SOIL
Chromium 104
RE12-10-7601 2-3.2 ft QBT3
Barium 57 (J+)

12-610637
RE12-10-7603 1.9-2.5 ft QBT3
Chromium 35.2

12-610638
RE12-10-7606 0-0.5 ft SOIL
Uranium 2.35
RE12-10-7607 2-2.7 ft QBT3
Barium 111 (J+)
Chromium 37.2
Cobalt 3.44

12-610634
RE12-10-7597 2.5-3 ft SOIL
Antimony 2.74 (J)
Perchlorate 0.0019 (J)

12-610635
RE12-10-7598 0-0.5 ft SOIL
Chromium 40.7
RE12-10-7599 2-2.9 ft QBT3
Barium 53.7 (J+)

12-610570
RE12-10-7353 0-0.75 ft SOIL
Chromium 33.5
RE12-10-7354 1.75-2.7 ft QBT3
Aluminum 10800
Barium 166 (J-)
Chromium 10.1
Cobalt 5.38
Copper 6.8
Lead 12.4
Magnesium 1880
Vanadium 26.7

12-610573
RE12-10-7360 2-2.5 ft QBT3
Aluminum 17100
Barium 143 (J-)
Calcium 2300
Chromium 11.6
Cobalt 6.49
Copper 7.29
Iron 15100
Magnesium 2320
Nickel 8.43
Vanadium 24.9

12-610569
RE12-10-7351 0-0.5 ft SOIL
Cadmium 0.832
Copper 28.1
Silver 2.56
Uranium 3.86
RE12-10-7352 2-3 ft SOIL
Perchlorate 0.00117 (J)

AOC C-12-004
Generator building (12-5)

12-610572
RE12-10-7357 0-0.75 ft SOIL
Lead 58.6
Zinc 54.9
RE12-10-7358 2-2.5 ft SOIL
Lead 29.7
Perchlorate 0.00104 (J)

12-610571
RE12-10-7356 2-2.5 ft QBT3
Aluminum 12800
Barium 171 (J-)
Calcium 3810
Chromium 13.1
Cobalt 4.56
Copper 5.77
Iron 14700
Magnesium 2500
Nickel 7.09
Perchlorate 0.0012 (J)
Vanadium 19.2

12-610629
RE12-10-7580 0-0.5 ft SOIL
Uranium 3.13

12-610632
RE12-10-7587 2-3 ft QBT3
Aluminum 10300
Barium 275
Calcium 2710
Chromium 8.79
Cobalt 6.64
Copper 7.21
Magnesium 2310 (J+)
Nickel 7.88
Vanadium 21.5

12-610630
RE12-10-7583 2-3 ft SOIL
Perchlorate 0.00164 (J)

AOC C-12-002
Former control building (12-2)

12-610633
RE12-10-7590 0-0.5 ft SOIL
Cobalt 12.1
Manganese 1070
RE12-10-7591 2-3 ft SOIL
Chromium 23
Perchlorate 0.000655 (J)

12-610631
RE12-10-7584 0-0.5 ft SOIL
Uranium 2.55
RE12-10-7585 2-3 ft QBT3
Aluminum 11300
Barium 125
Chromium 11.6
Cobalt 5.28
Copper 5.97
Magnesium 1710 (J+)
Vanadium 18.8

AOC C-12-001
Former building (12-1)

12-610627
RE12-10-7558 2.4-3 ft QBT3
Aluminum 8840
Barium 161
Calcium 4530
Magnesium 1860 (J+)
Perchlorate 0.00241

12-610624
RE12-10-7552 2-3 ft QBT3
Barium 66.8
Chromium 16.9
Cobalt 3.67

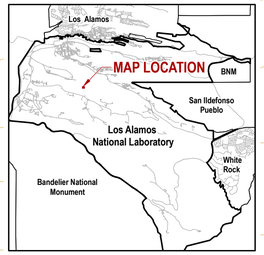
12-610626
RE12-10-7556 2.1-3 ft QBT3
Aluminum 8220
Barium 92.4
Cobalt 3.16

12-610625
RE12-10-7553 0-0.5 ft SOIL
Uranium 4.07
RE12-10-7554 2-3 ft QBT3
Aluminum 8510
Barium 132
Calcium 3670 (J+)
Chromium 27
Magnesium 1970 (J+)
Nickel 7.45
Perchlorate 0.000754 (J)

12-610628
RE12-10-7561 0-1 ft SOIL
Uranium 2
RE12-10-7562 2-3 ft QBT3
Aluminum 10800
Barium 144
Calcium 2300
Chromium 8.05
Cobalt 3.56
Copper 5.36
Magnesium 2100 (J+)
Nickel 9.26

Pajarito Mesa

Redondo Road



- Sampling location
- SWMU or AOC
- Fence
- Unpaved road

Elevation contours
- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Note: Concentrations are in mg/kg

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N W E S

0 25 50

Feet
1:250

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

Plate 8

Inorganic chemicals detected or detected above BVs at AOCs C-12-001, C-12-002, C-12-003, and C-12-004

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-PLT-3.2 INORG 22 MARCH 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
Revised 17 May 2011 by AdelanteConsultingInc.

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1622200 1622400 1622600

1765800 1765600

7310 7312 7314 7316 7318 7320 7322 7324

12-610637
12-610638
12-610634
12-610636
12-610635

AOC C-12-003
Magazine (12-3)

12-610569
12-610570
12-610573
12-610572
12-610571
12-610629
12-610633
12-610632
12-610630
12-610631

AOC C-12-004
Generator building (12-5)

AOC C-12-002
Former control building (12-2)

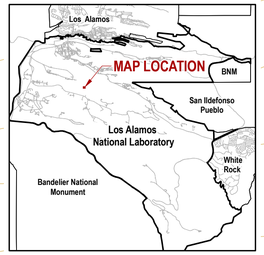
12-610624
12-610625
12-610627
12-610626

AOC C-12-001
Former building (12-1)

12-610628
RE12-10-7561 0-1 ft SOIL
Aroclor-1242 0.114
Aroclor-1254 0.109
Aroclor-1260 0.0477

Pajarito Mesa

Redondo Road



- Sampling location
- SWMU or AOC
- Fence
- Unpaved road

Elevation contours
- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Note: Concentrations are in mg/kg

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N W E S

0 25 50

Feet
1:250

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

Plate 9

Organic chemicals detected at AOC C-12-001

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-PLT-3.3 ORG 22 MARCH 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
Revised 20 May 2011 by AdelanteConsultingInc.

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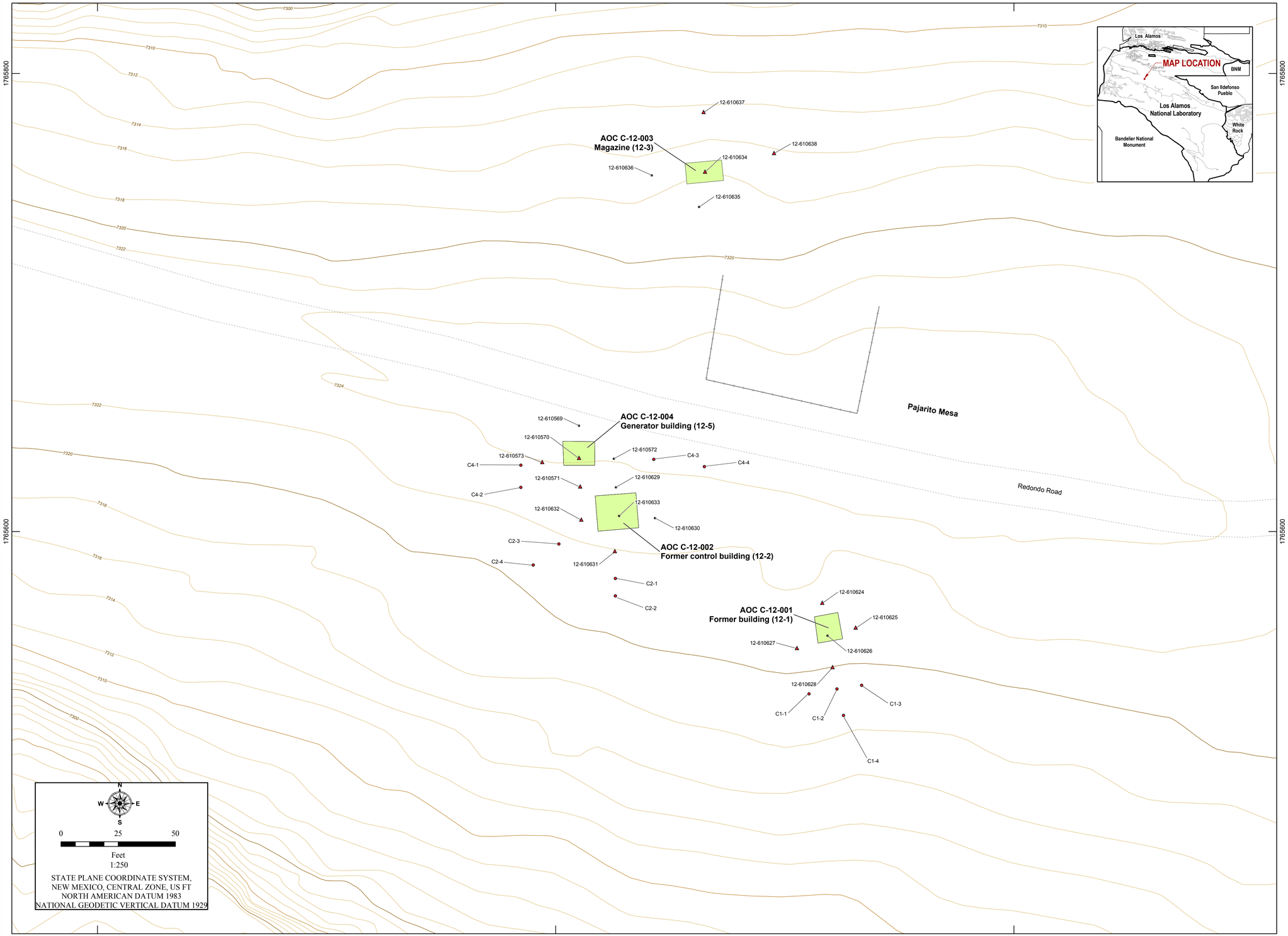

- Proposed location to resample
- Proposed new sampling location
- Sampling location
- SWMU or AOC
- Fence
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

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Plate 10

Proposed sampling locations at AOCs C-12-001, C-12-002, C-12-003, and C-12-004

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Los Alamos, New Mexico 87545

Map# 3MC10-IR-PLT-3.1 SITE 22 MARCH 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
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1626200 1626250 1626300 1626350 1626400 1626450 1626500

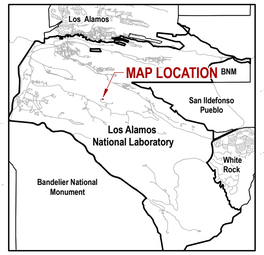
1763400 1763350 1763300 1763250 1763200

15-610817
15-610816
15-610798
15-610793
15-610799
15-610797
15-610809
15-610808
15-610807
15-610792
15-610812
15-610810
15-610814
15-610796
15-610813
15-610802
15-610806
15-610800
15-610794
15-610811
15-610805
15-610801
15-610804
15-610803
15-610818
15-610820
15-610819

SWMU 15-007(c)
Shaft (15-264)

SWMU 15-007(d)
Shaft (15-265)

7174 7172 7170 7168 7166 7164 7162 7160



- Samplinglocation
- Structure or building
- SWMU or AOC
- Unpaved road

Elevation contours
- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

N W E S

0 25 50

Feet
1:150

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

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Plate 11

Site map and sampling locations for Consolidated Unit 15-007(c)-00

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-10.1 SITE 15 MARCH 2010 TOOMEY
Los Alamos Technical Associates (LATA-LAO)
Revised 23 May 2011 by AdelanteConsultingInc.

This map was created for work processes associated with the Corrective Actions Projects (CAP) of the Los Alamos National Laboratory (LANL) Environmental Programs (EP) Directorate. All other uses for this map should be confirmed with LANL EP-CAP staff.

1626200 1626250 1626300 1626350 1626400 1626450 1626500

1763400 1763350 1763300 1763250 1763200

15-610816
RE15-10-8174 3.5-5 ft QBT3
Barium 173 (J+)
Calcium 2930
Cobalt 4.72
Copper 5.26
Lead 11.6
Manganese 614
Perchlorate 0.000576 (J)
RE15-10-8175 17.5-20 ft QBT3
Perchlorate 0.000838 (J)
RE15-10-8176 34-35 ft QBT3
Beryllium 1.37
Perchlorate 0.00462
RE15-10-8177 49-50 ft QBT3
Beryllium 1.36
Perchlorate 0.00141 (J)
RE15-10-8178 65-66 ft QBT3
Perchlorate 0.000587 (J)
RE15-10-8182 124-125 ft QBT2
Chromium 24.8
RE15-10-8183 139-140 ft QBT2
Beryllium 1.54 (J-)
Chromium 11.3
Copper 5.13
RE15-10-8184 154-155 ft QBT2
Beryllium 8.68 (J-)
RE15-10-8185 169-170 ft QBT1G
Aluminum 4670
Arsenic 0.728 (J-)
Beryllium 3.14 (J-)
Chromium 4.04
Iron 6590
Manganese 243
Nickel 2.5 (J-)
Vanadium 4.98
Zinc 44.4
RE15-10-8210 181.5-182.5 ft QBT1G
Aluminum 3990
Arsenic 0.714 (J-)
Beryllium 2.46 (J-)
Chromium 4.61
Iron 7600
Magnesium 777 (J+)
Manganese 297
Nickel 2.43 (J-)
Vanadium 5.7
Zinc 50.3

15-610807
RE15-10-8157 1-2 ft QBT3
Aluminum 20800
Barium 223 (J+)
Calcium 2790
Chromium 14
Cobalt 7.48 (J)
Copper 10.2 (J)
Iron 17300
Lead 15.7 (J+)
Magnesium 3080 (J+)
Nickel 9.82
Perchlorate 0.000579 (J)
Vanadium 33.1

15-610814
RE15-10-8170 0-0.5 ft SOIL
Antimony 243
Lead 63700 (J)
Perchlorate 0.000831 (J)
Zinc 206 (J+)
RE15-10-8171 1-2 ft QBT3
Aluminum 15100
Barium 180 (J+)
Calcium 2240 (J+)
Chromium 15.5
Cobalt 6.75
Copper 8.99
Iron 14700
Lead 90.6 (J)
Magnesium 2400 (J+)
Nickel 9.15
Perchlorate 0.0017 (J)
Vanadium 30.9 (J)

15-610797
RE15-10-8137 1-1.5 ft SOIL
Chromium 151
Nickel 16.8
Zinc 54.3

15-610798
RE15-10-8139 1-2 ft QBT3
Aluminum 13400
Barium 150
Chromium 14.4
Cobalt 4.62 (J)
Copper 6.81 (J)
Lead 12.1
Magnesium 2060
Nickel 8.06 (J)
Vanadium 23.9

15-610799
RE15-10-8140 0-0.5 ft SOIL
Chromium 22.5

15-610793

15-610817
RE15-10-8188 34-35 ft QBT3
Perchlorate 0.00213
RE15-10-8189 49-50 ft QBT3
Chromium 15.4 (J-)
Perchlorate 0.000533 (J)
RE15-10-8196 156-157.5 ft QBT2
Chromium 16.1 (J-)
RE15-10-8197 171.5-172.5 ft QBT1G
Iron 5970
Manganese 266
Zinc 46
RE15-10-8211 181.5-182.5 ft QBT1G
Iron 6270
Manganese 317
Zinc 52.4

15-610808
RE15-10-8159 1-2 ft QBT3
Aluminum 16600
Arsenic 3.01
Barium 174 (J+)
Calcium 2710
Chromium 13.6
Cobalt 5.64 (J)
Copper 8.26 (J)
Iron 15900
Lead 13.3 (J)
Magnesium 2660 (J+)
Nickel 9.31
Vanadium 30.1

15-610809
RE15-10-8161 1-1.5 ft QBT3
Barium 106 (J+)
Calcium 3390
Chromium 11.1
Cobalt 4.61 (J)
Copper 7.78 (J)
Magnesium 1830 (J+)

SWMU 15-007(c)
Shaft (15-264)

15-610812

15-610810
RE15-10-8162 0-0.5 ft SOIL
Lead 28.3 (J+)

15-610813
RE15-10-8168 0-0.5 ft SOIL
Lead 45.9 (J)
RE15-10-8169 1-1.5 ft SOIL
Antimony 1.76
Lead 180 (J)

15-610806
RE15-10-8154 0-0.5 ft SOIL
Cadmium 0.635 (J)
Lead 35.7 (J+)

15-610796

15-610792
RE15-10-8127 1-2 ft SOIL
Chromium 23.4
Zinc 54.5

15-610800

15-610811

15-610802
RE15-10-8147 0-0.5 ft SOIL
Chromium 23.2
Lead 150
Zinc 108
RE15-10-8146 1-2 ft SOIL
Lead 200
Zinc 77.5

15-610801
RE15-10-8145 1-2 ft QBT3
Aluminum 7630
Barium 125
Chromium 10.1
Cobalt 5.83 (J)
Copper 6.57 (J)
Magnesium 1860
Nickel 6.92 (J)
Vanadium 24.3

15-610794
RE15-10-8130 0-0.5 ft SOIL
Lead 44.7
Silver 14.7
RE15-10-8131 1-2 ft QBT3
Aluminum 10800
Arsenic 3.2 (J)
Barium 158
Calcium 3510
Chromium 13.1
Cobalt 5.39 (J)
Copper 6.48 (J)
Lead 12.6
Magnesium 2120
Nickel 9.69 (J)
Vanadium 24.7

15-610804
RE15-10-8151 0-0.5 ft SOIL
Chromium 41.4
RE15-10-8150 1-2 ft SOIL
Chromium 22.7
Perchlorate 0.000619 (J)

15-610805
RE15-10-8153 0-0.5 ft SOIL
Chromium 23.2

15-610803
RE15-10-8148 0-0.5 ft SOIL
Chromium 21.7
RE15-10-8149 1-2.1 ft SOIL
Chromium 42.5

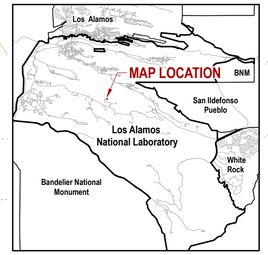
15-610818
RE15-10-8198 4-5 ft QBT3
Lead 25.7
RE15-10-8199 19-20 ft QBT3
Lead 17.9
RE15-10-8209 169-170 ft QBT1G
Chromium 10.6 (J)
Iron 5950
Manganese 334
Zinc 41
RE15-10-8212 180-182.5 ft QBT1G
Iron 5980
Manganese 322
Zinc 46.8

SWMU 15-007(d)
Shaft (15-265)

15-610820
RE15-10-8253 18-20 ft QBT3
Perchlorate 0.00212
RE15-10-8254 34-35 ft QBT3
Beryllium 1.67
Perchlorate 0.00237
RE15-10-8260 124-125 ft QBT2
Chromium 18.7
RE15-10-8261 138.5-140 ft QBT2
Chromium 12
RE15-10-8265 178-180 ft QBT1V
Chromium 3

15-610819
RE15-10-8249 138.5-140 ft QBT2
Chromium 9.27
Selenium 0.549 (J)
RE15-10-8251 169-170 ft QBT1G
Iron 5910
Manganese 268 (J)
Zinc 40.8
RE15-10-8264 181.5-182.5 ft QBT1G
Iron 5890
Manganese 282 (J)
Selenium 0.513 (J)
Zinc 42.4

7174 7172 7176 7174 7170 7168 7166 7164 7162 7160



- Samplinglocation
- Structure or building
- SWMU or AOC
- Unpaved road

Elevation contours
- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

N W E S
0 25 50
Feet
1:150

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

Note: Concentrations are in mg/kg

FEATURE DATA REFERENCES

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WQH Inactive Outfalls; Los Alamos National Laboratory; ENV Water Quality and Hydrology Group; Edition 2002.01; 01 September 2003.
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Plate 12

Inorganic chemicals detected or detected above BVs at Consolidated Unit 15-007(c)-00

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-10.2 INORG 28 APRIL 2010 TOOMEY
Los Alamos Technical Associates (LATA-LAO)
Revised 23 May 2011 by AdelanteConsultingInc.

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1626200 1626250 1626300 1626350 1626400 1626450 1626500

1763400 1763350 1763300 1763250 1763200

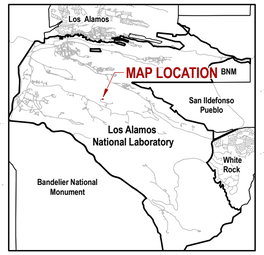
15-610817
15-610816
15-610798
15-610793
15-610799
15-610797
15-610809
15-610808
15-610807
15-610792
15-610814
15-610812
15-610810
15-610796
15-610813
7c-1
15-610802
15-610806
15-610794
15-610800
15-610811
15-610805
15-610801
15-610804
15-610803
15-610818
15-610820
15-610819

SWMU 15-007(c)
Shaft (15-264)

SWMU 15-007(d)
Shaft (15-265)

7d-1

7174 7172 7170 7168 7166 7164 7162 7160



- Proposed location to resample
- Proposed new sampling location
- Sampling location
- Concrete pad
- Proposed excavation boundary
- Structure or building
- SWMU or AOC
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

FEATURE DATA REFERENCES

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WQH Inactive Outfalls; Los Alamos National Laboratory, ENV Water Quality and Hydrology Group; Edition 2002.01; 01 September 2003.
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N W E S

0 25 50

Feet
1:150

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

Plate 14

Proposed sampling locations at Consolidated Unit 15-007(c)-00

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-10.1 SITE 15 MARCH 2010 TOOMEY
Los Alamos Technical Associates (LATA-LAO)
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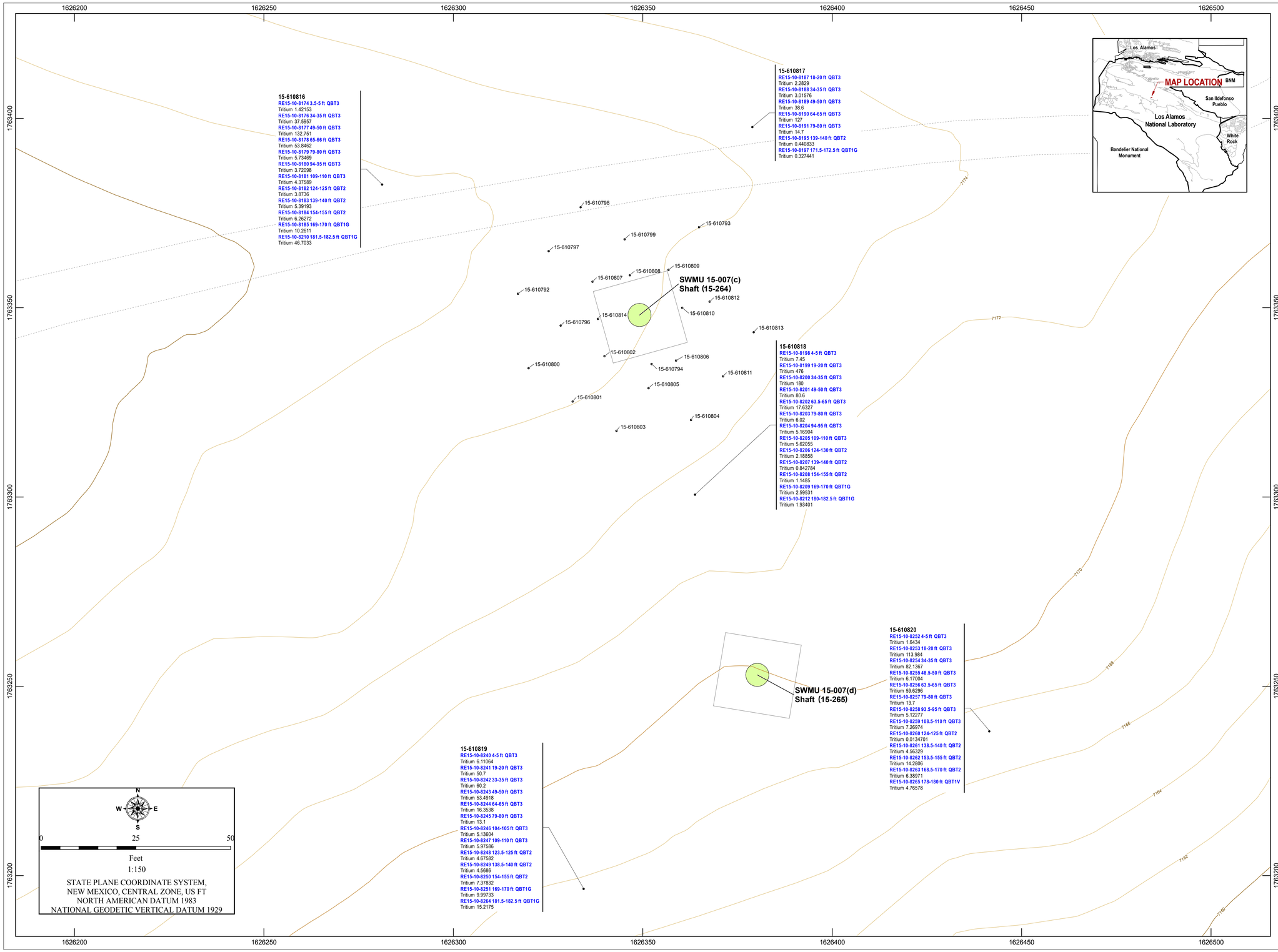

- Sampling location
- Structure or building
- SWMU or AOC
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Note: Concentrations are in pCi/g

FEATURE DATA REFERENCES

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Plate 13

Radionuclides detected or detected above BVs/FVs at Consolidated Unit 15-007(c)-00

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-10.4 RAD 28 APRIL 2010 TOOMEY
Los Alamos Technical Associates (LATA-LAO)
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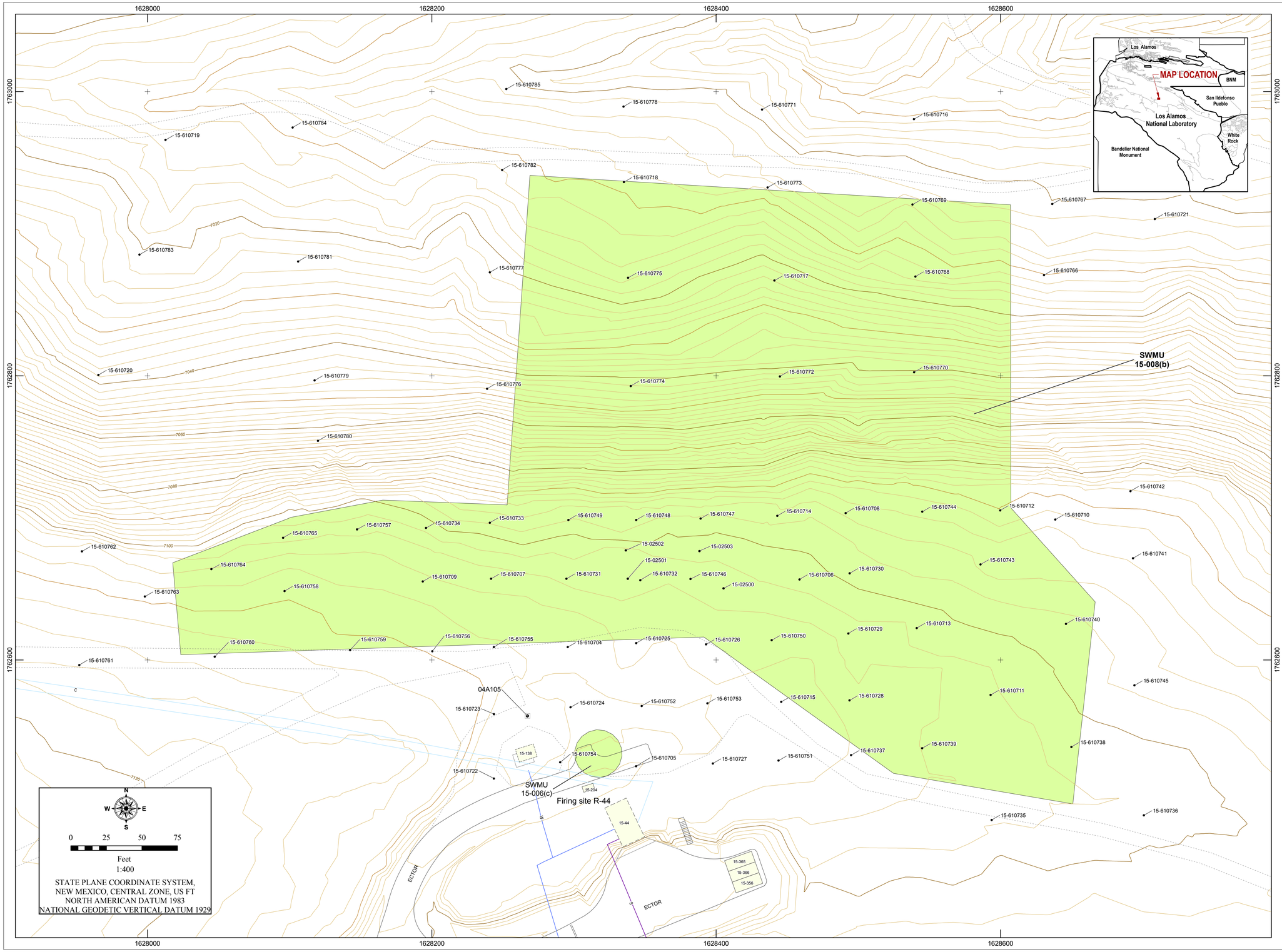

- Outfall
- Sampling location
- Former structure
- Structure or building
- SWMU or AOC
- Underground structure

- Paved road
- Storm drain
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities

- C Communication
- S Sewer
- W Water

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Plate 15

Site map and sampling locations for SWMU 15-008(b)

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-08.1 INORG 22 FEBRUARY 2010 TOOMEY
Los Alamos Technical Associates (LATA-LAO)
Revised 23 May 2011 by AdelanteConsultingInc.

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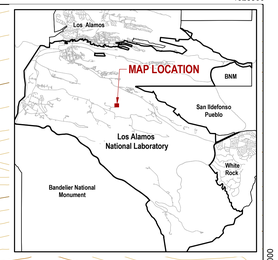

- Outfall
- Sampling location
- Former structure
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Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities

- C Communication
- S Sewer
- W Water

Note: Concentrations are in mg/kg

FEATURE DATA REFERENCES

Hypsography: Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
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Plate 16

Inorganic chemicals detected or detected above BVs at SWMU 15-008(b)

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-08.2 INORG 06 MAY 2010 TOOMEY
Los Alamos Technical Associates (LATA-LAO)
Revised 20 May 2011 by AdelanteConsultingInc.

This map was created for work processes associated with the Corrective Actions Projects (CAP) of the Los Alamos National Laboratory (LANL) Environmental Programs (EP) Directorate. All other uses for this map should be confirmed with LANL EP-CAP staff.

N W E S

0 25 50 75

Feet
1:300

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

15-610785
RE15-10-8031 0-0.5 ft SOIL
Uranium 16.5

15-610778
RE15-10-8017 0-0.5 ft SED
Beryllium 4.41
Copper 50.2 (J)
Lead 34.8 (J)
Uranium 126
RE15-10-8018 1-2 ft SED
Beryllium 1.35
Uranium 189

15-610771
RE15-10-8003 0-0.5 ft SED
Beryllium 7.96
Chromium 10.6
Copper 20.9
Nickel 9.93
Uranium 103
RE15-10-8004 1-2 ft SOIL
Uranium 4.82

15-610716
RE15-10-7893 0-0.5 ft SED
Chromium 34.2
Lead 31.3
Uranium 16.2
RE15-10-7894 1-2 ft SED
Chromium 22
Uranium 14.9

15-610719
RE15-10-7899 0-0.5 ft SED
Chromium 15.6
Iron 22300
Magnesium 2870 (J+)
Uranium 4.21
Vanadium 34.8
Zinc 92
RE15-10-7900 1-1.5 ft QBT3
Chromium 17.8
Cobalt 3.47
Copper 6.27
Iron 15300
Nickel 7.1
Vanadium 23.8

15-610784
RE15-10-8029 0-0.5 ft SOIL
Uranium 4.57
RE15-10-8030 1-2 ft SOIL
Uranium 7.44

15-610782
RE15-10-8025 0-0.5 ft SOIL
Chromium 24.4 (J)
Uranium 2.09
Zinc 66.5 (J+)
RE15-10-8026 1-2 ft SOIL
Perchlorate 0.00213 (J)

15-610718
RE15-10-7897 0-0.5 ft SED
Beryllium 2.65
Chromium 14.5
Copper 33.3
Iron 14300
Lead 32.5
Nickel 11.9
Uranium 36.5
Vanadium 20.8
RE15-10-7898 1-2 ft SED
Arsenic 4.96
Beryllium 2.91
Chromium 23.3
Copper 18.1
Iron 15600
Nickel 16.9
Perchlorate 0.000616 (J)
Uranium 15.5
Vanadium 23.1

15-610773
RE15-10-8007 0-0.5 ft SED
Chromium 17.8
Cobalt 9.34
Copper 47.3
Iron 20300
Lead 48.4
Manganese 765
Uranium 28.4
Vanadium 27.6
Zinc 83.9

15-610769
RE15-10-7999 0-0.7 ft SOIL
Uranium 15.6
RE15-10-8000 1-2 ft SOIL
Perchlorate 0.000589 (J)

15-610767
RE15-10-7995 0-1 ft SED
Copper 15.6
Uranium 19.3
RE15-10-7996 1-1.8 ft SED
Uranium 6.46

15-610721
RE15-10-7903 0-0.5 ft SOIL
Uranium 5.11
Zinc 65 (J)
RE15-10-7904 1-1.9 ft SOIL
Chromium 26.3
Zinc 53.7 (J)

15-610783
RE15-10-8027 0-0.5 ft SOIL
Cadmium 0.411 (J)
Chromium 36.4
Uranium 2.22
RE15-10-8028 1-2 ft SOIL
Chromium 20.1

15-610781
RE15-10-8023 0-0.5 ft SOIL
Chromium 25.5 (J)
RE15-10-8024 1-2 ft SOIL
Barium 344
Beryllium 1.9
Chromium 35.2 (J)

15-610777
RE15-10-8015 0-0.5 ft SED
Beryllium 1.68
Chromium 0.949
Copper 91.4 (J)
Lead 27.6 (J)
Uranium 32.6

15-610775
RE15-10-8011 0-0.5 ft SED
Beryllium 1.7
Copper 20.1
Silver 3.27
Uranium 39.3

15-610717
RE15-10-7895 0-0.5 ft SED
Beryllium 1.32
Uranium 2.38
RE15-10-7896 1-2 ft QBT3
Beryllium 1.33
Chromium 10.4
Copper 5.68

15-610768
RE15-10-7997 0-0.7 ft SED
Copper 15.9
Uranium 27.3
RE15-10-7998 1-1.5 ft SED
Uranium 4.02

15-610766
RE15-10-7993 0-0.7 ft SOIL
Uranium 3.08

15-610720
RE15-10-7901 0-0.5 ft SOIL
Cadmium 0.581 (J)
Uranium 17.2
RE15-10-7902 1-2 ft SOIL
Uranium 3.07

15-610779
RE15-10-8019 0-0.5 ft SOIL
Copper 16.3 (J)
Perchlorate 0.000629 (J)
Uranium 9.2
RE15-10-8020 1-2 ft QBT3
Chromium 7.2 (J)
Copper 5.2 (J)
Perchlorate 0.000569 (J)

15-610776
RE15-10-8013 0-0.5 ft SED
Beryllium 6.27
Copper 64.4 (J)
Lead 23 (J)
Uranium 33.7
RE15-10-8014 1-2 ft QBT3
Barium 50.5
Beryllium 1.56
Copper 6.83 (J)

15-610774
RE15-10-8009 0-0.5 ft SED
Antimony 3.45 (J-)
Beryllium 7.37
Cadmium 0.422 (J)
Copper 175
Lead 97.7
Uranium 348
RE15-10-8010 1-2 ft QBT3
Barium 82 (J)
Chromium 7.4 (J)
Copper 17.2
Lead 12.4
Uranium 13.7

15-610772
RE15-10-8005 0-0.5 ft SOIL
Antimony 1.02 (J-)
Beryllium 3.81
Cadmium 0.824
Copper 88.9
Lead 57.3
Uranium 59
Zinc 54.8

15-610770
RE15-10-8001 0-0.8 ft SED
Beryllium 2.2
Chromium 31.6
Copper 43.8
Lead 27.1
Uranium 47.9
RE15-10-8002 1-2 ft QBT3
Chromium 11.8
Copper 5.27

SWMU
15-008(b)

15-610749
RE15-10-7959 0-0.7 ft SOIL
Antimony 9.56
Beryllium 7.52
Copper 618
Lead 777
Silver 1.05
Uranium 249
Zinc 90.6
RE15-10-7960 3-3.6 ft QBT3
Antimony 4.1
Beryllium 4.02
Chromium 11.5 (J)
Cobalt 16.5
Copper 187
Lead 257
Uranium 143

15-610747
RE15-10-7955 0-0.5 ft SOIL
Antimony 5.53
Beryllium 6.85 (J)
Copper 1200 (J+)
Lead 203 (J)
Silver 1.06
Uranium 183
Zinc 64.7
RE15-10-7956 3-3.7 ft QBT3
Antimony 0.528 (J)
Arsenic 2.82
Barium 54.6
Beryllium 29.1 (J)
Calcium 2290
Chromium 11.2 (J)
Copper 73.9 (J+)
Lead 23.9 (J)
Nickel 7.17 (J)
Perchlorate 0.000923 (J)
Selenium 0.64 (J)
Uranium 69.8

15-610714
RE15-10-7889 0-0.5 ft SOIL
Antimony 5.16 (J)
Beryllium 4.94
Copper 813
Lead 128
Uranium 104
Zinc 57.5
RE15-10-7890 2.5-3.5 ft QBT3
Beryllium 1.29
Chromium 14.8
Cobalt 6.97
Copper 54.6
Lead 24.5
Nickel 6.99 (J-)
Selenium 0.573 (J)
Uranium 17.1

15-610708
RE15-10-7877 0-0.5 ft SOIL
Antimony 1.49
Beryllium 2.57
Copper 131 (J+)
Lead 85.4
Uranium 46.4
RE15-10-7878 3-4 ft QBT3
Chromium 21.4
Cobalt 3.85

15-610712
RE15-10-7885 0-0.4 ft SOIL
Cadmium 7.98
Cobalt 10.1
Copper 168
Lead 43.8
Uranium 39.8
Zinc 72.4
RE15-10-7886 3-3.5 ft QBT3
Chromium 10.1
Cobalt 14.8
Copper 5.92

15-610731
RE15-10-7923 0-0.5 ft QBT3
Antimony 2.45
Barium 48.9 (J)
Beryllium 1.68
Copper 307 (J+)
Lead 71.7
Uranium 81.3
RE15-10-7924 2-3 ft QBT3
Antimony 0.575 (J)
Chromium 12.7
Cobalt 5.43
Copper 6.51 (J+)
Uranium 10.5

15-610748
RE15-10-7957 0-1 ft SOIL
Antimony 7.9
Beryllium 7.22
Copper 36400
Lead 473
Silver 6.95
Uranium 364
Zinc 13300
RE15-10-7958 3-4 ft SOIL
Antimony 6.77
Beryllium 4.31
Copper 622
Lead 283
Uranium 515
Zinc 91.3

15-610744
RE15-10-7949 0-0.5 ft SOIL
Cadmium 0.419 (J)
Copper 88.6
Lead 55.2
Uranium 48.8
Zinc 83.6
RE15-10-7950 1.5-1.7 ft SOIL
Uranium 5.41

15-610742
RE15-10-7945 0-0.3 ft SOIL
Copper 37
Lead 26.3
Uranium 46.3
RE15-10-7946 2.5-3.5 ft QBT3
Chromium 15.8
Cobalt 17.1
Copper 5.87

15-610733
RE15-10-7927 0-0.5 ft SOIL
Beryllium 5.83
Cadmium 1.17
Copper 526
Lead 102
Uranium 84.6
Zinc 56.8
RE15-10-7928 3-4 ft QBT3
Chromium 8.03 (J)
Copper 5.69

15-610706
RE15-10-7873 0-0.5 ft SOIL
Antimony 1.13 (J-)
Beryllium 3.56 (J+)
Lead 95.1 (J+)
Uranium 71.1 (J)
Zinc 53.3
RE15-10-7874 3-3.5 ft QBT3
Cobalt 4.66
Lead 17.1 (J+)
Uranium 13.3 (J)

15-610730
RE15-10-7921 0-0.5 ft SOIL
Beryllium 2.32
Copper 260
Lead 91.8
Uranium 30.9
RE15-10-7922 2-3 ft QBT3
Aluminum 7490
Barium 71.8 (J-)
Beryllium 1.6
Chromium 9.58 (J)
Cobalt 5.92 (J)
Copper 726
Iron 19900
Lead 66.8
Nickel 7.35 (J-)
Perchlorate 0.000587 (J)
Silver 1.26
Uranium 23.5

15-610710
RE15-10-7881 0-0.5 ft SOIL
Beryllium 2.82
Copper 16.7
Uranium 29.5
Zinc 51.6
RE15-10-7882 1-1.6 ft QBT3
Chromium 25.7
Cobalt 6.65
Copper 4.87

15-610741
RE15-10-7943 0-1 ft QBT3
Chromium 20
Cobalt 4.12
RE15-10-7944 2.9-3.5 ft QBT3
Barium 59.1 (J-)
Chromium 25.8
Cobalt 9.43
Copper 6.02
Nickel 7.46 (J-)

15-610762
RE15-10-7985 0-0.4 ft SOIL
Calcium 9490
Copper 25.4
Cyanide (Total) 0.555
Lead 42.8
Uranium 57.8
Zinc 63.7

15-610765
RE15-10-7991 0-0.5 ft SOIL
Cobalt 12.9
Uranium 2.8
RE15-10-7992 3-4 ft QBT3
Chromium 8.69
Cobalt 5.19
Copper 6.09
Nickel 17 (J+)

15-610757
RE15-10-7975 0-0.3 ft SOIL
Beryllium 1.84 (J-)
Cadmium 1.17
Copper 45.6
Lead 46.4 (J-)
Uranium 45.7 (J+)
RE15-10-7976 3-3.6 ft QBT3
Chromium 7.19 (J)
Cobalt 10.1 (J)
Copper 21
Lead 16.4 (J)
Uranium 5.33 (J+)

15-610734
RE15-10-7929 0-0.5 ft SOIL
Beryllium 2.06
Cadmium 1.6
Copper 73.3
Lead 102
Uranium 31.8
RE15-10-7930 2.5-3.5 ft QBT3
Barium 47.3
Chromium 14.1 (J)
Cobalt 6.48
Copper 44.7
Lead 15.6
Uranium 8.68

15-610707
RE15-10-7875 0-0.5 ft SOIL
Beryllium 2.12
Copper 225 (J+)
Lead 63.5
Uranium 87.7
RE15-10-7876 2.5-3.5 ft QBT3
Chromium 8.96
Cobalt 3.6
Copper 15.7 (J+)
Lead 26.1
Uranium 3.88

15-610704
RE15-10-7869 0-0.5 ft SOIL
Beryllium 3.07 (J+)
Lead 64.2 (J-)
Uranium 69.6 (J)
RE15-10-7870 1-2.5 ft QBT3
Cobalt 9.38
Uranium 3.75 (J)

15-610746
RE15-10-7953 0-0.8 ft SOIL
Antimony 256
Beryllium 12.2 (J)
Cadmium 0.448 (J)
Copper 686 (J+)
Lead 13000 (J)
Silver 2.52
Uranium 362
Zinc 125
RE15-10-7954 3-4 ft QBT3
Antimony 5.04
Barium 48.8
Beryllium 1.37 (J)
Chromium 13.4 (J)
Copper 155 (J+)
Lead 578 (J)
Nickel 7.19 (J)
Uranium 84.4

15-610709
RE15-10-7879 0-0.5 ft SOIL
Antimony 4.33
Copper 110 (J+)
Lead 977
Uranium 14.8
RE15-10-7880 2.8-3.6 ft QBT3
Chromium 8.57 (J)
Cobalt 4.77 (J)
Lead 34.4 (J-)

15-610759
RE15-10-7979 0-0.5 ft SOIL
Copper 20.3
Lead 64.2
Uranium 11.4
RE15-10-7980 3-3.7 ft QBT3
Antimony 0.729 (J)
Chromium 16 (J)
Cobalt 3.59
Perchlorate 0.00138 (J)

15-610760
RE15-10-7981 0-0.5 ft SOIL
Cobalt 8.87
Lead 26.4
Uranium 9.1
RE15-10-7982 3-3.5 ft QBT3
Aluminum 10200
Arsenic 3.38
Barium 171
Beryllium 1.26
Calcium 3370
Chromium 9.79
Cobalt 5
Copper 7.77
Lead 11.5
Magnesium 2170 (J+)
Nickel 9.25
Perchlorate 0.000859 (J)

15-610732
RE15-10-7925 0-0.5 ft SOIL
Antimony 3.53
Beryllium 47.5
Copper 289 (J+)
Lead 241
Uranium 276
Zinc 52.4
RE15-10-7926 2-2.8 ft QBT3
Antimony 0.947 (J)
Chromium 14.7
Cobalt 4.1
Copper 8.38 (J+)
Uranium 54.5

15-610750
RE15-10-7961 0-0.5 ft SOIL
Antimony 1.91
Copper 531
Lead 166
Uranium 49.3
RE15-10-7962 3-4 ft QBT3
Barium 47.8
Cobalt 8.03 (J)
Copper 30
Lead 32.9 (J-)
Perchlorate 0.000689 (J)
Uranium 17 (J+)

15-610729
RE15-10-7919 0-0.5 ft SOIL
Beryllium 2.95
Copper 196
Lead 36.1
Uranium 38.2
RE15-10-7920 2-3.3 ft QBT3
Beryllium 1.29
Chromium 7.83 (J)
Copper 47.6
Lead 25.8
Silver 1.23
Uranium 26.1

15-610713
RE15-10-7887 0-0.6 ft SOIL
Uranium 2.54
RE15-10-7888 3-4 ft QBT3
Aluminum 7810
Barium 118 (J-)
Calcium 4570
Chromium 7.42
Cobalt 8.4
Copper 7.27
Magnesium 1710 (J+)
Nickel 7.47 (J+)
Perchlorate 0.00123 (J)
Selenium 0.67 (J)

15-610740
RE15-10-7941 0-0.5 ft SOIL
Copper 16.6
Lead 24.3
Uranium 26.5
RE15-10-7942 3-4 ft QBT3
Barium 63.4 (J-)
Chromium 8.83
Cobalt 4.28

15-610745
RE15-10-7951 0-0.5 ft QBT3
Cobalt 11.9
Copper 5.03
RE15-10-7952 2.5-3.5 ft QBT3
Barium 48.8
Chromium 24 (J)
Cobalt 5.01

15-610761
RE15-10-7983 0-0.5 ft SOIL
Uranium 4.12
RE15-10-7984 3-3.7 ft QBT3
Cobalt 4.67

15-610723
RE15-10-7907 0-0.5 ft SOIL
Antimony 1.16 (J+)
Beryllium 4.84 (J+)
Lead 179 (J+)
Uranium 118 (J)
RE15-10-7908 2-3.5 ft QBT3
Antimony 1.96 (J-)
Arsenic 5.61
Barium 48.2
Beryllium 3.17 (J+)
Cobalt 5.93
Lead 170 (J-)
Uranium 403 (J)

15-610752
RE15-10-7965 0-0.5 ft SOIL
Antimony 1.05 (J)
Copper 49.2
Lead 113 (J-)
Uranium 71.2 (J+)
RE15-10-7966 3-4.2 ft QBT3
Beryllium 1.59
Chromium 8.43 (J)
Cobalt 4.86
Copper 1410
Uranium 11.2

15-610753
RE15-10-7967 0-0.5 ft SOIL
Antimony 4.62
Beryllium 11.9
Cadmium 0.438 (J)
Chromium 31.7 (J)
Copper 2200
Lead 383 (J-)
Silver 1.87
Uranium 295 (J+)
Zinc 75.1
RE15-10-7968 3-3.5 ft QBT3
Antimony 1.34
Beryllium 1.23 (J)
Chromium 33.9 (J)
Cobalt 3.43 (J)
Copper 116
Lead 25.3 (J-)
Uranium 37.7 (J+)

15-610715
RE15-10-7891 0-0.5 ft SOIL
Antimony 1.31
Beryllium 2.95
Calcium 27600
Copper 280
Lead 117 (J-)
Uranium 213 (J+)
RE15-10-7892 3-4 ft QBT3
Calcium 2880
Chromium 23.8 (J)
Cobalt 3.53 (J)
Copper 7.36
Perchlorate 0.000571 (J)
Uranium 6.79 (J+)

15-610728
RE15-10-7917 0-0.6 ft SOIL
Uranium 2.5
RE15-10-7918 1.3-3.6 ft QBT3
Barium 88.2 (J-)
Calcium 2480
Chromium 19.6 (J)
Nickel 7.97 (J-)
Perchlorate 0.00181 (J)

15-610711
RE15-10-7883 0-0.4 ft SOIL
Uranium 7.58
RE15-10-7884 3-3.8 ft QBT3
Barium 46.2 (J)
Chromium 11.1
Cobalt 3.49

15-610722
RE15-10-7905 0-0.5 ft SOIL
Antimony 5.43 (J+)
Beryllium 2.75 (J+)
Calcium 7200 (J+)
Lead 644 (J-)
Uranium 30.9 (J)
RE15-10-7906 3-3.8 ft QBT3
Lead 15.4 (J-)
Uranium 5.34 (J)

15-610724
RE15-10-7909 0-0.5 ft SOIL
Antimony 0.93 (J-)
Beryllium 6.73 (J+)
Lead 266 (J-)
Uranium 132 (J)
RE15-10-7910 3-3.6 ft QBT3
Antimony 1.13 (J-)
Beryllium 3.27 (J+)
Cobalt 3.17
Lead 75.4 (J-)
Uranium 62.6 (J)

15-610705
RE15-10-7871 0-0.5 ft SOIL
Antimony 2.07 (J+)
Beryllium 4.42 (J+)
Lead 147 (J-)
Nickel 21 (J+)
Uranium 66.9 (J)
RE15-10-7872 2-3 ft QBT3
Antimony 1.66 (J+)
Barium 117
Beryllium 4.55 (J+)
Lead 157 (J-)
Uranium 82.3 (J)

15-610727
RE15-10-7915 0-0.4 ft SOIL
Beryllium 5.87
Copper 451
Lead 125
Silver 1.15
Uranium 73.1
Zinc 56.1 (J)
RE15-10-7916 2-3.1 ft QBT3
Copper 7.13
Uranium 8.75

15-610751
RE15-10-7963 0-0.5 ft SOIL
Copper 29
Uranium 7.41 (J+)
RE15-10-7964 3-4 ft QBT3
Aluminum 8080 (J+)
Barium 78.8
Chromium 13.5 (J)
Cobalt 5.37 (J)
Copper 4.95
Nickel 7.05 (J)
Vanadium 17.5

15-610737
RE15-10-7935 0-0.3 ft SOIL
Antimony 2.52 (J)
Beryllium 2.47
Chromium 25.2
Copper 552
Lead 123 (J-)
Silver 1.68
Uranium 141
Zinc 52.9
RE15-10-7936 2.9-4 ft QBT3
Chromium 14.1
Copper 6.48

15-610739
RE15-10-7939 0-0.5 ft SOIL
Chromium 21.1
Copper 23.1
Uranium 16.5
RE15-10-7940 3-3.5 ft QBT3
Barium 55.2 (J)
Calcium 3040 (J)
Chromium 27.7
Nickel 7.31
Perchlorate 0.00081 (J)

15-610738
RE15-10-7937 0-0.5 ft SOIL
Cobalt 9.4
Copper 33
Lead 30.5 (J)
Manganese 738
Uranium 27.7
RE15-10-7938 2.9-3.7 ft QBT3
Chromium 41.3

15-610754
RE15-10-7969 0-0.5 ft SOIL
Antimony 1.63
Chromium 55.8 (J)
Copper 103
Lead 406
Uranium 5.37
RE15-10-7970 3-3.3 ft SOIL
Copper 22.1
Lead 33.3 (J-)
Uranium 4.23 (J+)
Zinc 56.9

15-610735
RE15-10-7931 0-0.5 ft SOIL
Chromium 19.9
Uranium 2.26
RE15-10-7932 3-4 ft QBT3
Barium 77.7 (J)
Chromium 18.4
Cobalt 3.52

15-610736
RE15-10-7933 0-0.5 ft SOIL
Uranium 13.8
RE15-10-7934 3-3.9 ft QBT3
Aluminum 8850
Barium 123 (J)
Calcium 2620 (J)
Chromium 28.3
Cobalt 4.42
Copper 5.24
Magnesium 1740 (J+)
Nickel 7.26
Perchlorate 0.00243

15-610755
RE15-10-7971 0-0.5 ft SOIL
Antimony 1.49
Copper 1010
Lead 155
Uranium 45.9
RE15-10-7972 3-3.6 ft QBT3
Barium 52.6
Chromium 9.12 (J)
Cobalt 7.2
Copper 6.67
Uranium 8.19

15-610725
RE15-10-7911 0-0.3 ft SOIL
Antimony 5.54 (J-)
Beryllium 16.5 (J+)
Cadmium 0.569
Lead 274 (J-)
Silver 2
Uranium 348 (J)
Zinc 54.8
RE15-10-7912 3-4 ft QBT3
Antimony 2.27 (J+)
Barium 85.5
Beryllium 2.15 (J+)
Calcium 8790 (J+)
Lead 79.1 (J-)
Uranium 163 (J)

15-610726
RE15-10-7913 0-0.3 ft SOIL
Nickel 16.2 (J+)
Uranium 27.2 (J)
RE15-10-7914 2-3 ft QBT3
Barium 93.6 (J-)
Calcium 2250
Chromium 7.79 (J)
Cobalt 8.49 (J)
Copper 6.43
Iron 15000
Uranium 5.45

15-610717
RE15-10-7897 0-0.5 ft SED
Beryllium 1.32
Uranium 2.38
RE15-10-7896 1-2 ft QBT3
Beryllium 1.33
Chromium 10.4
Copper 5.68

15-610768
RE15-10-7997 0-0.7 ft SED
Copper 15.9
Uranium 27.3
RE15-10-7998 1-1.5 ft SED
Uranium 4.02

15-610766
RE15-10-7993 0-0.7 ft SOIL
Uranium 3.08

15-610721
RE15-10-7903 0-0.5 ft SOIL
Uranium 5.11
Zinc 65 (J)
RE15-10-7904 1-1.9 ft SOIL
Chromium 26.3
Zinc 53.7 (J)

15-610767
RE15-10-7995 0-1 ft SED
Copper 15.6
Uranium 19.3
RE15-10-7996 1-1.8 ft SED
Uranium 6.46

15-610769
RE15-10-7999 0-0.7 ft SOIL
Uranium 15.6
RE15-10-8000 1-2 ft SOIL
Perchlorate 0.000589 (J)

15-610773
RE15-10-8007 0-0.8 ft SED
Chromium 17.8
Cobalt 9.34
Copper 47.3
Iron 20300
Lead 48.4
Manganese 765
Uranium 28.4
Vanadium 27.6
Zinc 83.9

15-610718
RE15-10-7897 0-0.5 ft SED
Beryllium 2.65
Chromium 14.5
Copper 33.3
Iron 14300
Lead 32.5
Nickel 11.9
Uranium 36.5
Vanadium 20.8
RE15-10-7898 1-2 ft SED
Arsenic 4.96
Beryllium 2.91
Chromium 23.3
Copper 18.1
Iron 15600
Nickel 16.9
Perchlorate 0.000616 (J)
Uranium 15.5
Vanadium 23.1

15-610716
RE15-10-7893 0-0.5 ft SED
Chromium 34.2
Lead 31.3
Uranium 16.2
RE15-10-7894 1-2 ft SED
Chromium 22
Uranium 14.9

15-610771
RE15-10-8003 0-0.5 ft SED
Beryllium 7.96
Chromium 10.6
Copper 20.9
Nickel 9.93
Uranium 103
RE15-10-8004 1-2 ft SOIL
Uranium 4.82

15-610778
RE15-10-8017 0-0.5 ft SED
Beryllium 4.41
Copper 50.2 (J)
Lead 34.8 (J)
Uranium 126
RE15-10-8018 1-2 ft SED
Beryllium 1.35
Uranium 189

15-610785
RE15-10-8031 0-0.5 ft SOIL
Uranium 16.5

15-610784
RE15-10-8029 0-0.5 ft SOIL
Uranium 4.57
RE15-10-8030 1-2 ft SOIL
Uranium 7.44

15-610782
RE15-10-8025 0-0.5 ft SOIL
Chromium 24.4 (J)
Uranium 2.09
Zinc 66.5 (J+)
RE15-10-8026 1-2 ft SOIL
Perchlorate 0.00213 (J)

15-610719
RE15-10-7899 0-0.5 ft SED
Chromium 15.6
Iron 22300
Magnesium 2870 (J+)
Uranium 4.21
Vanadium 34.8
Zinc 92
RE15-10-7900 1-1.5 ft QBT3
Chromium 17.8
Cobalt 3.47
Copper 6.27
Iron 15300
Nickel 7.1
Vanadium 23.8

15-610783
RE15-10-8027 0-0.5 ft SOIL
Cadmium 0.411 (J)
Chromium 36.4
Uranium 2.22
RE15-10-8028 1-2 ft SOIL
Chromium 20.1

15-610781
RE15-10-8023 0-0.5 ft SOIL
Chromium 25.5 (J)
RE15-10-8024 1-2 ft SOIL
Barium 344
Beryllium 1.9
Chromium 35.2 (J)

15-610777
RE15-10-8015 0-0.5 ft SED
Beryllium 1.68
Chromium 0.949
Copper 91.4 (J)
Lead 27.6 (J)
Uranium 32.6

15-610775
RE15-10-8011 0-0.5 ft SED
Beryllium 1.7
Copper 20.1
Silver 3.27
Uranium 39.3

15-610717
RE15-10-7895 0-0.5 ft SED
Beryllium 1.32
Uranium 2.38
RE15-10-7896 1-2 ft QBT3
Beryllium 1.33
Chromium 10.4
Copper 5.68

15-610768
RE15-10-7997 0-0.7 ft SED
Copper 15.9
Uranium 27.3
RE15-10-7998 1-1.5 ft SED
Uranium 4.02

15-610766
RE15-10-7993 0-0.7 ft SOIL
Uranium 3.08

15-610720
RE15-10-7901 0-0.5 ft SOIL
Cadmium 0.581 (J)
Uranium 17.2
RE15-10-7902 1-2 ft SOIL
Uranium 3.07

15-610779
RE15-10-8019 0-0.5 ft SOIL
Copper 16.3 (J)
Perchlorate 0.000629 (J)
Uranium 9.2
RE15-10-8020 1-2 ft QBT3
Chromium 7.2 (J)
Copper 5.2 (J)
Perchlorate 0.000569 (J)

15-610776
RE15-10-8013 0-0.5 ft SED
Beryllium 6.27
Copper 64.4 (J)
Lead 23 (J)
Uranium 33.7
RE15-10-8014 1-2 ft QBT3
Barium 50.5
Beryllium 1.56
Copper 6.83 (J)

15-610774
RE15-10-8009 0-0.5 ft SED
Antimony 3.45 (J-)
Beryllium 7.37
Cadmium 0.422 (J)
Copper 175
Lead 97.7
Uranium 348
RE15-10-8010 1-2 ft QBT3
Barium 82 (J)
Chromium 7.4 (J)
Copper 17.2
Lead 12.4
Uranium 13.7

15-610772
RE15-10-8005 0-0.5 ft SOIL
Antimony 1.02 (J-)
Beryllium 3.81
Cadmium 0.824
Copper 88.9
Lead 57.3
Uranium 59
Zinc 54.8

15-610770
RE15-10-8001 0-0.8 ft SED
Beryllium 2.2
Chromium 31.6
Copper 43.8
Lead 27.1
Uranium 47.9
RE15-10-8002 1-2 ft QBT3
Chromium 11.8
Copper 5.27

SWMU
15-008(b)

15-610749
RE15-10-7959 0-0.7 ft SOIL
Antimony 9.56
Beryllium 7.52
Copper 618
Lead 777
Silver 1.05
Uranium 249
Zinc 90.6
RE15-10-7960 3-3.6 ft QBT3
Antimony 4.1
Beryllium 4.02
Chromium 11.5 (J)
Cobalt 16.5
Copper 187
Lead 257
Uranium 143

15-610747
RE15-10-7955 0-0.5 ft SOIL
Antimony 5.53
Beryllium 6.85 (J)
Copper 1200 (J+)
Lead 203 (J)
Silver 1.06
Uranium 183
Zinc 64.7
RE15-10-7956 3-3.7 ft QBT3
Antimony 0.528 (J)
Arsenic 2.82
Barium 54.6
Beryllium 29.1 (J)
Calcium 2290
Chromium 11.2 (J)
Copper 73.9 (J+)
Lead 23.9 (J)
Nickel 7.17 (J)
Perchlorate 0.000923 (J)
Selenium 0.64 (J)
Uranium 69.8

15-610714
RE15-10-7889 0-0.5 ft SOIL
Antimony 5.16 (J)
Beryllium 4.94
Copper 813
Lead 128
Uranium 104
Zinc 57.5
RE15-10-7890 2.5-3.5 ft QBT3
Beryllium 1.29
Chromium 14.8
Cobalt 6.97
Copper 54.6
Lead 24.5
Nickel 6.99 (J-)
Selenium 0.573 (J)
Uranium 17.1

15-610708
RE15-10-7877 0-0.5 ft SOIL
Antimony 1.49
Beryllium 2.57
Copper 131 (J+)
Lead 85.4
Uranium 46.4
RE15-10-7878 3-4 ft QBT3
Chromium 21.4
Cobalt 3.85

15-610712
RE15-10-7885 0-0.4 ft SOIL
Cadmium 7.98
Cobalt 10.1
Copper 168
Lead 43.8
Uranium 39.8
Zinc 72.4
RE15-10-7886 3-3.5 ft QBT3
Chromium 10.1
Cobalt 14.8
Copper 5.92

15-610731
RE15-10-7923 0-0.5 ft QBT3
Antimony 2.45
Barium 48.9 (J)
Beryllium 1.68
Copper 307 (J+)
Lead 71.7
Uranium 81.3
RE15-10-7924 2-3 ft QBT3
Antimony 0.575 (J)
Chromium 12.7
Cobalt 5.43
Copper 6.51 (J+)
Uranium 10.5

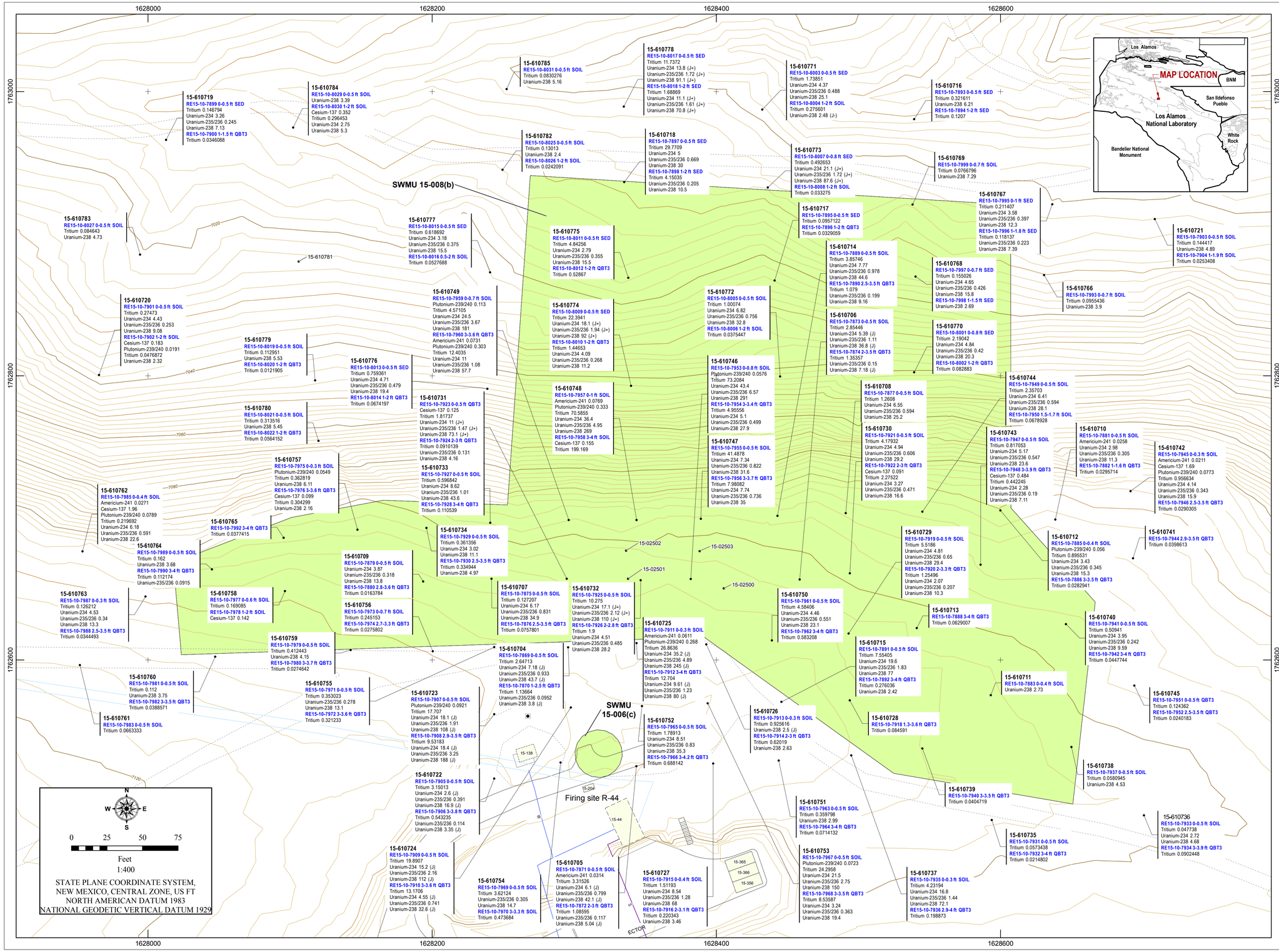
15-610748
RE15-10-7957 0-1 ft SOIL
Antimony 7.9
Beryllium 7.22
Copper 36400
Lead 473
Silver 6.95
Uranium 364
Zinc 13300
RE15-10-7958 3-4 ft SOIL
Antimony 6.77
Beryllium 4.31
Copper 622
Lead 283
Uranium 515
Zinc 91.3

15-610744
RE15-10-7949 0-0.5 ft SOIL
Cadmium 0.419 (J)
Copper 88.6
Lead 55.2
Uranium 48.8
Zinc 83.6
RE15-10-7950 1.5-1.7 ft SOIL
Uranium 5.41

15-610742
RE15-10-7945 0-0.3 ft SOIL
Copper 37
Lead 26.3
Uranium 46.3
RE15-10-7946 2.5-3.5 ft QBT3
Chromium 15.8
Cobalt 17.1
Copper 5.87

15-610733
RE15-10-7927 0-0.5 ft SOIL
Beryllium 5.83
Cadmium 1.17
Copper 526
Lead 102
Uranium 84.6
Zinc 56.8
RE15-10-7928 3-4 ft QBT3
Chromium 8.03 (J)
Copper 5.69

15-610706
RE15-10-7873 0-0.5 ft SOIL
Antimony 1.13 (J-)
Beryllium 3.56 (J+)
Lead 95.1 (J+)
Uranium 71.1 (J)
Zinc 53.3
RE15-10-



Note: Concentrations are in pCi/g

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Plate 17

Radionuclides detected or detected above BVs/FVs at SWMU 15-008(b)

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-08.4 RAD 22 FEBRUARY 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
Revised 23 May 2011 by AdelanteConsultingInc.

This map was created for work processes associated with the Corrective Actions Projects (CAP) of the Los Alamos National Laboratory (LANL) Environmental Programs (EP) Directorate. All other uses for this map should be confirmed with LANL EP-CAP staff.

1628000 1628200 1628400 1628600

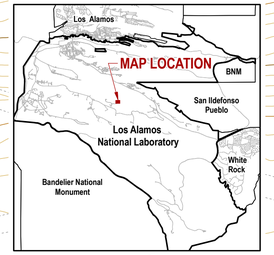
1763000 1762800 1762600

8b-7 8b-6 15-610785 15-610778 15-610771 15-610716 15-610784 15-610719 15-610782 15-610718 15-610773 15-610769 15-610767 15-610721 15-610783 15-610781 15-610777 15-610775 15-610717 15-610768 15-610766 7020 7040 7060 7080 7100 7120

15-610720 15-610779 15-610776 15-610774 15-610772 15-610770 15-610780

SWMU 15-008(b)

15-610742 8b-4 8b-5 15-610712 15-610710 15-610708 15-610744 15-610714 15-610749 15-610748 15-610747 15-610733 15-610734 15-610757 15-610765 8b-10 15-02502 15-02503 8b-8 15-610709 15-02501 15-610743 15-610741 8b-1 15-610762 8b-2 15-610764 8b-13 8b-11 15-610707 15-610731 15-610732 15-610746 15-610706 15-610730 15-610758 15-02500 15-610763 8b-12 8b-9 15-610740 15-610729 15-610713 15-610760 15-610759 15-610756 15-610755 15-610704 15-610725 15-610726 15-610750 15-610761 15-610745 04A105 15-610711 8b-3 15-610724 15-610752 15-610753 15-610715 15-610728 15-610723 15-610739 15-610738 15-610737 15-610722 15-610754 15-610705 15-610727 15-610751 15-138 15-204 SWMU 15-006(c) Firing site R-44 15-610735 15-610736 15-44 15-365 15-366 15-356 ECTOR ECTOR



- Outfall
- Proposed new sampling location
- Proposed location to resample
- Sampling location
- Former structure
- Proposed excavation boundary
- Structure or building
- SWMU or AOC
- Underground structure
- Paved road
- Storm drain
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities

- C Communication
- S Sewer
- W Water

N W E S

0 25 50 75

Feet
1:400

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

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Plate 18

Proposed sampling locations at SWMU 15-008(b)

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-08.1 INORG 22 FEBRUARY 2010 TOOMEY
Los Alamos Technical Associates (LATA-LAO)
Revised 25 May 2011 by AdelanteConsultingInc.

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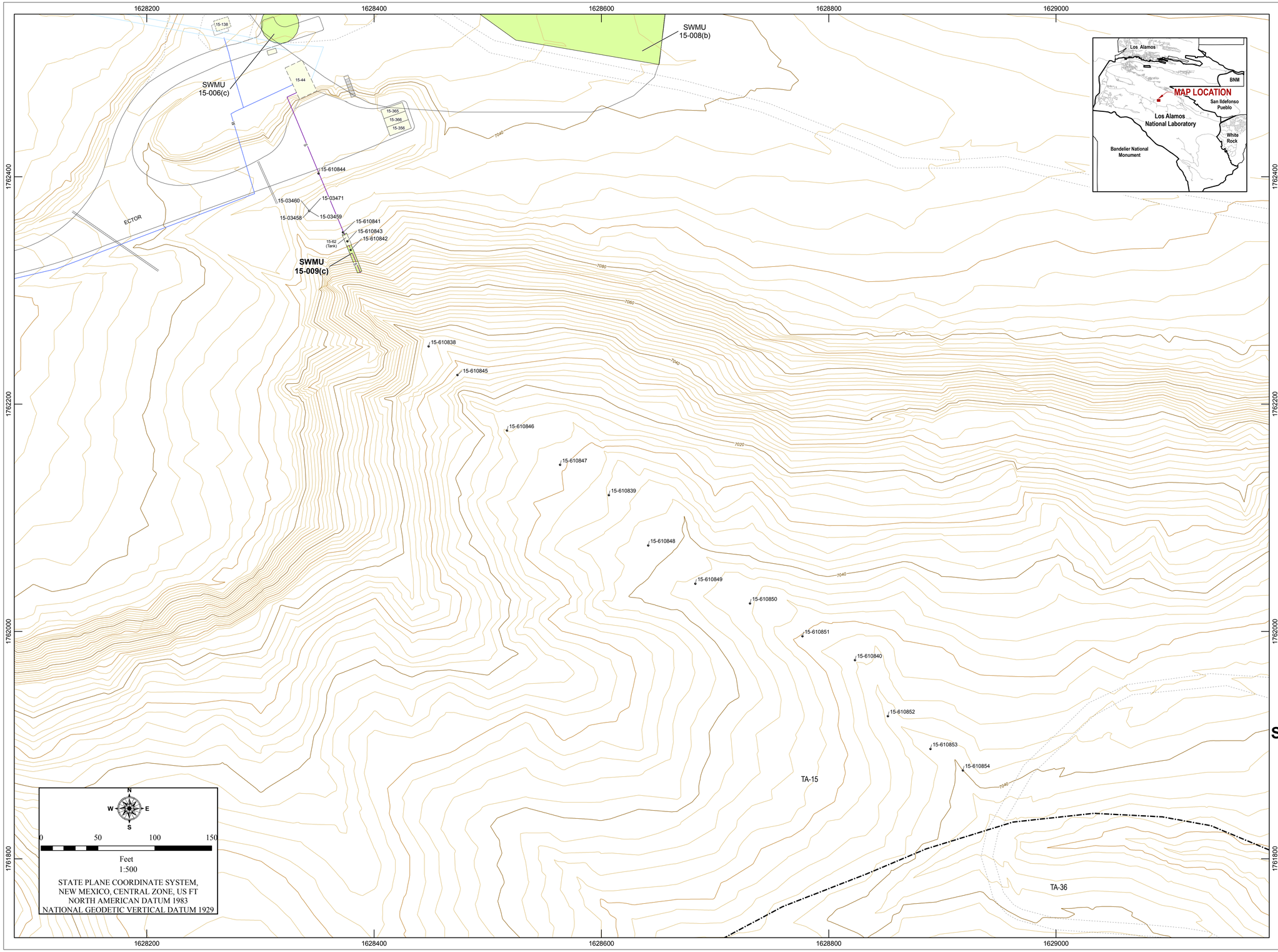

- Sampling location
- Former structure
- Structure or building
- SWMU or AOC
- Underground structure

- Paved road
- Storm drain
- TA boundary
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities

- C Communication
- S Sewer
- W Water

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Plate 19

Site map and sampling locations for SWMU 15-009(c)

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-12.1 SITE 01 APRIL 2010 TOOMEY
Los Alamos Technical Associates (LATA-LAO)
Revised 18 May 2011 by AdelanteConsultingInc.

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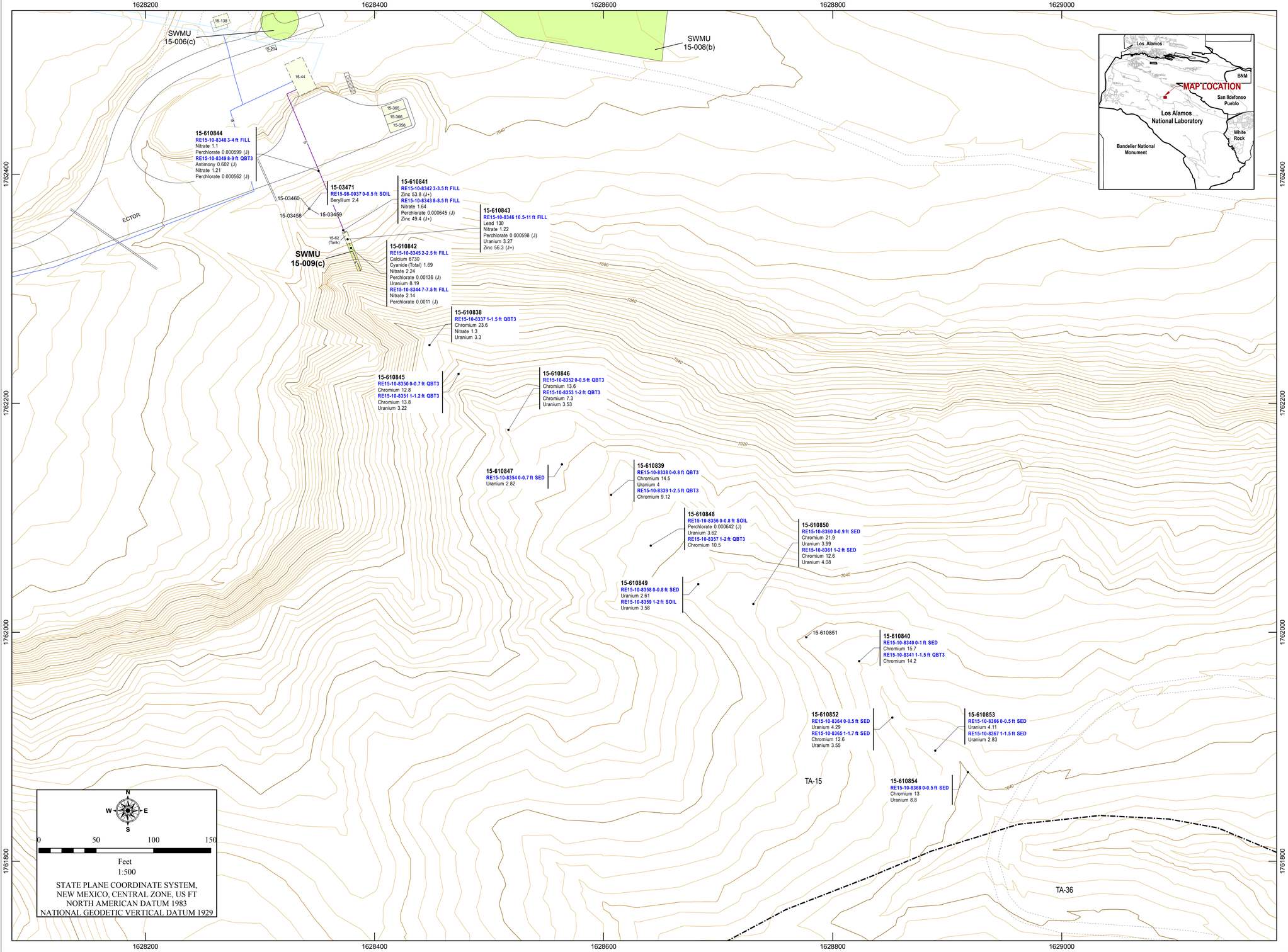

- Sampling location
- Former structure
- Structure or building
- SWMU or AOC
- Underground structure

- Paved road
- Storm drain
- TA boundary
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities

- C Communication
- S Sewer
- W Water

Note: Concentrations are in mg/kg

FEATURE DATA REFERENCES

Hypsography; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991
WQH Inactive Outfalls; Los Alamos National Laboratory, ENV Water Quality and Hydrology Group; Edition 2002.01; 01 September 2003.
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Plate 20

Inorganic chemicals detected or detected above BVs at SWMU 15-009(c)

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-12.2 INORG 28 MAY 2010 TOOMEY
Los Alamos Technical Associates (LATA-LAO)
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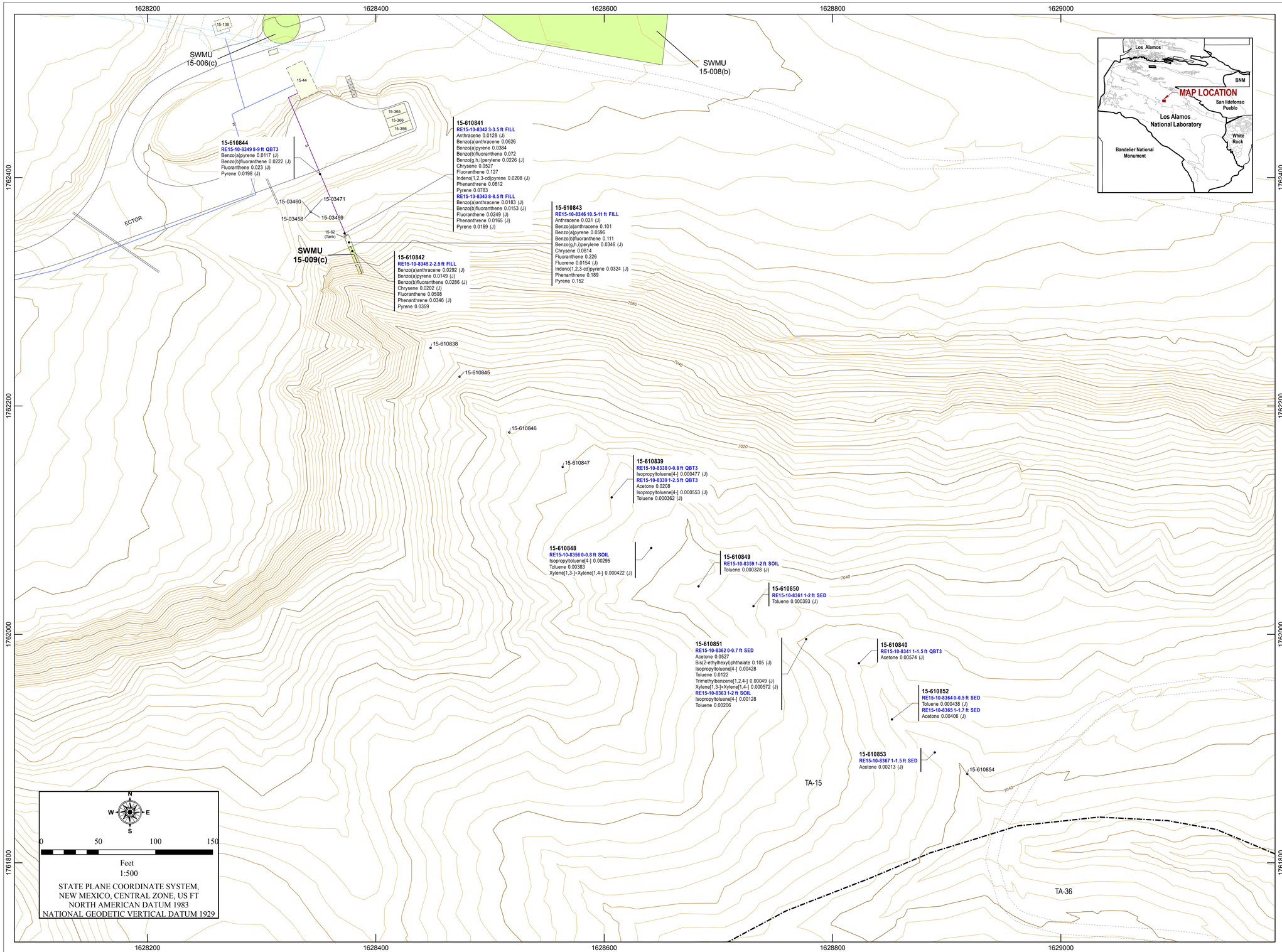

- Sampling location
- Former structure
- Structure or building
- SWMU or AOC
- Underground structure

- Paved road
- Storm drain
- TA boundary
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities

- Communication
- Sewer
- Water

Note: Concentrations are in mg/kg

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Plate 21

Organic chemicals detected at SWMU 15-009(c)

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Los Alamos, New Mexico 87545

Map# 3MC10-IR-12.3 ORG 28 APRIL 2010 TOOMEY
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1628200 1628400 1628600 1628800 1629000

1762400 1762200 1762000 1761800

SWMU 15-006(c)

SWMU 15-008(b)

SWMU 15-009(c)

15-138 15-204 15-44 15-365 15-366 15-356 15-03460 15-03471 15-03458 15-03459 15-62 (Tank) ECTOR TA-15 TA-36

7040 7080 7060 7020

15-610844
RE15-10-8348 3-4 ft FILL
Tritium 0.0123333
RE15-10-8349 8-9 ft QBT3
Tritium 0.018232

15-610841
RE15-10-8342 3-3.5 ft FILL
Tritium 0.0177526
RE15-10-8343 8-8.5 ft FILL
Tritium 0.010856

15-610843
RE15-10-8346 10.5-11 ft FILL
Tritium 0.0353128
RE15-10-8347 15.5-16 ft QBT3
Tritium 0.00701481

15-610842
RE15-10-8345 2-2.5 ft FILL
Tritium 0.011553
RE15-10-8344 7-7.5 ft FILL
Tritium 0.0200962

15-610838
RE15-10-8337 1-1.5 ft QBT3
Tritium 0.026377

15-610845
RE15-10-8350 0-0.7 ft QBT3
Tritium 0.168519

15-610846
RE15-10-8353 1-2 ft QBT3
Tritium 0.0407931
Uranium-234 2.33
Uranium-235/236 0.221
Uranium-238 7.96

15-610847
RE15-10-8354 0-0.7 ft SED
Uranium-238 2.94
RE15-10-8355 1-2 ft QBT3
Tritium 0.0599359

15-610839
RE15-10-8339 1-2.5 ft QBT3
Tritium 0.0634763
Uranium-238 3.33

15-610848
RE15-10-8356 0-0.8 ft SOIL
Tritium 0.0654865
Uranium-238 2.7
RE15-10-8357 1-2 ft QBT3
Tritium 0.0456768

15-610849
RE15-10-8358 0-0.8 ft SED
Uranium-238 2.56
RE15-10-8359 1-2 ft SOIL
Tritium 0.0557413

15-610850
RE15-10-8361 1-2 ft SED
Uranium-234 13.9
Uranium-235/236 0.78
Uranium-238 15.1

15-610851

15-610840
RE15-10-8341 1-1.5 ft QBT3
Tritium 0.173379

15-610852
RE15-10-8364 0-0.5 ft SED
Uranium-238 2.93

15-610853
RE15-10-8366 0-0.5 ft SED
Uranium-234 2.75
Uranium-238 3.93
RE15-10-8367 1-1.5 ft SED
Uranium-238 3.43

15-610854
RE15-10-8368 0-0.5 ft SED
Tritium 0.10734
Uranium-238 3.45

N W E S

0 50 100 150

Feet
1:500

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

- Sampling location
- Former structure
- Structure or building
- SWMU or AOC
- Underground structure

- Paved road
- Storm drain
- TA boundary
- Unpaved road

Elevation contours
- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities
- C Communication
- S Sewer
- W Water

Note: Concentrations are in pCi/g

FEATURE DATA REFERENCES

Hypsography; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991
WQH Inactive Outfalls; Los Alamos National Laboratory; ENV Water Quality and Hydrology Group; Edition 2002.01; 01 September 2003.
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Plate 22

Radionuclides detected or detected above BVs/FVs at SWMU 15-009(c)

LOS ALAMOS NATIONAL LABORATORY
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CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-12.4 RAD 28 APRIL 2010 TOOMEY
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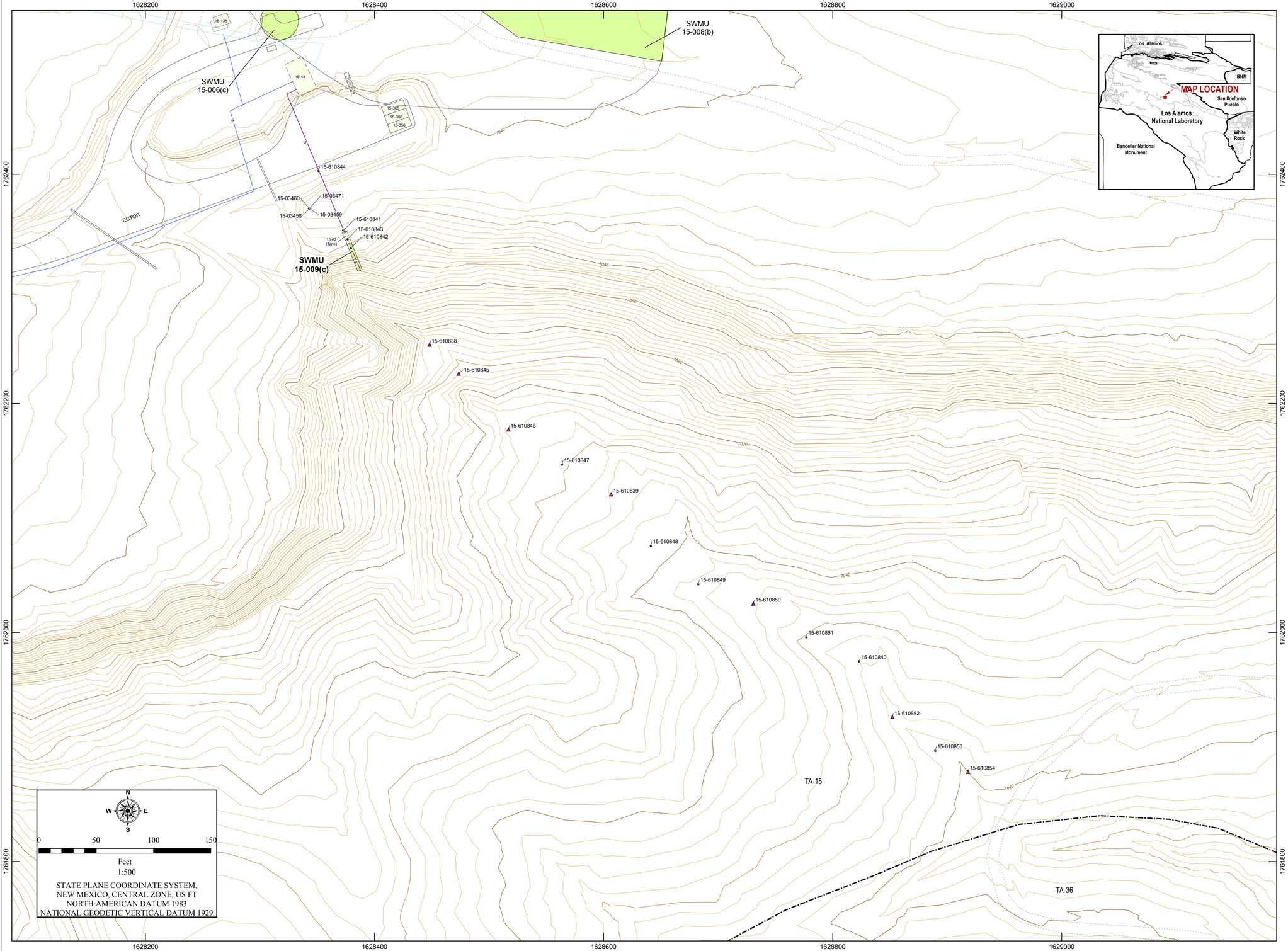

- Proposed location to resample
- Sampling location
- Former structure
- Structure or building
- SWMU or AOC
- Underground structure
- Paved road
- Storm drain
- TA boundary
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities

- C Communication
- S Sewer
- W Water

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Plate 23

Proposed sampling locations at SWMU 15-009(c)

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-12.1 SITE 01 APRIL 2010 TOOMEY
Los Alamos Technical Associates (LATA-LAO)
Revised 18 May 2011 by AdelanteConsultingInc.

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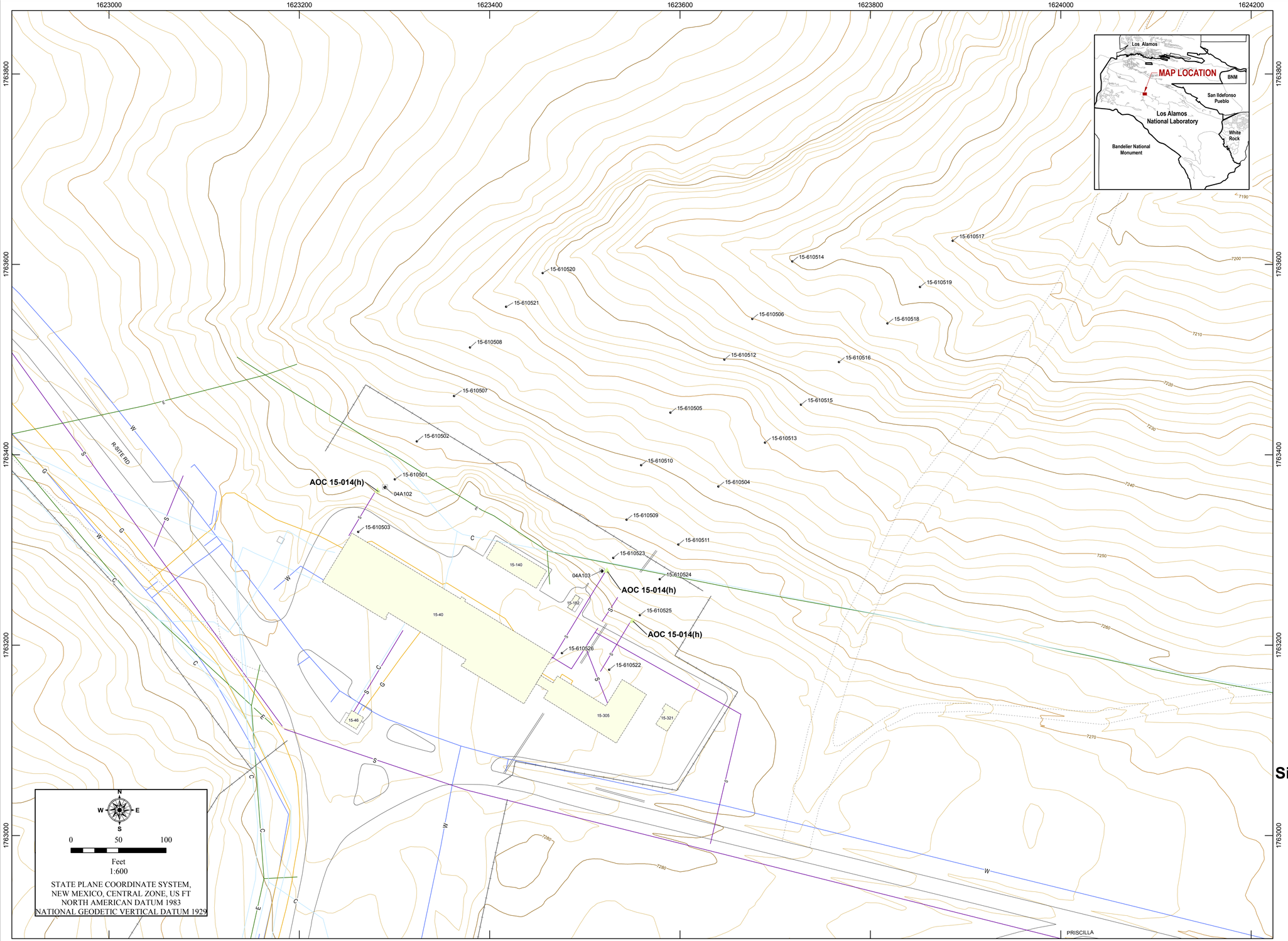

Outfall
Sampling location
SWMU or AOC outfall
Former structure
SWMU or AOC

Fence
Storm drain
Unpaved road

Elevation contours

100-ft and 20-ft contour
10-ft contour
2-ft contour

Utilities

C Communication
E Electric
G Gas
S Sewer
W Water

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Plate 24

Site map and sampling locations for AOC 15-014(h)

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-PLT-15.1 SITE 01 APRIL 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
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1623000 1623200 1623400 1623600 1623800 1624000 1624200

1763800 1763600 1763400 1763200 1763000

15-610502
RE15-10-7162 0-0.5 ft SED
Barium 138
Cadmium 0.463 (J)
Chromium 25.3 (J-)
Cobalt 6.1
Copper 24.3
Iron 15300
Lead 25.1
Mercury 1.54
Nickel 9.5
Silver 21
Uranium 3.57
Vanadium 29.1
Zinc 60.6
RE15-10-7163 1-2.5 ft QBT3
Barium 55.4
Chromium 48.9 (J-)
Copper 7.8
Lead 12.2
Mercury 0.542
Nickel 9.61
Silver 4.12

15-610501
RE15-10-7160 0-0.5 ft SED
Barium 180
Chromium 15.1 (J-)
Cobalt 4.96
Copper 26.6
Lead 25.9
Mercury 0.644
Nickel 9.94
Perchlorate 0.000831 (J)
Silver 8.47
Vanadium 25.8
Zinc 68.4
RE15-10-7161 1-2.2 ft SED
Barium 152
Chromium 20.7 (J-)
Cobalt 4.92
Copper 15
Mercury 0.106
Nickel 10.5
Silver 3.67
Vanadium 26

15-610503
RE15-10-7164 2-3.9 ft SOIL
Silver 7.63
RE15-10-7165 7-8.8 ft SOIL
Silver 1.9

15-610521
RE15-10-7200 0-0.5 ft SED
Barium 157
Chromium 16.1
Cobalt 5.69
Uranium 3.76
Vanadium 25.7
RE15-10-7201 2-3.7 ft SOIL
Perchlorate 0.000617 (J)

15-610508
RE15-10-7174 0-1 ft SOIL
Perchlorate 0.0012 (J)
Uranium 4.81
RE15-10-7175 1-2 ft QBT3
Aluminum 9680
Barium 106
Chromium 24.2 (J-)
Cobalt 5.91
Copper 6.2
Lead 12.5
Magnesium 1730
Nickel 8.81
Perchlorate 0.00284
Vanadium 21.4

15-610507
RE15-10-7172 0-0.7 ft SOIL
Perchlorate 0.00065 (J)
Uranium 3.51
RE15-10-7173 1-2.6 ft SOIL
Perchlorate 0.0011 (J)

15-610520
RE15-10-7198 0-0.5 ft SED
Barium 140
Cyanide (Total) 2.84 (J-)
Lead 27.4
Uranium 13.9
Vanadium 20.4
RE15-10-7199 1-2.4 ft SOIL
Chromium 21.4
Perchlorate 0.000829 (J)
Silver 1.02

15-610505
RE15-10-7168 0-0.5 ft SED
Barium 195
Chromium 13.1
Cobalt 4.87
Perchlorate 0.000895 (J)
Uranium 4.86
Vanadium 25.2
RE15-10-7169 1-2.1 ft QBT3
Aluminum 10700
Barium 193
Chromium 11.2
Cobalt 8.24
Copper 7.2
Lead 14.7
Magnesium 1830 (J+)
Manganese 574
Nickel 6.66
Vanadium 30.8

15-610510
RE15-10-7178 0-0.5 ft SED
Barium 138
Chromium 12.2
Cobalt 4.74
Lead 22.9
Mercury 0.119
Perchlorate 0.00127 (J)
Uranium 3.47
Vanadium 23.3
RE15-10-7179 1-2 ft SOIL
Chromium 23.2
Lead 22.8
Mercury 0.171
Perchlorate 0.000752 (J)
Uranium 3.8

15-610523
RE15-10-7204 0-0.5 ft SED
Barium 137
Cadmium 0.928
Chromium 15.2
Cobalt 5.1
Copper 34.5
Lead 48.9
Mercury 0.678
Silver 3.2
Uranium 7.55
Vanadium 25
Zinc 126
RE15-10-7205 1-1.5 ft SOIL
Cadmium 1.54
Chromium 26.3
Copper 53.6
Cyanide (Total) 3.25 (J-)
Lead 80.2
Mercury 1.34
Silver 5.42
Uranium 9.66
Zinc 125

15-610509
RE15-10-7176 0-0.6 ft SOIL
Perchlorate 0.00119 (J)
Uranium 3.28
RE15-10-7177 1-2 ft SOIL
Perchlorate 0.00116 (J)

15-610514
RE15-10-7187 1-2 ft SOIL
Silver 1.08
Uranium 3.2

15-610506
RE15-10-7170 0-0.7 ft SED
Barium 169
Cobalt 4.89
Copper 11.9
Lead 22.4
Perchlorate 0.000686 (J)
Uranium 11
Vanadium 24.7

15-610512
RE15-10-7182 0-0.6 ft SED
Barium 144
Uranium 2.38
RE15-10-7183 1-1.8 ft QBT3
Barium 89.4
Chromium 21.1
Cobalt 3.19

15-610504
RE15-10-7166 0-1 ft SED
Barium 180
Chromium 29.6
Perchlorate 0.00158 (J)
Uranium 2.81
Vanadium 21.6
RE15-10-7167 1-2.2 ft SED
Barium 163
Chromium 12.4
Cobalt 6.69
Iron 14800
Vanadium 28.4

15-610524
RE15-10-7206 0-0.7 ft SED
Arsenic 4.45
Barium 150
Nickel 10.8 (J)
Vanadium 23.5
RE15-10-7207 1-2.1 ft QBT3
Aluminum 9540
Barium 111
Chromium 10.3
Copper 5.45
Magnesium 1730 (J+)
Nickel 7.58 (J)
Vanadium 17.8

15-610522

15-610526
RE15-10-7210 2-2.9 ft SOIL
Calcium 8490 (J)
Cobalt 9.41
RE15-10-7211 6-6.7 ft QBT3
Barium 49.4
Calcium 2240 (J)
Chromium 12.4

15-610511
RE15-10-7180 0-1 ft SED
Chromium 10.6
Vanadium 24.1
RE15-10-7181 1-1.9 ft SOIL
Chromium 21.6

15-610525
RE15-10-7208 0-0.5 ft SED
Copper 13.8
Perchlorate 0.00138 (J)
RE15-10-7209 1-1.4 ft SED
Barium 158
Chromium 36
Cobalt 6.07
Iron 16900
Nickel 12.1 (J)
Silver 1.14
Vanadium 29.1

15-610519
RE15-10-7196 0-0.5 ft SED
Cobalt 6.83
Manganese 510
Uranium 3.42
Vanadium 20.5
RE15-10-7197 1-2 ft SED
Chromium 43.3

15-610517
RE15-10-7192 0-0.5 ft SED
Silver 1.68
Uranium 5.93
RE15-10-7193 1-2 ft SED
Chromium 27.9
Silver 1.83
Uranium 2.67
Vanadium 22.3

15-610518
RE15-10-7194 0-1 ft SED
Uranium 6.67

15-610516
RE15-10-7190 0-0.7 ft SED
Barium 149
Chromium 22.2
Cobalt 4.82
Uranium 4.85
Vanadium 20
RE15-10-7191 1-2 ft SED
Beryllium 1.33

15-610515
RE15-10-7188 0-0.8 ft SED
Barium 162
Chromium 12.5
Cobalt 5.21
Iron 15000
Lead 32.4
Mercury 0.692
Nickel 9.67
Perchlorate 0.000889 (J)
Uranium 4.11
Vanadium 29.5
RE15-10-7189 1-2.2 ft SOIL
Perchlorate 0.000646 (J

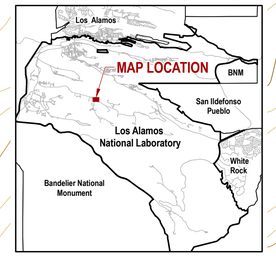
15-610513
RE15-10-7184 0-0.7 ft SED
Barium 150
Chromium 15.3
Cobalt 5.06
Lead 30.5
Mercury 0.185
Perchlorate 0.000616 (J)
Uranium 2.8
Vanadium 25.5

04A102
AOC 15-014(h)
04A103
AOC 15-014(h)
AOC 15-014(h)

15-40 15-140 15-192 15-46 15-305 15-321

7190 7200 7210 7220 7230 7240 7250 7260 7270 7280 7280

R-SITE RD PRISCILLA



- Sampling location
- Outfall
- SWMU or AOC outfall
- Former structure
- SWMU or AOC

- Fence
- Storm drain
- Unpaved road

Elevation contours
- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities
- C Communication
- E Electric
- G Gas
- S Sewer
- W Water

Note: Concentrations are in mg/kg

FEATURE DATA REFERENCES

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N W E S

0 50 100

Feet
1:600

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

Plate 25

Inorganic chemicals detected or detected above BVs at AOC 15-014(h)

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-PLT-15.2 INORG 01 APRIL 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
Revised 23 May 2011 by AdelanteConsultingInc.

This map was created for work processes associated with the Corrective Actions Projects (CAP) of the Los Alamos National Laboratory (LANL) Environmental Programs (EP) Directorate. All other uses for this map should be confirmed with LANL EP-CAP staff.

1623000 1623200 1623400 1623600 1623800 1624000 1624200

1763800 1763600 1763400 1763200 1763000

15-610508
RE15-10-7174 0-1 ft SOIL
Acenaphthene 0.232
Bis(2-ethylhexyl)phthalate 0.343 (J)
Methylene Chloride 0.00319 (J)
RE15-10-7175 1-2 ft QBT3
Acenaphthene 0.121
Acetone 0.00839 (J)

15-610507
RE15-10-7172 0-0.7 ft SOIL
Benzoic Acid 1.01 (J)
Methylene Chloride 0.00443 (J)
Toluene 0.000546 (J)
RE15-10-7173 1-2.6 ft SOIL
Acetone 0.00535 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000599 (J)

15-610502
RE15-10-7162 0-0.5 ft SED
Aroclor-1254 0.704
Aroclor-1260 0.258
Chrysene 0.0112 (J)
Di-n-butylphthalate 0.129 (J)
Fluoranthene 0.0231 (J)
Phenanthrene 0.014 (J)
Pyrene 0.0164 (J)
RE15-10-7163 1-2.5 ft QBT3
Aroclor-1254 0.114
Aroclor-1260 0.0369
Di-n-butylphthalate 0.093 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000375 (J)

15-610501
RE15-10-7160 0-0.5 ft SED
Aroclor-1254 0.114
Aroclor-1260 0.0385
Benzo(a)anthracene 0.0216 (J)
Benzo(a)pyrene 0.0144 (J)
Benzo(b)fluoranthene 0.0312 (J)
Chrysene 0.0172 (J)
Fluoranthene 0.0183 (J)
Indeno(1,2,3-cd)pyrene 0.13
Pyrene 0.0179 (J)
RE15-10-7161 1-2.2 ft SED
Aroclor-1254 0.0052
Aroclor-1260 0.0033 (J)

15-610520
RE15-10-7198 0-0.5 ft SED
Acenaphthene 0.0373 (J)
Benzoic Acid 0.401 (J)
Dichloroethene[1,1-] 0.000772 (J+)
Isopropyltoluene[4-] 0.000812 (J+)
Methylene Chloride 0.00462 (J+)
Tetrachloroethene 0.000668 (J+)
Toluene 0.000524 (J+)
RE15-10-7199 1-2.4 ft SOIL
Toluene 0.000394 (J)
Trimethylbenzene[1,2,4-] 0.000383 (J)
Xylene[1,2-] 0.000371 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000743 (J)

15-610521
RE15-10-7200 0-0.5 ft SED
Benzoic Acid 0.392 (J)
Toluene 0.000466 (J-)

15-610514
RE15-10-7187 1-2 ft SOIL
Tetrachloroethene 0.000505 (J+)

15-610506
RE15-10-7170 0-0.7 ft SED
Methylene Chloride 0.00341 (J)
RE15-10-7171 1-2.1 ft SOIL
Xylene[1,3-]+Xylene[1,4-] 0.000369 (J)

15-610512

15-610505
RE15-10-7168 0-0.5 ft SED
Tetrachloroethene 0.00104 (J+)
RE15-10-7169 1-2.1 ft QBT3
Xylene[1,3-]+Xylene[1,4-] 0.000483 (J)

15-610510
RE15-10-7179 1-2 ft SOIL
Methylene Chloride 0.00472 (J)
Toluene 0.000464 (J)

15-610523
RE15-10-7204 0-0.5 ft SED
Acenaphthene 0.0388 (J)
Acetone 0.00335 (J)
Anthracene 0.011 (J)
Benzo(a)anthracene 0.0625
Benzo(a)pyrene 0.0905
Benzo(b)fluoranthene 0.255
Benzo(g,h,i)perylene 0.0652 (J)
Chrysene 0.107
Fluoranthene 0.0468
Indeno(1,2,3-cd)pyrene 0.0633 (J)
Phenanthrene 0.0164 (J)
Pyrene 0.0733
Tetrachloroethene 0.000452 (J)
Toluene 0.000535 (J)
RE15-10-7205 1-1.5 ft SOIL
Acenaphthene 0.0268 (J)
Benzo(a)anthracene 0.0155 (J)
Benzo(b)fluoranthene 0.0473
Bis(2-ethylhexyl)phthalate 0.0793 (J)
Chrysene 0.0279 (J)
Fluoranthene 0.0185 (J)
Isopropyltoluene[4-] 0.000741 (J-)
Phenanthrene 0.0112 (J)
Pyrene 0.0266 (J)
Toluene 0.00244 (J-)
Xylene[1,3-]+Xylene[1,4-] 0.000619 (J-)

15-610526
RE15-10-7210 2-2.9 ft SOIL
Acetone 0.00531 (J)
Benzo(a)pyrene 0.0196 (J)
Benzo(b)fluoranthene 0.0373 (J)
Benzo(g,h,i)perylene 0.0269 (J)
Chrysene 0.0299 (J)
Fluoranthene 0.025 (J)
Phenanthrene 0.0182 (J)
Pyrene 0.0328 (J)
Toluene 0.000929 (J)
Xylene[1,2-] 0.00035 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000883 (J)

15-610517
RE15-10-7193 1-2 ft SED
Ethylbenzene 0.000489 (J)
Tetrachloroethene 0.000415 (J)
Toluene 0.000796 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000406 (J)

15-610519
RE15-10-7196 0-0.5 ft SED
Isopropyltoluene[4-] 0.000447 (J)
Toluene 0.000685 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000574 (J)
RE15-10-7197 1-2 ft SED
Tetrachloroethene 0.000442 (J)
Toluene 0.000405 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000789 (J)

15-610518
RE15-10-7194 0-1 ft SED
Tetrachloroethene 0.000799 (J)
RE15-10-7195 1-2 ft SOIL
Tetrachloroethene 0.000404 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000783 (J)

15-610516
RE15-10-7190 0-0.7 ft SED
Acetone 0.0037 (J)
Isopropyltoluene[4-] 0.00079 (J)
Methylene Chloride 0.00941 (J+)
Tetrachloroethene 0.00155 (J+)
Toluene 0.00117 (J+)
Xylene[1,3-]+Xylene[1,4-] 0.00114 (J+)
RE15-10-7191 1-2 ft SED
Tetrachloroethene 0.000458 (J)
Xylene[1,3-]+Xylene[1,4-] 0.00043 (J)

15-610515
RE15-10-7188 0-0.8 ft SED
Bis(2-ethylhexyl)phthalate 0.0959 (J)
Di-n-octylphthalate 1.43
Ethylbenzene 0.00076 (J+)
Tetrachloroethene 0.000733 (J+)
Xylene[1,3-]+Xylene[1,4-] 0.000962 (J+)
RE15-10-7189 1-2.2 ft SOIL
Chloroform 0.000687 (J)
Tetrachloroethene 0.000578 (J)
Toluene 0.00153
Xylene[1,3-]+Xylene[1,4-] 0.000761 (J)

15-610513
RE15-10-7184 0-0.7 ft SED
Tetrachloroethene 0.000905 (J+)
Xylene[1,3-]+Xylene[1,4-] 0.00046 (J+)
RE15-10-7185 1-2 ft SOIL
Tetrachloroethene 0.000453 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000635 (J)

15-610504
RE15-10-7186 0-1 ft SED
Acetone 0.0295 (J)
Isopropyltoluene[4-] 0.0425
Methylene Chloride 0.00587 (J)
Toluene 0.00145 (J)
Xylene[1,3-]+Xylene[1,4-] 0.00107 (J)

15-610525
RE15-10-7208 0-0.5 ft SED
Fluoranthene 0.0139 (J)
Isopropyltoluene[4-] 0.00362
RE15-10-7209 1-1.4 ft SED
Acenaphthene 0.053

15-610522
RE15-10-7202 2-3.9 ft SOIL
Toluene 0.000421 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000397 (J)

AOC 15-014(h)
04A102
04A103
15-610503
15-610509
15-610511
15-610524
15-40
15-46
15-140
15-182
15-305
15-321
R-SITE RD
PRISCILLA

7190 7200 7210 7220 7230 7240 7250 7260 7270 7280

N W E S
0 50 100
Feet
1:600

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

- Outfall
- Sampling location
- SWMU or AOC outfall
- Former structure
- SWMU or AOC
- Fence
- Storm drain
- Unpaved road

Elevation contours
- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities
- C Communication
- E Electric
- G Gas
- S Sewer
- W Water

Note: Concentrations are in mg/kg

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Hypsography; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
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Plate 26

Organic chemicals detected at AOC 15-014(h)

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-PLT-15.3 ORG 01 APRIL 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
Revised 20 May 2011 by AdelanteConsultingInc.

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1623000 1623200 1623400 1623600 1623800 1624000 1624200

1763800 1763600 1763400 1763200 1763000

15-610520
RE15-10-7198 0-0.5 ft SED
Cesium-137 1.53
Uranium-234 4.17
Uranium-238 5.21
RE15-10-7199 1-2.4 ft SOIL
Tritium 0.0364505

15-610521
RE15-10-7201 2-3.7 ft SOIL
Tritium 0.0274285

15-610508
RE15-10-7174 0-1 ft SOIL
Uranium-238 2.6

15-610507
RE15-10-7172 0-0.7 ft SOIL
Plutonium-239/240 0.0622
Uranium-238 2.72

15-610502
RE15-10-7162 0-0.5 ft SED
Uranium-238 2.69
RE15-10-7163 1-2.5 ft QBT3
Tritium 0.020885

15-610514
RE15-10-7187 1-2 ft SOIL
Cesium-137 0.334

15-610517
RE15-10-7192 0-0.5 ft SED
Uranium-238 3.22

15-610519
RE15-10-7196 0-0.5 ft SED
Uranium-238 3.32

15-610506
RE15-10-7170 0-0.7 ft SED
Uranium-234 2.8
Uranium-238 3.58

15-610518

15-610512

15-610516
RE15-10-7190 0-0.7 ft SED
Uranium-238 3.05

15-610505
RE15-10-7168 0-0.5 ft SED
Uranium-234 3.56
Uranium-235/236 0.219
Uranium-238 4.44

15-610515
RE15-10-7189 1-2.2 ft SOIL
Cesium-137 0.13

15-610510
RE15-10-7178 0-0.5 ft SED
Uranium-238 2.73
RE15-10-7179 1-2 ft SOIL
Cesium-137 0.45
Uranium-238 2.86

15-610513
RE15-10-7185 1-2 ft SOIL
Cesium-137 0.288

15-610509
RE15-10-7176 0-0.6 ft SOIL
Tritium 0.0123661
RE15-10-7177 1-2 ft SOIL
Cesium-137 0.339
Plutonium-239/240 0.0194

15-610504

15-610523
RE15-10-7204 0-0.5 ft SED
Uranium-238 3.58
RE15-10-7205 1-1.5 ft SOIL
Cesium-137 0.514
Plutonium-239/240 0.029
Tritium 0.100017
Uranium-234 2.98
Uranium-235/236 0.23
Uranium-238 4.21

15-610511
RE15-10-7180 0-1 ft SED
Plutonium-238 0.0599

15-610524
RE15-10-7207 1-2.1 ft QBT3
Tritium 0.0280974

15-610526
RE15-10-7210 2-2.9 ft SOIL
Tritium 0.0445575
RE15-10-7211 6-6.7 ft QBT3
Tritium 0.883301

04A102
AOC 15-014(h)
15-610501
15-610503
04A103
AOC 15-014(h)
15-610525
AOC 15-014(h)
15-610522

15-140
15-40
15-192
15-46
15-305
15-321

R-SITE RD

7190 7200 7210 7220 7230 7240 7250 7260 7270 7280

PRISCILLA

Outfall
Sampling location
SWMU or AOC outfall
Former structure
SWMU or AOC

Fence
Storm drain
Unpaved road

Elevation contours
100-ft and 20-ft contour
10-ft contour
2-ft contour

Utilities
C Communication
E Electric
G Gas
S Sewer
W Water

Note: Concentrations are in pCi/g

FEATURE DATA REFERENCES

Hypsography; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
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Roads - Streets; County of Los Alamos, Information Services; as published 16 May 2006. Road Paved road:Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009. Paved Parking; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 12 August 2002; as published 15 January 2009. Dirt Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
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N W E S
0 50 100
Feet
1:600

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

Plate 27

Radionuclides detected or detected above BVs/FVs at AOC 15-014(h)

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-PLT-15.4 RAD 01 APRIL 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
Revised 20 May 2011 by AdelanteConsultingInc.

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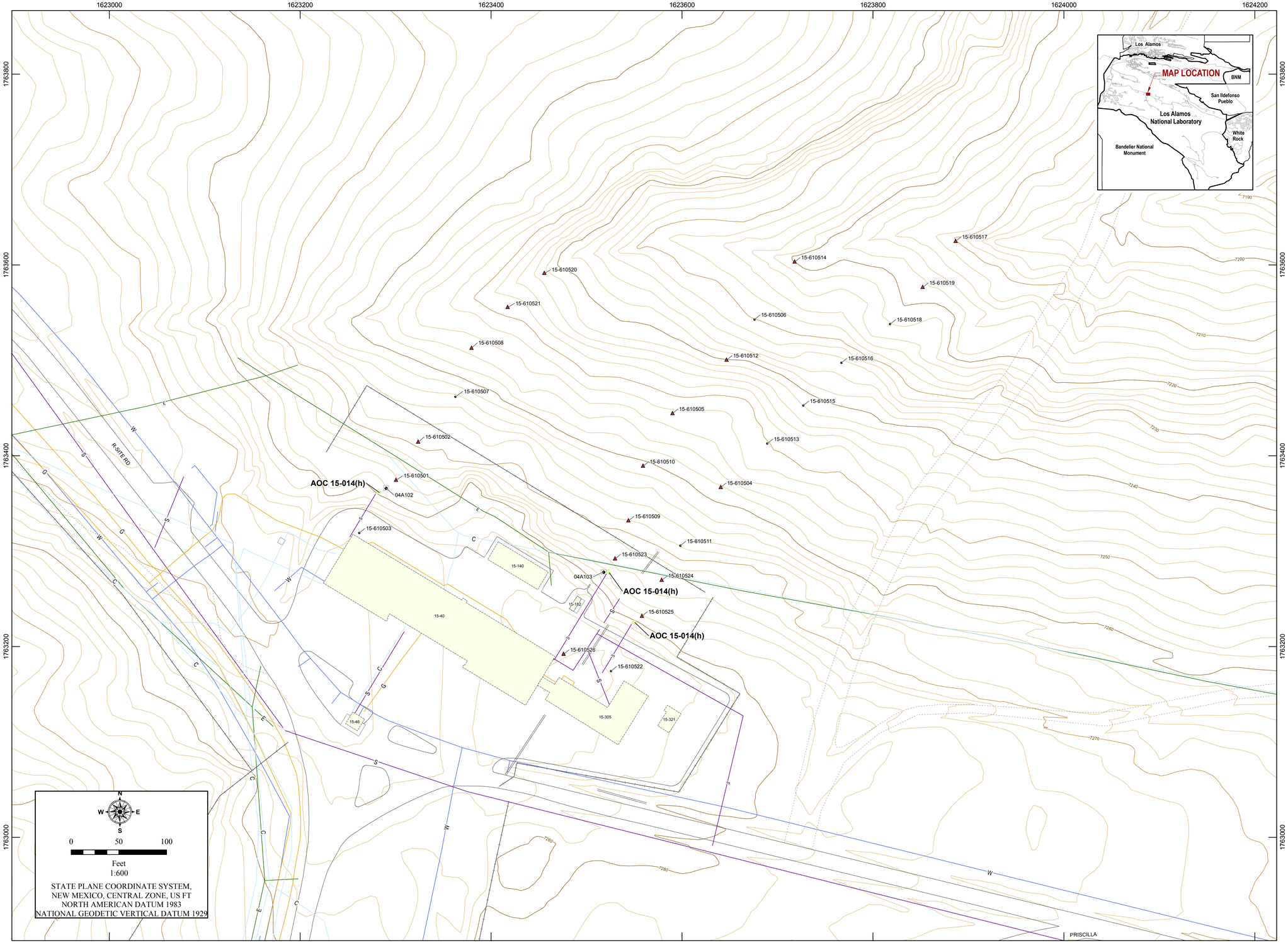

- Proposed location to resample
- Outfall
- Sampling location
- SWMU or AOC outfall
- Former structure
- SWMU or AOC
- Fence
- Storm drain
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities

- C Communication
- E Electric
- G Gas
- S Sewer
- W Water

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Potential Release Sites; Los Alamos National Laboratory, Waste and Environmental Services Division, Environmental Data and Analysis Group, EP2009-0633; 1:2,500 Scale Data; 25 January 2010
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Paved road/Paved Road Area; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Paved Parking; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 12 August 2002; as published 15 January 2009 . Dirt Road Area; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009
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Plate 28

Proposed sampling locations at AOC 15-014(h)

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-PLT-15.1 SITE 01 APRIL 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
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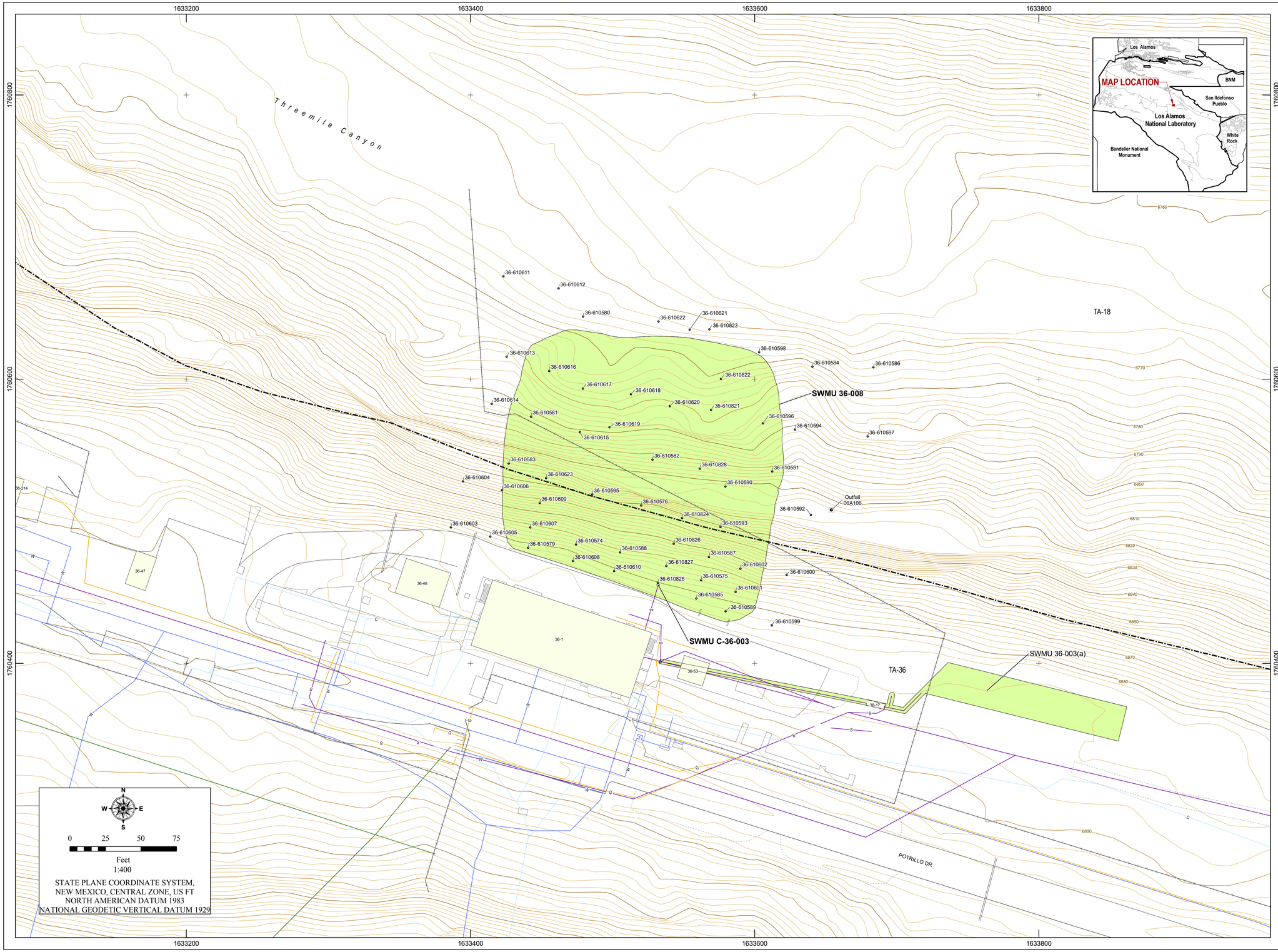

- Manhole
- Outfall
- Sampling location
- Structure or building
- SWMU or AOC
- Underground structure
- Fence
- Paved road
- Storm drain
- TA boundary
- Unpaved road

Elevation contours

- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities

- C Communication
- E Electric
- G Gas
- S Sewer
- W Water

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Plate 29

Site map and sampling locations for SWMUs 36-008 and C-36-003

LOS ALAMOS NATIONAL LABORATORY
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CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-19.1-PLT SITE 15 MARCH 2010 CRUZ
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1633200 1633400 1633600 1633800

1760800 1760600 1760400

Threemile Canyon

36-610580
RE36-10-7415 0-0.5 ft SOIL
Calcium 8490
Cyanide (Total) 0.633
Nitrate 12.4
Perchlorate 0.00104 (J)
Uranium 3.55
RE36-10-7416 2-3 ft SOIL
Nitrate 2.97

36-610582
RE36-10-7419 0-0.5 ft SOIL
Mercury 0.302
Nitrate 5.29
Perchlorate 0.0188
RE36-10-7420 2-3 ft SOIL
Nitrate 2.73
Perchlorate 0.0219

36-610612
RE36-10-7479 0-0.5 ft SOIL
Chromium 22

36-610616
RE36-10-7487 0-0.5 ft SOIL
Nitrate 6.15
RE36-10-7488 2-3 ft SOIL
Nitrate 2.67
Perchlorate 0.000627 (J)

36-610617
RE36-10-7489 0-0.5 ft SOIL
Chromium 29.9
RE36-10-7490 2-3 ft SOIL
Chromium 21.4
Nitrate 1.45

36-610613
RE36-10-7481 0-0.5 ft SOIL
Chromium 20
Uranium 2.78
RE36-10-7482 2-3 ft SOIL
Chromium 47.3

36-610611
RE36-10-7478 2-3 SOIL
Nitrate 2.23

36-610581
RE36-10-7417 0-0.5 ft SOIL
Chromium 22.2
Nitrate 1.34
Zinc 61.7
RE36-10-7418 2-3 ft SOIL
Nitrate 1.47

36-610619
RE36-10-7493 0-0.5 ft SOIL
Cyanide (Total) 0.591
Manganese 893
Mercury 0.186
Perchlorate 0.00931
RE36-10-7494 2-3 ft SOIL
Perchlorate 0.00604
Zinc 51.5

36-610618
RE36-10-7491 0-0.5 ft SOIL
Cyanide (Total) 0.697
Nitrate 1.93
Perchlorate 0.00264 (J)
Uranium 4.12
RE36-10-7492 2-3 ft SOIL
Nitrate 5.34
Perchlorate 0.00118 (J)

36-610622
RE36-10-7499 0-0.5 ft SOIL
Nitrate 1.55
Uranium 3.09
RE36-10-7500 2-3 ft SOIL
Nitrate 2.61

36-610621
RE36-10-7497 0-0.5 ft SOIL
Nitrate 2.91
Uranium 2.43
RE36-10-7498 2-3 ft SOIL
Nitrate 1.9

36-610620
RE36-10-7495 0-0.5 ft SOIL
Mercury 0.135
Nitrate 1.81
Perchlorate 0.00218 (J)
Uranium 1.88
RE36-10-7496 2-3 ft SOIL
Nitrate 5.04
Perchlorate 0.00205 (J)

36-610823
RE36-10-8277 0-0.5 ft SED
Chromium 11.3
Nitrate 2.23
RE36-10-8278 2-3 ft SED
Nitrate 1.44

36-610822
RE36-10-8275 0-0.5 ft SED
Mercury 0.109
Uranium 2.26
RE36-10-8276 2-3 ft SED
Chromium 10.7
Nitrate 1.73
Perchlorate 0.000642 (J)

36-610598
RE36-10-7451 0-0.5 ft SOIL
Chromium 21.5
Cyanide (Total) 2.88
Nitrate 1.69
RE36-10-7452 2-3 ft SOIL
Chromium 23.2
Cyanide (Total) 4.24
Nitrate 1.56

36-610821
RE36-10-8273 0-0.5 ft SED
Chromium 27.8
Manganese 576
Mercury 0.232
Nitrate 4.43
Perchlorate 0.000991 (J)
Silver 4.32
Uranium 3.89
RE36-10-8274 2-3 ft SOIL
Nitrate 2.43
Perchlorate 0.000926 (J)
Silver 2.96

36-610584
RE36-10-7423 0-0.5 ft SOIL
Perchlorate 0.00128 (J+)
Uranium 4.63
RE36-10-7424 2-3 ft QBT3
Aluminum 11000 (J+)
Arsenic 3.2
Barium 153
Calcium 6350
Chromium 13.2
Cobalt 5.34
Copper 7.32
Magnesium 2590
Nickel 9.22
Nitrate 1.33 (J)
Vanadium 26.2

36-610586
RE36-10-7427 0-0.5 ft SOIL
Cyanide (Total) 0.659
Nitrate 12.7 (J)
Perchlorate 0.00215 (J+)
Uranium 2.97
RE36-10-7428 2-3 ft SOIL
Nitrate 2.08 (J)
Perchlorate 0.00113 (J+)

36-610576
RE36-10-7407 0-0.5 ft SOIL
Cyanide (Total) 0.572
Mercury 0.706
Nitrate 4.25
Perchlorate 0.0541
Zinc 72.8

36-610614
RE36-10-7483 0-0.5 ft SOIL
Nitrate 1.96
Perchlorate 0.000724 (J)
Uranium 2.43
RE36-10-7484 2-3 ft SOIL
Nitrate 1.7
Perchlorate 0.000817 (J)

36-610595
RE36-10-7445 0-0.5 ft SOIL
Cyanide (Total) 0.621
Manganese 692
Mercury 0.199
Nitrate 2.64
Perchlorate 0.0319
Zinc 53.7

36-610583
RE36-10-7421 0-0.5 ft SOIL
Nitrate 1.39
Perchlorate 0.00181 (J)
RE36-10-7422 2-3 ft SOIL
Nitrate 1.01
Perchlorate 0.0015 (J)

36-610606
RE36-10-7467 0-0.5 ft SED
Cadmium 1.23
Calcium 4780 (J-)
Copper 20.9 (J+)
Lead 59.7
Mercury 1.68
Nitrate 2.66 (J-)
Perchlorate 0.00072 (J)
RE36-10-7468 2-2.9 ft SED
Cadmium 0.895
Copper 15.1 (J+)
Lead 53.5
Mercury 1.75

36-610604
RE36-10-7463 0-0.5 ft SOIL
Nitrate 2.87 (J+)
Perchlorate 0.000689 (J)
RE36-10-7464 2-3 ft SOIL
Nitrate 1.56 (J+)
Perchlorate 0.000602 (J)

36-610607
RE36-10-7469 0-0.5 ft SED
Copper 33.5 (J+)
Lead 75.7
Mercury 25
Nickel 12.2 (J)
Nitrate 19.9 (J-)
Perchlorate 0.00905
Silver 1.5
Zinc 70.6
RE36-10-7470 2-3 ft SOIL
Copper 16.1 (J+)
Lead 23.2
Mercury 22
Nitrate 2.91 (J-)
Perchlorate 0.00222 (J)
Zinc 59.6

36-610609
RE36-10-7473 0-0.5 ft SED
Calcium 6260 (J-)
Chromium 15.6
Copper 12.8 (J+)
Mercury 2.32
Nitrate 2.25 (J-)
Perchlorate 0.0107

36-610603
RE36-10-7462 2-3 ft SOIL
Copper 420 (J+)
Lead 35.4
Zinc 188

36-610605
RE36-10-7465 0-0.5 ft FILL
Cadmium 0.411 (J)
Copper 37.9 (J+)
Lead 65
Uranium 2.35
Zinc 80.8
RE36-10-7466 2-3 ft FILL
Copper 76.5 (J+)
Lead 45.3
Mercury 0.469
Zinc 69.4

36-610579
RE36-10-7413 0-0.5 ft FILL
Cadmium 0.436 (J)
Chromium 57.8
Copper 88.2 (J+)
Cyanide (Total) 0.868
Lead 41.6
Zinc 109
RE36-10-7414 2-3 ft QBT3
Chromium 9.78
Copper 18.5 (J+)
Lead 11.9

36-610608
RE36-10-7471 0-0.8 ft FILL
Cadmium 0.642 (J)
Chromium 99
Copper 33.3 (J+)
Lead 26.7
Mercury 0.421
Zinc 96.7
RE36-10-7472 2-3 ft FILL
Mercury 0.111
Zinc 50.7

36-610574
RE36-10-7403 0-0.5 ft SOIL
Copper 23.6
Mercury 0.169
Nitrate 15.5
Perchlorate 0.0591
Zinc 67.9
RE36-10-7404 2-2.5 ft SOIL
Mercury 0.118
Nitrate 17.7
Perchlorate 0.0882
Zinc 51.2

36-610588
RE36-10-7431 0-0.5 ft SOIL
Cadmium 0.902 (J)
Copper 4870
Lead 202
Mercury 14.8
Perchlorate 0.00912
Silver 1.15
Uranium 3.1
Zinc 936
RE36-10-7432 2-2.5 ft SOIL
Copper 31
Lead 106
Mercury 10.3
Perchlorate 0.0175
Uranium 1.88
Zinc 134

36-610610
RE36-10-7475 0-0.5 ft SED
Cadmium 0.554 (J)
Copper 87.4 (J+)
Lead 39.4
Mercury 0.862
Perchlorate 0.00347
Zinc 126
RE36-10-7476 2-3 ft SOIL
Mercury 0.146
Perchlorate 0.002 (J)
Zinc 51.8

36-610825
RE36-10-8281 0-1 ft SOIL
Cadmium 1.36
Calcium 11700
Chromium 28.5
Copper 2720
Cyanide (Total) 1.65
Lead 144
Mercury 0.297
Nickel 53
Nitrate 19.9
Perchlorate 0.0304
Silver 32.4
Uranium 2.23
Zinc 1320
RE36-10-8282 2-2.5 ft QBT3
Chromium 30.4
Copper 309
Lead 35.7
Mercury 0.131
Nitrate 4.07
Perchlorate 0.00801
Selenium 0.635 (J-)
Silver 85.9
Zinc 235

36-610827
RE36-10-8285 0-0.5 ft SOIL
Chromium 192
Copper 15.3
Cyanide (Total) 1.57
Mercury 0.461
Nitrate 1.92
Perchlorate 0.0126
Silver 102
Uranium 10.4
Zinc 74.2
RE36-10-8286 2-3 ft SOIL
Cadmium 3.35
Chromium 97.9
Copper 25.2
Cyanide (Total) 1.39
Mercury 0.254
Perchlorate 0.0117
Silver 302
Uranium 4.73
Zinc 53.2

36-610589
RE36-10-7433 0-0.5 ft SOIL
Cyanide (Total) 0.577
Lead 27.1
Nitrate 2.04
Perchlorate 0.0029
Uranium 3.88
RE36-10-7434 1-2 ft SOIL
Cyanide (Total) 0.534
Nitrate 1.84
Perchlorate 0.00221 (J)

36-610599
RE36-10-7453 0-0.5 ft SOIL
Nitrate 3.42
Zinc 55.5
RE36-10-7454 0.5-1 ft QBT2
Chromium 11.7
Nitrate 1.47

36-610826
RE36-10-8283 0-0.5 ft SOIL
Cadmium 0.469 (J)
Chromium 108
Cyanide (Total) 2.18
Mercury 0.366
Nitrate 540
Perchlorate 0.688
Silver 215
Sodium 1000
Uranium 5.15
Zinc 58.3
RE36-10-8284 2-3 ft SOIL
Chromium 70.9
Cyanide (Total) 0.825
Mercury 0.309
Nitrate 131
Perchlorate 0.212
Silver 199
Uranium 4.36
Zinc 49.5

36-610602
RE36-10-7459 0-0.5 ft SOIL
Cyanide (Total) 1.31
Manganese 579
Nitrate 1.99
Perchlorate 0.00414
RE36-10-7460 1.5-2.6 ft QBT2
Beryllium 2.44
Chromium 17.9
Nitrate 1.68
Perchlorate 0.00241

36-610587
RE36-10-7429 0-0.5 ft SOIL
Nitrate 4.09
Perchlorate 0.00499
Uranium 1.85
Zinc 200

36-610601
RE36-10-7457 0-0.5 ft SOIL
Cyanide (Total) 1.1
Nitrate 2.52
Perchlorate 0.00433
RE36-10-7458 2-3 ft SOIL
Perchlorate 0.00364

36-610575
RE36-10-7405 0-0.5 ft SOIL
Cyanide (Total) 0.98
Nitrate 1.61
Perchlorate 0.0136
Zinc 51.4
RE36-10-7406 2-2.5 ft SOIL
Perchlorate 0.0124

36-610585
RE36-10-7425 0-1 ft SOIL
Nitrate 29.9
Perchlorate 0.00506
RE36-10-7426 2-3 ft SOIL
Perchlorate 0.00319

36-610596
RE36-10-7447 0-0.5 ft SOIL
Cyanide (Total) 1.78
Nitrate 7.51
Perchlorate 0.000994 (J)
RE36-10-7448 2-3 ft SOIL
Cyanide (Total) 0.888
Nitrate 4.29

36-610615
RE36-10-7485 0-0.5 ft SOIL
Perchlorate 0.00137 (J)
RE36-10-7486 2-3 ft SOIL
Chromium 20.6
Perchlorate 0.00173 (J)
Uranium 2.21

36-610623
RE36-10-7501 0-0.5 ft SOIL
Perchlorate 0.00775

36-610597
RE36-10-7449 0-0.5 ft SOIL
Nitrate 1.95
Perchlorate 0.000714 (J)
RE36-10-7450 2-3 ft SOIL
Nitrate 1.22
Perchlorate 0.000672 (J)

36-610828
RE36-10-8287 0-0.5 ft SED
Calcium 4470 (J+)
Chromium 21.1
Manganese 860
Mercury 0.139
Nitrate 3.36
Perchlorate 0.00715
Silver 6.49
RE36-10-8288 2-3 ft SOIL
Nitrate 5.08
Perchlorate 0.0111
Silver 1.03

36-610591
RE36-10-7437 0-0.5 ft SED
Cyanide (Total) 0.875
Nitrate 4.61
Perchlorate 0.0018 (J)
RE36-10-7438 2-3 ft QBT3
Chromium 12.2
Nitrate 1.03
Perchlorate 0.000633 (J)

36-610590
RE36-10-7435 0-0.5 ft SED
Manganese 646
Nitrate 1.58
RE36-10-7436 2-3 ft SOIL
Nitrate 1.25
Perchlorate 0.00143 (J)

36-610592
RE36-10-7439 0-0.5 ft SOIL
Perchlorate 0.000991 (J)
RE36-10-7440 2-3 ft SOIL
Nitrate 1.17
Perchlorate 0.000658 (J)

36-610593
RE36-10-7441 0-0.5 ft SOIL
Mercury 0.109
Nitrate 3.29
Perchlorate 0.00268
Uranium 2.68
RE36-10-7442 2-3 ft SOIL
Nitrate 1.24
Perchlorate 0.00164 (J)

36-610824
RE36-10-8279 0-0.5 ft SOIL
Cadmium 0.542
Chromium 101
Copper 18.5
Cyanide (Total) 0.838
Mercury 0.582
Nitrate 54.1
Perchlorate 0.027
Silver 348
Uranium 5.2
Zinc 89.7 (J+)
RE36-10-8280 2-3 ft SOIL
Cadmium 1.09
Chromium 90.2
Copper 27.8
Cyanide (Total) 1.12
Mercury 0.815
Nitrate 20.4
Perchlorate 0.0216
Silver 338
Uranium 5.96
Zinc 74.9 (J+)

36-610600
RE36-10-7455 0-0.5 ft SOIL
Cyanide (Total) 0.596
Nitrate 2.39
Perchlorate 0.00206 (J)
Uranium 2.34
RE36-10-7456 1-2 ft QBT2
Barium 54.2
Chromium 13.5
Nitrate 1.39
Perchlorate 0.00178 (J)

36-610594
RE36-10-7443 0-0.5 ft SOIL
Nitrate 4.83
RE36-10-7444 2-3 ft SOIL
Chromium 32.7
Cobalt 11.3
Nitrate 1.86
Perchlorate 0.000673 (J)

SWMU 36-008

SWMU C-36-003

SWMU 36-003(a)

POTRILLO DR

TA-36

06A106

36-214 36-46 36-1 36-53 36-17

- Manhole
- Outfall
- Sampling location
- Structure or building
- SWMU or AOC
- Underground structure
- Fence
- Paved road
- Storm drain
- TA boundary
- Unpaved road

Elevation contours
- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities
- C Communication
- E Electric
- G Gas
- S Sewer
- W Water

Note: Concentrations are in mg/kg

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N W E S

0 25 50 75

Feet
1:400

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929

Plate 30

Inorganic chemicals detected or detected above BVs at SWMUs 36-008 and C-36-003

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-19.2 -PLT INORG 15 MARCH 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
Revised 20 May 2011 by AdelanteConsultingInc.

This map was created for work processes associated with the Corrective Actions Projects (CAP) of the Los Alamos National Laboratory (LANL) Environmental Programs (EP) Directorate. All other uses for this map should be confirmed with LANL EP-CAP staff.

1633200 1633400 1633600 1633800

1760800 1760600 1760400 1760200

Threemile Canyon

SWMU 36-008

SWMU C-36-003

SWMU 36-003(a)

TA-36

POTRILLO DR

MAP LOCATION

Los Alamos

BNM

San Ildefonso Pueblo

Los Alamos National Laboratory

White Rock

Bandelier National Monument

36-610614
RE36-10-7483-0-0.5 ft SOIL
Acetone 0.00718 (J)
Isopropyltoluene[4-] 0.0893 (J+)
Methylene Chloride 0.00357 (J+)
Pyrene 0.0134 (J)
Toluene 0.00524 (J+)
Trichloroethene 0.000605 (J+)
Xylene[1,2-] 0.000513 (J+)
Xylene[1,3-]+Xylene[1,4-] 0.00096 (J+)
RE36-10-7484 2-2 ft SOIL
Butylbenzylphthalate 0.214 (J)
Isopropyltoluene[4-] 0.00342 (J+)
Toluene 0.000412 (J+)

36-610609
RE36-10-7473 0-0.5 ft SED
Benzo(a)anthracene 0.0153 (J)
Benzo(a)pyrene 0.0165 (J)
Benzo(b)fluoranthene 0.0325 (J)
Chrysene 0.0148 (J)
Fluoranthene 0.0206 (J)
Methylene Chloride 0.00573 (J)
Pyrene 0.0206 (J)

36-610613
RE36-10-7481 0-0.5 ft SOIL
Acenaphthene 0.12
Acetone 0.00758 (J)
Anthracene 0.216
Benzo(a)anthracene 0.363
Benzo(a)pyrene 0.328
Benzo(b)fluoranthene 0.538
Benzo(g,h,i)perylene 0.137 (J)
Chrysene 0.407
Fluoranthene 0.962
Fluorene 0.131
Indeno(1,2,3-cd)pyrene 0.131
Methylnaphthalene[2-] 0.0324 (J)
Naphthalene 0.0815
Phenanthrene 0.919
Pyrene 0.829
Toluene 0.00161 (J+)
RE36-10-7482 2-3 ft SOIL
Acenaphthene 0.0645
Acetone 0.0132 (J+)
Anthracene 0.104
Benzo(a)anthracene 0.168
Benzo(a)pyrene 0.157
Benzo(b)fluoranthene 0.195
Benzo(g,h,i)perylene 0.0545 (J)
Chrysene 0.146
Fluoranthene 0.399
Fluorene 0.0842
Indeno(1,2,3-cd)pyrene 0.0492
Isopropyltoluene[4-] 0.0656 (J+)
Methylnaphthalene[2-] 0.0178 (J)
Naphthalene 0.0396 (J)
Phenanthrene 0.48
Pyrene 0.345
Toluene 0.00155 (J+)

36-610611
RE36-10-7477 0-0.5 ft SOIL
Benzo(a)anthracene 0.0179 (J)
Benzo(a)pyrene 0.0136 (J)
Benzo(b)fluoranthene 0.0248 (J)
Chrysene 0.0167 (J)
Fluoranthene 0.0297 (J)
Isopropyltoluene[4-] 0.00093 (J)
Phenanthrene 0.0154 (J)
Pyrene 0.0278 (J)
Trimethylbenzene[1,2,4-] 0.000406 (J)
RE36-10-7478 2-3 ft SOIL
Benzo(a)anthracene 0.0133 (J)
Benzo(b)fluoranthene 0.0193 (J)
Chrysene 0.0158 (J)
Fluoranthene 0.0217 (J)
Phenanthrene 0.0117 (J)
Pyrene 0.024 (J)
Xylene[1,2-] 0.000366 (J+)
Xylene[1,3-]+Xylene[1,4-] 0.000543 (J+)

36-610581
RE36-10-7477 0-0.5 ft SOIL
Aroclor-1254 0.0043
Isopropyltoluene[4-] 0.00101 (J+)
RE36-10-7478 2-3 ft SOIL
Isopropyltoluene[4-] 0.00161

36-610616
RE36-10-7487 0-0.5 ft SOIL
Isopropyltoluene[4-] 0.00232 (J+)
Toluene 0.00199 (J+)

36-610612
RE36-10-7480 2-3 ft SOIL
Chloronaphthalene[2-] 0.0215 (J)
Isopropyltoluene[4-] 0.00091 (J+)
Toluene 0.000626 (J+)
Trichloroethene 0.0005001 (J+)

36-610580
RE36-10-7415 0-0.5 ft SOIL
Acetone 0.00915 (J+)
Benzo(a)pyrene 0.0054 (J)
Isopropyltoluene[4-] 0.026 (J-)
Toluene 0.000351 (J+)

36-610617
RE36-10-7489 0-0.5 ft SOIL
Isopropyltoluene[4-] 0.0561 (J+)
Toluene 0.00106 (J+)
RE36-10-7490 2-3 ft SOIL
Acetone 0.00245 (J)
Isopropyltoluene[4-] 0.00666
Toluene 0.00159

36-610615
RE36-10-7485 0-0.5 ft SOIL
Acetone 0.00369 (J)
Benzo(a)anthracene 0.0139 (J)
Benzo(b)fluoranthene 0.0145 (J)
Fluoranthene 0.017 (J)
Isopropyltoluene[4-] 0.00235 (J+)
Pyrene 0.0169 (J)
Toluene 0.000707 (J+)
RE36-10-7486 2-3 ft SOIL
Benzo(a)anthracene 0.0144 (J)
Benzo(b)fluoranthene 0.0173 (J)
Chrysene 0.013 (J)
Fluoranthene 0.0212 (J)
Methylene Chloride 0.0026 (J+)
Phenanthrene 0.013 (J)
Pyrene 0.02 (J)

36-610619
RE36-10-7493 0-0.5 ft SOIL
Benzo(a)pyrene 0.0173 (J)
Benzo(b)fluoranthene 0.0232 (J)
Benzo(g,h,i)perylene 0.0234 (J)
Chrysene 0.0337 (J)
Dibenz(a,h)anthracene 0.0169 (J)
Fluoranthene 0.0359 (J)
Indeno(1,2,3-cd)pyrene 0.0197 (J)
Phenanthrene 0.112
Pyrene 0.0298 (J)
RE36-10-7494 2-3 ft SOIL
Aroclor-1260 0.034
Trimethylbenzene[1,2,4-] 0.000388 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000548 (J)

36-610618
RE36-10-7491 0-0.5 ft SOIL
Acetone 0.00309 (J+)
Chloromethane 0.000633 (J+)
Fluoranthene 0.018 (J)
Pyrene 0.016 (J)
Toluene 0.000494 (J+)
RE36-10-7492 2-3 ft SOIL
Acetone 0.00996 (J)
Toluene 0.000418 (J)
Trimethylbenzene[1,2,4-] 0.000862 (J)
Xylene[1,2-] 0.000393 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000774 (J)

36-610622
RE36-10-7499 0-0.5 ft SOIL
Acetone 0.00316 (J)
RE36-10-7500 2-3 ft SOIL
Acetone 0.00273 (J)
Toluene 0.000537 (J)
Trichloroethene 0.000448 (J)

36-610582
RE36-10-7419 0-0.5 ft SOIL
Aroclor-1254 0.0048
Benzo(a)anthracene 0.0171 (J)
Benzo(b)fluoranthene 0.0174 (J)
Fluoranthene 0.0258 (J)
Fluorene 0.0163 (J)
Pyrene 0.0212 (J)
RE36-10-7420 2-3 ft SOIL
Benzoic Acid 0.245 (J)

36-610621
RE36-10-7497 0-0.5 ft SOIL
Acetone 0.00353 (J)
Dichloroethene[1,1-] 0.000711 (J)
Isopropyltoluene[4-] 0.00117 (J)
Toluene 0.000874 (J)

36-610823
RE36-10-8277 0-0.5 ft SED
Isopropyltoluene[4-] 0.0124 (J+)
RE36-10-8278 2-3 ft SED
Isopropyltoluene[4-] 0.00105 (J+)
Toluene 0.000331 (J+)

36-610620
RE36-10-7495 0-0.5 ft SOIL
Acetone 0.0099 (J+)
Benzo(a)pyrene 0.0221 (J)
Benzo(b)fluoranthene 0.0327 (J)
Fluoranthene 0.0383 (J)
Isopropyltoluene[4-] 0.000591 (J+)
Phenanthrene 0.114
Pyrene 0.0403 (J)
Toluene 0.00106 (J+)
Xylene[1,3-]+Xylene[1,4-] 0.000523 (J+)
RE36-10-7496 2-3 ft SOIL
Acetone 0.00746
Bis(2-ethylhexyl)phthalate 0.604
Fluoranthene 0.0152 (J)
Pyrene 0.0126 (J)
Toluene 0.000599 (J)

36-610822
RE36-10-8275 0-0.5 ft SED
Isopropyltoluene[4-] 0.0101 (J+)
Toluene 0.00135 (J+)

36-610598
RE36-10-7451 0-0.5 ft SOIL
Acetone 0.00286 (J+)
Dichloroethene[1,1-] 0.00246 (J+)
Isopropyltoluene[4-] 0.00338 (J+)
Toluene 0.0032 (J+)
Xylene[1,3-]+Xylene[1,4-] 0.000792 (J+)
RE36-10-7452 2-3 ft SOIL
Acetone 0.00614 (J+)
Isopropyltoluene[4-] 0.0128 (J+)
Toluene 0.015 (J+)

36-610821
RE36-10-8273 0-0.5 ft SED
Aroclor-1254 0.00442 (J)
Fluoranthene 0.0183 (J)
Isopropyltoluene[4-] 0.00235 (J+)
Pyrene 0.0156 (J)
Toluene 0.001 (J+)

36-610584
RE36-10-7423 0-0.5 ft SOIL
Acetone 0.0236
Dichloroethene[1,1-] 0.000846 (J)
Isopropyltoluene[4-] 0.0696
Styrene 0.00197 (J)
Toluene 0.00552
Xylene[1,3-]+Xylene[1,4-] 0.00072 (J)

36-610586
RE36-10-7427 0-0.5 ft SOIL
Acetone 0.0095 (J+)
Benzo(b)fluoranthene 0.0236 (J)
Dichloroethene[1,1-] 0.000495 (J+)
Fluoranthene 0.0281 (J)
Pyrene 0.0315 (J)
Toluene 0.000763 (J+)

36-610576
RE36-10-7407 0-0.5 ft SOIL
Aroclor-1254 0.0185
Aroclor-1260 0.013
Benzo(a)anthracene 0.0272 (J)
Benzo(a)pyrene 0.0201 (J)
Benzoic Acid 0.621 (J)
Chrysene 0.0214 (J)
Fluoranthene 0.0448
Phenanthrene 0.0273 (J)
Pyrene 0.0357 (J)
Trichloroethene 0.000661 (J+)
Trimethylbenzene[1,2,4-] 0.000454 (J+)
Xylene[1,3-]+Xylene[1,4-] 0.000454 (J+)

36-610824
RE36-10-8279 0-0.5 ft SOIL
Acenaphthene 0.0965 (J)
Anthracene 0.294
Aroclor-1254 0.0315
Aroclor-1260 0.0176
Benzo(a)anthracene 2.03
Benzo(a)pyrene 2.24
Benzo(b)fluoranthene 4.17
Benzo(g,h,i)perylene 1.29
Chrysene 2.18
Di-n-butylphthalate 0.441 (J)
Fluoranthene 3.34
Fluorene 0.0928 (J)
Indeno(1,2,3-cd)pyrene 1.21
Phenanthrene 1.35
Pyrene 3.31
Toluene 0.000334 (J+)
RE36-10-8280 2-3 ft SOIL
Anthracene 0.133 (J)
Aroclor-1254 0.0655
Aroclor-1260 0.0369
Benzo(a)anthracene 0.971
Benzo(a)pyrene 1.15
Benzo(b)fluoranthene 2.31
Benzo(g,h,i)perylene 0.682
Chrysene 1.21
Fluoranthene 1.63
Indeno(1,2,3-cd)pyrene 0.641
Phenanthrene 0.608
Pyrene 1.57
Toluene 0.000398 (J+)

36-610826
RE36-10-8283 0-0.5 ft SOIL
Acenaphthene 0.0912 (J)
Anthracene 0.277
Aroclor-1254 0.0678
Aroclor-1260 0.0473
Benzo(a)anthracene 1.55
Benzo(a)pyrene 1.57
Benzo(b)fluoranthene 3
Benzo(g,h,i)perylene 0.71
Chrysene 1.62
Di-n-butylphthalate 0.547 (J)
Fluoranthene 2.77
Fluorene 0.0957 (J)
Indeno(1,2,3-cd)pyrene 0.695
Isopropyltoluene[4-] 0.00236 (J-)
Methylene Chloride 0.00315 (J+)
Phenanthrene 1.33
Pyrene 2.83
Toluene 0.00113 (J+)
Trimethylbenzene[1,2,4-] 0.001 (J+)
Xylene[1,3-]+Xylene[1,4-] 0.000822 (J+)
RE36-10-8284 2-3 ft SOIL
Acenaphthene 0.0725 (J)
Anthracene 0.191
Aroclor-1254 0.0641
Aroclor-1260 0.043
Benzo(a)anthracene 0.988
Benzo(a)pyrene 1.08
Benzo(b)fluoranthene 1.96
Benzo(g,h,i)perylene 0.525
Chrysene 1.2
Di-n-butylphthalate 0.739 (J)
Fluoranthene 2.04
Fluorene 0.0719 (J)
Indeno(1,2,3-cd)pyrene 0.502
Isopropyltoluene[4-] 0.0101 (J+)
Phenanthrene 0.988
Pyrene 1.88
Toluene 0.000476 (J+)

36-610590
RE36-10-7435 0-0.5 ft SED
Acetone 0.00429 (J+)
Isopropyltoluene[4-] 0.00208 (J+)
Toluene 0.000816 (J+)
Trichloroethene 0.000701 (J+)
Xylene[1,2-] 0.000616 (J+)
RE36-10-7436 2-3 ft SOIL
Acetone 0.00332 (J)
Chlorobenzene[4-] 0.000496 (J)
Isopropyltoluene[4-] 0.00261 (J+)
Toluene 0.000569 (J)

36-610591
RE36-10-7437 0-0.5 ft SED
Chrysene 0.0297 (J)
Fluoranthene 0.0545
Phenanthrene 0.0351 (J)
Pyrene 0.0498
RE36-10-7438 2-3 ft QBT3
Acetone 0.00261 (J)
Isopropyltoluene[4-] 0.00187 (J+)
Toluene 0.00109

36-610592
RE36-10-7439 0-0.5 ft SOIL
Acetone 0.00474 (J)
Anthracene 0.0239 (J)
Benzo(a)anthracene 0.0749
Benzo(a)pyrene 0.0845
Benzo(b)fluoranthene 0.128
Benzo(g,h,i)perylene 0.0596 (J)
Benzo(k)fluoranthene 0.0528
Benzoic Acid 0.562 (J)
Chrysene 0.115
Fluoranthene 0.241
Fluorene 0.014 (J)
Phenanthrene 0.178
Pyrene 0.226
RE36-10-7440 2-3 ft SOIL
Acetone 0.00358 (J+)
Fluoranthene 0.027 (J)
Isopropyltoluene[4-] 0.00233 (J+)
Phenanthrene 0.0154 (J)
Pyrene 0.0223 (J)
Toluene 0.00371 (J+)
Xylene[1,3-]+Xylene[1,4-] 0.00037 (J+)

36-610593
RE36-10-7441 0-0.5 ft SOIL
Acetone 0.00442 (J+)
Chrysene 0.0324 (J)
Fluoranthene 0.0673
Isopropyltoluene[4-] 0.000451 (J+)
Phenanthrene 0.0458
Pyrene 0.0585

36-610587
RE36-10-7429 0-0.5 ft SOIL
Benzo(a)anthracene 0.0488 (J)
Benzo(a)pyrene 0.0371 (J)
Benzo(b)fluoranthene 0.074 (J)
Chrysene 0.0394 (J)
Fluoranthene 0.0749 (J)
Phenanthrene 0.0524 (J)
Pyrene 0.0775 (J)

36-610600
RE36-10-7455 0-0.5 ft SOIL
Benzo(a)anthracene 0.036 (J)
Benzo(a)pyrene 0.0365 (J)
Benzo(b)fluoranthene 0.0507
Benzoic Acid 0.627 (J)
Chrysene 0.0477
Fluoranthene 0.0903
Phenanthrene 0.0537
Pyrene 0.0754
RE36-10-7456 1-2 ft QBT2
Isopropyltoluene[4-] 0.00067 (J)
Toluene 0.0008 (J)
Trimethylbenzene[1,2,4-] 0.000454 (J)
Xylene[1,3-]+Xylene[1,4-] 0.00053 (J)

36-610602
RE36-10-7459 0-0.5 ft SOIL
Benzo(a)anthracene 0.0278 (J)
Benzo(a)pyrene 0.0247 (J)
Benzo(b)fluoranthene 0.0439
Benzoic Acid 0.552 (J)
Chrysene 0.0368 (J)
Fluoranthene 0.0634
Isopropyltoluene[4-] 0.00101 (J+)
Phenanthrene 0.0369 (J)
Pyrene 0.0517
RE36-10-7460 1.5-2.6 ft QBT2
Isopropyltoluene[4-] 0.000575 (J)
Toluene 0.000442 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000343 (J)

36-610601
RE36-10-7457 0-0.5 ft SOIL
Anthracene 0.0204 (J)
Benzo(a)anthracene 0.072
Benzo(a)pyrene 0.0741
Benzo(b)fluoranthene 0.148
Benzo(g,h,i)perylene 0.039 (J)
Benzoic Acid 0.615 (J)
Chrysene 0.0899
Fluoranthene 0.181
Fluorene 0.013 (J)
Indeno(1,2,3-cd)pyrene 0.042 (J)
Phenanthrene 0.126
Pyrene 0.151
RE36-10-7458 2-3 ft SOIL
Acetone 0.00218 (J)
Benzo(a)anthracene 0.0267 (J)
Benzo(b)fluoranthene 0.0301 (J)
Benzoic Acid 0.568 (J)
Chrysene 0.0264 (J)
Fluoranthene 0.0527
Isopropyltoluene[4-] 0.00264 (J)
Phenanthrene 0.0344 (J)
Pyrene 0.0427

36-610589
RE36-10-7433 0-0.5 ft SOIL
Acenaphthene 0.0613 (J)
Anthracene 0.0889 (J)
Benzo(a)anthracene 0.297
Benzo(a)pyrene 0.263
Benzo(b)fluoranthene 0.517
Benzo(g,h,i)perylene 0.134
Benzoic Acid 1.56 (J)
Chrysene 0.29
Di-n-butylphthalate 0.403 (J)
Fluoranthene 0.617
Fluorene 0.0507 (J)
Indeno(1,2,3-cd)pyrene 0.13
Phenanthrene 0.522
Pyrene 0.731
RE36-10-7434 1-2 ft SOIL
Benzo(a)anthracene 0.0793 (J)
Benzo(a)pyrene 0.061 (J)
Benzo(b)fluoranthene 0.119
Benzo(g,h,i)perylene 0.0374 (J)
Benzoic Acid 1.65 (J)
Chrysene 0.0653 (J)
Fluoranthene 0.149
Indeno(1,2,3-cd)pyrene 0.0337 (J)
Phenanthrene 0.118
Pyrene 0.145

36-610575
RE36-10-7405 0-0.5 ft SOIL
Aroclor-1254 0.0019
Aroclor-1260 0.0057
Benzo(a)anthracene 0.0416 (J)
Benzo(a)pyrene 0.0348 (J)
Benzo(b)fluoranthene 0.0772 (J)
Chrysene 0.0337 (J)
Fluoranthene 0.0497 (J)
Methylene Chloride 0.00297 (J)
Phenanthrene 0.0272 (J)
Pyrene 0.0508 (J)
RE36-10-7406 2-2.5 ft SOIL
Toluene 0.000437 (J)

36-610605
RE36-10-7455 0-0.5 ft FILL
Acenaphthene 1.04 (J-)
Acenaphthylene 0.0243 (J)
Anthracene 2.29 (J-)
Benzo(a)anthracene 5.16 (J-)
Benzo(a)pyrene 4.87 (J-)
Benzo(b)fluoranthene 8.12 (J-)
Benzo(g,h,i)perylene 2.87 (J-)
Bis(2-ethylhexyl)phthalate 0.112 (J-)
Chrysene 5.63 (J-)
Dibenz(a,h)anthracene 0.943 (J-)
Dibenzofuran 0.665 (J-)
Fluoranthene 13.6 (J-)
Fluorene 1.04 (J-)
Indeno(1,2,3-cd)pyrene 2.63 (J-)
Isopropyltoluene[4-] 0.000399 (J)
Methylnaphthalene[2-] 0.207 (J-)
Naphthalene 0.357 (J-)
Phenanthrene 12.1 (J-)
Pyrene 9.79 (J-)
Toluene 0.000489 (J)
Xylene[1,3-]+Xylene[1,4-] 0.000437 (J)
RE36-10-7466 3-3 ft FILL
Acenaphthene 0.108
Anthracene 0.205
Benzo(a)anthracene 0.604
Benzo(a)pyrene 0.559
Benzo(b)fluoranthene 1.01
Benzo(g,h,i)perylene 0.36
Chrysene 0.681
Dibenz(a,h)anthracene 0.122
Fluoranthene 1.44
Fluorene 0.102
Indeno(1,2,3-cd)pyrene 0.336
Methylnaphthalene[2-] 0.0202 (J)
Naphthalene 0.0315 (J)
Phenanthrene 1.35
Pyrene 1.36

36-610604
RE36-10-7463 0-0.5 ft SOIL
Acenaphthene 0.0129 (J)
Anthracene 0.029 (J)
Benzo(a)anthracene 0.107
Benzo(a)pyrene 0.153
Benzo(b)fluoranthene 0.207
Benzo(g,h,i)perylene 0.0818 (J)
Chrysene 0.128
Dibenz(a,h)anthracene 0.031 (J)
Fluoranthene 0.249
Fluorene 0.0136 (J)
Indeno(1,2,3-cd)pyrene 0.0715
Phenanthrene 0.172
Pyrene 0.222
RE36-10-7464 2-3 ft SOIL
Benzo(a)anthracene 0.0227 (J)
Benzo(a)pyrene 0.0209 (J)
Benzo(b)fluoranthene 0.0353 (J)
Benzo(g,h,i)perylene 0.0167 (J)
Chrysene 0.026 (J)
Fluoranthene 0.0489
Indeno(1,2,3-cd)pyrene 0.0136 (J)
Phenanthrene 0.0314 (J)
Pyrene 0.0408

36-610603
RE36-10-7461 0-0.5 ft FILL
Acenaphthene 0.0329 (J)
Anthracene 0.0647
Benzo(a)anthracene 0.242
Benzo(a)pyrene 0.219
Benzo(b)fluoranthene 0.413
Benzo(g,h,i)perylene 0.178 (J)
Chrysene 0.264
Dibenz(a,h)anthracene 0.0651
Fluoranthene 0.539
Fluorene 0.0297 (J)
Indeno(1,2,3-cd)pyrene 0.164
Phenanthrene 0.41
Pyrene 0.51
TATB 0.303 (J)
RE36-10-7462 2-3 ft SOIL
Anthracene 0.0187 (J)
Benzo(a)anthracene 0.0667
Benzo(a)pyrene 0.0577
Benzo(b)fluoranthene 0.108
Benzo(g,h,i)perylene 0.055 (J)
Chrysene 0.0764
Fluoranthene 0.166
Indeno(1,2,3-cd)pyrene 0.0451
Phenanthrene 0.107
Pyrene 0.129

36-610579
RE36-10-7413 0-0.5 ft FILL
Acenaphthene 0.765
Acenaphthylene 0.0202 (J)
Anthracene 1.49
Aroclor-1254 0.191
Aroclor-1260 0.116
Benzo(a)anthracene 4.03
Benzo(a)pyrene 3.7
Benzo(b)fluoranthene 6.62
Benzo(g,h,i)perylene 1.79
Chrysene 4.24
Dibenz(a,h)anthracene 0.669
Dibenzofuran 0.481
Di-n-butylphthalate 0.185 (J)
Fluoranthene 10
Fluorene 0.764
Indeno(1,2,3-cd)pyrene 1.85
Methylnaphthalene[2-] 0.108
Naphthalene 0.26
Phenanthrene 8.64
Pyrene 7.76
TATB 0.331 (J)
Toluene 0.000455 (J)

36-610574
RE36-10-7403 0-0.5 ft SOIL
Anthracene 0.0484 (J)
Aroclor-1254 0.0151
Aroclor-1260 0.0103
Benzo(a)anthracene 0.242
Benzo(a)pyrene 0.234
Benzo(b)fluoranthene 0.705
Benzo(g,h,i)perylene 0.153 (J)
Chrysene 0.267
Fluoranthene 0.411
Indeno(1,2,3-cd)pyrene 0.157
Phenanthrene 0.265
Pyrene 0.412
RE36-10-7404 2-2.5 ft SOIL
Anthracene 0.042 (J)
Aroclor-1254 0.015
Aroclor-1260 0.0117
Benzo(a)anthracene 0.19
Benzo(a)pyrene 0.194
Benzo(b)fluoranthene 0.414
Benzo(g,h,i)perylene 0.123
Chrysene 0.208
Fluoranthene 0.362
Indeno(1,2,3-cd)pyrene 0.117
Phenanthrene 0.252
Pyrene 0.379

36-610606
RE36-10-7467 0-0.5 ft SED
Acenaphthene 0.0604
Anthracene 0.0213 (J)
Benzo(a)anthracene 0.078
Benzo(a)pyrene 0.0768
Benzo(b)fluoranthene 0.144
Benzo(g,h,i)perylene 0.0562
Chrysene 0.0868
Dibenz(a,h)anthracene 0.0187 (J)
Di-n-butylphthalate 0.0913 (J)
Fluoranthene 0.17
Indeno(1,2,3-cd)pyrene 0.0508
Methylene Chloride 0.00462 (J)
Phenanthrene 0.136
Pyrene 0.157
RE36-10-7468 2-2.9 ft SED
Benzo(a)anthracene 0.0269 (J)
Benzo(a)pyrene 0.0249 (J)
Benzo(b)fluoranthene 0.035 (J)
Benzo(g,h,i)perylene 0.0254 (J)
Chrysene 0.0295 (J)
Fluoranthene 0.0488
Indeno(1,2,3-cd)pyrene 0.0226 (J)
Isopropyltoluene[4-] 0.00294
Phenanthrene 0.028 (J)
Pyrene 0.0372 (J)

36-610583
RE36-10-7421 0-0.5 ft SOIL
Acetone 0.004774 (J+)
Aroclor-1254 0.0444
Aroclor-1260 0.034
Benzo(a)anthracene 0.0199 (J)
Benzoic Acid 0.702 (J)
Chrysene 0.02 (J)
Di-n-butylphthalate 0.168 (J)
Fluoranthene 0.0357 (J)
Phenanthrene 0.0225 (J)
Pyrene 0.036 (J)
Trichloroethene 0.000905 (J+)

36-610607
RE36-10-7469 0-0.5 ft SED
Anthracene 0.0127 (J)
Benzo(a)anthracene 0.0424
Benzo(a)pyrene 0.0386
Benzo(b)fluoranthene 0.0719
Benzo(g,h,i)perylene 0.0355 (J)
Chrysene 0.05
Dibenz(a,h)anthracene 0.0123 (J)
Di-n-butylphthalate 0.211 (J)
Fluoranthene 0.105
Indeno(1,2,3-cd)pyrene 0.0311 (J)
Phenanthrene 0.0829
Pyrene 0.0854
RE36-10-7470 2-3 ft SOIL
Acenaphthene 0.0931
Anthracene 0.158
Benzo(a)anthracene 0.237
Benzo(a)pyrene 0.208
Benzo(b)fluoranthene 0.325
Benzo(g,h,i)perylene 0.161 (J)
Chrysene 0.255
Dibenz(a,h)anthracene 0.0514
Fluoranthene 0.614
Fluorene 0.112
Indeno(1,2,3-cd)pyrene 0.146
Methylnaphthalene[2-] 0.0227 (J)
Naphthalene 0.037 (J)
Phenanthrene 0.762
Pyrene 0.453

36-610608
RE36-10-7471 0-0.8 ft FILL
Acenaphthene 0.556
Anthracene 1.02
Benzo(a)anthracene 1.95
Benzo(a)pyrene 1.74
Benzo(b)fluoranthene 3.04
Benzo(g,h,i)perylene 1.06 (J)
Chrysene 2.11
Dibenz(a,h)anthracene 0.354
Dibenzofuran 0.341 (J)
Fluoranthene 4.74
Fluorene 0.637
Indeno(1,2,3-cd)pyrene 1.01
Isopropyltoluene[4-] 0.000484 (J)
Methylnaphthalene[2-] 0.115
Naphthalene 0.164
Phenanthrene 4.93
Pyrene 3.98
Toluene 0.000869 (J)
Trimethylbenzene[1,2,4-] 0.00499
Trimethylbenzene[1,3,5-] 0.00279
RE36-10-7472 2-3 ft FILL
Anthracene 0.0097 (J)
Benzo(a)anthracene 0.0348 (J)
Benzo(a)pyrene 0.0327 (J)
Benzo(b)fluoranthene 0.0578
Benzo(g,h,i)perylene 0.0268 (J)
Chrysene 0.0366 (J)
Fluoranthene 0.0849
Indeno(1,2,3-cd)pyrene 0.023 (J)
Phenanthrene 0.0594
Pyrene 0.0686

36-610588
RE36-10-7431 0-0.5 ft SOIL
Acenaphthene 3.43
Acenaphthylene 0.0638 (J)
Anthracene 5.03
Benzo(a)anthracene 11.4
Benzo(a)pyrene 10.1
Benzo(b)fluoranthene 19.6
Benzo(g,h,i)perylene 4.88
Bis(2-ethylhexyl)phthalate 0.436 (J)
Chrysene 12.3
Dibenzofuran 2.94
Di-n-butylphthalate 0.377 (J)
Fluoranthene 79.8
Fluorene 4
Indeno(1,2,3-cd)pyrene 4.65
Methylene Chloride 0.00268 (J)
Methylnaphthalene[2-] 1.3
Naphthalene 2.67
Phenanthrene 85.7
Pyrene 75.6
RE36-10-7432 2-2.5 ft SOIL
Acenaphthene 0.563
Anthracene 0.958
Benzo(a)anthracene 2.55
Benzo(a)pyrene 2.08
Benzo(b)fluoranthene 4.12
Benzo(g,h,i)perylene 0.802
Bis(2-ethylhexyl)phthalate 0.178 (J)
Chrysene 2.35
Dibenzofuran 0.404 (J)
Di-n-butylphthalate 0.193 (J)
Fluoranthene 5.88
Fluorene 0.627
Indeno(1,2,3-cd)pyrene 0.81
Methylnaphthalene[2-] 0.153
Naphthalene 0.277
Phenanthrene 5.58
Pyrene 5.34

36-610610
RE36-10-7475 0-0.5 ft SED
Acenaphthene 0.692
Anthracene 1.19
Benzo(a)anthracene 2.08
Benzo(a)pyrene 1.76
Benzo(b)fluoranthene 2.9
Benzo(g,h,i)perylene 1.27 (J)
Chrysene 2.26
Dibenzofuran 0.529
Fluoranthene 5.47
Fluorene 0.843
Indeno(1,2,3-cd)pyrene 1.2
Methylnaphthalene[2-] 0.203
Naphthalene 0.41
Phenanthrene 6.15
Pyrene 3.68
RE36-10-7476 2-3 ft SOIL
Benzo(a)anthracene 0.024 (J)
Benzo(a)pyrene 0.0217 (J)
Benzo(b)fluoranthene 0.0402
Benzo(g,h,i)perylene 0.0194 (J)
Chrysene 0.0251 (J)
Fluoranthene 0.0505
Indeno(1,2,3-cd)pyrene 0.0159 (J)
Phenanthrene 0.0299 (J)
Pyrene 0.0404

36-610827
RE36-10-8285 0-0.5 ft SOIL
Acenaphthene 0.244
Anthracene 0.787
Aroclor-1254 0.137
Aroclor-1260 0.101
Benzo(a)anthracene 4.68
Benzo(a)pyrene 5.94
Benzo(b)fluoranthene 13
Benzo(g,h,i)perylene 3.13
Chrysene 5.7
Di-n-butylphthalate 1.24 (J)
Fluoranthene 7.63
Fluorene 0.253
Indeno(1,2,3-cd)pyrene 3.01
Phenanthrene 3.59
Pyrene 9.03
RE36-10-8286 2-3 ft SOIL
Acenaphthene 0.0145 (J)
Anthracene 0.0304 (J)
Aroclor-1254 0.0791
Aroclor-1260 0.0556
Benzo(a)anthracene 0.171
Benzo(a)pyrene 0.22
Benzo(b)fluoranthene 0.49
Benzo(g,h,i)perylene 0.126
Chrysene 0.269
Di-n-butylphthalate 0.258 (J)
Fluoranthene 0.425
Fluorene 0.034 (J)
Indeno(1,2,3-cd)pyrene 0.111
Phenanthrene 0.212
Pyrene 0.425
Toluene 0.000422 (J-)

36-610585
RE36-10-7425 0-1 ft SOIL
Acenaphthene 0.0353 (J)
Anthracene 0.709
Benzo(a)anthracene 6.25
Benzo(a)pyrene 6.52
Benzo(b)fluoranthene 17.8
Benzo(g,h,i)perylene 2.72
Chrysene 6.76
Fluoranthene 9.25
Fluorene 0.0605 (J)
Indeno(1,2,3-cd)pyrene 2.73
Methylnaphthalene[2-] 0.0235 (J)
Naphthalene 0.0661 (J)
Phenanthrene 1.17
Pyrene 19.1
RE36-10-7426 2-3 ft SOIL
Anthracene 0.171
Benzo(a)anthracene 1.61
Benzo(a)pyrene 1.51
Benzo(b)fluoranthene 2.53
Benzo(g,h,i)perylene 0.623
Chrysene 1.48
Fluoranthene 2.02
Indeno(1,2,3-cd)pyrene 0.628
Isopropyltoluene[4-] 0.00364
Phenanthrene 0.278
Pyrene 2.71
Trimethylbenzene[1,3,5-] 0.00569

36-610825
RE36-10-8281 0-1 ft SOIL
Aroclor-1254 1.03
Aroclor-1260 0.617
Benzo(a)pyrene 0.792 (J)
Benzo(b)fluoranthene 1.7 (J)
Bromodichloromethane 0.00117 (J+)
Chlorodibromomethane 0.000639 (J+)
Chloroform 0.00982 (J+)
Chrysene 0.888 (J)
Di-n-butylphthalate 8.07 (J)
Fluoranthene 1.2 (J)
Isopropyltoluene[4-] 0.000453 (J+)
Methylene Chloride 0.00378 (J+)
Phenanthrene 0.879 (J)
Pyrene 1.44 (J)
RDX 0.106 (J)
Toluene 0.000524 (J+)
RE36-10-8282 2-2.5 ft QBT3
Chloroform 0.00052 (J)

36-610589
RE36-10-7433 0-0.5 ft SOIL
Acenaphthene 0.0613 (J)
Anthracene 0.0889 (J)
Benzo(a)anthracene 0.297
Benzo(a)pyrene 0.263
Benzo(b)fluoranthene 0.517
Benzo(g,h,i)perylene 0.134
Benzoic Acid 1.56 (J)
Chrysene 0.29
Di-n-butylphthalate 0.403 (J)
Fluoranthene 0.617
Fluorene 0.0507 (J)
Indeno(1,2,3-cd)pyrene 0.13
Phenanthrene 0.522
Pyrene 0.731
RE36-10-7434 1-2 ft SOIL
Benzo(a)anthracene 0.0793 (J)
Benzo(a)pyrene 0.061 (J)
Benzo(b)fluoranthene 0.119
Benzo(g,h,i)perylene 0.0374 (J)
Benzoic Acid 1.65 (J)
Chrysene 0.0653 (J)
Fluoranthene 0.149
Indeno(1,2,3-cd)pyrene 0.0337 (J)
Phenanthrene 0.118
Pyrene 0.145

36-610599
RE36-10-7453 0-0.5 ft SOIL
Benzo(a)anthracene 0.0521 (J)
Benzo(a)pyrene 0.0554 (J)
Benzo(b)fluoranthene 0.0752
Benzo(k)fluoranthene 0.0324 (J)
Chrysene 0.0636
Fluoranthene 0.146
Indeno(1,2,3-cd)pyrene 0.0313 (J)
Isopropyltoluene[4-] 0.00185
Phenanthrene 0.089
Pyrene 0.107

36-610828
RE36-10-8287 0-0.5 ft SED
Benzoic Acid 0.335 (J)
Isopropyltoluene[4-] 0.00131 (J)
Toluene 0.00013 (J)
RE36-10-8288 2-3 ft SOIL
Toluene 0.000405 (J+)

36-610596

36-610594

36-610597

36-610623
RE36-10-7487 0-0.5 ft SOIL
Acetone 0.0284
Isopropyltoluene[4-] 0.0246
Toluene 0.00164

36-610595
RE36-10-7485 0-0.5 ft SOIL
Acetone 0.00328 (J+)
Benzo(a)anthracene 0.027 (J)
Benzo(a)pyrene 0.022 (J)
Benzo(b)fluoranthene 0.034
Fluoranthene 0.0374
Phenanthrene 0.0322 (J)
Pyrene 0.0438 (J)
Trichloroethene 0.000622 (J+)
Xylene[1,3-]+Xylene[1,4-] 0.00043 (J+)

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36-610608
RE36-10-7471 0-0.8 ft FILL
Acenaphthene 0.556
Anthracene 1.02
Benzo(a)anthracene 1.95
Benzo(a)pyrene 1.74
Benzo(b)fluoranthene 3.04
Benzo(g,h,i)perylene 1.06 (J)
Chrysene 2.11
Dibenz(a,h)anthracene 0.354
Dibenzofuran 0.341 (J)
Fluoranthene 4.74
Fluorene 0.637
Indeno(1,2,3-cd)pyrene 1.01
Isopropyltoluene[4-] 0.000484 (J)
Methylnaphthalene[2-] 0.115
Naphthalene 0.164
Phenanthrene 4.93
Pyrene 3.98
Toluene 0.000869 (J)
Trimethylbenzene[1,2,4-] 0.00499
Trimethylbenzene[1,3,5-] 0.00279

1633200 1633400 1633600 1633800

1760800 1760600 1760400

Threemile Canyon

36-610580
RE36-10-7415 0-0.5 ft SOIL
Americium-241 0.0246
RE36-10-7416 2-3 ft SOIL
Cesium-137 0.0773

36-610622
RE36-10-7500 2-3 ft SOIL
Cesium-137 0.516
Plutonium-239/240 0.0263

36-610612
RE36-10-7480 2-3 ft SOIL
Cesium-137 0.103

36-610617
RE36-10-7490 2-3 ft SOIL
Cesium-137 0.148

36-610611
RE36-10-7478 2-3 ft SOIL
Cesium-137 0.161

36-610822
RE36-10-8276 2-3 ft SED
Plutonium-238 0.026

36-610821
RE36-10-8273 0-0.5 ft SED
Cesium-137 2.02
Plutonium-239/240 0.0762
RE36-10-8274 2-3 ft SOIL
Cesium-137 0.379

36-610613
RE36-10-7482 2-3 ft SOIL
Cesium-137 0.296

36-610598
RE36-10-7452 2-3 ft SOIL
Cesium-137 0.733
Plutonium-239/240 0.0258

36-610621

36-610823

36-610584
RE36-10-7423 0-0.5 ft SOIL
Americium-241 0.0318
Cesium-137 3.31
Plutonium-239/240 0.0895
Uranium-238 3.27

TA-18

36-610581
RE36-10-7418 2-3 ft SOIL
Cesium-137 0.39

36-610618
RE36-10-7491 0-0.5 ft SOIL
Plutonium-239/240 0.0829
Uranium-238 2.68
RE36-10-7492 2-3 ft SOIL
Cesium-137 0.629

36-610616

36-610586
RE36-10-7427 0-0.5 ft SOIL
Plutonium-239/240 0.087

36-610596
RE36-10-7448 2-3 ft SOIL
Cesium-137 0.312

36-610614
RE36-10-7483 0-0.5 ft SOIL
Americium-241 0.0189
RE36-10-7484 2-3 ft SOIL
Cesium-137 0.553

36-610620
RE36-10-7496 2-3 ft SOIL
Cesium-137 0.415
Plutonium-239/240 0.031

SWMU 36-008

36-610594
RE36-10-7443 0-0.5 ft SOIL
Americium-241 0.0171
RE36-10-7444 2-3 ft SOIL
Cesium-137 0.383

36-610615
RE36-10-7486 2-3 ft SOIL
Cesium-137 0.663
Plutonium-239/240 0.0262

36-610582
RE36-10-7420 2-3 ft SOIL
Cesium-137 0.207

36-610619

36-610597

36-610824
RE36-10-8279 0-0.5 ft SOIL
Uranium-234 3.43 (J+)
Uranium-238 3.24 (J+)
RE36-10-8280 2-3 ft SOIL
Cesium-137 0.614
Uranium-234 3.49 (J+)
Uranium-238 3.01 (J+)

36-610828
RE36-10-8288 2-3 ft SOIL
Cesium-137 0.166

36-610604
RE36-10-7463 0-0.5 ft SOIL
Plutonium-239/240 0.0633
Tritium 0.0125553
RE36-10-7464 2-3 ft SOIL
Tritium 0.00940506

36-610583

36-610623

36-610606

36-610595

36-610576

36-610591

36-610590

Outfall 06A106

36-610592
RE36-10-7439 0-0.5 ft SOIL
Americium-241 0.0169
RE36-10-7440 2-3 ft SOIL
Cesium-137 0.0793

36-610609
RE36-10-7473 0-0.5 ft SED
Cesium-137 1.17

36-610825
RE36-10-8281 0-1 ft SOIL
Tritium 0.0913562
RE36-10-8282 2-2.5 ft QBT3
Tritium 0.15437
Uranium-235/236 0.122

36-610593
RE36-10-7442 2-3 ft SOIL
Cesium-137 0.193

36-610826
RE36-10-8283 0-0.5 ft SOIL
Tritium 0.0241377
Uranium-234 4.43
Uranium-238 3.72
RE36-10-8284 2-3 ft SOIL
Cesium-137 0.326
Tritium 0.0277619
Uranium-234 3.72
Uranium-238 2.88

36-610603
RE36-10-7462 2-3 ft SOIL
Cesium-137 0.139

36-610605
RE36-10-7466 2-3 ft FILL
Cesium-137 0.157
Uranium-238 2.49

36-610579

36-610587

36-610610

36-610600

36-610575

36-610574
RE36-10-7404 2-2.5 ft SOIL
Cesium-137 0.362

SWMU C-36-003

36-610607
RE36-10-7469 0-0.5 ft SED
Americium-241 0.0465
Cesium-137 1.14
RE36-10-7470 2-3 ft SOIL
Cesium-137 0.469
Tritium 0.0346542

36-610608
RE36-10-7471 0-0.8 ft FILL
Tritium 0.0517892

36-610588
RE36-10-7431 0-0.5 ft SOIL
Tritium 0.97974
Uranium-234 4.3
Uranium-238 5.17
RE36-10-7432 2-2.5 ft SOIL
Cesium-137 0.228

36-610599

36-610602
RE36-10-7460 1.5-2.6 ft QBT2
Cesium-137 0.0986

36-610601
RE36-10-7458 2-3 ft SOIL
Cesium-137 0.156

SWMU 36-003(a)

36-610589
RE36-10-7433 0-0.5 ft SOIL
Plutonium-239/240 0.0953
RE36-10-7434 1-2 ft SOIL
Cesium-137 0.31

36-610585
RE36-10-7426 2-3 ft SOIL
Cesium-137 0.166

36-610827
RE36-10-8285 0-0.5 ft SOIL
Tritium 0.0812778
Uranium-234 6.1
Uranium-235/236 0.278
Uranium-238 4.51
RE36-10-8286 2-3 ft SOIL
Cesium-137 0.143
Uranium-234 3.21
Uranium-238 2.62

POTRILLO DR

TA-36

36-214 36-47 36-46 36-1 36-53 36-17

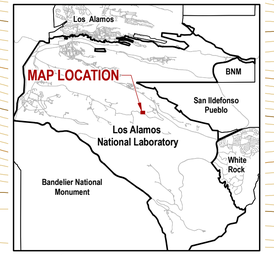
6760 6770 6780 6790 6800 6810 6820 6830 6840 6850 6870 6880 6890

N W E S

0 25 50 75

Feet
1:400

STATE PLANE COORDINATE SYSTEM,
NEW MEXICO, CENTRAL ZONE, US FT
NORTH AMERICAN DATUM 1983
NATIONAL GEODETIC VERTICAL DATUM 1929



- Manhole
- Outfall
- Sampling location
- Structure or building
- SWMU or AOC

- Fence
- Paved road
- Storm drain
- TA boundary
- Unpaved road

Elevation contours
- 100-ft and 20-ft contour
- 10-ft contour
- 2-ft contour

Utilities
- C Communication
- E Electric
- G Gas
- S Sewer
- W Water

Note: Concentrations are in pCi/g

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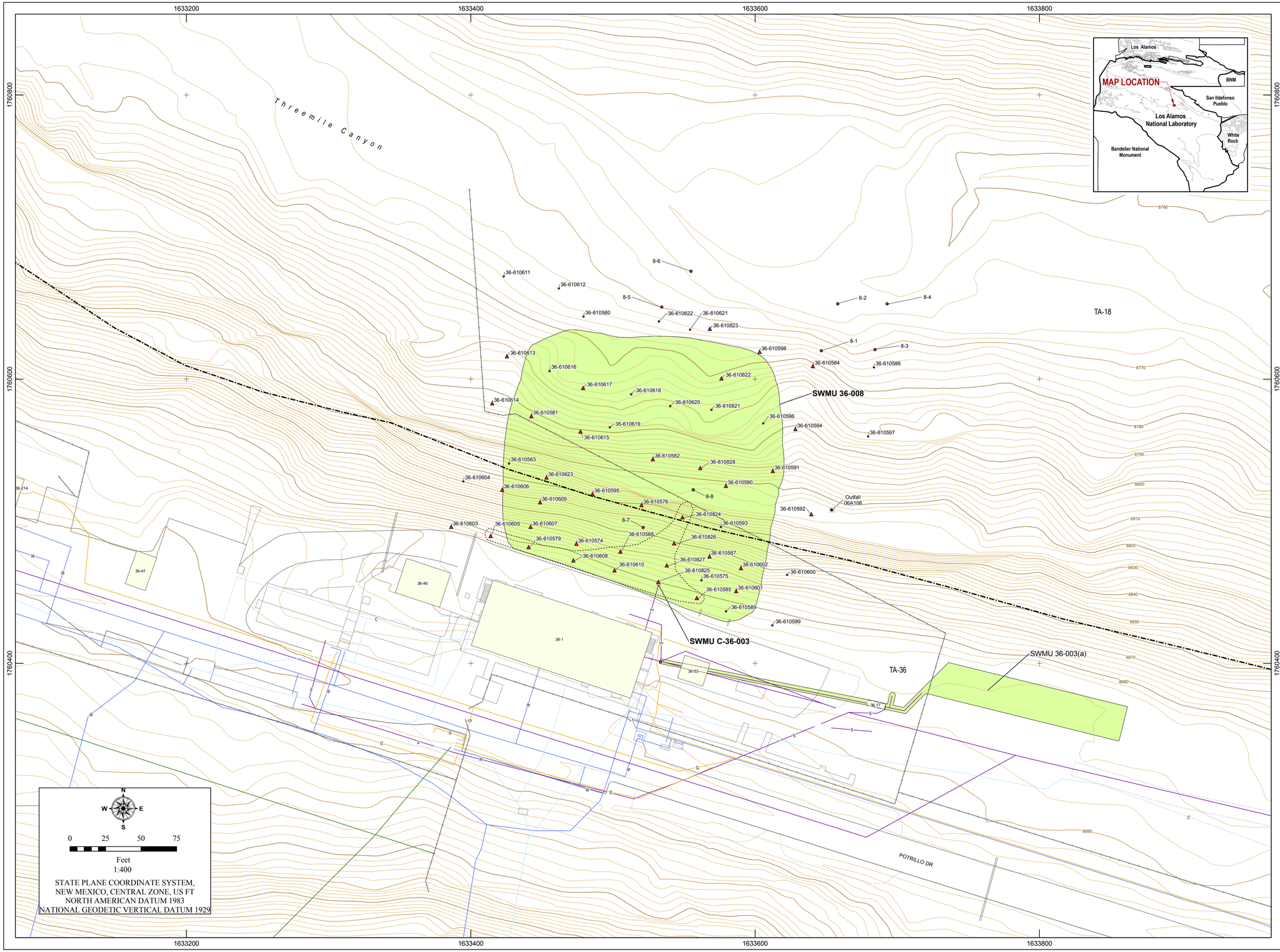
Plate 32

Radionuclides detected or detected above BVs/FVs at SWMUs 36-008 and C-36-003

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-19.4-PLT RAD 15 MARCH 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
Revised 23 May 2011 by AdelanteConsultingInc.

This map was created for work processes associated with the Corrective Actions Projects (CAP) of the Los Alamos National Laboratory (LANL) Environmental Programs (EP) Directorate. All other uses for this map should be confirmed with LANL EP-CAP staff.



- Proposed location to resample
- Proposed new sampling location
- Sampling location
- Manhole
- Outfall
- Proposed soil removal
- Structure or building
- SWMU or AOC
- Underground structure
- Fence
- Paved road
- Storm drain
- TA boundary
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Elevation contours

- 100-ft and 20-ft contour
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Utilities

- Communication
- Electric
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Plate 33

Proposed sampling locations at SWMUs 36-008 and C-36-003

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ENVIRONMENTAL PROGRAMS DIRECTORATE
CORRECTIVE ACTIONS PROJECTS
Los Alamos, New Mexico 87545

Map# 3MC10-IR-19.1-PLT SITE 15 MARCH 2010 CRUZ
Los Alamos Technical Associates (LATA-LAO)
Revised 23 May 2011 by AdelanteConsultingInc.

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